Family Status and Low Birth Weight Risk: Trends and Changes over Time

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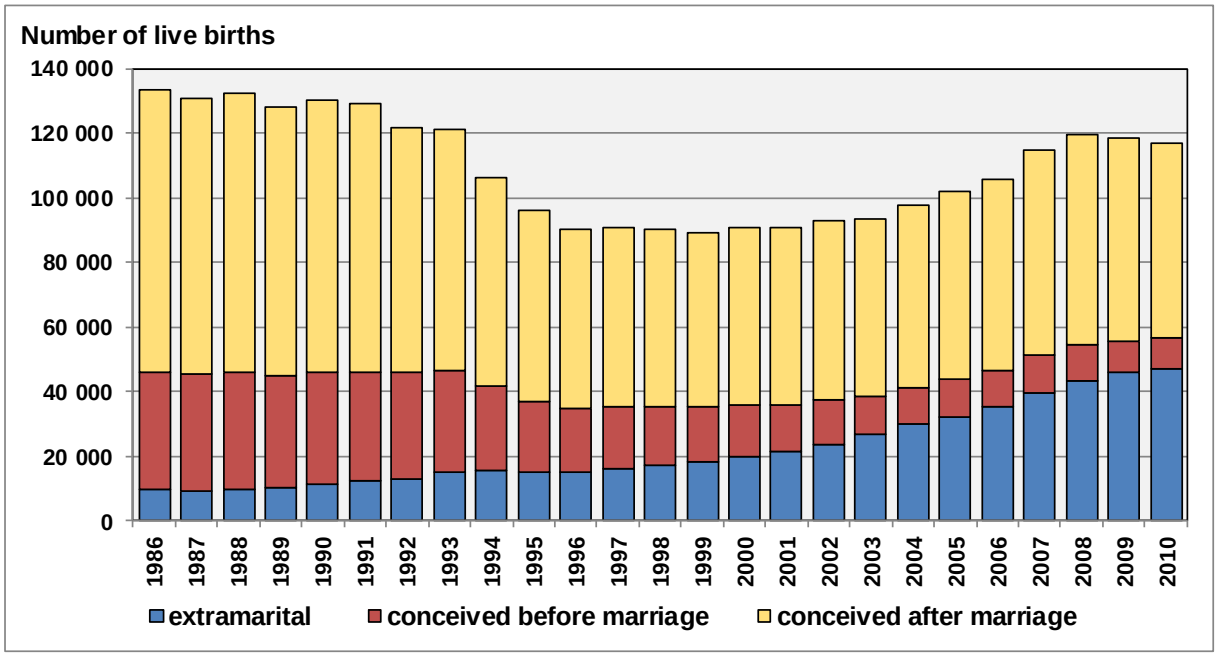
The frequency of children born with low birth weight (less than 2 500 grams) has recently increased in the Czech Republic. In 2010, 8.2 % live births with low birth weight were reported, compared to only 5.7 % in 1986. Over the same time period, the percentage of extramarital live births increased from 7.4 % to 40.3 %. Unmarried mothers are often considered to be more likely to deliver a low-birth weight baby. However, the adverse effect on low birth weight outcome can also vary according to age, education and other factors. In addition, the increasing size of the population of unmarried mothers is becoming more heterogeneous today than in the past when they represented a small marginal group. The proposed research focuses on examining changes in low birth weight over time (1986-2010) across three groups of live births: children born to unmarried women, those coming from premarital conceptions, and children conceived after marriage. The analysis also allows us to compare the impact of two different socio-economic settings (before and after 1989) on birth weight. The aim is primarily to disentangle the effect of changing structure of mothers from the effects of intensity change. In the first stage, the trends in low birth weight by three family statuses (extramarital, premarital, and marital) for the years 1986-2010 will be compared based on several risk factors changing over time (multiplicity, maternal age, birth order, and educational attainment). Next, logistic regression will be used to estimate the unadjusted and adjusted odds ratios of risk factors for low birth weight (dependent variable). The data are individual anonymous records of vital statistics (2 735 238 live births) collected by the Czech Statistical Office for the period 1986-2010.

Figure 1 Trends in live births according to three family statuses; Czech Republic 1986-2010



Between 1986 and 2010 the total number of live births decreased in the Czech Republic from 133 356 to 117 153 passing through the minimum of 89 471 live births in 1999 (Figure 1). However, the number of extramarital live births increased from 9 892 to 47 164 while those of conceived within 0-7 completed months before marriage decreased during the same time

period from 36 354 to 9 290. Live births of unmarried mothers are predominantly children born to single women (69.4 % in 1986 and 83.8 % in 2010). These mothers are more likely to be young and less educated, therefore they have more frequently low birthweight babies. Premarital conceptions are found at the beginning of the study, primarily among women who did not have access to or had limited access to modern contraception. During the 1990s; however, contraception use widely increased; therefore children conceived before marriage during that period of time could have been planned intentionally. The increase in the number of extramarital births was marked by a decrease in the proportion of low birth weights babies (Figure 2), however higher risk of poorer birth outcome (compared with marital live births) have persisted over time. Consequently the increase of extramarital births has contributed to the overall rise in the percentage of low birth weight for the whole live birth population. More striking phenomenon is seen when looking at the growing proportion of low birth weight among children born within marriage (Figure 2). The impact of assisted reproduction and consequently of increasing numbers of multiple births or older maternal age can affect the trend.

Figure 2 Trends in levels of low birth weight; Czech Republic 1986-2010

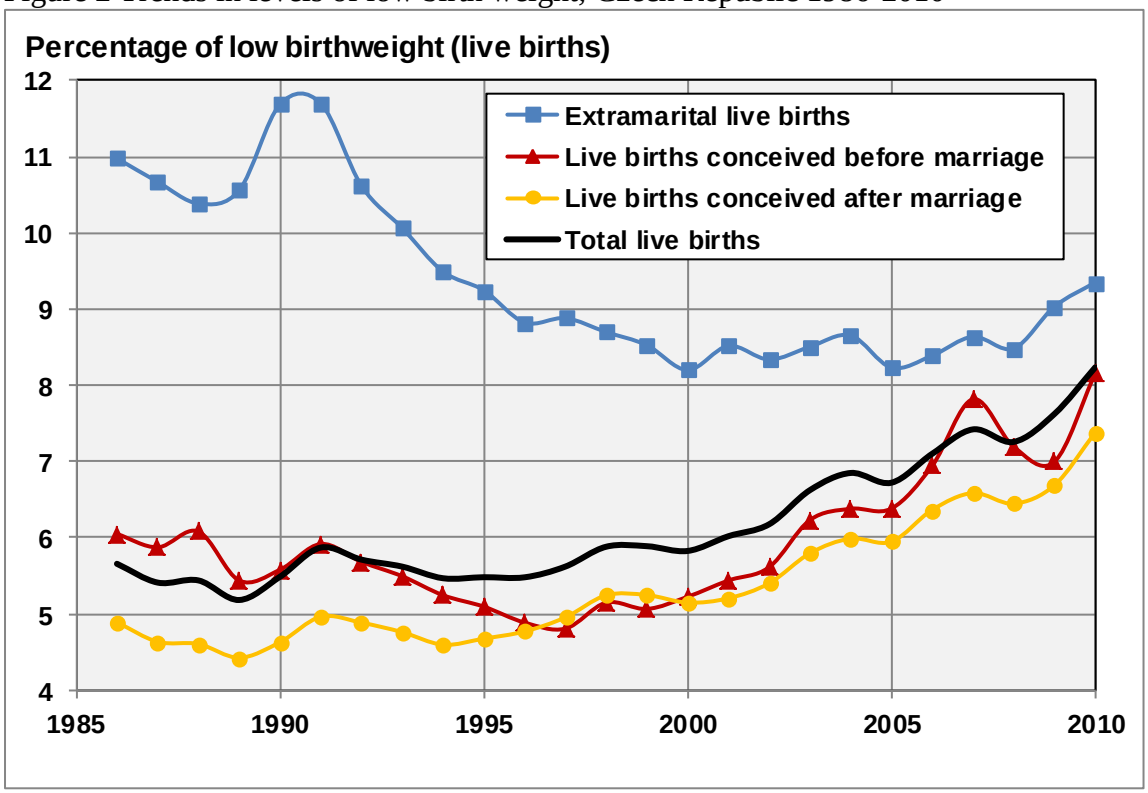


Table 1 shows the results of the binary logistic regression analysis used in order to investigate the relationship between the low birthweight and the set of explanatory variables with their respective categories (mother's age, biological birth order, mother's education, multiplicity of births, family status, and calendar year). Multiple births are the known risk factor for low birth weight. Old age (40+), low education, first and higher birth orders as well as being born out of wedlock are also associated with low birth weight. Surprisingly, the time trend (across calendar years) disappeared after adjustment for other variables in the model. It indicates that there is not real increase in the proportion of low birth weight in the Czech Republic. However, in order to understand more closely and to identify precisely the role played by individual factors, additional binary logistic regressions will be made separately for each family status.

Table 1: Impact of biological and social factors on the occurrence of low birth weight

Predictor	Contrast	Pr > ChiSq	OR
mother's age		*<.0001*	
	15-19 vs 20-24	<.0001	1.07
	25-29 vs 20-24	<.0001	1.05
	30-34 vs 20-24	<.0001	1.16
	35-39 vs 20-24	<.0001	1.38
	40+ vs 20-24	<.0001	1.73
child birth order		*<.0001*	
biological	1 vs 2	<.0001	1.41
	3 vs 2	0.0006	1.03
	4+ vs 2	<.0001	1.41
mother's education		*<.0001*	
	basic vs vocational	<.0001	1.89
	secondary vs vocational	<.0001	0.80
	university vs vocational	<.0001	0.73
multiple birth		*<.0001*	
	2+ vs 1	<.0001	26.36
family status		*<.0001*	
	extramarital vs marital	<.0001	1.45
	premarital vs marital	<.0001	1.06
calendar year		*<.0001*	
	1987 vs 1986	0.0043	0.95
	1988 vs 1986	0.3191	0.98
	1989 vs 1986	0.0004	0.94
	1990 vs 1986	0.9022	1.00
	1991 vs 1986	0.0003	1.07
	1992 vs 1986	0.3684	1.02
	1993 vs 1986	0.9346	1.00
	1994 vs 1986	0.0027	0.95
	1995 vs 1986	<.0001	0.92
	1996 vs 1986	<.0001	0.90
	1997 vs 1986	<.0001	0.90
	1998 vs 1986	<.0001	0.90
	1999 vs 1986	<.0001	0.89
	2000 vs 1986	<.0001	0.90
	2001 vs 1986	<.0001	0.90
	2002 vs 1986	0.0001	0.93
	2003 vs 1986	0.5624	0.99
	2004 vs 1986	0.7603	0.99
	2005 vs 1986	0.0681	0.97
	2006 vs 1986	0.8997	1.00
	2007 vs 1986	0.0007	1.06
	2008 vs 1986	0.1677	1.03
	2009 vs 1986	0.0002	1.07
	2010 vs 1986	<.0001	1.14