Intergenerational social mobility and health: the inequality paradox

Patrick Deboosere

Systematic and persistent differences in health and mortality according to socio-economic position have been established for decades. Since the Black Report (1980) formulated several hypotheses to explain the persistence of these inequalities in the UK (artefact, health selection, behavioural and materialist causation), a consensus emerged mainly based on longitudinal studies. "Causation" is largely accepted as the main explanation for socio-economic inequalities in health with "health selection" being of minor importance. However, there is some evidence that health selection processes are becoming more important over time, especially to explain the persistence in inequality among the lowest educated groups in the younger part of the population. This observation has implications for the evaluation of health inequality measures.

Methods and data

the birth cohorts of 1972 to 1976 have been selected on the basis of the 1991 census. As most young people aged 15 to 19 live with their parents, we were able to retrieve the parental characteristics in 1991 for most members of these birth cohorts. Only children living in the parental household have been withhold, excluding about 1% living in other types of household (collective households, living with grand-parents, single or already married). Of these 603.428 young men and women selected in 1991, 27.081 were not in the 2001 census due to migration or mortality. In 2001 the 1972-76 birth cohorts were aged between 24 and 29 years and most of them have attained a final educational level or can be classified according to.

The Belgian 2001 census included several questions related to health. The response rate for most of the health-related questions was around 95%.

Educational level has been coded in 5 educational levels according to the ISCED classification. Parental education in 1991 and own education in 2001 allows for the construction of transition matrices. For each cell of a transition matrix the proportion of persons in bad health could be calculated. By using Standardised Illness Ratios (SIR) for each combination of the risk of illness is given by educational mobility.

The educational transition matrix is constructed by classifying parental education in rows and own educational attainment in columns. In table 1 the overall totals are given by row. About 8% of the men (21.179) and women (20.329) of the 1972-76 Belgian birth cohorts appear to have a parental household where both parents (or the only parent in monoparental households) declare to have no formal education. The four other groups sorted by parental educational categories are roughly of equal numerical importance. However the percentage of children that is reaching higher education is largely dependent on the parental educational attainment and varies between 16,5% and 71,2% for men and 24% and 83% for women. Among the men and women in the birth cohorts 1972-76 without formal education an inverse gradient according to the parental educational level is also observed going from 0,4% to 3,2% for men and from 0,3% to 2,5% for women. In absolute numbers these are

relatively small groups with the smallest group including 165 women (0,3%) in higher educated parental households and the largest 788 men (1,5%) in parental households with elementary education as highest educational level.

	Highest educational attainment 72-76 birth cohorts					
Parental education men	no formal	elementary	lower sec.	higher sec.	higher	total
no formal education	3,2	4,5	28,5	47,3	16,5	21179
elementary education	1,5	3,7	23,2	48,8	22,7	53480
lower secondary	1,0	2,0	17,8	46,3	33,0	75717
higher secondary	0,7	1,2	10,8	41,1	46,2	56851
higher education	0,4	0,5	4,5	23,4	71,2	61426
total	1,1	2,0	15,2	40,5	41,2	268653

Parental education women	no formal	elementary	lower sec.	higher sec.	higher	total
no formal education	2,5	3,2	23,1	47,2	24,0	20329
elementary education	1,2	2,2	16,4	45,9	34,4	51596
lower secondary	0,8	1,1	11,1	39,6	47,4	72808
higher secondary	0,6	0,6	6,4	31,4	61,1	55303
higher education	0,3	0,3	2,1	14,4	83,0	59420
total	0,8	1,2	10,0	33,9	54,0	259456

Table 1 Transition matrix parental education (1991) - own education (2001): row percentages and total number of persons

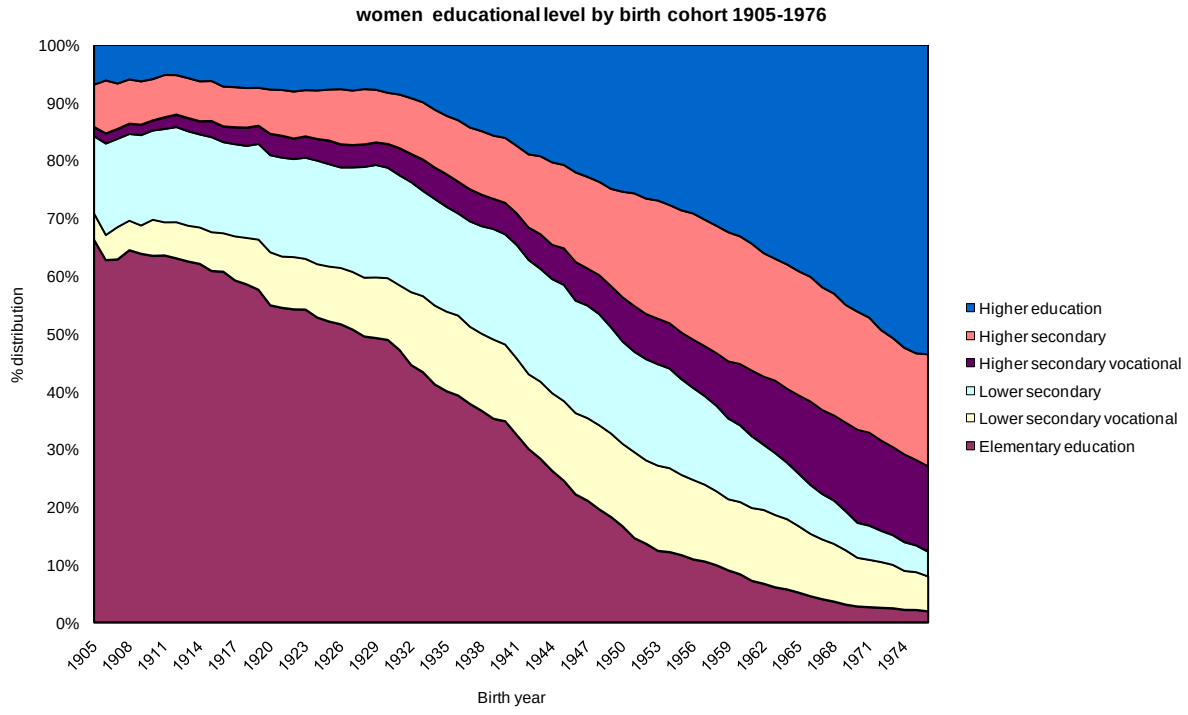

Fig. 1 Cross section by birth cohort and educational level of the 2001 female Belgian population: 100% distributions by birth cohort

The transition matrix for the 1972-76 birth cohorts illustrates the tremendous shift in educational level between different generations. This evolution is also visible in a cross sectional view by birth cohort and educational level of the female population in the 2001 Belgian census (fig 1).

Results

By concentrating on the transition of the youngest generations, we have to be aware that this analysis is not necessarily relevant for the older generations where lower education was more common among the population. In table 2 the prevalence of less than good health for each cell of the transition matrix has been calculated. There is a very strong association between health and education, but clearly this association is mainly linked to the own educational attainment. In fact the overall picture is a health gradient combining the own educational attainment with parental educational attainment, with the latter being less pronounced. The ratios in prevalence of less than good health by column in table 2 reveal however a pattern with some specific deviations. The high ratios for bad health among men and women without formal education coming from high educated parental households can be explained by several hypotheses. However health selection is probably the most important mechanism. Health problems are at the origin of low educational attainment and not the other way around. Although the selection process is only illustrated for the younger generations, the impact of this evolution is not trivial depending on the inequality measures used.

	Highest educational attainment 72-76 birth cohorts					
Parental education men	no formal	elementary	lower sec.	higher sec.	higher	total
no formal education	23,2	25,1	17,0	11,9	7,5	21179
elementary education	23,5	21,3	13,9	9,3	5,6	53480
lower secondary	24,4	19,7	12,8	8,5	4,7	75717
higher secondary	23,7	22,8	13,3	8,2	4,8	56851
higher education	35,4	23,5	13,7	8,6	4,3	61426
total	2864	5462	40850	108859	110618	268653
Parental education women						
Geen diploma	25,5	27,1	20,5	12,5	7,9	20329
Lager onderwijs	23,3	26,1	17,0	10,1	5,0	51596
Lager secundair	24,7	23,2	16,9	8,8	4,5	72808
Hoger secundair	23,8	22,8	15,9	8,0	4,2	55303
Hoger onderwijs	29,7	33,8	18,9	9,6	3,9	59420
totaal	2183	3070	26041	87981	140181	259456

Table 2 Transition matrix parental education (1991) - own education (2001): prevalence of less than good self-assessed health for each transition cell

	Highest educational attainment 72-76 birth cohorts					
Parental education men	no formal	elementary	lower sec.	higher sec.	higher	total
no formal education	0,9	1,1	1,2	1,3	1,6	21179
elementary education	0,9	1,0	1,0	1,0	1,2	53480
lower secondary	1,0	0,9	0,9	0,9	1,0	75717
higher secondary	1,0	1,0	1,0	0,9	1,0	56851
higher education	1,4	1,1	1,0	1,0	0,9	61426
total	24,8	21,9	13,9	8,9	4,7	268653
Parental education women						totaal
no formal education	1,0	1,1	1,2	1,3	1,8	20329
elementary education	0,9	1,0	1,0	1,1	1,1	51596
lower secondary	1,0	0,9	1,0	0,9	1,0	72808
higher secondary	1,0	0,9	0,9	0,8	1,0	55303
higher education	1,2	1,3	1,1	1,0	0,9	59420
total	24,7	25,6	17,5	9,5	4,4	259456

Table 3 Transition matrix parental education (1991) - own education (2001): health prevalence ratio off each transition cell compared to column total

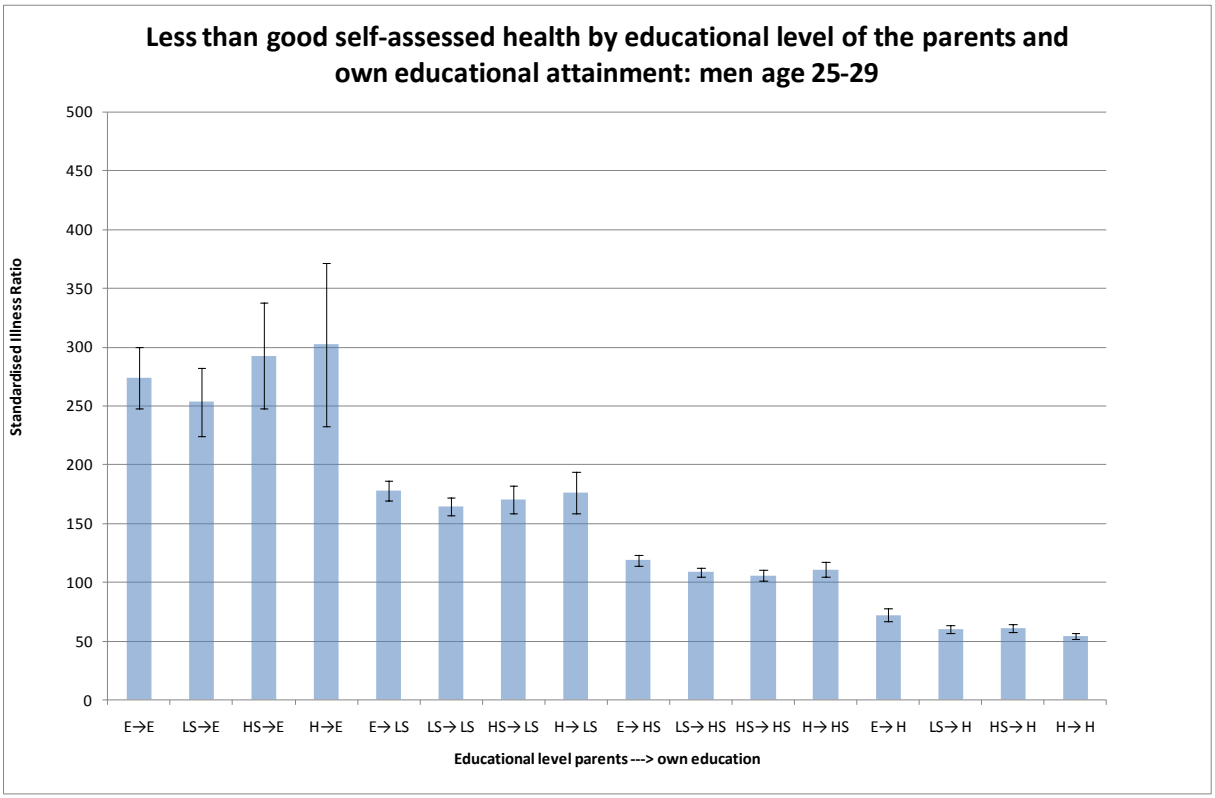

Fig. 2 Standardised Illness Ratios (and 95% C.I.) for men by origin-destination transition of parental educational level and own educational level (E: elementary; LS: lower secondary; HS: higher secondary; H: higher education)

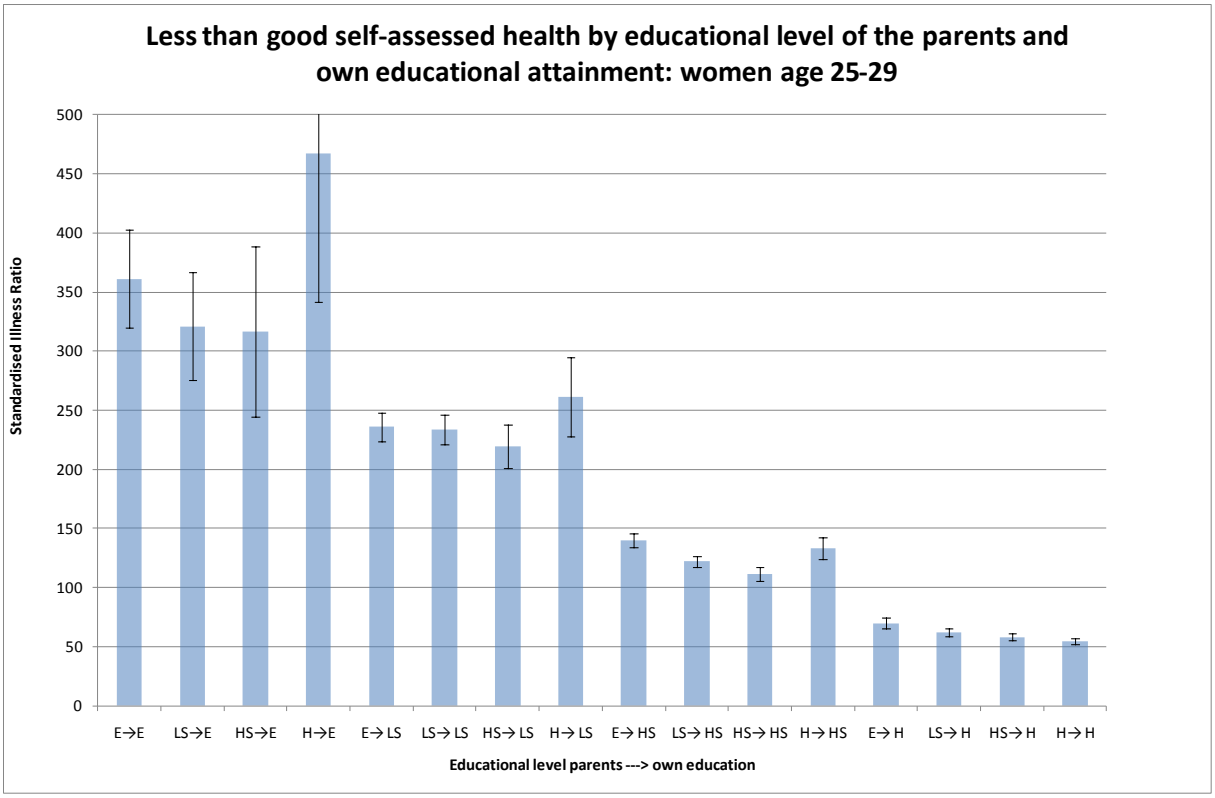

Fig. 3 Standardised Illness Ratios (and 95% C.I.) for women by origin-destination transition of parental educational level and own educational level (E: elementary; LS: lower secondary; HS: higher secondary; H: higher education)

Discussion

Using a large census population allows for a more robust interpretation of some relations between parental education, own education and health. Causal relations cannot be quantified due to the lack of a health measure at the start of the observation period, but the patterns of health by transition are very clear and allow to formulate some hypotheses.

1. The health selection mechanism is probably increasingly important for the composition of the lowest educational groups. It is unlikely that such a high proportion of bad health is the result of lower educational attainment. It is even less likely that high educated parents, with many resources at their disposal, don't do everything that is within the bounds of possibilities to stimulate their children to reach higher educational levels. Bad health (including mental health, maybe not reported here) is presumably the main explicative factor for the low educational attainment of this group. The very small numbers involved (< 1%) are also pointing in this direction. Moreover, the fact that the prevalence of bad health in the lowest educated group - regardless the parental education - is very similar, suggests a health selection effect as an important factor in the association between health and lower education for all the cells in the first column of the transition matrix and gradually decreasing in importance in the other columns.

2. This observation does not exclude another conclusion: education does still matter for the health outcome. Although no causal relationship can be established based on these data, there is a clear

health gradient in the association between educational level and health suggesting a strong interaction effect besides the health selection. In this regard it is clear from the SIR's that one's own education is a much stronger predictor for health outcome than parental education.

3. The link between health and parental education is apparently mainly explained by the opportunities depending on parental education to attain higher educational levels.

4. There are life course cumulative effects. The combination of parental education with one's own education creates a global gradient in health outcome. The exceptions in this global gradient document the relative importance of selection mechanisms.

Implications for policy:

1. Education still matters. It is the strongest factor to enhance social mobility and improve both standards of living and the health of younger generations.

2. Egalitarian policies can contribute to sharper inequalities in the link between educational level and health because of inverse selection processes. This does not mean that egalitarian policies have to be abandoned. Quite the contrary. But it implies that by measuring health inequalities we have to correctly assess the impact of this mechanism that probably helps to explain why - depending on the inequality measures used - more "egalitarian" countries may still have high health inequalities by SEP.

3. The unequal access to higher education depending on the parental educational level demonstrates that, in spite of the democratization of higher education, our societies still have to improve the efforts to give all children equal opportunities in education. The gradient in educational attainment depending on the educational attainment of both parents (appendix) demonstrates the strong cumulative effect of the conditions of the parental household in the creation of opportunities.

4. Nationality of origin and migration (not documented) are important factors that contribute to the lower educational levels from both parents and the birth cohorts of 1972 to 1976. Additional attention is needed for children from migrant origin to cope with this extra obstacle.

5. Finally, when analyzing the relationship between the transition matrix and health, it becomes clear that promoting higher education may contribute to a higher level of general population health, but that at a certain level, such a policy also can result in the paradoxical increase of inequality in health by educational level. This implies that we have to fine tune our measurement of inequality when looking for the adequate policies to tackle health inequalities and that we have to pay attention to the difficult situation of parents and children confronted with both health and educational problems.

Bibliography

Bartley, M. and I. Plewis (2007). "Increasing social mobility: an effective policy to reduce health inequalities." Journal of the Royal Statistical Society: Series A (Statistics in Society) **170**(2): 469-481.

Ben-Shlomo, Y. and D. Kuh (2002). "A life course approach to chronic disease epidemiology: conceptual models, empirical challenges and interdisciplinary perspectives." International Journal of Epidemiology **31**: 285-293.

Bossuyt, N., S. Gadeyne, et al. (2004). "Socio-economic inequalities in health expectancy in Belgium." Public Health **118**(1): 3-10.

Boyle, P. J., P. Norman, et al. (2009). "Social mobility: Evidence that it can widen health inequalities." Social Science & Medicine **68**(10): 1835-1842.

Deboosere, P., S. Gadeyne, et al. (2009). "The 1991-2004 Evolution in Life Expectancy by Educational Level in Be lgium Based on Linked Census and Population Register Data." European Journal of Population **25**(2): 175-196.

Elstad, J. I. and S. Krokstad (2003). "Social causation, health-selective mobility, and the reproduction of socioeconomic health inequalities over time: panel study of adult men." Social Science & Medicine **57**(8): 1475-1489.

Gadeyne, S. and P. Deboosere (2002). "De ultieme ongelijkheid: sterfteverschillen bij Belgische mannen en vrouwen naar socio-economische karakteristieken en huishoudenstype." Belgisch Tijdschrift voor Sociale Zekerheid **44**(1): 571-571.

Huisman, M., A. E. Kunst, et al. (2005). "Educational inequalities in cause-specific mortality in middle-aged and older men and women in eight western European populations." The Lancet **365**(9458): 493-500.

Kuh, D. and Y. Ben-Shlomo (1997). A life course approach to chronic disease epidemiology, Oxford University Press.

Lundberg, O. (1991). "Childhood Living Conditions, Health Status, and Social Mobility: A Contribution to the Health Selection Debate." Eur Sociol Rev **7**(2): 149-162.

Manor, O., S. Matthews, et al. (2003). "Health selection: the role of inter- and intra-generational mobility on social inequalities in health." Social Science & Medicine **57**(11): 2217-2227.

Marmot, M. (2005). "Social determinants of health inequalities." The Lancet **365**: 1099-1104.

Marmot, M. and R. G. Wilkinson, Eds. (1999). Social determinants of health. Oxford, Oxford University Press.

Power, C., S. Matthews, et al. (1996). "Inequalities in self rated health in the 1958 birth cohort: lifetime social circumstances or social mobility?" BMJ **313**(7055): 449-453.

Tan, B. (1998). Blijvende Sociale ongelijkheden in het Vlaamse onderwijs. Berichten/UFSIA, Centrum voor Sociaal Beleid. Antwerpen**:** 30.

Tiikkaja, S. and Ö. Hemstrom (2008). "Does intergenerational social mobility among men affect cardiovascular mortality? A population-based register study from Sweden." Scandinavian Journal of Public Health **36**(6): 619-628.

van de Mheen, D., K. Stronks, et al. (1998). A lifecourse perspective on socio-economic inequalities in health: the influence of childhood socio-economic conditions and selection processes. The sociology of health inequalities. M. Bartley, D. Blane and G. Davey-Smith. Oxford, Blackwell Publishers**:** 241-254.

Van Oyen, H., N. Bossuyt, et al. (2005). "Differential inequity in health expectancy by region in Belgium." Sozial und Praventivmedizin **50**(5): 301-310.

Verbergt, G., B. Cantillon, et al. (2009). Sociale ongelijkheden in het Vlaams onderwijs: tien jaar later. Berichten/UFSIA, Centrum voor Sociaal Beleid. Antwerpen**:** 8.

West, P. (1991). "Rethinking the health selection explanation for health inequalities." Social Science and Medicine **32**(4): 373-384.

Wilkinson, R. G. (1986). Socio-economic differences in mortality: interpreting the data on their size and trends. Class and health. Research and longitudinal data. R. G. Wilkinson. London, New York, Tavistock Publications**:** 1-20.

Wunsch, G., J. Duchêne, et al. (1996). "Socio-economic differences in mortality. A life course approach." European Journal of Population **12**(2): 167-185.

Appendix

		educational level birth cohort 72-76					
educational level parents (father - mother)	code	no formal	element.	lower sec.	higher sec.	higher	N
higher education - higher education	44	0,3	0,2	1,7	12,7	85,0	58004
higher education - higher secundary	43	0,4	0,4	3,2	21,6	74,5	27130
higher secundary - higher education	34	0,5	0,3	3,4	22,3	73,5	16873
higher education (monoparental)	4	0,4	0,7	6,0	24,7	68,1	14389
onbekend - higher education	94	0,9	0,0	7,2	24,2	67,7	570
higher education - lower secundary	42	0,4	0,5	5,2	26,8	67,2	17870
lower secundary - higher education	24	0,5	0,5	5,0	27,0	66,9	9777
elementary - higher education	14	0,4	1,1	8,0	30,6	59,9	2786
higher education - unknown education	49	1,2	0,8	6,7	32,0	59,2	490
higher secundary - higher secundary	33	0,5	0,6	6,0	34,4	58,6	32344
higher education - elementary	41	0,6	1,6	8,3	32,1	57,4	3986
no formal education - higher education	04	0,6	1,1	9,7	34,8	53,8	535
higher secundary - lower secundary	32	0,6	0,8	9,3	39,8	49,5	33259
lower secundary - higher secundary	23	0,7	0,9	9,5	40,1	48,8	25266
higher education - no formal education	40	1,6	0,5	11,3	39,8	46,8	573
higher secundary (monoparental)	3	0,9	1,7	13,4	39,4	44,5	15464
unknown education - higher secundary	93	1,4	2,0	12,4	40,8	43,3	902
lower secundary - lower secundary	22	0,8	1,2	13,8	44,2	40,2	60805
higher secundary - elementary	31	0,8	1,5	12,9	44,9	39,9	12410
elementary - higher secundary	13	0,7	1,5	12,9	45,5	39,4	10212
higher secundary - unknown education	39	1,8	2,2	17,0	44,9	34,2	731
lower secundary - elementary	21	1,0	2,2	17,3	46,9	32,6	26852
elementary - lower secundary	12	1,0	2,0	17,6	47,5	32,0	27281
no formal education - higher secundary	03	1,9	2,5	16,4	47,5	31,7	2604
higher secundary - no formal education	30	1,9	2,2	18,1	46,5	31,2	2518
lower secundary (monoparental)	2	1,2	2,8	21,6	44,1	30,3	21564
lower secundary - unknown education	29	2,5	3,2	22,3	43,1	28,9	1132
unknown education - lower secundary	92	2,2	2,8	20,9	45,5	28,7	1744
elementary - elementary	11	1,4	3,2	20,0	49,2	26,2	42793
unknown education (monoparental)	9	3,1	6,0	28,7	36,6	25,6	2174
unknown education - unknown education	99	3,8	4,0	26,3	40,6	25,2	4299
lower secundary - no formal education	02	1,6	2,8	21,9	49,1	24,6	6556
no formal education - lower secundary	20	2,1	2,8	22,1	48,7	24,3	5207
unknown education - elementary	91	2,0	4,4	25,5	46,4	21,7	1713
elementary - unknown education	19	2,7	5,0	24,3	47,7	20,3	1499
elementary (monoparental)	1	2,1	4,9	27,4	45,9	19,7	14955
no formal education - elementary	01	2,3	4,1	25,5	48,4	19,7	7702
no formal education - unknown education	09	2,3	4,9	28,3	45,2	19,2	1609
elementary - no formal education	10	2,5	4,1	26,3	47,8	19,2	7154
unknown education - no formal education	90	2,6	3,8	29,4	45,9	18,2	1974
no formal education - no formal education	00	3,6	3,8	27,4	47,9	17,3	16764
no formal education (monoparental)	0	3,8	5,7	31,4	43,3	15,8	6423
total		***0,9***	***1,6***	***12,5***	***37,2***	***47,7***	***532414***

Educational level of the 1972-1976 birth cohorts in 2001 according to the educational level of both parents in 1991 (Statistics Belgium: census data)