Fertility trajectories and later-life depression among parents in England

Short title: Fertility trajectories and depression

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Abstract

We examined pathways between indicators of fertility tempo and quantum and depressive symptoms among older parents with at least two children using three waves of the English Longitudinal Study of Ageing. Using standard regression approaches and path analysis within the structural equation framework, we additionally investigated whether fertility trajectories mediated the association between childhood disadvantage and later-life depression. Results provided limited support for 'direct' influences of fertility trajectories on depression but indicated indirect linkages for both women and men. Associations were mediated by partnership history, social support, wealth, later-life smoking and functional health. Associations between childhood disadvantage and later-life depression were partially mediated by fertility stressors. Results confirm the influence of life-course experiences on depression at older ages and demonstrate the interlinked role of family and other life course pathways on later-life wellbeing.

Keywords: Depression; Ageing; Fertility; Parity; Age at first birth; Birth intervals; Path analysis; Lifecourse; Life history.

Introduction

Depression and depressive symptoms in mid and later life are a major cause of poor health and contribute substantially to the overall burden of disease (Wittchen et al. 2011). In this paper nationally representative longitudinal data from England are analysed to investigate linkages between the fertility trajectories of women and men with two or more children and later-life depression. Some trajectories may be directly related to later life depression, due to long-term effects of accumulated stress, and also indirectly related via impacts of fertility pathways on subsequent life experiences linked to depression. The paper additionally investigates whether fertility trajectories mediate associations between childhood disadvantage and depression at older ages.

Theoretical background

Identified current and life course socio-demographic factors associated with depressive symptoms in mid and later adulthood include childhood circumstances, level of education, adult socio-economic resources, partnership status, social support, and physical health (Fiske et al. 2009; Virtanen et al. 2015). Fertility trajectories intersect with all these factors and theoretical frameworks from several disciplinary traditions would suggest that the tempo and quantum of fertility may be directly or indirectly related to later-life depression. These frameworks – from social psychiatry, life course epidemiology and sociology, and life history theory, all posit that biological and social factors throughout life cumulatively and interactively influence later health outcomes and that effects of stress are one mechanism underlying this association (Ben-Shlomo and Kuh 2002).

From a social psychiatry perspective, seminal research by Brown and collaborators highlighted the role of exposure to recent adverse events and chronic stressors - including having three or more children to look after - in increasing risks of depression among women, particularly in the face of vulnerabilities arising from early loss of a parent and absence of a supportive relationship (Brown and Harris 1990). Consistent with this, a more recent systematic review of studies of life events, stress and depression concluded that stressors were important influences on depression, with some moderating effect of social relationships. Although most studies reviewed indicated that the effect of acute stressors dissipated over time, there was evidence that prior depressive episodes sensitised individuals to subsequent

stress induced disorder, meaning that earlier stresses may have long lasting effects (Tennant 2002). Other subsequent studies have also demonstrated the enduring effects of earlier stress burden on women's risk of depression in later life (Kasen et al. 2010) and the importance of relationships with partners and children (Stafford et al. 2011).

Life course theories in epidemiology and sociology similarly emphasise the cumulative influence of prior circumstances, particularly those at key developmental stages, on later-life health (Ben-Shlomo and Kuh 2002). Adversity in childhood, for example, is associated with adult mental health disorders (Comijs et al., 2007; Ford et al. 2011; Gershon et al. 2013; Weich et al. 2009). There is, however, disagreement as to whether direct effects persist at older ages (Wainwright and Surtees 2002; Gershon et al. 2013) or whether the association arises because childhood adversity sets in train 'chains of risk', including poorer quality social relationships and partnerships in adulthood (Brown et al. 2008; Ford et al. 2011) which in turn increase risks of mental health problems. Childhood socio-economic position (SEP), as distinct from specific adversities, is also associated with later–life depression. Again, some studies suggest lasting direct effects (Luo and Waite 2005; Schaan et al. 2014) whereas others indicate that associations are mediated by educational attainment and adult SEP and social resources (Kamiya et al. 2013; Kendig et al. 2015; Nicholson et al. 2018).

Less attention has been paid to the possible role of early parenthood as a mediator of associations between childhood circumstances and later-life depression. However, childhood adversity and low SEP are associated with poorer mental health in adolescence, with risky behaviours including smoking and sexual risk taking, and with early parenthood (Hale and Viner 2016; Henretta 2007; Hobcraft 2008; Pudrowska and Carr 2009; Sigle-Rushton 2005). Associations between early parenthood and later-life depression may thus mediate - or be confounded by - links between childhood circumstances and later depression. This pathway is emphasised in life history theories developed by evolutionary biologists which propose that unstable and unpredictable environments favour evolution of 'r-selected' traits associated with high reproduction rates but low parental investment. In contrast, 'K-selected' traits involve low reproduction but high parental investment (Mace 2000). Humans lie at the K end of the continuum but there is within species variation of reproductive strategy and epigenetic and hormonal influences prompted by unstable environments in childhood may lead to earlier sexual maturation and poorer choice of partners (Belsky et al. 1991; Ellis 2004; Waynforth 2012). Consistent with this theory, a range of studies have found associations between lack of parental care and earlier sexual maturation, sexual debut and reproduction, and greater risk of

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own partnership breakdown (Nettle et al. 2011; Quinlan 2003). Some studies have also suggested a negative association between high- *K* strategies and depression (Giosan 2013).

Fertility trajectories and stress

Parenthood has potential benefits for mental health, including provision of a sense of purpose, performance of a valued social role and enhanced social interaction and social support during childrearing and later phases of life (Offer and Schneider 2007). However, parenthood also presents challenges particularly for those following parenting trajectories likely to involve exposure to additional stress, such as early parenthood, closely spaced births and large family size. Young parents may be less resilient to the physical, emotional and economic stresses involved in raising children, have fewer stress-buffering resources and, in some social contexts, experience stigma (Barban 2013; Falci et al. 2010). Closely spaced or multiple births are physically challenging with higher risks of complications for both mother and babies (Conde-Agudelo et al. 2012). Parents of closely spaced children may experience stresses, albeit to a lesser extent, similar to those reported for parents of multiples; these include physical stress, sleep deprivation, greater risks of post-partum depression, economic strain and social isolation (Campbell, Teilingen and Yip, 2004). Thorpe et al. (1991), for, example, found that both mothers of twins and mothers of closely spaced singletons in a British nationally representative sample were more likely than other mothers to have depressive symptoms when the index child was aged 5. High parity (which is associated with both early parenthood and short inter-birth intervals) brings the stress of coping with the demands of several children at once and often financial strain (Townsend 1979).

In addition to involving exposures to stresses which themselves have possible cumulative effects on later-life mental health, certain fertility patterns may increase the risks of experiencing subsequent socio-economic and socio-demographic disadvantages linked to depression. Early parenthood may disrupt educational and career progression and is associated with increased chances of divorce (Ermisch and Pevalin 2005; Hofferth et al. 2001), as are multiple births (Jena et al. 2011). Large family size constrains opportunities for undertaking other roles, including mothers' labour market involvement, and is negatively associated with wealth accumulation (Grundy and Read 2015).

Previous research

Most research on associations between fertility patterns and later-life mental health has focussed on early motherhood, although some studies have also considered men. Results of these studies have been mixed (for a review see Umberson et al. 2012). Mirowsky and Ross's (2002) analysis of a US data set suggested that for parous women the age at first birth associated with the lowest later risk of depression was 30; for men there was a monotonic decrease in risk associated with older age at first birth. Similarly, a study based on Norwegian register data found that older age at first birth was associated with lower use of antidepressant medication in late mid-life (Kravdal et al. 2015) and a recent analysis of Australian panel data reported an association between teenage motherhood and poor mental health among women aged 40 and over, after adjustment for early life and later socio-economic circumstances (Aitken et al. 2016). However, Henretta et al. (2008), in a comparative study of the US and UK, found that, after control for early and mid-life socioeconomic status and midlife health, motherhood before age 21 was associated with poorer mid-life mental health in the British, but not the US sample. Some other analyses of US data have also found no associations or suggested that associations between early parenthood and later life mental health reflect the influence of other measured or unmeasured confounders or mediators, such as mental health before the first birth, marital status at time of the birth or later socio-economic or health status (Kalil and Kunz 2002; Koropeckyj-Cox et al. 2007; Mollborn and Morningstar 2009; Patel and Sen 2012; Spence 2008; Taylor 2009).

Research on associations between other aspects of fertility trajectories and later-life depressive symptoms is limited. Although mental health consequences of childlessness have been investigated (see Umberson et al. 2012), fewer studies have examined effects of large family size and results are inconsistent. Some report adverse effects of high parity (three or more than three children) among mothers but not fathers (Kruk and Reinhold 2014), fathers but not mothers (Buber and Engelhardt, 2008; Pudrovska 2008), both (Kim et al. 2015) or neither (Hank 2010). Associations between inter-birth intervals and mental health in mid and later life have not, to our knowledge, been previously investigated.

A more extensive literature has reported associations between fertility stressors and later life physical health or mortality. Adverse effects of early age at entry to parenthood and/or high parity have been reported in studies from a range of populations for both women and, in fewer studies, men (for reviews see Aiken et al. 2012; Zeng at al. 2016). These include

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studies which have used sibling comparison models or similar approaches to try to control for selection effects (Barclay et al. 2017). A few studies have considered longer term implications of birth spacing. One of these reported an association between experience of a short birth interval (< 18 months) and poorer physical functioning and accelerated functional decline in a sample of older people in the UK (Read et al. 2011). A subsequent study, based on Norwegian register data, found that mothers of twins and mothers and fathers of closely spaced singleton births had higher mortality and made greater use of prescription medication in late mid-life than parents with inter-birth intervals of 31-41 months (Grundy and Kravdal 2014).

The inconsistent results from earlier studies of fertility trajectories and later life depression may partly reflect variations in contextual influences such as supports for parents, cultural norms, and variations in access to modern methods of contraception and legal abortion in the populations studied (Grundy and Foverskov 2016). Differences in methods and measures and the extent of control for antecedent and later circumstances are also important. Many previous studies have controlled for factors which may lie on the causal path from, for example, early parenthood to depression rather than examining the possible role of such factors as mediators and as such may 'over control' and miss potentially informative associations (see Rosendaal and Pirkle (2017) for a discussion of this issue).

Research questions

In this paper a life course approach is employed to examine associations between fertility trajectories and depressive symptoms in later life with a focus on investigating mediating pathways. Based on the previous theoretical and empirical literature, it was hypothesised that early parenthood, experience of a short inter-birth interval and high parity would be associated with later-life depression because of lasting effects of accumulated stress and because these interrelated fertility experiences increase risks of experiencing other stressors and disadvantages, including divorce, lower labour market participation (for women), lower wealth, and worse physical health. A possible offsetting factor might be higher levels of social support for parents of large families (Grundy and Read 2012). Additionally, it was expected that poorer childhood circumstances would be related to a higher chance of early parenthood (and so to high parity) and that early parenthood would contribute to (mediate) the association between childhood circumstances and later life depression. It was expected that all these associations would be stronger for women than for men because of stresses

associated with pregnancy and parturition exclusive to women, women's greater role in childrearing and the increased domestic work associated with having children (Nomaguchi and Milkie 2003) and identified stresses associated with consequent 'multitasking' among mothers (Offer and Schneider 2011) The study is based on analysis of data from three rounds of the English Longitudinal Study of Ageing (ELSA) (Clemens et al. 2019), one of which collected retrospective information on childhood and earlier life.

Data and methods

Data

Data were drawn from Waves 3-5 of the ELSA, a nationally representative study of the older population in England (Steptoe et al. 2012). Wave 3 was fielded in 2006-07, and the later waves at subsequent two-yearly intervals. All ELSA participants gave written informed consent at the recruitment wave to participate in the study and have reaffirmed consent at each subsequent wave. Ethical consent for the study was granted by the NHS-REC and by the University College London Research Ethics Committee. The analytic sample for this study comprised core members of the study who had had at least two children, participated in Wave 3 and were at least 55 years old at that time (N=5,006). Core members of ELSA are men and women who participated in any of the 1998, 1999 or 2001 waves of the Health Survey of England (HSE), and were at least 50 years old at the time the first wave of ELSA was collected in 2002-03. The sample represents 54% of the original core sample who had at least two children and were in our selected age group (N=9,290) in Wave 1. The outcome, more than three depressive symptoms, was measured at Wave 5, as was current partnership status. The life history data collected in Wave 3 provided relevant measures of fertility history, childhood circumstances, teen smoking, experience of divorce, and labour force participation between the ages of 20 and 55. Measures of household wealth, social support, social isolation, and physical health were drawn from Wave 4 in order to reduce the probability of reverse causation (as poor mental health may, for example, lead people to withdraw from social activities). In addition to measures of childhood circumstances, educational attainment, labour force participation, experience of divorce, social support, partnership, and physical health, two indicators of smoking history were included. These were smoked as a teenager, included because of known associations between teenage smoking, other risky behaviours including sexual risk taking- and adolescent mental health (Guleria et al. 2017; Hale and

Viner 2016; Wilkinson et al. 2016) and smoking in later-life, included because of known associations between smoking and mental health at older ages (Shabab et al. 2015).

Figure 1 presents an overview of the data structure and hypothesised linkages underlying the analysis.

Measures

Outcome variable

Depressive symptoms were measured using an eight-item version of the original 20-item Center of Epidemiological Studies Depression Scale (CES-D) (Eaton et al. 2004; Radloff 1977). The scale includes questions asking whether respondents felt depressed, happy, sad or lonely much of the time during the past week, had problems sleeping, and felt that everything they did required an effort. Respondents were classified as having depressive symptoms if they reported having suffered at least three of the symptoms (White et al. 2016). The use of this cut off to indicate 'caseness' has been validated in DSM-based clinical interviews (Turvey et al. 1999).

Fertility history measures

Potential stressors related to fertility history include: an indicator of early age at entry to parenthood, defined as younger than age 20 for women and below age 23 for men; experience of a short birth interval (given birth to or fathered twins or two natural children born less than 18 months apart); and large completed family size (four or more children). These cut points were based on thresholds used in the previous literature and the sample distribution (Grundy and Tomassini 2005; Hobcraft 2008).

Intermediate and control variables

Childhood and early adulthood

Three indicators of retrospectively reported circumstances in childhood and adolescence were used. A latent variable was derived to capture SEP (at age 10) based on parental occupational social class, housing tenure, access to household amenities, number of books in the household and number of persons per room (see Ploubidis et al. 2014). Health in childhood was classified as poor if respondents reported that they had missed school, been confined to bed

or in hospital for at least a month and/or had health problems which restricted their physical activities for at least three months. Respondents were classified as having experienced adverse events in childhood if they reported one or more of the following before age 16: parents were unemployed for at least six months when they wanted to work; parents argued often; parents took drugs, had mental health problems or drank a lot of alcohol; parents physically abused the respondent. Additionally, we included a binary variable indicating whether or not respondents reported starting smoking before age 20.

Highest level of educational attainment was trichotomised distinguishing those with no formal qualifications, those with intermediate level qualifications (generally taken in high school), and those with tertiary education.

Mid and later adulthood

Wave 3 data were used to derive an indicator of respondents' labour market participation between the ages of 20 or the end of full-time education, whichever was later, and age 55. A sum score with values of 0 for each year of unemployment or non-employment, 0.5 for each year of part-time employment, and 1 for each year of full-time employment was created. This score was used to derive a variable ranging from 0 to 10 with every one unit increase representing a 10 %-point increase in the proportion of time spent in full-time employment. For men the distribution of this score was highly negatively skewed, the variable used in the main analysis was therefore dichotomised (0 if spent less than 50% in full time employment, 1 otherwise). A further dichotomous variable was created to identify respondents who had ever-experienced divorce by Wave 3.

Other potential intermediate variables related to lifestyle, social support, wealth and physical health were extracted from the Wave 4 interview. Current smoking was measured using a binary indicator (yes/no). Social support was measured using the mean value of the level of support respondents reported receiving from their partner, children, other family and/or friends. Respondents rated, using a scale from one (not at all) to four (a lot), how much (a) others understand the way the respondent feels about things, (b) how much the respondent relies on others if s/he has a serious problem, and (c) how much the respondent opens up to others if s/he needs to talk about worries. Social support was coded as 0 for those who reporting 'not applicable'. As the distribution of this variable was highly skewed, it was recoded as an ordinal variable ranging from 0 to 4, where higher values indicate more

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support. Additionally a binary indicator of restricted social interaction was derived identifying those who, on average, had less than monthly face-to-face, telephone or written contact with any child, other family or friends. Household wealth was based on the net value of primary and secondary property, business, and non-housing financial wealth and divided into quintiles. Physical health was measured using the Nagi-scale of mobility and functional limitations (Nagi 1976). Respondents were categorised as having functional limitations if they reported difficulties with one or more of the following activities: walking 100 yards (0.9 m.); sitting for two hours; getting up from a chair; climbing one or more flights of stairs; stooping, kneeling or crouching; reaching or extending arms above shoulder level; pushing or pulling large objects; lifting or carrying weights over 10 pounds (4.5 kg.); or picking up a small coin from a table. Information regarding current partnership (no partner vs. married or cohabiting) was drawn from the Wave 5 interview.

Analytic strategy

The data were analysed using standard regression methods and path analysis within the structural equation framework (Muthén and Muthén 2007). Age was available for all participants and was included as a continuous independent variable. Loss to follow-up is a usual problem in longitudinal studies and not all Wave 3 participants responded in Wave 5. Complete case analysis is a common way of dealing with missing data but can lead to bias as it rests on the assumption that missingness is completely at random and unrelated to observed or unobserved variables, whereas it is known that drop out is often associated with various disadvantages (Chatfield et al. 2004). Preliminary analysis showed that in our sample loss to follow-up was associated with lower education, lower social support and higher social isolation, older age, functional limitation and, among those aged 65 and over, lower wealth. In the main analysis we used the full information maximum likelihood method (FIML) to address this problem (Acock 2005). This enabled inclusion of cases with missing values for any dependent variable in the path models. FIML produces estimates for means and the variance covariance matrix and uses these to obtain model parameters; results are generally very similar to those obtained using multiple imputation (Acock 2005; Enders and Bandalos 2001). The FIML approach is particularly suitable for complex analyses in the structural equation framework (SEM) because it fits the hypothesised model and takes into account missingness in a single run (Craig et al. 2001). Maximum likelihood estimation in Mplus is available for a range of different types of variable, including continuous, binary, ordered

categorical, and counts. The assumption is that if all the variables that are responsible for the missing data generating mechanism are included in the model, then this can be ignored and parameter estimates robustly computed for participants with missing data.

Following descriptive analysis, logistic regression was used to test associations between the fertility stressors and depression with and without control for other variables. Although some criticisms have been raised about comparing logit samples across samples because of variation in unobserved heterogeneity (Mood 2010), recent methodological investigations have suggested these concerns are usually misplaced (Kuha and Mills 2018). As a sensitivity analysis, we repeated this analysis using average marginal effects and found the results (available on request) very similar. A range of regression models (logistic, ordinal or linear depending on the structure of the outcome variable) were then used to test associations between childhood and youth factors and the fertility stressors, and between the stressors and hypothesised intermediate variables (labour force participation, social support and isolation, experience of divorce, wealth, physical health). Finally, path models were fitted to investigate indirect and direct associations in more detail. The sum of standardized indirect effects from the path models including all significant paths were calculated using the theta method as recommended by Múthen and Múthen (2007). Bootstrapping was used to calculate the bias corrected 95% confidence intervals (95% CI) for the standardized indirect effects (Fritz, Taylor and MacKinnon, 2012).

Separate analyses for those aged 55-64 at Wave 3 and those then aged 65 or older were undertaken because of cohort differences in fertility patterns and in access to modern methods of contraception and legal abortion. In England, the contraceptive pill became available in 1961 and legal abortion in 1967 (Sigle-Rushton 2008); most of those in the younger age group considered, but few of those in the older, would have had access to these methods of birth control. In a sensitivity analysis we also ran models for those aged 65-74, excluding those aged 75 and over, and found results very close to those for the whole group aged 65 and over. We fitted separate models for men and women because of gender differences in relevant variables, such as work history, and because we expected associations would be stronger for women. Robust standard errors were used to allow for any nonnormality of the sample. Paths that were not significant ($p \ge 0.05$) were dropped from the model. The weighted least squares means and variance adjusted estimator (WLSMV), which is suitable for categorical outcomes, was used. Model fit was measured with Comparative Fit Index (CFI) and Root Mean Square of Approximation (RMSEA). A CFI value 0.95 or above and an RMSEA value 0.05 or less indicate a good fit to the data. The descriptive analyses and regression models were conducted using Stata version 14; Mplus version 7.3 was used to construct the path models.

Results

Descriptive results

Table 1a and 1b show the distributions of men and women respectively by age group and variables used in the analysis. Among men, 15% of those aged 55-64 and 18% of those aged 65 and over reported three or more depressive symptoms at Wave 5, consistent with previous research, the proportions of women with depressive symptoms (20% and 30%) were higher than for men and showed more differentiation by age. Proportions with no current partner were also much higher for women than men and higher for older than younger respondents. Among both men and women a larger proportion of the younger group had had a child before the age of 23/20, fewer had had three or more children and more had ever-divorced by Wave 3. These differences are consistent with known cohort variations in fertility patterns and experience of divorce (Office for National Statistics 2016; Schoen and Baj 1984). Seventeen percent of men aged 55-64 and 19% of women had had children born less than 18 months apart; in the older age group these proportions were 20% and 22% respectively. In both age groups, around 30% of men reported poor health in childhood. Childhood SEP score was lower (worse) in the older age group, however the proportions reporting adverse childhood experiences were similar. Among women there was a greater differentiation by age in reporting of childhood health problems and women's reports of adverse childhood experiences were slightly higher than for men. Historical changes are reflected in the differences between age groups in educational level; compared with men aged 55-64, more of those aged 65 and over had no formal qualifications and a smaller proportion had degree level qualifications. Levels of educational attainment were lower in women compared to men, and lower among older than younger women. Over half the men in both age groups had been teenage smokers. Reported teenage smoking was higher in the younger than the older age group of women, but lower than among men. Labour force participation scores at ages 20-55, measured at Wave 3, were similar for older and younger men. Women's labour force

participation scores were much lower than those for men and slightly higher for younger than older women.

In terms of variables measured at Wave 4, differences by age group in distribution by wealth quintile and the social support and contact measures were slight, but a lower proportion of men in the older group were smokers; this may partly reflect differential survival to older ages by smoking status. Higher proportions of women than men – and of older than younger women- were in lower wealth quintiles. Social support scores were slightly higher, and the proportions who were socially isolated slightly lower, for women than men aged 55-64, and for women in this age group compared with older women. The proportions of female smokers at Wave 4 were similar to those for men and higher among younger than older women.

As would be expected, the proportions with a functional limitation were much higher in the older than the younger age group and higher for women than men.

Distributions were broadly similar among the smaller sample who provided data in all survey waves except that the proportion lacking a current partner was higher among those present at all waves, particularly among older women (not shown, available on request).

Associations between depressive symptoms, stressors and socio-demographic characteristics

Tables 2a and b show for men and women respectively results from regression models of direct (unmediated) associations between variables of interest and the proportions reporting three or more depressive symptoms at Wave 5. We fitted three models: Model 1 adjusted only for age, Model 2 additionally included variables based on reported childhood circumstances and Model 3 added all the other variables of interest.

Among men large family size, and for older men early fatherhood, were associated with depression in the age adjusted model (Model 1); adjusting for other variables attenuated coefficients. In the fully adjusted models, only functional limitation and childhood adverse events/lower childhood SEP were positively associated with depression score.

Depressive symptoms among women in the younger age group were associated with all the fertility stressors, and with experience of divorce in the age adjusted models (Model 1; Table 2 b). Adjusting for childhood circumstances (Model 2) resulted in attenuation of associations

in the younger group of women, although in the older group the association between everdivorced and CES-D strengthened and remained significant in the fully adjusted model. In these final fully adjusted models childhood adversity; functional limitation and, among younger women, teen smoking, and wealth, but none of the fertility variables, were significantly associated with depression.

These differences between results from models adjusted just for age, for age and childhood indicators and for all variables considered reflect substantial intercorrelations between variables including associations between stressors and background and intermediate variables (Appendix Supplementary Table 1). Fertility history items correlated with each other as expected: early parenthood was positively associated with experience of a short birth interval and both of these with higher parity. In general, early parenthood and/or high parity were inversely associated with higher childhood SEP, more education, social support and wealth and positively associated with divorce, smoking and functional limitation. Having had a short inter-birth interval was inversely associated with wealth and positively associated with smoking and functional limitation in the younger group of women and positively associated with divorce among older women. Controlling for all these intercorrelated variables, including possible mediators of associations between fertility characteristics and depression, as in Table 2, may thus represent an over adjustment masking potentially important associations. To investigate this, we used path analyses to investigate linkages between childhood factors and fertility variables and linkages between these and depressive symptoms.

Path models for depressive symptoms

Figures 2a to 2d show results from the path models for men and women by age group for pathways of most interest for this analysis. (Figures in Appendix supplementary materials show all pathways). The thickness of the arrows of the paths varies according to the strength of the association (thinnest for the associations with p<0.05 and thickest for the associations with p<0.001). The models fitted the data well for men (younger age group χ^2 =154.64, *df*=77, CFI=0.95, RMSEA= 0.033; older age group χ^2 =169.54, *df*=85, CFI=0.96, RMSEA=0.028) and for women (younger age group χ^2 =180.25, *df*=75, CFI=0.96, RMSEA= 0.034; older age group χ^2 =167.00, *df*=77, CFI=0.97, RMSEA= 0.027). Only statistically significant pathways are shown, but even so the diagrams illustrate the complexity of the associations we investigate. To ease interpretation, we firstly comment on significant direct (unmediated)

linkages between variables considered and depressive symptoms. We next consider interlinkages between the three fertility stressors of interest and pathways from these to depression. Finally, we consider antecedent factors linked to the fertility variables to address the question as to whether fertility tempo and quantum mediate associations between childhood factors and later-life depression.

Direct (unmediated) influences on depression

Figures 2a to 2d show that absence of a current partner (Wave 5) and functional limitation (Wave 4) were positively associated with depressive symptoms in all age and gender groups. For younger men and older women smoking at wave 4 was also positively associated with depression. For men social support (Wave 4) was inversely associated with depression; for women there was an inverse association between wealth and depression and a positive association between childhood adversity (reported in Wave 3) and depression; for older women higher childhood SEP was also inversely associated with depression. These risk factors were interrelated and had additional indirect effects. For example, wealth was inversely associated with functional limitation in all groups. For women aged 55-64 at baseline there was a positive association between high parity and depression, otherwise none of the fertility stressors were directly linked to depressive symptoms although, as discussed below there were a number of indirect associations.

Linkages between the fertility stressors

Early parenthood was positively linked to high parity (4+ children rather than 2-3) and, among men aged 55-64 at baseline and women in both age groups also linked to experience of a short birth interval, which in turn was positively linked to high parity.

Linkages between fertility stressors and depression

For all women and for younger men early parenthood was positively linked with experience of divorce and negatively with wealth and social support; these in turn were linked (in different directions) to absence of a current partner, functional limitation and, in some groups, smoking, and so to depression. For women, having had closely spaced children was also associated with experience of divorce. However, for women in the younger age group (Figure 2a) there was additionally an unmediated *negative* association between early motherhood and absence of a current partner. Early parenthood, and experience of a short birth interval, were

also linked to depression through large family size. Although there was only a direct association between this variable and depression in the younger group of women, there were a number of pathways from high parity to depression mediated through other variables. For older men and women high parity was positively associated with functional limitation and for men in both age groups large family size was positively associated with divorce and inversely associated with wealth. For women high parity was negatively associated with labour force score which in the younger group was associated with wealth, so through this pathway high parity had a negative impact on wealth. However, for both younger and older women high parity also had an unmediated positive association with wealth which served to offset adverse impacts of larger family size.

Linkages between childhood circumstances and depression mediated by fertility variables

Finally, we consider pathways from childhood circumstances to depression mediated by fertility variables. For women and men in both age groups there was an indirect negative association between higher childhood SEP and early parenthood mediated by education (positively associated with higher childhood SEP and negatively with early parenthood) and teen smoking (negatively associated with higher childhood SEP and positively associated with early parenthood) and teen smoking (negatively associated with higher childhood SEP and positively associated with early parenthood) and an additional direct inverse link among women in the younger age group. Among women in the younger group poor child health was positively linked to short inter-birth interval and for men childhood adversity was positively associated with large family size.

Direct, indirect and total effects of fertility trajectories and childhood circumstances on depression

Table 3 summarises these findings and presents standardised direct (unmediated), indirect (mediated) and total (unmediated plus mediated) effects of the fertility and childhood variables on depressive symptoms. For women early motherhood and experience of a short birth interval had significant adverse indirect (and total) associations with depressive symptoms which were stronger in the younger than the older age group. Among women aged 55-64 high parity was positively directly associated with depressive symptoms but this was offset by a negative (beneficial) indirect association largely mediated by the positive association with wealth already noted. Young age at fatherhood, having closely spaced children and large family size had significant positive indirect (and total) associations with

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depression among men, although effects were not large. In both age groups of women and the younger group of men experience of adversity in childhood had direct effects on depression; additional indirect associations were evident for women and men in both age groups which were partly mediated by the fertility variables. Higher childhood SEP was inversely related to depression, with associations being indirect in the younger groups (and again partly mediated by fertility) but predominantly direct among older women and men.

Discussion

This paper examined associations between fertility experiences and risks of depression in later life using longitudinal data for older people in England. Measures were based on data collected at three points in respondents' later lives, one of which asked about earlier life circumstances and events, including fertility history. As one of the potential fertility history stressors of interest was experience of a short inter-birth interval, the analysis was restricted to parents of two or more children. It was hypothesised that early parenthood, experience of a short inter-birth interval and high parity (four or more children) would be linked to depressive symptoms in later-life due to cumulated effects of stress and impact on other sources of life course advantage and disadvantage associated with depression. It was expected that associations would be stronger for women than for men due to the challenges of pregnancy and parturition and women's greater role in childrearing. It was also hypothesised that these interlinked fertility patterns, and particularly early parenthood, would mediate effects of childhood disadvantage on later-life depressive symptoms.

Overall, results support the hypotheses about influences of fertility stressors on later depression, but indicate that these were predominantly indirect – that is mediated by other life course experiences, with some variation by gender and birth cohort/age group. Initial regression analyses (Table 2, Model 2) showed that in models adjusted for childhood circumstances, teen motherhood and high parity were associated with depressive symptoms among women aged 55-64 at baseline but after adjustment for later life circumstances, these associations were no longer significant. Similarly, for men aged 65 and over at baseline, there was an association between early fatherhood and depression which ceased to be significant in the fully adjusted model. In these fully adjusted analyses functional limitation two years before the outcome measure and childhood adversity and/or childhood SEP were the variables most consistently associated with depressive symptoms among both women and men and in both age groups.

Investigation of correlations between variables and the path analysis revealed a more complex pattern. For women in both age groups and men aged 55-64 at baseline, early parenthood was positively associated with experience of divorce, lower wealth and less social support and these were related to depression indirectly, mainly through indicators of health and health behaviour (functional limitation and smoking) and absence of a current partner. For women experience of a short inter-birth interval was also associated with depression through similar pathways. Among younger women high parity was linked to depressive symptoms through the same pathways and also directly. However, these adverse effects of high parity were offset by a positive association between high parity and wealth. This seems surprising but, given that early motherhood and short birth intervals (associated with high parity) were both negatively associated with wealth, this positive association may reflect the experience of an advantaged subgroup who, in these pre-second demographic transition cohorts, actively chose to have a large family and had the resources to do so. As discussed below, the greater availability of modern birth control methods may mean that high parity in this later cohort was to a greater extent a matter of positive choice than in the older age group.

Estimation of total, direct, and indirect effects showed that among women early motherhood and experience of a short inter-birth interval were associated with later-life depressive symptoms. Among men the total effect of all three fertility stressors on depression was significantly positive, although effects were not large. We expected that associations between fertility stressors and later depression would be stronger for women than men reflecting stresses attendant on parturition experienced only by women and women's greater role in childrearing and associated domestic work. Results seem to support this expectation, particularly in the younger age group, although, as we fitted models separately by gender, the significance of this difference cannot be tested. Further work on gender differences in life course impacts of fertility and parenting on later-life mental health is warranted.

Results also showed some support for the hypothesis that fertility trajectories, especially those including early parenthood, may partly mediate effects of childhood circumstances on later life depression. Higher childhood SEP was associated positively with education and negatively with teen smoking both linked (in different directions) with early parenthood. Among men childhood adversity was also associated with high parity and, as discussed above, there were pathways from these fertility variables to depression in later life.

In interpreting these results, consideration must be paid to the different historical experiences and selection of the cohorts we consider. Firstly, as already noted, the analyses were restricted to parents of two or more children. It thus excluded the childless (and so most of the never-married) and those with only one child -groups which previous research indicates have higher risks of depression in later life than parents of two or more children (Kravdal et al. 2015). This implies that the results reported here may be conservative in estimating the complete impact of fertility history on depression in later life. Secondly, those in the study had to have survived to 2006-7. At the older end of our age distribution these survivors represent only a minority of their birth cohort; for example, 18% of men and 33% of women born in 1921 survived to age 85, in contrast 89% of males and 93% of females born in 1952 survived to reach their 55th birthday (Office for National Statistics 2011). Given strong social inequalities in mortality throughout the relevant period (Coleman and Salt 1992) this means that those considered here represent the more advantaged components of their respective birth cohorts and the extent of this social selection through prior mortality will be greater for men than women and greater at older ages. Previous research has also shown higher mortality among those with an early age at first birth and high parity (Grundy and Tomassini 2005; Barclay et al. 2016; Zeng et al. 2016) which again suggests that in this study of people who survived to later life, estimates may be conservative, especially for the older age group.

There are also relevant differences in the fertility of these cohorts. Only 7% of females born in 1922 had a teenage birth and 16% had four or more children; among those born in 1950 equivalent proportions were 20% and 10% (ONS 2016). These later born women had an earlier age at sexual debut and more often engaged in pre-marital sex than women born in the 1920s (Dunnell 1979). They also had greater access to modern methods of birth control and legal abortion as the contraceptive pill first became available in 1961 and abortion was legalised in 1967. However, the pill was initially available only to married women and use of legal abortion was limited until the mid-1970s (Sigle-Rushton 2008). The 1976 Family Formation Survey (FFS) found rather small differences in the proportion of first births in the 1966-75 period described as a 'complete accident' (25% in 1966-67 compared with 23% in 1974-75) (Dunnell 1979). However, the younger group would have had more access to modern methods of birth control later in their family life cycle and this might suggest that large family size more often arose as a result of choice in the younger compared with the older group. Results from the FFS showed that only 30% of births of birth orders 4 or higher in 1966-7 were planned (mothers reported they had been trying for a baby) compared with

53% in 1974-5. This is relevant for mental health as previous research has shown negative impacts of having an unplanned baby. For example, results based on women included in the Wisconsin Longitudinal Study, a cohort who graduated from high school in 1957, found both that unintended births increased with increasing birth order and that having a birth described as unwanted was strongly associated with poorer mental health at age 53 (Herd et al. 2016). Social class differences in fertility are also relevant. Before WW1 there was a substantial and graded inverse association between higher social class and fertility but in the middle decades of the twentieth century a J shaped association between fertility and social class emerged with the lowest fertility among skilled non manual workers (clerks etc.) rather than in professional and managerial groups (Coleman and Salt 1992).

Study limitations and strengths

Limitations of the study include reliance on retrospective measures of circumstances in childhood and earlier adulthood. Although studies have shown a good correspondence between reporting of childhood circumstances and macro circumstances at the time (Havari and Fabrizio 2015) and accurate reporting by women of fertility history, men's reporting may be less good and some recall and reporting bias is probable (Rendall et al. 1999). Potentially this might be influenced by mental state – although in our analysis depression was measured four years after the report of childhood circumstances and other retrospective information so it seems unlikely that this would be a major source of bias. The data set also suffers from initially missing data (those who dropped out before the third wave of ELSA which constitutes our baseline) and it is known that these drop outs (and decedents) include an overrepresentation of people in poor health and social circumstances. Our analytic strategy took account of missingness over the follow-up but some bias may result from the initially selected sample, although comparisons with Census data have indicated that the ELSA sample has remained nationally representative (Steptoe et al. 2012). Strengths of the study include the theory driven analytic strategy, the use of nationally representative longitudinal data and the focus on understanding mediating linkages rather than just considering estimates of net effects from regression models. .

Our results confirm the important influence of events and circumstances over the life course – including fertility history- on depression in older age groups. The paper also shows the usefulness of path analysis in depicting complex associations that are mediated through various factors over time and demonstrates the interlinked role of family and other lifecourse

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pathways on later-life wellbeing. It is noteworthy, that our results show direct (unmediated) influences of childhood circumstances on depressive symptoms in later life, even after inclusion of a wide range of possible mediators. Some variations by gender and age group were found indicating the importance of both gender and contextual issues on the association between family life courses and later mental health, both noted as important in previous studies (Umberson et al. 2012; Grundy and Foverskov 2016).

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| | Age 55-64 | | Age 65 or older | | | |
|------------------------------------------------------------------------------------------------|---------------------------------------------|------------------------|------------------------------------------------|------------------------|--|--|
| | Analytic sample, % or mean (std. dev) | N (Non- missing) | Analytic sample, % or mean (std. dev) | N (Non- missing) | | |
| Total N | | 913 | | 1274 | | |
| Current status (Wave 5, 2010-11) | | | | | | |
| 3+ CES-D items | 15.1 | 742 | 18.1 | 841 | | |
| No current partner | 11.6 | 769 | 20.6 | 889 | | |
| Wave 3, 2006-7 and retrospective | | | | | | |
| Mean age | 59.5 | 913 | 74.3 | 1274 | | |
| Early first birth (age<23) | 19.4 | 913 | 12.4 | 1274 | | |
| 1+ Short birth interval (<18 mo.) | 17.0 | 913 | 19.7 | 1274 | | |
| Parity: | | 913 | | 1274 | | |
| Parity 2 | 65.6 | | 54.9 | | | |
| Parity 3 | 23.2 | | 28.0 | | | |
| Parity 4+ | 11.2 | | 17.1 | | | |
| Ever divorced | 26.7 | 771 | 17.2 | 1034 | | |
| Mean childhood SEP | 0.340 (0.784) | 770 | 0.063 (0.782) | 1034 | | |
| Poor childhood health | 30.4 | 770 | 30.7 | 1029 | | |
| Childhood adversity | 25.8 | 627 | 22.0 | 877 | | |
| Educational qualifications: | | 913 | | | | |
| None | 15.2 | | 30.0 | 1274 | | |
| Intermediate | 56.5 | | 52.2 | | | |
| Higher | 28.3 | | 17.8 | | | |
| Teen smoker | 57.6 | 750 | 55.3 | 1015 | | |
| Mean labour participation score (% of working life in employment) <i>Wave 4 (2008-9)</i> | 79.0 (22.89) | 770 | 79.1 (23.84) | 1024 | | |
| Restricted social ties | 11.4 | 784 | 12.2 | 994 | | |
| Mean social support: | | 784 | | 994 | | |
| 0 (no support) | 10.7 | | 11.7 | | | |
| 1 | 0.5 | | 1.5 | | | |
| 2 | 7.7 | | 7.6 | | | |
| 3 | 38.5 | | 38.5 | | | |
| 4 (high support) | 42.6 | | 40.7 | | | |
| Wealth: | 15.4 | 766 | 15.3 | 967 | | |
| Q1 (lowest | | | | | | |
| Q2 | 17.0 | | 19.8 | | | |
| Q3 | 19.3 | | 21.7 | | | |
| Q4 | 24.5 | | 22.3 | | | |
| Q5 (highest) | 23.7 | | 20.9 | | | |
| Current smoker | 12.7 | 786 | 9.4 | 983 | | |
| Functional limitation | 35.0 | 786 | 60.6 | 993 | | |

Table 1a Distribution of male sample by variables used in the analysis

| | Age 55-64 | | Age 65 or older | | | |
|-------------------------------------------------------------------|---------------------------------------------|------------------------|------------------------------------------------|------------------------|--|--|
| | Analytic sample, % or mean (std. dev) | N (Non- missing) | Analytic sample, % or mean (std. dev) | N (Non- missing) | | |
| Total N | | 1194 | | 1625 | | |
| Current status (Wave 5, 2010-11) | | | | | | |
| 3+ CES-D items | 19.7 | 984 | 30.3 | 1128 | | |
| No current partner | 24.4 | 1008 | 52.7 | 1208 | | |
| Wave 3, 2006-7 and retrospective | | | | | | |
| Mean age | 59.4 | 1194 | 74.6 | 1625 | | |
| Early first birth (age<23) | 17.0 | 1194 | 8.1 | 1625 | | |
| 1+ Short birth interval (<18 | 19.0 | 1194 | 21.6 | 1625 | | |
| months) | | | | | | |
| Parity: | | | | | | |
| Parity 2 | 62.2 | 1194 | 51.8 | 1625 | | |
| Parity 3 | 27.2 | | 29.5 | | | |
| Parity 4+ | 10.6 | | 18.8 | | | |
| Ever divorced | 33.4 | 771 | 17.5 | 1329 | | |
| Mean childhood SEP | 0.389 (0.772) | 1028 | 0.123 (0.857) | 1327 | | |
| Poor childhood health | 25.3 | 1027 | 32.4 | 1320 | | |
| Childhood adversity | 29.7 | 831 | 24.0 | 1093 | | |
| Educational qualifications: | 24.2 | 110.4 | 4 c . P | 1.00 | | |
| None | 24.2 | 1194 | 46.5 | 1625 | | |
| Intermediate | 59.8 | | 47.0 | | | |
| Higher | 16.0 | 00 5 | 6.5 | 10.00 | | |
| Teen smoker | 43.0 | 995 | 31.4 | 1266 | | |
| Mean labour participation score (% of working life in employment) | 47.52 (21.416) | 1014 | 41.91 (22.291) | 1310 | | |
| Wave 4 (2008-9) | | | | | | |
| Restricted social ties | 10.0 | 1029 | 14.3 | 1329 | | |
| Mean social support: (ordinal) - | | | | | | |
| 0 (no support) | 10.0 | 1029 | 13.8 | 1331 | | |
| 1 | 0.6 | | 1.7 | | | |
| 2 | 7.4 | | 13.8 | | | |
| 3 | 34.7 | | 41.3 | | | |
| 4 (high support) | 47.3 | | 29.5 | | | |
| Wealth: | 18.6 | 1000 | 22.8 | 1302 | | |
| Q1 (lowest) | | | | | | |
| Q2 | 18.4 | | 23.7 | | | |
| Q3 | 20.4 | | 21.2 | | | |
| Q4 | 21.0 | | 17.1 | | | |
| Q5 (highest) | 21.6 | | 15.3 | | | |
| Current smoker | 14.9 | 1027 | 8.5 | 1310 | | |
| Functional limitation | 55.5 | 1029 | 75.1 | 1331 | | |

Table 1b Distribution of female sample by variables used in the analysis

| | Age 55 | -64years | Age | | | |
|----------------------------------------|--------------|----------------|----------|----------|----------------|----------|
| | Madal 1. Ass | Model 2: + all | Model 3: | Model 1: | Model 2: + all | Model 3: |
| | Model 1: Age | childhood | Fully | Age | childhood | Fully |
| | ugusteu | variables | adjusted | adjusted | variables | adjusted |
| Childhood & Youth | | | | | | |
| Early SEP | -0.67*** | -0.64*** | -0.20 | -0.61*** | -0.65*** | -0.59*** |
| Early health: not healthy | 0.21 | 0.29 | 0.14 | 0.10 | 0.21 | 0.26 |
| Childhood adverse event(s) | 0.80** | 0.72** | 0.96** | 0.42 | 0.28 | 0.18 |
| Teen smoker | 0.08 | -0.10 | -0.31 | 0.02 | -0.21 | -0.35 |
| Intermediate education (ref. No qual.) | -0.84** | -0.57 | -0.39 | -0.34 | -0.07 | 0.03 |
| High education (ref. No qual.) | -1.01*** | -0.52 | 0.27 | -0.82** | -0.22 | -0.14 |
| Family life course events | | | | | | |
| Early first birth | 0.37 | 0.12 | 0.11 | 0.58* | 0.58* | 0.45 |
| Short birth interval | 0.29 | -0.04 | -0.76 | 0.02 | -0.12 | -0.32 |
| Four or more children | 0.79** | 0.60 | 0.53 | 0.64** | 0.48 | 0.50 |

Table 2 a. Direct associations (β from logistic regression) between stressors and CES-D among men, complete cases.

| Observations | | | 497 | | | 611 |
|----------------------------------------|----------|----------|---------|----------|---------|--------|
| Age | 0.04 | 0.01 | 0.04 | 0.052*** | 0.040* | 0.02 |
| No partner | 1.05*** | 0.69 | 0.23 | 1.06*** | 0.81** | 0.44 |
| Any Functional limitation | 1.62*** | 1.68*** | 1.62*** | 0.94*** | 1.01*** | 0.90** |
| Current smoker | 1.03*** | 0.80* | 0.10 | 1.04*** | 0.91* | 0.53 |
| Social support 4 (ref. No support = 0) | -1.24*** | -1.52** | -12.90 | -0.98** | -0.83 | -0.25 |
| Social support 3 (ref. No support = 0) | -0.49 | -0.65 | -12.00 | -0.51 | -0.39 | 0.07 |
| Social support 2 (ref. No support = 0) | 0.39 | -0.30 | -11.70 | 0.43 | 0.45 | 0.63 |
| Social support 1 (ref. No support = 0) | 1.22 | 0.19 | -11.40 | 0.66 | 0.34 | -0.19 |
| Restricted social ties | 0.65* | 0.68 | -11.70 | 0.63* | 0.54 | 0.68 |
| Current status | | | | | | |
| Wealth | -0.49*** | -0.37*** | -0.22 | -0.25*** | -0.04 | 0.11 |
| 50% + of working life in employment | -0.55 | -0.74* | -0.58 | 0.19 | 0.34 | 0.21 |
| Working life | | | | | | |
| Ever divorced | 0.46 | 0.14 | -0.20 | 0.29 | 0.10 | -0.23 |

Model 1: adjusted for age; Model 2: adjusted for age; early SEP; early health, and childhood adversity; Model 3: adjusted for all variables listed. * p<0.05; ** p<0.01; *** p<0.001

| | Age 55 | 5-64years | | Age > | | |
|----------------------------------------|----------|---------------|----------|----------|---------------|----------|
| | Model 1: | Model 2: + | Model 3: | Model 1: | Model 2: + | Model 3: |
| | Age | all childhood | Fully | Age | all childhood | Fully |
| | adjusted | variables | adjusted | adjusted | variables | adjusted |
| Childhood& Youth | | | | | | |
| Early SEP | -0.48*** | -0.46*** | 0.08 | -0.36*** | -0.29** | -0.22 |
| Early health: not healthy | 0.33 | 0.10 | 0.14 | -0.001 | 0.05 | -0.19 |
| Childhood adverse event(s) | 0.65*** | 0.57** | 0.73** | 0.69*** | 0.62*** | 0.72*** |
| Teen smoker | 0.69*** | 0.62** | 0.50* | 0.41** | 0.25 | 0.06 |
| Intermediate education (ref. No qual.) | -0.76*** | -0.44 | -0.27 | -0.38** | -0.12 | 0.07 |
| High education (ref. No qual.) | -1.26*** | -0.87* | -0.47 | -0.28 | 0.15 | 0.39 |
| Family life course events | | | | | | |
| Early first birth | 1.07*** | 0.95*** | 0.45 | 0.46 | 0.24 | 0.04 |
| Short birth interval | 0.66*** | 0.34 | 0.13 | 0.21 | 0.20 | 0.28 |
| Four or more children | 0.98*** | 0.79** | 0.22 | 0.25 | 0.03 | -0.50 |
| Ever divorced | 0.64*** | 0.73*** | 0.32 | 0.43* | 0.54** | 0.53* |

Table 2 b. Direct associations (β from logistic regression) between stressors and CES-D among women, complete cases.

| Observations | | | 650 | | | 618 |
|-----------------------------------------|----------|----------|---------|----------|---------|---------|
| Age | -0.071* | -0.07 | -0.09* | 0.042*** | 0.029* | 0.004 |
| No partner | 1.06*** | 1.14*** | 0.32 | 0.67*** | 0.72*** | 0.44 |
| Any Functional limitation | 1.27*** | 1.00*** | 0.86** | 1.68*** | 1.67*** | 1.90*** |
| Current smoker | 0.75*** | 0.47 | -0.32 | 0.74** | 0.63* | 0.64 |
| Social support 4 (ref. No support = 0) | -1.28*** | -0.94* | 0.00 | -1.13*** | -0.74* | 0.15 |
| Social support 3 (ref. No support = 0) | -0.44 | -0.24 | 0.43 | -0.71** | -0.23 | 0.28 |
| Social support 2 (ref. No support = 0) | 0.40 | 0.29 | 0.50 | -0.56* | -0.20 | 0.16 |
| Social support 1 (ref. No support = 0) | -0.59 | -0.08 | 0.00 | -0.67 | 0.16 | 0.70 |
| Restricted social ties | 0.73** | 0.53 | 0.29 | 0.77*** | 0.41 | 0.47 |
| Current status | | | | | | |
| Wealth | -0.54*** | -0.49*** | -0.29** | -0.20*** | -0.17** | -0.006 |
| Labour participation score ^a | -0.11*** | -0.06 | -0.09 | 0.00 | 0.00 | -0.03 |
| Working life | | | | | | |

| | Direct effect | Sum of indirect | Total effect |
|--------------------------|-----------------|------------------|-----------------------|
| | | effects | |
| Women 55-64 | | | |
| Early parenthood | 0 | 0.35 (0.056)*** | 0.35 (0.056)*** |
| Short birth interval | 0 | 0.15 (0.049)** | 0.15 (0.049)** |
| High parity | 0.26 (0.078)** | -0.36 (0.059)*** | -0.09 (0.123) |
| Early SEP | 0 | -0.22 (0.036)*** | -0.22 (0.036)*** |
| Childhood adverse events | 0.15 (0.072)* | 0.06 (0.023)** | 0.22 (0.070)** |
| Early health | 0 | 0.05 (0.023)* | 0.05 (0.023)* |
| Women 65+ | | | |
| Early parenthood | 0 | 0.07 (0.033)* | 0.07 (0.033)* |
| Short birth interval | 0 | 0.04 (0.019)* | 0.04 (0.019)* |
| High parity | 0 | 0.03 (0.034) | 0.03 (0.034) |
| Early SEP | -0.15 (0.054)** | -0.02 (0.03) | -0.17 (0.07; 0.18)*** |
| Childhood adverse events | 0.15 (0.064)* | 0.09 (0.035)* | 0.24 (0.065)*** |
| Early health | 0 | 0 | 0 |
| Men 55-64 | | | |
| Early parenthood | 0 | 0.04 (0.015)* | 0.04 (0.015)* |
| Short birth interval | 0 | 0.06 (0.02)** | 0.06 (0.02)** |
| High parity | 0 | 0.12 (0.033)** | 0.12 (0.033)** |
| Early SEP | 0 | -0.15 (0.033)*** | -0.15 (0.033)*** |
| Childhood adverse events | 0.24 (0.082)** | 0.03 (0.015)* | 0.27 (0.100)** |
| Early health | 0 | 0 | 0 |
| Men 65+ | | | |
| Early parenthood | 0 | 0.03 (0.012)** | 0.03 (0.012)** |
| Short birth interval | 0 | 0.05 (0.016)** | 0.05 (0.016)** |
| High parity | 0 | 0.09 (0.028)** | 0.09 (0.028)** |
| Early SEP | -0.144 (0.059)* | -0.09 (0.019)*** | -0.23 (0.060)*** |
| Childhood adverse events | 0 | 0.08 (0.025)** | 0.08 (0.025)** |
| Early health | 0 | 0 | 0 |

Table 3: Standardised direct, indirect and total effects of fertility and childhood variables on depressive symptoms, standard errors in parenthesis (SE).

p < 0.05, p < 0.01, p < 0.01

Figure 1. Overview of data structure and conceptual linkages

| Wave 3 | Wave 3 | Wave 3 2006-7 | Wave 4 2008-9 | Wave 5 2010-11 |
|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-------------------------------------------|
| 4 | | Retrospective | Current | Current |
| Childhood | Early adulthood | Mid adulthood | Later life | Later life |
| Childhood SEP (age 10) Childhood health (age 10) Childhood adverse experiences (age <16) | Educational level Teen smoker Early parenthood (<20 F, <23 M) | Parity Experience of short birth interval (<18 months) Ever–divorced Labour participation (ages 20-55) | Household wealth Current smoker Social isolation Social support Functional limitations | CES-D (depression) Current partnership |
| | | | | |

Figure 2a: Key results from path model showing significant linkages from childhood factors to fertility stressors and depression, and from fertility stressors to depression, men 55-64



Figure 2b: Key results from path model showing significant linkages from childhood factors to fertility stressors and depression, and from fertility stressors to depression, women 55-64



Figure 2c: Key results from path model showing significant linkages from childhood factors to fertility stressors and depression, and from fertility stressors to depression, men 65+



Figure 2d: Key results from path model showing significant linkages from childhood factors to fertility stressors and depression, and from fertility stressors to depression, women 65+



| - ADDENDIA TADIE I. MEC AUTUSICA ASSOCIATIONS DELWEEN INCOMMENTATIONES (IDEISTIC, OPAMIA) AND INCALINE AUTOMOUS |
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| as bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar bar <br< th=""><th>11 3 3</th><th>Smoked</th><th></th><th>Fouls finat</th><th>Short</th><th></th><th>Error</th><th>Labour</th><th>Family</th><th>Contol</th><th>Contal</th><th>Commont</th><th>Emotional</th><th>No</th></br<> | 11 3 3 | Smoked | | Fouls finat | Short | | Error | Labour | Family | Contol | Contal | Commont | Emotional | No |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|----------|-----------|-------------|----------|-----------|--------------|-------------|-----------|-----------|-----------|-------------|------------|----------|
| Men Interval Name | | as | Education | birth | birth | Parity 4+ | divorced | participati | wealth | isolation | support | smoker | limitation | nortner |
| Mar and SSA Only ** O.By*** O.By**** O.By*** | Men | teenager | | birtii | interval | | uivoreeu | on | weaten | isolation | support | smoker | mintation | partici |
| Early SEP 0.15 0.44** 0.42** 0.45** 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.43* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* 0.44* | Men aged 55-64 | | | | | | | | | | | | | |
| Early health 0.03** 0.04** 0.03** 0.02** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04** 0.04**< | Early SEP | -0.15 | 0.94*** | -0.62*** | -0.50*** | -0.40** | -0.23* | 1.33 | 0.62*** | -0.35* | 0.14** | -0.34* | -0.49*** | -0.42** |
| Chailboad at venus 0.19 0.13 0.07 0.10 0.64* 0.31 2.71 0.19 0.04 0.03 0.27 0.18 0.38 0.44 0.04 0.04 0.03 0.27 0.18 0.38 0.44 0.04 0.04 0.03 0.27 0.18 0.38 0.44 0.04 0.04 0.08 0.23 0.12 0.27 0.28* 0.23* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* 0.28* <th0.28*< th=""> 0.28* <th0.28*< th=""> <t< th=""><th>Early health</th><th>-0.23**</th><th>0.04</th><th>-0.65***</th><th>-0.28**</th><th>-0.08</th><th>-0.13</th><th>2.46**</th><th>0.65***</th><th>-0.55</th><th>-0.01</th><th>-0.50***</th><th>0.12</th><th>0.10</th></t<></th0.28*<></th0.28*<> | Early health | -0.23** | 0.04 | -0.65*** | -0.28** | -0.08 | -0.13 | 2.46** | 0.65*** | -0.55 | -0.01 | -0.50*** | 0.12 | 0.10 |
| Shock of steenager -0.49** 0.79** 0.32 0.12 0.88 0.48 0.14 0.06 0.01 1.56*** 0.21 Degree eduction (ref. No gud.) -1.52*** 0.18*** 0.24** 0.88** 0.18 0.77*** 0.22 0.22*** 0.81** 0.24** 0.88** 0.31** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** 0.78*** <th0.78***< th=""> 0.78*** 0.78***</th0.78***<> | Childhood adv. events | -0.19 | -0.13 | 0.09 | -0.10 | 0.64* | 0.31 | -2.71 | -0.19 | -0.48 | 0.03 | 0.27 | 0.18 | 0.29 |
| Intermediate centraling (ref. No qual.) | Smoked as teenager | | -0.49** | 0.79*** | 0.32 | 0.12 | 0.38* | 0.48 | -0.14 | 0.06 | -0.01 | 1.36*** | 0.53** | 0.21 |
| Degree denation (rf. No qual.) i.82*** i.82*** i.82*** i.83*** | Intermediate education (ref. No qual.) | | | -0.69** | -0.82*** | -0.81** | 0.10 | 5.27* | 0.78*** | -0.73* | 0.34** | -0.88** | -0.73*** | 0.22 |
| Early firsh birds 0.988*** 0.988*** 0.988*** 0.981*** 0.988*** 0.33 0.15 0.058*** 0.03 0.04 0.88 0.368*** 0.32 Farity 2.35 v. 4 1.83*** 0.33 0.15 0.53*** 0.161*** 0.88** 0.34*** 0.401*** 0.88** 0.34*** 0.401*** 0.88** 0.34*** 0.401*** 0.80** 0.32** 0.38* 0.42*** 0.38* 0.42*** 0.38* 0.42*** 0.40*** 0.40*** 0.40*** 0.40*** 0.40*** 0.40*** 0.40*** 0.40*** 0.40*** 0.40*** 0.40*** 0.40*** 0.41* 0.11* 0.40*** 0.40*** 0.40*** 0.41* 0.11* 0.40** 0.40*** 0.44* 0.40** 0.41* 0.40** 0.44* 0.40** 0.44* 0.40** 0.44** 0.44** 0.44** 0.44** 0.44** 0.44** 0.44** 0.46** 0.40** 0.44** 0.44** 0.44** 0.46** 0.46*** 0.44** 0.44** 0.44** 0.44** 0.44** 0.44** 0.44** 0.44** 0.44** < | Degree education (ref. No qual.) | | | -1.82*** | -1.27*** | -1.08** | -0.29 | 3.16 | 1.77*** | -1.13** | 0.49*** | -1.37*** | -1.49*** | -0.60 |
| Short irrin interval 1.83*** 0.33 -1.53 -0.55*** 0.14* 0.18 0.18 0.22** 0.23*** Ever divarced 0.83*** 0.35** 0.43*** 0.43*** 0.43*** 0.43*** 0.43*** 0.43*** 0.43*** 0.43*** 0.43*** 0.43*** 0.41*** 0.43*** 0.43*** 0.41*** 0.40*** 0.63*** 0.41*** 0.63*** 0.41*** 0.63*** 0.41*** 0.63*** 0.41*** 0.63*** 0.41*** 0.63*** 0.41*** 0.40*** 0.63**** 0.44*** 0.43*** 0.44*** 0.49**** 0.44*** 0.49**** 0.44*** 0.44*** 0.44*** 0.44*** 0.44*** 0.44*** 0.44*** 0.44*** 0.44*** 0.44*** 0.44*** 0.44*** 0.44*** 0.44*** 0.44*** 0.44*** 0.44*** 0.44*** 0.44*** 0.44*** 0.44*** 0.44*** 0.44*** 0.44*** 0.44**** 0.44**** 0.44**** 0.44***** 0.44*********************************** | Early first birth | | | | 0.98*** | 0.90*** | 0.54** | -2.49 | -0.65*** | -0.03 | -0.04 | 0.58* | 0.65*** | 0.32 |
| Parity 2.3 v. 4 0.88** 0.538* 0.68** 0.63** 0.63** 0.63** 0.64** 0.68** 0.43** 0.43** 0.43** 0.43** 0.43** 0.43** 0.43** 0.43** 0.43** 0.43** 0.43** 0.47*** 0.47*** 0.47*** 0.47*** 0.47*** 0.47*** 0.47*** 0.47*** 0.47*** 0.41** 0.40** 0.43** 0.43** 0.43** 0.43** 0.43** 0.43** 0.43** 0.43** 0.43** 0.43** 0.43** 0.43** 0.43** 0.43** 0.43** 0.43** 0.43** 0.43** 0.43** 0.43** 0.43** 0.44** 0.43* 0.44** 0.43** 0.44** 0.44** 0.44** 0.44** 0.14 0.13 2.40 0.45** 0.44 0.7*** 0.13 2.40 0.45** 0.44 0.7*** 0.14 0.46** 0.17 0.45** 0.03 0.01 7.42** 0.45** 0.14** 0.45** 0.11*** 0.44** 0.45** 0.14 0.45** 0.14 0.45** 0.11*** 0.14** 0.45** 0.15** <t< th=""><th>Short birth interval</th><th></th><th></th><th></th><th></th><th>1.83***</th><th>0.33</th><th>-1.53</th><th>-0.55***</th><th>0.14</th><th>-0.18</th><th>0.18</th><th>0.34</th><th>0.46</th></t<> | Short birth interval | | | | | 1.83*** | 0.33 | -1.53 | -0.55*** | 0.14 | -0.18 | 0.18 | 0.34 | 0.46 |
| Ever divorced | Parity 2-3 vs. 4 | | | | | | 0.88^{***} | -5.38* | -0.61*** | 0.68* | -0.36** | 0.82** | 0.38 | 0.16 |
| Lahoar participation Image value Image value </th <th>Ever divorced</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>-0.72***</th> <th>0.50</th> <th>-0.43***</th> <th>0.49*</th> <th>0.22</th> <th>2.34***</th> | Ever divorced | | | | | | | | -0.72*** | 0.50 | -0.43*** | 0.49* | 0.22 | 2.34*** |
| Family weath -0.9*** 0.49*** 0.49*** 0.49*** 0.63*** Barly SP -0.47*** 0.15 0.27*** 0.13** 0.49*** 0.49*** 0.49*** Early Seal 0.15 0.27*** 0.01* 0.07*** 0.18 0.18 0.18 0.07 0.01 0.66** Childhood adv. events 0.49 0.27*** 0.65*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** 0.75*** | Labour participation | | | | | | | | -0.0003 | 0.00 | 0.0002 | -0.01 | -0.01 | -0.05 |
| Mane aged >64 -0.40**** 0.40**** 0.41*** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** 0.41** <th0.41**< th=""> 0.41** 0</th0.41**<> | Family wealth | | | | | | | | | -0.29*** | 0.18*** | -0.50*** | -0.40*** | -0.63*** |
| Early SP -0.40*** 0.40*** 0.12 -0.18 0.01 -0.31* 0.14** -0.40** -0.28** -0.49** Childhood adv. events 0.04 0.07 0.21 0.01 -1.09 0.10 0.18 0.17* 0.10 0.18 0.077 0.21 0.01* 0.00 0.007 0.21 0.01* 0.01 0.00 0.007 0.21 0.01* 0.01 0.00 0.007 0.21 0.01* 0.04* Childhood adv. events 0.44 0.09*** 0.13 0.13 0.13 0.13 0.13 0.13 0.13* 0.14** 0.44 0.03** 0.14** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03** 0.03*** 0.03** 0.03** | Men aged >64 | | | | | | | | | | | | | |
| Early health 0.15 0.27 0.02 0.14 0.12 0.01 0.18 0.07 0.11 0.06 0.05 Smoked as teenager 0.05 0.75*** 0.05 0.55** 0.13 0.14 0.04 0.05*** 0.07 0.21 0.51*** 0.44 Smoked as teenager 0.05*** 0.05 0.75*** 0.06 0.13 0.14 0.42*** 0.45 0.08 0.77*** 0.04 0.76*** 0.65*** 0.65*** 0.05 0.65** 0.05 0.65** 0.05 0.65** 0.05 0.65** 0.05 0.65** 0.14 0.25 0.25** 0.05 0.65** 0.14 0.25 0.25** 0.14 0.25 0.25** 0.35* 0.35* 0.35* 0.31** 0.36* 0.31** 0.36* 0.35* 0.31** 0.36* 0.35** 0.35** 0.35** 0.35** 0.35** 0.35** 0.35** 0.35** 0.35** 0.35** 0.35** 0.35** 0.35** 0.35** | Early SEP | -0.40*** | 1.36*** | -0.47*** | -0.12 | -0.18 | 0.01 | -2.73** | 0.72*** | -0.31* | 0.14 ** | -0.40* | -0.28** | -0.49*** |
| Childhood adv. events 0.04 0.07 0.25 0.25 0.25* 0.47* 1.61 -0.19 0.06 -0.07 0.21 0.51** 0.44 Danked as teenager -0.55*** 0.06 0.13 0.14 -0.03*** 0.43** 0.43 0.03*** 0.03*** 0.03*** 0.03*** 0.03*** 0.03*** 0.03*** 0.03*** 0.03*** 0.03*** 0.03*** 0.03*** 0.03*** 0.03*** 0.03*** 0.03*** 0.03*** 0.03*** 0.03*** 0.04*** 0.04*** 0.05*** 0.05*** 0.05*** 0.05*** 0.05*** 0.05*** 0.05*** 0.05*** 0.05*** 0.05*** 0.05*** 0.07** 0.04*** 0.04*** 0.07*** 0.04*** 0.04*** 0.07*** 0.04*** 0.04*** 0.04*** 0.04*** 0.05*** 0.01**** 0.02*** 0.01**** 0.02**** 0.01**** 0.02**** 0.01***** 0.02**** 0.01***** 0.00****** 0.01*********************************** | Early health | 0.15 | 0.27 | -0.02 | 0.14 | -0.12 | -0.01 | -1.09 | 0.10 | 0.18 | -0.07 | -0.11 | -0.01 | 0.06 |
| Smoked as teenager -0.59*** 0.75*** 0.06 0.13 0.13 0.43 -0.44 -0.44*** 0.43*** 0.45 -0.14 -0.14*** Internediate devication (ref. No qual.) -2.11*** 0.49 -0.72*** 0.03 0.17* -0.62*** 0.60* 0.07* 0.41 -0.76*** 0.12*** 0.67* 0.41 0.22** 0.60* 0.07* 0.41 0.23* 1.29** 0.60* 0.17* 0.22*** 0.60* 0.17* 0.22*** 0.60* 0.12* 0.21*** 0.55*** 0.40 0.12 0.21*** 0.55*** 0.40 0.40* 0.14** 0.58*** 0.40* 0.14** 0.58*** 0.40 0.45*** 0.40 0.41*** 0.45*** 0.40 0.45*** 0.41*** 0.45*** 0.40**** 0.28*** 0.28*** 0.21**** 0.28*** 0.21**** 0.28*** 0.21**** 0.24***** 0.24****** 0.44****** 0.44****** 0.44***** 0.45*** 0.44**** 0.44*********************************** | Childhood adv. events | 0.04 | 0.07 | 0.25 | 0.25 | 0.56** | 0.47* | 1.61 | -0.19 | 0.06 | -0.07 | 0.21 | 0.51** | 0.44 |
| Intermediate education (ref. No qual.) -0.43 -0.14 -0.04** 0.16 -1.2* 0.63*** 0.64 0.72** 0.64 0.72** 0.64* 0.72** 0.64* 0.72** 0.66** 0.73** 0.33* 1.32** 0.67** 0.23** 1.32** 0.67** 0.41 0.23** 1.32** 0.67** 0.41 0.23* 0.11 0.23* 0.11** 0.43 0.57** 0.30* 0.33* 0.30* 0.30* 0.35* 0.30* 0.35* 0.41 0.85** 0.41* 0.85** 0.41* 0.85** 0.41* 0.85** 0.41* 0.85** 0.41* 0.45** 0.41* 0.45** 0.41* 0.45** 0.41* 0.45** 0.41* 0.45** 0.45** 0.41* 0.45** 0.41* 0.45** 0.45** 0.45** 0.45** 0.45** 0.45** 0.45** 0.45** 0.45** 0.45** 0.45** 0.45** 0.45** 0.45** 0.45** 0.45** 0.45** <th0.40*< th=""> 0.45** 0.45***</th0.40*<> | Smoked as teenager | | -0.59*** | 0.75*** | -0.06 | 0.13 | 0.13 | 2.40 | -0.43*** | 0.45 | -0.08 | 1.39*** | 0.32* | -0.14 |
| Degree education (ref. No qual.) ≤ 2.11*** 0.49 0.72** 0.01 -7.22** 0.72** 0.73 0.33** 1.32** 0.68** -1.14 0.68* 0.73 0.33** 1.32** 0.68** -1.14** 0.39* 0.39* 1.36** 0.03 0.17 0.52** 0.50* 0.40 -0.13 0.53* 0.20 0.39 1.23** Parity 2.3 x.4 0.58* 0.40* -0.13 0.35* 0.20 0.39 1.23** Labour participation = 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | Intermediate education (ref. No qual.) | | | -0.43 | -0.14 | -0.69*** | 0.16 | -4.12* | 0.63*** | -0.46 | 0.27** | -0.67* | -0.34 | -0.76*** |
| Early first birth 0.39** 1.36*** 0.17 -0.25*** -0.06 0.05 0.67* 0.41 0.28 Short birth interval 1.89*** 0.12 -2.31 -0.05 0.06 0.04 -0.13 0.35* 0.36* 0.31* 0.35* 0.36* 0.31** 0.36* 0.51** 0.36** 0.31** 0.36* 0.51** 0.36** 0.24 0.57*** 0.03** 0.63*** 0.24** 0.63*** 0.24*** 0.57*** 0.001 0.001 -0.001 0.001 -0.001 0.001 -0.001 0.001 -0.001 0.001 -0.001 0.001 -0.01*** 0.24*** 0.36** 0.34** 0.44*** 0.55** 0.30** 0.34** 0.44*** 0.55** 0.28** 0.36* 0.31** 0.44*** 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.02 0.54* 0.01** 0.22** 0.20* 0.20* 0.21*** 0.21 0.15 0.10 0.02 0.54* 0.21* 0.21 0.36* 0.21*** 0.22*** 0.21 | Degree education (ref. No qual.) | | | -2.11*** | -0.49 | -0.72** | 0.01 | -7.62** | 1.66*** | -0.73 | 0.33** | -1.32** | -0.68** | -1.11*** |
| Short birth interval Short birth interval 0.12 -2.31 0.05 0.40 0.13 0.35 0.20 0.35 Parity 2-3 v. 4 0.57** 4.03* 0.63** 0.61* 0.61* 0.62** 0.53** 0.53** 0.54** 0.54** 0.54** 0.54** 0.54** 0.54** 0.54** 0.54** 0.54** 0.54** 0.54** 0.54** 0.54** 0.54** 0.54** 0.54** 0.54** 0.54** 0.54** 0.54** 0.54** 0.54** 0.54** 0.55** 0.34** 0.64** 0.64* 0.14* 0.10* 0.18** 0.20* 0.50** 0.30** 0.21** 0.55** 0.30* 0.31 0.53* 0.10 0.10* 0.14** 0.22* 0.50*** 0.21** 0.21** 0.35* 0.21** 0.35* 0.10* 0.10* 0.20* 0.50** 0.31** 0.10* 0.10* 0.10* 0.10** 0.21*** 0.35** 0.10** 0.10** 0.32** 0.10** 0.10*** 0.22**** 0.50*** 0.21**** 0.21**** 0.25***** 0.25***** 0.25***** <t< th=""><th>Early first birth</th><th></th><th></th><th></th><th>0.39*</th><th>1.36***</th><th>0.03</th><th>0.17</th><th>-0.52***</th><th>-0.06</th><th>0.05</th><th>0.67*</th><th>0.41</th><th>0.28</th></t<> | Early first birth | | | | 0.39* | 1.36*** | 0.03 | 0.17 | -0.52*** | -0.06 | 0.05 | 0.67* | 0.41 | 0.28 |
| Parity 23 vs. 4 0.53** 0.03** 0.03** 0.03** 0.03** 0.03** 0.02** 0.02** 0.02** 0.02** 0.02** 0.02** 0.02** 0.02** 0.02** 0.02** 0.02** 0.02** 0.02** 0.02** 0.02** 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.00** 0.04*** 0.2*** 0.02*** 0.02*** 0.02*** 0.02*** 0.02*** 0.001 0.001 0.001 0.001 0.001 0.001 0.001** 0.02*** 0.44*** Women aged 55-64 Early SEF 0.02* 0.02* 0.03 0.32* 0.01 0.05 0.03 0.35* 0.01 0.05 0.03 0.35* 0.11 0.14** 0.14** 0.14** 0.14** 0.14** 0.04** 0.24** 0.24** 0.24** 0.24** 0.25 0.25** 0.25** 0.05** 0.01** 0.02** 0.05** 0.01** 0.02** 0.05** 0.01** 0.02** 0.25** 0.25*** 0.25*** 0.25*** 0.25*** 0.25*** 0.25*** 0.25*** | Short birth interval | | | | | 1.89*** | 0.12 | -2.31 | -0.05 | 0.40 | -0.13 | 0.35 | 0.20 | 0.19 |
| Ever divorced -0.45*** 0.045*** 0.02* 0.02*** 0.02** 0.00 0.00 0.00 0.05 Family wealth | Parity 2-3 vs. 4 | | | | | | 0.57** | 4.03* | -0.34** | 0.63** | -0.14 | 0.68* | 0.51** | 0.36 |
| Labour participation -0.001 0.00 -0.001 0.00 -0.001 0.00 0.00 0.001 0.00 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.044*** Women aged 55-64 0.02 0.22 0.004 0.15 0.01 0.01 0.01 0.02 0.037 0.37* 0.02 0.03 0.014** 0.014* 0.011 0.24 0.01** 0.01 0.02 0.05** 0.011 0.24** 0.21* 0.01** 0.02** 0.01** 0.02** 0.01** 0.02** 0.21* 0.01** 0.02** 0.01** 0.02** 0.01** 0.01** 0.01*** 0.02*** 0.01*** 0.02*** 0.01**** 0.02*** 0. | Ever divorced | | | | | | | | -0.45*** | 0.21 | -0.34*** | 0.82^{**} | 0.26 | 1.21*** |
| Family wealth -0.28*** 0.18*** -0.56*** 0.30*** -0.44*** Women ged 55-64 Women aged 55-64 | Labour participation | | | | | | | | -0.001 | 0.00 | -0.001 | -0.001 | 0.00 | 0.05 |
| Women Women aged 55-64 Verter aged 55-64 Early SEP 0.28 1.16*** -0.02 -0.03 -0.34** -0.04 -0.14 -0.10 0.14*** 0.22 -0.50*** -0.32** -0.20 Childhood adv. events 0.37* -0.22 -0.04 0.15 -0.03 -0.33* -0.91 0.02 0.54 -0.11 0.24 0.62*** -0.21 Smoked as trenager -0.33* 0.36* -0.91*** -0.94*** -0.34** 0.64*** -0.91*** -0.94*** -0.48*** 0.63** -0.26*** 1.82*** 0.26 0.50** 1.02*** -0.26 1.82*** -0.26 0.50*** -0.17 Degree education (ref. No qual.) -1.30*** -0.89*** -1.2*** -0.38** 0.25 -6.21*** -0.06 -0.04 0.7*** -0.20 Early first birth 1.15*** 0.25 -6.21*** -0.18** -0.26*** 1.01*** 0.50*** 0.06*** 0.26 0.22 0.26 2.2 2.35 0.25 < | Family wealth | | | | | | | | | -0.28*** | 0.18*** | -0.56*** | -0.30*** | -0.44*** |
| Women aged 53-64 U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U | Women | | | | | | | | | | | | | |
| Early SEP 0.28 1.16*** -0.02 -0.03 -0.34** -0.04 2.04 -0.10 -0.10 0.14** 0.22 -0.50*** -0.30** Early Mealth 0.07 0.22 0.02 0.03 0.31 0.36* 0.31 0.16 -1.50 -0.10 -0.05 0.33 0.37 0.35* 0.12 Smoked as teenager -0.33* 0.36* 0.31 0.64** 0.37* 0.91 0.02 0.64** 0.37* 0.24 0.65** 0.12 Smoked as teenager -0.33* 0.36* 0.31* 0.66*** 0.91* -0.23 6.85*** 0.66*** -0.88 0.42** 0.52* -0.22* 0.22 0.20* Early Inst birth - - - 1.44*** 1.34*** -3.82* -1.01*** 0.56* -0.33** 0.56** 0.22 0.36* 0.34*** Short birth interval - - - 0.42** 0.35*** 0.24 0.25 2.19**** | Women aged 55-64 | | | | | | | | | | | | | |
| Early health 0.07 0.25 0.27 0.28 0.21 -0.16 -1.50 -0.10 -0.05 0.03 0.37 0.35* -0.21 Childhoad adv. events 0.37* 0.22 -0.04 0.15 -0.03 0.37* -0.91 -0.02 0.54* -0.11 0.24* 0.62*** -0.21 Smoked as teenager -0.33* 0.36* 0.31* 0.64*** 0.37* -0.94 -0.48*** 0.65*** -0.26*** 1.24*** -0.26** 1.24*** -0.38 9.34*** 1.34*** -0.56** -0.27** -0.27** -0.17 Degree education (ref. No qual.) - - -1.30*** -1.43*** -1.32*** -0.38** 1.34*** -0.56** -0.31*** 1.35*** 0.36*** -0.33*** 1.35*** 0.36*** -0.34*** 0.36* 0.66*** 0.21* 0.33*** 0.44**** Short birth interval - - - 0.33*** -0.64**** 0.34*** 0.56*** 0.71** 0.36** 0 | Early SEP | 0.28 | 1.16*** | -0.02 | -0.03 | -0.34** | -0.04 | 2.04 | -0.14 | -0.10 | 0.14** | 0.22 | -0.50*** | -0.30** |
| Childhood adv. events 0.37* 0.22 -0.04 0.15 -0.03* 0.33* -0.91 0.02 0.54* -0.11 0.24* 0.62*** -0.21 Smoked as teenager -0.33* 0.36* 0.31* 0.64** 0.37** -0.94 -0.48*** 0.48*** 0.48*** 0.69** -0.25** 0.42** 0.20 Degree education (ref. No qual.) - - 0.99** -1.42*** -0.38 9.34*** 1.34*** -0.52 0.21 0.07** 0.02*** 0.02*** 0.02*** 0.02*** 0.02*** 0.02*** 0.02*** 0.02*** 0.02*** 0.02*** 0.02*** 0.02*** 0.02*** 0.02*** 0.02*** 0.02*** 0.02*** 0.02*** 0.02*** 0.02*** 0.02*** 0.04*** 0.23*** 0.42*** 0.02*** 0.02*** 0.02*** 0.02*** 0.02*** 0.02*** 0.04*** 0.23*** 0.24*** 0.02*** 0.02*** 0.04*** 0.23*** 0.24*** 0.23*** 0.25**** 0.03*** | Early health | 0.07 | 0.25 | 0.27 | 0.28 | 0.21 | -0.16 | -1.50 | -0.10 | -0.05 | 0.03 | 0.37 | 0.35* | -0.12 |
| Sinoked as teenager -0.33* 0.36* 0.31 0.64** 0.37* -0.94 -0.48*** 0.63** -0.26*** 1.82*** 0.26 0.50** Intermediate education (ref. No qual.) -0.96*** -0.67*** -0.91** -0.23 6.85*** 0.66*** -0.66*** -0.22 0.65*** -0.22 0.22** 0.22** -0.22* 0.23*** 0.23*** 0.23*** 0.23*** 0.23*** 0.23*** 0.23*** 0.23*** 0.24*** 0.23*** 0.23*** 0.23*** 0.23*** 0.23*** 0.23*** 0.23*** 0.23*** 0.23*** 0.23*** 0.23*** 0.23*** 0.23*** 0.23*** 0.23*** 0.34*** 0.36* 0.23*** 0.34*** 0.36** 0.24*** 0.35*** 0.24*** 0.35*** 0.24*** 0.35*** 0.24*** 0.35*** 0.24*** 0.36*** 0.26*** 0.34*** 0.36*** 0.26*** 0.25*** 0.25*** 0.25*** 0.25*** 0.26**** 0.03*** 0.26**** 0.31**** 0.46**** 0.26**** 0.31**** 0.46**** 0.26**** 0.35**** 0.26**** 0.25***** </th <th>Childhood adv. events</th> <th>0.37*</th> <th>-0.22</th> <th>-0.04</th> <th>0.15</th> <th>-0.03</th> <th>0.33*</th> <th>-0.91</th> <th>0.02</th> <th>0.54</th> <th>-0.11</th> <th>0.24</th> <th>0.62***</th> <th>-0.21</th> | Childhood adv. events | 0.37* | -0.22 | -0.04 | 0.15 | -0.03 | 0.33* | -0.91 | 0.02 | 0.54 | -0.11 | 0.24 | 0.62*** | -0.21 |
| Intermediate education (ref. No qual.) -0.96*** -0.67*** -0.23 6.85*** 0.66*** -0.08 0.09 -0.59** -0.42* -0.17 Degree education (ref. No qual.) -1.30*** -0.89*** -1.42*** -0.38 9.34**** 1.34*** -0.52 0.23 -0.79* -0.72** 0.20 Early first birth 1.74*** 1.74*** 1.74*** -0.38 9.34*** 1.54*** 0.50* -0.33*** 1.5*** 0.38** 0.43*** 0.50* -0.33*** 1.5*** 0.38** 0.34*** Short birth interval 1.74*** 1.85*** 0.25 -6.21*** 0.43*** 0.60** 0.61** 0.50** 0.23** 0.24** 0.35** 0.34*** Parity 2.3 vs. 4 Ever divorced 1.85** 0.56** -12.3*** 0.61*** -0.05*** 0.25* 0.36*** 0.61** -0.05*** 0.91*** 0.25 2.91**** Labour participation Ever divorced 1.2**** 0.15 0.40* 0.55*** 0.21* 0.64*** 0.01** -0.64*** 0.01*** 0.02** 0.03*** 0.21** <th>Smoked as teenager</th> <th></th> <th>-0.33*</th> <th>0.36*</th> <th>0.31</th> <th>0.64**</th> <th>0.37**</th> <th>-0.94</th> <th>-0.48***</th> <th>0.63**</th> <th>-0.26***</th> <th>1.82***</th> <th>0.26</th> <th>0.50**</th> | Smoked as teenager | | -0.33* | 0.36* | 0.31 | 0.64** | 0.37** | -0.94 | -0.48*** | 0.63** | -0.26*** | 1.82*** | 0.26 | 0.50** |
| Degree education (ref. No qual.) -1.30*** -0.89** -1.42*** -0.38 9.34*** 1.34*** -0.52 0.23 -0.79* -0.72** 0.20 Early first birth 1.74*** 1.13*** -3.82* -1.01*** 0.03 0.03 0.14*** 0.83*** 0.84*** Parity 2-3 vs. 4 1.85*** 0.25* -6.21*** -0.37*** -0.04 0.74*** 0.33*** 0.84*** Labour participation | Intermediate education (ref. No qual.) | | | -0.96*** | -0.67*** | -0.91*** | -0.23 | 6.85*** | 0.66*** | -0.08 | 0.09 | -0.59** | -0.42* | -0.17 |
| Early first birth 1.04*** 1.74*** 1.13*** -3.82* -1.01*** 0.50* -0.33*** 1.15*** 0.83*** 0.84*** Short birth interval 1.85*** 0.25 -6.21*** -0.43*** 0.06 -0.04 0.74*** 0.35* 0.34 Ever divorced 1.85*** 0.26*** -12.3*** 0.06*** 0.74** 0.36* 0.66** 0.22 2.36 Panity 2-3 vs. 4 - - -0.43*** 0.06** 0.74** 0.36** 0.91*** 0.25 2.19*** Labour participation - - - -0.05** 0.71** 0.06** 0.21 0.33*** 0.66*** 0.25 2.19*** Women aged>64 - - - 0.03 -0.14** 0.49*** -0.66*** 0.06 -0.04** 0.33*** -0.66*** Early SEP -0.35*** 1.29*** -0.62*** 0.01 -0.27** 0.15 -0.40* 0.55*** -0.14* 0.49*** -0.35*** -0.05 Childhoad adv events 0.11 -0.19 0.10 0.15 0.40* | Degree education (ref. No qual.) | | | -1.30*** | -0.89** | -1.42*** | -0.38 | 9.34*** | 1.34*** | -0.52 | 0.23 | -0.79* | -0.72** | -0.20 |
| Short birth interval 1.85*** 0.25 -6.21*** -0.43*** 0.06 -0.04 0.74*** 0.35** 0.34 Parity 2-3 vs. 4 52** 0.56** -12.3*** 0.05*** 0.75*** 0.75*** 0.75*** 0.75*** 0.61** -0.36** 0.22 0.35 Labour participation 5 5 1.5*** 0.5** 0.61** 0.0004 -0.03*** 0.00 0.001 0.01** 0.25 2.19*** Women aged>-64 5 5 0.5*** 0.15 0.40 0.55*** 0.22 0.35*** 0.64*** Early SEP 0.35*** 1.29*** 0.02 0.10 0.10 0.23 -0.45 0.03 -0.49*** -0.64*** 0.04 Early SEP 0.26** 0.12 0.13 -0.01 0.10 0.23 -0.45 0.03 -0.12** 0.49*** -0.49*** -0.05 0.03 0.12** 0.29*** 0.05 0.03 0.12** 0.24** 0.01 0.10*** 0.15*** 0.15*** 0.29*** 0.15*** 0.29*** 0.15*** 0.29*** | Early first birth | | | | 1.04*** | 1.74*** | 1.13*** | -3.82* | -1.01*** | 0.50* | -0.33*** | 1.15*** | 0.83*** | 0.84*** |
| Parity 2-3 vs. 4 0.56** -12.3*** -0.75*** 0.77** -0.36*** 0.66** 0.22 0.36 Ever divorced | Short birth interval | | | | | 1.85*** | 0.25 | -6.21*** | -0.43*** | -0.06 | -0.04 | 0.74*** | 0.35* | 0.34 |
| Ever divorced Labour participation -0.86*** 0.61** -0.50*** 0.91*** 0.25 2.19*** Women aged>64 - - - - -0.86*** 0.61** -0.003 0.01 -0.03** 0.02 0.03*** 0.33*** 0.64*** Women aged>64 - Early SEP -0.35*** 1.29*** 0.01 -0.27** 0.15 -0.40 0.55*** 0.29*** 0.43*** 0.06*** Early SEP -0.35*** 1.29*** -0.62*** 0.01 0.27** 0.15 -0.40* 0.55*** 0.29*** 0.49*** 0.35*** -0.06 Smoked as teenager 0.11 -0.19 0.10 0.21 0.40* 3.50* -0.18 0.33 -0.14** 0.48*** 0.22 0.35 -0.55*** 0.03 Smoked as teenager -1.04*** 0.04 -0.48** 0.21 4.05*** 0.76*** 1.12*** 0.37 0.12 0.14 4.24 1.56*** 0.44*** 0.24 0.55*** -0.52 | Parity 2-3 vs. 4 | | | | | | 0.56** | -12.3*** | -0.75*** | 0.77** | -0.36** | 0.66** | 0.22 | 0.36 |
| Labour participation Family wealth 0.001 0.0021 0.0004 0.0004 0.0004 0.003 0.01 0.04*** Women aged>64 Early SEP -0.35*** 1.29*** -0.62*** 0.01 0.15 0.40 0.55*** 0.02 0.83*** 0.06**** 0.06 Childhood adv. events 0.12 0.13 -0.01 0.15 0.40* 5.56*** 0.32 0.14* 0.02** 0.13*** -0.49*** 0.05*** 0.02 0.28 0.32** -0.05 Childhood adv. events 0.11 0.10 0.15 0.40* 3.50* -0.18 0.03 -0.14* 0.48 0.68*** 0.03 Smoked as teenager -0.56*** 0.37 -0.12 0.08 0.31* 1.06 -0.40** 0.33 -0.17** 1.62*** 0.26** 0.31* Degree education (ref. No qual.) - -1.04*** 0.40** 0.21 4.05** 0.76*** -1.14** 0.48 0.81 0.52 0.54** Early first birth - - 0.45** 0.44** 0.40 0.49** <td< th=""><th>Ever divorced</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>-0.86***</th><th>0.61**</th><th>-0.50***</th><th>0.91***</th><th>0.25</th><th>2.19***</th></td<> | Ever divorced | | | | | | | | -0.86*** | 0.61** | -0.50*** | 0.91*** | 0.25 | 2.19*** |
| Family weath -0.29*** 0.19*** -0.56*** -0.33*** -0.64*** Women aged>64 | Labour participation | | | | | | | | 0.0051* | 0.00 | 0.00004 | -0.003 | 0.00 | 0.01 |
| Women aged>64 Early SEP -0.35*** 1.29*** -0.62*** -0.01 -0.27** 0.15 -0.40 0.55*** -0.29* 0.13*** -0.49*** -0.35*** -0.06 Early SEP 0.26* 0.12 0.13 -0.01 0.10 0.23 -0.45 0.03 -0.24 0.02 0.28 0.32** -0.05 Childhood adv. events 0.11 -0.19 0.10 0.16 0.15 0.40* 3.50** -0.14 0.48 0.68*** 0.03 Smoked as teenager -0.56*** 0.37 -0.12 0.08 0.31* 1.06 -0.40*** 0.33 -0.17** 1.62*** 0.23 0.18 Degree education (ref. No qual.) -1.04*** 0.02 -0.44** 0.21 4.05** 0.76** -1.12*** 0.33 -0.17** 1.62*** 0.30** -0.41*** Degree education (ref. No qual.) -1.75* -0.29 -0.45* 0.14 4.24 1.66*** 0.44*** 0.41*** Short b | Family wealth | | | | | | | | | -0.29*** | 0.19*** | -0.56*** | -0.33*** | -0.64*** |
| Early SEP -0.35*** 1.29*** -0.62*** -0.01 -0.27** 0.15 -0.40 0.55*** -0.29* 0.13*** -0.49*** -0.35*** -0.06 Early Iselth 0.26* 0.12 0.13 -0.01 0.10 0.23 -0.45 0.03 -0.24* 0.02 0.28 0.32*** -0.06 Childhood adv. events 0.11 -0.19 0.10 0.16 0.15 0.40* 3.50* -0.18 0.03 -0.14* 0.48 0.68** 0.03 Smoked as teenager -0.56*** 0.37 -0.12 0.08 0.31* 1.06 -0.49*** 0.33 -0.17** 1.62*** 0.23 0.18 0.03 -0.17** 0.23 0.18 0.03 -0.17** 0.23 0.18 0.16 0.49*** 0.03 -0.17** 0.23 0.18 0.24*** 0.23 0.18 0.25* 0.44*** 0.24*** 0.23** 0.37** 0.44*** 0.24 0.66*** 0.42*** 0.24*** 0.37* | Women aged>64 | | | | | | | | | | | | | |
| Early health 0.26* 0.12 0.13 -0.01 0.10 0.23 -0.45 0.03 -0.24 0.02 0.28 0.22* -0.05 Childhood adv. events 0.11 -0.19 0.10 0.16 0.15 0.40* 3.50* -0.18 0.02 0.28 0.22* -0.05 Smoded as teenager -0.56***0 0.37 -0.12 0.08 0.31* 1.06 -0.40* 0.33 -0.17* 1.62*** 0.23 0.41* 0.68*** 0.33 -0.17* 1.62**** 0.23 0.41** 0.04 0.48** 0.21 4.05** 0.33 -0.17** 1.62**** 0.23 0.41** Degree education (ref. No qual.) -1.04*** 0.02 0.48** 0.21 4.05** 0.76*** -1.12*** 0.39*** -0.78* 0.39*** -0.50** 0.34*** Degree education (ref. No qual.) -1.75** 0.29 0.45** 0.28 0.55*** 0.42*** 0.30*** 0.78*** 0.78*** 0.78*** 0.42*** <th>Early SEP</th> <th>-0.35***</th> <th>1.29***</th> <th>-0.62***</th> <th>-0.01</th> <th>-0.27**</th> <th>0.15</th> <th>-0.40</th> <th>0.55***</th> <th>-0.29*</th> <th>0.13***</th> <th>-0.49***</th> <th>-0.35***</th> <th>-0.06</th> | Early SEP | -0.35*** | 1.29*** | -0.62*** | -0.01 | -0.27** | 0.15 | -0.40 | 0.55*** | -0.29* | 0.13*** | -0.49*** | -0.35*** | -0.06 |
| Childhood adv. events 0.11 -0.19 0.10 0.16 0.15 0.40* 3.50* -0.18 0.03 -0.14* 0.48 0.68*** 0.03 Smoked as teenager -0.56*** 0.37 -0.12 0.08 0.31* 1.06 -0.40*** 0.33 -0.17** 1.62*** 0.23 0.18 Intermediate education (ref. No qual.) -1.04*** -0.04 -0.48** 0.21 4.05*** 0.76*** -1.12*** 0.39** -0.70** -0.70** -0.39** -0.70** -0.39** -0.37* -0.12* 0.56*** 0.31* 1.06 -0.40*** 0.40*** 0.31* 1.06*** -0.40*** 0.33 -0.17** 1.62*** 0.39*** -0.39** -0.37* -0.29** -0.34** Degree education (ref. No qual.) -1.04*** -0.04 -0.48** 0.40** 0.31* 1.06** -1.12*** 0.39*** -0.31** -0.39** 0.31* 0.41** Short birth interval - - 0.89**** 1.50*** 0.85*** -1.32* -0.15 -0.01 -0.02 0.01* -0.02 0.01* </th <th>Early health</th> <th>0.26*</th> <th>0.12</th> <th>0.13</th> <th>-0.01</th> <th>0.10</th> <th>0.23</th> <th>-0.45</th> <th>0.03</th> <th>-0.24</th> <th>0.02</th> <th>0.28</th> <th>0.32*</th> <th>-0.05</th> | Early health | 0.26* | 0.12 | 0.13 | -0.01 | 0.10 | 0.23 | -0.45 | 0.03 | -0.24 | 0.02 | 0.28 | 0.32* | -0.05 |
| Smoked as teenager -0.56*** 0.37 -0.12 0.08 0.31* 1.06 -0.40*** 0.33 -0.17** 1.62*** 0.23 0.18** 0.03* -0.17** 1.62*** 0.23 0.17** 1.62*** 0.23 0.17** 1.62*** 0.23 0.17** 1.62*** 0.23 0.17** 1.62*** 0.24** 0.24** 0.33 -0.17** 1.62*** 0.23 0.17** 1.62*** 0.24** 0.37* 0.17** 1.62*** 0.24*** 0.37* 0.17** 0.33* 0.17** 1.62*** 0.34** 0.76*** 0.12*** 0.37** 0.70** 0.37* 0.90** 0.37* 0.90*** 0.37* 0.90*** 0.37* 0.90*** 0.37* 0.90*** 0.37* 0.90*** 0.37* 0.90*** 0.37* 0.90*** 0.37* 0.38** 1.30*** 0.38** 1.32*** 0.96*** 0.44*** 0.30*** 0.31*** 0.00*** 0.31*** 0.00*** 0.31*** 0.30*** 0.31**** 0.30*** 0.31*** | Childhood adv. events | 0.11 | -0.19 | 0.10 | 0.16 | 0.15 | 0.40* | 3.50* | -0.18 | 0.03 | -0.14* | 0.48 | 0.68*** | 0.03 |
| Intermediate detaction (ref. No qual.) I.104*** 0.012 0.012 0.012 0.013 0.015 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.014 0.013 0.013 0.014** 0.014** Degree education (ref. No qual.) -1.75* 0.29 -0.45 0.14 4.24 1.66*** -0.40 0.19 -0.81 -0.52 -0.54* Early first birth 0.89*** 1.50*** 0.85*** -4.28* -0.96*** 0.88** -0.44** 0.70* 0.39*** 0.37 Short birth interval 2.03*** 0.38* -1.32 -0.15 -0.01 -0.03 0.17 0.14 0.08 Parity 2-3 sys. 4 0.30 -7.12*** -0.44*** 0.30 -0.21** -0.005 0.66*** 0.22 Ever divorced | Smoked as teenager | | -0.56*** | 0.37 | -0.12 | 0.08 | 0.31* | 1.06 | -0.40*** | 0.33 | -0.17** | 1.62*** | 0.23 | 0.18 |
| Degree education (ref. No qual.) -1.75* -0.29 -0.45 0.14 4.24 1.66* -0.40 0.19 -0.81 -0.52 -0.54* Early first birth 0.89*** 1.50*** 0.85*** -4.28* -0.96*** 0.88*** -0.44*** 0.73* 0.90** 0.37 Short birth interval 2.03*** 0.38* -1.32 -0.15 -0.01 -0.03 0.17 0.14 0.24 Parity 2-3 vs. 4 0.30 -7.12*** 0.44*** 0.73* 0.90** 0.37 Ever divorced 0.30 -7.12*** 0.41*** 0.30 0.17 0.14 0.24 Labour participation -0.02 0.01 -0.02 0.05 0.06** 0.22 Parily 2-3 vs. 4 -0.44*** 0.31 0.16 1.31*** Labour participation -0.002 0.01 -0.02 0.02 0.00 0.01 Contraction -0.33*** 0.10*** -0.42*** 0.34**** 0.5**** | Intermediate education (ref. No qual.) | | 5.50 | -1.04*** | -0.04 | -0.48** | 0.21 | 4.05** | 0.76*** | -1.12*** | 0.39*** | -0.70** | -0.39** | -0.41** |
| Early first birth 0.25 0.26 0.12 0.02 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 <th0.03< th=""> 0.03 0.03</th0.03<> | Degree education (ref. No gual.) | | | -1 75* | -0.29 | -0.45 | 0.14 | 4 24 | 1 66*** | -0.40 | 0.19 | -0.81 | -0.52 | -0 54* |
| Laty instruct 0.57 1.00 0.60 -4.20 0.50 -0.44** 0.15 0.50* 0.50* Short birth interval 2.03** 0.38* -1.32 -0.15 -0.01 -0.03 0.17 0.14 0.08 Parity 2-3 vs. 4 0.30 -7.12*** -0.44*** 0.30 -0.21** -0.005 0.66*** 0.22 Ever divorced -0.57*** 0.12 -0.39*** 0.31 0.16 1.31*** Labour participation -0.002 0.01 -0.002 0.05 0.00 0.01 | Forly first hirth | | | | 0.29 | 1 50*** | 0.85*** | -4.28* | -0.96*** | 0.50 | -0.44*** | 0.73* | 0.02 | 0.37 |
| Stort of an interval 2.05 0.06 -1.02 -0.01 -0.03 0.17 0.14 0.00 Parity 2-3 yrs. 4 0.30 -7.12*** 0.44 0.30 -0.21** 0.005 0.66*** 0.22 Ever divorced -0.57*** 0.12 -0.39*** 0.31 0.16 1.31*** Labour participation -0.002 0.01 -0.002 0.005 0.00 0.01 Parily 2-33*** 0.10*** 0.42*** 0.47*** 0.47*** 0.47*** 0.47*** 0.47*** 0.47**** 0.47**** 0.47**** 0.47**** 0.47**** 0.47**** 0.47**** 0.47**** 0.47**** 0.47***** 0.47****** 0.47***** 0.47***** 0.47************ | Short hirth interval | | | | 0.07 | 2 03*** | 0.38* | -1.32 | -0.15 | -0.01 | -0.03 | 0.17 | 0.14 | 0.08 |
| Labor participation 0.00 -1.2 0.00 -0.21 0.00 0.02 Labor participation -0.57*** 0.12 -0.039*** 0.31 0.16 1.31*** Labor participation -0.002 0.01 -0.002 0.005 0.00 0.01 | Parity 2-3 ve 4 | | | | | 2.05 | 0.30 | -1.34 | -0.15 | 0.30 | -0.05 | -0.005 | 0.14 | 0.00 |
| Labour participation -0.37 ··· 0.12 -0.39 ··· 0.31 0.10 1.51 ··· Labour participation -0.002 0.01 -0.005 0.00 0.01 Emplit wealth -0.31 ··· 0.12 -0.32 ··· 0.01 -0.005 0.00 0.01 | Fuer diverged | | | | | | 0.50 | -1.12 | 0.57*** | 0.12 | 0.20*** | -0.005 | 0.16 | 1 21*** |
| Lation participation -0.002 0.01 -0.002 0.00 0.01 -0.202 -0.00 0.01 -0.202 -0.00 0.01 -0.202 -0.00 -0.01 -0.202 -0.00 -0.01 -0.202 -0.00 -0.01 -0.202 -0.00 -0.01 -0.202 -0.00 -0.01 -0.202 -0.00 -0.01 -0.202 -0.00 -0.01 -0.202 -0.00 -0.01 -0.202 -0.00 -0.01 -0.202 -0.00 -0.01 -0.202 -0.00 -0.01 -0.202 -0.00 -0.01 -0.202 -0.00 -0.01 -0.202 -0.00 -0.01 -0.202 -0.00 -0.01 -0.202 -0.00 -0.01 -0.202 -0.00 -0.01 -0.202 -0.00 -0.01 -0.202 -0.00 -0.01 -0.202 -0.00 -0.01 -0.202 -0.00 -0.01 -0.202 -0.00 -0.01 -0.202 -0.00 -0.01 -0.202 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.002 -0.0 | Loca unoffee | | | | | | | | -0.57**** | 0.12 | -0.59**** | 0.005 | 0.10 | 1.31 |
| | Family wealth | | | | | | | | -0.002 | -0 33*** | 0 19*** | -0 43*** | -0 34*** | -0 50*** |

*P<0.05; ** P<0.01: *** P<0.001.

Appendix Figure 2a: Results from path model showing all significant linkages between variables in the model, men 55-64



p<0.05

-0.13 Short birth 0.47 Education interval 0.21 -0.17 High parity 0.55 0.18 Early Smoker 0.16 parenthood 0.28 0.19 0.46 -0.24 0.44 V Functional 0.37 -0.14 Teen limitations smoker -0.28 -0.21 0.24 -0.17 0.26 Childhood 0.85 SEP 0.10 3+ CES-D 0.15 0.95 -0.26 -0.96 -0.34 0.27 Childhood adverse -0.10 events Has no 0.46 -0.49 partner 0.14 -0.45 Early 0.13 0.19 -0.43 health 0.22 Light grey: Linkages between fertility Social -0.42 support -0.83 Black: Direct and indirect linkages from fertility variables to depression Dark grey: Linkages from childhood 0.52 -0.33 factors to fertility Ever divorced Blue: Other association Wealth Labour Thicker arrows p<0.01, thinner arrows

0.13

score

variables

p<0.05

Appendix Figure 2b: Results from path model showing all significant linkages between variables in the model, women 55-64





Appendix Figure 2d: Results from path model showing all significant linkages between variables in the model, women 65+.

