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Karsten Hank

**Childbearing history, later life health,
and mortality in Germany**

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Childbearing history, later life health, and mortality in Germany

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Abstract: Using data from the German Socio-Economic Panel, we investigated the role of childbearing history in later life health and mortality, paying particular attention to possible differences by sex and region. Higher parity is associated with better self-rated health in Western German mothers and fathers aged 50+, but its relationship with Eastern German women's physical health and survival is negative. Early motherhood is paralleled by poorer physical health in West Germany, whereas late motherhood is associated with lower psychological well-being in East Germany. Moreover, among Western German women, having had a non-marital first birth is weakly correlated with lower physical health. Our findings support the notion of biosocial pathways playing an important role in shaping the fertility-health-nexus. Specifically, the Western German 'male breadwinner' model of specialisation appears to have buffered the stresses associated with childrearing, whereas fertility off the 'normative' life course track supposedly had adverse effects on women's health in West Germany.

Keywords: reproductive history; health; mortality; life course; SOEP

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Introduction

In his review of 'New Directions in Life Course Research' Mayer (2009) identifies the trajectories of health outcomes as one of the fastest growing research areas in life course sociology and related fields, where an important research track concerns the linkages between early conditions and later life health, morbidity, and mortality (also see Grundy and Holt 2000; van den Berg et al. 2009). Along these lines, recent studies investigated possible linkages between women's reproductive history and various dimensions of later life health (e.g., Grundy and Tomassini 2005; Spence 2008; Sudha et al. 2006) or mortality (e.g., Doblhammer 2000; Grundy and Kravdal 2008; Hurt et al. 2006). The main issue in this literature is to analyse differences between parents and childless individuals (e.g., Kendig et al. 2007; Zhang and Hayward 2001) or to address differential effects of early and late childbearing (e.g., Henretta 2007; Mirowsky 2005). Such research seems of particular interest against a demographic background which is characterized by increasing rates of childlessness as well as a trend towards late fertility (e.g., Billari et al. 2007; Rowland 2007) and a fast growing older population, whose quality of life depends substantially on the future development of health trends (e.g., Crimmins 2004; Parker and Thorslund 2007).

The present study uses data from the German Socio-Economic Panel (SOEP) to analyse the role of childbearing history in a variety of later life health outcomes, including mortality. Germany's population as a whole is among the fastest ageing worldwide (cf. Birg and Flöthman 2002). However, assuming that particular societal contexts might matter for health related consequences of individuals' fertility behaviour (e.g., Grundy 2009), we pay particular attention to possible differences between Eastern and Western Germany. The two parts of the country were not only characterized by different political

and economic systems after World War II, but also by quite different demographic regimes, with distinct – though slowly converging – fertility and mortality patterns until today (e.g., Kreyenfeld 2004; Luy 2004). Moreover, for health outcomes other than mortality, our data source allows us to take a gendered perspective. Thus, our study also adds to the so far very limited literature addressing the association between older men's reproductive history and well-being (cf. Grundy and Kravdal 2008; Grundy and Tomassini 2006).

The remainder of this article is structured as follows: The next section provides some background information on childbearing and childrearing patterns in East and West Germany and how differences therein might be associated with different health outcomes in later life. We then give a brief overview of theory and evidence regarding the mechanisms driving the childbearing-health-nexus as well as empirical evidence on the association between reproduction and physical health, mental health, and mortality. After that our data and measures are introduced, followed by a detailed description of results. The final section concludes.

Background: childbearing and childrearing in East and West Germany

An assessment of childbearing patterns in East and West Germany during the second half of the 20th century reveals several marked differences. *First*, the quantum of fertility was somewhat higher in the East than in the West, mainly due to lower levels of childlessness and – at least temporarily – higher proportions of women having two or more children. While there were basically no differences in the cohort of women born 1940 (childless: 11 percent; two children: 34 percent), this had changed substantially for the cohort born in 1955 (cf. Kreyenfeld 2009: Table 1). By then, the proportion of childless women had almost doubled (19 percent) in the West, whereas it had even slightly decreased in the

East (8 percent). The share of women with two children, on the other hand, had remained fairly stable in West Germany (36 percent), but had increased to 48 percent in East Germany. While this gap had closed in the mid-1960s cohorts, the absolute difference in the proportions of childless women had further increased (West: 27 percent; East: 13 percent); see Kreyenfeld (2009: Table 3). *Second*, the timing of fertility in both parts of Germany also differed markedly, with Eastern German women having their first child significantly earlier than their Western German counterparts (e.g., Kreyenfeld 2004; 2009). *Third*, and finally, the proportion of non-marital births in East Germany was much higher than in West Germany. While this gap already existed in the late 1940s, it increased steadily – and parallel to the rise in overall levels of non-marital fertility – since the 1970s (see Konietzka and Kreyenfeld 2002: Figure 1). In 1989, the year prior to German unification, 33 percent of all births in the East occurred outside of marriage, compared to only 10 percent in the West.

These patterns have been related to differences in East and West Germany's institutional settings and family policies. While the West German tax and social security system set incentives promoting the traditional 'male-breadwinner' and 'female-housekeeper' model, East German family policies were directed towards increasing fertility and mothers' integration into the labour market (see Kreyenfeld, 2004: Section 2, for a comprehensive overview). These policies contained measures to support an early family formation as well as special allowances for higher parity births. Moreover, single mothers were particularly supported, which may have encouraged Eastern German women not to get married (Konietzka and Kreyenfeld 2002: 332). However, there also was a strong economic and ideological pressure to be employed, whereas in West Germany the care for a child was considered as a highly legitimate reason to withdraw from the labour market. Despite a very supportive infrastructure (such as an encompassing public day care

system) this meant that Eastern German women, more than their Western counterparts, were confronted with the ‘double burden’ of family work and paid employment (e.g., Adler 2002).

To our knowledge barely any research has yet investigated the consequences of the different childbearing and childrearing conditions in East and West Germany for parents’ health. Razum et al. (1999) showed that after unification maternal mortality ratios in both parts of the country were significantly higher in unmarried than in married women. Such inequality was not found in pre-unification East Germany, which the authors attribute to better support programmes for pregnant women (eliminated after 1990) and less heterogeneity in married and unmarried women’s socio-economic status. Next to *marital status*, one might also assume that differences in *mothers’ employment* may be reflected in differential health outcomes. For cohorts born 1928 to 1938, for example, the difference in the average number of years that West and East German childless women spent in employment was substantial (27 vs. 34 years), but still small compared to the difference between West and East German mothers of two or more children (15 vs. 30 years); see Stegmann and Mika (2007: Table 2). Although there is indication for a positive effect of employment on health (e.g., Ross and Mirowsky 1995), longer exposure to the ‘double burden’ of childrearing and paid work might also reduce individuals’ well-being. Recent U.S. evidence suggests that while there are significant health benefits of employment they decline somewhat when employment is combined with the care of a young child (Schnittker 2007). How employment, childrearing, and health interact in the long-run of individuals’ life course is yet unclear, though.

Theory and evidence on the childbearing-health-nexus

Mechanisms driving the childbearing-health-nexus

Two main causal mechanisms have been suggested to drive the relationship between individuals' fertility and later life health outcomes (including survival); see, for example, Grundy and Tomassini (2005); Henretta (2007); Mirowsky (2005). *First*, there is evidence for biological effects, that is, direct long-term physiological and psychological implications of women's reproductive history on particular diseases. Most notably, breast cancer as well as other cancers of the female reproductive system were shown to be associated with pregnancy, childbirth, and lactation (see Grundy and Kravdal, forthcoming, for a recent analysis). More generally, some authors suggested that human life histories involve a trade-off between longevity and fertility, because resources allocated to somatic maintenance compete with investments in reproduction (e.g., Westendorp and Kirkwood 1998).

Second, childbearing has been proposed to be related to a variety of social factors that might have both positive and negative effects on women's and men's health in later years. Specifically, differences in socio-economic status, social relationships, and health behaviours across the life-course have been put forward as being potentially relevant in this regard (e.g., Henretta 2007; Kendig et al. 2007; Grundy and Tomassini 2005). Having children may lead to economic strain, and particularly early childbearing is likely to be related to lower socio-economic status and poorer family functioning over the life course. There also is considerable potential for role overload and stresses related to raising children, particularly among lone parents. This, however, is contrasted by potentially health enhancing aspects of parenthood, such as greater opportunities for community participation and social support by children in later life. Moreover, parenthood may be

associated with incentives – and social pressures – to adopt healthier behaviours (e.g. quit smoking). The net effect of these factors not only varies according to individuals' socio-economic circumstances, but also with particular fertility pathways. Levels of early or non-marital childbearing, for example, are likely to reflect age and sequencing norms in the transition to adulthood (cf. Koropeckyj-Cox et al. 2007; Mirowsky and Ross 2002), suggesting that it is important to account for societal context. Moreover, specific welfare state arrangements, such as policies supporting lone mothers, might also matter. Thus, “in populations in which fertility control is usual, contextual factors influencing the relative costs and benefits of childbearing may influence associations between fertility histories and later mortality” (Grundy 2009: 541).

The relative importance of the outlined biological and social mechanisms in determining the childbearing-health-nexus is yet poorly understood (cf. Grundy and Kravdal forthcoming). Causal analysis is further complicated by a range of possible selection effects, that is, factors affecting both fertility and health. For example, individuals with a poor health endowment may not only be less fecund than their healthier counterparts, they are also less likely to marry; that is, their opportunities to become a parent and to enjoy the health benefits of marriage are reduced also (e.g., Brockmann and Klein 2004; Kiernan 1989). Socio-economic status is another potentially confounding factor that needs to be controlled for, because it is highly correlated with fertility and health alike (e.g., Bollen et al. 2007; Elo 2009). Thus, the possibility of ‘reverse causation’ always requires consideration.

Physical health

Although there is evidence for a differential effect of childbearing (particularly timing of births) on specific physical health outcomes, such as diabetes, cardiovascular disease, or

cancer (e.g., Alonzo 2002; Henretta 2007), many studies use composite health indices (e.g., Mirowsky 2005) or other general health measures, such as individuals' self-rated health (e.g., Kington et al. 1997; Sudha et al. 2006). Findings suggest that high parity (six or more children), early first birth, and the experience of infant death (pregnancy loss, respectively) are associated with worse self-reported health at older ages. Early childbearing also bears a clear positive correlation with the prevalence of limitations in activities of daily living, whereas no significant effects of high parity were found (cf. Kington et al. 1997; Spence 2008). Looking at the presence of limiting long term illness, Grundy and Tomassini (2005) report higher risks among older women with five or more children and those who had a teenage birth. Controlling for parity, mothers with short birth intervals were more likely to experience long term illness, whereas those who had a late birth (at age 40 or later) exhibited a reduced risk. Mirowsky (2005), however, reports a steep increase in later life general health problems among women who delayed their first birth beyond age 40.

Mental health

While childless men and women tend to exhibit lower levels of depression than parents, marital status has been shown to be more important for older people's mental health than parental status (e.g., Bures et al. 2009; Zhang and Hayward 2001; also see Hughes and Waite 2009). A recent cross-national study confirms these associations for a variety of Continental European countries (cf. Buber and Engelhardt 2008). Based on an analysis of British and American cohorts, Henretta et al. (2008) report poorer mental health among older mothers who experienced their first birth early (that is, before age 21), but also point out the importance of controlling for educational attainment. Spence (2008) finds evidence for early *and* late childbearing to be associated with more depressive symptoms. This is

consistent with Mirowsky and Ross (2002), whose research suggests a monotonically negative correlation between depression and age at first birth for men, though.

Mortality

Finally, a large number of studies deal with individuals' childbearing history and mortality (see Hurt et al. 2006, for a recent review). Research for both historical (e.g., Doblhammer and Oeppen 2003; McArdle et al. 2006; Müller et al. 2002) and contemporary (e.g., Doblhammer 2000; Henretta 2007; Mirowsky 2005) cohorts generally suggests that early childbearing tends to be associated with a higher hazard of dying, whereas late children enhance women's longevity. Grundy and Kravdal (2008), however, report a positive association between earlier parenthood and later mortality as well as a reverse association with late age at last birth in Norway (with similar results for both men and women). Moreover, the authors find an overall negative association between higher parity and mortality, which is only partially consistent with Doblhammer (2000), for example, who showed for England/Wales and Austria that childless women *and* those with three or more children experience excess mortality (also see Grundy and Tomassini 2005). Henretta (2007), however, does not find evidence for an effect of the number of children ever born on mortality. It seems important to keep in mind that even if the influence of reproductive history on longevity is statistically significant, it generally "is small compared to differences in longevity stemming from environmental factors such as level of education or family status." (Doblhammer 2000: 175; also see Hurt et al. 2006)

Data and measures

Data

This study uses data from the German Socio-Economic Panel (SOEP; e.g., Wagner et al. 1993), collected in the period 1984–2007. SOEP is a representative longitudinal study of currently more than 20,000 individuals (including foreigners and recent immigrants) living in private households. The panel, which is conducted annually, was originally started in Western Germany in 1984. Since then it has been supplemented by several refresher samples, with Eastern German households being covered from 1990 onwards. As in other surveys, SOEP's baseline response rates have continuously declined, from 61 per cent in the initial sample (1984) to 40 per cent in the latest refresher sample (2006) contributing to our analysis. Retention rates, however, remained continuously high, ranging from 80-85 per cent in the first follow-up wave to 90-95 per cent in subsequent waves (see Kroh and Spieß 2008, for a detailed documentation). Obviously, non-response bias might threaten the reliability of our results. Previous research comparing, for example, survival curves based on SOEP data with survival curves in the total population did not provide any indication for the presence of significant bias, though (cf. Brockmann and Klein 2004: Figure 1; also see Andersen et al. 2007: Section 3).

Topics of the survey include household composition, employment, earnings, health, and life-satisfaction indicators. Moreover, detailed biography and life history information is provided, including the fertility histories of all women who ever completed a SOEP interview and men who entered the panel in 2000 or later (cf. Frick et al. 2008).¹ This allows us to take a gendered perspective on the childbearing-health-nexus.

¹ Retrospective fertility histories are obviously prone to reporting error. Particularly men's reporting of fertility outside their current union tends to be incomplete (e.g., Rendall et al. 1999),

We define two different analytic samples (see Table 1 for descriptive statistics). The first one consists of 4,283 women and 2,325 men aged 50-75 in 2006, for whom detailed information on their physical and mental health status is available from the respective SOEP wave (see below for details on these measures). The second sample comprises 9,514 women aged 50-99, whom we observe from age 50 (or their first year in the panel) until death (or their last year in the panel), which results in a total of 68,798 person-years of observation. The average number of person-years each woman contributed to the analysis is 7.3. Unfortunately the window of observation for men is severely limited by the availability of fertility histories, prohibiting us from including males in our analysis of mortality.

[Table 1 about here]

Measures

Our analysis comprises four *dependent variables*. To begin with, respondents were asked to assess their current health status on a 5-point scale ranging from ‘very good’ to ‘bad’. From this information we derived our first dependent variable, a binary indicator of self-rated general health that equals 1, if the respondent reported to be in good or better health, 0 otherwise. The next two dependent variables were derived from a slightly modified version of the so called “SF-12v2TM Health Survey”, which is included in the SOEP questionnaire since 2002, collecting information on respondents’ overall health status (for details see Andersen et al. 2007; Ware et al. 2002). The survey’s standard inventory of

but Murphy (2009), for example, also found that women were more likely to report childlessness at older ages compared to when they were young. However, previous studies analysing SOEP’s (male) fertility histories do not suggest that this is a serious issue in our data (e.g., Schmitt 2005). SOEP data also reflect fairly well the cohort childbearing patterns described in this article’s ‘Background’ section (see, for example, Schmitt and Winkelmann’s (2005: Figure 2) analysis of childlessness in the cohorts born 1930 to 1960).

health measures consists of 12 items encompassing eight subscales, namely physical functioning, role physical, bodily pain, general health, vitality, social functioning, role emotional, and mental health. Using explorative factor analysis, these subscales were grouped into the two superordinate dimensions ‘physical health’ and ‘mental health’, with four scales being assigned to each of these factors. The values of both dimensions were z-transformed such that higher values indicate better health and that for the total SOEP sample in 2004 the mean of each factor is 50 points with a standard deviation of 10 points (Andersen et al. 2007). Note that these generated variables are provided with the standard SOEP data files. Finally, information on respondents’ year of death was used to create a time-varying indicator that switches from 0 to 1, if the respondent died. – For the analysis of health outcomes other than mortality we employed standard logistic and linear regression. Mortality risks were calculated using discrete-time event-history models (e.g., Allison 1982) with years as time unit and controlling for the year in which each SOEP wave was collected.

The main *explanatory variables* in our analyses are the number of biological children ever born, binary indicators of an early first birth and late childbearing as well as a variable indicating the individual’s marital status at first birth. The threshold we chose to define ‘early’ and ‘late’ births is supposed to identify socially ‘off-time’ childbearing (e.g., Mirowsky 2005). Because women and East Germans have been shown to give birth at earlier ages than their respective counterparts (e.g., Kreyenfeld 2004), it varies by sex and region, that is: ‘early’ indicates the age at which not more than roughly one quarter of the respective population already had a first child, whereas ‘late’ indicates the age at which roughly three quarters of the respective population already experienced their last birth; see Table 1. Moreover, we use a set of standard socio-demographic *control variables*. In addition to age, nativity (German vs. immigrant), and current marital status (time-

varying), we particularly account for the individual's socio-economic status (SES); see, for example, Henretta (2007). Earlier life SES is represented by a single binary indicator of the father's education (which equals 1 if he obtained at least a higher qualification at lower secondary level; *Realschulabschluss*) as well as dummy variables for the respondent's highest educational degree, distinguishing low (=lower secondary level of education or less), medium (= upper secondary or post-secondary, non-tertiary level of education), and high levels of education (=first stage of tertiary education or higher). Current SES is represented by – time-varying – indicators of the household's assets (operationalised by a dummy that equals 1, if the respondent is a homeowner, 0 otherwise) and equivalent household income in the year of the SOEP interview.

Results

Health

For all health outcomes (that is, self-rated general health as well as the physical [PHS] and mental health scores [MHS] based on SF-12) we ran separate regressions by sex and region, whose results we present jointly; see Tables 2-5. Across all models the probability to rate one's health as (very) good or to score high on the physical health measure decreases with *age*, whereas individuals' MHS tend to increase with age (see Yang 2007, for a thorough discussion of the complex association between age and depression). *Nativity* barely matters, with the exception of Eastern German native men, who are less likely to enjoy higher PHS than their immigrant counterparts. Current *marital status* turned out to bear no significant association with self-rated health and PHS in the Western German samples, whereas the coefficients in the models for MHS suggest lower levels of well-being among those who are separated or divorced (cf. Hughes and Waite 2009). Some of our models for Eastern Germany, though, suggest that the currently married are

less healthy than everybody else (particularly in the PHS regression for all women; see Table 2).²

Turning to (earlier and later life) SES, we find that, in Western Germany, a higher level of one's *father's education* is positively associated with PHS and – for men – with a greater propensity to report being in good or better health. Looking at Western German *respondents' education* we generally observe the expected health gradient (e.g., Jürges 2009), that is those with lower degrees tend to exhibit lower-levels of well-being than the average, whereas the reverse is true for more highly educated individuals. Among men, though, there is no significant association between education and mental health. For Eastern Germans, beneficial effects of education on health are only suggested by the PHS model for men (see Table 5). *Homeownership* – our indicator for the household's assets – bears a positive correlation with Western German women's self-rated health and PHS but is insignificant in all other models. *Log equivalent household income*, however, is statistically significant throughout, suggesting a positive association between higher income and better health outcomes.

With regard to the role of the *number of children* in individuals' health outcomes, our findings show that Western German women *and* men with four or more children are significantly more likely to rate their health as (very) good than their counterparts with two children. However, the suggested health benefit of higher parity is neither found in

² This particular finding stands in contrast to the frequently suggested positive effect of marriage on health (e.g., Hughes and Waite 2009) and we do not have a straightforward explanation for it. However, Nolte and McKee (2004), who analysed health inequalities in East and West Germany since unification, also found that – compared to singles – separation, divorce, or widowhood was associated with elevated risks of reporting less than good health in Eastern German men and Western German women. Moreover, the latter also reported poorer health when being married or cohabiting at the time of the interview.

Eastern Germany, nor is it substantiated further by findings from the PHS or MHS models (with the exception of parous Western German mothers of 4+ children, who are more likely to enjoy better mental health; see Table 4). For high-parity Eastern German women there is even evidence for a significantly lower probability to enjoy better physical health. The *timing of fertility* (as well as marital status at first birth) is not related in statistically significant ways to older men's health outcomes (see Table 5). However, an early transition to motherhood (at age 21 or younger) as well as having had a non-marital first birth reduces Western German women's PHS (the latter coefficient being statistically significant at the 10-percent-level only). Moreover, among Eastern German women, late childbearing (that is, at age 32 or over) is associated with lower scores on the mental health measure.

[Tables 2-5 about here]

Mortality

Next to the expected effect of increasing *age* on mortality, we also observe higher risks of dying among *native* West German women, possibly suggesting a healthy migrant effect (but see Kibele et al. 2008). Moreover, mortality risks of divorced, widowed (in West Germany), or never married (in East Germany) women exceed those of their currently *married* counterparts. Most of our indicators of respondents' *SES* turned out to be insignificant or marginally significant only (income being the only exception). At first glance this might look surprising, because socio-economic inequalities in mortality have been shown to persist in later life, despite a tendency to decrease with age (e.g., Huisman et al. 2004). However, there is ample evidence suggesting that such inequalities are smaller for women than for men by income, education, and homeownership (Elo 2009: 563), which is likely to explain the pattern observed here.

Turning to factors related to the individual's *fertility history*, we find that Eastern German women with high parity (that is, mothers of three or more children) exhibit marginally significant higher mortality risks than their counterparts with two children. The number of children appears to be unrelated to female mortality in Western Germany (note, however, that nulliparity is associated with higher risks of mortality at the 10-percent-level of significance). There is some indication for non-marital childbearing to be associated with higher risks of dying in Western Germany, but the respective odds-ratio is – again – only marginally significant; see Table 6.

[Table 6 about here]

Discussion

Based on data from the German Socio-Economic Panel, we investigated the role of childbearing history in later life health outcomes (including mortality), controlling in particular for individuals' marital status and socio-economic position. Our general findings suggest, *first*, that Western German mothers and fathers of 4+ children are more likely to perceive their health as good or better than two-child-parents, whereas high-parity Eastern German women achieve the lowest physical health score. *Second*, while fertility timing is not associated with older men's health, there is some evidence for early motherhood to be paralleled by poorer physical health (in Western Germany), whereas late motherhood is associated with lower psychological well-being (in Eastern Germany). Moreover, among Western German women, having had a non-marital first birth is also weakly correlated with lower PHS. *Third*, we observe excess mortality among Eastern German high parity mothers as well as weak (in terms of statistical significance) indication for a negative association between survival and nulliparity as well as non-

marital childbearing in Western Germany. The lesson we learn from this – confirming previous research – is that there is no unambiguous reproduction-health-nexus in the older population, but that it is fundamental to consider a variety of (physical and mental) health outcomes.

While data limitations prohibited a sex-specific analysis of mortality, we took a gendered perspective in our investigation of physical and mental health as well as self-reported general health. Both the observed similarities (such as the association between high parity and self-rated health in Western German men and women) as well as gender differences (such as the lacking significance of fertility timing for men's health outcomes) suggest biosocial pathways underlying the relationships between reproductive history and later health (also see the discussion in Grundy and Kravdal 2008).³ Despite women's greater risk of suffering from potential health problems directly related to pregnancy and childbirth, men and women appear to be affected in similar ways by the benefits and/or stresses of parenthood as such. However, older women who had an early first birth seem to be more likely than their male counterparts (at least in Western Germany) to suffer from poor self-rated health, presumably resulting from adverse social and economic consequences of early childbearing across the life course, by which men were less affected (e.g., Hofferth and Moore 1979; Hoffman et al. 1993).

³ An innovative approach to study further the relative importance of social vs. biologic factors in driving the fertility-health nexus was followed by Grundy and Kravdal (forthcoming), whose register-based analysis of cause-specific mortality in Norwegian women and men showed great similarity across sexes for most causes relevant to both men and women, indicating an important role of lifestyle related health behaviours, whereas for some causes of death specific to women (such as cancers of the breast, ovary, and uterus) findings suggest a relatively strong impact of physiological factors.

We also had a special interest in possible differences between Eastern and Western Germany. To begin with we detect differential associations of parity with health and mortality: Western German parents of four or more children enjoy better (self-rated) health than their lower-parity counterparts, but Eastern German high-parity mothers exhibit both lower physical health scores and higher mortality risks. While the association in the West might indicate a positive selection effect (*better initial health endowment* → *greater fecundity* → *higher parity* → *better later life health*), the observed correlation in the Eastern sample clearly does not point in such direction. Rather, if we interpret negative associations of high parity with later life health outcomes as a consequence of higher levels of stress in larger families, our findings for East and West Germany should reflect differences in spouses' specialisation and division of labour during the childrearing years. The West German model of a 'male-breadwinner' and 'female-housekeeper' family is likely to have buffered (for both parents) the stresses associated with rearing a relatively large number of children, whereas the majority of East German mothers needed to handle family obligations and paid employment in parallel.

Moreover, we observe that an early transition to motherhood and a non-marital first birth bear negative associations with older women's physical health in Western Germany, but not so in the East. Similar holds for the relationship between a non-marital birth and survival. Performing a Chow test to determine whether the coefficients of fertility related variables are actually the same in the two subsamples (details not shown; cf. Greene 2000: 289ff.) showed that the correlations between higher parity and women's self-rated health, physical health scores, and mortality are significantly different in Eastern and Western Germany, whereas the respective differences between the coefficients for early and non-marital childbearing fail to meet standard levels of statistical significance. Even so, it is still plausible to assume that childbearing patterns off the 'normative' life course track

might have had more severe adverse social and economic consequences – eventually affecting their later life health – for women in the Western German cohorts considered here, because their Eastern German counterparts enjoyed greater behavioural and economic autonomy from traditional patterns of marriage and family formation (e.g., Konietzka and Kreyenfeld 2002; also see Koropecj-Cox et al. 2007).

Against this background in particular, future studies should attempt to account (better) for the role of various kinds of social support in shaping the fertility-health-nexus. Grundy and Kravdal (2008: 278), for example, suggest that ‘family friendly’ policies may result in long-term health benefits for parents, which would be important to consider in further comparative research (also see Grundy 2009). More generally, a mere focus on parental status might not be sufficient to fully understand the role of children in well-being. Silverstein and Bengtson (1991), for example, argued that it is not children per se, but high-quality parent-child relations that may reduce mortal health risks (also see Koropecj-Cox 2002).

In addition to gaining deeper insights into the social mechanisms driving the association between childbearing and health, it seems particularly important to improve our understanding of the relative importance of biological and social factors. Some progress in this regard has already been made through gendered analyses of the relationship between reproductive histories and mortality from specific causes (cf. Grundy and Kravdal forthcoming). Data providing detailed information on childhood conditions, health related behaviours, and potentially relevant biomarkers would be desirable as well. Although even such rich data are not a panacea, they might eventually provide researchers with opportunities to also tackle at least some of the selection problems frequently challenging a causal interpretation of observed associations between fertility and health.

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Tables

Table 1: Means and percentages for variables used in the analysis

	Analytic sample for health outcomes (stdv.)		Analytic sample for mortality (stdv.)
	<i>women</i>	<i>men</i>	<i>women</i>
<i>Dependent variables</i>			
Self-rated health: (very) good	33%	42%	--
Physical health score	50.3 (10.5)	53.1 (9.8)	--
Mental health score	45.1 (10.1)	47.3 (9.9)	--
Died in observation period	--	--	12%
<i>Demographics</i>			
Age at time of interview	61.2 (7.3) ^d	61.4 (7.2) ^d	63.9 (10.0) ^e
Eastern German sample	27%	21%	24%
German born	89%	92%	87%
Current marital status			
Married	72%	81%	63%
Separated or divorced	11%	11%	9%
Widowed	13%	4%	24%
Never married	4%	4%	4%
<i>Socio-economic status</i>			
Father's education: high	19%	23%	13%
Respondent's education: low	21%	7%	38%
Respondent's education: medium	55%	48%	48%
Respondent's education: high	24%	45%	14%

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Table 1 (cont'd.): Means and percentages for variables used in the analysis

	Analytic sample for		Analytic sample for
	health outcomes (stdv.)		mortality (stdv.)
	<i>women</i>	<i>men</i>	<i>women</i>
Homeowner	60%	69%	51%
Log equiv. household income	7.3 (.53)	7.5 (.58)	7.1 (.51)
<i>Reproductive history</i>			
Children ever born			
None	12%	13%	14%
One	22%	22%	23%
Two	41%	41%	34%
Three	16%	16%	17%
Four or more	9%	8%	12%
Early first birth ^{a,b}	26%	25%	23%
Unmarried at first birth ^a	13%	11%	12%
Late first birth ^{a,c}	25%	26%	24%
N (individuals)	4,283	2,325	9,514
N (person-years)	--	--	68,798

Source: SOEP (1984-2007). ^a Parous respondents only. ^b Threshold age for 'early' first birth: 21 (woman, West); 20 (woman, East); 24 (man, West); 22 (man, East). ^c Threshold age for 'late' birth: 33 (woman, West); 32 (woman, East); 37 (man, West); 33 (man, East). ^d Survey year: 2006. ^e Survey years: 1984-2006 (Western German sample); 1990-2006 (Eastern German sample).

Table 2: Regression results for different health outcomes in 2006 (95% confidence intervals) – all *women*, by region

	<u>Self-rated general health^a</u>		<u>Physical health score^b</u>		<u>Mental health score^b</u>	
	Western Germany	Eastern Germany	Western Germany	Eastern Germany	Western Germany	Eastern Germany
Age	0.97** (0.96 - 0.98)	0.95** (0.93 - 0.97)	-0.33** (-0.38 - -0.28)	-0.33** (-0.41 - -0.25)	0.10** (0.04 - 0.15)	0.14** (0.05 - 0.22)
German born	1.08 (0.85 - 1.38)	1.07 (0.41 - 2.79)	0.95+ (-0.08 - 1.98)	0.62 (-3.30 - 4.54)	0.98+ (-0.15 - 2.10)	-1.20 (-5.48 - 3.07)
Current marital status						
Married ^c	1.00	1.00	0.00	0.00	0.00	0.00
Separated or divorced	1.05 (0.80 - 1.37)	1.17 (0.78 - 1.74)	1.11+ (-0.05 - 2.27)	2.30** (0.59 - 4.01)	-1.82** (-3.08 - -0.55)	-1.13 (-2.99 - 0.74)
Widowed	1.14 (0.89 - 1.47)	1.30 (0.88 - 1.93)	0.49 (-0.58 - 1.56)	2.12* (0.45 - 3.79)	-0.04 (-1.20 - 1.13)	-0.65 (-2.47 - 1.17)
Never married	1.03 (0.67 - 1.60)	1.76 (0.77 - 4.05)	1.23 (-0.72 - 3.17)	4.81** (1.23 - 8.39)	-0.86 (-2.98 - 1.26)	0.97 (-2.93 - 4.88)
Father's education: low ^c	1.00	1.00	0.00	0.00	0.00	0.00
Father's education: high	1.20+ (0.98 - 1.47)	0.89 (0.61 - 1.30)	1.88** (0.95 - 2.80)	0.17 (-1.46 - 1.80)	0.09 (-0.92 - 1.10)	-0.59 (-2.37 - 1.20)
Respondent's education: low	0.66** (0.53 - 0.81)	0.89 (0.57 - 1.39)	-1.87** (-2.74 - -1.00)	-1.24 (-3.05 - 0.56)	-1.90** (-2.85 - -0.96)	-0.34 (-2.31 - 1.63)
Respondent's education: medium ^c	1.00	1.00	0.00	0.00	0.00	0.00
Respondent's education: high	1.00 (0.81 - 1.24)	0.76+ (0.56 - 1.03)	0.00 (-0.98 - 0.98)	-0.34 (-1.63 - 0.96)	0.25 (-0.82 - 1.31)	0.21 (-1.21 - 1.62)

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Table 2 (cont'd.): Regression results for different health outcomes in 2006 (95% confidence intervals) – all *women*, by region

	<u>Self-rated general health^a</u>		<u>Physical health score^b</u>		<u>Mental health score^b</u>	
	Western Germany	Eastern Germany	Western Germany	Eastern Germany	Western Germany	Eastern Germany
Homeowner	1.32** (1.10 - 1.58)	1.15 (0.88 - 1.51)	1.05** (0.28 - 1.83)	0.25 (-0.90 - 1.39)	0.58 (-0.27 - 1.43)	-1.21 (-2.47 - 0.04)
Log equivalent household income	1.60** (1.35 - 1.89)	1.91** (1.36 - 2.68)	2.03** (1.29 - 2.77)	2.32** (0.88 - 3.76)	2.18** (1.37 - 2.99)	2.38** (0.81 - 3.95)
Children ever born (vs. two)						
None	1.00 (0.77 - 1.30)	0.99 (0.57 - 1.72)	-0.11 (-1.28 - 1.06)	-1.66 (-3.94 - 0.61)	0.29 (-0.98 - 1.57)	-0.30 (-2.78 - 2.19)
One	0.99 (0.81 - 1.22)	1.05 (0.76 - 1.45)	0.12 (-0.78 - 1.03)	-0.03 (-1.42 - 1.35)	-0.55 (-1.54 - 0.44)	0.43 (-1.08 - 1.95)
Two ^c	1.00	1.00	0.00	0.00	0.00	0.00
Three	0.88 (0.70 - 1.11)	1.12 (0.77 - 1.63)	-0.43 (-1.42 - 0.56)	-0.89 (-2.50 - 0.73)	0.68 (-0.40 - 1.76)	-0.92 (-2.68 - 0.84)
Four or more	1.42* (1.07 - 1.89)	0.82 (0.47 - 1.45)	0.86 (-0.38 - 2.11)	-2.56* (-4.80 - -0.32)	1.23 (-0.12 - 2.59)	-0.27 (-2.72 - 2.18)
Constant	0.09** (0.02 - 0.37)	0.10 (0.01 - 1.60)	49.07** (42.59 - 55.55)	47.63** (35.79 - 59.46)	27.88** (20.82 - 34.94)	26.30** (13.39 - 39.22)
Observations	3123	1160	3123	1160	3123	1160
(Pseudo-)R ²	0.046	0.041	0.123	0.099	0.038	0.026

Source: As Table 1; author's calculations. ^a Odds ratios obtained from logistic regression. ^b Unstandardized regression coefficients obtained from linear regression.

^c Reference category. Significance: ** p<0.01, * p<0.05

Table 3: Regression results for different health outcomes in 2006 (95% confidence intervals) – all *men*, by region

	<u>Self-rated general health^a</u>		<u>Physical health score^b</u>		<u>Mental health score^b</u>	
	Western Germany	Eastern Germany	Western Germany	Eastern Germany	Western Germany	Eastern Germany
Age	0.98*	0.95**	-0.26**	-0.40**	0.26**	0.18**
	(0.97 - 1.00)	(0.92 - 0.98)	(-0.32 - -0.20)	(-0.52 - -0.28)	(0.19 - 0.32)	(0.06 - 0.31)
German born	1.28	0.41	0.77	-5.81*	0.70	0.09
	(0.90 - 1.83)	(0.13 - 1.34)	(-0.81 - 2.34)	(-11.06 - -0.57)	(-0.90 - 2.30)	(-5.40 - 5.58)
Current marital status						
Married ^c	1.00	1.00	0.00	0.00	0.00	0.00
Separated or divorced	1.06	1.19	1.08	-0.30	-1.54*	-1.10
	(0.78 - 1.45)	(0.65 - 2.18)	(-0.32 - 2.49)	(-2.89 - 2.30)	(-2.97 - -0.11)	(-3.81 - 1.62)
Widowed	0.96	1.06	1.23	2.73	-2.02	1.32
	(0.54 - 1.69)	(0.45 - 2.53)	(-1.28 - 3.73)	(-0.91 - 6.37)	(-4.57 - 0.53)	(-2.49 - 5.12)
Never married	1.08	4.45*	0.83	3.94	-1.78	-3.18
	(0.62 - 1.89)	(1.11 - 17.84)	(-1.65 - 3.31)	(-1.74 - 9.62)	(-4.30 - 0.74)	(-9.12 - 2.76)
Father's education: low ^c	1.00	1.00	0.00	0.00	0.00	0.00
Father's education: high	1.40**	1.08	1.53**	0.58	0.47	0.83
	(1.11 - 1.77)	(0.63 - 1.84)	(0.45 - 2.60)	(-1.75 - 2.91)	(-0.62 - 1.56)	(-1.61 - 3.26)
Respondent's education: low	0.69	2.02	-1.62*	4.59	-0.72	-3.26
	(0.47 - 1.02)	(0.65 - 6.26)	(-3.24 - -0.00)	(-0.28 - 9.45)	(-2.36 - 0.92)	(-8.35 - 1.84)
Respondent's education: medium ^c	1.56**	1.44	2.06**	2.48*	0.46	-0.60
Respondent's education: high	1.07	1.25	0.23	1.56	0.93	-0.27
	(1.25 - 1.95)	(0.92 - 2.25)	(1.05 - 3.07)	(0.59 - 4.37)	(-0.57 - 1.49)	(-2.58 - 1.37)

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Table 3 (cont'd.): Regression results for different health outcomes in 2006 (95% confidence intervals) – all *men*, by region

	<u>Self-rated general health^a</u>		<u>Physical health score^b</u>		<u>Mental health score^b</u>	
	Western Germany	Eastern Germany	Western Germany	Eastern Germany	Western Germany	Eastern Germany
Homeowner	(0.85 - 1.35) 1.46**	(0.83 - 1.86) 1.61*	(-0.80 - 1.26) 2.23**	(-0.14 - 3.26) 2.88**	(-0.12 - 1.98) 2.93**	(-2.04 - 1.51) 1.37
Log equivalent household income	(1.21 - 1.77) 1.56**	(1.01 - 2.57) 1.44	(1.38 - 3.07) 2.06**	(0.89 - 4.87) 2.48*	(2.06 - 3.79) 0.46	(-0.71 - 3.45) -0.60
Children ever born						
None	0.99 (0.71 - 1.37)	0.67 (0.25 - 1.83)	0.14 (-1.33 - 1.62)	0.16 (-3.75 - 4.08)	1.21 (-0.29 - 2.71)	0.04 (-4.06 - 4.13)
One	1.06 (0.82 - 1.37)	1.11 (0.68 - 1.80)	0.33 (-0.81 - 1.48)	0.50 (-1.57 - 2.57)	0.93 (-0.23 - 2.10)	0.75 (-1.42 - 2.91)
Two ^c	1.00	1.00	0.00	0.00	0.00	0.00
Three	1.15 (0.87 - 1.52)	1.41 (0.78 - 2.55)	-0.26 (-1.51 - 1.00)	1.09 (-1.45 - 3.63)	0.49 (-0.78 - 1.77)	0.04 (-2.62 - 2.69)
Four or more	1.56* (1.07 - 2.27)	1.20 (0.55 - 2.63)	-1.08 (-2.76 - 0.60)	-2.50 (-5.76 - 0.76)	0.20 (-1.51 - 1.90)	0.35 (-3.06 - 3.76)
Constant	0.06** (0.01 - 0.35)	0.74 (0.01 - 41.17)	44.59** (36.99 - 52.19)	52.58** (35.36 - 69.80)	13.55** (5.82 - 21.27)	32.02** (14.00 - 50.04)
Observations	1840	485	1840	485	1840	485
(Pseudo-)R ²	0.045	0.056	0.109	0.172	0.080	0.042

Source: As Table 1; author's calculations. ^a Odds ratios obtained from logistic regression. ^b Unstandardized regression coefficients obtained from linear regression.

^c Reference category. Significance: ** p<0.01, * p<0.05

Table 4: Regression results for different health outcomes in 2006 (95% confidence intervals) – parous women, by region

	<u>Self-rated general health^a</u>		<u>Physical health score^b</u>		<u>Mental health score^b</u>	
	Western Germany	Eastern Germany	Western Germany	Eastern Germany	Western Germany	Eastern Germany
Age	0.96** (0.95 - 0.97)	0.94** (0.92 - 0.96)	-0.36** (-0.42 - -0.31)	-0.36** (-0.44 - -0.28)	0.07* (0.01 - 0.13)	0.13** (0.04 - 0.23)
German born	1.14 (0.88 - 1.48)	1.10 (0.39 - 3.15)	1.15* (0.06 - 2.23)	1.10 (-3.09 - 5.29)	1.03 (-0.16 - 2.22)	-0.80 (-5.39 - 3.78)
Current marital status						
Married ^c	1.00	1.00	0.00	0.00	0.00	0.00
Separated or divorced	1.00 (0.75 - 1.34)	1.16 (0.77 - 1.76)	1.04 (-0.20 - 2.29)	2.19* (0.42 - 3.96)	-1.92** (-3.28 - -0.55)	-0.82 (-2.76 - 1.12)
Widowed	1.13 (0.86 - 1.48)	1.26 (0.83 - 1.90)	0.49 (-0.65 - 1.63)	1.64 (-0.08 - 3.37)	-0.05 (-1.30 - 1.19)	-0.71 (-2.59 - 1.18)
Never married	0.77 (0.28 - 2.11)	1.81 (0.49 - 6.74)	1.41 (-2.78 - 5.59)	4.34 (-1.11 - 9.80)	-3.02 (-7.60 - 1.56)	-0.28 (-6.25 - 5.69)
Father's education: low ^c	1.00	1.00	0.00	0.00	0.00	0.00
Father's education: high	1.09 (0.87 - 1.37)	0.96 (0.65 - 1.42)	1.61** (0.59 - 2.63)	0.74 (-0.94 - 2.42)	0.22 (-0.90 - 1.34)	-0.54 (-2.38 - 1.30)
Respondent's education: low	0.70** (0.56 - 0.88)	0.82 (0.51 - 1.33)	-1.58** (-2.49 - -0.67)	-0.86 (-2.75 - 1.02)	-1.82** (-2.81 - -0.82)	-0.32 (-2.38 - 1.74)
Respondent's education: medium ^c	1.00	1.00	0.00	0.00	0.00	0.00
Respondent's education: high	1.04 (0.82 - 1.32)	0.72* (0.52 - 0.99)	-0.27 (-1.37 - 0.82)	-0.64 (-2.01 - 0.72)	0.38 (-0.82 - 1.58)	0.31 (-1.18 - 1.81)
Homeowner	1.33** (1.08 - 1.62)	1.15 (0.87 - 1.53)	1.09* (0.24 - 1.94)	0.12 (-1.08 - 1.31)	0.66 (-0.27 - 1.59)	-1.15 (-2.45 - 0.16)
Log equivalent household income	1.61** (1.34 - 1.94)	1.82** (1.28 - 2.59)	1.79** (0.99 - 2.60)	2.20** (0.70 - 3.70)	2.09** (1.22 - 2.97)	2.12* (0.48 - 3.76)

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Table 4 (cont'd.): Regression results for different health outcomes in 2006 (95% confidence intervals) – parous women, by region

	<u>Self-rated general health^a</u>		<u>Physical health score^b</u>		<u>Mental health score^b</u>	
	Western Germany	Eastern Germany	Western Germany	Eastern Germany	Western Germany	Eastern Germany
Children ever born						
One	0.99 (0.80 - 1.22)	1.04 (0.75 - 1.44)	0.07 (-0.84 - 0.98)	-0.04 (-1.44 - 1.36)	-0.57 (-1.57 - 0.43)	0.29 (-1.25 - 1.82)
Two ^c	1.00	1.00	0.00	0.00	0.00	0.00
Three	0.89 (0.71 - 1.13)	1.22 (0.82 - 1.80)	-0.31 (-1.32 - 0.69)	-0.74 (-2.38 - 0.91)	0.79 (-0.32 - 1.89)	-0.47 (-2.27 - 1.34)
Four or more	1.49** (1.10 - 2.02)	0.89 (0.49 - 1.61)	1.19 (-0.13 - 2.50)	-2.48* (-4.80 - -0.15)	1.54* (0.10 - 2.98)	0.51 (-2.04 - 3.05)
Early first birth	0.83 (0.67 - 1.03)	0.97 (0.70 - 1.34)	-1.62** (-2.53 - -0.71)	-0.51 (-1.89 - 0.86)	-0.16 (-1.16 - 0.84)	-0.57 (-2.08 - 0.93)
Unmarried at first birth	1.04 (0.79 - 1.37)	0.91 (0.62 - 1.34)	-1.09 (-2.27 - 0.10)	0.26 (-1.35 - 1.88)	1.08 (-0.22 - 2.38)	-0.64 (-2.41 - 1.13)
Late first birth	1.02 (0.83 - 1.24)	0.74 (0.51 - 1.08)	0.17 (-0.71 - 1.05)	-0.35 (-1.88 - 1.18)	-0.72 (-1.69 - 0.24)	-1.87* (-3.54 - -0.19)
Constant	0.12* (0.02 - 0.61)	0.23 (0.01 - 4.39)	52.94** (45.86 - 60.01)	49.97** (37.53 - 62.42)	30.19** (22.44 - 37.95)	28.28** (14.67 - 41.89)
Observations	2693	1061	2693	1061	2693	1061
(Pseudo-)R ²	0.051	0.051	0.131	0.109	0.039	0.028

Source: As Table 1; author's calculations. ^a Odds ratios obtained from logistic regression. ^b Unstandardized regression coefficients obtained from linear regression.

^c Reference category. Significance: ** p<0.01, * p<0.05

Table 5: Regression results for different health outcomes in 2006 (95% confidence intervals) – parous *men*, by region

	<u>Self-rated general health^a</u>		<u>Physical health score^b</u>		<u>Mental health score^b</u>	
	Western Germany	Eastern Germany	Western Germany	Eastern Germany	Western Germany	Eastern Germany
Age	0.98*	0.96**	-0.26**	-0.40**	0.25**	0.19**
	(0.97 - 1.00)	(0.93 - 0.99)	(-0.33 - -0.19)	(-0.52 - -0.27)	(0.18 - 0.32)	(0.06 - 0.32)
German born	1.32	0.35	0.87	-5.77*	0.43	0.62
	(0.89 - 1.95)	(0.10 - 1.19)	(-0.82 - 2.56)	(-11.21 - -0.33)	(-1.34 - 2.19)	(-5.07 - 6.31)
Current marital status						
Married ^c	1.00	1.00	0.00	0.00	0.00	0.00
Separated or divorced	1.05	1.06	0.62	-0.68	-1.71*	-1.03
	(0.74 - 1.48)	(0.57 - 1.99)	(-0.92 - 2.16)	(-3.35 - 1.99)	(-3.31 - -0.10)	(-3.83 - 1.76)
Widowed	0.86	0.98	0.75	3.22	-2.29	1.01
	(0.47 - 1.58)	(0.39 - 2.46)	(-1.83 - 3.34)	(-0.62 - 7.05)	(-4.99 - 0.40)	(-3.01 - 5.02)
Never married	6.37	8.65	4.10	12.87*	-1.87	2.09
	(0.63 - 64.25)	(0.85 - 73.6)	(-5.10 - 13.31)	(0.01 - 25.74)	(-11.46 - 7.73)	(-11.37 - 15.55)
Father's education: low ^c	1.00	1.00	0.00	0.00	0.00	0.00
Father's education: high	1.44**	1.01	1.21*	0.12	0.64	0.66
	(1.11 - 1.87)	(0.58 - 1.76)	(0.04 - 2.39)	(-2.27 - 2.51)	(-0.58 - 1.87)	(-1.84 - 3.16)
Respondent's education: low	0.64*	2.99	-2.15*	4.65	-0.50	-3.95
	(0.42 - 0.99)	(0.88 - 10.17)	(-3.92 - -0.39)	(-0.70 - 10.00)	(-2.34 - 1.34)	(-9.55 - 1.64)
Respondent's education: medium ^c	1.00	1.00	0.00	0.00	0.00	0.00
Respondent's education: high	1.41**	1.31	1.69**	2.15*	0.32	-0.82
	(1.10 - 1.80)	(0.82 - 2.10)	(0.58 - 2.80)	(0.18 - 4.12)	(-0.84 - 1.48)	(-2.88 - 1.24)
Homeowner	1.09	1.29	0.06	1.29	0.74	-0.39
	(0.84 - 1.42)	(0.85 - 1.95)	(-1.09 - 1.20)	(-0.46 - 3.05)	(-0.45 - 1.93)	(-2.22 - 1.45)
Log equivalent household income	1.46**	1.74*	2.52**	3.31**	3.24**	1.41
	(1.18 - 1.81)	(1.06 - 2.84)	(1.58 - 3.46)	(1.24 - 5.37)	(2.26 - 4.22)	(-0.75 - 3.56)

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Table 5: Regression results for different health outcomes in 2006 (95% confidence intervals) – parous *men*, by region

	<u>Self-rated general health^a</u>		<u>Physical health score^b</u>		<u>Mental health score^b</u>	
	Western Germany	Eastern Germany	Western Germany	Eastern Germany	Western Germany	Eastern Germany
Children ever born						
One	1.05 (0.81 - 1.36)	1.08 (0.66 - 1.77)	0.36 (-0.78 - 1.50)	0.49 (-1.59 - 2.58)	0.86 (-0.33 - 2.05)	0.46 (-1.72 - 2.64)
Two ^c	1.00	1.00	0.00	0.00	0.00	0.00
Three	1.14 (0.86 - 1.52)	1.43 (0.79 - 2.61)	-0.10 (-1.38 - 1.17)	1.18 (-1.37 - 3.74)	0.81 (-0.52 - 2.14)	0.14 (-2.53 - 2.81)
Four or more	1.54* (1.04 - 2.28)	1.24 (0.56 - 2.75)	-0.91 (-2.64 - 0.83)	-2.50 (-5.79 - 0.80)	0.60 (-1.22 - 2.41)	0.67 (-2.78 - 4.11)
Early first birth	0.92 (0.70 - 1.19)	0.84 (0.53 - 1.35)	-0.98 (-2.14 - 0.19)	-0.02 (-2.00 - 1.97)	-0.76 (-1.97 - 0.46)	-1.58 (-3.66 - 0.50)
Unmarried at first birth	0.90 (0.62 - 1.31)	0.94 (0.55 - 1.60)	0.24 (-1.41 - 1.88)	-1.77 (-4.03 - 0.48)	0.68 (-1.03 - 2.39)	-0.18 (-2.54 - 2.17)
Late first birth	1.04 (0.81 - 1.35)	1.01 (0.62 - 1.63)	-0.28 (-1.42 - 0.86)	0.16 (-1.86 - 2.18)	-0.88 (-2.07 - 0.31)	-0.14 (-2.26 - 1.97)
Constant	0.07** (0.01 - 0.47)	0.36 (0.01 - 24.99)	43.01** (34.61 - 51.41)	50.40** (32.48 - 68.31)	12.35** (3.60 - 21.11)	31.41** (12.68 - 50.15)
Observations	1552	449	1552	449	1552	449
(Pseudo-)R ²	0.045	0.049	0.115	0.186	0.079	0.040

Source: As Table 1; author's calculations. ^a Odds ratios obtained from logistic regression. ^b Unstandardized regression coefficients obtained from linear regression.

^c Reference category. Significance: ** p<0.01, * p<0.05

Table 6: Odds-ratios (95% confidence intervals) from discrete-time logistic regressions for *female mortality* in Western Germany (1984-2006) and Eastern Germany (1990-2006)^a

	<u>All women</u>		<u>Parous women</u>	
	Western Germany	Eastern Germany	Western Germany	Eastern Germany
Age	1.11** (1.10 - 1.12)	1.11** (1.09 - 1.12)	1.12** (1.11 - 1.13)	1.11** (1.09 - 1.13)
German born	2.13** (1.53 - 2.96)	0.83 (0.40 - 1.72)	2.11** (1.47 - 3.03)	0.77 (0.35 - 1.70)
Current marital status				
Married ^b				
Separated or divorced	1.27 (0.94 - 1.71)	1.79* (1.13 - 2.84)	1.28 (0.92 - 1.79)	1.74* (1.04 - 2.90)
Widowed	1.24* (1.04 - 1.49)	1.25 (0.88 - 1.80)	1.23* (1.00 - 1.50)	1.21 (0.82 - 1.78)
Never married	1.01 (0.71 - 1.44)	1.04 (0.49 - 2.18)	0.75 (0.33 - 1.70)	3.17* (1.13 - 8.90)
Father's education: low ^b				
Father's education: high	0.88 (0.68 - 1.14)	0.66 (0.36 - 1.21)	0.96 (0.72 - 1.27)	0.92 (0.49 - 1.72)
Respondent's education: low	1.09 (0.94 - 1.28)	1.00 (0.74 - 1.35)	0.96 (0.81 - 1.14)	1.04 (0.74 - 1.44)
Respondent's education: medium ^b				
Respondent's education: high	0.83 (0.60 - 1.13)	0.99 (0.64 - 1.53)	0.77 (0.52 - 1.13)	0.90 (0.54 - 1.48)
Homeowner	0.90 (0.78 - 1.04)	1.23 (0.93 - 1.61)	0.85 (0.72 - 1.00)	1.23 (0.91 - 1.66)
Log household income	0.77** (0.66 - 0.90)	0.71 (0.47 - 1.05)	0.82* (0.69 - 0.98)	0.82 (0.52 - 1.30)

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Table 6 (cont'd): Odds-ratios (95% confidence intervals) from discrete-time logistic regressions for *female mortality* in Western Germany (1984-2006) and Eastern Germany (1990-2006)^a

	<u>All women</u>		<u>Parous women</u>	
	Western Germany	Eastern Germany	Western Germany	Eastern Germany
<hr/>				
Children ever born				
None	1.25 (1.00 - 1.55)	1.20 (0.76 - 1.90)	--	--
One	1.10 (0.91 - 1.33)	1.09 (0.75 - 1.59)	1.08 (0.88 - 1.31)	0.96 (0.65 - 1.43)
Two ^b				
Three	0.90 (0.72 - 1.14)	1.43 (0.97 - 2.11)	0.93 (0.73 - 1.18)	1.42 (0.95 - 2.12)
Four or more	1.04 (0.83 - 1.31)	1.43 (0.91 - 2.23)	1.06 (0.83 - 1.35)	1.53 (0.95 - 2.46)
Early first birth			1.15 (0.93 - 1.43)	0.92 (0.60 - 1.40)
Unmarried at first birth			1.20 (0.96 - 1.50)	0.93 (0.61 - 1.41)
Late first birth			0.90 (0.74 - 1.09)	0.80 (0.56 - 1.14)
Constant	17.31 (-4.09 - 38.71)	37.98 (-26.84 - 102.80)	8.39 (-16.06 - 32.83)	56.61 (-15.53 - 128.75)
Observations	53,470	15,328	45,638	13,379
Pseudo-R ²	0.159	0.134	0.161	0.142

Source: As Table 1; author's calculations. ^a Controlling for year of survey (coefficient not displayed). ^b Reference category. Significance: ** p<0.01, * p<0.05