Master Thesis

Programme: Population Studies (M.Sc.), Population Research Centre, Rijksuniversiteit Groningen

Supervisor: Roberta Rutigliano

Academic year 2018/2019

Maternity leave durations and the relevance of selection: A demographic approach to maternal health outcomes after maternity leave for first-time mothers in Germany

Submitted by

Name: Lara Bister

Student number: S3807843

Email address: l.bister@student.rug.nl

Date and place: Groningen, 29 August 2019

Acknowledgements

I would first like to thank my thesis supervisor, the awesome Dr. Roberta Rutigliano of the Population Research Centre at the University Groningen. I am very grateful for her outstanding support, her advice and her encouragement. She spared no effort in assisting with my analysis (even via Skype!), teaching me new methods, and discussing my results. Without her passionate participation and input I would have never made such a good progress or would feel so confident about my future academic career.

For my thesis research I was accepted for an internship at the Max Planck Institute for Demographic Research. I want to thank the institute and especially the research group Labor Demography, who hosted me during my internship. This experience was enriching for both my research project and my personal development. I very much enjoyed working with this inspiring team of advanced researchers and I feel like I learned a lot. A very special gratitude goes to Dr. Peter Eibich and Dr. Karen van Hedel, who were my main supervisors at the institute and whose doors where always open for my questions and concerns. I also want to thank Dr. Mine Kühn, who advised me, and all the other researchers at the institute, who provided me with feedback on my research project. I also want to thank the Cine Club for the very warm welcome in the team and in Rostock. You made my stay unforgettable.

Being able to experience such a research internship and to include it in a one-year master programme requires a great administrative effort for the University Groningen. For that reason, special thanks go to Dr. Billie de Haas, the super engaged and supportive master coordinator of Population Studies, and also to Chris Diedericks, the internship coordinator, of the Faculty of Spatial Sciences who made this experience possible for me.

I am also looking forward to hearing the opinion of the (still unknown) second reviewer. I really appreciate the additional input and the feedback.

Finally, I want to thank René, Sophie, Katharina, Eugenia, and Angela for providing me with unfailing support and continuous encouragement throughout my years of study and through the process of researching and writing this thesis. This accomplishment would not have been possible without you!

Lara Bister

Table of contents

Abstract

Background. Since the 1960s, women increasingly remain employed after the transition into motherhood resulting in multiple role burdens and increased maternal distress. This shifts the attention towards maternity leave entitlements as a reconciliation strategy of family and work. Research on maternity leave utilisation has indicated positive effects of the leave duration on mothers' health outcomes. Others suggest differences in the health outcome depend on the selection into maternity leave spells **Objective**. Little attention has been paid to the maternity leave-health nexus in the German context, which is characterised by low fertility levels, traditional role models of parenting and generous maternity leave entitlements. The presented master thesis research investigates the effect of maternity leave durations on first-time mothers' health outcomes for first-time mothers in Germany. The analysis focuses on mothers' demographic characteristics to observe whether there is a causal or a selection mechanism. **Method**. Using administrative panel data on 4,237 women from the German Pension Insurance, discrete-time event history analysis is applied to estimate the effect of the maternity leave lengths on the probabilities of serious sickness occurrence as a proxy for health outcomes. **Findings**. Findings show that the probabilities of becoming sick increase with the duration of the maternity leave. When differentiating between characteristics of women, high-income- and poor-health- mothers show higher probabilities of sickness increasing with the maternity leave length. Average- and reduced working hours-mothers show lower and more stable probabilities of sickness across the leave durations. Also, sickness probabilities seem to increase over time for only long-leave mothers. A selection effect of maternity leave durations on mothers' health outcomes can be concluded.

Keywords: Maternity leave, mothers' health, Germany, demography, administrative data, panel data, discrete-time event history analysis

List of Figures

List of Tables

List of Abbreviations

€	Euro
BMAS	Bundesministerium for Arbeit und Soziales [German Federal Ministry for Labour and Social Affairs]
BMFSFJ	Bundesministerium für Familie, Senioren, Frauen und Jugend [German Federal Ministry for Family Affairs, Women, Senior Citizens and Youth]
BMJV	Bundesministerium der Justiz und für Verbraucherschutz [German Federal Ministry of Justice and Consumer Protection]
CI	Confidence interval
df	Degrees of freedom
DRV	Deutsche Rentenversicherung [German pension insurance]
FDZ	Forschungsdatenzentrum der DRV [Research data centre of the DRV]
GDR	German Democratic Republic
M	Mean
MPIDR	Max Planck Institute for Demographic Research
NNT	Numbers needed to treat
SD	Standard deviation
SE	Standard error
SUF	Scientific use file
UK	United Kingdom
US	United States of America
VSKT	FDZ-Biografiedatensatz für die Biografiedaten der Versicherten [FDZ pension data set on biography data of insured persons]

1. Introduction

1.1 Problem statement

The increasing female labour force participation since the 1960s has caused a significant change in family organisation in Western countries (Destatis, 2017; DIW, 2015; OECD, 2016; World Bank, 2019): women are increasingly employed and are not only wives and mothers anymore. In line with traditional gender role models, the necessary adaption in family responsibility mainly affects women due to their historically established role as caretaker for children. In fact, it is mostly women compromising their professional careers and taking over parenting when a child is born (Hein, 2005). However, mothering becomes far more challenging for employed woman. These challenges of coping with the physical and psychological impact of the childbirth, the reorganisation of daily routines, and balancing the different roles of motherhood and employment are assumed to affect *maternal distress* (Barnett & Baruch, 1985; Esping-Andersen & Billari, 2015; Tiedje et al., 1990). To alleviate those stressors, family-work-reconciliation strategies help women to ease the double burden of employment and motherhood, and to diminish the negative impact on their distress levels. One reconciliation strategy is *maternity leave*, a legal entitlement enabling the postponement of returning to work and prolonging the period of familiarisation of motherhood while protecting the jobs of mothers. Respective legislations aim to protect the maternal health and to ensure the labour market attachment of mothers (Joesch, 1997). Regarding postnatal *maternal distress* levels, this strategy has been proven beneficial for mothers' health outcomes (Dagher et al., 2014). Yet, there are differences in the utilisation of *maternity leave* in terms of leave durations and mothers' motivation for these. Those differences suggest variations in *maternal distress* and also mothers' health outcomes due to *maternity leave*'s purpose of stress alleviation. The question remains which determinants are important in the selection into *maternity leave* durations and whether the selection mechanisms themselves have an impact on mothers' health.

Germany offers a unique opportunity to investigate *maternity leave* and its health effects on mothers. Fertility levels are low despite of recent increases during the last decade (Destatis, 2017) and the female labour force participation is low but continuously increasing (Kreyenfeld & Geisler, 2006; Spiess & Wrohlich, 2008). Additionally, Germany shows a higher prevalence of traditional gender role models in family organisation referring to the classical male-breadwinner model with the woman as a housewife and mother (Borck, 2014; Maurer, 2006). This model also empowers *intensive mothering* meaning that mother's available resources are entirely focussed on the needs of and the care for the child (Allen et al., 2013; Hays, 1996). Besides the organisational task allocation within a family, there seem to be cultural norms forcing women into *intensive mothering* as an ideology (Damaske, 2013; Johnston & Swanson, 2006). This feeds the women's objective of being a *good mother* and focussing all attention and resources on raising and caring for the child. The cultural anchoring of this ideology in Germany is emphasised by the expression 'Rabenmutter' (literal translation: 'raven mother', means an uncaring or bad mother). The term appeals to the social condemnation of deviating from the established norms of being a *good mother*, which is socially perceived as a role neglect and failure of motherhood by, for instance, being employed. Although this cultural understanding of working mothers is slightly shifting towards a more modern understanding of gender division and families, being blamed as a 'Rabenmutter' still states an issue for working mothers in Germany in terms of their socio-psychological well-being (Rizzo et al., 2013). Furthermore, the thorough *maternity leave* legislation in Germany supports these social structures of traditional of *intensive mothering*, but only hardly enables a sufficient balance between employment and motherhood (BMFSFJ, 2004). Only the latest policy reform of 2007 seems to shift the objective of the entitlements towards a better reconciliation of both *intensive mothering* and employment (BMFSFJ, 2018; Guertzgen & Hank, 2018). When taking a look at the German *maternity leave* legislation, Germany has one of the shortest *statutory maternity leave* entitlements compared to the country's peers in welfare economies (ILO, 2010). Yet, besides the *statutory maternity leave*, there have been various reforms and different models of an extended *maternity leave* enabling up to 36 months of *maternity leave* after the childbirth since 1992 (BMFSFJ, 2018). The current policy, which came into force in 2007, is accompanied by different models of childcare allowances and introduced a paternity leave utilisation by fathers. The several reforms on *maternity leave* entitlements have also allowed additional parental allowances (BMFSFJ, 2004; BMFSFJ, 2018). Although the regular *maternity leave* policies in Germany show a political interest of

adapting to cultural trends like female labour force participation, they also maintain *intensice mothering* norms by poorly stimulating fathers to engage in infant parenting. As a result, mothers are seemingly solely responsible for the parenting act. Even though the German policy already includes fathers (BMFSFJ, 2018) and this direction is additionally stimulated in the international public debate as, for instance, recently addressed in the European Union directive on statutory paternity leave (European Commission, 2017; European Commission, 2019), the policy implications of paternity leave are less attractive for men and suffer from stigmatisation of declined masculinity (Coltrane et al., 2013; Rudman & Mescher, 2013).

However, any *maternity leave* length embodies different conditions in its utilisation for mothers. Due to the heterogeneous composition of the population, the selection into *maternity leave* durations is shaped by mothers' characteristics such as age at childbirth, occupation, income, or general health (Guertzgen & Hank, 2018). Three important selection criteria for different *maternity leave* durations derived from individual contexts of mothers are *affordability*, *amortisation*, and *personal motivation*. The *affordability* aspect refers to the mothers' and her partner's economic resources and their sufficiency during an employment interruption. The second principle of *amortisation* focuses on the individual assessment of the ratio of monetary remuneration and the simultaneous income loss during the leave (Spiess & Wrohlich, 2008). Both mechanisms account for socio-economic selectivity. The third angle, *motivation,* addresses the individual priority of the leave duration, which is, for instance, shaped by the women's general health condition or other welfare state amenities, their formal and informal support after the childbirth, or their parenting preferences (Johnston & Swanson, 2006; Spiess & Wrohlich, 2008). However, those mechanisms introduce a dimension of exclusiveness in the recovery from childbirth and the coping with the new challenges of motherhood in daily life routines, which further establishes structures of social inequality among women. One example for this is the childcare allowance entitlement in Germany that has not fully replaced mothers' income for a long time and therefore forced women with lower income to return to their employments in an earlier stage. The current study investigates how mothers' characteristics affect their selection into *maternity leave* durations and how these further influence mothers' health outcomes. The case of Germany affords thereby an opportunity of including the relevance of multiple role occupations within a framework of strong welfare support. Those insights might contribute relevant results to the current body of literature on *maternity leave* and mothers' health.

1.2 Academic and societal relevance

The fact that women increasingly remain employed after the transition into motherhood (Destatis, 2017) emphasises the relevance of the investigation of *maternity leave* and mothers' health. Due to the increased share of female employees, the most relevant implication for the labour market is the growing group experiencing motherhood and multiple role requirements. To sustain a generally healthy workforce, it is important to offer reconciliation mechanisms, which do not interfere with mothers' attachment to the labour market. For that reason, *maternity leave* entitlements increasingly gain in importance since they aim to protect maternal health, facilitate mothers' return to the labour market, and provide financial support for mothers. However, most studies have focussed on the labour market or policy perspective on *maternity leave* (for example: Baum, 2003; Berger & Waldfogel, 2004; Dagher et al., 2014; Dahl, 2013; Dechter, 2014; Hanel, 2013; Hashimoto et al., 2004; Hoherz, 2014; Houston & Marks, 2003; Lott, 2018; Low & Sánchez-Marcos, 2015; Nowak et al., 2013; Schönberg & Ludsteck, 2014) and neglected its direct interrelation with mothers' health. Also, little attention has been paid to the demographic components of mothers and linked variations in utilising *maternity leave* entitlements. Recent findings suggest an association between social characteristics and post-*maternity leave* mothers' health outcomes, which emphasises the need for a more demographic perspective on *maternity leave* and mothers' health (2.2). Also, the political debate mainly focuses on health protection aspects for mother and child of *maternity leave* periods (Aitken et al., 2015). In addition to the unique societal and policy conditions of *maternity leave* in Germany, only a few studies have investigated the effect of *maternity leave* and its durations on mothers' health in this or a comparable welfare context. Most research on the association between *maternity leave* and health has focussed on the United Kingdom (UK), the United States (US) and Australia (2.2). Since the German *maternity leave* legislation introduces a high selectivity component by for instance the availability of childcare benefits, the current study allows for an in-depth insight into this selection into *maternity leave* spells with-

in the complex context of Germany by considering demographic characteristics in the investigation of the *maternity leave*-mothers' health association.

The above-mentioned health effects of *maternity leave* can be attributed to the selective impact of the German law, which may have a relaxing or triggering effect on the health of mother (BMFSFJ, 2018). The conservative role model understanding, the prevalence of *intensive mothering* and the social stratification make the German context particularly relevant for studying the association between *maternity leave* and health (Bernardi & Keim, 2017; Kreyenfeld & Konietzka, 2017; Schaeper et al., 2017). The present research contributes a demographic perspective on *maternity leave* and its selection effect on mothers' health outcomes by considering the individual and legal context of fertility and reconciling family and work. Especially in terms of population health outcomes, this investigation might gain important insights into patterns of post-*maternity leave* health and its relationship with the duration of the leave.

1.3 Objective of the research and research question

The current study investigates the effect of *maternity leave* durations on health outcomes of first-time mothers in Germany. The outcome variable is the occurrence of a serious sickness considering the properties of the data set measuring sickness as a longer period of absence from work due to illness. Particular attention is paid to demographic and contextual components influencing the health consequences of *maternity leave* spells. Referring to the different mechanisms of selection into *maternity leave*, the investigation considers mothers' health status, socio-economic characteristics, employment conditions and German *maternity leave* legislation impacts (2.3). To meet this objective, the following research question has been postulated:

Under which conditions does the length of maternity leave affect the post-childbirth health outcomes for first-time mothers in Germany?

To answer the research question, administrative time series data from the German Pension Insurance (DRV) is analysed in an event history analysis model that approximates the probabilities of sickness occurrence after *maternity leave* durations and also considers other demographic factors possibly affecting this association.

1.4 Structure of the presented master thesis

The present study is divided into a theoretical, methodological, results and discussion- and conclusion chapter. The theoretical considerations entailing a review on the literature and the German *maternity leave* legislation are summarised in a conceptual model showing the selection mechanisms into *maternity leave* durations and their effect on mothers' health. From this theoretical framework, hypotheses are derived that determine the methodological design of the study. The data and the analysis approach to answer the hypothesis and the research question are explained in the following chapter. The results of the analysis are presented and then discussed. What follows is a contextualisation of the outcomes that enables interpretation in the light of its strengths and limitations. A policy implication is derived from the findings and, finally, the main research question is answered, and a conclusion is drawn.

2. Theoretical framework and conceptual model

2.1 Transition into motherhood, role compatibility, and health consequences

Becoming a mother introduces many new challenges for women affecting their post-childbirth distress levels. This cannot only be explained by the physical and psychological consequences of the childbirth but also by the social and cultural context of having a child for mothers (Barclay, 1994; Barclay & Lloyd, 1996). The impact of this important trajectory on women's well-being is determined by many contextual factors such as the planning of motherhood or the age at childbirth (Myrskylä & Margolis, 2014; Rackin & Brasher, 2016). The combination of physical consequences of the pregnancy and the childbirth, the immediately arising care obligation for the new-born child, and the reconciliation of the new role as a mother with other social or professional obligations emphasise the complexity of the situation women experience after the transition into motherhood. Those challenges can cause severe *maternal distress* appearances (Emmanuel & St John, 2010), which further might cause negative health consequences (Barnett & Baruch, 1985; Tiedje et al., 1990). The theory of social roles as introduced by Ralf Dahrendorf (1965) provides a solid framework to explain how different roles can interfere with each other in their role expectations and create inter-role conflicts. Human behaviour is here explained as a fulfilment of socially constructed expectations and norms, which are linked with a specific role that a person entails and its function in society. Fulfilment of role requirements is favourably responded to with social acceptance, a violation of it can be penalised by social exclusion (Dahrendorf, 1965). Since its establishment, the role model theory has been proven successful in the explanation of socially dependent behaviour and for that reason, it is also used in the current study. A woman obtains multiple roles during her life-course, for example mother, spouse, or employee (Barnett & Baruch, 1985; Tiedje et al., 1990). But the externally determined expectations towards those different roles might be incompatible and cause struggles for women when attempting to simultaneously fulfil multiple and partially competing role expectations and pursuing them perfectly (Dahrendorf, 1965). For example, caring for at least one child can be exhaustive and affect a woman's performance in her professional role, which might result in worries about her professional accomplishments. On the other hand, the presence at work and the inability to simultaneously care for her child might cause feelings of guilt in mothers, which goes in line with the *intensive mothering* concept (Damaske, 2013; Guendouzi, 2006; Johnston & Swanson, 2006; Rizzo et al., 2012). Those examples emphasise the complexity of combining different roles and reconciling various obligations after the transition into motherhood. As a result, *maternal distress* levels increase and might negatively affect mothers' health.

A similar framework of multiple role responsibilities explaining how *maternal distress* and its effect on mental health arises has been picked up in several studies. Tiedje and colleagues (1990) investigated how challenges of balancing motherhood, partnership, and employment are perceived by employed mothers in advanced career levels in the US, and how this might affect their mental health. Their results suggest that women having high role responsibilities and less role conflict experiences also have a greater satisfaction from their different roles and fewer mental health consequences (Tiedje et al., 1990). Based on their findings, it can be assumed that inter-role conflicts or the incompatibility of, for instance, being a mother and employed, have a negative effect on mental health. Similar results were found in a study by Barnett and Baruch (1985) investigating white women living in the US and their maternal multiple-role occupation of motherhood, partnership, and employment. They found that mothers' psychological distress is caused by perceived role overload, role conflict, and anxiety. Especially meeting the expectations of motherhood was linked with role conflicts and increased levels of anxiety indicating the individual importance of mothering (Barnett & Baruch, 1985). A more recent study by Morgenroth and Heilman (2017) investigated perceived role loads in the context of *maternity leave* in working mothers from the UK and the US. They found that both the decision for and against *maternity leave* were linked with negative experiences either in the mothers' employment (pro-leave) or in their perceived family life (contra-leave) (Morgenroth & Heilman, 2017). Their suggestion that employed women struggle either way after the transition into motherhood emphasises the relevance of effective reconciliation strategies such as *maternity leave* to improve the maternal health. The concept of *maternal distress* linked with changes in social roles after having a child was outlined in a concept study by Emmanuel and St John (2010). They found that compromises in mothers' mental health, her maternal role development, and her overall life quality and satisfaction define the extent of *maternal distress* (Emmanuel & St John, 2010). The complexity of this phenomenon and the broad impact of

having a child is demonstrated by the mutual influence and interdependence of *maternal distress* attributes and their relation to mother's post-childbirth health development (Barclay & Lloyd, 1995).

In the nexus of inter-role conflicts and *maternal distress*, the first childbirth is not only of significant influence for mothers' health due to the introduction of a new role for the women. Several physical, psychological and social implications accompanying the first childbirth also affect the women's well-being. As suggested in a study by Gjerdingen and Center (2003) in first-time parents in the US, the transition into motherhood is followed by significant declines in the perceived quality of life for mothers in the first six months after the childbirth. The findings suggest increased stress levels although most women perceived an improved vitality after the childbirth (Gjerdingen & Center, 2003). This indicates not only a negative impact of the childbirth on the mothers' well-being, despite many mothers experiencing the transition as a serious burden in their lives. In addition to these mental consequences of the first childbirth, the physical consequences also seem most severe after having the first child (Atan et al., 2018). Brown and Lumley (2000) showed in their study the psychological and physical health consequences in six to seven months after the childbirth of mothers in Australia. Their study focussed on maternal depressions but also linked those mental problems with physical health conditions and recovery from the childbirth. Their results confirmed those interlinkages within the short-term observation period (Brown & Lumley, 2000). Another study by Carlander and colleagues (2015) elaborates on the difference in mothers' health performance right after the childbirth and five years later. The findings show no significant illness appearance and suggest that health consequences would become clear in the long run, which is contrary to the findings of Brown and Lumley's research (2000). However, Carlander and colleagues' (2015) study did not specifically control for influence factors such as *maternity leave*, which might change the results within a short observation period. Taken together, there is evidence for different timing of post-childbirth health effects. Both latter studies emphasise the consequences in mental and physical health and the close connection of both kinds of health outcomes for mothers. This raises questions on when and how post-childbirth health outcomes take effect, and to what extent the respective health outcomes can be alleviated by reconciliation strategies.

2.2 Maternity leave, the effects on mothers' health, and selection mechanisms

The double role occupation of employment and motherhood seems to cause multiple challenges for mothers after their first childbirth. Reconciliation strategies support mothers in balancing the obligations of all social roles and cope with the resulting increased mental load. By postponing the return to work and the challenge of combining the roles of motherhood and employment, *maternity leave* represents such a reconciliation strategy. *Maternity leave* aids mothers in being able to focus on the familiarisation with the new situation of caring for a child, rehabilitate from the physically and emotionally challenging childbirth, and return to work after a sufficient period of recovery from those challenges. For that reason, *maternity leave* can be seen as a strategy to alleviate the *maternal distress* after the transition into motherhood and to protect mothers' health. However, the question remains which factors influence mothers' different *maternity leave* utilisation.

Some studies have investigated the effects of *maternity leave* on *maternal distress* and mothers' health. Generally, all studies show a positive influence of *maternity leave* on mothers' health regardless of the duration of the leave. McGovern and colleagues (1997) investigated in their study on mothers in the US a positive effect of *maternity leave* utilisation on vitality and mental health within the first six months after childbirth. Significant associations were also found between good pre-conception and post-childbirth general health, high levels of social support and good physical health, and lower job stress and good mental health (McGovern et al., 1997). Grace and colleagues (2006) found that *maternity leave* increases the probabilities of post-childbirth physical activity and other health-promoting behaviour in mothers in England. This could be an indicator of the stress-relieving role of *maternity leave,* which allows better recovery from childbirth and improved role transition after the having a child (Grace et al., 2006). Bullinger (2019) investigated the effect of paid family leave on mothers' health in the state of California in the US. Her findings suggest that an extended *maternity leave* especially improves the mental health of mothers due to a delayed entry of the child to institutional childcare, the possibility of maternal engagement, and improved economic well-being due to childcare benefits during the *maternity leave* (Bullinger, 2019). Avendano and colleagues (2015) who investigated the long-term effect of *maternity leave* in Europe on mothers' mental health found evi-

dence that *maternity leave* yields significant mental health benefits. Especially an extended leave period after the first childbirth is suggested as highly preventive towards depressive symptoms in later life (Avendano et al., 2015).

Despite their overall positive effect, *maternity leave* durations and their underlying selection mechanisms differ in their impact and selectivity on mothers' health. The aforementioned study by Morgenroth and Heilman (2017), for instance, emphasises the role of welfare arrangements in the *maternity leave* nexus. The countries of origin of their study objectives are the UK and the US showing low welfare coverage for the case of maternal protection (Scruggs & Allan, 2006). This implies a selection mechanism, which is based on individual financial capabilities and social support networks leading to social inequalities in the utilisation of *maternity leave*. It can be assumed that women with a lower socio-economic status cannot afford taking a leave without any income compensation, whereas mothers with high economic resources experience fewer economic consequences. Subsequently, the decision for or against *maternity leave* as well as a specific duration can mostly be determined by a woman's capabilities. The *maternity leave* entitlements in Germany have been developed through several reforms aiming to maximise the protection of mothers after the childbirth and lately also to raise the attractiveness of *maternity leave* for advanced professional mothers by increased financial allowances (Spiess & Wrohlich, 2008). A panel study by Guertzgen and Hank (2018) investigated the *maternity leave* effects in Germany before and after the first significant *maternity leave* extension of 1978 (2.3). They focussed especially on post-leave health consequences and labour market attachment. Using register and administrative data from the DRV and the German Federal Employment Agency, they found a negative effect on mothers' health outcomes after the *maternity leave* extension from two to six months as a result of increased post-childbirth sick leaves of mothers (Guertzgen & Hank, 2018). Since they controlled for mothers' pre-conception health, a reform-caused facilitation of mothers indicating pre-conception sickness and re-entering the labour market can be assumed. This implies a negative health selection meaning that increased *maternity leave* enables the return to work also for mothers, who are in need of the recovery to cope with their poor health and being able to their resumption of work. However, especially the latest leave reform of 2007 has aroused the public interest due to its aim to increase the parental benefits after the childbirth (2.3). Thyrian and colleagues (2010) examine the short-term effects on fertility rates and demographic variables in Germany focussing on this reform. They found no increase in the crude birth and general fertility rates but a change in the demographic composition of mothers taking *maternity leave*. Especially mothers with full-time employments previous to the childbirth and obtaining high socio-economic statuses and higher income levels seemed to have increased after 2007 (Thyrian et al., 2010). Based on these results, it can be assumed that demographic characteristics such as income, employment characteristics, general health status, and in the case of Germany also the different policy conditions, have been important for the selection into *maternity leave* both before and after the recent reform.

When elaborating on the socio-economic dimension of *maternity leave* utilisation, leave entitlements such as financial benefits seem to be relevant. A study by Ensminger and Juon (2001) demonstrates the negative impact of a low socio-economic status on maternal health of mothers receiving welfare during child-rearing years in the US. The decreased economic resources due to lacking welfare support cause significant negative health performances (Ensminger & Juan, 2001). Other studies suggest that a sufficient financial benefit during *maternity leave* improves the health outcomes of mothers (Bullinger, 2019; Hewitt et al., 2017). Especially the study by Hewitt and colleagues (2017) on mothers' health outcomes in Australia drawing a comparison between *maternity leave* effects before and after the establishment of an allowance indicated a significant improvement of the maternal health after the introduction of an allowance. This accounts for both mental and physical health and was mostly explained by decreased *maternal distress* due to postponing the period of institutional childcare and income security due to the financial support (Hewitt et al., 2017). This mechanism of perceived social security was also found by Burgess and colleagues (2008) in mothers in the UK enjoying up to 4 months of paid *maternity leave* although this was not associated with maternal health outcomes. For that reason, a positive relationship between the payment of *maternity leave* allowances and a lower *maternal distress* levels can be assumed. In addition to those financial aspects, occupational characteristics also seem to play a role in the *maternity leave*-mothers' health association. A study by Benson and colleagues (2017) on work and family care histories predicted health outcomes for women in later life and found that occupational sequences determine disability and mortality in older ages. Their re-

sults suggest that the combination of short *maternity leave* and a transition to part- or full-time work lowers the odds of disabilities. Longer leave periods and a shift towards part-time work even positively affected mortality (Benson et al., 2017). These results emphasise that it is not only about the *maternity leave* duration itself but also about the accompanying socio-economic and employment characteristics of mothers.

2.3 *Maternity leave* legislation in Germany

Maternity leave is a legal entitlement in Germany aiming to protect the maternal health by granting an absence period from work for mothers before and after the childbirth and enabling a return to the previous employment afterwards (BMFSFJ, 2018). The current *maternity leave* legislation in Germany states a statutory absence period of six weeks prior and eight weeks after the calculated date of birth. If a child is born earlier than initially calculated, the difference in days is added to the post-childbirth *maternity leave.* Women can prolong their absence from work to a maximum leave period of 36 months, during which their jobs are protected until their return to work (BMFSFJ, 2004; BMFSFJ, 2018). The leave duration and the additional state-financed financial benefit were established in Germany in the last 30 years. Although the German history of *maternity leave* goes back to the 1920s (Schmalz, 1950), the opportunity to extend the leave was firstly introduced with the reform of 1978 enabling a prolongation from the two statutory to a total of six months *maternity leave* with full job protection (Guertzgen & Hank, 2018). With the reform of 1992, mothers could extend their leaves up to 36 months after childbirth, in which their jobs were protected (BMFSFJ, 2004). In addition, the reform of 1992 introduced childcare leave entitlements for fathers for the first time. However, the statutory *maternity leave* is until today only entitled to mothers and not to fathers (BMFSFJ, 2018). For reasons of simplification, mothers' post-childbirth absence is in the current study always called *maternity leave* regardless of the different titles of the leave entitlements in the respective policies and reforms.

In addition to a lawful absence from work, the 1986 reform firstly introduced financial benefits for mothers, which should also be considered in the investigation of *maternity leave* and health. For reasons of simplification, the German currency before the introduction of the Euro (€) in 2001, the Deutsche Mark, is always recalculated to €. Financial benefits state an incentive for *maternity leave* and sustainably affects the selection into leave durations. The initial childcare allowance model of 1986 supported parents with a monthly payment of €300 for a leave duration of two years or €450 for a leave duration of one year after the childbirth (Hürten, 2007). The benefit amount did not exceed the equivalent of €450 until 1992 and was increased in 2000 to a maximum of €450 for two-year *maternity leaves* in 1994, of which the additional €150 were calculated based on the income. In 2004, the income limits for the variable amount were lowered meaning that high income mothers received only the basic benefit (Hürten, 2007). In addition to protecting maternal health, the recent reform of *maternity leave* also promotes fertility by introducing more attractive leave conditions for mothers affecting the selection mechanisms (Spiess & Wrohlich, 2008). The 1992 introduced extension of the *maternity leave* is still based on the individual considerations of *affordability*, *amortisation*, and *personal motivation* of the mothers. Since the both first aspects are strongly interlinked with available financial benefits, respective leave entitlements have an impact on the selection into *maternity leave* durations as they might attract specific groups of women (Hürten, 2007; Spiess & Wrohlich, 2008). The *maternity leave* reform of 2007 was based on the legislation in Scandinavia, where there is a higher level of fertility and maternal employment. Accordingly, the reform aimed to attract mothers who had been neglected by previous vacation incentives, such as advanced working women with higher incomes. (Guertzgen & Hank, 2018). The entitled leave duration has not changed, but the granted benefit introduced a 67% of the replacement of mothers' net income between a minimum of €300 (even if no income was generated before the childbirth) and a maximum of €1,800 per month. In addition, a higher replacement rate is applicable to mothers with a monthly income below €1,000 net to alleviate socio-economic disadvantages. The allowance is available for 12 months after the childbirth if only one parent stays at home or up to 14 months after childbirth if both parents share the leave. The financial benefit is reduced by share of mothers working hours if they decide to work part-time (BMFSFJ, 2018; BMFSFJ, 2019). The legislation aimed to provide greater incentives for *maternity leave* and fair distribution of financial support to young families (Spiess & Wrohlich, 2008).

2.4 Conceptual model

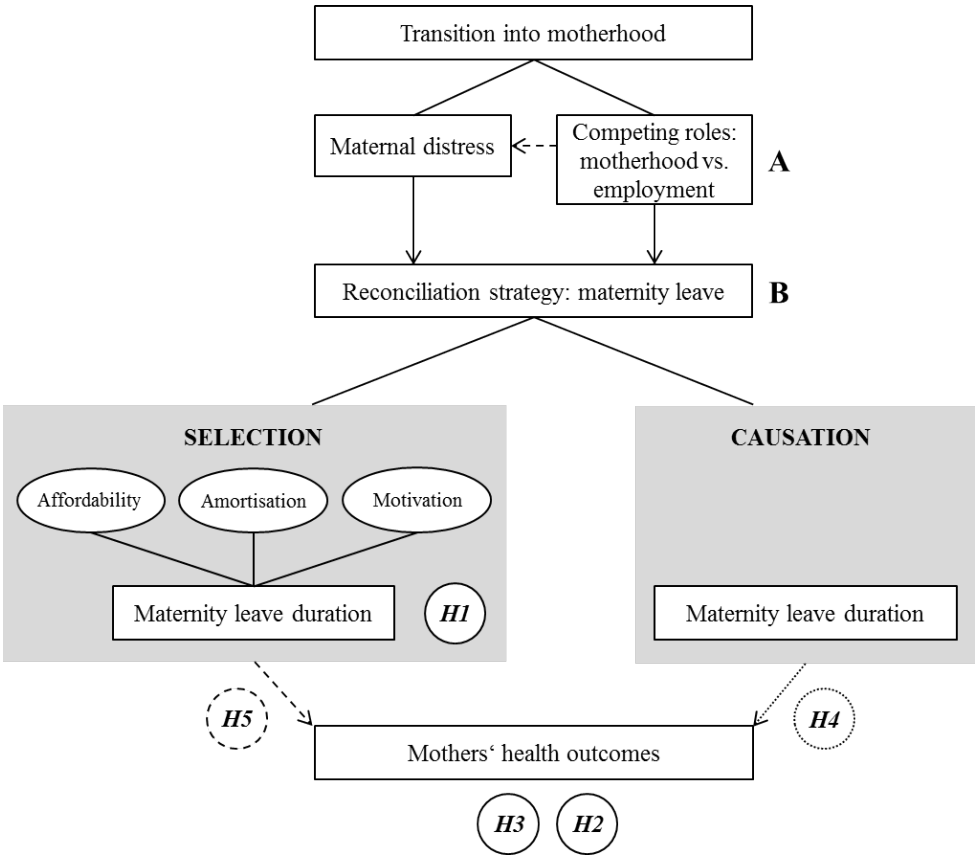
The presented theoretical framework and literature review give an overview on how and to what extent *maternity leave* durations affect *maternal distress* levels and mothers' health outcomes. Thereby, the following hypotheses were derived to frame the empirical analysis. The literature review has shown that the health outcomes of different *maternity leave* durations differ (2.2). Due to the *maternity leave* legislation in Germany (2.3), it can also be assumed that the characteristics of mothers vary among the different *maternity leave* durations since each leave has different implications. As elaborated on in the theoretical framework, it might also be the case that mothers' health outcomes after the *maternity leave* differ between different characteristics (2.2). For that reason, the hypotheses *H1*, *H2* and *H3* were developed, which will be answered within a descriptive analysis (4.1).

H1: The demographic composition of women varies across different maternity leave durations.

H2: The demographic composition of women varies by post-childbirth sickness occurrence.

H3: The post-childbirth sickness occurrence differs between maternity leave durations.

Figure 1: Conceptual model: maternity leave durations and mothers' health outcomes



*Note: The illustration shows how the underlying selection mechanisms into maternity leave derived from the theoretical assumptions and the literature review. **A** refers to the theory of social roles (Dahrendorf, 1965), and **B** implements the maternity leave policy regulations in Germany. The main hypotheses in the present analysis are incorporated in the model as H# in circles.*

Source: author's own illustration, based on theoretical framework and literature review (2.1, 2.2, 2.3)

To test for the effect of *maternity leave* durations on the different mothers' health outcomes (2.2), hypotheses are developed which address both possible relations: either the health outcomes are positively affected by the *maternity leave* durations (*H4*), or the selection into *maternity leave* durations and its mechanisms determine mothers' health (*H5*). Those hypotheses will be addressed using event history analysis (0).

H4: A longer maternity leave positively affects mothers' health outcomes.

H5: Mothers' health outcomes are affected by the selection into maternity leave durations and not by the duration itself.

To transfer the conclusions drawn from the theory and literature review to the current research, the main assumptions are summarised and illustrated in Figure 1. This conceptual model demonstrates how both the transition into motherhood and its resulting challenges of inter-role conflicts increase *maternal distress* levels based on the theory of social roles by Ralf Dahrendorf (1965) (**A**). Within this context, *maternity leave* aims to alleviate *maternal distress* in its reconciliation function to offset the double burden of motherhood and employment. In accordance with the German *maternity leave* legislation (**B**), women choose between different leave durations: the selection into a *maternity leave* spell is thereby influenced by considerations of how long of *maternity leave* they can financially afford (*affordability*), which duration amortises regarding the income and the available law benefits (*amortisation*), and what their personal preferences are (*motivation*) (1.2) (**selection**). *H1* reflects on those differences in the choice of maternity leave. It determines the selection into a *maternity leave* duration. Whether those differences in the demographic composition of the women can also be found in the outcome variable and that the sickness occurrence shows differences in leave durations are tested by *H2* and *H3*. On the other hand, a causal relation might be possible, in which the *maternity leave* duration solely results from the possibilities given in the legislation (**causation**). In a final step, the leave durations are associated with mothers' post-*maternity leave* health outcomes. But since the selection criteria have a lasting effect on the *maternity leave* duration it is questionable whether there is a direct effect from the duration on the health outcomes (*H4*), or an effect from the selection mechanism on the health outcomes (*H5*).

3. Data and methods

3.1 Description of the data set

The current study uses a biography data set by the DRV, the 'FDZ-Biografiedatensatz für die Biografiedaten der Versicherten' (VSKT) [Pension data set on biography data of insured persons] of the year 2015. This is a subset from the complete administrative register data base initially collected by the DRV to calculate pension payments. The VSKT aims to support the legislator in pension insurance policy implementations, policy revision and advice, and internal planning of the DRV. The data becomes available as a panel survey providing employment biographies meaning that the information for each person are available in a longitudinal data format (DRV, 2018a).

In form of a stratified random 25 %-subsample from the master data set, the VSKT is drawn yearly since 1983. The sample includes all persons whose insurance account contains at least one entry, live in Germany, and are between 30 and 67 years old at the end of a reporting year. The currently used VSKT 2015 contains continually and monthly recorded information on 66,037 insured persons born between 1948 and 1985 since the first month of the year they turned 14 (DRV, 2018a). The case selection is based on the disproportionally designed and unbalanced structure of the VSKT panel meaning that the sample drawing is adjusted to the population structure in Germany. The aim of this sample composition is to obtain relatively similar case numbers in the individual layers of the sample. Stratification characteristics are the target group (gender, nationality, insurance branch of insured person) and the age. The draw from the master record stock selects each target group and age group from a randomly chosen initial value to every x^{th} insurance number. The arrangement of the drawing system does not allow any violation of randomness. In addition, the cases selected for the sample are marked in the master record with the reference date on which they were drawn to avoid repeated drawing in following sample selections (DRV, 2018b). The data is anonymised and provided in scientific use files (SUF), which are available as basic or topic files. The basic SUF contains personal demographic and other information of relevance for the DRV. That information can be time-constant (DRV, 2014), for instance gender, year of birth, or birthdays of children, and time-varying, such as the employment status (DRV, 2018a). The information in the basic file allows to profile the insured persons in the respective VSKT sample. The current study uses demographic information from the basic file. The other components of the VSKT are topic SUF providing additional information on the employment biography of an insured person, for example the entrance of the labour market (Addition A1). In the present research, the topic files were used to extract information on the *maternity leave* length, (pre-conception and post-leave) sickness occurrence, employment situation, and income. The data is organised in a cross-section format offering one variable on the respective topic for every month of observation since the start of recording (DRV, 2018a). Every person in the sample has a unique identifier, which is incorporated in the basic and in all topic files to merge the files into one data set matching the requirements of the study they are used for (DRV, 2018a).

In line with the objective of the current study to assess the effect of the length of the *maternity leave* and the timing of a post-leave sickness occurrence (1.3), the data was shaped into a longitudinal format. This means that the variables extracted from the topic files are translated into one variable per topic file tracking the same observed feature over several points of time per individual. In that way, it is possible to indicate dates like sickness occurrence, identify the length of specific periods such as *maternity leave*, and relate this to an objective measurement of time as the calendar date (3.5). The VSKT was chosen due to its uniqueness and suitability for the research aim and context. Since the current study aims to elaborate on the case of Germany, working with German administrative data used by a state agency like the DRV states a reliable data source. Also, the data structure represents biography data, which is organised in a panel structure. This entails advantages when investigating *maternity leave* and health and especially considering the timing of the events. First of all, due to the administrative purpose of the data, it is detailed and of high quality. Since demographic compositions were already considered when the sample was drawn, the data is also representative for the German population. Secondly, the panel structure and the monthly data collection allow a consideration of development over time. This includes the definition of time points, for instance entering the labour market, or the specification of a periods, such as the length of *maternity leave*, which are essential characteristics when performing an event history analysis (Allison, 2004).

3.2 Sample selection

After synthesising the basic and the used SUF of the VSKT, the sample was limited to match the framework of the current research (Figure A9). The selection conditions were considerately applied (Addition A2) with a focus on first-time mothers to investigate the trajectory of transitioning into motherhood and the effect of *maternity leave* durations on mothers' health. The experience of *maternity leave* after the second or further childbirths differs since mothers have already experienced childbirth and parenting. They would indicate a higher selectivity on health, which might bias the comparison between first-time and multiple mothers. The latest observed date of childbirth was 31 December 2010, which was set to ensure a sufficient observation period of at least 5 years until the sample drawing in December 2015. The age limitation for first-time mothers was 20 to 39 years at childbirth to avoid biased results due to age-dependent influences on mothers' health, which young and advanced first-time maternal ages tend to cause (Gustafsson, 2001; Myrskylä & Fenelon, 2012; Saloojee & Coovadia, 2015; Rackin & Brasher, 2016; Sauer, 2015). Only women born from (January) 1960 to (December) 1979 were selected. The upper limit has been set to avoid an unbalanced distribution of age at first childbirth among the younger birth cohorts since childbirth is only detected until 2010 and younger birth cohorts might not have delivered their first children by then (3.4). The lower limit was set to obtain a sample with similar experiences in labour force participation and policy conditions.

The labour market attachment of the observed women was also an important selection criterion. Only women employed in the month of their first child conception or at least the four months before the statutory *maternity leave* prior to the childbirth were included. This condition was introduced to ensure an equal meaning of *maternity leave* among the women referring to their legal absence from work and their right on job protection (2.3). Women who conceived their second child before returning to work from their first child's *maternity leave* could not be considered due to the overlapping periods of *maternity leave* and pregnancy, which might cause unwanted interactions in the investigation of post-leave mothers' health. For that reason, women who conceived another child within 9 months after the first childbirth or for whom occurred sickness after their second conception were excluded from the sample. Additionally, women from the former German Democratic Republic (GDR) who received their children before the reunification in 1990 were excluded from the sample due to differences in the recording of sickness between the DRV data base and the GDR pension data base (BMJV, 1990). After applying these selection criteria, the final sample consisted of 4,237 women.

3.3 Observation period

The observation period starts with the month of the childbirth to set an equal starting point of observation. It allows to include all women in one analysis model and to control for the total length of official absence when investigating the relationship of *maternity leave* duration and post-leave sickness occurrence. Mothers are considered from their 20th birthday onwards until they experience a sickness as the event of interest. Additionally, the observation period ends at the moment women conceive a second child, which is regarded as truncation (3.4), or their 50th birthday set as the latest exit of the sample and also considered truncation (3.4). This prevents biased results due to an interaction between the second pregnancy or advanced age and the women's health.

3.4 Censoring and truncation

Since the present research applies event history analysis, censoring and truncation represent the most important data issues (Addition A3). Both concepts depend on the initially set observation period and criteria. Censoring describes sickness occurrences outside of the observation period. Right censoring refers to persons leaving a study before the event happens, left censoring means that the event of interest has already occurred before the observation started (Allison, 2004). In the current research, left censoring is not an issue since the event of interest is severe sickness occurrence after the *maternity leave*. Nonetheless, the pre-childbirth history is also important and will therefore be considered by controlling for pre-conception sickness (3.5.4). All information is available, and the observed event has a necessary accuracy preventing left censoring in this case. Right censoring might occur due to, for instance, emigration or permanent dropouts from the labour market (3.6; Figure A9). The latter case causes problems if those dropouts are related to health problems meaning a structural neglection of those women. However, this cannot be controlled for in the current analysis.

Truncation, on the other hand, refers in the current research to the occurrence of sickness outside of the set observation period due to observational limitations and exclusions. Right truncation means that the observation period ends before the event of interest occurred, left truncation means that the event occurred before the observation period started (Allison, 2004). As explained before, the specification of the event of interest prevents the miss-out of events before the actual observation period starts. Right truncation, on the other hand, should be considered when interpreting the results. It might be an issue since women are per sample definition no longer observed once they conceived their second child (3.3). This applies to 392 women in the current sample and those cases are treated as truncated (8.47% of the final sample). This exclusion and the thereby possibly caused bias on the results should be considered when interpreting the analysis outcomes. The upper limit of the observation period is the 50th birthday of mothers and reflects another case of right truncation. Since women are included until an age at childbirth of 40, this leaves an observation period of at least ten years or even longer when the child is born earlier. Since most sickness occurrences already happen in the first five years after childbirth (4.1), only few sicknesses occur after the observation period and those might also not be affected by the *maternity leave* duration. Furthermore, the choice of birth cohorts can also cause right truncation. Due to the sample limitations in terms of motherhood and upper cohort limits (3.2), the younger birth cohorts indicate relatively less mothers in the oldest age group at first childbirth of 35 to 39 years. This is caused by the structural exclusion of all cases, who have not received any children (yet) before January 2011. Since the observations only reach until December 2015, this choice was made to guarantee an observation period of at least five years for every first-time mother. When taking a look at the distribution between age at first childbirth and cohort (Table A4), an equal distribution of the age groups at first childbirths across the birth cohorts can be observed except the youngest cohort (1975 to 1979), which indicates the lowest share in the oldest category of age at first childbirth (35 to 39 years). Most likely, fertility has not been finished yet in this cohort when the sample was drawn (3.3). However, this should be considered when including age at first childbirth in the analysis.

3.5 Used variables and operationalisation

3.5.1 Outcome variable: sickness occurrence

The main dependent variable is a binary outcome variable indicating sickness occurrence to fulfil the requirements of the discrete-time logit model used in the analysis (0). The variable *SICK* was built as a time-varying variable coding the month of the first sickness occurrence after the *maternity leave* as 1 and all other months as 0. Synchronised with the time variable (3.5.3), this makes it possible to estimate the outcome of the regression analysis based on exact timings of sickness occurrence. The variable is based on a sickness indicator in one of the initial topic files (3.1) called *KRANK* [sick] (DRV, 2018a). This variable marks every month with serious sickness occurrence, which is defined as any sickness causing long-term absence from work of at least six weeks that can be spread across multiple incidences of one condition, or as a period of rehabilitation measures (DRV, 2018b). In the initial variable, sickness is coded in every calendar month, in which it is resent, with a binary code with 0 for no sickness and 1 for sickness. This coding could be transferred to the variable *SICK* with the difference that the code 1 only applied to the first sickness occurrence after the return from the *maternity leave*. Sickness was only measured after the leave to analyse the women under equal conditions. Assumingly, the sickness reporting to the DRV is more reliable when women are not officially on *maternity leave* as this could create an impression of the unnecessity of an official sick lesve and further lead to biased results.

3.5.2 Main explanatory variable: duration of *maternity leave*

The main explanatory variable is the duration of *maternity leave* and is referred to as *length*. It is time-constant and measured in categories referring to the total month mothers spent in *maternity leave* after their first childbirth. The construction of *length* was based on the topic file *KI* (3.1) containing a variable indicating different consideration times due to parenting obligations, such as *maternity leave*, regarding the compensation of inactiveness on the labour market and to collect additional pension points (DRV, 2018a). After summing up those parenting time months and linking the values to the first childbirth in accordance with the German law (2.3), the variable *m1_sum* was created indicating the total sum of *maternity leave* months (Table A5), and further reorganised to the categorical variable

length. The categories are coded as 0 for the statutory two months of *maternity leave* (2.3), 1 for 3-12 months, 2 for 13-24 months, and 3 for 25-36 months. The span of the categories was chosen based on the distribution of the continuous variable on *maternity leave* durations counting leave months per mother (Table A10). The usage of a categorical variable has the advantage of a clearer interpretability in the regression analysis.

3.5.3 Inclusion of time

In the present study, an event history analysis is performed using discrete-time logit models. Those regression models treat the observed event as binary outcome variable using time and other independent variables to explain the association (Blossfeld et al., 2014). For that reason, time is an important variable in the current research. The variable *t* is used as time estimator and counts the months from the childbirth onwards. In addition, a quadratic function of time, t^2 (*t*t*), is added to account for a non-linear trend in the effect of time on the outcome variable.

3.5.4 Independent variables

The following variables are used to control for characteristics of mothers and were extracted from the basic or the respective topic files (Addition A1). The variables are organised as categorical or dummy variables to simplify the interpretation of the results.

The **age at first childbirth** (*ageb1*) is included in the analysis since it is assumed to have an effect on post-childbirth mothers' health (Myrskylä & Margolis, 2014; Rackin & Brasher, 2016). It is measured in years of age and split in categories of five years: 20-24, 25-29, 30-34, and 35-39 years. The age at first childbirth was determined by synchronising the age of the mother and the birthdate of the child.

In the present study, the birth cohort might be linked to the changing context of female labour force participation, which is steadily increasing and higher in the younger age groups (World Bank, 2019). To account for such a cohort effect, a categorical variable for the **birth cohort** (*cohort*) is included in the analysis. The variable *cohort* is based on the year of birth of the mother and grouped into year categories of 1960-1964, 1965-1969, 1970-1974, and 1975-1979.

Also, **pre-conception sickness occurrences** as a proxy for mothers' bad health are included in the analysis (*prevsick*). In accordance with the reviewed literature (Guertzgen & Hank, 2018; McGovern et al., 1997), sickness occurrences prior to the childbirth might affect the selection into a *maternity leave* duration and are therefore important to consider. *Prevsick* is a dummy variable indicating whether a mother had any pre-conception sickness occurrence and is based on the same information and topic file as the main outcome variable *SICK* (3.5.1).

Mothers' socio-economic status might play a key role in the selection into *maternity leave* durations as it affects both the *affordability* and the *amortisation* considerations (Thyrian et al., 2010). In the current analysis, the earning points calculated by the DRV are used to gain information on a **mothers' income** prior to the childbirth as a proxy for her socio-economic status. Those earning points are a relative measure of income referring to the mean population earnings. Earning points are calculated by dividing the annual income of an individual by the mean income of all persons contributed to the German pension fund during the respective year (DRV, 2019). For example, the mean income used for the calculation of the earning points of the year 2015 was €35,363 gross (BMAS, 2019) meaning that the annual earning points of a women with exactly the mean population income is one. Regarding the monthly data structure of the VSKT 2015, the annual earning points are divided by 12 for each month of the respective year resulting in monthly earning points of 0.0833 for the mean income (DRV, 2018a). The distribution of the monthly earning points in the year before the conception of the first child was used to calculate a categorical percentile-based income distribution variable (*pre_income*), and two dummy variables showing whether a woman earns above the mean (*high*) or below the median population income (*low*).

To account for the different consequences of the ***maternity leave*** **legislation**, the two big policy reforms of 1992 (*reform1990*) and 2007 (*reform2007*) in Germany are included in the analysis as dummy variables to control for changing benefit entitlements (Thyrian at al., 2010) that possibly affect the *maternity leave*-health association (Bullinger, 2019; Guertzgen & Hank, 2018). Since both *maternity leave* reforms came into force on the first of January of the respective year and applied to all childbirths from those dates onwards, the variables were constructed based on the birthdate of the first

child. *Reform1990* applies to all mothers giving birth to their first child from 01.01.1992 to 31.12.2006, *reform2007* refer to childbirths from the 01.01.2007 onwards. Mothers delivering before 1992 indicate a zero in both variables.

Many studies suggest an effect of post-*maternity leave* **employment conditions** on the experience of *maternal distress* due to different roles balancing (Benson et al., 2017; Johnston & Swanson, 2006; McGovern et al., 1997; Thyrian at al., 2010). For that reason, it is controlled for with three dummy variables for full-time employment (*postempl*) and the transition from full-time employment to either reduced working hours (*reduced*) or to marginal employment (*postmarg*) after the return to work from *maternity leave*. *Postempl* indicates whether a woman is recorded as liable to full pension contribution within a regular employment right after ending her *maternity leave*, which is based on a respective dummy variable for every month in the initial data set. *Reduced* shows whether a woman has reduced her working hours after returning to work from *maternity leave*, which is indicated by a decrease in the pension earning points (see above). *Postmarg* refers to a transition from no marginal employment before the childbirth to marginal employment after the childbirth meaning a low number of hours without social security contribution (DRV, 2014). This variable also refers to a monthly dummy indicator in the initial data set.

3.6 Missing values and the *maternity leave* imputation variable

Dealing with missing data is an important step of any quantitative analysis since they might bias the results (Schafer & Graham, 2002). The data cleaning process also includes the deletion of cases with missing data (Figure A9). Due to its administrative purpose, the data set is predominantly complete and does not indicate many missing values. Missing data was observed in the *maternity leave* variable, for which 2,447 cases indicated sequences of missing values. When taking a closer look at it, it became clear that the structure of the missing sequences partially equalled the organisation of the *maternity leave* coding (3.5.2). This raised the suspicion that the missing values were caused by measurement errors and might actually represent absence from work due to *maternity leave*. For that reason, an imputation variable for *maternity leave* was designed to cover for those cases. All missing values for the *maternity leave* variable were recoded if they reflected the same sequence and structure in the variable composition as for cases without missing values (Table 1).

Table 1: Example of coding sequence for maternity leave imputation variable

Variables/characteristics	**Coding per month**						
No missing values							
Maternity leave	*0*	*0*	*1*	*1*	*1*	*1*	*0*
Childbirth	–	*childbirth*	–	–	–	–	–
Employment	*1*	*1*	*0*	*0*	*0*	*0*	*1*
Missing values and application of imputation conditions							
Maternity leave	*0*	*0*	.	.	.	.	*0*
Childbirth	–	*childbirth*	–	–	–	–	–
Employment	*1*	*1*	*0*	*0*	*0*	*0*	*1*

Note: The table displays the conditions (grey shaded) and the missing data spells (.) in the maternity leave variable with missing values (dashed frame) applicable to the maternity leave imputation variable.

The conditions for the *maternity leave* imputation variable are patterns in the missing data, which are comparable to the *maternity leave* variable without missing values. This means for the variable with missing values that *maternity leave* is coded zero and employment one in the month of the childbirth. In the following months, *maternity leave* values are missing and do not exceed the total sum of 36 months. Finally, after the missing sequence, *maternity leave* must be coded zero and employment one again (Table 1). These criteria, and especially the latter one, assure the reliability of the *maternity leave* imputation variable by adapting to the non-missing *maternity leave* structure and introducing a further condition by controlling for labour market participation. The 853 cases, which did not comply with the imputation conditions, were deleted after checking that they were missing completely at random for all model covariates.

3.7 Methodological approach of analysis

Firstly, a descriptive analysis is presenting the distribution of the variables, summary statistics, and a survival analysis. Thereby, t-tests and variance ratio tests are applied to compare the means of the variables of interest. For the core analysis, the event history analysis approach discrete-time logit regression is used. Event history analysis refers to statistical models describing, explaining or predicting the occurrence of events (Allison, 2004). They are applied to time-series data considering not only the occurrence of an event but also its timing. This can be used to reconstruct the individual history of events in longitudinal data sets (Allison, 1982). As mentioned previously, the panel structure of the VSKT allows such an analysis (DRV, 2018a) and was in line with the used method evaluated as appropriate for the set objective of the current research (Addition A4). Additionally, the monthly data records enable a detailed coverage of *maternity leave* and sickness biographies of mothers. Compared to the descriptive analysis, the event history analysis enables to take covariates and time into account in the effect estimation of *maternity leave* lengths and is therefore a beneficial approach within the current analysis. All analyses were conducted with the Stata/SE software version 15.0 and Microsoft Excel version 2016.

With monthly records for each individual and the investigation of sickness occurrence on a monthly scale, time could be treated as continuous in the current analysis. Nevertheless, a discrete-time model chosen since the model assumptions for a proportional hazard model were not met. Subsequently, the regression models are estimated with a binary outcome variable in a logistic regression model: either a woman gets sick or she does not, but those two possibilities are mutually exclusive. The respective hazard function in logit models is

$$h_i(t) = \Pr(y_i(t = x) = 1 | y_i(t > x) = 0)$$

with the probability of the first sickness occurrence after return from *maternity leave* during the time interval *t* $h_i(t)$, the correspondent binary response $y_i(t)$ to sickness occurrence in each time interval *t* (month since childbirth) for each mother, which is indicated with the *i*, and under the condition that the event has not yet occurred in the past noted by the relation of *t* to *x*. The used discrete-time logit regression predicts the effect of *maternity leave* durations on the sickness occurrence by considering the timing of the event. The model is described as

$$\log\left(\frac{p_{ti}}{1 - p_{ti}}\right) = \alpha * D_{ti} + \beta * x_{ti}$$

with the probability of sickness occurrence p_{ti} during the time interval, time *t* measured in months, the vector of functions of the cumulative duration by the time interval D_{ti} with coefficients α, and the vector of covariates x_{ti} with coefficients β for each mother *i*. The model assumption of time-constant covariates is met in the current research.

The analysis was conducted in four different models, which were developed in a hierarchical way. Different covariates were added in each model to control for the effect of independent variables and time. All models drafted in the following can be accessed in the appendix (Appendix B: Regression equations). The first model only considers the time *t* measured in months, the time squared t^2 to account for a quadratic trend of time in the current analysis, and the categories of the *maternity leave* variable *length*. The statutory *maternity leave* of two months is used as reference category.

$$\textbf{\textit{Model 1}}: \log\left(\frac{SICK}{1-SICK}\right) = t * \alpha_1 + t^2 * \alpha_2 + \beta_0 + length_{3-12\,months} * \beta_1 + length_{13-24\,months} * \beta_2 + length_{25-36\,months} * \beta_3 + \varepsilon$$

Since an interaction with time and the length of the *maternity leave* can be expected in the effect on post-leave sickness occurrence, the second regression model additionally considers the interaction between the different *length* categories and the time variables *t* and t^2.

$$\textbf{\textit{Model 2}}: \log\left(\frac{SICK}{1-SICK}\right) = [Model\ 1] + t * length_{3-12\,months} * \beta_4 + t * length_{13-24\,months} * \beta_5 + t * length_{25-36\,months} * \beta_6 + t^2 * length_{3-12\,months} * \beta_7 + t^2 * length_{13-24\,months} * \beta_8 + t^2 * length_{25-36\,months} * \beta_9 + \varepsilon$$

The third model also controls for relevant covariates (3.5.4). Those are *ageb1* with the reference category of 20-24 years of age at the first childbirth, *cohort* with the reference category of 1960-1964 as

birth cohorts, and the dummy variables *prevsick*, *high*, *low*, *postempl*, *postmarg*, *reduced*, *reform1990* and *reform2007*.

$$\textbf{\textit{Model}}\ \mathbf{3}\text{: } \log\left(\frac{SICK}{1-SICK}\right) = [Model\ 2] + ageb1_{24-29} * \beta_{10} + ageb1_{30-34} * \beta_{11} + ageb1_{35-39} * \beta_{12} + cohort_{1965-1969} * \beta_{13} + cohort_{1970-1974} * \beta_{14} + cohort_{1975-1979} * \beta_{15} + prevsick * \beta_{16} + high * \beta_{17} + low * \beta_{18} + postempl * \beta_{19} + postmarg * \beta_{20} + reduced * \beta_{21} + reform1990 * \beta_{22} + reform2007 * \beta_{23} + \varepsilon$$

To control for effects of the selection into different *maternity leave* durations on mothers' health outcomes, interaction terms between *ageb1*, *cohort*, *prevsick*, *high*, *postempl* and *reduced* and the *length* categories as well as three-way interaction terms with *ageb1* and *cohort* interacting with *t* and the *length* categories are added. In that way, the fourth model accounts for both selection and time effects.

$$\textbf{\textit{Model}}\ \mathbf{4}\text{: } \log\left(\frac{SICK}{1-SICK}\right) = [Model\ 3] + [interaction\ term\ ageb1 * length] * \beta_{[25-32]} + [interaction\ term\ cohort * length] * \beta_{[33-41]} + [interaction\ term\ prevsick * length] * \beta_{[42-44]} + [interaction\ term\ high * length] * \beta_{[45-47]} + [interaction\ term\ postempl * length] * \beta_{[48-50]} + [interaction\ term\ reduced * length] * \beta_{[51-53]} + [three-way\ interaction\ term\ ageb1 * length * t] * \beta_{[54-62]} + [three-way\ interaction\ term\ cohort * length * t] * \beta_{[63-71]} + \varepsilon$$

Using likelihood ratio tests, the improvement of the hierarchical model building by adding covariates was approved. Robustness checks and sensitivity analyses are applied to indicate the models' solidity and to identify those covariates to which the models are sensitive (4.2.2). Predictive margins calculated from the predictions of the discrete-time logit models are used to approximate the effect of *maternity leave* durations on sickness occurrence. The predictive margins estimate the effect of one covariate based on fixed values for the other covariates, which are either set values, values on average or at mean (Williams, 2012). This allows to create different types of women by applying varying sets of covariates to the prediction of margins to investigate the relevance of mothers' characteristics in the *maternity leave*-mothers' health association. The interpretation of the predictive margins is supported by the epidemiological measure of risk reduction *numbers needed to treat* (NNT). NNT are used in clinical studies and defined as the average number of subjects (mothers) who need to utilise a specific treatment (months of *maternity leave*) compared to no treatment (statutory *maternity leave* of 2 months) to prevent one additional sickness occurrence (CEBM, 2012). It is calculated as one divided by the ratio of the risk rates (marginal effects) of the treatment (*maternity leave* duration) and no treatment (reference group of statutory *maternity leave*) (4.2.3).

4. Results

4.1 Descriptive findings

4.1.1 Distribution and summary statistics

To test for the hypotheses *H1* (*The demographic composition of women varies across different maternity leave durations*), *H2* (*The demographic composition of women varies by post-childbirth sickness occurrence*) and *H3* (*The post-childbirth sickness occurrence differs between maternity leave durations*), the sample is introduced, and the variable distribution and summary statistics are shown. The sample consists of 4,237 first-time mothers, who differ in characteristics such as birth cohort, age at first childbirth, income, post-*maternity leave* working conditions and their *maternity leave* entitlements (Table A9). Table 2 illustrates those characteristics by providing information on the variables used in the regression analysis (4.2.1). The mean *maternity leave* duration is 13.5 months with a standard deviation of 14.85 months. The distribution across the leave categories shows that the majority of the mothers either only takes the *statutory maternity leave* of two months (46.66 %) or a leave of more than 25 months (28.30 %). 10.17 % prolong their leave up to 12 months and 14.87 % take a leave of 13-24 months. 27.26 % of the women in the sample experience a sickness occurrence after their first-child's *maternity leaves*. The incidence of pre-conception sickness is 14.63 %. Besides the slightly smaller share in the birth cohort category of 1960-1964 (17.18 %), the women are approximately equally distributed among the birth cohort categories with shares between 25 % and 32 %. The highest share of first-time mother can be found in the age category of 25-34 with 39.79 %, the smallest share has a child with 35-39 years (8.83 %). This trend is relatively similar across birth cohorts, although younger cohorts more often experience their first childbirth at a higher age (Table A11). The income characteristics show that 30.92 % of the sample earn above mean, which is found in the 75 %-percentile of the income distribution, and that 36.09 % earn below the median income (50 %-percentile) indicating a left-skewed distribution and income inequalities across the women. The post-*maternity leave* working conditions show that 12.91 % of the sample changes their employment arrangement from regular employment before the childbirth to marginal employment after the *maternity leave*. 44.65 % of the mothers return back to their pre-childbirth employment and 18.62 % return but reduce their working hours.

Table 2: Snapshot of the sample (selection)

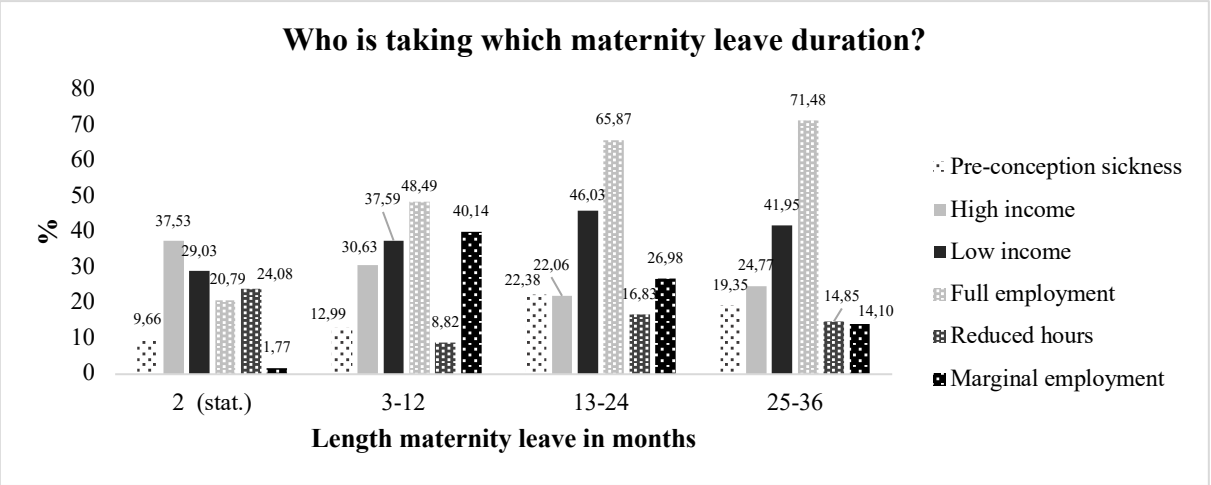
	cases	%		cases	%
N	**4,237**	100	***Maternity leave*** (M = 13.50 months, SD = 14.85 months)		
			2 months (stat.)	**1,977**	46.66
Sickness occurrences*	**1,155**	27.26	3-12 months	**431**	10.17
(Duration until sickness: M = 2.87 years, SD = 3.94 years)			13-24 months	**630**	14.87
Previous sickness*	**620**	14.63	25-36 months	**1,199**	28.30
Birth cohort (M = 1970.37)			**Age at first childbirth** (M = 28.37 years, SD = 4.27)		
1960-64	**728**	17.18	20-24	**877**	20.70
1965-69	**1,065**	25.14	25-29	**1,686**	39.79
1970-74	**1,339**	31.60	30-34	**1,298**	30.63
1975-79	**1,105**	26.08	35-39	**374**	8.83
Income > mean*	**1,310**	30.92	**Post-*maternity leave* working conditions**		
Income < median*	**1,529**	36.09	Return to full employment*	**1,892**	44.65
Income distribution			Return with reduced working hours*	**789**	18.62
<= 25 %	**718**	16.95	Transition to marginal employment*	**547**	12.91
26-50 %	**811**	19.14	**Childcare benefit reforms (1992 & 2007)**		
51-75 %	**1,170**	27.61	1992*	**2,919**	68.89
> 75 %	**1,538**	36.30	2007*	**675**	15.93

Note: The table shows a snapshot of the sample by providing a selection of the women's characteristics. Indicated are the total number of cases, the share of the entire sample (%), and partially means (M) and standard deviation (SD). If dummy variables are used (*), only their positive expressions are shown. The full tables can be found in the appendix (Table A8/Table A9).

Source: VSKT 2015, own analysis (if not differently specified, all figures and tables refer to this reference)

All age groups at the first childbirth and birth cohorts are represented in every *maternity leave* duration category and equally distributed. The mean age at first childbirth is between 28.50 and 28.80 except the leave duration of 13-24 months, in which the mothers are on average 27 years old. The mean year of birth also does not vary strongly across the leave groups (Table A11). Figure 2 shows the composition of the four *maternity leave* duration categories by different demographic characteristics of the women. When looking at pre-conception sickness, it becomes clear that the share of affected mothers represented in the *maternity leave* categories generally increases with the leave duration from 9.66 % within the statutory leave group to 22.38 % in the 13-24 months and afterwards slightly decreases to 19.35 % in the 25-36 months category. The mean *maternity leave* duration in months for mothers with pre-conception sickness (mean (M) = 18.63) is six months longer than for those without (M = 12.62) and this difference is significant (Table A14: variance ratio test; degrees of freedom (df) = 1,305,736, 223,819; f-value: 0.9820).

Figure 2: Health, income and employment characteristics of women by maternity leave durations



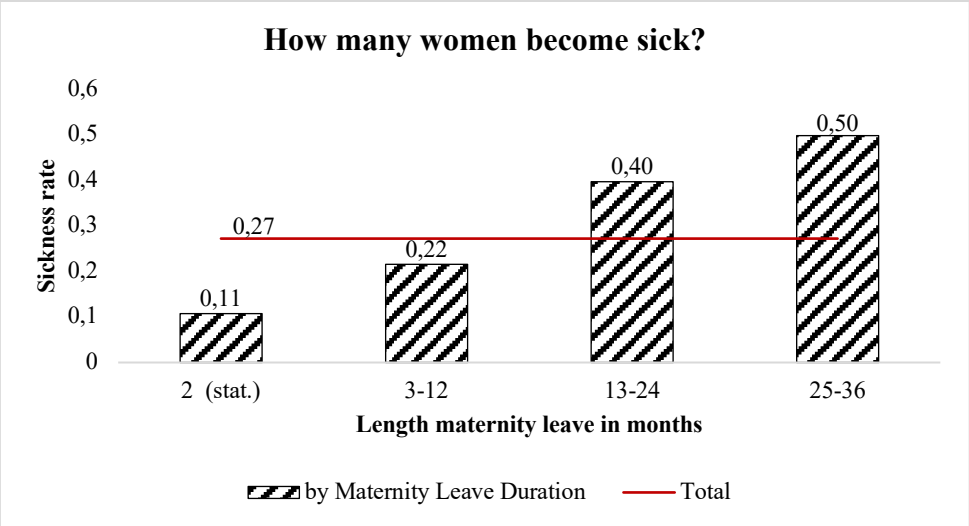
Note: The graphic plots the share of demographic characteristics within the maternity leave duration categories for the variables: pre-conception sickness (prevsick), high income (high), low income (low), full employment (postempl), reduced hours (reduced), and marginal employment (postmarg).

The majority of the women with an income above the mean take the statutory leave with a share of 56.64 %. The longer leave categories are chosen relatively less often (10.08 % vs. 10.61 % vs. 22.67 %). There was significant difference in mean *maternity leave* durations in months between mothers with income above (M = 10.62) and below the mean (M = 14.79) (Table A14: variance ratio test; df = 1,056,646, 472,909; f-value: 1.0857). The other income determinant, the women with earnings below the median income, shows a similar distribution: 37.54 % take the statutory leave, only 10.60 % the 3-12 months leave and then the share is decreasing with a rising leave duration to 18.97 % and 32.9 %. The difference in the mean *maternity leave* lengths in months is also significantly different between the women earning below (M = 16.01) and equal and above the median income (M = 12.08) (Table A14: variance ratio test; df = 977,687, 551,968; f-value: 0.9877). The post-*maternity leave* employment conditions show different distributions in the leave durations. Those women who return to their pre-childbirth employment take to a big share the longest *maternity leave* durations (45.3 %) and also show significantly different and three times higher leave duration means in months (M = 21.03) than women returning to their full work immediately (M = 7.43) (Table A14: variance ratio test; df = 846,544, 683,011; f-value: 0.7860). Those mothers who also return to employment but reduce their working hours are mainly represented in the statutory leave group with 59.65 % and show low but with the leave duration increasing shares in the other categories. They take significantly shorter mean leaves in months (M = 11.15) than those who do not (M = 14.05) (Table A14: variance ratio test; df = 1,241,478, 288,077; f-value: 0.9984). The transition from full-time to marginal employment after the *maternity leave* indicates a proportional distribution with the length of the leave and significantly different mean durations in months indicating that those mothers take 5 months longer maternity leaves (M = 17.8) than those who do not change to marginal employment (M = 12.86) (Table A14: variance ratio test; df = 1,332,089, 197,466; f-value: 1.9991). The aforementioned results show that there are

differences between the women choosing different *maternity leave* durations. For that reason, the hypothesis *H1* can be confirmed by the descriptive analysis.

The outcome variable, sickness occurrence, can be observed in 27.26 % of all cases, of which 24.33 % indicate pre-conception sickness. Those women show significantly higher means of sickness occurrence (M = 0.24, SD = 0.43) than those who have never been sick (M = 0.11, SD = 0.31) (Table A12: t-test; df = 1.5e+06; t-value = -2.1e+02). When taking a look at the subsample of women becoming sick, different distributional patterns are observed. Women who become sick have a significantly lower mean age at first childbirth (M = 27.31, SD = 4.36) than those who are not (M = 28.77; SD = 4.17) (Table A12: t-test; df = 1.5e+06; t-value = 189.5114). It can also be observed that the distribution of birth cohorts among the women with sickness occurrence approximately equals the full sample. The only difference lies in the cohorts 1970-1974, which accounts with 30.82 % of all women with sickness occurrence for a 6.29 percentage points higher share, and the cohorts 1975-1979 indicating with 20.61 % a 5.47 percentage points lower share of sickness occurrence than in the full sample. The mean year of birth of the sickness-subsample (M = 1969.76, SD = 5.1) is slightly earlier than of not-affected women (M = 1970.60, SD = 5.35) (Table A12: t-test; df = 1.5e+06; t-value = 87.0880). The income distribution also differs between affected and non-affected women. Of those women who earn above the mean income, only 20.45 % experience sickness whereas the share in the group earning below the 50 %-percentile 31.13 % become sick. The sickness-subsample also indicates a lower mean income category (M = 2.67) compared to the ones experiencing sickness (M = 2.9) (Table A13: variance ratio test; df = 1,112,601, 558,466; f-value = 0.9192). The post-*maternity leave* employment conditions also show differences in sickness occurrence. Of those mothers who return to their employment after ending the *maternity leave*, 43.87 % become sick. Mothers, who become sick, also more often return to their full employment after the leave (M = 0.72, SD = 0.45) than those who do not show any sickness occurrence (M = 0.34, SD = 0.48) (Table A12: t-test; df = 1.5e+06; t-value = -4.4e+02). 30.42 % of women reducing their working hours after their return become sick. Those women tend to reduce their working hours (M = 0.21, SD = 0.41), which is significantly different from the mean in the no-sickness group (M = 0.18, SD = 0.39) (Table A12: t-test; df = 1.5e+06; t-value = -37.6834). Of those women who change their employment from full to marginal, 13.53 % experience sickness. The sickness-subsample shows significantly lower means in marginal employment (M = 0.06, SD = 0.24) than the women without sickness (M = 0.15, SD = 0.36) (Table A12: t-test; df = 1.5e+06; t-value = 147.882). The results indicate various differences between mothers becoming sick or not. Subsequently, the hypothesis *H2* can also be confirmed within the present research.

Figure 3: Sickness rate per woman total and by maternity leave duration



Note: The graph shows the incidence rate of sickness occurrence by maternity leave duration (lined bars) and for the complete sample (red line).

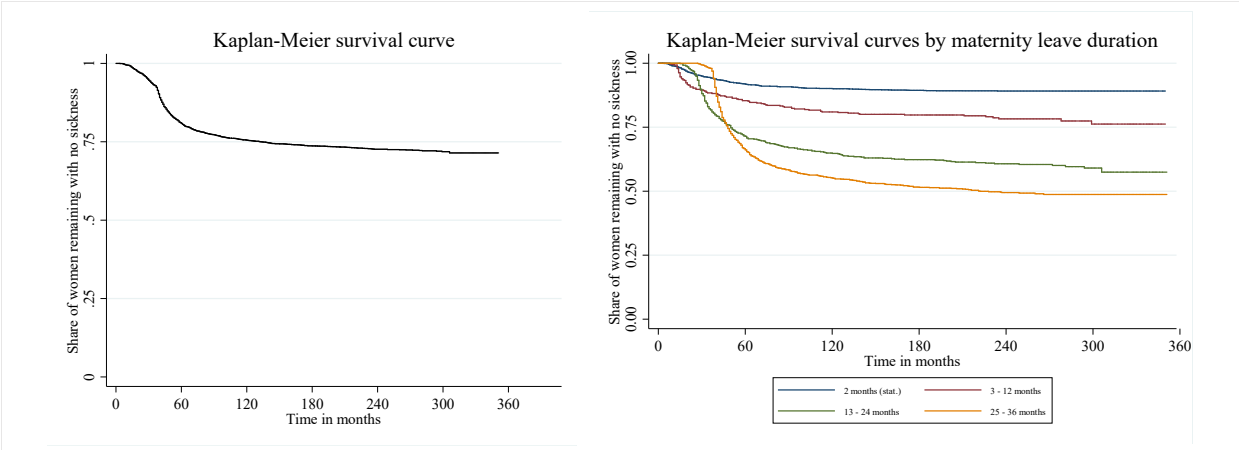
An association between the *maternity leave* and sickness occurrence can already be observed in the descriptive analysis. A majority of the women experiencing sickness occurrences took a *maternity leave* in the longest category of 25 and 36 months (51.78 %). Figure 3 shows the incidence rate for

sickness occurrences across the four *maternity leave* duration categories. It can be observed that the shares of mothers experiencing sickness increase gradually with the leave categories and the longest leave category also includes the highest share of sickness occurrence with 49.87 %. The total incidence rate of 27.26 % is already exceed with the 13-24 months leave category (39.84 %). The mean *maternity leave* duration in months also significantly differs between mothers experiencing sickness (M = 9.78, SD = 13.45) and those who do not (M = 23.43, SD = 13.82) (Table A12: t-test; df = 1.5e+06; t-value = -5.5e+02). This indicates that more mothers becoming sick take longer *maternity leaves*. For that reason, the hypothesis *H3* can be approved in the present study.

4.1.2 Survival analysis

The approval of the hypotheses *H2* and *H3* can be further emphasised by a survival analysis (Table A16). Figure 4 shows Kaplan-Meier survival curves indicating the women remaining in the sample without sickness occurrence over time. Almost all sickness occurrences take place within the first 5 years (t = month 60) from the childbirth onwards (t = month 0) since the survival curve shows a steep decrease after the gradient decreases. This applies to both the entire sample and the subsamples by leave durations.

Figure 4: Kaplan-Meier survival curves total and by maternity leave durations



Note: The graphs plot the Kaplan-Meier survival functions showing how sickness occurs over the entire observation period. They indicate how many women remain in the sample without sickness occurrence by each time point for the entire sample (left) and by maternity leave durations (right).

70.22 % (811 cases) of all sickness has occurred until month 60 after the childbirth, and 89.87 % (1,038 cases) until month 120 (Table A18). The *maternity leave* duration subsamples show similar show similar trends. The share of women experiencing no sickness decreases in the first five years of observation with 23.94 to 32.26 %. In the following five years, the decline decreases to 7.98 to 11.83 %. The monthly incidence rates of sickness occurrence increase gradually by the *maternity leave* categories from 0.000486 to 0.001058 to 0.002245 and to 0.003321 (Table A19). This confirms again the hypothesis *H3*. When taking a look at subsamples of different maternal ages, pre-conception sickness, different post-*maternity leave* income and employment conditions, the Kaplan-Meier survival curves also differ significantly from each another (Figure A10), which is also reflected in the monthly incidence rates of sickness occurrence across subgroups (Table A17). For instance, the experience of pre-conception sickness shows double the incidence rates than for women without pre-conception sickness (0.0029 vs. 0.0012), a higher income decreases the sickness rates (-0.0004 vs. -0.0002), and the sickness rate is 4.47 times higher for women returning to their regular employment after the *maternity leave* than for those who do not (0.0028 vs. 0.0006) (Table A17). This again emphasises the varying demographic characteristics of women who become sick and those who do not and supports the confirmation of *H2* in the current analysis.

4.2 Event history analysis

4.2.1 Discrete-time logit regression

Four different discrete-time logit models were applied to estimate the effect of *maternity leave* durations and time on sickness occurrence. They were built hierarchically and include different covariates and interaction terms (0).

Table 3: Condensed regression table of discrete-time logit models

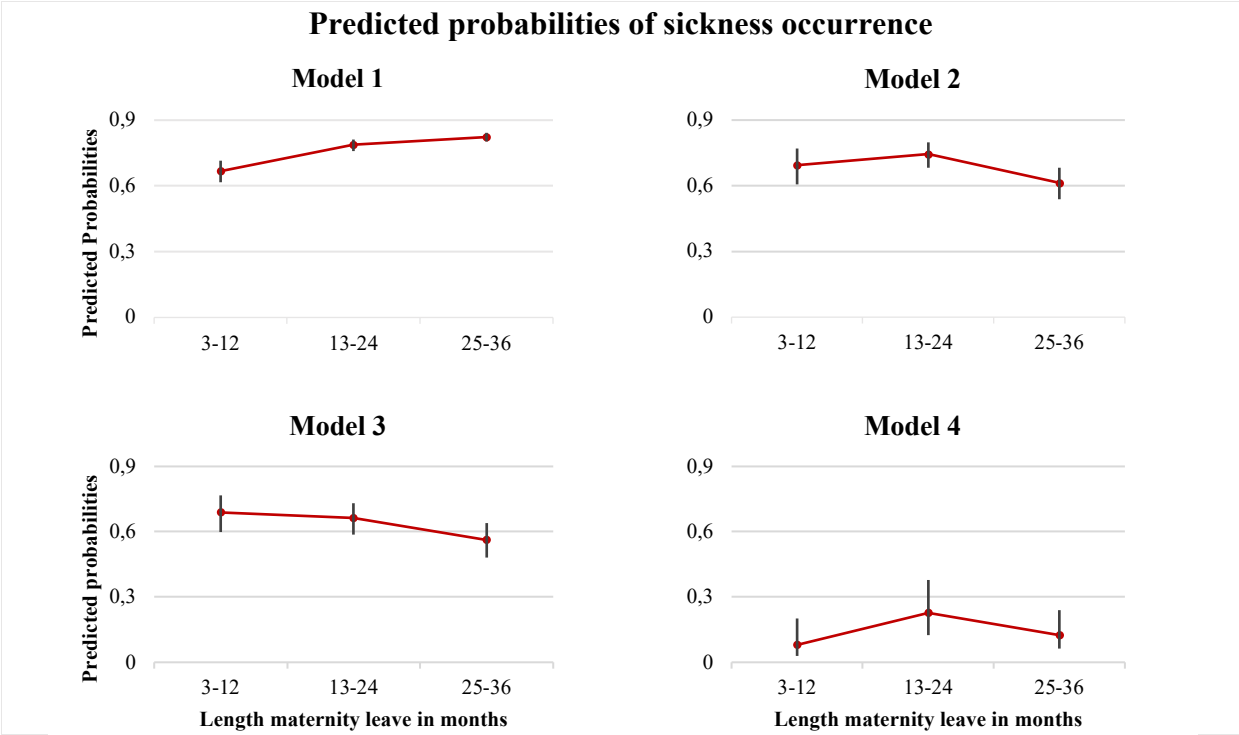
Sickness occurrence	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	Coef.	Coef.	Coef.	Coef.
Maternity leave duration (ref.: 2 months (statutory))				
3-12 months	0.697***	0.821***	0.793***	-2.442***
	(0.113)	(0.200)	(0.203)	(0.541)
13-24 months	1.307***	1.072***	0.675***	-1.225***
	(0.081)	(0.155)	(0.165)	(0.371)
25-36 months	1.537***	0.462***	0.249	-1.939***
	(0.071)	(0.157)	(0.165)	(0.397)
Time (months)	-0.00534**	-0.0174***	-0.0171***	-0.0206***
	(0.002)	(0.004)	(0.00382)	(0.00649)
Time^2	-5.41e-05***	-2.03e-05	-2.26e-05	-4.98e-05
	(0.0000154)	(0.0000255)	(0.0000249)	(0.0000354)
Constant	-6.636***	-6.156***	-5.904***	-4.823***
	(0.0893)	(0.118)	(0.142)	(0.242)
Observations	1,049,205	1,049,205	1,049,205	1,049,205
Chi2 value	1,516	1,052	1,521	1,578
Degrees of freedom	5	11	25	73
Log-likelihood	-8,245	-8,196	-8,065	-7,967
Clustered cases	4,237	4,237	4,237	4,237
Pseudo R2	0.0861	0.0915	0.106	0.117
Included covariates				
Interaction: *length* x *time*$^{(2)}$		X	X	X
Age at first childbirth			X	X
Birth cohort			X	X
Pre-conception sickness			X	X
Income (proxy SES)			X	X
Employment conditions			X	X
Interactions: *length* x covariates				X
Three-way interactions: *length* x *age/cohort* x *time*				X

*Note: The table shows the log odd coefficients of the main explanatory variable maternity leave, the time variables and the constant for all discrete-time logit models. The included covariates per model are indicated in the bottom rows. The standard errors are in parentheses, the significance levels are *** p<0.01, ** p<0.05, * p<0.1.*

Table 3 is a condensed version of the regression table showing the coefficients for all *maternity leave* length categories, time and time squared estimating the log odds of sickness occurrence. Models 3 and 4 additionally include different covariates and interaction terms as specified in the lowest row of the table. The full regression table can be accessed in the appendix (Table A20). Except for the 3-12 months category in Model 1, all CIs of the *maternity leave* categories overlap indicating that the coefficients might not be significantly different from one another. When taking a look at the coefficients, different trends can be observed. Besides the fourth category in Model 4, the regression coefficients for the main variable *maternity leave duration* are significantly different from zero in each model. The coefficients also differ in their sign and their relation to each other between the models. Figure 5 shows how the predicted probabilities of sickness occurrence by the *maternity leave* categories change between the regression models. Whereas the probabilities in Model 1 are the highest and increase with

a longer *maternity leave* compared to the reference category of statutory 2-months leave duration, the probabilities decline with every model and the trend shifts towards declining probabilities (Model 2 and 3) and a parable-shaped development with longer leave durations (Model 4).

Figure 5: Predicted probabilities of sickness occurrence by regression model and maternity leave duration



Note: The figure shows the predicted probabilities and CIs of the three categories of the maternity leave variable calculated based on the log odd coefficients by regression models.

4.2.2 Model fit, robustness and sensitivity analysis

The model fit of the regression models was tested by applying likelihood-ratio tests after every model. The tests show that extension of the regression models had improved the overall fit (Table A21). This improvement was also confirmed by the increasing pseudo R^2.

To check for robustness and sensitivity of the models, different variations in sample, time measurement and selected covariates were applied to the model. Those analyses observe the change of the log odds coefficients of the main variables of interest, the *maternity leave* duration (*length*), if either only specific subsamples are included (robustness) or covariates are omitted (sensitivity) in the analysis. The robustness checks (Table A25) include subsamples dependent on the applicable reform (after 1992, between 1992 and 2006, and after 2007) and a variation in the time variables measuring time from the first months after ending the maternity leave onwards (t_0 = last month maternity leave) instead of using the month of the childbirth as t_0. The test shows that the coefficients for the reform-subsamples only slightly change but remain stable in terms of sign, significance and relation to each another in the first model. In the second to the fourth models, the coefficients in the regression analysis with the subsample of all mothers giving birth from 1992 onwards (N = 3594, 84.82 % of the entire sample) remain constant. The other tested subsamples only indicate changes in the relation of the coefficients but show similar signs and significance levels. Different results are found for the model with the changed starting point of observation. Whereas the *length* coefficients are almost identical to the ones of the initial regression for Model 1, they differ in sign and their relationship in the model variations 2 to 4. This can be explained by the interaction of the *maternity leave* variable with time from Model 2 onwards and in Model 4 the three-way interaction with *maternity leave*, age at first childbirth or birth cohort, and time, which completely changes the regression expression with another time measurement. Subsequently, all four models show robust results for different subsamples and also for a different setup of the time variable (Model 1) if time is not interacted with other variables. Additionally, all four regression models were applied to a sample with yearly aggregated time instead of the monthly time units in the initial sample. The regression coefficients (Table A26) were almost identical

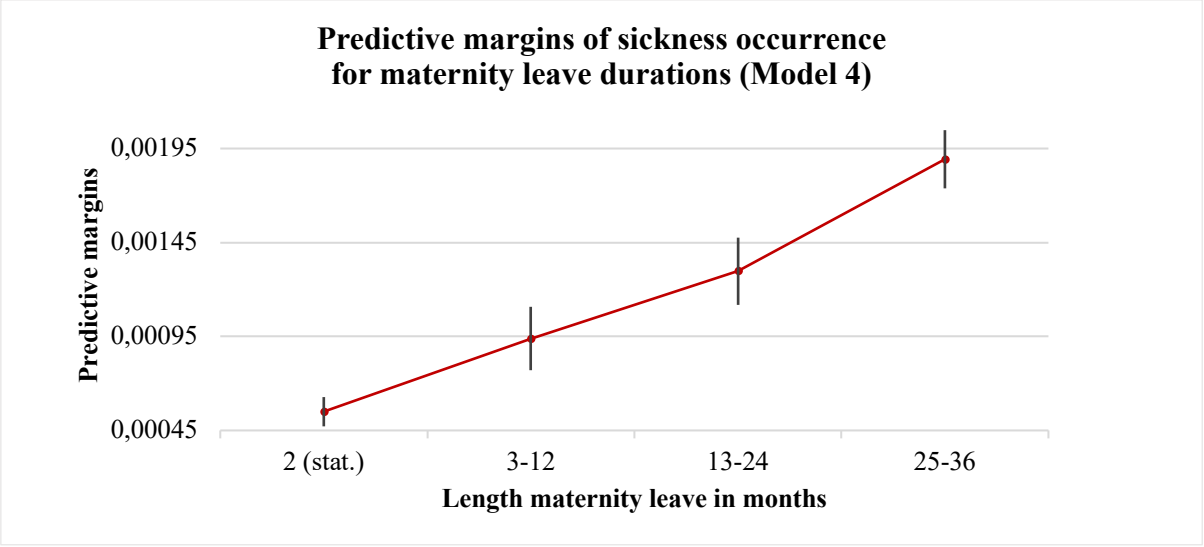
to the ones in the initial analysis. A similar robustness was found in the respective predictive margins: in the yearly aggregated model, they were approximately 12 times the margins of the initial model (Table A22).

In the sensitivity analysis (Table A27), the covariates age at first childbirth, birth cohort, pre-conception sickness, mothers' income, applicability to *maternity leave* legislation, and employment conditions were omitted in Model 3 and 4 to test for the sensitivity of the *maternity leave* coefficients. The changes of interest were in sign, significance, and relation to one another. The tests show that the coefficients in Model 3 are only sensitive to the omission of *postempl* and all employment conditions (*postempl*, *reduced*, and *postmarg*), after which they change completely. In Model 4, the omission of all employment conditions still causes a complete change of the coefficients whereas omitting *postempl* leads to the only model variation with almost identical coefficients compared with the initial model. The omission of *ageb1* and *cohort* also resulted in complete changes, which might be related with the three-way interaction with *maternity leave*, *ageb1*/*cohort* and *time*. All other omitted variables only caused minor changes in the coefficients. The sensitivity analysis shows that employment conditions are very relevant covariates in the estimations of the effect of *maternity leave* duration, especially if all three are excluded from the regression models.

4.2.3 Predictive margins

To test for the hypotheses *H4* (*A longer maternity leave positively affects mothers' health outcomes*) and *H5* (*Mothers' health outcomes are affected by the selection into maternity leave durations and not by the duration itself*), predictive margins are calculated for all regression models (Table A22). In accordance with the monthly time units used in the current analysis, the predictive margins are calculated as the monthly probabilities of experiencing sickness. Other than the predicted probabilities (Figure 5), the trend of the margins across the *maternity leave* categories does not differ between the regression models (Figure A11) and shows increasing monthly probabilities with longer leave durations, as exemplarily reflected in Figure 6.

Figure 6: Predictive margins and 95 % CIs of sickness occurrence for maternity leave durations (Model 4)

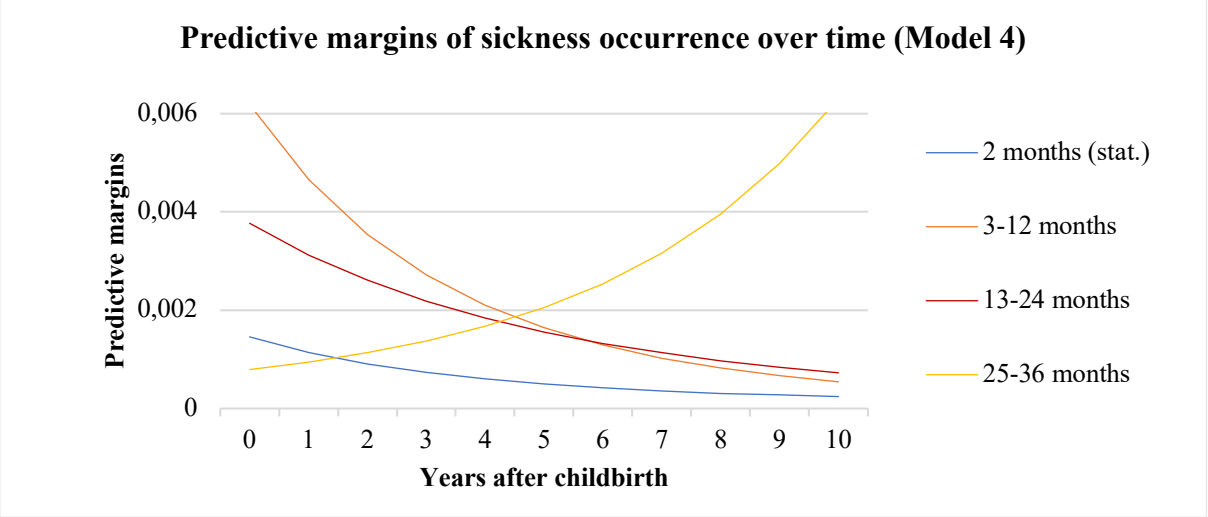


Note: The graph shows the monthly predictive margins and CIs of sickness occurrence for all maternity leave duration categories for regression Model 4.

The margins show that if all women in the sample would take the statutory 2 months of maternity leave, the average predicted probability of becoming sick in the following months would be 0.00055. This average probability of sickness occurrence would increase to 0.0009392, 0.0012972, and 0.001893 with every category of *maternity leave* duration. Also, the only observed overlap in the CIs of the predictive margins for *maternity leave* were indicated in Model 3 between the 3-12- and 13-24-months categories. This indicates that all other predictive margins are significantly different from one another. The event rate of 0.001412 (sickness occurrences (1,155) divides by the time at risk (817,907)) goes in line with the dimensions of the predictive margins. Another measure to interpret the

meaning of the margins and the number of women those refer to are NNT using the predictive margins as event rates (Table A15Table A23). For Model 4, the NNT or the women who needed to take the 3-12 months leave to prevent one sickness occurrence in the next month is 2,571.36. The NNT for 13-24 months is 1,338.87 and for 25-36 months is 744.77.

Figure 7: Predictive margins of sickness occurrence over time by leave durations (Model 4)



Note: The graph shows the monthly probabilities of sickness occurrence calculated by predictive margins for regression Model 4 and how they develop over time (x-axis) for an observation period of 10 years by the length maternity leave in categories. The y-axis shows the monthly predictive margins.

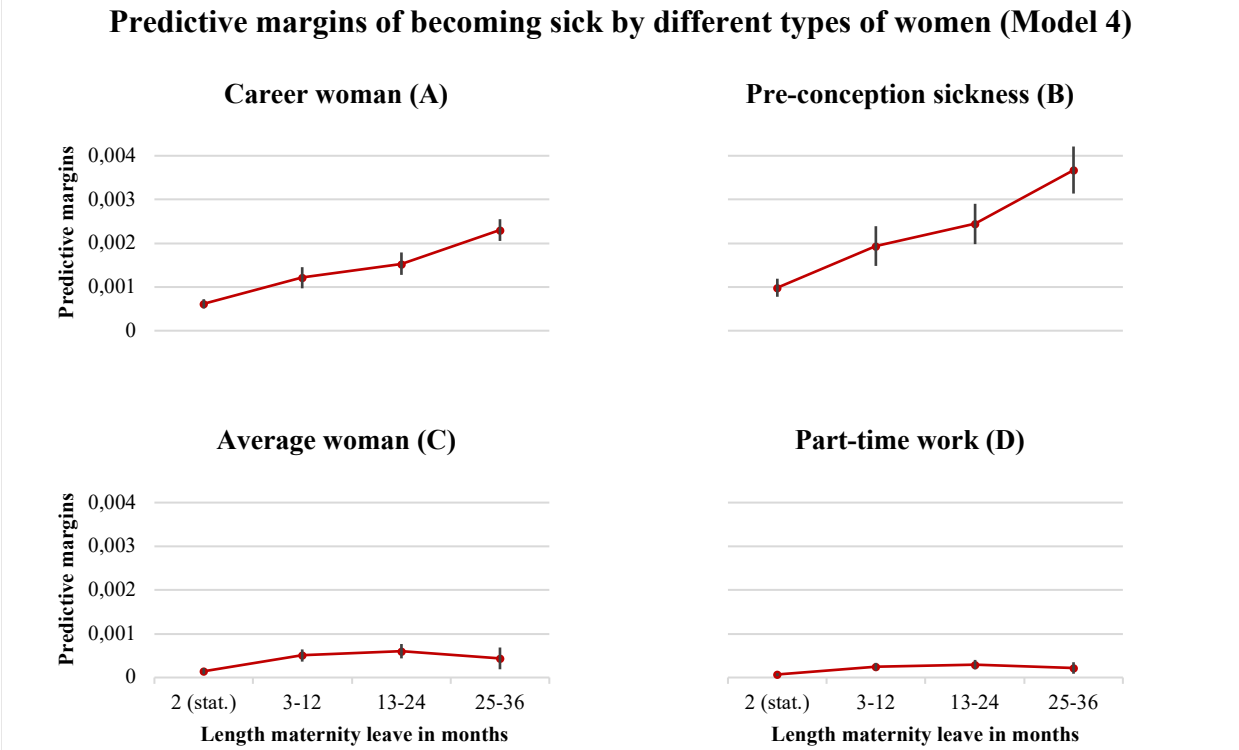
However, neither the predicted probabilities (Figure 5), nor the predictive margins (Figure 6; Table A22) suggest a negative and proportional relationship between the length of *maternity leave* and sickness occurrences. Differences in the predictive margins when considering different covariates and also a clearly positive trend between the leave durations and sickness occurrence can be observed emphasising the relevance of those covariates. For that reason, the hypothesis *H4* can be rejected in the current research. When analysing the predictive margins, the effect of *maternity leave* does not only change across the four leave categories but is also dependent from the setting of the other covariates. When taking a look on how the margins in Model 4 develop over time (Figure 7), there are clear differences across the different leave categories. Whereas the monthly predictive margins of sickness occurrence clearly decrease within the first 10 years after childbirth for the statutory 2-, 3-12- and 13-24-months leaves, it increases for women in the longest leave category of 25-36 months. The trends displayed in Figure 7 for Model 4 can also be found in Models 2 and 3 but less extreme, only Model 1 does not show an increase of the predictive margins for the 25-36-months-leave (Figure A12). Since the major overlap of Models 2, 3 and 4 is the interaction of time and maternity leave, this seems to have an impact on sickness probabilities over time.

4.2.4 Types of women and different characteristics

When adjusting the margins for characteristics of women, different results are found (Table A22). The first type is a woman having a career (A), which is defined by an income above the mean, an immediate return to work after the *maternity leave*, and no reduction of working hours. The second type (B) is a woman who experienced pre-conception sickness. She returns to work after the *maternity leave* but with reduced working hours. Her income is estimated between the median and the mean income of the population. Type C is the average women, which differs from the general margins calculation without any characteristics specified by using the average characteristics, for instance a woman being born in 1970.37, has 0.31 income above the mean and took 13.5 months of *maternity leave* (Table A8). The fourth type (D) is a mother who changes into part-time employment after returning from her *maternity leave*. Her income is estimated similar to type B. To simplify the comparison, all women (except the type C) are assumed to have their first child between 1992 and 2006 and being entitled for the conditions of German the *maternity leave* reform of 1992 (2.3).

Models 3 and 4 both include control variables and show similar trends when differentiating between types of mothers (Figure A23, Figure 8). Using Model 4, the monthly predictive margins estimating the average probability of sickness occurrence for the four types are plotted (Figure 8). Type A indicates a similar trend of the predicted probabilities of sickness occurrence by *maternity leave* duration as observed in the unspecified model but with slightly higher probabilities (Table A22). The probabilities of becoming sick gradually increase with a longer *maternity leave* category. The same is observed for type B, but with even higher probabilities, which are more than the double of the margins in the unspecified prediction. The average woman (C) shows completely different probabilities for the leave durations. They are about 10 times smaller and only increase from 2 to 13-24 months but then decrease again. The same pattern can be observed for type D but with only half as high predicted probabilities as for C. It can be concluded that mothers with different characteristics show different outcomes in terms of sickness probabilities. When linking these differences with the assumingly different initial conditions of the transition into a *maternity leave* length, those differ as well. As shown in this example, the different properties expressed in the analysis of specific types of mothers might influence the selection into *maternity leave* spells, which further result in different health outcomes.

Figure 8: Predictive margins and 95 % CIs of maternity leave by different types (Model 4)



Note: The table shows the monthly probabilities of sickness occurrence calculated by predictive margins (y-axis) of Model 4 for the different maternity leave durations (x-axis) in categories by different types of women. Type A (career woman) is characterised by full employment after the leave and a high income, B indicates pre-conception sickness, C has all characteristics on average, and D changes to part-time work after the leave.

When observing other covariates for the same model (Figure A13Figure A22), different trends in the predictive margins can be observed. A higher age at first childbirth decreases the predicted probability of sickness occurrence (Figure 7). When interacting age at childbirth with *maternity leave*, the probabilities of sickness occurrence decline with an older age of motherhood for all leave duration except 3-12 months, for which an overall increase of sickness probabilities with an older age can be observed. The predictive margins of becoming sick first increase but then decrease again with a later year of birth (Figure 6). Interacting cohort with *maternity leave* shows higher probabilities for longer leave categories. Also, for all leave durations first the probabilities increase and then remain stable with a later year of birth. An exception is the statutory leave group, which indicates lower sickness probabilities with a later year of birth (Figure A20).

The health estimation of mothers also shows a clear influence on the predictive margins of sickness, which are significantly higher for mothers having experienced pre-conception sickness (Figure 8).

This difference to mothers considered having a good health can also be observed when looking for the interaction with the leave duration, where the smallest difference in the sickness probabilities can be found in the 3-12 months leave group and the biggest one in the 13-24-months group. Generally, longer *maternity leave* spells indicate higher predictive margins of becoming sick, which also applies for high income and reduced working hours. When looking at the probabilities of the first covariate, women having an income above the population mean show slightly lower sickness probabilities but also wider range of the CI indicating a bigger variety of probabilities among the high-income group of mothers. The relation of sickness probabilities also changes with the length of *maternity leave*: if high income mothers take a *maternity leave* longer than 12 months, their sickness probabilities are higher than the ones of low earners. For women who reduce their working hours after their *maternity leave*, the probabilities of sickness occurrence are higher than for those who do not, but they also show a higher variability. There are also differences across the leave lengths indicating that maternity leaves up to 12 months show lower predicted probabilities of sickness occurrence (Table A22). Based on the differences in the predictive margins of sickness occurrence by characteristics and types of women (Figure 8), the hypothesis *H5* can be confirmed by the current analysis.

5. Conclusion and Discussion

5.1 Synthesis of the results

The present research investigates the effect of *maternity leave* durations on mothers' health outcomes in first-time mothers in Germany. Using a panel data set on employment biographies of the German Pension Insurance (DRV), 4,237 mothers born between 1960 and 1979, having their first child between the age of 20 and 39, and being attached to the labour market were analysed. The theoretical framework identifies the double role burden of motherhood and employment after the transition into motherhood as main mechanism causing *maternal distress* affecting mothers' health outcomes either in a causal or in a selective way (2). The extracted selection mechanisms refer to considerations of *affordability*, *amortisation*, and *motivation* for *maternity leave* durations. The descriptive results show that there are differences in the demographic characteristics of women choosing different *maternity leave* durations (*H1*). For example, women who experienced serious sickness before their first pregnancy are more prevalent in the longer leave groups. The share of high-income mothers decreases with the length of maternity leave, whereas low-income women are more frequent in longer leave spells. The share of mothers returning to full employment right after their maternity leave increases with the leave duration; an opposite development can be observed for mothers changing their working time to reduced working hours or marginal employment (except the shortest leave period of the 2 statutory months, where they show a low prevalence). When taking a look at post-*maternity leave* sickness occurrence, the affected women also differ in their demographic characteristics (*H2*). On average, women who become sick indicate pre-conception sickness experiences, have less often above-mean income, go more often back to their regular employment immediately after the leave, and do not change to marginal employment after the leave. Also, the prevalence of post-*maternity leave* sickness differs between leave durations (*H3*). The sickness rates per woman increase with the length of maternity leave and women who become sick take on average longer *maternity leaves*. More than half of all women experiencing sickness took the longest leaves of 25-36 months. This trend is also confirmed when looking at timing and frequency of sickness occurrences in the survival analysis.

The results of the event history analysis show that a longer maternity leave is not related with better health outcomes (rejection of *H4*). The longer the leave duration the higher the estimated predicted probabilities of becoming sick. This result can be observed in all variations of the regression analysis that include the control variables and their interaction with *maternity leave* duration and time. When differentiating between different types of women, various patterns can be observed. For instance, the return to full employment and having a high income is associated with increased probabilities with a longer *maternity leave*. Previous illness further increases these probabilities of sickness occurrence. On the other hand, women with average characteristics as well as those who change to part-time work after their leaves show lower probabilities of becoming sick. When looking at the development of the predicted probabilities of sickness occurrence for 10 years after the childbirth in a complex regression model considering all covariates and interactions with *maternity leave* and time, the probabilities for sickness occurrence generally decrease with time except for the longest leave category of 25-36 months. The sickness probabilities over time significantly differ between the leave groups and shows only an increase in the longest leave group while decreasing in all other group shifting the attention towards women deciding for the longest maternity leave. The increased probabilities of sickness occurrence with longer *maternity leave* durations can be observed in all models despite their included covariates. On the other hand, the coefficients of the *maternity leave* duration categories decrease by its length. Subsequently, it can be assumed that demographic characteristics as the mentioned ones affect the probabilities of sickness occurrence and selection is relevant in the relationship between *maternity leave* duration and mothers' health (*H5*). The research question *Does the length of maternity leave affect the post-childbirth health outcomes for first-time mothers in Germany?* is answered with *No*. It seems that the characteristics included in the analysis affect the selection of mothers into maternity leave spells, which further interferes with the effect of the leave on the sickness occurrence. For that reason, the role of selection is concluded to be relevant in the association between maternity leave durations and mothers' sickness occurrence.

5.2 Discussion

The current study shows that there is a selection effect into *maternity leave* durations affecting mothers' post-leave health outcomes. This effect is observed when differentiating between different subgroups of women. Whilst the general trend shows increasing probabilities of sickness occurrence with longer *maternity leaves*, the differentiation of different types of women shows that this trend is not the case for all mothers. The experience of pre-conception sickness, for instance, causes generally higher and with the leave duration increasing probabilities of becoming sick. Similar results were obtained by McGovern and colleagues (1997) who found that a good vitality in combination with *maternity leave* lowers the risks of mental health problems for mothers in a short-term observation after the childbirth. Guertzgen and Hank (2018) found a similar association with health. They conclude that pre-conception sickness in combination with the opportunity to extend the maternity leave results in a negative health selection into the labour market. Similar results can also be found in the present study showing that mothers having experienced serious sickness before, take longer *maternity leaves* (Figure 2) and also show higher probabilities of post-leave sickness occurrence (Figure A19). However, since the sickness measurement differs between the current study, serious and long-term sickness occurrence, and the two mentioned studies, self-reported health (McGovern et al., 1997) and short- and long-term sick leaves (Guertzgen & Hank, 2018). Since those health measurements refer to less severe conditions than the serious and work absence-causing sickness occurrence used in the present analysis, one might argue that the selection effect in the present study is even stronger since it refers to only sever illness and not to minor sickness, for instance a flu.

For that reason, the definition of the outcome variable, sickness occurrence, should always be considered when interpreting the effect of *maternity leave* durations on mothers' health, especially regarding the relevance of selection since this might affect the outcome differently when measuring for a different kind of illness. Estimating the effect of *maternity leave* durations on different and less severe measures of health might lead to different results. In line with the data set's administrative purpose, only sickness incidents relevant for the calculation of the retirement pension are considered. This refers to sickness causing long-term inability to work. Referring to the report of the German expert council on the assessment of healthcare development (SVR) (2015), those serious sickness occurrences are mainly due to diseases of the musculoskeletal system and connective tissue, for instance carpal tunnel syndrome, (29.0 %) or psychological and behavioural disorders (23.1 %), such as depressions (SVR, 2015). This supports the assumption that many of the measured serious sickness occurrences are mental conditions, as indicated in the literature (Avendano et al., 2015; Benson et al., 2017; McGovern et al., 1997). Although this assumption cannot be tested in the current data set due to missing information on the kinds of illness (DRV, 2018a), the distribution indicated by the SVR (2015) emphasises the relevance of the sickness measurements used in the present study for mothers' health outcomes. The analysis of the NNT showing high numbers (4.2.3) related with the interpretation of the outcome variable as a serious illness having a significant effect on women, their health and well-being and their social and labour market participation in society seems a reasonable argument to adapt the conditions of taking a *maternity leave* length. Especially the aim of *maternity leave* policy to keep mothers on the job market and prevent serious sickness the long term can be stressed by the current analysis. Although the indeterminate symptoms of disease are thus hardly linked to *maternal distress*, the lasting effect of post-childbirth reconciliation stress on mother's entire well-being should be emphasised (Emmanuel & St John, 2010).

Another relevant selection mechanism can be found in the *maternity leave* benefits, supporting the mothers' economic resources and proving beneficial for mothers' post-leave health outcomes (Bullinger, 2019; Hewitt et al., 2017; Morgenroth & Heilman, 2017). In the current analysis, the considered *maternity leave* legislations after 1992 and 2007 refer to different benefit schemes, which mainly differ in their monetary allowances shifting from a low and means-tested benefit towards an increased and individual-based income replacement benefit resulting in higher economic benefits during the leave (2.3). The monthly predicted probabilities of becoming sick for mothers being entitled to the parental allowance of the reform of 2007 are much lower than for mothers being only eligible for the means-tested benefit of 1992 (Table A22). In combination with welfare arrangements like *maternity leave* legislation, the individual economic resources play an important role, too, which was also confirmed by the literature (Ensminger & Juon, 2001). When belonging to the high-income group, the

monthly predicted probabilities are lower for leaves up to 12 months are higher for leaves above 12 months compared to mothers having an income below the mean (Table A22). Type A, for instance, has a high income and would have the highest economic loss when taking a leave under the conditions of the reform of 1992 (2.3). Additionally, childcare amenities are easier accessible with higher income. And without previous sickness, the health of this type is considered as good so that she might tend to decide on her leave duration without considering additionally needed recovery time to protect her own health. These results support the assumption of a positive effect of economic benefits addressing the two mechanisms of *affordability* and *amortisation*, which both directly affects the selection into *maternity leave* durations. However, since the income variable only refers to the mothers' salary and does not consider any other income sources on the household level, the effect of income might be biased in the current analysis. Besides economic policy entitlements and income, the post-*maternity leave* working conditions also influence the probabilities of sickness occurrence. In the sensitivity analysis, the complex models were sensitive to changes in the employment condition variables emphasising their meaning for the probabilities of sickness occurrence. The transition into part-time work or reduced working hours after the maternity leave has a negative effect on the sickness probabilities (Table A22), which was also found in the study by Benson and colleagues (2017) associating the combination of reduced working hours with a short *maternity leave* and lower disability risks. When the working hours are reduced after a long *maternity leave* the mortality decreases. The way of a return to the labour market seems to be relevant for mothers' post-leave health outcomes. On the other hand, this decision is not always up to the mothers' and cannot be utilised by everyone emphasising another argument for the relevance of selection in the *maternity leave*-mothers' health nexus.

5.3 Strengths and Limitations

The strengths of this study support its contribution to the body of literature in the nexus of *maternity leave* durations and mothers' health. A major strength is that the present research closes an important research gap and, for the first time, explores the link between the length of *maternity leave* and mothers' health. Whereas previous research has focussed on the impact of *maternity leave* on the labour market participation of women, this study focuses on the health implications, which are influencing both the labour market but also the well-being of the women. The context of Germany is thereby special due to the interplay of rather generous *maternity leave* entitlements (BMFSFJ, 2018) and cultural challenges such as low fertility levels (Destatis, 2017), established traditional role models (Borck, 2014; Maurer, 2006), a still low and slowly rising female labour force participation (World Bank, 2019), and the cultural disparities of parenting between the former East and West German states (Kreyenfeld & Geisler, 2006). Further, the topic is highly relevant and currently debated in the work-life-balance directive of the European Parliament focussing on mandatory parental leave entitlements for all member states to improve the well-being of the European citizens (European Commission, 2019). The regular updates on the German *maternity leave* law (2.3) additionally emphasise the relevance of the topic and that they aimed for improved conditions of having a child.

Regarding the study design, the used data set VSKT 2015 of the DRV offers a unique opportunity to investigate the topic from a longitudinal perspective. Especially the panel structure and the administrative purpose of the data set providing monthly information on individual employment biographies allow to follow women and obtain these significant results. Using administrative data has the advantage of reliable, representative and in this case detailed data. For that reason, the findings are highly relevant and should been paid special attention to when elaborating on the effect of *maternity leave* durations on mothers' health. Since the data was initially collected to calculate pensions, it includes many demographic characteristics of women, which are relevant in the present investigation since they affect the *maternity leave*-health association such as employment information, unemployment, sickness, and childbirth. Based on the *maternity leave* legislation in Germany, using *maternity leave* duration states a reliable explanatory variable for the probabilities of sickness occurrence. It can be assumed that all mothers in the sample having their first child after 1992 (3,594 women: 84.82 %) were eligible to the opportunity of a three-year maternity leave. First maternity leave extensions have already been established since 1986, which only leave a few mothers (117 women: 2.76 %) in the full sample with no maternity leave entitlements or allowances at all. However, since only a small share of women was not entitled to the three-year-leave possibility, the conditions of *maternity leave* durations were similar for a majority of the women in the sample. When taking a look at the measurement of

time in the current analysis, the monthly observations for each woman in the sample allow a detailed and change-focussed observation of mothers' health and are mostly not limited. The shortest possible observation period is five years after the childbirth for women giving birth in 2010, for all other mothers it is a way longer. Since post-childbirth health outcomes might be directly related to the recovery from childbirth (Brown & Lumley, 2000) but also to the general circumstances of reconciliation, recovery and balancing role responsibilities in the long run (Carlander et al., 2015), this allows to control for both short- and long-term timing of sickness occurrence. However, due to the usage of discrete-time logit models, the women could be observed over a long time, which has proven beneficial. Some results refer to a longer observation period. Also, the models were robust and the results significant showing reliable results. The used conceptual model (2.4) forms a solid theoretical framework, in which the facts and the various mechanisms of the observed relationship can be explained and explored. The derived hypotheses were all relevant for the analysis and to find the results. The theoretical and methodological study design state a solid base for the current research and can be therefore seen as a major strength.

On the other hand, the study also has some limitations, which should be considered when interpreting the results. As mentioned previously (5.2), the operationalisation of the outcome variable sickness occurrence as a proxy for mothers' health implies sickness occurrence measured by long-term inability to work but without any further information on the health condition. Also, minor but repeated sickness occurrences, which might be an indicator for bad health conditions, are not taken into account. One could argue that this is necessary to stand out serious sickness from less severe and less relevant conditions such as a flu. *Maternal distress*, which might be used as a moderator between *maternity leave* and post-leave health outcomes (0), might also cause not-reported sickness occurrences such as migraines or a weakened immune system causing frequent minor illness occurrences (Brown & Lumley, 2000). Also, indicators of self-reported health and well-being are also not accessible despite their relevance in the measurements of mothers' health (Baker & Milligan, 2007; McGovern et al., 1997). This raises the question whether the outcome variable is an appropriate measure for mothers' post-*maternity leave* health since it covers only a specific kind of sickness. Another limitation of the present study to discuss is the utilisation of covariates and their implication for the results. Although the included variable account for some mechanisms explaining the relationship between *maternity leave* durations and mothers' health, for example the income or pre-conception health assumptions, not all possible influence factors are covered by the analysis models. Unmeasured characteristics, which might be associated with the *maternity leave*-mothers' health association bear the risks of incorrectness of the findings, in accordance with the definition of unobserved heterogeneity (Arellano, 2003). For example, lacking information on social support like the quality of partnership, family relations, of the social network of a woman might lead to biased results when assessing the effect of her *maternity leave* duration on her sickness probabilities since the circumstances of her transition into motherhood are not covered by the used data set but as important as financial resources. The same accounts for the socio-economic status, which can only be approximated by the woman's income but is actually affected by the household income. There is no information on the partner's income or employment status available in the VSKT 2015, which makes the comprehensibility of the circumstances of the situation for women more difficult. All this missing information are important for the reconciliation of motherhood and employment and how much this process affects the *maternal distress* levels and the sickness probabilities for mothers. Social support is associated with better physical post-childbirth health (McGovern et al., 1997). A study by Sabbath and colleagues (2015), for instance, shows that women having a child show the lowest mortality risks, whereas the highest risks were characterized by spells of single mothers. This emphasises the importance of social support for post-childbirth health outcomes. Also, the physical and social bonding between mother and child is seen as one positive influence factor on mothers' health during *maternity leave* periods promoted by, for instance, breastfeeding (Baker & Milligan, 2007; Bullinger, 2019). Also, health-promoting and harmful behaviours are not covered, which also influences mothers' health after the *maternity leave* (Grace et al., 2006). Also, the conditions of returning to work for women are not included in the analysis. Increased pressure due to double burden of employment and extreme cases of discrimination due to flexibility stigmata (Rudman & Mescher, 2013). Controlling for those unobserved influence factors on the outcome variable in the current analysis is nearly impossible and prevents the fully approach of the selection mechanisms in the current analysis. However, the possibility of other unobserved effects on post-*maternity leave* mothers' health should be considered. In addition, the study shows some risks of truncation (3.4), such

as mothers who drop out due a second pregnancy, which cannot be resolved in the current study but might be considered in the future.

5.4 Implications, policy advice and further recommendations

The present study shows that the association between *maternity leave* durations and health in Germany is of a selective nature: the circumstances and conditions of the selection into *maternity leave* durations is relevant. This is shown by the effect of mothers' characteristics on the predicted probabilities of sickness occurrence, which also differs across different *maternity leave* lengths. In the ma*ternity leave*-mothers' health nexus, the study contributes an important insight, which also refers to the current legislation in Germany. One important conclusion of the present study is the relevance of the topic: *maternity leave* is an institutionalised reconciliation strategy and part of the public debate in the context of the rising female labour force participation (World Bank, 2019), and the development of appropriate parental leave policies, as demonstrated by the regular policy updates of the childcare leave policies in Germany (2.4) or as recently thematised in the EU directive on work-life-balance and the mandatory paternity leave (European Commission, 2017). The implications drawn from the findings emphasise the relevance of selection into *maternity leave* durations and the effect on probabilities of severe sickness occurrences for first-time mothers in the context of Germany. The results show that there are major differences between women with different characteristics showing they really matter. When differentiating between different types of women, this becomes clear. For mothers having a career meaning that they work full-time and earn above the average, the probabilities increase with the length of *maternity leave*. Mothers having experienced pre-conception sickness indicate far higher probabilities, which also increase with the leave duration. On the other hand, post-leave working conditions such as part-time and marginal employment seem to decrease the sickness probabilities and also do not increase with the leave duration. This emphasises that the characteristics of women are relevant in her *maternity leave* utilisation affecting her post-leave health. Subsequently, to reach a just and equal maternal (health) protection for mothers, policies should focus on the selection component to improve maternal health protection in the association with *maternity leave durations*.

The total fertility rate in Germany has increased during the last years (Destatis, 2017) assuming a possible effect of the latest *maternity leave* reform of 2007. What remains unclear is whether this trend is related to the reform's changed entitlements such as the increased childcare benefit. The improved financial benefits address two selection mechanisms presented in the present research, *affordability* and *amortisation*. However, the *maternity leave* reform still offers room for improvement in accordance with the *maternity leave* utilisation-mothers' health nexus. The childcare allowance introduced in the reform of 2007 has proven beneficial for many women by providing generally higher childcare benefits (2.3). This enables *maternity leave* prolongations in favour of mothers' socio-economic statuses since the monthly salary adjustment and the amortisation threshold of remaining without the full income are approached. However, the level of income changes its relative value relative to the standard cost of living (Rablen, 2008), which means that a loss of net income of 33 % as stated in the youngest *maternity leave* reform (2.3) is significantly more relevant for households with low than with high income. This calls for a more solidarity-based system adjusting the childcare allowance upwards in relation to the respective household income to reduce the relatively higher rising cost of living for lower-income families and to offset disadvantages. The pressure on mothers to return to work due to *affordability* issues could be reduced while maintaining the incentive system for better earning mothers to extent their leaves since it is worthwhile. The *motivation* mechanism to prolong the *maternity leave* would also be influenced by this change in the benefit system, as the financial support would relieve women and allow them to decide freely on their *maternity leave* duration. This might empower mothers to take a leave duration as they need it without being externally forced. This might be important for, for instance, women having experiences pre-conception illness showing higher probabilities of sickness occurrence than mothers with a good pre-conception health (4.2.3). Nonetheless, when taking a look at the NNT calculations (Table A23), the average number of mothers who need to take a longer *maternity leave* duration is relatively high in a three- to four-digit range meaning that the effect of changing the *maternity leave* length is not big. Nonetheless, maternal protection should be a top priority and its relevance should not be measured by numbers alone for policy makers. The German state has a high interest in the development of the *maternity leave* legislation as emphasised by its frequent reforms (2.3) since the topic is highly relevant for the country. Especially in times of increas-

ing female labour force participation and low fertility levels, state support is to make childbearing more attractive and make it easier to reconcile work and family life. The attachment of women to the labour market is necessary to bear the burden of ageing society economically. In addition, fertility levels are expected to increase resulting in the urgency to attract more working women to have a child and mothers to stay employed. This goal was also pursued with the recent reform aiming for the 'Scandinavian model': establishing the compatibility of employment and motherhood into society and the labour market (Hürten, 2007; Spiess & Wrohlich, 2008). For that reason, the recent *maternity leave* reform of 2007 is a good starting point and its improvement should receive the highest attention, also by research-driven policy interventions.

Not only the policy making, but also future research can contribute to the development towards a more effective, protective, and research-driven *maternity leave* legislation. The present study indicates perspectives on the *maternity leave*-mothers' health association require further investigation to fully comprehend the relationship and implement the right policy measures. In accordance with the limitations (5.3), future research on *maternity leave*-mothers' health association should aim to include more and detailed information on the mother. For instance, the socio-economic situation might be better reflected by presenting a woman's educational attainment and the household income in addition to individual earnings. Those aspects give a good overview on the actual habitus and socio-economic resources, which are important for the situation after the transition into motherhood. Also, social support should be included, for instance information on the partnership status, family support and the social capital would be beneficial to approximate a more accurate picture of the context of reconciliation. *Maternal distress* is affected by those factors and the actual interplay of these aspects with *maternity leave* durations and the association with serious illness should be paid attention to. In addition to the health measurement used in the current study, future research should also consider less severe or short-term sickness occurrences since those can also be indicators for an affected health by *maternity leave* periods. Due to the lacking research on maternity leave-mothers' health association in countries with similar welfare amenities than Germany, a cross-national comparison with, for instance, Sweden or Denmark would elaborate on whether the selectivity component is part of a generous *maternity leave* policy or unique in the case of Germany. Finally, to investigate the unique case of Germany to the fullest extent, the recent history of the reunification and the following cultural clash in terms of, for instance, family organisation should be included in an analysis. The differentiation might be beneficial to investigate differences in the perception of multiple role burdens, *maternal distress* and balancing motherhood and employment.

References

Aitken, Z., Garrett, C. C., Hewitt, B., Keogh, L., Hocking, J. S., & Kavanagh, A. M. (2015). The maternal health outcomes of paid maternity leave: A systematic review. *Social Science & Medicine*, 130, 32–41.

Allen, K. R., Walker, A. J., & McCann, B. R. (2013). Feminism and Families. In G. W. Peterson & K. R. Bush (Eds.), *Handbook of Marriage and the Family* (pp. 139–158).

Allison, P. (2004). Event History Analysis. In M. A. Hardy & A. Bryman (Eds.), *Handbook of data analysis*. London: Sage.

Arellano, M. (2003). Panel Data Econometrics. Advanced Tests in Econometrics. Oxford: Oxford Scholarship.

Atan, I. K., Lin, S., Dietz, H. P., Herbison, P., & Wilson, P. D. (2018). It is the first birth that does the damage: A cross-sectional study 20 years after delivery. *International Urogynecology Journal*, 29(11), 1637–1643.

Avendano, M., Berkman, L. F., Brugiavini, A., & Pasini, G. (2015). The long-run effect of maternity leave benefits on mental health: Evidence from European countries. *Social Science & Medicine*, 132, 45–53.

Baker, M., & Milligan, K. S. (2007). *Maternal employment, breastfeeding, and health: Evidence from maternity leave mandates* (Working Paper No. No. 12188). Cambridge: National Bureau of Economic Research.

Barclay, L. M. (1994). *Women's experience of new motherhood*. Presented at the Healthy Families: Healthy Children Conference.

Barclay, L. M., & Lloyd, B. (1996). The misery of motherhood: Alternative approaches to maternal distress. *Midwifery*, 12, 136–139.

Barnett, R. C., & Baruch, G. K. (1985). Women's Involvement in Multiple Roles and Psychological Distress. *Journal of Personality and Social Psychology*, 49(1), 135–145.

Baum, C. L. (2003). The Effects of Maternity Leave Legislation on Mothers' Labor Supply after Childbirth. *Southern Economic Journal*, *69*(4), 772–799.

Benson, R., Glaser, K., Corna, L. M., Platts, L. G., Di Gessa, G., Worts, D., … Sacker, A. (2017). Do work and family care histories predict health in older women? *European Journal of Public Health*, 27(6), 1010–1015.

Berger, L. M., & Waldfogel, J. (2004). Maternity leave and the employment of new mothers in the United States. *Journal of Population Economics*, 17(2), 331–349.

Bernardi, L., & Keim, S. (2017). Childless at Age 30: A Qualitative Study of the Life Course Plans of Working Women in East and West Germany. In Michael Kreyenfeld & D. Konietzka (Eds.), *Childlessness in Europe: Context, Causes, and Consequences* (pp. 253–268). Cham: Springer.

Billari, F. C. (2009). The happiness commonality: Fertility decisions in low-fertility settings. In F. C. Billari (Ed.), *How generations and gender shape demographic change* (pp. 7–38). New York: United Nations Publications.

Blossfeld, H.-P., Hamerle, A., & Mayer, K. U. (2014). *Event history analysis: Statistical theory and application in the social sciences*. New York: Psychology Press.

BMFSFJ (2006). *Erziehungsgeld, Elternzeit. Das Bundeserziehungsgeldgesetz. [Childcare benefit, parental leave. The federal childcare benefit law]*. Bundesministerium für Familie, Senioren, Frauen und Jugend. [German Federal Ministry of Family Affairs, Senior Citizens, Women and Youth].

BMFSFJ (2018). *Elterngeld, ElterngeldPlus und Elternzeit. Das Bundeselterngeld- und Elternzeitgesetz. [Parental benefit, parental benefit plus, and parental leave. The federal parental benefit and leave law]*. Bundesministerium für Familie, Senioren, Frauen und Jugend. [German Federal Ministry of Family Affairs, Senior Citizens, Women and Youth].

BMFSFJ. *Mutterschutzgesetz [Maternity Protection Act]*. Bundesministerium für Familie, Senioren, Frauen und Jugend. [German Federal Ministry of Family Affairs, Senior Citizens, Women and Youth].

BMJV. *Gesetz zu dem Vertrag vom 31. August 1990 zwischen der Bundesrepublik Deutschland und der Deutschen Demokratischen Republik über die Herstellung der Einheit Deutschlands – Einigungsvertragsgesetz – und der Vereinbarung vom 18. September 1990. [Law on the Treaty of 31 August 1990 between the Federal Republic of Germany and the German Democratic Republic on the Establishment of the Unity of Germany – Unification Treaty Act – and the Agreement of 18 September 1990]*. Bundesministerium für Justiz und Verbraucherschutz. [German Federal Ministry of Justice and Consumer Protection].

Borck, R. (2014). Adieu Rabenmutter – culture, fertility, female labour supply, the gender wage gap and childcare. *Journal of Population Economics*, 27(3), 739–765.

Brown, S., & Lumley, J. (2000). Physical health problems after childbirth and maternal depression at six to seven months postpartum. *British Journal of Obstetrics and Gynaecology*, 107, 1194–1201.

Brugiavini, A., Pasini, G., & Trevisan, E. (2010). Maternity and Labour Market Outcome: Short and Long Term Effects. In A. Börsch-Supan, M. Brandt, K. Hank, & M. Schröder (Eds.), *The Individual and the Welfare State: Life Histories in Europe* (pp. 151–159). Berlin and Heidelberg: Spinger.

Bullinger, L. R. (2019). The Effect of Paid Family Leave on Infant and Parental Health in the United States. *Journal of Health Economics*, 66, 101–116.

Burgess, S., Gregg, P., Propper, C., & Washbrook, E. (2008). Maternity rights and mothers' return to work. *Labour Economics*, 15(2), 168–201.

CEBM Centre for Evidence-Based Medicine (2012). *Numbers needed to treat (NNT)*. Definition by the Centre for Evidence-Based Medicine, University of Oxford. https://www.cebm.net/2014/03/number-needed-to-treat-nnt/, retrieved on 1 July 2019.

Chatteriji, P., & Markowitz, S. (2004). *Does the length of maternity leave affect maternal health?* (Working Paper No. No. 10206). Cambridge: National Bureau of Economic Research.

Coltrane, S., Miller, E. C., DeHaan, T., & Stewart, L. (2013). Fathers and the Flexibility Stigma: Fathers and the Flexibility Stigma. *Journal of Social Issues*, 69(2), 279–302.

Dagher, R. K., McGovern, P. M., & Dowd, B. E. (2014). Maternity Leave Duration and Postpartum Mental and Physical Health: Implications for Leave Policies. *Journal of Health Politics, Policy and Law*, 39(2), 369–416.

Dahl, G., Løken, K. V., Mogstad, M., & Selvanes, K. V. (2013). *What is the case for paid maternity leave?* (Working Paper No. No. 19595). Cambridge: National Bureau of Economic Research.

Dahrendorf, R. (1965). Homo sociologicus. E*in Versuch zur Geschichte, Bedeutung und Kritik der Kategorie der sozialen Rolle* [Homo sociologicus. An introduction to the history, meaning, and criticism of the category of social roles] (fifth edition). Köln/Opladen: Westdeutscher Verlag.

Damaske, S. (2013). Work, Family, and Accounts of Mothers' Lives Using Discourse to Navigate Intensive Mothering Ideals. *Sociology Compass*, 7(6), 436–444.

Dechter, E. K. (2014). Maternity Leave, Effort Allocation, and Postmotherhood Earnings. *Journal of Human Capital*, *8*(2), 97–125.

Destatis (2017). *Kinderlosigkeit, Geburten und Familie. Ergebnisse des Mikrozensus 2016.* [Childlessness, Childbirths, and Family. Results of the Micro Census 2016] (No. Issue 2017 / Article number: 5122203169014). Wiesbaden: Statistisches Bundesamt (Destatis).

DIW Deutsches Institut für Wirtschaftsforschung (2015). *Women Catching Up in German Labor Market – Participation Rate Rising Faster Than That of Men*. Press release of 30 January 2015. https://www-diw-de.proxy-ub.rug.nl/en/diw_01.c.495875.en/topics_news/women_catching_up_in_german_labor_market_participation_rate_rising_faster_than_that_of_men.html, retrieved on 20 February 2019.

DRV Deutsche Rentenversicherung (2014, April 3). *Datenbeschreibung des Forschungsdatenzentrums der Rentenversicherung (FDZ-RV).* [Data description of the Research Data Centre of the German Pension Insurance (FDZ-RV)]. http://forschung.deutsche-rentenversicherung.de/FdzPortalWeb/dispcontent.do?id=main_fdz_datadesc&chmenu=ispvwNavEntriesByHierarchy13, retrieved on 15 May 2019.

DRV Deutsche Rentenversicherung (2018a). *Code plan FDZ-Biografiedatensatz für die Biografiedaten der Versicherten für das Jahr 2015 (VSKT 2015). [Codebook for the FDZ biography data set for the biography data of insured persons in the year 2015 (VSKT 2015)]*. Forschungsdatenzentrum (FDZ) of the Deutsche Renten-versicherung (DRV).

DRV Deutsche Rentenversicherung (2018b). *FDZ-Biografiedatensatz aus der Versicherungskontenstichprobe. Benutzerhinweise Methodische Umsetzung.* [FDZ biography data set for the biography data of insured persons. User instruction on the methodological implementation]. Forschungsdatenzentrum (FDZ) of the Deutsche Renten-versicherung (DRV).

Emmanuel, E., & St John, W. (2010). Maternal distress: A concept analysis. Jo*urnal of Advanced Nursing*, 66(9), 2104–2115.

Ensminger, M. E., & Juon, H.-S. (2001). The Influence of Patterns of Welfare Receipt During the Child-Rearing Years on Later Physical and Psychological Health. *Women & Health*, 32(1–2), 25–46.

Esping-Andersen, G., & Billari, F. C. (2015). Re-theorizing family demographics. *Population and Development Review*, 41(1), 1–31.

European Commission (2017). *Directive of the European Parliament and of the council on work-life balance for parents and careers and repealing*. Pub. L. No. 2010/18/EU, 2017/0085(COD).

European Commission (2019, June 13). *Work-life balance*. European Pillar of Social Rights in detail: Work-life balance website: https://ec.europa.eu/social/main.jsp?catId=1311&langId=en, retrieved on 8 February 2019.

Gjerdingen, D. K., & Center, B. A. (2003). First-Time Parents' Prenatal to Postpartum Changes in Health, and the Relation of Postpartum Health to Work and Partner Characteristics. T*he Journal of the American Board of Family Medicine*, 16(4), 304–311.

Grace, S. L., Williams, A., Stewart, D. E., & Franche, R.-L. (2006). Health-Promoting Behaviors Through Pregnancy, Maternity Leave, and Return to Work: Effects of Role Spillover and Other Correlates. *Women & Health*, 43(2), 51–72.

Guendouzi, J. (2006). 'The Guilt Thing': Balancing Domestic and Professional Roles. *Journal of Marriage and Family*, 68, 901–909.

Guertzgen, N., & Hank, K. (2018). Maternity Leave and Mothers' Long-Term Sickness Absence: Evidence From West Germany. *Demography*, 55(2), 587–615.

Gustafsson, S. (2001). Optimal Age at Motherhood. Theoretical and Empirical Considerations on Postponement of Maternity in Europe. *Journal of Population Economics*, 14(2), 225–247.

Hanel, B. (2013). The Impact of Paid Maternity Leave Rights on Labour Market Outcomes. *Economic Record*, *89*(286), 339–366.

Hashimoto, M., Percy, R., Schoellner, T., & Weinberg, B. A. (2004). *The Long and Short of It: Maternity Leave Coverage and Women's Labor Market Outcomes July 2004* (Discussion Paper No. No. 1207). Bonn: Forschungsinstitut zur Zukunft der Arbeit (Institute for the Study of Labor).

Hein, C. (2005). *Reconciling work and family responsibilities*. Practical ideas from global experience. Geneva: International Labour Office.

Hewitt, B., Strazdins, L., & Martin, B. (2017). The benefits of paid maternity leave for mothers' postpartum health and wellbeing: Evidence from an Australian evaluation. *Social Science & Medicine*, 182, 97–105.

Hoherz, S. (2014). *Maternity leave in the context of couples: The impact of both partners' characteristics and employment experiences on mothers' re-entry into the labour market* (No. No. 647). Berlin: Deutsches Institut für Wirtschaftsforschung (DIW).

Houston, D. M., & Marks, G. (2003). The Role of Planning and Workplace Support in Returning to Work after Maternity Leave. *British Journal of Industrial Relations*, *41*(2), 197–214.

Hürten, M. (2007). *Vom Erziehungsgeld zum Elterngeld – frauenpolitischer Fortschritt oder Umverteilung von Unten nach Oben?* [The green party in the federal state of North Rhine-Westphalia]. (Master Thesis, The Green Party North-Rhine Westphalia). http://www.barbara-stef-fens.de/fileadmin/media/MdB/barbarasteffens_de/barbara_steffens/themen_bis_mai_2010/frauen/sonstiges_frauenpolitik/vom_erziehungsgeld_zum_elterngeld_abschl/vom_erziehungsgeld_zum_elterngeld_abschl.pdf, retrieved on 16 June 2019.

ILO International Labour Organisation (2010). *Maternity at work: A review of national legislation. Conditions of Work and Employment Branch* (second edition). Geneva: International Labour Office.

Joesch, J. M. (1997). Paid Leave and the Timing of Women's Employment Before and After Birth. *Journal of Marriage and Family*, 59(4), 1008–1021.

Johnston, D. D., & Swanson, D. H. (2006). Constructing the "Good Mother": The Experience of Mothering Ideologies by Work Status. *Sex Roles*, 54(7–8), 509–519.

Kreyenfeld, Michael, & Konietzka, D. (2017). Childlessness in East and West Germany: Long-Term Trends and Social Disparities. In Michael Kreyenfeld & D. Konietzka (Eds.), *Childlessness in Europe: Context, Causes, and Consequences* (pp. 97–114). Cham: Springer.

Kreyenfeld, Michaela, & Geisler, E. (2006). Müttererwerbstätigkeit in Ost- und Westdeutschland. [Female labour force participation in East and West Germany]. *Zeitschrift Für Familienforschung*, 18(3), 333–360.

Lott, Y. (2018). *German mothers' labor market re-entry after parental leave: Do parents' flexible working time arrangements help?* (Working Paper No. 071). Düsseldorf: Hans Böckler Stiftung.

Low, H., & Sánchez-Marcos, V. (2015). Female labour market outcomes and the impact of maternity leave policies. *IZA Journal of Labor Economics*, *4*(1).

Maurer, G. (2006). Unter aller Kritik und über alle Maße – die Mutter. [Under all criticism and over all measures – the mother]. *Figurationen*, 7(1), 87–101.

McGovern, P. M., Dowd, B. E., Gjerdingen, D., Moscovice, I., Kochevar, L., & Lohman, W. (1997). Time Off Work and the Postpartum Health of Employed Women. *Medical Care*, 35(5), 507–521.

Morgenroth, T., & Heilman, M. E. (2017). Should I stay or should I go? Implications of maternity leave choice for perceptions of working mothers. *Journal of Experimental Social Psychology*, 72, 53–56.

Myrskylä, M., & Fenelon, A. (2012). Maternal Age and Offspring Adult Health: Evidence From the Health and Retirement Study. *Demography*, *49*(4), 1231–1257.

Myrskylä, M., & Margolis, R. (2014). Happiness: Before and after the kids. SO*EPpapers on Multidisciplinary Panel Data Research*, 642.

Nowak, M. J., Naude, M., & Thomas, G. (2013). Returning to Work After Maternity Leave: Childcare and Workplace Flexibility. *Journal of Industrial Relations*, *55*(1), 118–135.

OECD Organisation for Economic Co-operation and Development (2016). How does GERMANY compare? In OECD (Ed.), *The Pursuit of Gender Equality: An Uphill Battle*. Paris: OECD Publishing.

Rablen, M. D. (2008). Relativity, Rank and the Utility of Income. *The Economic Journal*, 118(528), 801–821.

Rackin, H. M., & Brasher, M. S. (2016). Is Baby a Blessing? Wantedness, Age at First Birth, and Later-Life Depression. *Journal of Marriage and Family*, 78(5), 1269–1284.

Rizzo, K. M., Schiffrin, H. H., & Liss, M. (2013). Insight into the Parenthood Paradox: Mental Health Outcomes of Intensive Mothering. *Journal of Child and Family Studies*, 22(5), 614–620.

Rudman, L. A., & Mescher, K. (2013). Penalizing Men Who Request a Family Leave: Is Flexibility Stigma a Femininity Stigma? Feminizing Male Leave Requesters. *Journal of Social Issues*, 69(2), 322–340.

Sabbath, E. L., Mejía-Guevara, I., Noelke, C., & Berkman, L. F. (2015). The long-term mortality impact of combined job strain and family circumstances: A life course analysis of working American mothers. *Social Science & Medicine*, 146, 111–119.

Saloojee, H., & Coovadia, H. (2015). Maternal age matters: For a lifetime, or longer. *The Lancet Global Health*, *3*(7), e342–e343.

Sauer, M. V. (2015). Reproduction at an advanced maternal age and maternal health. *Fertility and Sterility*, *103*(5), 1136–1143.

Schaeper, H., Grotheer, M., & Brandt, G. (2017). Childlessness and fertility dynamics of female higher education graduates in Germany. In Michael Kreyenfeld & D. Konietzka (Eds.), *Childlessness in Europe: Context, Causes, and Consequences* (pp. 209–232). Cham: Springer.

Schafer, J. L., & Graham, J. W. (2002). Missing data: Our view of the state of the art. *Psychological Methods*, *7*(2), 147–177.

Schmalz, G. (1950). Gesetzlicher Mutterschutz gestern und heute. [Legislatory maternity leave earlier and nowadays]. *Gewerkschaftliche Monatshefte [Union's Monthly Publication]*, *1*(283). http://library.fes.de/gmh/main/pdf-files/gmh/1950/1950-06-a-282.pdf, retrieved on 2 July 2019.

Schönberg, U., & Ludsteck, J. (2014). Expansions in Maternity Leave Coverage and Mothers' Labor Market Outcomes after Childbirth. *Journal of Labor Economics*, *32*(3), 469–505.

Scruggs, L., & Allan, J. (2006). Welfare-state decommodification in 18 OECD countries: A replication and revision. *Journal of European Social Policy*, 16(1), 55–72.

Spiess, C. K., & Wrohlich, K. (2008). The Parental Leave Benefit Reform in Germany: Costs and Labour Market Outcomes of Moving towards the Nordic Model. *Population Research and Policy Review*, *27*(5), 575–591.

SVR Sachverständigenrat zur Begutachtung der Entwicklung im Gesundheitswesen (2015). *Krankengeld – Entwicklung, Ursachen und Steuerungsmöglichkeiten. Sondergutachen 2015. [Sick pay – development, causes and control options. Special report 2015]* [Special report on needs-based management of health care]. Retrieved from Sachverständigenrat zur Begutachtung der Entwicklung im Gesundheitswesen. https://www.svr-gesundheit.de/fileadmin/GA2015/SVR_Sondergutachten_2015_Krankengeld_Druckfassung.pdf, retrieved on 31 July 2019.

Thyrian, J. R., Fendrich, K., Lange, A., Haas, J.-P., Zygmunt, M., & Hoffmann, W. (2010). Changing maternity leave policy: Short-term effects on fertility rates and demographic variables in Germany. *Social Science & Medicine*, 71(4), 672–676.

Tiedje, L. B., Wortman, C. B., Downey, G., Emmons, C., Biernat, M., & Lang, E. (1990). Women with Multiple Roles: Role-Compatibility Perceptions, Satisfaction, and Mental Health. *Journal of Marriage and Family*, 52(1), 63–72.

Williams, R. A. (2012). Using the margins command to estimate and interpret adjusted predictions and marginal effects. *The Stata Journal*, *12*(2), 308–331.

World Bank (2019). *World Bank Data: Development labour force, female, Germany*. https://data.worldbank.org/indicator/SL.TLF.TOTL.FE.ZS?locations=DE&view=chart, retrieved on 22 February 2019.

Appendix

Appendix A: Sample selection, data cleaning and definition of variables

Addition A1: Composition of the data file VSKT 2015

Following topic files were used: Erwerbstätigkeit [employment], Arbeitslosigkeit [unemployment], Geringfügige Beschäftigung [marginal employment], Kindererziehungszeiten/Berücksichtigugnszeiten [childcare/consideration period], Arbeitsunfähigkeit/Krankheit [inability to work/sickness], Entgeltpunkte auf Basis der sozialen Erwerbssituation [earning points based on the social labour situation], Rechtsgrundlage für die Entgeltermittlung [legal basis for the calculation of earning points in the German pension system], and Soziale Erwerbssituation [social labour situation]. For a detailed overview on the variables in the respective topic files, please see the code plan of the VSKT 2015 (DRV, 2018a). Example: If the topic file refers to unemployment, it contains the case number for all persons and a dummy variable for every person-month since the January of the year the subject turned 14 indicating whether he or she was unemployed (Code: 1) or not (Code: 0) (DRV, 2018a; DRV, 2018b). If a person is 30 years old and born in March, there are 194 (= 16 years since the person turned 14 times 12 months for each of those years plus 2 months difference from January) variables on unemployment at the time of the person's 30th birthday.

Table A4: Distribution age at first childbirth by birth cohorts in percentage

	Age at first childbirth				
Birth cohort	**20-24**	**25-29**	**30-34**	**35-39**	**Total**
1960-1964	22.66	38.60	28.30	10.44	100.00
1965-1969	23.89	36.78	27.94	11.38	100.00
1970-1974	19.19	35.70	32.49	12.62	100.00
1975-1979	18.19	48.51	32.58	0.72	100.00
Total	20.71	39.81	30.65	8.83	100.00

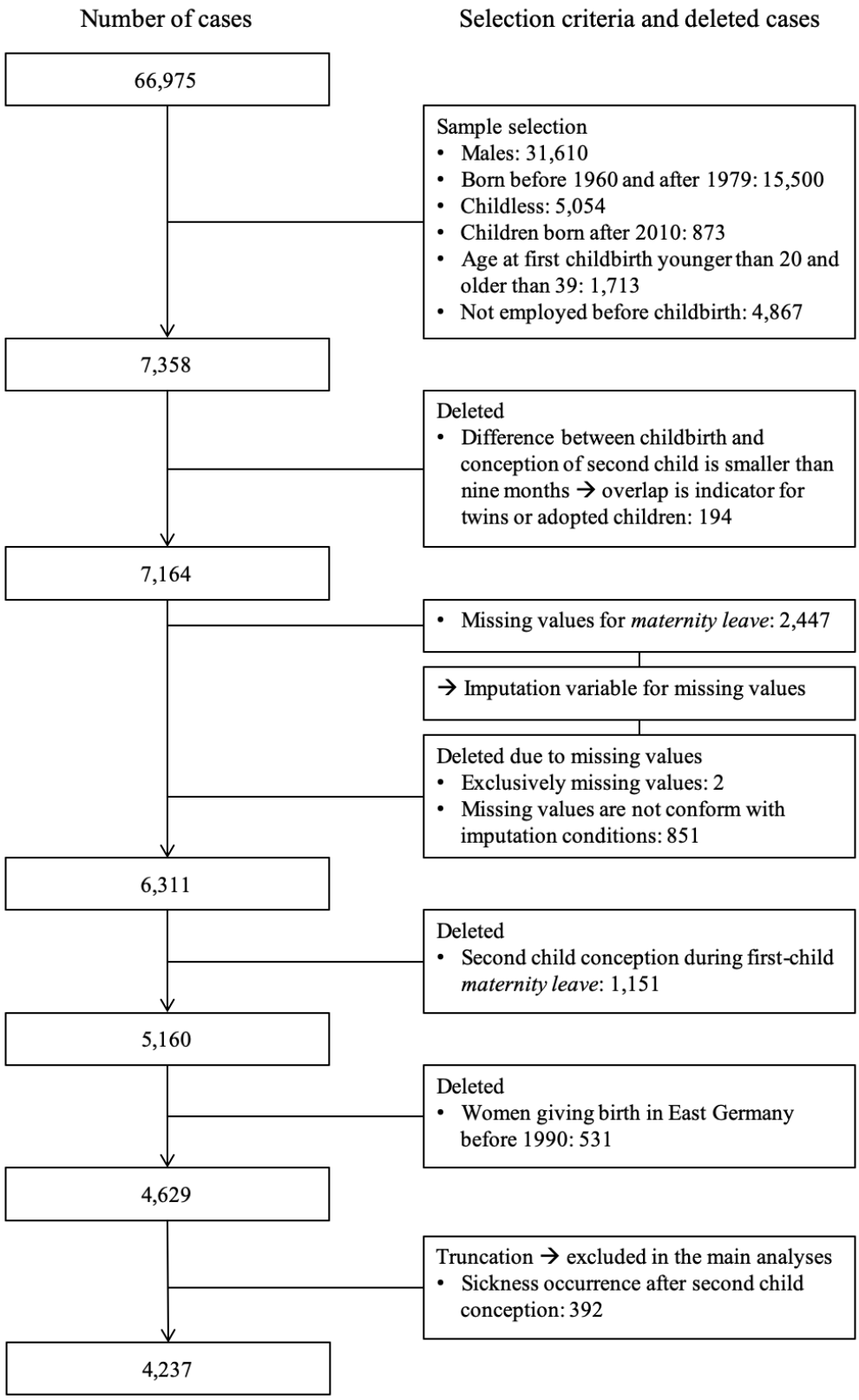
Note: The table shows the distributions of the four categories of age at first childbirth on the birth cohort categories. The distribution is rather similar across the birth cohorts with a slight shift towards higher ages of first-time motherhood with a younger birth year. Notable is that the youngest birth cohort 1975-1979 indicates very few first-time mothers aged 35 to 39 (dashed frame). This can be explained by the sample selectio. The original VSKT 2015 sample was drawn on 31 December 2015.To ensure a sufficient observation period of at least five years, all mothers giving birth after 31 December 2010 were excluded from the sample. This means that many women in the youngest birth cohort had not yet reached the oldest category of age at first childbirth of 35-39 years.

Table A5: Distribution maternity leave durations in months

ML	%	Cum.	length	ML	%	Cum.	length	ML	%	Cum.	length
0	46.66	46.66	2 months	**13**	1.30	58.13		**25**	1.09	72.79	
				14	0.94	59.07		**26**	0.94	73.73	
3	0.94	47.60		**15**	0.68	59.76		**27**	0.64	74.37	
4	0.66	48.27		**16**	0.54	6.30		**28**	0.54	74.91	
5	0.99	49.26		**17**	0.85	61.15		**29**	0.80	75.71	
6	0.90	5.15		**18**	0.64	61.79	13-24 months	**30**	0.57	76.28	25-36 months
7	0.50	5.65	3-12 months	**19**	0.52	62.31		**31**	0.92	77.20	
8	0.64	51.29		**20**	0.71	63.02		**32**	0.64	77.84	
9	0.94	52.23		**21**	0.54	63.56		**33**	0.90	78.73	
10	0.80	53.03		**22**	0.83	64.39		**34**	0.52	79.25	
11	2.01	55.04		**23**	1.63	66.01		**35**	4.11	83.36	
12	1.79	56.83		**24**	5.69	71.70		**36**	16.64	100	

Note: The table shows how many women in the sample choose how many months of maternity leave (ML) and how the categories of the variable length were built based on the distribution. The grey shaded markers show the relatively highest shares of utilised maternity leave months and the limits for the length categories (in dashed lines).

Figure A9: Process description of the data cleaning process



Note: The graphic shows the process description of the data cleaning process and sample selection (right column) and how the number of cases developed (left column).

Addition A2: Reflection on sample selection

The sample selection within the current analysis was proceeded carefully and all cases, which did not match the sample requirements (3.2), were excluded to prevent biases. The sample was regularly tested for a balanced distribution during the data cleaning process and always appeared balanced (Figure A9: Process description of the data cleaning process) with the exemption of the distribution of age at first childbirth and birth cohort. The youngest cohort of women born between 1975 and 1979 indicate very few cases (N = 8) in the oldest category of age at first childbirth (Table A4). This can be explained by the set observation limitation excluding all mothers giving birth after 31.12.2010 (3.3). Women who give birth the first time until this date and belong to the youngest cohort group cannot be older than 35, which is only 0.72% of this cohort group. The underrepresentation of the youngest birth cohort in the age at first childbirth group of 35 to 39 should be considered in the interpretation of the results. Considering the trend of increasing age of first-time motherhood with later years of birth across the sample, the birth cohorts of 1975 to 1979 might be expected to show a higher prevalence of first-time mothers in the oldest motherhood age group. This issue of truncation is discussed in chapter 3.4.

The sample includes first-time mothers, to whom different *maternity leave* policies were applicable. Noticeable in the sample structure is the sickness prevalence in the subsample with children born before 1992 (N = 643/15.18%). Since the 36 months prolongation of the leave only came into force in 1992, no *maternity leave* policy reform is applicable for this subsample (2.3). With 43% of sickness occurrence within this group (vs. total: 28%, *reform1992*: 26%, and *reform2007*: 19%), the prevalence is exceptionally high in the entire distribution. When looking at subsamples with different policy conditions before 1992, different patterns in the sickness occurrence and the *maternity leave* lengths can be observed (Table A25). The main differences to the other reform groups in the sample are that all women having children before 1992 had a maximum leave entitlement of 6 months and mothers with children born before 1986 (N = 157) also received no financial benefit. This subgroup (a) has a sickness share of 43%, the one having children between 1986 and 1991 (N = 486) (b) one of 54%. When looking at the *maternity leave* utilisation among these subgroups, the only few women (9(a)/6(b)%) take longer leaves than 24 months. In subgroup b an increased share of women prolongs their leaves up to 24 months (+11%) compared to group a, in which, on the other hand, are more women prolonging to 12 moths (+14%). When taking a look at the leave distribution for those mothers who experience sickness, the trend in subgroup a is similar to the one of the full sample: the longer the maternity leave, the higher the share of women becoming sick. Group b indicates an opposite distribution. Remarkably many women who take the statutory leave become sick (59%), a prolongation of up to 24 months shows a 26% share of sickness occurrence. Many women of the cohorts represented in these subgroups belong to older birth cohorts and also more traditional role models. They did not return to their work after having a child and became full-time mothers. When considering the policy conditions for those women who returned, extending the leave for more than 6 months burdened risks of not being able to return to work and also required financial independence from the welfare state. After introducing financial benefits in 1986, more women extended their leaves longer, but those women who returned to work after the statutory leave had high sickness prevalence. One could argue that they could not afford longer leaves due to the means-tested allowance with which living costs could not be covered.

Similar benefit conditions were applicable for women giving birth between 1992 and 2006. Although they were entitled to up to 36 months of maternity leave, they allowance was means-tested and still as low as before resulting in exclusiveness of long maternity leaves. The selection dimension of affordability was higher prioritised than after the reform of 2007, when most women received relative and absolute higher financial allowances. The descriptive results show, that a majority of women within this group either not extends the statutory leave (48%) or takes a leave longer than 24 months (34%) (appendix). This distribution is far more balanced after the reform of 2007, although the fertility and *maternity leave* utilisation of the considered cohorts is not yet finished. Repeating the analysis with more recent data and complete fertility and post-maternity leave health information on the 1975 to 1979 birth cohorts might bring more specific insights whether the introduction of an individual-based income-related allowance balances selection effects based on financial considerations.

Another aspect of the sample selection worth to discuss is the exclusion of mothers in East Germany before the reunification in 1990. With the reunification of East and West Germany in 1990, there was also the need to convert the pension entitlements from the pension systems of the German Democratic Republic (GDR) into federal German law agreed upon in the unification agreement and implemented accordingly with the Pension Transfer Act as well as the Claims and Provisions Transfer Act (BMJV, 1990). The merging of the two pension insurance databases in 1991 revealed measurement differences in some employment information such as sickness absence. Different from the recording of only serious sickness cases by the DRV, sickness was counted as total sick leave days of any kind in the GDR. When the data bases were merged, the GDR sickness days were summed up and counted down from the last day of the respective year. Every month indicating at least one sick day was counted as a sickness month in the DRV translation. For instance, if a woman in the GDR had 38 sick days in 1985 it was translated in two sickness months of November and December 1985 in her records. Since this actually does not reflect the true timing of sickness for these women and is also not comparable with the kind of serious sickness measured by the DRV, the results of the analysis would be biased. For that reason, all cases having childbirth in the GDR before 1991 were excluded from the sample.

Addition A3: Reflection on dealing with data issues

Possible data issues in the current analysis are missing data, (right-)censoring and truncation (3.4). Observations with missing values were deleted from the sample to avoid biased results by unknown information (Figure A9: Process description of the data cleaning process). An exemption was made for missing values in the *maternity leave* variable, which were replaced by an imputation variable if the missing data's structure was similar to the patterns of women on *maternity leave* (3.6). Problems might occur due to the exclusion of women being not employed before their first pregnancy since the reason is unknown. If those women dropped out of the labour market due to health reasons, they were not included in the analysis. The same accounts for women who could not be included in the sample since they were not registered at the DRV due to health reasons (3.1; 3.2). The missing knowledge about those cases who are either not active in the labour market anymore or not even included in the sample due to their inactiveness can be summarised under the issue of censoring (3.4). Since there is no information on the health outcomes of those women, it is hard to guess the effect of their *maternity leave* durations on their sickness occurrence. The neglection of those cases raises the question whether the sample selection is representative for the population and considers all types of women. However, within the scope of the used data set, as many cases as possible were kept in the sample and many aspects such as previous sickness occurrence are covered by the operationalised variables (3.5).

Table A6: Codebook of the used variables

Variable name	Description
ageb1	Age of mother at first childbirth in categories Explanation: age of the mother at the first childbirth and categorised in age groups of 20 to 24, 25 to 29, 30 to 34, and 35 to 39 years of age *Time-constant, categorical* Coding: 1 = 20-24, 2 = 25-29, 3 = 30-34, 4 = 35-39
ageb1y	Age of mother at first childbirth in years Explanation: age of the mother at the first childbirth rounded to full years *Time-constant, continuous*
case	Case number of the insured person Explanation: number as a unique identifier, allocated in the process of the sample drawing from the master data by the German Pension Insurance (DRV) *Time-constant, continuous*
cohort	Birth cohort of mother Explanation: year of birth of mother categorised in birth cohorts of 1960 to 1964, 1965 to 1969, 1970 to 1974, and 1975 to 1979 *Time-constant, categorical* Coding: 1 = 1960-1964, 2 = 1965-1969, 3 = 1970-1974, 4 = 1975-1979
conception2	Age at conception of second pregnancy in months Explanation: age of mother in month in which the second child was conceived and starting point of a second pregnancy used as exclusion criterium of the sample to avoid interference of a second pregnancy with the mother's health *Time-constant, continuous*

duration	Duration until sickness occurs in months Explanation: duration from childbirth to sickness occurrence (if applicable) measured in months *Time-constant, continuous*
high	Income above average Explanation: mean income in the year before the first child conception is above the average of the population during that period, estimations based on the earning points system of the DRV *Time-constant, categorical (dummy)* Coding: 0 = No, 1 = Yes
length	Maternity leave duration in categories Explanation: length of maternity leave measured in categories of 2 months (statutory), 3 to 12, 13 to 24 and 25 to 36 months (including the statutory 2 months) *Time-constant, categorical* Coding: 0 = 2 months (stat.), 1 = 3-12 months, 2 = 13-24 months, 3 = 25-36 months
low	Income below median Explanation: mean income in the year before the first child conception is below the median (50 % percentile) of the population income distribution during that period, estimations based on the earning points system of the DRV *Time-constant, categorical (dummy)* Coding: 0 = No, 1 = Yes
m1sum	Total months of maternity Explanation: length of maternity leave measured in the total amount of months *Time-constant, categorical (dummy)*
maternity1	Maternity leave after first childbirth Explanation: indicates whether maternity leave (in addition to the statutory 2 months) was taken after the first childbirth *Time-constant, categorical (dummy)* Coding: 0 = No, 1 = Yes
postempl	Employed after maternity leave Explanation: indicates whether a woman returns to her regular employment immediately after finishing her maternity leave *Time-constant, categorical (dummy)* Coding: 0 = No, 1 = Yes
postmarg	Transition to marginal employment maternity leave Explanation: indicates whether a woman changes from her pre-birth regular employment to marginal employment after finishing her maternity leave *Time-constant, categorical (dummy)* Coding: 0 = No, 1 = Yes
preincome	Income distribution Explanation: mean income in the year before the first child conception in an income category across the population income distribution during that period, estimations based on the earning points system of the DRV *Time-constant, categorical* Coding: 1 = lower than 25 % (percentile), 2 = between 26 % and 50 %, 3 = between 51 % and 75 %, 4 = above 75 %
prevsick	Bad health condition Explanation: indicates whether a woman experiences any serious sickness previous to first pregnancy as a proxy for a bad health condition *Time-constant, categorical (dummy)* Coding: 0 = No, 1 = Yes
reduced	Reduced working hours after maternity leave Explanation: indicates whether a woman reduced her working hours after finishing her maternity leave compared to before the first pregnancy *Time-constant, categorical (dummy)* Coding: 0 = No, 1 = Yes
reform1992	Maternity leave reform of 1992 Explanation: indicates whether a mothers' first child is born on or later than 01.01.1992 and the maternity leave reform of 1992 is applicable to her

	Time constant, categorical (dummy) Coding: 0 = No, 1 = Yes
reform2007	Maternity leave reform of 2007 Explanation: indicates whether a mothers' first child is born on or later than 01.01.2007 and the maternity leave reform of 2007 is applicable to her *Time constant, categorical (dummy)* Coding: 0 = No, 1 = Yes
SICK	Sickness occurrence (event and dependent variable) Explanation: marks the month of first sickness occurrence to identify the event of interest *Time-varying, categorical (dummy)* Coding: 0 = No, 1 = Yes
*sick_*	Sickness occurrence Explanation: indicates whether a woman experiences any sickness after the maternity leave *Time-constant, categorical (dummy)* Coding: 0 = No, 1 = Yes
sicknessy	Age of first sickness occurrence after first childbirth in years Explanation: indicates the age a woman experiences the post-leave sickness (if applicable) rounded to years *Time-constant, continuous*
t	Time indicator (months) Explanation: continuous time variable counting the months from the childbirth birth onwards (t_0 = childbirth) *Time-varying, continuous*
tsqr	Time indicator squared (months^2) Explanation: squared term of time variable *Time-varying, continuous*
yob	Year of birth (mother) Explanation: indicates the year of birth of the mother *Time-constant, continuous*

Note: The table lists and describes all used variables in the current analysis and how they are operationalised and specified.

Addition A4: Type of research and appropriateness of methodological approach

In line with the objective of the present study to investigate the effect of *maternity leave* durations on health outcomes in first-time mothers in Germany, a quantitative analysis is an appropriate method. The used data set of the VSKT 2015 (DRV, 2018a) is a panel data set providing information on the employment biography of individuals. Due to its initial administrative purpose in the pension system, the VSKT data set includes those characteristics of women, which are relevant for the calculation of pension rates. This includes information on employment and different kinds of work, income, and reasons for temporary or long-term absence from the labour market such as unemployment, sickness or childcare/maternity leave. In combination with demographic data such as the age of a woman, how many children she has and when they were born, it is possible to reconstruct all necessary information to investigate the effect of *maternity leave* on mothers' health as described in chapter 3.5.1. For that reason, the data set was evaluated as matching the objective of the current research. Ethical standards of a quantitative data analysis were also considered and evaluated as appropriate (Table A7). In addition, the panel structure of the data set allows to follow the employment, *maternity leave* and sickness history of women over time enabling the observation of developments in single individuals.

The data format also enables the application of a longitudinal analysis design like the used event history analysis approach of discrete-time logit. They estimate in a logistic regression design the log odds of sickness occurrence after *maternity leave* durations considering the timing and different covariates and interaction terms between *maternity leave*, time and/or other variables. Based on the log odds coefficients, probabilities of sickness occurrence can be calculated. The main advantage of this type of analysis is the ability and to include the timing of the outcome variable sickness occurrence, which is besides other control variables assumed to be an important influence factor on the sickness risks of women after their *maternity leave*. Similar results were expected from the firstly initiated data analysis with proportional hazard models, which could be not be applied since the proportionality assumption was not met (3.7). Nonetheless, the results of the descriptive, survival and discrete-time logit regression analysis were used to test the hypotheses, and the to answer the research question (2.4; 1.3). For

that reason, the used method and type of analysis is evaluated as appropriate for the used data set and the current analysis.

Table A7: Ethical considerations of the current analysis

Reliability of the data	The initial administrative purpose of the data for the DRV introduces a high level of data quality and a high probability of reliability of the information.
Traceability of observations	Due to the randomised sample drawn from the full population and the usage of anonymous identifiers (3.1), the risks of included observations being traced is very low.
Informed consent	The subjects did not specifically agree on their data being used in the current study. But in accordance with the anonymisation of the individuals in the sample by the FDZ, the informed consent might be seen as less relevant since the persons are hardly traceable.
Secondary data analysis	Since the data collection is delocalised from the data analysis, the high level of sensitivity of the data might also be less of an issue since the involved persons never were in direct or indirect contact with the observed individuals.
Usage and confidentiality	The availability of the SUF is exclusively for research in independent, scientific institutions (including departmental research institutions). The data sets may then be evaluated in the location agreed upon between the FDZ (data owner) and the respective institution (data user). The current analysis of the VSKT 2015 was conducted at the Max Planck Institute for Demographic Research (MPIDR) in Rostock, Germany. The data could only be accessed within the facilities of the MPIDR. The data usage licence for the duration of my research internship (01.05.-31.07.2019) at the MPIDR was agreed upon on 2 May 2019 by the FDZ. I am aware of the sensitivity as well as confidentiality of the data and have agreed to the confidentiality declaration.

Note: The table shows some ethical considerations in quantitative analysis in social research applicable in the present research. The information is given from the perspective of the author of the present research, Lara Bister.

Appendix B: Regression equations

Equation A1: Discrete-time logit regression Model 1

$$\log\left(\frac{SICK}{1-SICK}\right) = t * \alpha_1 + t^2 * \alpha_2 + \beta_0 + length_{3-12\ months} * \beta_1 + length_{13-24\ months} * \beta_2 + length_{25-36\ months} * \beta_3 + \varepsilon$$

Equation A2: Discrete-time logit regression Model 2

$$\log\left(\frac{SICK}{1-SICK}\right) = t * \alpha_1 + t^2 * \alpha_2 + \beta_0 + length_{3-12\ months} * \beta_1 + length_{13-24\ months} * \beta_2 + length_{25-36\ months} * \beta_3 + t * length_{3-12\ months} * \beta_4 + t * length_{13-24\ months} * \beta_5 + t * length_{25-36\ months} * \beta_6 + t^2 * length_{3-12\ months} * \beta_7 + t^2 * length_{13-24\ months} * \beta_8 + t^2 * length_{25-36\ months} * \beta_9 + \varepsilon$$

Equation A3: Discrete-time logit regression Model 3

$$\log\left(\frac{SICK}{1-SICK}\right) = t * \alpha_1 + t^2 * \alpha_2 + \beta_0 + length_{3-12\ months} * \beta_1 + length_{13-24\ months} * \beta_2 + length_{25-36\ months} * \beta_3 + t * length_{3-12\ months} * \beta_4 + t * length_{13-24\ months} * \beta_5 + t * length_{25-36\ months} * \beta_6 + t^2 * length_{3-12\ months} * \beta_7 + t^2 * length_{13-24\ months} * \beta_8 + t^2 * length_{25-36\ months} * \beta_9 + ageb1_{24-29} * \beta_{10} + ageb1_{30-34} * \beta_{11} + ageb1_{35-39} * \beta_{12} + cohort_{1965-1969} * \beta_{13} + cohort_{1970-1974} * \beta_{14} + cohort_{1975-1979} * \beta_{15} + prevsick * \beta_{16} + high * \beta_{17} + low * \beta_{18} + postempl * \beta_{19} + postmarg * \beta_{20} + reduced * \beta_{21} + reform1 * \beta_{22} + reform2 * \beta_{23} + \varepsilon$$

Equation A4: Discrete-time logit regression Model 4

$$\log\left(\frac{SICK}{1-SICK}\right) = t * \alpha_1 + t^2 * \alpha_2 + \beta_0 + length_{3-12\ months} * \beta_1 + length_{13-24\ months} * \beta_2 + length_{25-36\ months} * \beta_3 + t * length_{3-12\ months} * \beta_4 + t * length_{13-24\ months} * \beta_5 + t * length_{25-36\ months} * \beta_6 + t^2 * length_{3-12\ months} * \beta_7 + t^2 * length_{13-24\ months} * \beta_8 + t^2 * length_{25-36\ months} * \beta_9 + ageb1_{24-29} * \beta_{10} + ageb1_{30-34} * \beta_{11} + ageb1_{35-39} * \beta_{12} + cohort_{1965-1969} * \beta_{13} + cohort_{1970-1974} * \beta_{14} + cohort_{1975-1979} * \beta_{15} + prevsick * \beta_{16} + high * \beta_{17} + low * \beta_{18} + postempl * \beta_{19} + postmarg * \beta_{20} + reduced * \beta_{21} + reform1 * \beta_{22} + reform2 * \beta_{23} + ageb1_{25-29} * length_{3-12\ months} * \beta_{24} + ageb1_{25-29} * length_{13-24\ months} * \beta_{25} + ageb1_{25-29} * length_{25-36\ months} * \beta_{26} + ageb1_{30-34} * length_{3-12\ months} * \beta_{27} + ageb1_{30-34} * length_{13-24\ months} * \beta_{28} + ageb1_{30-34} * length_{25-36\ months} * \beta_{29} + ageb1_{35-39} * length_{3-12\ months} * \beta_{30} + ageb1_{35-39} * length_{13-24\ months} * \beta_{31} + ageb1_{35-39} * length_{25-36\ months} * \beta_{32} + cohort_{1965-1969} * length_{3-12\ months} * \beta_{33} + cohort_{1965-1969} * length_{13-24\ months} * \beta_{34} + cohort_{1965-1969} * length_{25-36\ months} * \beta_{35} + cohort_{1970-1974} * length_{3-12\ months} * \beta_{36} + cohort_{1970-1974} * length_{13-24\ months} * \beta_{37} + cohort_{1970-1974} * length_{25-36\ months} * \beta_{38} + cohort_{1975-1979} * length_{3-12\ months} * \beta_{39} + cohort_{1975-1979} * length_{13-24\ months} * \beta_{40} + cohort_{1975-1979} * length_{25-36\ months} * \beta_{41} + prevsick * length_{3-12\ months} * \beta_{42} + prevsick * length_{13-24\ months} * \beta_{43} + prevsick * length_{25-36\ months} * \beta_{44} + high * length_{3-12\ months} * \beta_{45} + high * length_{13-24\ months} * \beta_{46} + high * length_{25-36\ months} * \beta_{47} + postempl * length_{3-12\ months} * \beta_{48} + postempl * length_{13-24\ months} * \beta_{49} + postempl * length_{25-36\ months} * \beta_{50} + reduced * length_{3-12\ months} * \beta_{51} + reduced * length_{13-24\ months} * \beta_{52} + reduced * length_{25-36\ months} * \beta_{53} + ageb1_{25-29} * length_{3-12\ months} * t * \beta_{54} + ageb1_{25-29} * length_{13-24\ months} * t * \beta_{55} + ageb1_{25-29} * length_{25-36\ months} * t * \beta_{56} + ageb1_{30-34} * length_{3-12\ months} * t * \beta_{57} + ageb1_{30-34} * length_{13-24\ months} * t * \beta_{58} + ageb1_{30-34} * length_{25-36\ months} * t * \beta_{59} + ageb1_{35-39} * length_{3-12\ months} * t * \beta_{60} + ageb1_{35-39} * length_{13-24\ months} * t * \beta_{61} + ageb1_{35-39} * length_{25-36\ months} * t * \beta_{62} + cohort_{1965-1969} * length_{3-12\ months} * t * \beta_{63} + cohort_{1965-1969} * length_{13-24\ months} * t * \beta_{64} + cohort_{1965-1969} * length_{25-36\ months} * t * \beta_{65} + cohort_{1970-1974} * length_{3-12\ months} * t * \beta_{66} + cohort_{1970-1974} * length_{13-24\ months} * t * \beta_{67} + cohort_{1970-1974} * length_{25-36\ months} * t * \beta_{68} + cohort_{1975-1979} * length_{3-12\ months} * t * \beta_{69} + cohort_{1975-1979} * length_{13-24\ months} * t * \beta_{70} + cohort_{1975-1979} * length_{25-36\ months} * t * \beta_{71} + \varepsilon$$

Appendix C: Additional tables

Table A8: Summary statistics for all variables

Variable	Categorical	Observations	Mean	Std. Dev.	Min	Max
ageb1	X	1,528,835	2.28	0.889174	1	4
ageb1y		1,528,835	28.37	4.269852	20	39
case		1,529,557			79	673806
cohort	X	1,529,557	2.67	1.04295	1	4
conception2		788,063	374.40	48.42922	253	574
duration		416,955	34.52	47.33025	0	286
high	X	1,529,557	0.31	0.4621561	0	1
low	X	1,529,557	0.36	0.4802526	0	1
m1sum		1,529,557	13.50	14.85381	0	36
maternity1	X	1,529,557	0.53	0.4988836	0	1
postempl	X	1,529,557	0.45	0.4971342	0	1
postmarg	X	1,529,557	0.13	0.3353116	0	1
preincome	X	1,529,557	2.83	1.097378	1	4
prevsick	X	1,529,557	0.15	0.3534368	0	1
reduced	X	1,529,557	0.19	0.3909842	0	1
reform1992	X	1,529,557	0.69	0.4629312	0	1
reform2007	X	1,529,557	0.16	0.3659658	0	1
SICK	X	1,529,557	0.0008	0.0274691	0	1
sick	X	1,529,557	0.27	0.4452962	0	1
sicknessy		368,581	3.96	4.351645	21	39
t		1,049,205	129.64	79.78677	1	351
tsqr		1,049,205	23171.75	23496.54	1	123201
yob		1,529,557	1970.37	5.297506	1960	1979

Note: The table lists all variables used in the current analysis, indicates whether they are categorical and shows their summary statistics.

Table A9: Snapshot of the sample (full)

	Full		**Not sick** (sick_=0)			**Sick** (sick_=1)			
	cases	**%**	**case**	**%**	**% (full)**	**case**	**%**	**% (full)**	**% (sick)**
N	4,237	10.00	3082		0.73	1155		0.27	
Maternity leave (*length*)									
2 months (stat.)	1,977	0.47	1,764	0.89	0.42	213	0.11	0.05	0.18
3-12 months	431	0.10	338	0.78	0.08	93	0.22	0.02	0.08
13-24 months	630	0.15	379	0.60	0.09	251	0.40	0.06	0.22
25-36 months	1,199	0.28	601	0.50	0.14	598	0.50	0.14	0.52
Age at first childbirth (*ageb1*)									
20-24	877	0.21	532	0.17	0.13	345	0.30	0.08	0.30
25-29	1,686	0.40	1,224	0.40	0.29	462	0.40	0.11	0.40
30-34	1,298	0.31	1,029	0.33	0.24	269	0.23	0.06	0.23
35-39	374	0.09	295	0.10	0.07	79	0.07	0.02	0.07
Birth cohort (*cohort*)									
1960-1964	728	0.17	530	0.17	0.13	198	0.17	0.05	0.17
1965-1969	1,065	0.25	702	0.23	0.17	363	0.31	0.09	0.31
1970-1974	1,339	0.32	983	0.32	0.23	356	0.31	0.08	0.31
1975-1979	1,105	0.26	867	0.28	0.20	238	0.21	0.06	0.21
Previous sickness (*prevsick*)	620	0.15	339	0.55	0.08	281	0.45	0.07	0.24
Others	3,617	0.85	2,743	0.45	0.65	874	0.55	0.21	0.76
Income > mean (*high*)	1,310	0.31	1,042	0.80	0.25	268	0.20	0.06	0.23
Others	2,927	0.69	2,040	0.20	0.48	887	0.8	0.21	0.77
Income < median (*low*)	1,529	0.36	1,053	0.69	0.25	476	0.31	0.11	0.41
Others	2,708	0.64	2,029	0.31	0.48	679	0.69	0.16	0.59

Income distribution (*preincome*)									
<= 25 %	718	0.17	461	0.64	0.11	257	0.36	0.06	0.22
26-50 %	811	0.19	592	0.73	0.14	219	0.27	0.05	0.19
51-75 %	1,170	0.28	838	0.72	0.20	332	0.28	0.08	0.29
> 75 %	1,538	0.36	1,191	0.77	0.28	347	0.23	0.08	0.30
Post maternity leave working transitions									
Reg. employed (*postempl*)	1,892	0.45	1,062	0.56	0.25	830	0.44	0.20	0.72
Others	2,345	0.55	2,020	0.44	0.48	325	0.56	0.08	0.28
Reduced hours (*reduced*)	789	0.19	558	0.71	0.13	240	0.30	0.06	0.21
Others	3,448	0.81	2,524	0.29	0.60	915	0.70	0.22	0.79
Marginal work (*postmarg*)	547	0.13	473	0.86	0.11	74	0.14	0.02	0.06
Others	3,690	0.87	2,609	0.14	0.62	1,081	0.86	0.26	0.94
Childcare leave reforms									
No reform (birth<1992)	643	0.15	374	0.58	0.09	269	0.42	0.06	0.23
Reform 1992 (*reform1992*)	2,919	0.69	2,158	0.74	0.51	761	0.26	0.18	0.66
Reform 2007 (*reform2007*)	675	0.16	550	0.81	0.13	125	0.19	0.03	0.11

Note: The table shows the total and relative (to entire sample and sickness-sub samples) distribution of women across the different covariates by the total sample and the sub samples experiencing sickness and not.

Table A10: Choice of maternity leave duration

Length maternity leave			**2 months (stat.)**			**3-12 months**		
	cases	**% (full)**	**cases**	**%**	**% (full)**	**cases**	**%**	**% (full)**
Total	4,237		1977	0.47	0.47	431	0.10	0.10
SICK	1,155	0.27	213	0.11	0.05	93	0.22	0.02
Age at first childbirth (*ageb1*)								
20-24	877	0.21	365	0.42	0.09	93	0.11	0.02
25-29	1,686	0.40	818	0.49	0.19	146	0.09	0.03
30-34	1,298	0.31	626	0.48	0.15	146	0.11	0.03
35-39	374	0.09	166	0.44	0.04	46	0.12	0.01
Birth cohort (*cohort*)								
1960-1964	728	0.17	365	0.50	0.09	73	0.10	0.02
1965-1969	1,065	0.25	516	0.48	0.12	66	0.06	0.02
1970-1974	1,339	0.32	607	0.45	0.15	138	0.10	0.03
1975-1979	1,105	0.26	489	0.44	0.12	154	0.14	0.04
Bad health (*prevsick*)	620	0.15	191	0.31	0.05	56	0.09	0.01
Others	3,617	0.85	1,786	0.69	0.42	375	0.91	0.09
Income > mean (*high*)	1,310	0.31	742	0.57	0.18	132	0.10	0.03
Others	2,927	0.69	1,235	0.43	0.29	299	0.9	0.07
Income < median (*low*)	1,529	0.36	574	0.38	0.14	162	0.11	0.04
Others	2,708	0.64	1,403	0.62	0.33	269	0.89	0.06
Income distribution (*preincome*)								
<=25%	718	0.17	226	0.31	0.05	74	0.10	0.02
26-50%	811	0.19	348	0.43	0.08	88	0.12	0.02
51-75%	1,170	0.28	548	0.47	0.13	112	0.10	0.03
>75%	1,538	0.36	855	0.56	0.20	157	0.10	0.04
Post maternity leave working conditions								
Reg. employed (*postempl*)	1,892	0.45	411	0.22	0.10	209	0.11	0.05
Others	2,345	0.55	1,566	0.78	0.37	222	0.89	0.05
Reduced hours (*reduced*)	798	0.19	476	0.60	0.11	38	0.05	0.01
Others	3,439	0.81	1,501	0.4	0.35	393	0.95	0.09
Marginal work (*postmarg*)	547	0.13	35	0.06	0.01	173	0.32	0.04
Others	3,690	0.87	1,942	0.94	0.46	258	0.68	0.06
Childcare leave reforms								
No reform (birth<1992)	643	0.15	279	0.43	0.07	75	0.13	0.02
Reform 1992 (*reform1992*)	2,919	0.69	1,397	0.48	0.33	250	0.09	0.06
Reform 2007 (*reform2007*)	675	0.16	301	0.45	0.07	106	0.16	0.03

Length maternity leave			13-24 months			25-36 months		
	cases	%(full)	cases	%	%(full)	cases	%	%(full)
Total	4,237		630	0.19		1199	0.28	
SICK	1,155	0.27	251	0.40	0.06	598	0.50	0.14
ageb1								
20-24	877	0.21	209	0.24	0.05	210	0.24	0.05
25-29	1,686	0.40	258	0.16	0.06	464	0.28	0.11
30-34	1,298	0.31	129	0.10	0.03	397	0.31	0.09
35-39	374	0.09	34	0.09	0.01	128	0.34	0.03
cohort								
1960-1964	728	0.17	137	0.19	0.03	153	0.21	0.04
1965-1969	1,065	0.25	164	0.15	0.04	319	0.30	0.08
1970-1974	1,339	0.32	150	0.11	0.04	444	0.33	0.10
1975-1979	1,105	0.26	179	0.16	0.04	283	0.26	0.07
Bad health (*pre_sick*)	620	0.15	141	0.23	0.03	232	0.37	0.05
Others	3,617	0.85	489	0.77	0.12	967	0.63	0.23
Income > mean (*pre_inc*)	1,310	0.31	139	0.11	0.03	297	0.23	0.07
Others		0.69	491	0.89	0.12	902	0.77	0.21
Income < median (*low*)	1,529	0.36	290	0.19	0.07	503	0.33	0.12
Others	2,708	0.64	340	0.81	0.08	696	0.67	0.16
Income distribution (*pre_income*)								
<= 25 %	718	0.17	175	0.24	0.04	243	0.34	0.06
26-50 %	811	0.19	115	0.14	0.03	260	0.32	0.06
51-75 %	1,170	0.28	170	0.15	0.04	340	0.29	0.08
➢ **75 %**	1,538	0.36	170	0.11	0.04	356	0.23	0.08
Post maternity leave working conditions								
Reg. employed (*postempl*)	1,892	0.45	415	0.22	0.10	857	0.46	0.20
Others	2,345	0.55	215	0.78	0.05	342	0.54	0.08
Reduced hours (*reduced*)	798	0.19	106	0.13	0.03	178	0.223	0.04
Others	3,439	0.81	524	0.87	0.12	1021	0.777	0.24
Marginal work (*postmarg*)	547	0.13	170	0.31	0.04	169	0.31	0.04
Others	3,690	0.87	460	0.69	0.11	1030	0.69	0.24
Childcare leave reform								
No reform (birth<1992)	643	0.15	244	0.38	0.06	45	0.07	0.01
Reform 1992 (*reform1992*)	2,919	0.69	280	0.10	0.07	992	0.34	0.23
Reform 2007 (*reform2007*)	675	0.16	106	0.16	0.03	162	0.24	0.038

Note: Note: The table shows the total and relative (to entire sample and leave groups) distribution of women across the different covariates by the total sample and the maternity leave groups.

Table A11: Distribution age at first childbirth among different birth cohorts in percentage

	Birth cohorts			
Age at first childbirth	**1960-1964**	**1965-1969**	**1970-1974**	**1975-1979**
20-24	22.66	23.89	19.19	18.19
25-29	38.60	36.78	35.70	48.51
30-34	28.30	27.94	32.49	32.58
35-39	16.35	14.19	22.98	0.72
Total	100.00	100.00	100.00	100.00

Note: The table shows the distributions of the four categories of age at first childbirth on the four birth cohort categories. The distribution is rather similar across the birth cohorts with a slight shift towards advanced-aged first-time mothers with a younger birth year.

Table A12: Two-sample t tests by sickness occurrence

Variable	Observations	Mean	Std. Err.	Std. Dev.	95 % CI	
m1sum	1,529,557	13.50	0.012010	14.85	13.479	13.526
Not sick	1,112,602	9.78	0.012754	13.45	9.759	9.809
Sick	416,955	23.43	0.002141	13.82	23.38	23.47
Difference		-13.64	0.024613		-13.69	-13.59
H_0: difference(mean) = 0	Pr(T < t): 0.00	Pr(|T| > |t|): 0.00	Pr(T > t): 1.00			t = -5.5e+02
					Degrees of freedom: 1.5e+06	
ageb1y	1,529,557	28.37	0.003453	4.27	28.36	28.38
Not sick	1,112,602	28.77	0.003953	4.17	28.76	28.77
Sick	416,955	27.31	0.006748	4.36	27.30	27.33
Difference		1.45	0.007644		1.45	1.47
H_0: difference(mean) = 0	Pr(T < t): 1.00	Pr(|T| > |t|): 0.00	Pr(T > t): 0.00			t = 189.5114
					Degrees of freedom: 1.5e+06	
yob	1,529,557	1970.37	0.004283	5.30	1970.36	1970.38
Not sick	1,112,602	1970.60	0.005073	5.35	1970.59	1970.61
Sick	416,955	1969.76	0.007902	5.10	1969.75	19.69.78
Difference		0.84	0.009596		0.82	0.85
H_0: difference(mean) = 0	Pr(T < t): 1.00	Pr(|T| > |t|): 0.00	Pr(T > t): 0.00			t = 87.0880
					Degrees of freedom: 1.5e+06	
prevsick	1,529,557	0.15	0.000286	0.35	0.146	0.147
Not sick	1,112,602	0.11	0.000297	0.31	0.109	0.111
Sick	416,955	0.24	0.000665	0.43	0.146	0.147
Difference		-0.13	0.000633		-0.135	-0.132
H_0: difference(mean) = 0	Pr(T < t): 0.00	Pr(|T| > |t|): 0.00	Pr(T > t): 1.00			t = -2.1e+02
					Degrees of freedom: 1.5e+06	
postempl	1,529,557	0.45	0.000402	0.50	0.446	0.447
Not sick	1,112,602	0.34	0.000451	0.48	0.344	0.345
Sick	416,955	0.72	0.000697	0.45	0.717	0.720
Difference		-0.37	0.000851		-0.376	-0.372
H_0: difference(mean) = 0	Pr(T < t): 0.00	Pr(|T| > |t|): 0.00	Pr(T > t): 1.00			t = -4.4e+02
					Degrees of freedom: 1.5e+06	
reduced	1,529,557	0.19	0.390984	0.40	0.188	0.189
Not sick	1,112,602	0.18	0.000365	0.39	0.180	0.182
Sick	416,955	0.21	0.405728	0.41	0.207	0.209
Difference		-0.03	0.000710		-0.028	-0.025
H_0: difference(mean) = 0	Pr(T < t): 0.00	Pr(|T| > |t|): 0.00	Pr(T > t): 1.00			t = -37.6834
					Degrees of freedom: 1.5e+06	
postmarg	1,529,557	0.13	0.000271	0.34	0.129	0.130
Not sick	1,112,602	0.15	0.000342	0.36	0.153	0.154
Sick	416,955	0.06	0.000379	0.24	0.063	0.065
Difference		0.09	0.000605		0.088	0.091
H_0: difference(mean) = 0	Pr(T < t): 1.00	Pr(|T| > |t|): 0.00	Pr(T > t): 0.00			t = 147.882
					Degrees of freedom: 1.5e+06	

Note: The table shows the results of two-sample t tests by sickness occurrence with equal variances for the indicated variables with Std. Err. = standard error, Std. Dev. = standard deviation, difference(mean) = mean(not sick) – mean(sick) H_a: difference < 0: Pr(T < t), H_a: difference != 0: Pr(\|T\| < \|t\|), H_a: difference > 0: Pr(T > t).

Table A13: Variance ratio test for income distribution by sickness occurrence

Variable	Observations	Mean	Std. Err.	Std. Dev.	95 % CI	
preinc	1,529,557	2.83	0.000887	1.10	2.830	2.834
Not sick	1,112,602	2.90	0.001024	1.08	2.893	2.897
Sick	416,955	2.67	0.001744	1.13	2.662	2.669
H_0: ratio(sd) = 1	Pr(F < f): 0.00	2*Pr(F > f): 0.00	Pr(F > f): 1.00			f = 0.9192
					Degrees of freedom: 1,112,601, 558,466	

*Note: The tables show the results of the variance ratio test for income distribution by sickness occurrence with Std. Err. = standard error, Std. Dev. = standard deviation, ratio(sd = standard deviation) = sd(not sick) – sd(sick) H_a: ratio < 1: Pr(F < f), H_a: ratio != 1: 2 * Pr(F < f), H_a: ratio > 1: Pr(F > f).*

Table A14: Variance ratio test for maternity leave durations by different covariates

Variable	Observations	Mean	Std. Err.	Std. Dev.	95 % CI	
m1sum	1,529,557	13.50	0.012010	14.85	13.48	13.53
Pre-conception sickness (*prevsick*)						
No	1,305,737	12.62	0.012849	14.68	12.60	12.65
Yes	223,820	18.63	0.031316	14.82	18.57	18.69
H_0: ratio(sd) = 1	Pr(F < f): 0.00	2*Pr(F > f): 0.00	Pr(F > f): 1.00			f = 0.9820
					Degrees of freedom: 1,305,736, 223,819	
Income above mean (*high*)						
No	1,056,647	14.79	0.014506	14.91	14.76	14.82
Yes	472,910	10.62	0.020810	14.31	10.58	10.66
H_0: ratio(sd) = 1	Pr(F < f): 1.00	2*Pr(F > f): 0.00	Pr(F > f): 0.00			f = 1.0857
					Degrees of freedom: 1,056,646, 472,909	
Income below median (*low*)						
No	977,688	12.08	0.014868	14.70	12.05	12.11
Yes	551,969	16.02	0.019909	14.79	15.98	16.06
H_0: ratio(sd) = 1	Pr(F < f): 0.00	2*Pr(F > f): 0.00	Pr(F > f): 1.00			f = 0.9877
					Degrees of freedom: 977,687, 551,968	
Regular employment (*postempl*)						
No	846,545	7.43	0.013573	12.49	7.40	7.46
Yes	683,012	21.03	0.017047	14.09	20.99	21.06
H_0: ratio(sd) = 1	Pr(F < f): 0.00	2*Pr(F > f): 0.00	Pr(F > f): 1.00			f = 0.7860
					Degrees of freedom: 846,544, 683,011	
Reduced hours (*reduced*)						
No	1,241,479	14.05	0.013290	14.81	14.02	14.08
Yes	288,078	14.15	0.027612	14.82	11.09	11.20
H_0: ratio(sd) = 1	Pr(F < f): 0.2935	2*Pr(F > f): 0.5870	Pr(F > f): 0.7065			f = 0.9984
					Degrees of freedom: 1,241,478, 288,077	
Marginal employment (*postmarg*)						
No	1,332,090	12.87	0.013223	15.26	12.84	12.89
Yes	197,467	17.80	0.024291	10.79	17.76	17.85
H_0: ratio(sd) = 1	Pr(F < f): 1.00	2*Pr(F > f): 0.00	Pr(F > f): 0.00			f = 1.9991
					Degrees of freedom: 1,332,089, 197,466	

*Note: The table shows the results of the variance ratio tests for maternity leave durations by different covariates with Std. Err. = standard error, Std. Dev. = standard deviation, ratio(sd = standard deviation) = sd(not sick) – sd(sick) H_a: ratio < 1: Pr(F < f), H_a: ratio != 1: 2 * Pr(F < f), H_a: ratio > 1: Pr(F > f).*

Table A15: Measures of risk reduction

					Risk reduction measures			
Length maternity leave	**Sick**	**Not sick**	**Total**	**Sick rate**	**RR**	**ARR**	**RRR**	**NNT**
Full sample								
2 months (stat.)	213	1,764	1,977	0.11	10.00	0.00	0.00	
3-12 months	93	338	431	0.22	20.00	0.11	0.50	90.26
13-24 months	251	379	630	0.40	30.70	0.29	0.73	30.44
25-36 months	598	601	1,199	0.50	40.63	0.39	0.78	20.56
Bad health (*prevsick* = 1), N = 620								
2 months (stat.)	43	148	191	0.23	10.00	0.00	0.00	
3-12 months	17	39	56	0.30	10.35	0.08	0.26	120.75
13-24 months	90	51	141	0.64	20.84	0.41	0.65	20.42
25-36 months	131	101	232	0.56	20.51	0.34	0.60	20.95
High income (*high* = 1), N = 1,310								
2 months (stat.)	49	693	742	0.07	10.00	0.00	0.00	
3-12 months	25	107	132	0.19	20.87	0.12	0.65	80.11
13-24 months	48	91	139	0.35	50.23	0.28	0.81	30.58
25-36 months	146	151	297	0.49	70.44	0.43	0.87	20.35
Low income (*low* = 1), N = 1,529								
2 months (stat.)	72	502	574	0.13	10.00	0.00	0.00	
3-12 months	33	129	162	0.20	10.62	0.08	0.38	120.78
13-24 months	123	167	290	0.42	30.38	0.30	0.70	30.35
25-36 months	248	255	503	0.49	30.93	0.37	0.75	20.72
Return to employment (*postempl* = 1), N = 1,892								
2 months (stat.)	59	352	411	0.14	10.00	0.00	0.00	
3-12 months	78	131	209	0.37	20.60	0.23	0.62	40.35
13-24 months	207	208	415	0.50	30.47	0.36	0.71	20.81
25-36 months	486	371	857	0.57	30.95	0.42	0.75	20.36
Return with reduced working hours (*postmarg* = 1), N = 798								
2 months (stat.)	54	422	476	0.11	10.00	0.00	0.00	
3-12 months	11	27	38	0.29	20.55	0.18	0.61	50.68
13-24 months	71	35	106	0.67	50.90	0.56	0.83	10.80
25-36 months	104	74	178	0.58	50.15	0.47	0.81	20.12

Note: The table shows the distribution of sickness occurrence and the maternity leave durations, the sickness rates, and different measures of risk reduction for the full sample and different sub-samples. The abbreviations refer to the following terms: ***RR*** *= risk reduction (ratio of probability of sickness occurrence in a maternity leave = # group to the probability of sickness);* ***ARR*** *= absolute risk reduction (difference between the risk of sickness occurrence in the maternity leave = # (exposed) group and the maternity leave = 0 (unexposed) group);* ***RRR*** *= relative risk reduction (relative risk of sickness occurrence in the maternity leave = # (exposed) group compared to the one in the maternity leave = 0 (unexposed) group);* ***NNT*** *= numbers needed to treat (average number of mothers who need to take the maternity leave = # (> maternity leave = 0) to prevent one additional sickness occurrence).*

Table A16: Characteristics of survival time data set

		per subject			
Category	**Total**	**Mean**	**Min**	**Median**	**Max**
Number of subjects	4,237				
Number of records	817,907	193.04	3	219	351
(First) entry time		0	0	0	0
(Final) exit time		193.04	3	219	351
Time at risk	817,907	193.04	3	219	351
Failures	1,115	0.27	0	0	1

Note: The table shows the characteristics of the date set after set as survival time data indicating the total, mean minimum, median, and maximum of the number of subjects and records, the entry and exit times, the time at risk and the number of failures (= sickness occurrence). The survival-time settings refer to SICK as the failure event, t as the analysis time, and case as the identification variable.

Table A17: Summary statistics of survival analysis

				Percentiles survival time		
Variable	**Time at risk**	**Incidence rate**	**Number of subjects**	**25%**	**50%**	**75%**
Total	817,907	0.001412	4,237	134	.	.
Maternity leave duration (*length*)						
2 months (stat.)	438,159	0.000486	1,977	.	.	.
3-12 months	87,873	0.001058	431	.	.	.
13-24 months	111,813	0.002245	630	50	.	.
25-36 months	180,062	0.003321	1,199	48	222	.
Age at first childbirth (*ageb1*)						
20-24	189,245	0.001823	877	55	.	.
25-29	349,160	0.001223	1,686	132	.	.
30-34	230,086	0.001169	1,298	.	.	.
35-39	49,194	0.001606	374	.	.	.
Birth cohort (*cohort*)						
1960-1964	145,229	0.001363	728	167	.	.
1965-1969	188,945	0.001921	1,065	61	.	.
1970-1974	252,724	0.001409	1,339	143	.	.
1975-1979	231,009	0.001030	1,105	.	.	.
Bad health (*prevsick*)**: Y**	722,130	0.001210	3,617	306	.	.
N	95,777	0.002934	620	45	.	.
Income						
Above mean (*high*)**: Y**	580,293	0.001529	2,927	91	.	.
No	237,614	0.001128	1,310	.	.	.
Below median (*low*)**: Y**	506,855	0.001340	2,708	221	.	.
No	311,052	0.001530	1,529	92	.	.
Employment conditions after return from maternity leave						
Regular (*postempl*)**: Y**	520,453	0.000625	2,345	.	.	.
No	297,454	0.002790	1,892	45	.	.

Reduced hours (*red.*)**: Y**	652,5677	0.001402	3,439	143	.	.
No	165,340	0.001452	798	82	.	.
Marginal (*postmarg*)**: Y**	695,724	0.001554	3,690	91	.	.
No	122,183	0.000606	547	.	.	.

Note: The table shows the summary statistics of the survival analysis with the time at risk, the incidence rate (= sickness occurrence per time at risk), the number of subjects, and the 25 %-, 50 %-, and 75 % percentiles of the survival time for the full sample and the different covariates. Y equals a positive value for the respective dummy variable (1), N means that the dummy variable has the value of 0.

Table A18: Cases with sickness occurrence total and, after 5 and 10 years

Sub sample	Total	Month 60	%	1-%	Month 120	%	1-%
Total	1,155	811	70.22	29.78	1,038	89.87	10.13
Maternity leave duration							
2 months (stat.)	213	162	76.06	23.94	196	92.02	70.98
3-12 months	93	63	67.74	32.26	82	88.17	110.83
13-24 months	251	180	71.71	28.29	222	88.45	110.55
25-36 months	598	406	67.89	32.11	538	89.97	10.03

Note: The table presents an overview on the total and relative cases with sickness occurrence for the entire observation period (total), after 5 years (month 60) and after ten years (month 120) for the entire sample and by maternity leave duration category.

Table A19: Incidence rates of sickness

Sample	Time at risk	Cases (total)	Cases (sick)	Incidence rate
Total	817,907	4,237	1,155	0.00141214
Maternity leave duration (*length*)				
2 months (stat.)	438,159	1,977	213	0.00048612
3-12 months	87,873	431	93	0.00105835
13-24 months	111,813	630	251	0.00224482
25-36 months	180,062	1,199	598	0.00332108
Age at first childbirth (*ageb1*)				
20-24	189,245	877	345	0.00182303
25-29	349,160	1,686	462	0.00132318
30-34	230,086	1,298	269	0.00116913
35-39	49,194	374	79	0.00160589
Birth cohort (*cohort*)				
1960-1964	145,229	728	198	0.00136336
1965-1969	188,945	1,065	363	0.00192119
1970-1974	252,724	1,339	356	0.00140865
1975-1979	231,009	1,105	238	0.00103026
Bad health (*prevsick*): **Y**	95,777	620	281	0.0029339
N	722,130	3,617	874	0.00121031
Income				
Above mean (*high*): **Y**	237,614	1,310	268	0.001127880
N	580,293	2,927	887	0.001528538
Below median (*low*): **Y**	311,052	1,529	476	0.001530291
N	506,855	2,708	679	0.001339634

Employment conditions after return from maternity leave				
Regular (*postempl*): **Y**	297,454	1,892	830	0.002790347
N	520,453	2,345	325	0.000624456
Reduced hours (*reduced*): **Y**	165,340	789	240	0.001451554
N	652,567	3,439	915	0.000498033
Marginal (*postmarg*)**: Y**	122,183	547	74	0.000605649
N	695,724	3,690	1081	0.001553777

Note: The table shows the incidence rates of sickness occurrence of the survival analysis with the time at risk, the total cases and the cases with event occurrence, and the incidence rate (= sickness occurrence per time at risk) for the full sample and the different covariates. Y equals a positive value for the respective dummy variable (1), N means that the dummy variable has the value of 0.

Table A20: Regression table discrete-time logit models (full table)

Sickness occurrence	**Model 1**				**Model 2**			
Intercept	Coef.	se	[95% CI]		Coef.	se	[95% CI]	
Maternity leave duration (ref.: 2 months (stat.))								
3- 12 months	0.697***	(0.113)	0.4764183	0.9176608	0.821***	(0.200)	0.4284072	1.214023
13- 24 months	1.307***	(0.0812)	1.147829	1.466061	1.072***	(0.155)	0.7674119	1.375818
25- 36 months	1.537***	(0.0709)	1.39783	1.675923	0.462***	(0.157)	0.1546014	0.7701388
Time (months)	-0.00534**	(0.00230)	-0.009842	-0.000829	-0.0174***	(0.00388)	-0.025020	-0.0098069
Time^2	-5.41e-05***	(1.54e-05)	-0.000084	-0.000024	-2.03e-05	(20.55e-05)	-0.000070	0.0000298
Maternity leave x Time								
3- 12 months					-0.0103*	(0.00580)	-0.021630	0.0011138
13- 24 months					0.00254	(0.00519)	-0.007638	0.0127217
25- 36 months					0.0313***	(0.00592)	0.0197173	0.042915
Maternity leave x Time^2								
3- 12 months					7.85e-05**	(3.18e-05)	0.0000161	0.0001409
13- 24 months					10.94e-05	(3.26e-05)	-0.000045	0.0000833
25- 36 months					-0.00014***	(4.18e-05)	-0.00022	-0.0000557
Constant	-6.636***	(0.0893)	-6.811372	-6.461344	-6.156***	(0.118)	-6.387887	-5.9243
Observations	1,049,205				1,049,205			
Chi^2	1,516				1,052			
Degrees of Freedom	5				11			
Log-likelihood	-8,245				-8,196			
Number of cases	4,237				4,237			
Pseudo R^2	0.0861				0.0915			
	Model 3				**Model 4**			
Intercept	Coef.	se	[95% CI]		Coef.	se	[95% CI]	
Maternity leave duration (ref.: 2 months (stat.))								
3- 12 months	0.793***	(0.203)	0.3940645	1.191292	-2.442***	(0.541)	-3.50306	-1.381445
13- 24 months	0.675***	(0.165)	0.352117	0.9979357	-1.225***	(0.371)	-1.952071	-0.4969659
25- 36 months	0.249	(0.165)	-0.075040	0.5723204	-1.939***	(0.397)	-2.717732	-1.160996
Time (months)	-0.0171***	(0.00382)	-0.024636	-0.009651	-0.0206***	(0.00649)	-0.0333565	-0.0078993
Time^2	-2.26e-05	(2.49e-05)	-0.000072	0.0000262	-4.98e-05	(3.54e-05)	-0.0001191	0.0000195
Maternity leave x Time								
3- 12 months	-0.00942*	(0.00571)	-0.020623	0.0017734	0.0125	(0.00970)	-0.0065187	0.0314964
13- 24 months	0.00293	(0.00509)	-0.007040	0.0128953	0.0140*	(0.00793)	-0.0015231	0.029573
25- 36 months	0.0312***	(0.00585)	0.0197749	0.0427154	0.0503***	(0.00886)	0.0329519	0.0676807
Maternity leave x Time^2								
3- 12 months	7.29e-05**	(3.09e-05)	0.0000124	0.0001335	6.01e-05	(4.24e-05)	-0.000023	0.0001432
13- 24 months	1.67e-05	(3.17e-05)	-0.000046	0.0000788	3.06e-05	(4.11e-05)	-0.0000499	0.0001112
25- 36 months	-0.000137***	(4.12e-05)	-0.000218	-0.000056	-0.000131***	(4.83e-05)	-0.0002257	-0.0000365
Age at childbirth (ref.: 20- 24)								
25- 29	-0.153**	(0.0601)	-0.271129	-0.035653	-1.155***	(0.220)	-1.586178	-0.7238076
30- 34	-0.377***	(0.0809)	-0.536009	-0.218830	-1.955***	(0.306)	-2.554692	-1.355436
35- 39	-0.438***	(0.124)	-0.682091	-0.194654	-2.486***	(0.603)	-3.668457	-1.303572
Birth cohort (ref.: 1960-1964)								
1965-1969	0.235***	(0.0779)	0.0820339	0.3874437	0.459*	(0.261)	-0.05332	0.9710682
1970-1974	0.201**	(0.0916)	0.0216324	0.3807717	-0.570*	(0.310)	-1.178505	0.0377775
1975-1979	0.0574	(0.106)	-0.151196	0.2659453	-1.157***	(0.361)	-1.86375	-0.4493651
Bad health condition	0.395***	(0.0511)	0.2947866	0.4951582	0.805***	(0.146)	0.519546	1.090991
Income>average	-0.0783	(0.0637)	-0.203047	0.0464639	-0.322*	(0.179)	-0.6726782	0.028194
Income<median	-0.117**	(0.0571)	-0.228719	-0.004888	-0.0746	(0.0582)	-0.1886682	0.0395589
Post employed	0.521***	(0.0652)	0.3933081	0.6489045	0.498***	(0.136)	0.2322835	0.7644554
Marginal work	-0.637***	(0.122)	-0.876480	-0.397545	-0.624***	(0.124)	-0.8660266	-0.3816341
Reduced hours	0.0650	(0.0609)	-0.054424	0.1843358	-0.399**	(0.161)	-0.7149951	-0.0829915

Childcare reform applicable								
Reform of 1990	-0.357***	(0.101)	-0.554533	-0.159962	-0.233**	(0.109)	-0.4475333	-0.019385
Reform of 2007	-0.482***	(0.149)	-0.773768	-0.189658	-0.497***	(0.160)	-0.8097937	-0.1836819
Age at childbirth x Maternity leave								
25-29 x 3-12					1.537***	(0.426)	0.7024544	2.371483
25-29 x 13-24					1.146***	(0.306)	0.54709	1.745192
25-29 x 25-36					1.431***	(0.299)	0.8439884	2.017509
30-34 x 3-12					2.575***	(0.538)	1.519965	3.630459
30-34 x 13-24					1.866***	(0.409)	1.064494	2.66756
30-34 x 25-36					2.316***	(0.366)	1.598363	3.032799
35-39 x 3-12					3.400***	(0.760)	1.909831	4.889202
35-39 x 13-24					2.312***	(0.763)	0.8169596	3.808027
35-39 x 25-36					2.966***	(0.650)	1.691791	4.239873
Age at childbirth x Maternity leave x Time								
25-29 x 2 (stat.) x time					0.00990**	(0.00387)	0.0023245	0.0174799
25-29 x 3-12 x time					0.000340	(0.00364)	-0.0067944	0.0074744
25-29 x 13-24 x time					0.000922	(0.00319)	-0.005338	0.0071824
25-29 x 25-36 x time					-0.00585**	(0.00276)	-0.0112652	-0.0004316
30-34 x 2 (stat.) x time					0.0161***	(0.00446)	0.0073834	0.0248588
30-34 x 3-12 x time					-0.0119*	(0.00694)	-0.0254859	0.00172
30-34 x 13-24 x time					-0.00174	(0.00432)	-0.010205	0.0067245
30-34 x 25-36 x time					-0.00881***	(0.00274)	-0.0141723	-0.0034393
35-39 x 2 (stat.) x time					0.0248***	(0.00789)	0.0093806	0.0403191
35-39 x 3-12 x time					-0.00149	(0.00722)	-0.0156414	0.0126587
35-39 x 13-24 x time					-0.00605	(0.00766)	-0.0210689	0.0089633
35-39 x 25-36 x time					-0.0133***	(0.00321)	-0.0196341	-0.0070644
Birth Cohort x Maternity leave								
1965-69 x 3-12					0.531	(0.567)	-0.5812577	1.642624
1965-69 x 13-24					0.166	(0.366)	-0.5515426	0.8834055
1965-69 x 25-36					-0.0614	(0.384)	-0.8139159	0.6910981
1970-74 x 3-12					1.944***	(0.573)	0.8210115	3.067209
1970-74 x 13-24					1.155***	(0.410)	0.3505579	1.959431
1970-74 x 25-36					1.367***	(0.397)	0.5876908	2.145406
1975-79 x 3-12					2.415***	(0.593)	1.251929	3.577367
1975-79 x 13-24					2.327***	(0.428)	1.487708	3.166601
1975-79 x 25-36					2.462***	(0.437)	1.604949	3.31889
Birth cohort x Maternity leave x Time								
1965-69 x 2 (stat.) x time					-0.0108**	(0.00498)	-0.0205818	-0.0010428
1965-69 x 3-12 x time					-0.00630	(0.00559)	-0.0172533	0.0046437
1965-69 x 13-24 x time					-0.00504	(0.00367)	-0.0122425	0.0021533
1965-69 x 25-36 x time					-0.00147	(0.00362)	-0.0085615	0.0056143
1970-74 x 2 (stat.) x time					0.00420	(0.00453)	-0.0046706	0.0130674
1970-74 x 3-12 x time					-0.0179***	(0.00659)	-0.0308084	-0.0049664
1970-74 x 13-24 x time					-0.00497	(0.00367)	-0.0121605	0.0022264
1970-74 x 25-36 x time					-0.00697**	(0.00328)	-0.0133992	-0.0005342
1975-79 x 2 (stat.) x time					0.00503	(0.00458)	-0.0039434	0.0140091
1975-79 x 3-12 x time					-0.0153***	(0.00569)	-0.0264516	-0.0041285
1975-79 x 13-24 x time					-0.0173***	(0.00356)	-0.0243057	-0.0103666
1975-79 x 25-36 x time					-0.0163***	(0.00331)	-0.0227667	-0.0097795
Bad health x Maternity leave								
Yes x 3-12					-0.517**	(0.253)	-10.013111	-0.0206393
Yes x 13-24					-0.233	(0.173)	-0.5727938	0.1069014
Yes x 25-36					-0.596***	(0.160)	-0.9097058	-0.2823039
Income>average x Maternity leave								
Yes x 3-12					-0.154	(0.279)	-0.7011735	0.393114
Yes x 13-24					0.444*	(0.227)	-0.0020823	0.8893254
Yes x 25-36					0.364*	(0.193)	-0.014909	0.743253

Employment after maternity leave								
Post employed x Maternity leave								
Yes x 3-12					0.870***	(0.309)	0.2644515	10.47569
Yes x 13-24					0.0784	(0.195)	-0.3028418	0.4596465
Yes x 25-36					-0.119	(0.160)	-0.4332997	0.1949052
Reduced hours x Maternity leave								
Yes x 3-12					0.353	(0.298)	-0.2305441	0.9371922
Yes x 13-24					0.602***	(0.189)	0.232555	0.9724409
Yes x 25-36					0.525***	(0.170)	0.191698	0.8587993
Constant	-5.904***	(0.142)	-6.18287	-5.625727	-4.823***	(0.242)	-5.297522	-4.348724
Observations	1,049,205				1,049,205			
Chi^2	1,521				1,578			
Degrees of Freedom	25				73			
Log-likelihood	-8,065				-7,967			
Number of cases	4,237				4,237			
Pseudo R^2	0.106				0.117			

*Note: The table shows the regression results of the discrete-time logit models applied in the current analysis with robust standard errors in parentheses and significance levels of *** p<0.01, ** p<0.05, * p<0.1.*

Table A21: Model fit: likelihood-ratio test

	Log-likelihood	Likelihood-ratio (LR)	Degrees of freedom	Chi^2-value	LR>chi2
Model 1	-8,245		5		
Model 2	-8,196	98	11	260.757	Yes
Model 3	-8,065	262	25	460.928	Yes
Model 4	-7,967	196	73	1,070.862	Yes

Note: The table plots the results of the likelihood-ratio test. Since the likelihood ratio is always higher than the chi^2-value with an alpha of 0.05, the hierarchical model building with more variables added to each model improves the he regression model.

Table A22: Predictive margins for initial regression models and yearly aggregated (full table)

	Model 1 (initial/monthly observations)			Model 1 (yearly aggregated)		
Sickness occurrence	Margins	95 % CI		Margins	95 % CI	
Maternity leave duration						
2 months (stat.) (0)	0.000435***	0.0003799	0.0004902	0.005092***	0.0044532	0.0057307
3- 12 months (1)	0.0008727***	0.0007155	0.0010299	0.0101143***	0.0083301	0.0118986
13- 24 months (2)	0.0016038***	0.0014503	0.0017573	0.0183199***	0.0166273	0.0200125
25- 36 months (3)	0.0020168***	0.0019027	0.002131	0.0228769***	0.0216357	0.0241182
Over time (years)						
0: 0	0.0006204***	0.0003892	0.0008516	0.0070374***	0.0044627	0.0096122
0: 1	0.0012444***	0.0007409	0.0017479	0.0139603***	0.0084398	0.0194807
0: 2	0.0022865***	0.0014643	0.0031087	0.0252316***	0.016386	0.0340771
0: 3	0.002875***	0.0018917	0.0038582	0.0314703***	0.0209701	0.0419704
1: 0	0.0005819***	0.0003944	0.0007695	0.0066347***	0.0045424	0.0087271
1: 1	0.0011674***	0.0007506	0.0015841	0.0131696***	0.0085831	0.0177561
1: 2	0.0021451***	0.0014843	0.0028059	0.0238263***	0.016673	0.0309796
1: 3	0.0026974***	0.0019174	0.0034774	0.0297339***	0.0213335	0.0381343
2: 0	0.0005459***	0.0003967	0.000695	0.0062549***	0.0045892	0.0079205
2: 1	0.0010951***	0.000754	0.0014362	0.0124228***	0.0086572	0.0161884
2: 2	0.0020125***	0.0014944	0.0025305	0.0224965***	0.0168593	0.0281337
2: 3	0.0025307***	0.0019315	0.0031299	0.028089***	0.0215858	0.0345923

3: 0	0.0005121***	0.000396	0.0006281	0.0058965***	0.0046013	0.0071917
3: 1	0.0010273***	0.0007509	0.0013037	0.0117176***	0.0086576	0.0147775
3: 2	0.001888***	0.0014945	0.0022815	0.0212384***	0.0169406	0.0255362
3: 3	0.0023743***	0.0019347	0.002814	0.0265313***	0.0217278	0.0313347
4: 0	0.0004803***	0.000392	0.0005687	0.0055586***	0.0045723	0.0065448
4: 1	0.0009637***	0.0007406	0.0011867	0.0110517***	0.0085736	0.0135298
4: 2	0.0017712***	0.0014833	0.0020591	0.0200484***	0.0168983	0.0231985
4: 3	0.0022276***	0.0019261	0.002529	0.0250565***	0.0217481	0.0283649
5: 0	0.0004505***	0.0003835	0.0005176	0.0052398***	0.0044871	0.0059924
5: 1	0.000904***	0.0007218	0.0010862	0.010423***	0.0083867	0.0124593
5: 2	0.0016617***	0.0014567	0.0018666	0.0189232***	0.0166784	0.0211679
5: 3	0.0020898***	0.0019012	0.0022785	0.0236606***	0.0215909	0.0257303
6: 0	0.0004226***	0.0003686	0.0004767	0.0049392***	0.0043198	0.0055585
6: 1	0.000848***	0.0006928	0.0010032	0.0098296***	0.008074	0.0115851
6: 2	0.0015588***	0.0014042	0.0017135	0.0178592***	0.0161499	0.0195686
6: 3	0.0019606***	0.0018397	0.0020816	0.0223397***	0.0210173	0.0236621
7: 0	0.0003964***	0.0003457	0.0004472	0.0046556***	0.0040529	0.0052584
7: 1	0.0007955***	0.0006527	0.0009382	0.0092694***	0.0076242	0.0109146
7: 2	0.0014624***	0.001314	0.0016107	0.0168536***	0.0151674	0.0185398
7: 3	0.0018394***	0.0017057	0.001973	0.0210901***	0.0195902	0.02259
8: 0	0.0003719***	0.0003164	0.0004273	0.0043883***	0.0037117	0.0050649
8: 1	0.0007462***	0.0006032	0.0008892	0.0087407***	0.0070593	0.0104221
8: 2	0.0013719***	0.0011952	0.0015485	0.0159031***	0.01385	0.0179562
8: 3	0.0017256***	0.001532	0.0019192	0.0199082***	0.0176939	0.0221225
9: 0	0.0003488***	0.0002845	0.0004131	0.0041362***	0.0033432	0.0049292
9: 1	0.0007***	0.000548	0.0008519	0.0082418***	0.006428	0.0100556
9: 2	0.0012869***	0.001069	0.0015049	0.0150049***	0.012442	0.0175679
9: 3	0.0016188***	0.0013592	0.0018784	0.0187905***	0.0157901	0.021791
10: 0	0.0003272***	0.0002529	0.0004015	0.0038985***	0.0029782	0.0048189
10: 1	0.0006566***	0.0004913	0.0008218	0.007771***	0.0057776	0.0097645
10: 2	0.0012073***	0.0009465	0.001468	0.0141564***	0.0110687	0.0172441
10: 3	0.0015186***	0.0011976	0.0018397	0.0177339***	0.0139936	0.0214741

	Model 2 (initial/monthly observations)			**Model 2 (yearly aggregated)**		
Sickness occurrence	Margins	95 % CI		Margins	95 % CI	
Maternity leave duration						
2 months (stat.) (0)	0.0004351***	0.0003799	0.0004902	0.00509***	0.0044525	0.0057275
3- 12 months (1)	0.0008733***	0.0007162	0.0010304	0.0100842***	0.0083099	0.0118584
13- 24 months (2)	0.0015982***	0.0014451	0.0017514	0.0182612***	0.0165727	0.0199497
25- 36 months (3)	0.0020154***	0.0019012	0.0021297	0.0227883***	0.021551	0.0240257
Over time (years)						
0: 0	0.001454***	0.0001649	0.0027432	0.0150785***	0.0025565	0.0276005
0: 1	0.0484459***	-0.0343041	0.1311959	0.2217199***	0.042711	0.4007288
0: 2	0.0060321***	-0.0002209	0.012285	0.063532***	0.0020675	0.1249964
0: 3	0.0009489***	0.0005746	0.0013232	0.0106035***	0.0064514	0.0147556
1: 0	0.0011802***	0.0002362	0.0021242	0.0124333***	0.0031899	0.0216767
1: 1	0.0376154***	-0.0294939	0.1047247	0.1846465***	0.0252766	0.3440163
1: 2	0.0050511***	0.0002101	0.0098921	0.0539466***	0.0053879	0.1025053
1: 3	0.0011207***	0.0007942	0.0014472	0.0125605***	0.0089349	0.0161861
2: 0	0.0009579***	0.0002739	0.0016419	0.0102464***	0.003516	0.0169767
2: 1	0.0289141***	-0.0246829	0.0825112	0.1523573***	0.0118914	0.2928231
2: 2	0.004229***	0.0005067	0.0079513	0.0457365***	0.0077545	0.0837186
2: 3	0.0013235***	0.0010716	0.0015754	0.014865***	0.0120628	0.0176672

3: 0	0.0007774***	0.0002878	0.001267	0.0084401***	0.0036176	0.0132626
3: 1	0.0220084***	-0.020111	0.0641278	0.1245518***	0.0020596	0.247044
3: 2	0.0035403***	0.0007007	0.0063799	0.0387246***	0.0093329	0.0681163
3: 3	0.0015628***	0.0014104	0.0017153	0.0175734***	0.0158719	0.0192748
4: 0	0.0006309***	0.0002854	0.0009764	0.0069496***	0.0035582	0.010341
4: 1	0.0165953***	-0.0159563	0.049147	0.1008683***	-0.004736	0.206473
4: 2	0.0029633***	0.000817	0.0051097	0.0327507***	0.0102748	0.0552265
4: 3	0.0018453***	0.0017187	0.0019718	0.0207491***	0.0194378	0.0220605
5: 0	0.000512***	0.000272	0.000752	0.0057205***	0.0033843	0.0080567
5: 1	0.0124047***	-0.0123334	0.0371428	0.080913***	-0.009017	0.1708428
5: 2	0.0024802***	0.0008754	0.004085	0.0276717***	0.0107142	0.0446292
5: 3	0.0021785***	0.0018577	0.0024993	0.0244629***	0.0211553	0.0277705
6: 0	0.0004155***	0.0002513	0.0005798	0.0047075***	0.003128	0.006287
6: 1	0.0091994***	-0.0092949	0.0276937	0.0642811***	-0.011286	0.1398478
6: 2	0.0020757***	0.0008913	0.0032601	0.0233613***	0.0107651	0.0359574
6: 3	0.0025714***	0.0019399	0.003203	0.0287924***	0.0223036	0.0352812
7: 0	0.0003372***	0.0002257	0.0004487	0.0038731***	0.0028076	0.0049385
7: 1	0.0067754***	-0.0068389	0.0203897	0.050572***	-0.012016	0.1131604
7: 2	0.001737***	0.0008764	0.0025976	0.0197086***	0.0105217	0.0288955
7: 3	0.0030348***	0.0019818	0.0040878	0.0338216***	0.0231427	0.0445005
8: 0	0.0002736***	0.0001966	0.0003506	0.003186***	0.0024308	0.0039411
8: 1	0.004961***	-0.0049209	0.0148429	0.0394001***	-0.011641	0.090441
8: 2	0.0014535***	0.0008396	0.0020674	0.0166173***	0.0100585	0.0231761
8: 3	0.0035808***	0.0019727	0.0051889	0.0396395***	0.0236479	0.0556311
9: 0	0.000222***	0.0001651	0.0002789	0.0026204***	0.0020106	0.0032302
9: 1	0.0036151***	-0.0034692	0.0106994	0.030402***	-0.010540	0.0713435
9: 2	0.0012162***	0.0007873	0.0016452	0.0140039***	0.00943	0.0185778
9: 3	0.0042241***	0.0018958	0.0065524	0.0463382***	0.0237657	0.0689108
10: 0	0.0001802***	0.0001329	0.0002274	0.0021549***	0.0015863	0.0027236
10: 1	0.0026242***	-0.0024008	0.0076493	0.0232409***	-0.009036	0.0555178
10: 2	0.0010176***	0.0007236	0.0013116	0.0117966***	0.008669	0.0149242
10: 3	0.0049815***	0.0017286	0.0082344	0.0540102***	0.0234475	0.084573
10: 3	0.0015186***	0.0011976	0.0018397	0.0177339***	0.0139936	0.0214741

	Model 3 (initial/monthly observations)			**Model 3 (yearly aggregated)**		
Sickness occurrence	Margins	95 % CI		Margins	95 % CI	
Maternity leave duration						
2 months (stat.) (0)	0.0004961***	0.0004303	0.0005618	0.0058025***	0.0050494	0.0065556
3- 12 months (1)	0.0009796***	0.0008095	0.0011497	0.0112847***	0.0093808	0.0131885
13- 24 months (2)	0.0012345***	0.0010952	0.0013739	0.0141808***	0.0126235	0.015738
25- 36 months (3)	0.0018547***	0.0017175	0.0019919	0.0211079***	0.0196086	0.0226071
Age at first childbirth						
20-24	0.0013322***	0.0012008	0.0014636	0.0153246***	0.0138696	0.0167797
25-29	0.0011434***	0.0010636	0.0012232	0.0131931***	0.0123041	0.0140822
30-34	0.0009146***	0.0008215	0.0010077	0.0106153***	0.0095664	0.0116642
35-39	0.0008606***	0.0006879	0.0010334	0.0099383***	0.0080035	0.0118732
Birth cohort						
1960-1964	0.0009546***	0.0008198	0.0010895	0.011146***	0.0096124	0.0126796
1965-1969	0.0012062***	0.0011079	0.0013046	0.0138906***	0.0127926	0.0149886
1970-1974	0.0011666***	0.0010701	0.0012631	0.013423***	0.012357	0.0144891
1975-1979	0.0010108***	0.0008932	0.0011284	0.011656***	0.0103523	0.0129597
Bad health (previous serious illness)						
No	0.001014***	0.0009619	0.0010661	0.0117477***	0.0111631	0.0123323
Yes	0.0015028***	0.0013773	0.0016282	0.017107***	0.0157335	0.0184805
High income (income > mean)						
Yes	0.0011218***	0.0010626	0.001181	0.0129545***	0.0122933	0.0136157
No	0.0010376***	0.0009307	0.0011445	0.0119828***	0.0107925	0.0131732
Low income (income < median)						
No	0.001157***	0.0010837	0.0012304	0.013319***	0.0125079	0.0141302
Yes	0.0010299***	0.0009501	0.0011097	0.0119324***	0.0110336	0.0128312

Post-employed						
No	0.0007805***	0.0007021	0.000859	0.0091532***	0.0082544	0.0100521
Yes	0.0013123***	0.0012352	0.0013894	0.0150326***	0.0141802	0.015885
Reduced working hours						
No	0.0011638***	0.0010315	0.001142	0.0125685***	0.0119511	0.013186
Yes	0.0006165***	0.0010423	0.0012765	0.0133029***	0.0120015	0.0146042
Post-marginal employment						
No	0.0010867***	0.0011103	0.0012172	0.0134124***	0.0128169	0.0140079
Yes	0.0011594***	0.0004758	0.0007572	0.007263***	0.0056387	0.0088873
Reform of 1992						
No	0.0014111***	0.0012051	0.0016171	0.0162068***	0.0139511	0.0184626
Yes	0.0009886***	0.000918	0.0010592	0.0114296***	0.0106365	0.0122228
Reform of 2007						
No	0.0011745***	0.0011037	0.0012454	0.0135401***	0.0127558	0.0143244
Yes	0.0007266***	0.0005422	0.0009109	0.0084571***	0.0063621	0.0105521
Over time (years)						
0: 0	0.001622***	0.0002052	0.0030388	0.0166338***	0.0032225	0.0300452
0: 1	0.0412844***	-0.0285379	0.1111067	0.2015433***	0.0345117	0.3685749
0: 2	0.0042843***	0.0001119	0.0084568	0.0468816***	0.003514	0.0902491
0: 3	0.0008655***	0.0005247	0.0012063	0.0097881***	0.0059679	0.0136083
1: 0	0.001321***	0.0002797	0.0023623	0.0137906***	0.0038374	0.0237438
1: 1	0.0321355***	-0.0240581	0.0883291	0.1676354***	0.0210312	0.3142396
1: 2	0.0036155***	0.0003694	0.0068615	0.0399625***	0.0056676	0.0742575
1: 3	0.0010246***	0.0007249	0.0013242	0.011607***	0.008249	0.0149649
2: 0	0.0010757***	0.0003183	0.0018331	0.0114249***	0.0041418	0.018708
2: 1	0.0247965***	-0.0198082	0.0694013	0.1382408***	0.010774	0.2657076
2: 2	0.0030507***	0.0005434	0.0055579	0.0340199***	0.0071594	0.0608804
2: 3	0.0012128***	0.0009774	0.0014482	0.0137493***	0.0111093	0.0163893
3: 0	0.000876***	0.0003317	0.0014202	0.0094591***	0.0042167	0.0147015
3: 1	0.0189724***	-0.0159263	0.0538711	0.1130368***	0.0032772	0.2227964
3: 2	0.0025738***	0.0006533	0.0044942	0.0289281***	0.0081105	0.0497458
3: 3	0.0014354***	0.0012821	0.0015886	0.016267***	0.0145487	0.0179854
4: 0	0.0007133***	0.0003276	0.0010989	0.0078275***	0.0041248	0.0115301
4: 1	0.0144001***	-0.0125045	0.0413047	0.0916486***	-0.001906	0.1852036
4: 2	0.0021712***	0.0007145	0.003628	0.0245744***	0.0086284	0.0405203
4: 3	0.0016986***	0.0015605	0.0018367	0.0192185***	0.0177742	0.0206628
5: 0	0.0005807***	0.0003116	0.0008499	0.0064745***	0.0039128	0.0090361
5: 1	0.0108489***	-0.0095895	0.0312874	0.0736792***	-0.005202	0.1525603
5: 2	0.0018315***	0.0007393	0.0029238	0.0208584***	0.0088063	0.0329105
5: 3	0.0020098***	0.0017038	0.0023158	0.0226682***	0.0195328	0.0258036
6: 0	0.0004728***	0.0002877	0.000658	0.0053534***	0.0036123	0.0070945
6: 1	0.0081191***	-0.007187	0.0234252	0.0587301***	-0.007005	0.1244653
6: 2	0.0015448***	0.0007371	0.0023526	0.0176916***	0.0087221	0.026661
6: 3	0.0023776***	0.0017906	0.0029646	0.0266868***	0.0207144	0.0326592
7: 0	0.000385***	0.0002584	0.0005115	0.0044252***	0.0032407	0.0056097
7: 1	0.0060407***	-0.0052686	0.0173501	0.0464159***	-0.007677	0.1005086
7: 2	0.001303***	0.0007152	0.0018907	0.0149963***	0.0084394	0.0215533
7: 3	0.0028121***	0.0018392	0.003785	0.0313502***	0.0216048	0.0410956
8: 0	0.0003134***	0.0002254	0.0004014	0.003657***	0.0028048	0.0045091
8: 1	0.0044721***	-0.0037819	0.0127262	0.0363733***	-0.007538	0.0802848
8: 2	0.0010989***	0.0006792	0.0015187	0.012705***	0.0080071	0.017403
8: 3	0.0033252***	0.0018413	0.004809	0.0367387***	0.0222037	0.0512737
9: 0	0.0002552***	0.0001897	0.0003207	0.0030215***	0.0023207	0.0037223
9: 1	0.0032973***	-0.0026613	0.0092558	0.0282663***	-0.006868	0.0634006
9: 2	0.0009268***	0.0006327	0.0012208	0.010759***	0.0074594	0.0140586
9: 3	0.0039307***	0.0017819	0.0060795	0.0429349***	0.0224716	0.0633983
10: 0	0.0002077***	0.0001531	0.0002623	0.002496***	0.0018346	0.0031574
10: 1	0.002423***	-0.0018378	0.0066837	0.0217894***	-0.005899	0.0494776
10: 2	0.0007816***	0.000578	0.0009852	0.0091076***	0.0068141	0.0114011
10: 3	0.0046449***	0.0016404	0.0076493	0.0500218***	0.0223689	0.0776747

Career Woman						
0	0.0006159***	0.0005097	0.000722	0.0070961***	0.0058973	0.0082948
1	0.0012123***	0.0009653	0.0014594	0.0137616***	0.011048	0.0164752
2	0.001531***	0.0012794	0.0017826	0.0173259***	0.0145697	0.0200821
3	0.0023027***	0.0020556	0.0025497	0.0258069***	0.0231726	0.0284413
Woman with bad health						
0	0.0009834***	0.0007757	0.001191	0.0111588***	0.0088612	0.0134563
1	0.0019343***	0.0014785	0.0023901	0.0214732***	0.0166491	0.0262974
2	0.0024425***	0.0019796	0.0029055	0.0270004***	0.0221178	0.0318831
3	0.0036712***	0.0031305	0.004212	0.0399485***	0.0344158	0.0454811
Average						
0	0.0001427***	0.0000751	0.0002102	0.0016029***	0.0008015	0.0024042
1	0.0005032***	0.0003574	0.0006489	0.0058535***	0.0041452	0.0075618
2	0.0006023***	0.0004386	0.0007659	0.0069383***	0.0050421	0.0088344
3	0.0004394***	0.0001889	0.0006899	0.0048937***	0.0020213	0.0077661
No employment						
0	0.0001315***	0.0000671	0.0001958	0.0014686***	0.000711	0.0022262
1	0.0004637***	0.0003081	0.0006193	0.0053652***	0.0035551	0.0071752
2	0.000555***	0.0003782	0.0007318	0.00636***	0.0043251	0.0083949
3	0.0004049***	0.0001609	0.0006489	0.004485***	0.001706	0.0072641
Part-time employment						
0	0.0000695***	0.0000323	0.0001068	0.0007808***	0.0003436	0.0012179
1	0.0002453***	0.0001534	0.0003371	0.0028575***	0.0017824	0.0039326
2	0.0002936***	0.0001848	0.0004024	0.003389***	0.0021268	0.0046511
3	0.0002142***	0.0000784	0.00035	0.0023878***	0.0008339	0.0039417

	Model 4 (initial/monthly observations)			**Model 4 (yearly aggregated)**		
Sickness occurrence	Margins	95 % CI		Margins	95 % CI	
Maternity leave duration						
2 months (stat.) (0)	0.00055***	0.0004718	0.0006288	0.0063302***	0.0054626	0.0071978
3- 12 months (1)	0.0009392***	0.0007709	0.0011076	0.0107197***	0.0088561	0.0125832
13- 24 months (2)	0.0012972***	0.0011197	0.0014747	0.0148453***	0.0128671	0.0168235
25- 36 months (3)	0.001893***	0.0017383	0.0020477	0.0215094***	0.0198103	0.0232084
Age at first childbirth						
20-24	0.0013796***	0.0012415	0.0015176	0.0157955***	0.0142859	0.0173052
25-29	0.0011335***	0.001054	0.001213	0.0130657***	0.012184	0.0139474
30-34	0.000925***	0.0008237	0.0010263	0.0107373***	0.0096035	0.0118712
35-39	0.0009012***	0.0006916	0.0011107	0.0103425***	0.008063	0.012622
Age at first childbirth x maternity leave						
20-24: 0	0.0010123***	0.000781	0.0012436	0.0114098***	0.0089237	0.0138958
20-24: 1	0.0007085***	0.0004487	0.0009682	0.0081787***	0.0053087	0.0110488
20-24: 2	0.0013789***	0.0010946	0.0016633	0.0157536***	0.0126089	0.0188984
20-24: 3	0.0021848***	0.0019067	0.0024629	0.0247641***	0.0217271	0.0278012
25-29: 0	0.0004817***	0.0003775	0.0005859	0.0056086***	0.004427	0.0067903
25-29: 1	0.0010587***	0.000759	0.0013585	0.0120777***	0.0087919	0.0153635
25-29: 2	0.0014422***	0.0011842	0.0017002	0.0164804***	0.0136108	0.01935
25-29: 3	0.0019053***	0.0017081	0.0021025	0.0216405***	0.0194836	0.0237974
30-34: 0	0.0003049***	0.0002064	0.0004033	0.0035932***	0.0024454	0.004741
30-34: 1	0.0007645***	0.0004507	0.0010782	0.008721***	0.0052819	0.0121601
30-34: 2	0.0011469***	0.0008028	0.0014909	0.0131728***	0.0093388	0.0170068
30-34: 3	0.0017221***	0.0015061	0.0019381	0.0196663***	0.0172918	0.0220407
35-39: 0	0.0003449***	0.0001121	0.0005776	0.0038979***	0.001437	0.0063588
35-39: 1	0.001613***	0.0007093	0.0025167	0.0178985***	0.0084289	0.0273682
35-39: 2	0.0008555***	0.0002885	0.0014226	0.0098591***	0.0035228	0.0161953
35-39: 3	0.0014975***	0.0011312	0.0018638	0.0171065***	0.0130985	0.0211145
Birth cohort						
1960-1964	0.0009609***	0.0008187	0.0011031	0.0111606***	0.0095527	0.0127686
1965-1969	0.0012156***	0.0011162	0.0013149	0.0139799***	0.0128759	0.0150839
1970-1974	0.0011237***	0.0010221	0.0012253	0.0129433***	0.0118201	0.0140666
1975-1979	0.0010322***	0.0009103	0.0011542	0.0118423***	0.0105197	0.0131648

Birth cohort x maternity leave						
1960-1964: 0	0.0006832***	0.0004898	0.0008767	0.0079345***	0.0057544	0.0101146
1960-1964: 1	0.0006824***	0.0004154	0.0009494	0.0079431***	0.0048985	0.0109878
1960-1964: 2	0.0010494***	0.0007938	0.0013051	0.0120972***	0.0091973	0.0149971
1960-1964: 3	0.0014967***	0.0011989	0.0017945	0.0171262***	0.0138207	0.0204317
1965-1969: 0	0.0006991***	0.00056	0.0008382	0.0079294***	0.0064206	0.0094382
1965-1969: 1	0.0011241***	0.000709	0.0015392	0.0128432***	0.0082708	0.0174156
1965-1969: 2	0.0013939***	0.0010962	0.0016916	0.0159259***	0.0125993	0.0192526
1965-1969: 3	0.0019884***	0.001745	0.0022318	0.0226148***	0.0199294	0.0253002
1970-1974: 0	0.0004805***	0.0003575	0.0006036	0.0055978***	0.0041994	0.0069961
1970-1974: 1	0.0009389***	0.000611	0.0012667	0.0105719***	0.0070234	0.0141205
1970-1974: 2	0.0013454***	0.0010201	0.0016708	0.0154353***	0.0118251	0.0190456
1970-1974: 3	0.0020185***	0.0017907	0.0022464	0.0228616***	0.0203947	0.0253284
1975-1979: 0	0.0002806***	0.0001652	0.000396	0.0033226***	0.0019707	0.0046746
1975-1979: 1	0.0009266***	0.0006103	0.001243	0.0105351***	0.0070879	0.0139823
1975-1979: 2	0.0013456***	0.0010034	0.0016877	0.0152074***	0.0115252	0.0188897
1975-1979: 3	0.0019611***	0.0016725	0.0022497	0.0221751***	0.0190848	0.0252654
Bad health (previous serious illness)						
No	0.0010137***	0.0009624	0.0010649	0.0117409***	0.0111679	0.012314
Yes	0.0015457***	0.0014069	0.0016845	0.0175817***	0.0160672	0.0190963
Bad health x maternity leave						
No: 0	0.0004575***	0.0003865	0.0005285	0.0053044***	0.0045061	0.0061027
No: 1	0.0008903***	0.0007029	0.0010778	0.0101747***	0.0080946	0.0122549
No: 2	0.0011616***	0.0009808	0.0013424	0.01335***	0.0113237	0.0153763
No: 3	0.0018289***	0.0016679	0.0019899	0.0208122***	0.0190396	0.0225847
Yes: 0	0.0010199***	0.0007523	0.0012874	0.0114668***	0.0085879	0.0143458
Yes: 1	0.0011865***	0.0007869	0.0015862	0.0134253***	0.0091063	0.0177443
Yes: 2	0.0020541***	0.0017118	0.0023963	0.0230254***	0.0193619	0.0266889
Yes: 3	0.0022527***	0.0019732	0.0025322	0.0253476***	0.0223421	0.0283532
High income (income > mean)						
Yes	0.0011224***	0.0010637	0.0011811	0.0129555***	0.0123033	0.0136077
No	0.0010768***	0.000966	0.0011876	0.0124223***	0.0111978	0.0136468
High income x maternity leave						
No: 0	0.0005852***	0.0004938	0.0006766	0.0067301***	0.0057117	0.0077485
No: 1	0.0010718***	0.0008479	0.0012957	0.0121682***	0.0097318	0.0146046
No: 2	0.0012545***	0.0010679	0.0014412	0.0143592***	0.0122892	0.0164292
No: 3	0.0018709***	0.0017072	0.0020346	0.0212872***	0.0194861	0.0230882
Yes: 0	0.0004245***	0.0002892	0.0005598	0.0049375***	0.0034222	0.0064527
Yes: 1	0.0006668***	0.0004243	0.0009094	0.0076841***	0.0049664	0.0104017
Yes: 2	0.0014158***	0.0010587	0.001773	0.0161936***	0.0122365	0.0201506
Yes: 3	0.0019507***	0.0016786	0.0022228	0.02209***	0.0191389	0.0250412
Low income (income < median)						
No	0.001136***	0.0010645	0.0012076	0.0130823***	0.0122929	0.0138717
Yes	0.0010547***	0.0009715	0.001138	0.0122195***	0.011287	0.013152
Post-employed						
No	0.0007916***	0.0007097	0.0008736	0.0092834***	0.0083477	0.0102191
Yes	0.0013189***	0.0012333	0.0014045	0.0150757***	0.0141391	0.0160123
Post-employed x maternity leave						
No: 0	0.0004208***	0.0003578	0.0004838	0.0049126***	0.0041951	0.00563
No: 1	0.0003957***	0.0001981	0.0005933	0.0046415***	0.0023396	0.0069434
No: 2	0.0009541***	0.000702	0.0012063	0.0110139***	0.0081578	0.01387
No: 3	0.0015598***	0.0013144	0.0018051	0.0179253***	0.0151933	0.0206572
Yes: 0	0.0006913***	0.0005415	0.000841	0.0078413***	0.00621	0.0094726
Yes: 1	0.0015498***	0.0012487	0.0018509	0.017365***	0.014192	0.0205379
Yes: 2	0.0016955***	0.0014914	0.0018996	0.0191695***	0.0169513	0.0213878
Yes: 3	0.0022757***	0.002125	0.0024264	0.0255182***	0.0239048	0.0271316
Reduced working hours						
No	0.0011026***	0.0010451	0.00116	0.0127442***	0.0121049	0.0133834
Yes	0.0011494***	0.0010341	0.0012648	0.0131643***	0.0118978	0.0144308

Reduced hours x maternity leave						
No: 0	0.0006082***	0.0005102	0.0007062	0.0069553***	0.0058905	0.0080201
No: 1	0.0009476***	0.0007621	0.001133	0.0108676***	0.0088004	0.0129348
No: 2	0.0012415***	0.0010724	0.0014107	0.0142568***	0.0123673	0.0161463
No: 3	0.0018427***	0.0016865	0.0019988	0.0209777***	0.0192627	0.0226927
Yes: 0	0.0004088***	0.0002947	0.0005229	0.0047464***	0.0034517	0.0060411
Yes: 1	0.0009054***	0.0004943	0.0013166	0.0101305***	0.0057305	0.0145305
Yes: 2	0.0015206***	0.0011624	0.0018788	0.0171907***	0.0132664	0.021115
Yes: 3	0.0020896***	0.0017868	0.0023924	0.0235724***	0.020295	0.0268497
Post-marginal employment						
No	0.001162***	0.0011088	0.0012152	0.0133886***	0.0127985	0.0139786
Yes	0.0006238***	0.0004805	0.0007672	0.0073531***	0.0056998	0.0090063
Reform of 1992						
No	0.001291***	0.0010923	0.0014896	0.0148811***	0.0126877	0.0170744
Yes	0.0010231***	0.0009436	0.0011027	0.0118193***	0.0109292	0.0127094
Reform of 2007						
No	0.0011773***	0.0011027	0.0012518	0.0135624***	0.0127499	0.014375
Yes	0.0007176***	0.0005243	0.0009109	0.0083208***	0.0061267	0.0105149
Over time (years)						
0: 0	0.0014578***	0.0002636	0.002652	0.0264248***	0.0038136	0.0256514
0: 1	0.0061824***	-0.0028018	0.0151666	0.0197618***	-0.011799	0.1259155
0: 2	0.00377***	0.0008064	0.0067336	0.0186088***	0.0102586	0.0713964
0: 3	0.000793***	0.0004957	0.0010902	0.0200189***	0.0056008	0.0122196
1: 0	0.0011437***	0.0003133	0.0019741	0.0221807***	0.0041355	0.0197795
1: 1	0.0046578***	-0.0018175	0.0111331	0.0176968***	-0.007471	0.0961826
1: 2	0.0031251***	0.0009003	0.0053498	0.0158799***	0.0109501	0.0576202
1: 3	0.0009449***	0.000685	0.0012048	0.0172431***	0.0077541	0.0135516
2: 0	0.000909***	0.0003367	0.0014813	0.0191715***	0.004283	0.0152549
2: 1	0.0035401***	-0.00115	0.0082302	0.016228***	-0.004201	0.0733598
2: 2	0.0026051***	0.000944	0.0042663	0.0140152***	0.0112468	0.0465291
2: 3	0.0011342***	0.0009311	0.0013373	0.0151636***	0.0105508	0.0150904
3: 0	0.0007326***	0.0003447	0.0011206	0.0172427***	0.0043137	0.0117972
3: 1	0.002715***	-0.000698	0.0061278	0.0153069***	-0.001829	0.0560146
3: 2	0.0021837***	0.000953	0.0034144	0.0128589***	0.0112454	0.0376226
3: 3	0.0013717***	0.0012361	0.0015073	0.0136709***	0.014014	0.0170359
4: 0	0.000599***	0.0003433	0.0008547	0.0162923***	0.0042663	0.0091704
4: 1	0.0021014***	-0.000392	0.0045947	0.0149024***	-0.000166	0.0428937
4: 2	0.0018402***	0.0009378	0.0027427	0.0122903***	0.0110222	0.0304819
4: 3	0.0016713***	0.0015135	0.0018291	0.0126717***	0.01724	0.0205653
5: 0	0.0004971***	0.0003358	0.0006584	0.0162709***	0.0041522	0.0071984
5: 1	0.0016412***	-0.000186	0.0034689	0.0150014***	0.0009609	0.0329787
5: 2	0.0015587***	0.0009057	0.0022118	0.0122242***	0.0106322	0.0247671
5: 3	0.0020513***	0.0016982	0.0024044	0.0120901***	0.019471	0.0267643
6: 0	0.0004187***	0.0003213	0.0005161	0.0171755***	0.0039254	0.0057945
6: 1	0.0012935***	-0.00005	0.0026364	0.0156069***	0.0016938	0.0254772
6: 2	0.0013267***	0.0008607	0.0017927	0.0126064***	0.0101078	0.0202123
6: 3	0.0025355***	0.001855	0.003216	0.0118672***	0.0214837	0.0352334
7: 0	0.0003579***	0.0002924	0.0004234	0.0190391***	0.0034522	0.0049886
7: 1	0.0010284***	0.00004	0.0020167	0.0167351***	0.0021405	0.0197877
7: 2	0.0011344***	0.0008048	0.001464	0.0134077***	0.0094571	0.0166196
7: 3	0.0031554***	0.0019913	0.0043195	0.0119593***	0.0234874	0.0461749
8: 0	0.0003104***	0.0002421	0.0003787	0.0219127***	0.0027643	0.0046692
8: 1	0.0008246***	0.0000966	0.0015526	0.0184114***	0.0023801	0.0154606
8: 2	0.0009742***	0.0007374	0.001211	0.0146177***	0.0086615	0.0138546
8: 3	0.0039518***	0.0020918	0.0058118	0.0123354***	0.0255329	0.0599502
9: 0	0.0003104***	0.0002421	0.0003787	0.0258424***	0.0020785	0.0045586
9: 1	0.0008246***	0.0000966	0.0015526	0.0206645***	0.0024686	0.0121627
9: 2	0.0009742***	0.0007374	0.001211	0.0162381***	0.0076919	0.011823
9: 3	0.0039518***	0.0020918	0.0058118	0.0129752***	0.0276923	0.0768525

10: 0	0.0002435***	0.0001333	0.0003536	0.0308419***	0.0014724	0.0045329
10: 1	0.0005433***	0.0001476	0.0009391	0.0235189***	0.002444	0.0096488
10: 2	0.0007269***	0.0005631	0.0008907	0.0182771***	0.0065762	0.0103973
10: 3	0.0063006***	0.002062	0.0105391	0.0138665***	0.0301055	0.097
Career Woman						
0	0.0005929***	0.0003769	0.0008088	0.0067771***	0.0044078	0.0091464
1	0.0012126***	0.00079	0.0016352	0.0137007***	0.0091238	0.0182775
2	0.0019116***	0.0014712	0.002352	0.0215245***	0.0167714	0.0262775
3	0.0024759***	0.0021866	0.0027653	0.0275465***	0.0245017	0.0305912
Woman with bad health						
0	0.0010228***	0.0005891	0.0014565	0.0115125***	0.0067821	0.016243
1	0.0023604***	0.0011809	0.0035399	0.0252282***	0.0136352	0.0368212
2	0.0032959***	0.0025377	0.0040542	0.0355253***	0.0279421	0.0431084
3	0.0032075***	0.0026464	0.0037686	0.0350821***	0.0293394	0.0408249
Average						
0	0.0001154***	0.0000438	0.000187	0.0012646***	0.0004339	0.0020953
1	0.0002332***	0.0000854	0.000381	0.0026805***	0.0009632	0.0043979
2	0.0004676***	0.0002868	0.0006484	0.0053454***	0.00327	0.0074209
3	0.0003808***	0.0001618	0.0005998	0.0041763***	0.0017054	0.0066472
No employment						
0	0.0000813***	0.0000262	0.0001363	0.0008908***	0.0002563	0.0015253
1	0.0001538***	0.0000205	0.0002872	0.0017289***	0.0002147	0.003243
2	0.0004544***	0.0002192	0.0006896	0.0051341***	0.0024674	0.0078007
3	0.0003883***	0.0001465	0.00063	0.0042484***	0.001533	0.0069639
Part-time employment						
0	0.0000435***	0.0000123	0.0000748	0.0004795***	0.000119	0.0008401
1	0.0000825***	0.0000105	0.0001544	0.0009311***	0.0001092	0.0017529
2	0.0002436***	0.0001135	0.0003737	0.0027693***	0.0012796	0.0042591
3	0.0002081***	0.0000708	0.0003454	0.0022907***	0.0007438	0.0038376

*Note: The table shows the predictive margins and CIs for all regression models in their initial monthly time measurement and with time yearly aggregated with significance levels of *** p<0.01, ** p<0.05, * p<0.1.*

Table A23: Measures of risk reduction with predictive margins

					Risk reduction measures			
Length maternity leave	**Sick**	**Not sick**	**Total**	**Margins**	**RR**	**ARR**	**RRR**	**NNT**
Model 1								
2 months (stat.)	213	1,764	1,977	0.000435	1	0	0	
3-12 months	93	338	431	0.000873	0.095509	0.000438	0.501547	2,284.67
13-24 months	251	379	630	0.001604	0.058275	0.001169	0.728769	855.5784
25-36 months	598	601	1,199	0.002017	0.073486	0.001582	0.784312	632.1912
Model 2								
2 months (stat.)	43	148	191	0.000435	1	0	0	
3-12 months	17	39	56	0.000873	0.095465	0.000438	0.501775	2,282.063
13-24 months	90	51	141	0.001598	0.058492	0.001163	0.727756	859.7713
25-36 months	131	101	232	0.002015	0.073554	0.00158	0.784112	632.7912
Model 3								
2 months (stat.)	49	693	742	0.000496	1	0	0	
3-12 months	25	107	132	0.00098	0.097037	0.000484	0.493569	2,068.252
13-24 months	48	91	139	0.001235	0.086341	0.000738	0.598137	1354.28
25-36 months	146	151	297	0.001855	0.091132	0.001359	0.732517	736.0518

Model 4								
2 months (stat.)	72	502	574	0.00055	1	0	0	
3-12 months	33	129	162	0.000939	0.112269	0.000389	0.414076	2571.355
13-24 months	123	167	290	0.001297	0.091145	0.000747	0.575779	1338.867
25-36 months	248	255	503	0.001893	0.099043	0.001343	0.709297	744.768

*Note: The table shows different measures of risk reduction for all four regression models based on the predictive margins. The abbreviations refer to the following terms: **RR** = risk reduction (ratio of probability of sickness occurrence in a maternity leave duration group to the probability of sickness); **ARR** = absolute risk reduction (difference between the risk of sickness occurrence in the maternity leave duration = # (exposed) group and the maternity leave duration = 0 (unexposed) group); **RRR** = relative risk reduction (relative risk of sickness occurrence in the maternity leave duration = # (exposed) group compared to the one in the maternity leave duration = 0 (unexposed) group); **NNT** = numbers needed to treat (average number of mothers who need to take the maternity leave duration = # (> maternity leave duration = 0) to prevent one additional sickness occurrence).*

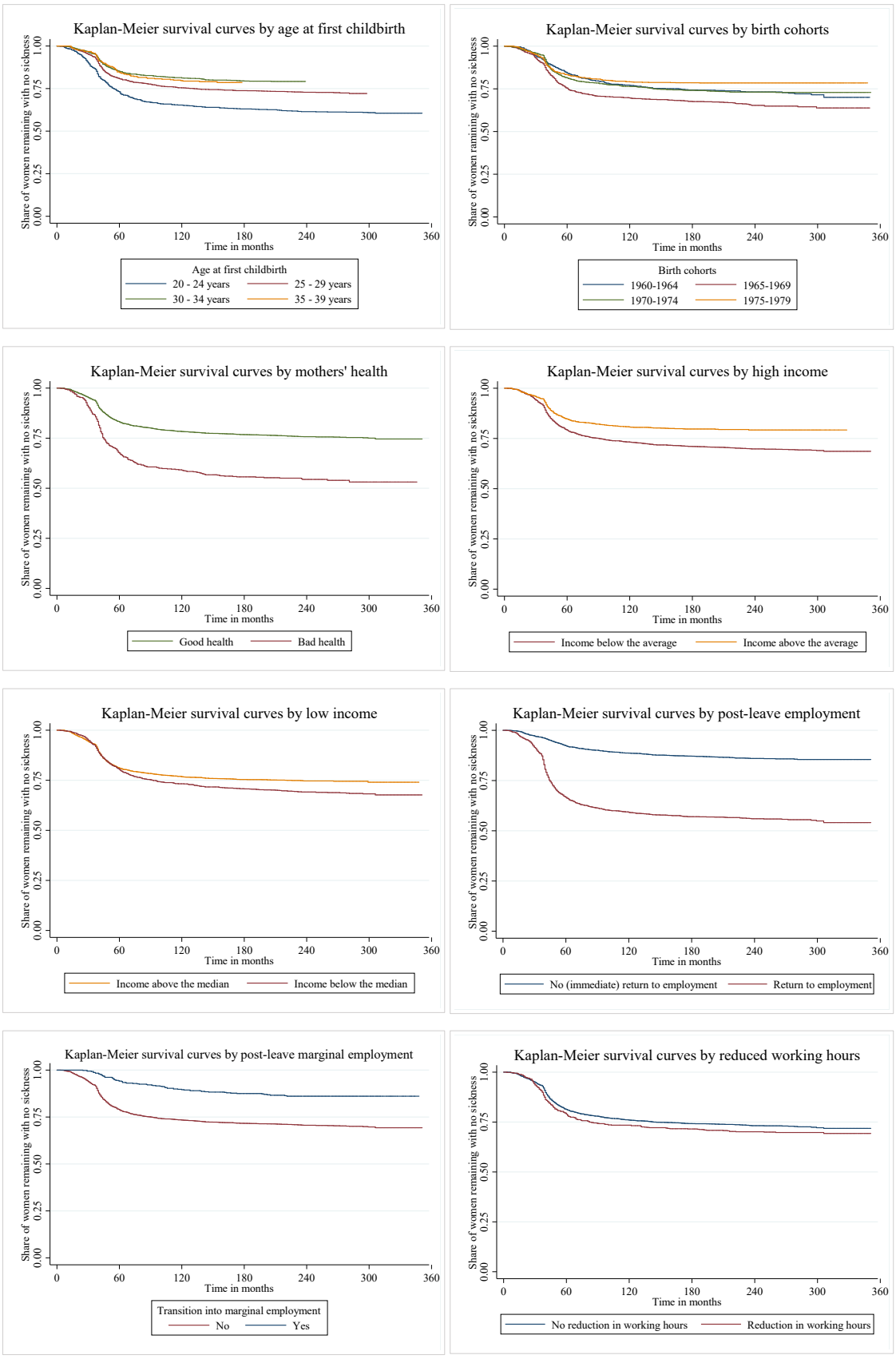
Table A24: Sickness rate and maternity leave distribution by pre-reform of 1992 subsamples

	Full		**Not sick** (*sick_*=0)			**Sick** (*sick_*=1)		
Subsample	**N_{Full}**	**%**	**N**	**%**	**% (N_F)**	**N**	**%**	**% (N_F)**
Full sample	4,237	100	3082		73	1155		28
Maternity leave (*length*)								
2 months (stat.)	1,977	47	1764	89	42	213	11	5
3-12 months	431	10	338	78	8	93	22	2
13-24 months	630	15	379	60	9	251	40	6
25-36 months	1,199	28	601	50	14	598	50	14
Childbirth < 1992	643	100	237		37	406		63
Maternity leave (*length*)								
2 months (stat.)	327	51	209	88	64	118	29	36
3-12 months	100	16	48	20	48	52	13	52
13-24 months	304	47	95	40	31	209	51	69
25-36 months	49	7	22	9	45	27	7	55
Childbirth 1986-1992	486	100	222		46	264		54
Maternity leave (*length*)								
2 months (stat.)	210	43	54	30	11	156	59	32
3-12 months	48	10	22	11	5	26	10	5
13-24 months	200	41	133	54	27	68	26	14
25-36 months	27	6	13	6	3	14	5	3
Childbirth < 1986	157	100	89		57	68		43
Maternity leave (*length*)								
2 months (stat.)	58	40	40	69	25	18	31	11
3-12 months	38	24	20	53	13	18	47	11
13-24 months	47	30	22	47	14	25	53	15
25-36 months	14	9	7	50	4	7	50	4

Note: The table shows the sickness rate and the maternity leave distribution of different variations of the pre-reform of 1992 subsample.

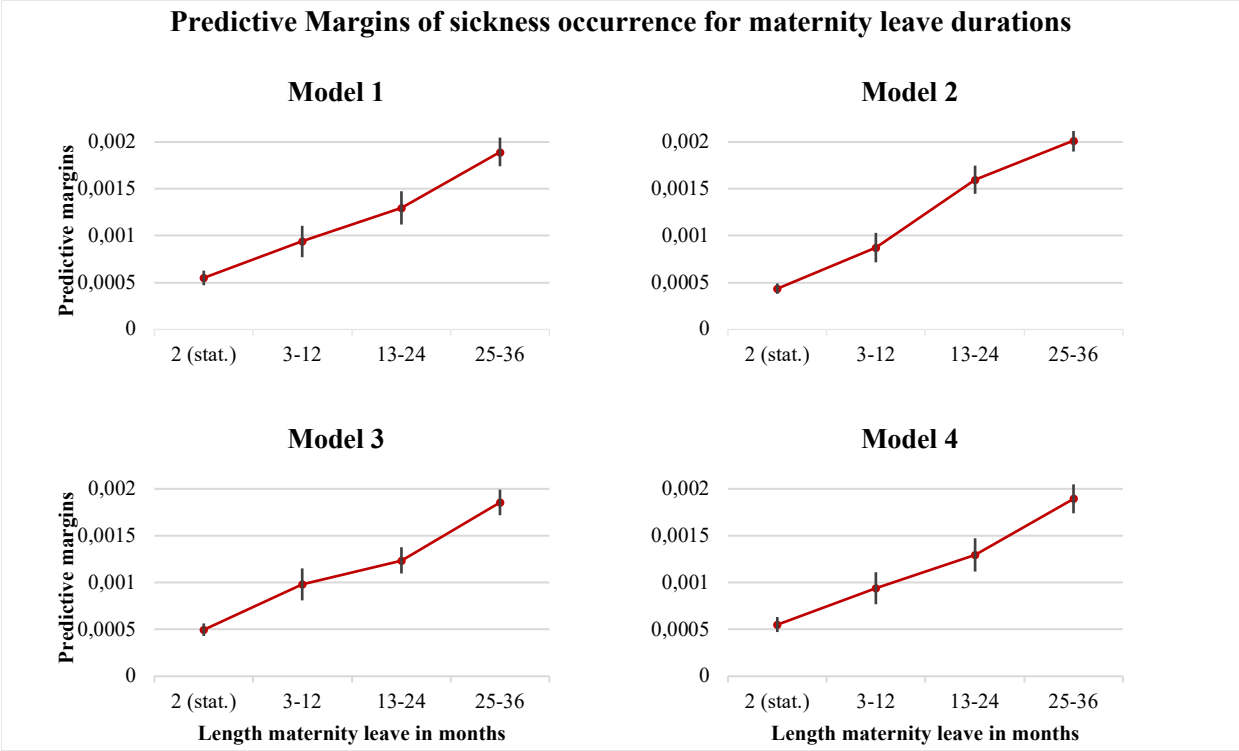
Appendix D: Additional figures

Figure A10: Kaplan-Meier survival curves by different covariates



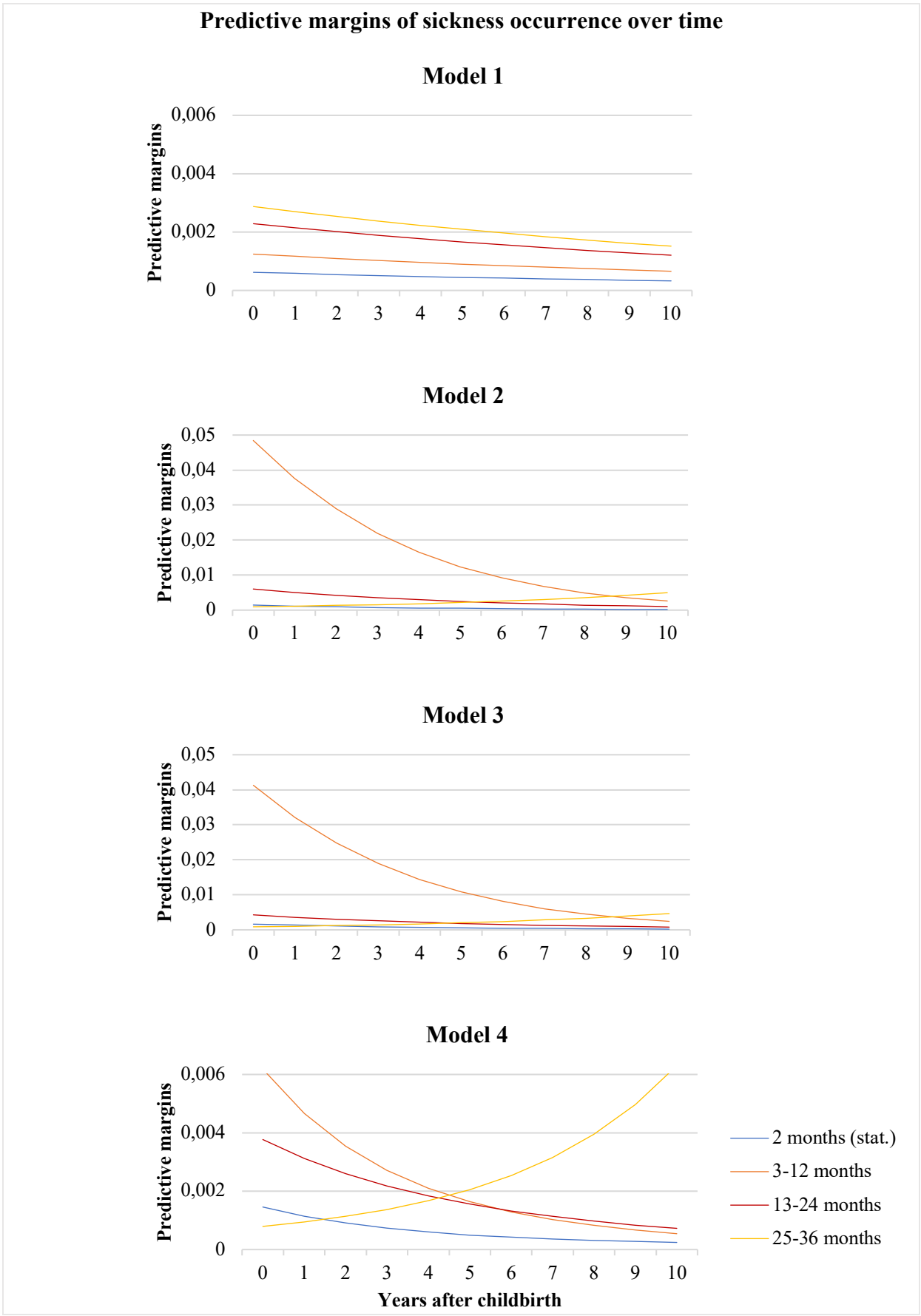
Note: The graphs show Kaplan-Meier survival curves by the covariates age at first childbirth, birth cohort, mother's health, high and low income, and post-leave full employment, marginal employment and reduced working hours.

Figure A11: Predictive margins and 95 % CIs of sickness occurrence for maternity leave durations



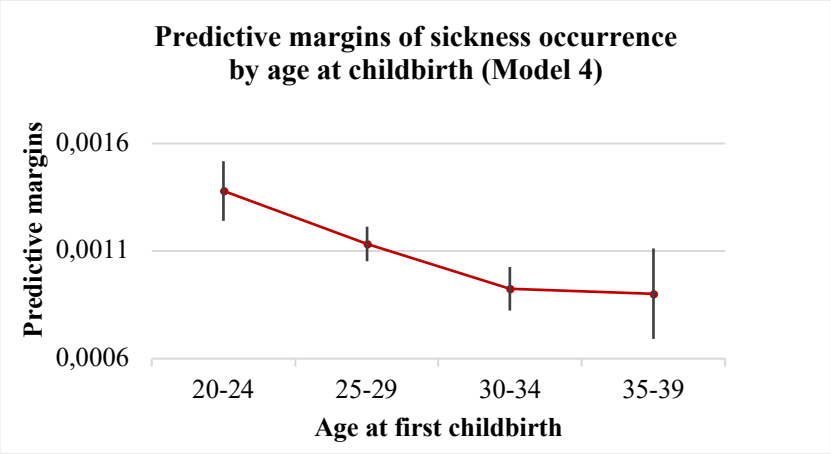
Note: The figure shows four different graphs of the monthly predictive margins and CIs of becoming sick by maternity leave durations for the different regression models. The x-axis shows the length maternity leave in months, the y-axis shows the monthly predictive margins.

Figure A12: Predictive margins of sickness occurrence over time by maternity leave durations



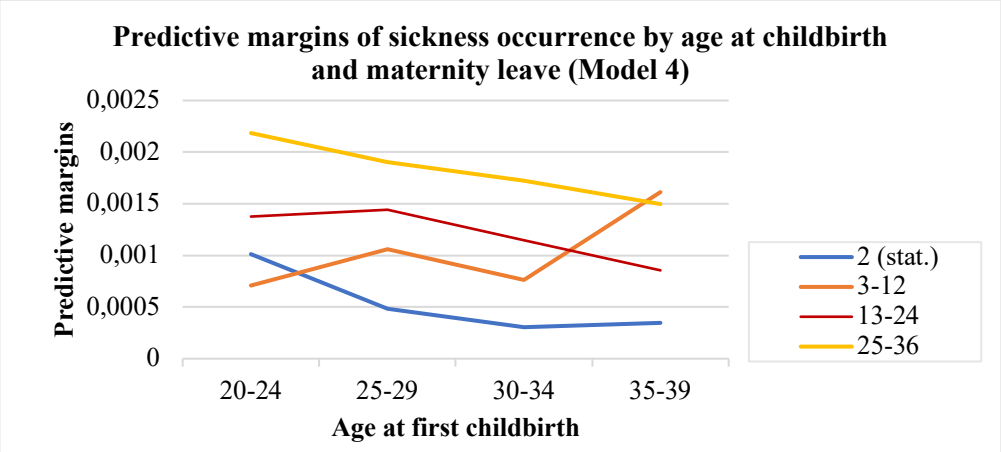
Note: The graph shows the monthly predictive margins of becoming sick (y-axis) by regression model and their development over time (x-axis) for an observation period of 10 years by the length maternity leave.

Figure A13: Predictive margins and 95 % CIs of sickness occurrence by age at first childbirth (Model 4)



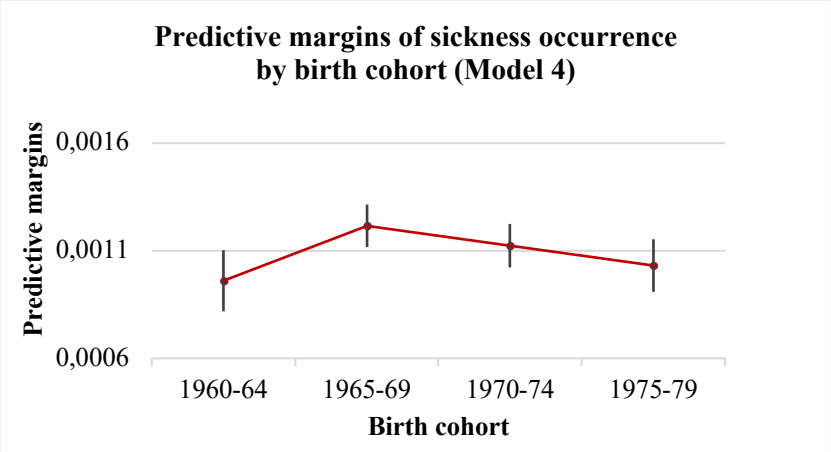
Note: The graph shows the monthly predictive margins and 95 % CIs of becoming sick for Model 4 by different ages at childbirth (x-axis). The y-axis shows the monthly predictive margins.

Figure A14: Predictive margins of sickness occurrence by age at childbirth and maternity leave (Model 4)



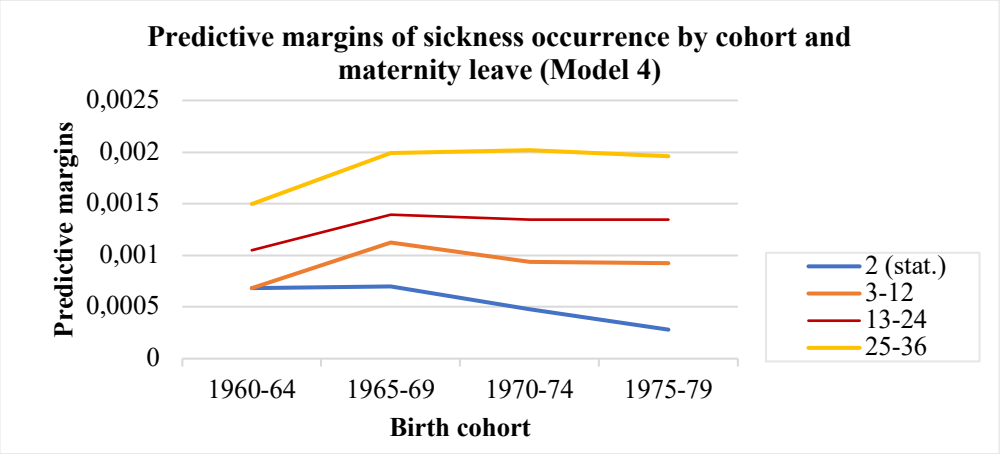
Note: The graph shows the monthly predictive margins of becoming sick for regression Model 4 by different ages at first childbirth (x-axis) for the different groups of maternity leave in categories of 0 = 2 months (stat.), 1 = 3-12 months, 2 = 13-24 months, and 3 = 25-36 months. The y-axis shows the monthly predictive margins.

Figure A15: Predictive margins and 95 % CIs of sickness occurrence by birth cohort (Model 4)



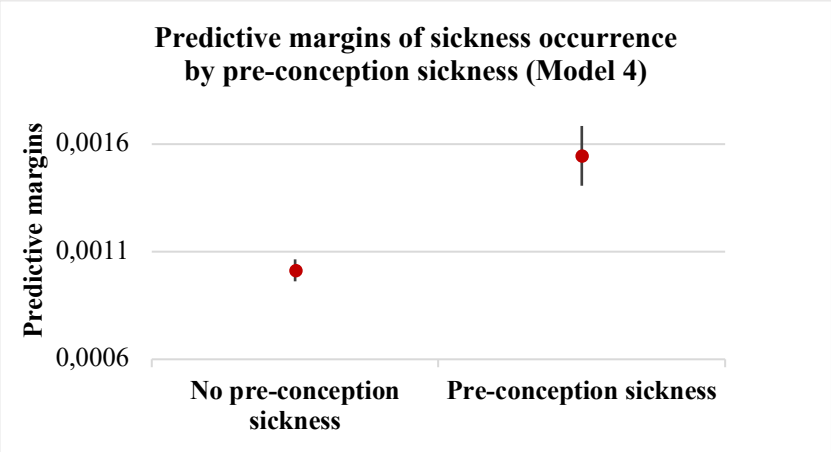
Note: The graph shows the monthly predictive margins and 95 % CIs of becoming sick for Model 4 by different birth cohorts (x-axis). The y-axis shows the monthly predictive margins.

Figure A16: Predictive margins of sickness occurrence by cohort and maternity leave (Model 4)



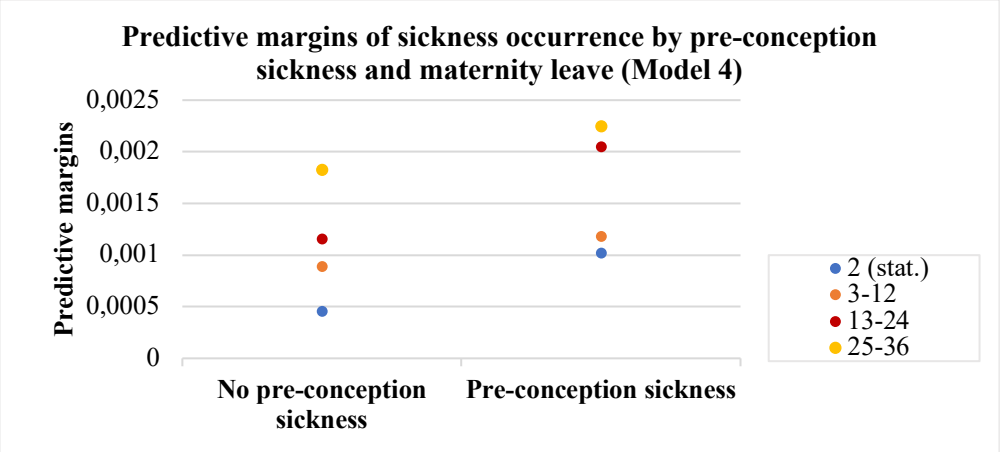
Note: The graph shows the monthly predictive margins of becoming sick for regression Model 4 by different birth cohorts (x-axis) for the different groups of maternity leave in categories of 0 = 2 months (stat.), 1 = 3-12 months, 2 = 13-24 months, and 3 = 25-36 months. The y-axis shows the monthly predictive margins.

Figure A17: Predictive margins and 95 % CIs of sickness occurrence by pre-conception health (Model 4)



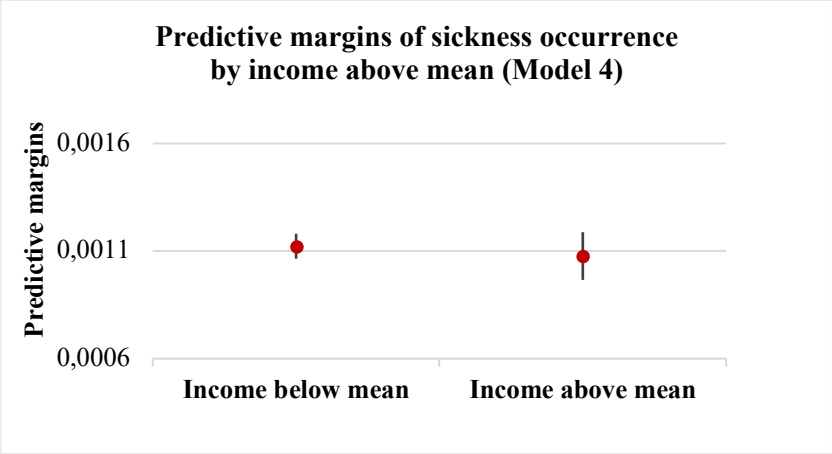
Note: The graph shows the monthly predictive margins and 95 % CIs of becoming sick for Model 4 by the mothers' health status (x-axis). The y-axis shows the monthly predictive margins.

Figure A18: Predictive margins of sickness occurrence by pre-conception sickness (Model 4)



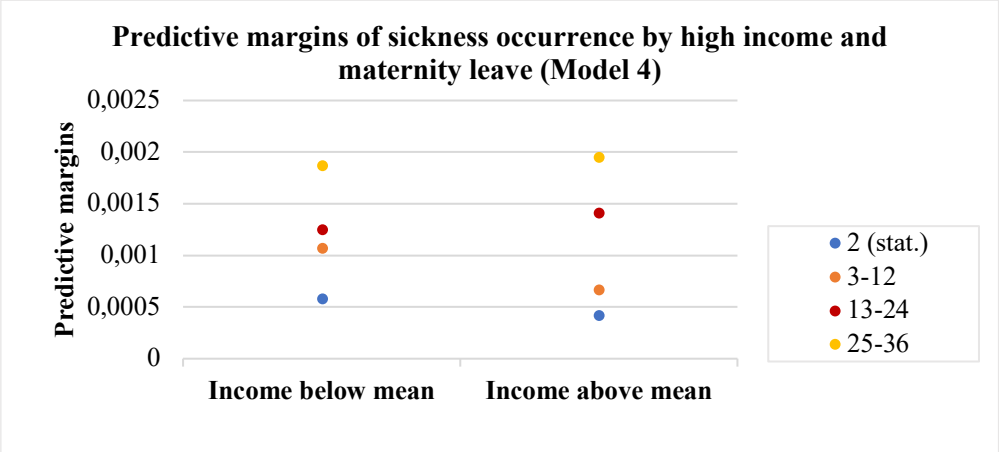
Note: The graph shows the monthly predictive margins of becoming sick for regression Model 4 by the mothers' health status (x-axis) for the different groups of maternity leave in categories of 0 = 2 months (stat.), 1 = 3-12 months, 2 = 13-24 months, and 3 = 25-36 months. The y-axis shows the monthly predictive margins.

Figure A19: Predictive margins and 95 % CIs of sickness occurrence by income above mean (Model 4)



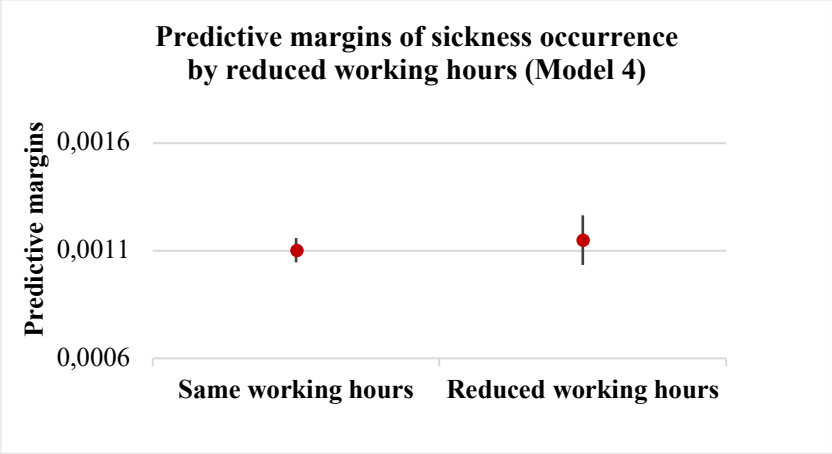
Note: The graph shows the monthly predictive margins and 95 % CIs of becoming sick for Model 4 by high income (x-axis). The y-axis shows the monthly predictive margins.

Figure A20: Predictive margins of sickness occurrence by high income and maternity leave (Model 4)



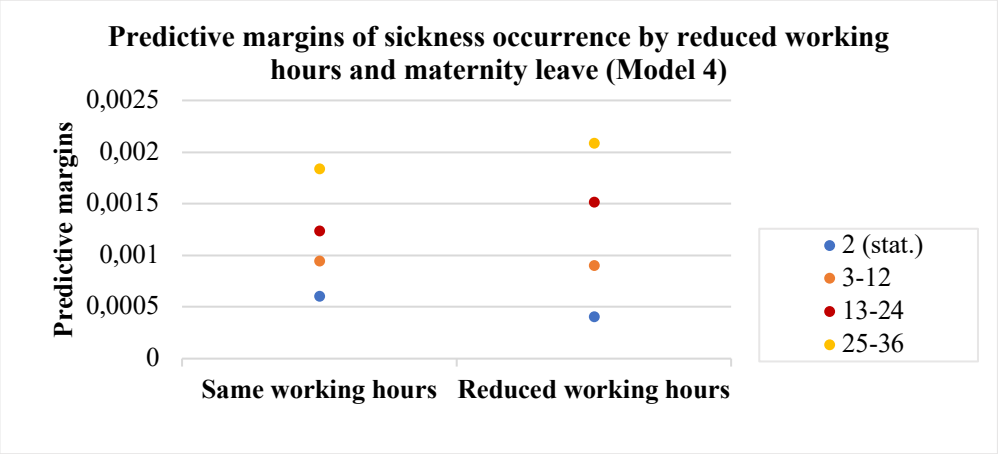
Note: The graph shows the monthly predictive margins of becoming sick for regression Model 4 by high income (x-axis) for the different groups of maternity leave in categories of 0 = 2 months (stat.), 1 = 3-12 months, 2 = 13-24 months, and 3 = 25-36 months. The y-axis shows the monthly predictive margins.

Figure A21: Predictive margins and 95 % CIs of sickness occurrence by reduced hours (Model 4)



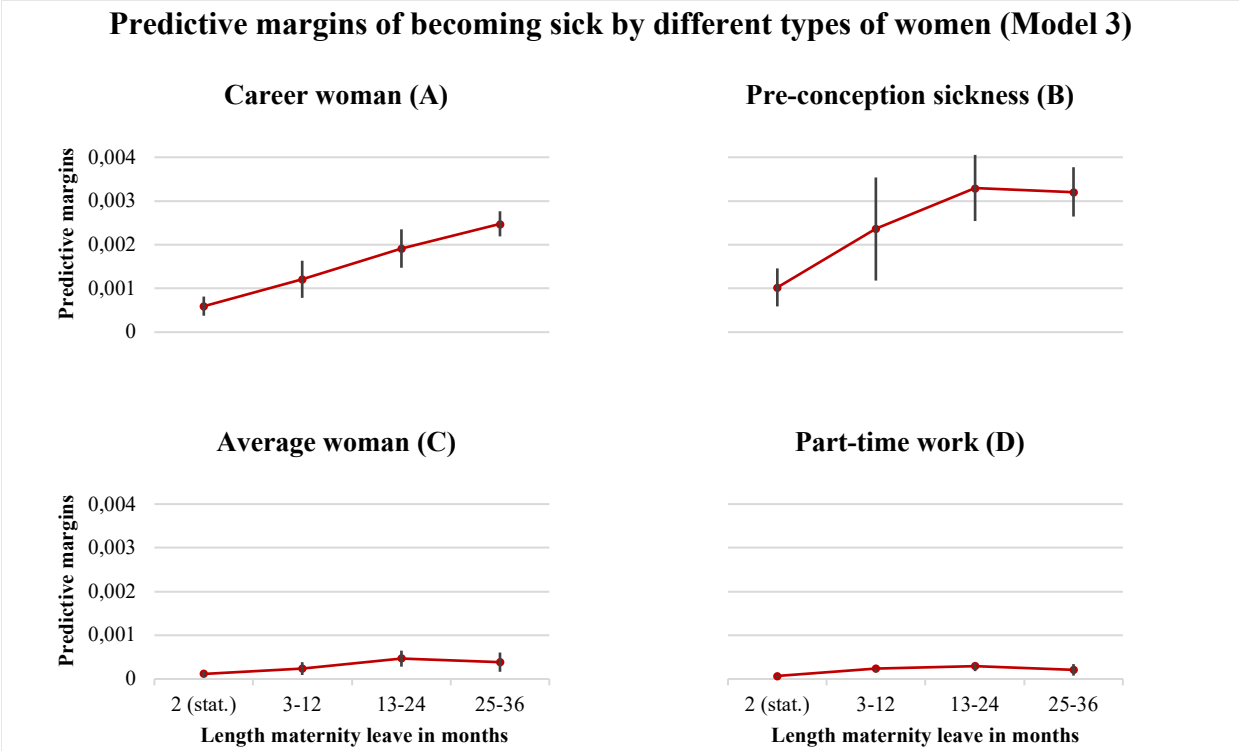
Note: The graph shows the monthly predictive margins and 95 % CIs of becoming sick for Model 4 by reduced working hours (x-axis). The y-axis shows the monthly predictive margins.

Figure A22: Predictive margins of sickness occurrence by reduced hours and maternity (Model 4)



Note: The graph shows the monthly predictive margins of becoming sick for regression Model 4 by reduced working hours (x-axis) for the different groups of maternity leave in categories of 0 = 2 months (stat.), 1 = 3-12 months, 2 = 13-24 months, and 3 = 25-36 months. The y-axis shows the monthly predictive margins.

Figure A23: Predictive margins and 95 % CIs of maternity leave by different types (Model 3)



Note: The table shows the monthly probabilities of sickness occurrence calculated by predictive margins (y-axis) of Model 4 for the different maternity leave durations (x-axis) in categories by different types of women. Type A (career woman) is characterised by full employment after the leave and a high income, B indicates pre-conception sickness, C has all characteristics on average, and D changes to part-time work after the leave.

Appendix E: Robustness and sensitivity analyses

Table A25: Robustness checks for different subsamples and time measurement

	Initial model	Variations A-D			
Model 1	**Coef.**	**A**	**B**	**C**	**D**
Maternity leave duration (ref.: 2 months (stat.))					
3-12 months (1)	**0.697*****	0.542***	1.739***	0.792***	0.695***
13-24 months (2)	**1.307*****	1.057***	1.777***	1.145***	1.313***
25-36 months (3)	**1.537*****	1.724***	2.136***	1.781***	1.543***
Model 2					
Maternity leave duration					
1	**0.821*****	0.252669	0.58722**	0.85464***	-4.27184
2	**1.072*****	0.6097**	0.47539**	0.99616***	-3.16412
3	**0.462*****	0.4344**	-0.75971	0.62010***	-15.157***
Model 3					
Maternity leave duration					
1	**0.793*****	0.463865	5.5458**	0.99184***	-4.317123
2	**0.675*****	0.5768096*	4.4406*	0.95984***	-3.446912
3	**0.249**	0.141049	-1.12396	0.31692*	-15.431***
Model 4					
Maternity leave duration					
1	**-1.765*****	-0.282	-	-1.887**	0.709
2	**-1.186*****	-2.377***	-	-2.406***	2.167
3	**-2.092*****	-3.362***	-	-3.371***	-21.28***

*Note: The table shows the log odd coefficients of the maternity leave categories 3-12 months (1), 13-24 months (2), and 25-36 months (3) with the reference category of 2 months (stat.) for the four regression models for different sub samples and with a different time measurement with significance levels of *** p<0.01, ** p<0.05, * p<0.1 in order to check for robustness of the regression models. The notations refer to: A = only mothers between the reform of 1992 and of 2007, B = only mothers since the reform of 2007, C = all mothers since the reform of 1992, and D = time measurement (t=0) starts in the month after finishing the maternity leave. The conditions for the robustness checks are the same significance level (1), same sign (+/-) (2), and the same quality of the number (size and relation to the other coefficients) (3). The initial coefficients are marked in **bold**, those which meet all conditions are shaded in grey, those who meet two conditions are without any markers, and coefficients meeting one or less conditions are shaded in black. The coefficients for variation 2 in model 4 could not be calculated due to too many omitted cases.*

Table A26: Comparison regression coefficients yearly aggregated and initial (monthly) models

Sickness occurrence	**Model 1**			**Model 2**		
Intercept	Coef. (yearly)	SE	Coef. (monthly)	Coef. (yearly)	SE	Coef. (monthly)
Maternity leave duration (ref.: 2 months (stat0.))						
3-12 months	0.696***	(0.112)	**0.697*****	0.828***	(0.202)	**0.821*****
13- 24 months	1.306***	(0.0809)	**1.307*****	1.089***	(0.158)	**1.072*****
25- 36 months	1.537***	(0.0707)	**1.537*****	0.466***	(0.160)	**0.462*****
Time (months)	-0.00496**	(0.00233)	**-0.00534****	-0.0163***	(0.00398)	**-0.0174*****
Time^2	-5.58e-05***	(1.55e-05)	**-5.41e-05*****	-2.58e-05	(2.63e-05)	**-2.03e-05**
Maternity leave x Time						
3- 12 months				-0.0106*	(0.00589)	**-0.0103***
13- 24 months				0.00186	(0.00529)	**0.00254**
25- 36 months				0.0309***	(0.00604)	**0.0313*****

Maternity leave x Time²						
3- 12 months				8.03e-05**	(3.24e-05)	**7.85e-05****
13- 24 months				2.31e-05	(3.32e-05)	**1.94e-05**
25- 36 months				-0.000134***	(4.24e-05)	**-0.00014*****
Constant	-4.178***	(0.0898)	**-5.904*****	-3.717***	(0.120)	**-6.156*****
Observations	90,867		**1,049,205**	90,867		**1,049,205**
Chi^2	1,466		**1,521**	1,031		**1,052**
Degrees of Freedom	5		**25**	11		**11**
Log-likelihood	-5,410		**-8,065**	-5,363		**-8,196**
Number of cases	4,237		**4,237**	4,237		**4,237**
Pseudo R^2	0.126		**0.106**	0.134		**0.0915**

	Model 3			**Model 4**		
Intercept	Coef. (yearly)	SE	Coef. (monthly)	Coef. (yearly)	SE	Coef (monthly)
Maternity leave duration (ref.: 2 months (stat.))						
3- 12 months	0.804***	(0.205)	**0.793*****	-2.475***	(0.544)	**-2.442*****
13- 24 months	0.703***	(0.166)	**0.675*****	-1.237***	(0.379)	**-1.225*****
25- 36 months	0.264	(0.168)	**0.249**	-1.968***	(0.403)	**-1.939*****
Time (months)	-0.0160***	(0.00391)	**-0.0171*****	-0.0198***	(0.00662)	**-0.0206*****
Time²	-2.83e-05	(2.56e-05)	**-2.26e-05**	-5.65e-05	(3.61e-05)	**-4.98e-05**
Maternity leave x Time						
3- 12 months	-0.00983*	(0.00579)	**-0.00942***	0.0129	(0.00977)	**0.0125**
13- 24 months	0.00193	(0.00517)	**0.00293**	0.0135*	(0.00804)	**0.0140***
25- 36 months	0.0307***	(0.00597)	**0.0312*****	0.0504***	(0.00898)	**0.0503*****
Maternity leave x Time²						
3- 12 months	7.51e-05**	(3.14e-05)	**7.29e-05****	6.22e-05	(4.29e-05)	**6.01e-05**
13- 24 months	2.18e-05	(3.21e-05)	**1.67e-05**	3.63e-05	(4.16e-05)	**3.06e-05**
25- 36 months	-0.000133***	(4.18e-05)	**-0.000137*****	-0.000127***	(4.89e-05)	**-0.00013*****
Age at childbirth (ref.: 20- 24)						
25- 29	-0.156***	(0.0603)	**-0.153****	-1.178***	(0.222)	**-1.155*****
30- 34	-0.382***	(0.0811)	**-0.377*****	-1.960***	(0.305)	**-1.955*****
35- 39	-0.450***	(0.124)	**-0.438*****	-2.464***	(0.584)	**-2.486*****
Birth cohort (ref.: 1960-1964)						
1965-1969	0.229***	(0.0784)	**0.235*****	0.451*	(0.267)	**0.459***
1970-1974	0.193**	(0.0919)	**0.201****	-0.597*	(0.311)	**-0.570***
1975-1979	0.0464	(0.107)	**0.0574**	-1.168***	(0.361)	**-1.157*****
Bad health condition	0.393***	(0.0514)	**0.395*****	0.807***	(0.147)	**0.805*****
Income>average	-0.0811	(0.0636)	**-0.0783**	-0.322*	(0.178)	**-0.322***
Income<median	-0.115**	(0.0573)	**-0.117****	-0.0713	(0.0583)	**-0.0746**
Post employed	0.513***	(0.0652)	**0.521*****	0.487***	(0.136)	**0.498*****
Marginal employment	-0.632***	(0.122)	**-0.637*****	-0.620***	(0.124)	**-0.624*****
Reduced working hours	0.0592	(0.0612)	**0.0650**	-0.399**	(0.163)	**-0.399****
Childcare reform applicable						
Reform of 1990	-0.365***	(0.101)	**-0.357*****	-0.241**	(0.110)	**-0.233****
Reform of 2007	-0.487***	(0.149)	**-0.482*****	-0.507***	(0.160)	**-0.497*****
Age at childbirth x Maternity leave						
25-29 x 3-12				1.571***	(0.424)	**1.537*****
25-29 x 13-24				1.172***	(0.310)	**1.146*****
25-29 x 25-36				1.465***	(0.302)	**1.431*****
30-34 x 3-12				2.609***	(0.534)	**2.575*****
30-34 x 13-24				1.878***	(0.409)	**1.866*****
30-34 x 25-36				2.343***	(0.366)	**2.316*****
35-39 x 3-12				3.436***	(0.742)	**3.400*****
35-39 x 13-24				2.308***	(0.750)	**2.312*****
35-39 x 25-36				2.996***	(0.632)	**2.966*****
Age at childbirth x Maternity leave x Time						
25-29 x 2 (stat.) x time				0.0103***	(0.00394)	**0.00990****
25-29 x 3-12 x time				0.000153	(0.00362)	**0.000340**
25-29 x 13-24 x time				0.000880	(0.00325)	**0.000922**
25-29 x 25-36 x time				-0.00601**	(0.00281)	**-0.00585****

30-34 x 2 (stat.) x time				0.0163***	(0.00451)	**0.0161*** **
30-34 x 3-12 x time				-0.0123*	(0.00697)	**-0.0119***
30-34 x 13-24 x time				-0.00185	(0.00434)	**-0.00174**
30-34 x 25-36 x time				-0.00910***	(0.00277)	**-0.0088*** **
35-39 x 2 (stat.) x time				0.0243***	(0.00763)	**0.0248*** **
35-39 x 3-12 x time				-0.00259	(0.00711)	**-0.00149**
35-39 x 13-24 x time				-0.00646	(0.00766)	**-0.00605**
35-39 x 25-36 x time				-0.0142***	(0.00321)	**-0.0133*** **
Birth Cohort x Maternity leave						
65-69 x 3-12				0.531	(0.570)	**0.531**
65-69 x 13-24				0.176	(0.373)	**0.166**
65-69 x 25-36				-0.0662	(0.388)	**-0.0614**
70-74 x 3-12				1.965***	(0.568)	**1.944*** **
70-74 x 13-24				1.185***	(0.411)	**1.155*** **
70-74 x 25-36				1.393***	(0.398)	**1.367*** **
75-79 x 3-12				2.427***	(0.590)	**2.415*** **
75-79 x 13-24				2.349***	(0.429)	**2.327*** **
75-79 x 25-36				2.491***	(0.438)	**2.462*** **
Birth cohort x Maternity leave x Time						
65-69 x 2 (stat.) x time				-0.0109**	(0.00510)	**-0.0108** **
65-69 x 3-12 x time				-0.00622	(0.00559)	**-0.00630**
65-69 x 13-24 x time				-0.00505	(0.00373)	**-0.00504**
65-69 x 25-36 x time				-0.00125	(0.00364)	**-0.00147**
70-74 x 2 (stat.) x time				0.00452	(0.00454)	**0.00420**
70-74 x 3-12 x time				-0.0179***	(0.00655)	**-0.0179*** **
70-74 x 13-24 x time				-0.00493	(0.00367)	**-0.00497**
70-74 x 25-36 x time				-0.00694**	(0.00331)	**-0.00697** **
75-79 x 2 (stat.) x time				0.00523	(0.00460)	**0.00503**
75-79 x 3-12 x time				-0.0153***	(0.00568)	**-0.0153*** **
75-79 x 13-24 x time				-0.0174***	(0.00363)	**-0.0173*** **
75-79 x 25-36 x time				-0.0165***	(0.00336)	**-0.0163*** **
Bad health x Maternity leave						
1 x 3-12				-0.517**	(0.254)	**-0.517** **
1 x 13-24				-0.237	(0.175)	**-0.233**
1 x 25-36				-0.601***	(0.161)	**-0.596*** **
Income>average x Maternity leave						
1 x 3-12				-0.156	(0.278)	**-0.154**
1 x 13-24				0.447**	(0.227)	**0.444***
1 x 25-36				0.360*	(0.193)	**0.364***
Employment after maternity leave						
Post employed x Maternity leave						
1 x 3-12				0.868***	(0.310)	**0.870*** **
1 x 13-24				0.0877	(0.195)	**0.0784**
1 x 25-36				-0.118	(0.161)	**-0.119**
Reduced hours x Maternity leave						
1 x 3-12				0.326	(0.297)	**0.353**
1 x 13-24				0.594***	(0.190)	**0.602*** **
1 x 25-36				0.521***	(0.171)	**0.525*** **
Constant	-3.452***	(0.143)	**-5.904*** **	-2.355***	(0.249)	**-4.823*** **
Observations	90,867		**1,049,205**	90,867		**1,049,205**
Chi^2	1,483		**1,521**	1,520		**1,578**
Degrees of Freedom	25		**25**	73		**73**
Log-likelihood	-5,236		**-8,065**	-5,139		**-7,967**
Number of cases	4,237		**4,237**	4,237		**4,237**
Pseudo R^2	0.154		**0.106**	0.170		**0.117**

*Note: The table shows the regression results of the discrete-time logit models applied with robust standard errors in parentheses and significance levels of *** p<0.01, ** p<0.05, * p<0.1 for the models with time aggregated for years in comparison with the coefficients of the initial regression model..*

Table A27: Sensitivity analysis for different covariates

	Initial model	Variations E-O				
Model 3	**Coef.**	**E**	**F**	**G**	**H**	**I**
Maternity leave duration						
1	**0.793*****	0.804***	0.783***	0.838***	0.796***	0.782***
2	**0.675*****	0.686***	0.689***	0.759***	0.679***	0.665***
3	**0.249**	0.259	0.255	0.309*	0.257	0.232
	J	**K**	**L**	**M**	**N**	**O**
1	0.785***	0.820***	1.076***	0.784***	0.602***	0.804***
2	0.668***	0.751***	0.995***	0.669***	0.500***	0.792***
3	0.238	0.210	0.569***	0.240	0.139	0.520***
Model 4	**Coef.**	**E**	**F**	**G**	**H**	**I**
Maternity leave duration						
1	**-1.765*****	-1.271**	-1.631***	-2.506***	-2.365***	-2.468***
2	**-1.186*****	-0.334	-0.548**	-1.111***	-1.191***	-1.253***
3	**-2.092*****	-0.532	-10.016***	-1.975***	-1.892***	-1.974***
	J	**K**	**L**	**M**	**N**	**O**
1	-2.391***	-2.383***	-1.413***	-2.242***	-2.810***	-1.285**
2	-1.218***	-1.189***	-0.869**	-0.977***	-1.466***	-0.498
3	-1.927***	-2.045***	-1.754***	-1.684***	-2.031***	-1.368***

*Note: The table shows the log odd coefficients of the maternity leave categories 3-12 months (1), 13-24 months (2), and 25-36 months (3) with the reference category of 2 months (stat.) for the regression models 3 and 4 with significance levels of *** p<0.01, ** p<0.05, * p<0.1 with the omission of different covariates in order to analyse the sensitivity of the models. The omitted variables in the model variations are ageb1 (E), cohort (F), prevsick (G), high (H), low (I), no income (J) reform1990 and reform2007 (K), postempl (L), reduced (M), postmarg (N), and employment conditions (O). The conditions for the sensitivity analysis of the maternity leave coefficients are similar to the ones of the robustness checks: the same significance level (1), same sign (+/-) (2), and the same quality of the number (size and relation to the other coefficients) (3). The initial coefficients are marked in **bold**, those which meet all conditions are shaded in grey, those who meet two conditions are without any markers, and coefficients meeting one or less conditions are shaded in black*