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Schlücker, Friederike U.; Blumenfelder, Raphaela A.

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Friederike U. Schlücker & A. Raphaela Blumenfelder

Effects of age at first birth on health of mothers aged 45 to 56

Effekte des Alters der Mutter bei Erstgeburt auf ihre Gesundheit im Alter zwischen 45 und 56 Jahren

Abstract: Employing the data from the Survey of Health, Ageing and Retirement in Europe (SHARE) for 13 European countries, we analyse the relationship between mother's age at first birth and her health at age 45 to 56. Compared to mothers who gave birth at middle age, we found a significantly higher risk of illness among young first-time mothers. In a first step, we show that this effect largely remains after controlling for selection effects which determine age at first birth. Next, we examine whether the biosocial view could be confirmed. This approach explains the negative effect of early births on later health through a lack of social and economic resources during young mothers' life course. Thus, fewer resources are expected to affect health outcomes. However, the results indicate that the negative effect of young age at first birth remains even after controlling for health-related resources throughout the life course. The operationalisation of health-related resources as well as unobserved effects might be regarded as possible explanations for this. Due to data restrictions, indicators for educational history, job history and social support, that are all likely to depend on age at first birth and also affect later health, could not be taken into account. The results identify mechanisms of cumulative social inequality when disadvantaged women become mothers at younger age and thereby further increase their risk of disease.

Zusammenfassung: Anhand der Daten des Survey of Health, Ageing and Retirement in Europe (SHARE) für 13 europäische Länder wird der Zusammenhang zwischen dem Alter der Mutter bei Erstgeburt und ihrer Gesundheit im Alter von 45 bis 56 Jahren untersucht. Im Vergleich zu Müttern, die ihr erstes Kind im mittleren Alter bekommen haben, zeigen sich signifikant höhere Erkrankungsrisiken unter jungen Erstgebärenden. In einem ersten Schritt wird gezeigt, dass dieser Effekt auch unter Berücksichtigung von Selektionseffekten, welche das Alter bei Erstgeburt bestimmen, weitgehend bestehen bleibt. Anschließend wird untersucht, ob sich der biosoziale Ansatz, der den negativen Effekt früher Geburten auf die spätere Gesundheit anhand geringerer sozialer und ökonomischer Ressourcen im Lebensverlauf von jungen Müttern erklärt, bestätigt. Die Ergebnisse zeigen jedoch, dass sich ein junges Alter bei Erstgeburt auch unter Berücksichtigung von gesundheitsrelevanten Ressourcen im Lebensverlauf negativ auf die Gesundheit auswirkt. Mögliche Erklärungen liegen in der Operationalisierung der gesundheitsrelevanten Ressourcen und in unbeobachteten Effekten. Aufgrund von Datenbeschränkungen konnten Indikatoren zur Bildungs- und Berufshistorie und zur sozialen Unterstützung, die vom Alter bei Erstgeburt abhängig sein können und die spätere Gesundheit beeinflussen, nicht berücksichtigt werden. Die Ergebnisse zeigen Mechanismen kumulativer sozialer Ungleichheit auf, wenn benachteiligte Frauen jünger Mütter werden und dadurch ihre Gesundheitsrisiken zusätzlich verstärkt werden.

***Key words*:** motherhood, health, young mothers, birth timing

***Schlagwörter*:** Mutterschaft, Gesundheit, junge Mütter, Alter bei Erstgeburt

Introduction

The relationship between motherhood and later health is extremely complex and an ongoing topic of debate in various disciplines. The effect of motherhood on health depends on a variety of individual characteristics like e.g. the mother's socioeconomic status, her fertility behaviour or her relationship status and history (Beral 1985; Kington et al. 1997; Doblhammer 2000; Floderus et al. 2008; Spence 2008; Dupre et al. 2009; Read et al. 2011). Effects of mother's age at first birth on her later health play an important part in this discussion. Since the age of first-time mothers at the time of family formation keeps increasing in most European countries, this aspect is especially interesting (OECD 2011).

Young mothers more often experience physical and mental as well as functional impairments in later life (Henretta 2007; Spence 2008; Taylor 2009; Read et al. 2011). While there is a consensus in empirical research about the health implications of young motherhood, the impacts of late motherhood are less clear. Some studies show that late motherhood is connected to better health in old age (Doblhammer 2000; Yi/Vaupel 2004). Others do not find any general (Alonzo 2002; Spence 2008) or even negative health effects of comparatively old age at first birth on later health (Cooper et al. 2000; Mirowsky 2005).

On these grounds, theoretical approaches and their implications with regard to the effects of age at first birth on later health will be tested using a data set that has not yet been analysed with the purpose of answering the research question presented here: How does age at first birth affect health at later age? The SHARE study has two advantages: Firstly, it is a new data source that can be used for testing whether findings from the recent state of research could be reproduced and therefore prove reliable. In doing so, we can contribute to the existing literature. Secondly, it allows us to incorporate information on mothers' circumstances before and after first birth. Therefore, not only determinants that might both affect the timing of first birth and later health, but also influences of circumstances after first birth that affect health in later life, can be analysed. This comprehensive approach offers the opportunity to examine different theories concerning the health situation of mothers.

Effects of mother's age at first birth on her later health: Theory and state of research

The relationship between mother's age at first birth and her later health can be explained by different sociological and sociobiological theoretical approaches. The biodevelopmental and the biosocial view play an important role. The two approaches differ in that the first focuses on complications during pregnancy and childbirth, while the latter emphasises problems of motherhood that have long-term social effects. Both above-mentioned problems can have an effect on the later health of mothers (Mirovsky 2005: 34).

According to the ***biodevelopmental view***, the optimal age for first birth with regard to later health is directly after puberty, when the body is still young and energetic and has not yet been harmed by chronic diseases (Mirowsky 2005: 32f). With increasing age, not only fecundity decreases, but the risks during pregnancy and birth grow for both mother and child (Gosden/Rutherford 1995). By contrast, the ***biosocial view*** emphasises the influence of age at first birth in connection to social factors that later on affect health. This approach postulates that with regard to later health, motherhood should be postponed for as long as possible in order to achieve a sufficient educational attainment, establish a stable marriage and a secure socioeconomic status (SES). Previous research provides evidence that a person's educational attainment and SES affect her or his health throughout her or his life course (e.g. Ross/Wu 1995). Moreover, the biosocial view acknowledges that from a certain age onwards, the aging reproductive system and the occurrence of chronic diseases may counterbalance the positive effect of a postponed first motherhood (Mirowsky 2005).

So far, study results about the influence of age at first birth on later health clearly support the biosocial view (Geronimus/Korenman 1992; Hobcraft/Kiernan 2001; Hofferth et al. 2001; Mirowsky 2005; Pudrovska/Carr 2007; Spence 2008; Taylor 2009).

The connections between age at first birth and later health are manifold (for an overview see Figure 1). In the following paragraphs, they will be discussed separately for young, middle-aged and older first-time mothers. Additionally, a connection to the abovementioned theoretical views will be drawn.

Early motherhood and health

On the one hand, the mechanisms among young mothers can be divided into selection effects (see Figure 1) that can be attributed to circumstances during childhood, and on the other hand, into mechanisms that work according to the biosocial view (see Figure 1).

Selection effects for young motherhood

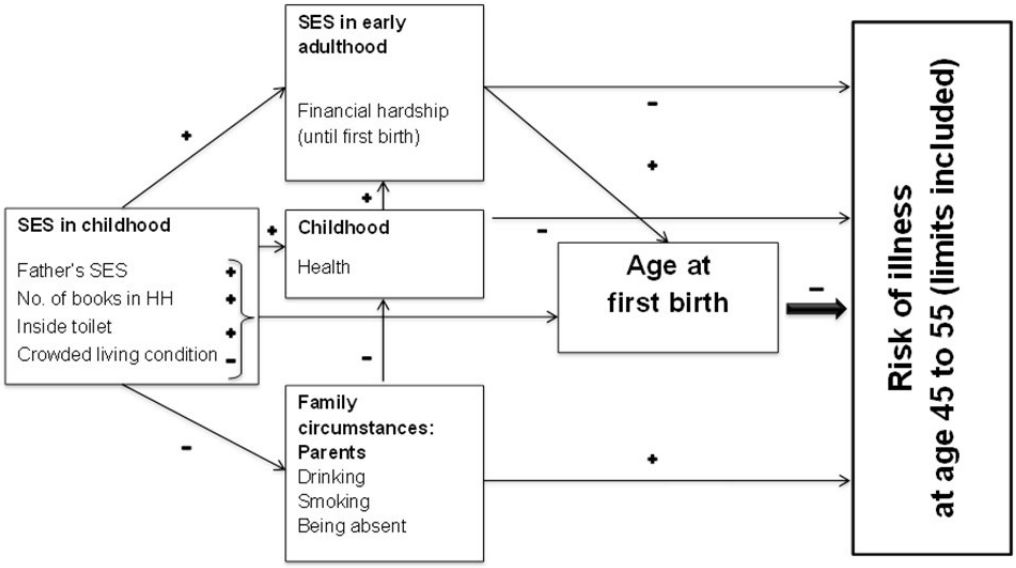
Empirical findings suggest that women with a disadvantaged socioeconomic background relatively frequently have children early in life (Hobcraft/Kiernan 2001; Henretta et al. 2008; Spence 2008; Taylor 2009). Thus, the poorer health of these women in later life might be attributed to their social background.

Important indicators to support this are the parents' SES or the father's SES, respectively (Olausson et al 2001: 72; Taylor 2009: 495). Moreover, the social situation in the family, such as an intact family (or the absence of a parent) seems to play an important role (for an overview see Blackwell et al. 2001: 1270; Hofferth et al. 2001: 260; Mirowsky 2002: 326; Pudrovska/Carr 2007: 106). An overview of the relevant factors and their relation in the selection process can be found in Figure 1. In addition to the description of positive and negative relationships, the indicators we use in our analysis are outlined.

Firstly, the parents' high SES has a positive influence on mother's health during her childhood (Case et al. 2002; Currie 2009). Secondly, there are direct (Blackwell et al. 2001) and indirect negative effects of poor health during childhood on later health. Poor health during childhood affects participation in education (Case et al. 2002) and thereby

has a negative effect on a person's SES in later life (Case et al. 2002; Currie 2009). As mentioned before, a person's higher SES is connected to better health (e.g. Ross/Wu 1995). Since there are several pathways how childhood health affects later health, it is crucial to control for childhood health in the present analysis.

Figure 1: Connection between childhood indicators, age at first birth and risk of illness at age 45 to 55. Authors' own graph.



For the association between better childhood health and parents' higher SES, health-related factors such as healthier nutrition, more frequent preventive health care or a better living environment play an important role. Moreover, health-related behavioural factors correlate with parents' income (for an overview see Blackwell et al. 2001: 1270; Case et al. 2002: 1309).

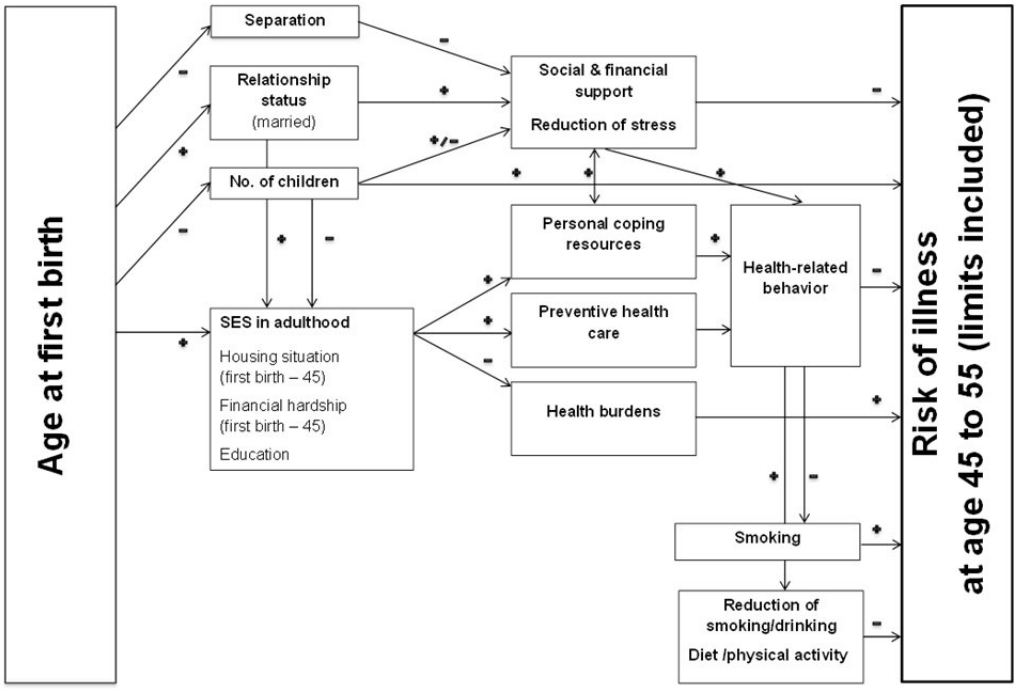
Controlling for mother's childhood health is not only beneficial for analysing the selection effect of who becomes a young mother, but it also offers additional benefits for our further analysis. Particularly, in a second step, we will examine the influence of health-related factors that occur after first birth on later health. For example, SES during adulthood is associated with a range of health-related outcomes (see e.g. Ross/Wu 1995). Since SES during adulthood is influenced amongst others by childhood health, childhood health is also an important factor in the second step of our analysis. The complex interactions between mother's age at first birth and her later health are depicted in Figure 2.

Circumstances in adulthood – the biosocial view

Early motherhood and the resulting additional burden can hinder acquisition of human capital which is known to have a positive influence on health. Often, becoming a mother early in life decreases participation in education (Hobcraft/Kiernan 2001: 515; Hofferth et

al. 2001: 264; Olausson et al. 2001; Taylor 2009). On the one hand, this may be due to time constraints, as young mothers may have to use their time and resources to care for their child instead of investing them in education (Waldron et al. 1998). On the other hand, young mothers have possibly not had enough time to develop coping resources needed to handle the challenges of motherhood. This lack of coping resources might hamper the acquisition of human capital (Hofferth et al. 2001: 259), as „humans mature reproductively about a decade before they mature socially" (Mirowsky 2002: 316).

Figure 1: Age at first birth and health in later life measured by periods of ill health at age 45 to 55. Authors' own graph.



Research findings show that compared to older mothers, young mothers' marriages are more often unstable (Hobcraft/Kiernan 2001: 515; Taylor 2009: 499). Also, young mothers more frequently have a disadvantaged social status (Olausson et al. 2001; Ermisch 2003; Taylor 2009). The mechanism between individual adult SES and individual adult health works similarly to the above-mentioned mechanism between parents' SES and children's health.

In this context, health-related behaviour constitutes an important factor. It can be attributed to personal coping resources, preventive health care behaviour and health burdens (Mielck/Helmert 1998). Results indicate that individuals with lower SES are more often smokers and they report less physical activity. Furthermore, they more often show problematic drinking patterns (for an overview see Burkert et al. 2012: 256). Thus, it seems that due to their social disadvantage, young mothers engage more frequently in health risk

behaviour such as smoking (Holm/Olausson in Olausson et al. 2001: 73; for an overview see Hugg et al. 2007: 60). Also, they use preventive health care less often than older mothers (Mirowsky 2005: 34).

When considering the impact of a stable marriage on health, in principle, it can be assumed that a relationship has a positive effect on health. That is because an intimate relationship may offer financial security, social support and promote health-conscious behaviour (Waldron et al. 1998; Dupre et al. 2009: 553; Bruhn 2011: 214ff.; for an overview see Choi/Marks 2011: 717f.). Previous research provides evidence that by way of comparison with unmarried women, married women report the best state of health (Kostiainen et al. 2009; Sperlich et al. 2011: 739). However, the connection between relationship status and health does not only depend on the status per se, but also on the quality of the relationship (Umberson et al. 1996; Dupre et al. 2009; Gruenewald/Seeman 2010; Choi/Marks 2011). Studies show that young mothers are not only married less often at the time of first birth (Olausson et al. 2001; Ermisch 2003), but they also more frequently live in single households later in live (Olausson et al. 2001; Ermisch 2003: 14). For this reason, we will not only incorporate mother's relationship status at the time of first birth, but also consider relationship separations after first birth that may provide information on relationship quality.

It can be assumed that women who start having children early in life also have a higher number of children throughout their lifetime (Morgan/Rindfuss 1999; Olausson et al. 2001; Henretta 2007). While some study results and theories suggest positive effects (for an overview see Smith et al. 2002) or no significant effects (Henretta 2007; Spence 2008) of high parity on mother's health, the majority of findings indicate that a high number of children influences mother's health negatively (Doblhammer 2000; Smith et al. 2002, Floderus et al. 2008: 72; Read et al. 2011). This negative effect can be attributed to the time and attention children need and the increasing amount of housework in large families. These psychological and physical demands go along with less flexibility for mothers (Floderus et al. 2008: 79). Additionally, biological causes are plausible explanations, as physical strain increases with each birth.

In the case of positive or absent effects of high parity on mothers' health, unobserved selection effects surely play an important role. Possibly only very healthy women can have many children during their lifetime (Smith et al. 2002: 186ff.).

Late motherhood and health

In contrast to young mothers, the mechanisms linking late first birth to health in later life, and the actual health effects from late birth are less clear. For example, Doblhammer (2000) and Yi and Vaupel (2004) find a positive correlation between comparatively late birth and better health in later life. Contrarily, Mirowsky (2005) reports negative effects.

So far, research on older mothers appears to be rather unsystematic. Especially with respect to age, the classification of a mother as 'old' varies within a relatively wide age range of 30 to 40 years at birth. Often, a justification for the age classification is entirely absent (for an overview see Zerle et al. 2012). However, it can be assumed that research on older first-time mothers will gain in importance. In the future, researchers will be able

to access larger samples of older first-time mothers, as there is a strong trend in Europe to postpone the birth of the first child (Mirowsky 2002: 316).

Positive effects

The underlying mechanisms of late birth's positive effects on mothers' health are as diverse as the results themselves. Yi and Vaupel (2004) observe positive effects of late births for Chinese women aged 80 to 105 years. The authors describe four factors that are possibly responsible for this effect: (1) social factors such as family support and health-related behaviour; (2) biological changes caused by giving birth at an older age; (3) genetic and other biological characteristics and (4) selection effects (see following paragraphs).

Firstly, social factors comprise positive effects of own children's support in old age, of a change in health-related behaviour and of the factor of time. Analogous to the argumentation concerning young mothers, the latter factor refers to the idea that older first-time mothers theoretically have had sufficient time to invest in their own health-related resources (such as education, stable relationship, financial security etc.). A further assumption states that mothers, who postponed the birth of their first child until quite late in life, enjoy better support in old age from their own children. That is because children are comparatively young when their parents are in old age and they are therefore better equipped to help their parents (Yi/Vaupel 2004: 48). Especially in rural areas, parents profit not only from financial, but also from direct support from their children (for example in housekeeping and in farming) (Smith et al. 2002: 186). Literature research has shown that individuals who have better access to social support also have better health (e.g. Strine et al. 2008; Cornwell/Waite 2009; Weyers et al. 2010; Gruenewald/Seeman 2010: 226ff.). Children are the second most important component of social ties (partners are the most important) in adult and family networks and thus play an important role in supporting their parents (for an overview see Smith et al. 2002: 187). It is also plausible that women who have their first child late in life specifically care for their health, as they are at more risk during pregnancy and at birth than younger mothers. Furthermore, good health is important for being able to take responsibility for raising children and to see the own children and grandchildren grow up (Yi/Vaupel 2004: 48).

Secondly, biological changes that are connected to giving birth can positively affect women's later health (a detailed description of biological mechanisms and relevant genetic characteristic can be found in Yi/Vaupel 2004). Moreover, Myrskylä and Margolis (2012) report that the first child's birth has more positive and more long-lasting positive effects on the subjective well-being of older parents and on parents with higher resource endowments than on younger and less endowed parents. Scientific literature shows that subjective well-being positively influences health (Diener/Chan 2011). These findings about a late first birth's positive effect on health in later life are in accordance with the bio-social view.

Selection effect for late first-motherhood

Older first-time mothers' good health in later life may be attributed to a selection effect and biological reasons. Hence, late first birth does not necessarily have to be connected to better health per se. Rather, it might be attributed to the fact that only very healthy women are fecund and fertile for a very long time (Smith et al. 2002: 201, Yi/Vaupel 2004: 49).

Negative effects

Negative effects of late birth are often associated with late birth's physical strain. From a certain age onwards, a women's body does not seem to be able to cope with that strain (for an overview see Mirowsky 2005: 35).

Results from Alonzo (2002) and Spence (2008) do not suggest general negative effects of comparatively late birth on mother's later health, but they illustrate that a differentiated analysis of health impairments and diseases in old age seems reasonable. Both studies show negative effects of late birth on a range of specific diseases such as cardiovascular diseases and risk factors (diabetes and hypertension), blood abnormalities, dental health, physical mobility and vision difficulties (Alonzo 2002). In addition to physical impairments, mental health (e.g. depressive symptoms) was found to be affected (even when controlling for current and childhood SES, support from children and physical health) (Spence 2008).

Mirowsky's analysis of optimal age at first birth (2005) indicates that women's health (measured by seven separate indicator groups) deteriorates when they have their first child after the age of 40. Similarly, Cooper et al. (2000) show that women's mortality risk is highest when they give birth at age 40 and older.

Mechanisms among middle-aged mothers

Middle-aged first-time mothers are expected to have better health later in life than young first-time mothers, due to the additional time available to accumulate health-related resources before first birth. In comparison to older first-time mothers, middle-aged first-time mothers should report better later health as they can expect less physical strain from giving birth and rearing children.

From the above discussion it is evident that examining effects of mother's age at first birth on her later health requires a life course perspective. Certain indicators (such as SES) influence both age at first birth and health, thus making an analysis of the connection between age at first birth and health difficult. Being able to control for circumstances during childhood (e.g. parents' SES) allows us to separate the selection effect on age at first birth from the net effect of age at first birth on later health.

Research question and hypotheses

This study addresses the question of how mother's age at first birth affects her later health. Based on previous research and theory, we expect that comparatively young and comparatively old first-time mothers report poorer health than mothers who had their first child at an age classified as 'middle-aged' according to their country and their specific birth cohort. We are particularly interested in answering the question of whether those assumed effects remain when controlling for circumstances during childhood that both influence age at first birth (selection effect) and later health. In a second step, we control for health-related indicators after first birth that might be affected by age at first birth. The

goal of the second step is to analyse whether the direct effect of mother's age at first birth on her later health can be explained by those health-related indicators. Assuming that these indicators explain the mechanisms linking age at first birth to her later health, the direct effect of age at first birth should disappear, when controlling for them. The second part of the analysis should be regarded as an excursus though, because it is not possible to control for all health-related indicators in periods exclusively after first birth due to data constraints. Thus we cannot restrict the influence of those health-related indicators on later health to the time after first birth as we assume in the model.

We use the first, the second and the third wave of the Survey of Health, Ageing and Retirement in Europe (SHARE) to test our hypotheses. The target population of this longitudinal study are individuals aged 50 years and older. In 2004/05 the first study wave and in 2006/07 the second study wave were conducted. The third wave about retrospective life histories (SHARELIFE) was conducted in 2008/09 with the goal to collect data on participants' previous life and connect them with the first two waves of the study. In the present study, analyses are based on data from 13 European countries. Participating countries are Denmark, Sweden, Germany, France, Belgium, Switzerland, Austria, the Netherlands, Spain, Italy, Greece, Poland and the Czech Republic. A detailed description of the methodological framework and the data collection of the SHARE study can be found in Börsch-Supan et al. (2013).

Sample

We use a sample of 11.469 mothers who were born in 1954 or earlier and whose age at their first child's birth is known.

Mothers who reported own experience of migration (N=460) were excluded from our sample for reasons of higher unobserved heterogeneity. A procedure of this kind involves advantages and disadvantages: indicators from childhood, youth and adulthood are analysed controlling for country-specific heterogeneity. For migrants, country-specific heterogeneity of at least two countries exists to varying extents. Moreover, the effects of each country are unknown. Consequently, estimation results for determinants of mother's later health could be distorted when including migrants. Estimating the model solely for individuals without migration experience facilitates the analysis. However, such a change of the population also changes the individual probability of developing an illness, since this individual probability can only be calculated relative to the population. When interpreting the results, it has to be kept in mind that the coefficients were estimated based on a population that does not exist in this form.

Mothers of adopted children were included in the sample if they also had a biological child and this child was the oldest of all children in the family. This will ensure that the first child of all mothers in the sample can both have a social and a biological effect.

A further restriction of the sample was necessary due to our operationalisation of the dependent variable 'health in later life'. Mother's later health is measured by state of health at age 45 to 55 (limits included). The beginning of this observation period was chosen because women's fecundity decreases and risk during pregnancy increases in their mid-thirties (Gnoth et al. 2003; Ritzinger 2013), most women enter menopause at age 50

to 55 (McKinlay 1996) and as a consequence, most women's childbearing ends in their mid-forties (Eurostat 2014). Thanks to this timeframe of the dependent variable, we can examine all births' causal effects on mother's later health. However, mothers who had a child at age 45 or older did not end their reproductive phase before the start of the dependent variable's observation period. These were excluded from the sample. The end of the dependent variable's observation period at age 55 (limit included) was chosen so that for reasons of comparison we would have data for the same age span of 11 years for all participants – even from the youngest survey participants who were aged 50 in the first wave. At the time of the third wave taking place up to five years later, participants reported on their state of health throughout their lifetime. We employ this information for our dependent variable. The youngest respondents were then aged 55 – this is the maximum age at which we have information on health from all participants. This comparatively small time frame of 11 years of 'later health' (age 45 to 55, limits included) obviously presents some restrictions. The main one is that the study looks at a short time range in life that stands rather at the beginning of a rapid increase in prevalence of health problems with advancing age. Recent statistics show that in 2010 in the EU-27 countries, average chronic morbidity increased from about 20% at age 40 to 40% at age 60 to more than 60% at age 80 (Robine/Cambois 2013: 2). Our age span thus covers a period where chronic morbidity rate is still relatively low. All in all, due to item non-response N=9762 mothers are included in the analysis.

Operationalisation

Dependent variable: later health

The present study aims at analysing the effect of age at first birth on the risk of illness at age 45 to 55. We define women as being ill if they reported at least one period of ill health or disability that lasted not less than one year and that started and/or ended within the defined 11 years. Serious illnesses that lasted for less than one year but influenced the respondent's daily life for more than one year were included as well.

Independent Variable: Age at first birth

Age at first birth is operationalised in a cohort- and country-specific way. Mothers are divided into three birth cohorts: *cohort 1* consists of birth cohorts up to and including 1938, *cohort 2* comprises births during and shortly after Second World War (1939-1947) and *cohort 3* is constituted of women born 1948 to 1954. On the strength of its robustness against outliers, we used the median to divide age groups. All women who had their first child at least two years before the cohort- and country-specific median age were defined as *young first-time mothers* while all first-time mothers who gave birth two and more years after the cohort- and country-specific median age were specified as *older first-time mothers. Middle-aged first-time* mothers serve as reference category for which we do not

expect any specific effects. An overview of the country- and age-specific classification of mothers' age at first birth is provided in Table 4 in the appendix.

This age classification does not only take into account country-specific differences in age at first birth, but it also incorporates varying trends over time. The sample consists of 22% young, 50% middle-aged and 28% older first-time mothers. Our age group distribution resembles the one from the empirical classification of Zerle et al. (2012) who used the first and third quartile point to define young and older mothers. However, our cutting points are on average at earlier ages than the ones in Zerle and colleagues' study on younger German birth cohorts.

Control variables in childhood before first birth

Socioeconomic status in childhood

The SHARE survey provides several socioeconomic indicators from childhood, such as the main breadwinner's socioeconomic status, the number of books at home, having had an inside toilet and having experienced crowded living condition at the age of ten. Except for crowded living conditions, all indicators are dummy variables. The income of respondent's parents or respondent's income in adulthood could not be used due to data restrictions.

The main breadwinner is defined as having a high socioeconomic status if her or his occupation at respondent's age of ten was reported as professional, technical or managerial (operationalisation based on Engelhardt et al. 2012). Further indicators are number of books in the household (more than 25 books yes/no), having an inside toilet and crowded living conditions. Crowdedness is calculated dividing the number of people per household by the number of rooms. Kitchen, hallway and bathroom(s) are excluded from the number of rooms.

Family circumstances in childhood

Information on specific childhood circumstances such as the *absence of a biological parent* and parents' *smoking* and *alcohol drinking patterns* is included in the SHARE data as well. According to the SHARELIFE questionnaire, the absence of a biological parent in the household, meaning respondent's father or mother, refers to the age of ten while information on parents' or guardians' smoking and drinking patterns refer to respondent's entire childhood up to and including the age of 15. Parents' drinking pattern is indicated by the information whether parents or guardians drank heavily during childhood.

Health in childhood

A control variable for general childhood health is *self-rated health* up to age 15. The values *excellent* and *very good* were grouped together into the category *very good*, the value *good* was carried over and the remaining categories *fair, poor* as well as the spontaneous value *health varied a great deal* were combined into *poor* health. As a result of expected bias due to recall problems, we forgo the possibility of using information on sick leave from school or specific illnesses during childhood in favour of the subjective self-rated health in childhood.

Socioeconomic status in adolescence and early adulthood before first birth

In early adulthood before first birth, we use *periods of financial hardship* as indicators for respondents' socioeconomic status. Mothers, who experienced a period of financial hard-

ship in childhood, adolescence or early adulthood before first birth, are represented in the variable *financial hardship before first birth*.

Control variables in adulthood after first birth

Socioeconomic status in adulthood

For the time period after first birth, we use information on the housing situation and periods of financial hardship as indicators for mother's socioeconomic status.

The variable *housing* was coded into the following three categories: tenant, member of a cooperative, living rent-free or other; owner and not yet established own household before age of 45. It provides an indication of mother's financial background and her resources. Respondents, who reported having possessed housing property at least once between first birth and age of 45, were coded as owners.

Family status

On the basis of SHARE data, we can also control for the total number of children, relationship status at first birth and the number of separations (including divorces) between first birth and age 45.

The *number of children* indicates maternal strain and stress that may influence mother's later health. Since we do not expect a linear effect on the dependent variable, we test the influence of different numbers of children separately, using a single child as reference category. Regarding the *relationship status*, we distinguish between *married* and *unmarried living together with a partner* as well as *single or living apart from a partner respectively*. Couples living together seem to enjoy advantages similar to those of marriage. While empirical results do indicate that couples who live together report better health than single people, they nevertheless report poorer health than married couples (Wu et al. 2003). For this reason, we distinguish between spouses and unmarried couples living in one household.

The relationship status and the number of *separations* can indicate the degree of support and financial security that a mother has in her relationship. Since the number of relationship breakdowns and the dependent variable do not show the functional form assumed by the logistic regression model (Kohler/Kreuter 2008: 283ff.), we dichotomise the variable into the new indicator *at least one separation between first birth and age of 45*.

Education

Using the ISCED-scale, *education* was grouped into three country-specific categories. Respondents belonging to the highest third of the country-specific distribution are coded as having high education, the second third as having a medium level of education and the lowest third as having the comparatively lowest level of education in the respective countries. Since some mothers reach their highest level of educational attainment before and others after first birth, this variable disregards the time of first birth. Thus the education variable can theoretically both influence and be influenced by timing of first birth. In order to model the selection effect on age at first birth correctly, education is only used as an indicator in adulthood after first birth.

Health-related behaviour
In the literature, health-related behaviour is seen as an important indicator for health. It is also closely connected to a person's SES (Mielck/Helmert 1998). Also, as previous discussions suggest, comparatively older mothers are more likely to show better health-related behaviour. Consequently, we control for mother's smoking patterns and changes in health-related behaviour.

Respondent's *smoking pattern* refers to her or his entire life course. The variable indicates whether the respondent has ever smoked either cigarettes, cigars, cigarillos or pipe on a daily basis for more than one year. Unfortunately it is impossible to determine the specific period of smoking throughout the life course of the mothers due to data restrictions. There are two distinct categories of indicators for changes in health-related behaviour: First*, increasing physical activity* and/or *changing diet*, second, *reducing alcohol consumption* and/or *stop smoking*[1]. Each of those is only registered if the behaviour lasts at least for one year with the goal of improving health. In order to represent solely self-directed behaviour change (and not a "forced" change due to illness), only those mothers who did not report any illness before their change in health-related behaviour were coded as having changed their behaviour.

Country-specific homogeneity
Since we expect contextual factors such as differing resources, varying health care services and diverging epidemiological environments (occurrence of different illnesses) etc. to influence health (Elo 1992), we control for country differences by including country dummies in each of our models.

Methods and models

Stepwise logistic regression models are used to explore the effect of age at first birth on risk of illness at age 45 to 56. Even though data were available for three waves, a pooled model was computed, because most of the variables used in estimations come from retrospective wave three. Information for health-related behaviour at different points in time would be available, but refers to the respective survey date, which is not consistent with the period of observation used for our analysis. Thus, a panel model was not estimated.

All models were tested for multicollinearity and proper functional relations. Average Marginal Effects (AME's) are used, as they allow for a robust estimation of coefficients' size, even for varying variance of the error term (when additional variables are included in stepwise models). Therefore, AME's are suitable for comparing effect sizes of differently nested models. Furthermore, interpretation is easier for AME's than for Odds Ratios: AME's indicate the average effect of the independent variable on the probability that the dependent variable equals one (Best/Wolf 2010, 2012).

1 This information is only available for predefined age categories. Thus, for the present study we grouped the two categories 16 to 25 years and 26 to 40 years together. A clear distinction between changes in behaviour before and after first birth is not possible.

In model 1 the effect of age at first birth on the dependent variable is tested controlling for birth cohort and country of origin. The aim is to show whether there is a basic correlation between age at first birth and health in later life. In model 2 the selection effect on age at first birth is examined. The model contains additional variables for childhood circumstances and similar factors, which originate from the time before the first birth and which influence both mother's age at first birth and her health in later life. When controlling for factors relevant to the time prior to first child's birth, a reduction of the effect of age at first birth on later health is expected. That is because it can be assumed that women from disadvantaged backgrounds become mothers earlier and show poorer health status in later life. Provided the effect of age at first birth is solely due to factors previous to first birth, the effect should disappear completely in model 2. In the last step, variables which are influenced by age at first birth and which could affect health in later life are added to model 3. Using this model, the biosocial view is tested. According to the biosocial view, the date of birth influences the accumulation of health-related resources throughout the life course. When taking these health-related factors in adulthood into account the effect of age at first birth on health in later life should vanish. The direct influence of age at first birth is expected to disappear in model 3.

Results

Descriptive results

Young first-time mothers experience more often an illness period at age 45 to 56 (13%) in comparison to middle-aged first-time mothers (11% with a period of ill health) and compared to older first-time mothers (9% show a period of ill health). The descriptive data show that women of comparatively young age at first birth seem to be disadvantaged in nearly every aspect. Childhood circumstances (such as parents' health behaviour) as well as living conditions (inside toilet, crowded living conditions etc.) prior to birth of first child are evidently more often poor compared to older first-time mothers (see Table 1).

Table 1: Mean values of young, middle-aged and older mothers

Variables	Mean middle-aged mothers (ref. category)	Mean young mothers	Mean older mothers	Significance test for equality of proportions*
cohort 1 (<1939)	.34	.37	.33	0.0109
cohort 2 (1939-1947)	.35	.34	.35	0.9973
cohort 3 (1948-1954)	.30	.29	.32	0.0085
SES in childhood				
SES father (age 10)	.10	.07	.15	0.0000
at least 25 books in HH (age 10)	.32	.22	.39	0.0000
inside toilet (age 10)	.46	.39	.53	0.0000
crowdedness of living (age 10)	2.01	2.13	1.88	0.0000+
Family circumstances in CH				
parents smoked (up to age 15)	.61	.62	.59	0.0259
parents drunk heavily (up to a. 15)	.07	.11	.06	0.0000
at least 1 biological parent absent (age 10)	.10	.14	.08	0.0000
Health in childhood				
self-rated „excellent-very good“	.66	.66	.69	0.0130
self-rated „good“	.24	.23	.23	0.7353
self-rated “fair, poor or varying”	.08	.09	.06	0.0002
SES before first child’s birth				
financial hardship (0-first birth)	.08	.07	.08	0.2097
SES in adulthood				
financial hardship (first birth-age 45)	.27	.37	.23	0.0000
housing 1: did not establish own household before age 45	.01	.00	.01	0.1712
housing 2: tenant, other, members of a cooperative	.31	.36	.30	0.0000
housing 3: homeowner	.67	.62	.68	0.0001
Relationship status				
number of children	2.41	2.67	1.98	0.0000+
relationship status at first birth: married	.94	.86	.91	0.0000
relationship status at first birth: unmarried living together	.01	.01	.03	0.0000
relationship status at first birth: single / not living together	.03	.12	.04	0.0000
separation between first birth up to age 45	.08	.15	.06	0.0000
Education				
low country specific education	.16	.26	.13	0.0000
middle country specific education	.64	.64	.58	0.0001
high country specific education	.18	.08	.27	0.0000
Health-related behaviour				
ever smoked daily	.32	.35	.33	0.0551
increased physical activity +/ changed diet	.09	.07	.10	0.0064
reduced smoking +/ reduced alcohol consumption	.04	.03	.06	0.0000

* Significance test for equality of proportions: do proportions of younger and older mothers differ significantly. Ha: difference !=0. Indicated are p-values. + t-test: do means of younger and older mothers differ significantly. N=9762.

Source: SHARE, SHARELIFE.

Older first-time mothers report a significantly better childhood health than young first-time mothers. The proportion of mothers with poor childhood health status is very small,

however, young mothers show significantly higher percentages in comparison to older mothers.

Additionally, the results for conditions in adulthood reveal that young mothers struggle more often with financial hardship between first birth and age 45 and own a house significantly less frequently. With regard to family status, young mothers have more children on average, are married in fewer cases at the time of first birth and experience more often at least one separation between first birth and the age of 45. Furthermore, older mothers show significantly higher levels of education, while young mothers on average obtain the lowest educational degrees.

Comparatively older mothers show significantly healthier behaviour with regard to changes of diet and physical activity, as well as to smoking and drinking behaviour. These findings are consistent with considerations by Yi and Vaupel (2004), which suggest that comparatively older mothers pay more attention to their health in order to be able to cope with the responsibility of child care and in order to be able to see their children and grandchildren grow up.

The descriptive data are consistent with current findings and are, all in all, in accord with the biosocial view. Furthermore, young mothers have lower childhood SES on average, indicating that there are selection processes for the age at first birth.

Multivariate results

Model 1 – Effect of age at first birth on health in later life

Model 1 shows a significant difference between young and middle-aged mothers regarding the occurrence of at least one period of ill health between 45 and 56 years (see Table 2). Women, who gave birth to their first child comparatively early, on average show a nearly three percent higher likelihood of having at least one period of ill health at age 45 to 56.

Older first-time mothers show a lower risk of illness in comparison to middle-aged first-time mothers. The effect, however, is not significant. The significantly lower likelihood to show an illness in later life of the earliest birth cohort (born before and including the year of birth 1938) in comparison to the middle birth cohort (1939 up to 1947) can be ascribed to selection effects. The participants of the SHARE survey from the first cohort still alive today are the healthiest subsample of this cohort and do not representatively reflect the health condition of the entire cohort.

Model 2 –Selection effects on age at first birth

Model 2 is built up in a stepwise manner and considers childhood factors and indicators which are attributable to the period before the first child's birth. The inclusion of childhood SES indicators only leads to a slight reduction of the effect of age at first birth on health in later life. The effect still remains highly significant for young first-time mothers; the same happens when parents' behaviour in childhood is taken into account. The effect is reduced further, whilst remaining highly significant.

The covariates show the expected effects: Respondents with an inside toilet available at the age of ten show a significantly lower risk of illness at age 45 to 56 in comparison to

respondents without an inside toilet. Increasingly crowded living conditions in childhood raise the likelihood of becoming ill between the age of 45 to 56.

Table 2: Model 1: Effects of age at first birth on later health (period of ill health between the age of 45 and 56) and model 2 including childhood indicators

Model	**1**	**2a**	**2b**	**2c**	**2d**
Variables	Average Marginal Effects/(SE)				
Age of mother at first birth					
ref.: middle-aged mother					
young mother	0.029***	0.027***	0.025***	0.024**	0.024**
	(0.009)	(0.008)	(0.008)	(0.008)	(0.008)
older mother	-0.009	-0.008	-0.007	-0.006	-0.006
	(0.008)	(0.007)	(0.008)	(0.008)	(0.008)
Cohort					
ref.: cohort 2					
cohort 1 (<1939)	-0.038***	-0.042***	-0.041***	-0.040***	-0.042***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
cohort 3 (1948-1954)	0.014*	0.017*	0.017*	0.017*	0.018*
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
SES in childhood					
SES father (age 10)		-0.004	-0.003	-0.004	-0.004
		(0.010)	(0.011)	(0.011)	(0.011)
at least 25 books in HH (age 10)		0.007	0.008	0.009	0.009
		(0.008)	(0.008)	(0.008)	(0.008)
inside toilet (age 10)		-0.020**	-0.019*	-0.019*	-0.019*
		(0.007)	(0.007)	(0.007)	(0.007)
crowdedness of living (age 10)		0.006*	0.006*	0.006*	0.005*
		(0.002)	(0.002)	(0.002)	(0.002)
Family circumstances in CH					
parents smoked (up to age 15)			0.014*	0.014*	0.014*
			(0.007)	(0.007)	(0.007)
parents drunk heavily (up to age 15)			0.020	0.017	0.017
			(0.011)	(0.011)	(0.011)
at least 1 biological parent absent (age 10)			0.038***	0.035***	0.034***
			(0.009)	(0.009)	(0.009)
Health in childhood					
ref.: "excellent -very good"					
self-rated health „middle"				0.011	0.011
				(0.008)	(0.008)
self-rated health „fair, poor or varying"				0.057***	0.056***
				(0.010)	(0.010)
SES young adulthood					
financial hardship					0.028**
(up to first birth)					(0.011)
Model fit					
LL	-3235.10	-3227.12	-3215.51	-3200.52	-3197.34
McFadden Pseudo R2	0.0305	0.0329	0.0364	0.0408	0.0418

All models with control for countries, N=9762.
***=p<=0.001 **= p<=0.01 *=p<=0.05 °p=<=0.10.

Source: SHARE, SHARELIFE.

Furthermore, parents' smoking habit or an absent parent at the age of ten increases the likelihood of experiencing a period of ill health between the age of 45 to 56. The remain-

ing covariates of model 2a and model 2b do not show significant effects. After adding self-rated health in childhood and SES in young adulthood before birth of first child to model 2c and to model 2d the effect of young age at first birth on later health remains highly significant. A poor or strongly varying health in childhood as well as a period of financial hardship increase the likelihood of illness at age 45 to 56. Although childhood factors partly explain the influence of age at first birth on later health, the statistical connection between young age at first birth and later health still remains when controlling for childhood factors. Hobcraft and Kiernan (2001) also found similar results. The SHARE data make it possible to observe the effects of mother's age at first birth on later health controlling for factors in adulthood. However, there may be distortions, as single indicators cannot be referred to the time of first birth. For this reason, results of model 3 may merely be seen as an excursus and an impulse for further research.

Excursus: Model 3 – Effects of mother's age on conditions after birth of first child (biosocial view)

In model 3 (see Table 3 which excludes listing single childhood factors) the control of childhood indicators and factors of young adulthood, which are described above, is maintained. Failing to control for childhood factors (regarding health as well as family background) would otherwise lead to an overestimation of the effects of adulthood SES (Blackwell et al. 2001: 1280). The model is extended by factors, that are – according to the biosocial view – influenced by mother's age at first birth, and that are expected to have an impact on health in later life. First, a model is estimated in which the indicators can be assigned specifically to the period before or after first birth. Hereafter, additional covariates are added, for which the time point of the first birth could not be considered in the operationalisation.

Adding the indicators of adulthood SES (financial hardship and residential status between first birth and the age of 45) decreases the effect of young age at first birth from 2.4% to 2.3% in model 3a. While residential status turned out to be insignificant for later health, there are significantly positive effects of financial hardship between time-point of first birth and age 45 on the likelihood of falling ill between the age of 45 and 56.

Taking family status (relationship status at time of first birth, occurrence of a separation between first birth and age 45 as well as number of children) into account in model 3b, the effect of young age at first birth slightly reduces to 2.1%. The number of children and the relationship status at the time of first birth do not show significant effects, whereas the occurrence of at least one separation between the birth of first child and the age of 45 significantly increases the likelihood of an illness period in later life.

Even after taking mother's education (model 3c) and changes in health-related behaviour as well as mother's smoking behaviour (model 3d) into consideration, the effect of young age at first birth remains significant. In the last two models only changes in diet and/or increased physical activity at age 16 to 40 increase the risk of illness at age 45 to 56, whereas smoking behaviour and education do not affect later health. However, the indicators of health-related behaviour and education cannot be assigned to the time-point of birth due to the data situation. Therefore, a causal link to age at first birth cannot be inferred. It is thus not surprising, that the effect of age at first birth does not disappear when controlling for these health-related variables.

Table 3: "Model 3": Effects of age at first birth on later health (period of ill health between the age of 45 and 56) including adulthood indicators

Model	**3a**	**3b**	**3c**	**3d**
Variables	**Average Marginal Effects/(SE)**			
Age of mother at first birth				
ref: middle-aged mother				
young mother	0.023**	0.021**	0.020*	0.019*
	(0.008)	(0.008)	(0.008)	(0.008)
older mother	-0.006	-0.007	-0.007	-0.007
	(0.008)	(0.008)	(0.008)	(0.008)
SES in adulthood				
financial hardship (first birth-age 45)	0.014*	0.011	0.010	0.011
	(0.007)	(0.007)	(0.007)	(0.007)
Housing				
ref: housing 3: homeowner				
housing 1: did not establish own household	-0.059	-0.060	-0.061	-0.060
before age 45	(0.043)	(0.043)	(0.043)	(0.043)
housing 2: tenant, other,	0.003	0.001	0.001	0.000
members of a cooperative	(0.007)	(0.007)	(0.007)	(0.007)
Family status				
Number of children				
ref: 1 child				
2 children		-0.013	-0.013	-0.013
		(0.009)	(0.009)	(0.009)
3 children		-0.172°	-0.017°	-0.017
		(0.010)	(0.010)	(0.010)
4 and more children		-0.001	-0.002	-0.001
		(0.012)	(0.012)	(0.012)
Relationship status at first birth				
ref: married				
unmarried living together		0.008	0.008	0.010
		(0.021)	(0.021)	(0.021)
single/not living together		-0.009	-0.009	-0.011
		(0.014)	(0.014)	(0.014)
separation between first birth up to age 45		0.031**	0.031**	0.029**
		(0.010)	(0.010)	(0.010)
Education ref:				
middle country specific education				
low country specific education			0.010	0.009
			(0.009)	(0.009)
high country specific education			-0.002	-0.001
			(0.009)	(0.009)
Health-related behaviour				
ever smoked daily				0.009
				(0.007)
increased physical activity +/ changed diet				-0.037**
				(0.012)
reduced smoking +/ alcohol consumption				-0.022
				(0.016)
Model Fit				
LL	-3193.99	-3186.15	-3185.42	-3178.21
McFadden Pseudo R2	.0428	.0452	.0454	.0475

All models with control for countries, cohorts and childhood indicators, N=9762.
***p<=0.001 **= p<=0.01 *p<=0.05 °p<=0.10.

Source: SHARE, SHARELIFE.

In model 3 we tested whether the effect of age at first birth on later health can be explained by the operationalised mechanisms (resources, strains, health-related behaviour). However, with the given operationalisation the effect does not disappear, as was expected. This result is discussed in the following section.

Conclusion and discussion

In this article, the influence of age at first birth on mother's health at age 45 to 56 was explored. First, mechanisms which influence the time of first birth and which are connected with later health were controlled. In a second step, we tested the assumption that the effect of age at first birth on later health can also be explained by health-related factors after birth, which vary with age at first birth.

In comparison to middle age at first birth, the analysis shows significant negative effects of young age at first birth on mother's later health at age 45 to 56. The biodevelopmental view, which postulates advantages on health in the case of a first birth given as early in life as possible, could therefore not be confirmed. The risk of illness for older mothers does not differ from the risk for mothers, which gave birth to child at middle age.

In the course of this analysis, controlling for childhood factors revealed only minor changes in the effect size and significance of mother's young age at first birth on later health at age 45 to 56. Women, who gave birth comparatively early in life, did more often have a disadvantaged family background, however, the effects of young age at first birth could not solely be reduced to this disadvantaged family background (selection effect in childhood). Our results are consistent with findings by Olausson et al. (2001), who point out that there is also a risk for a low SES in later life for those young mothers who were not exposed to a disadvantaged background.

According to the biosocial view, the remaining effect of age at first birth on later health can be explained by differences in SES and health behaviour in adulthood between young, middle-aged and older first-time mothers. Yet, even after controlling for SES in adulthood, family status and health behaviour, the effect of young age at first birth on health still remained. Thus, with the underlying operationalisation, the biosocial view could not be confirmed.

In the present study, the covariates in childhood are overall the more important factors with regard to later health in comparison to the adulthood indicators used. The missing effect of comparably older age at first birth may be a result of varying age classification for older mothers in different countries in this study ('older' mothers in e.g. the Netherlands range from age 28 upwards vs. 25 years and older in Austria in the youngest cohort). In comparison to other studies, our "older" mothers are comparatively young (see Table 4). This might have led to mixed effects of older and middle-aged mothers. These groups however experience de facto different biological and social consequences of first birth.

Restrictions

The remaining effect of mother's young age at first birth could be due to missing information on health-related factors in adulthood, which can be influenced by mother's age at first birth. Missing factors of importance include household income in adulthood (as a better operationalisation of SES), mother's educational and occupational history[2], use of health care as well as reliability and extent of social support[3]. Thus, the importance of health-related factors in adulthood is probably underestimated in this study.

Based on SHARE data it was not always possible to control for conditions in periods *before* or *after* birth of first child (see section about variables in adulthood). Furthermore, childhood variables refer to different time spans (some reflecting the whole childhood up to an age of 15, others only specifically the situation at the age of 10). These aspects could lead to distortions, but are not avoidable due to the available data.

Additionally, in this study findings referring to teenage mothers are mixed with results for later (but still comparatively early) first birth. As our results show, there is also an effect of young age at first birth on later health when broad age classification is used. However, the effect may be stronger when using more rigid age classifications.

As mothers with migration experience were excluded, the results apply only to mothers without migration experience. Therefore, the results refer to a population, which does not exist it this form. The estimation of individual probability of developing illnesses could be biased.

Despite these restrictions the advantage of this analysis lies in its simple, but convincing approach of analysing different mechanisms with retrospective cross-sectional data in a stepwise model.

Research perspectives

This study provides several opportunities for additional analyses about the effects of mother's age at first birth on her health.

A comparison of childless women with the mothers of the SHARE data set would have been a worthwhile addition to this study. This could have given additional information with regard to the influences of some factors such as relationship status or separa-

2 For consideration of physical strain during the life course, information about occupational trajectories is missing. As for on average younger mothers more frequently (as a result of their lower educational degrees) have manual occupations, higher health burdens can be expected; these influences could explain a part of the age effects at first birth on later health.
Additionally, a possible positive effect of a steady occupation on later health could not be observed. However, it can be assumed that – at least for the earlier cohorts – this circumstance is not of great importance as the occupation of women – independent of husband and household – can only be expected in larger numbers in later cohorts.

3 It remains uncertain to what extend mother's age at first birth influences her social contacts. It may be possible that age at first birth does not only influence women's educational attainment and SES but it might also prevent the formation of strong and tight networks, because mothers invest time and energy in bringing up their children.

tion on risk of illness. Unfortunately, this was not possible due to low case numbers. In addition, a comparison with fathers could have added information about the purely sociobiological effects of parenthood.

Furthermore, revealing underlying effects of young age at first birth on later health constitutes an interesting field of additional research, as there is some clear intergenerational continuity in age at first birth. Children of young parents also give birth to their own children comparatively early (for an overview see Pudrovska/Carr 2007: 105). Thus, the analysis of multigenerational fertility biographies could be worthwhile.

Generally, an analysis of the entire fertility history and its association with mother's health seems promising. This approach would not only enable a more detailed investigation of effects of age at first birth, but it could also consider age at last birth or influences of timing and spacing of births as explanatory factors. Based on British data, Read et al. (2011) show that short birth intervals of less than 18 months influence mother's later health negatively. In less industrialised societies a spacing of 24 months is recommended between births to keep optimal health (during and after birth) (WHO 2006). It remains unclear to which extent later negative consequences of narrower spacing can be traced back to sociobiological or purely biological factors.

Furthermore, a cross-country comparison of fertility behaviour and health may be a good option in order to explore context effects such as family policy frameworks. Thus, institutionalised childcare services, mothers' work history patterns and their effects on later health could be examined. The change of fertility behaviour in society needs deeper insight into causes and effects of age at first birth.

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Address of the authors/Anschrift der Autorinnen:

Friederike U. Schlücker, M.A. (Corresponding author/Korrespondenzautorin)
Bamberg Graduate School of Social Sciences (BAGSS)
University of Bamberg
Feldkirchenstr. 21
96052 Bamberg
Germany/Deutschland

E-Mail: friederike.schluecker@uni-bamberg.de

A. Raphaela Blumenfelder, M.A.
Magdalenenstrasse 40
80638 München
Germany/Deutschland

E-Mail: anna.raphaela@gmx.de

Appendix

Table 4: Cohort-specific age of middle-aged first-time mothers in years

Country	Age of middle-aged first-time mothers in years*		
	Cohort 1 (< 1938)	Cohort 2 (1939-1947)	Cohort 3 (1948-1954)
Austria	22-26	20-24	20-24
Belgium	23-27	22-26	22-26
Czech Republic	21-25	20-24	20-24
Denmark	22-26	21-25	22-26
France	22-26	22-26	22-26
Germany	22-26	21-25	21-25
Greece	23-27	23-27	22-26
Italy	23-27	22-26	22-26
the Netherlands	24-28	23-27	23-27
Poland	21-25	20-24	20-24
Spain	24-28	23-27	22-26
Sweden	23-27	22-26	22-26
Switzerland	24-28	23-27	23-27

* Based on the country- and cohort-specific median of age at first birth. Middle-aged first-time mothers: Median age +/- 2 years. Young mothers <2 years of median, older mothers >2 years of median age.