Childcare and maternal mental health

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Abstract

In this paper, we use regional variation in home care allowance to identify how childcare subsidies affect maternal health behavior. Higher home care allowance, a subsidy for parents who take care of under 3-year-old children at home, is linked to both longer childcare leaves and higher disposable income. We find that a small increase in the duration of home care does not affect mother's psychotropic medicine purchases on a population level, apart from a small increase in anxiolytic purchases. However, there is considerably large heterogeneity between mothers from different backgrounds. After an increase in home care allowance, mothers with basic education are more likely to have psychotropic medicine purchases, and their antidepressant and anxiolytic purchases increase. Similarly, mothers from the most disadvantaged backgrounds have the highest increase in both disposable income and psychotropic medicine purchases, suggesting that income constraints exist for appropriate medical treatment among these families.

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Introduction

Family leave benefits allow parents to concentrate on caring for their newborn baby and compensate for lost income. Financial compensation during the leave partly covers the wage loss, and job protection ensures a smooth employment re-entry. However, while these policies appear to have positive effects on maternal physical and mental health (see e.g., Bullinger, 2019), there is also some evidence that the impacts of longer family leave for parents' (mothers') health may be negligible, or even negative (Chuard, 2023). The effects of longer family leave on parental health have so far received only limited research attention, and it is unclear, at what point extensions in family leaves become detrimental, and which components of these policies improve parental mental health.

In this paper, we provide further evidence of the effects of extending family leaves when the child is 1–2 years old on the parental labor market and health behavior. First, we study if longer childcare leaves affect maternal mental health among mothers who gave birth to their first child between 2000 and 2009. Second, we study potential alternative causal channels, such as income and employment effects, and their effects on maternal mental health. Third, since previous research has found the largest negative effects for mothers from the highest socioeconomic backgrounds and mostly positive effects for mothers from the lowest background (see Canaan et al., 2022), we study if the effect of extending family leaves is heterogeneous among mothers from different socioeconomic backgrounds. To answer these questions, we exploit exogenous policy changes to examine the impact of a higher family leave benefit on mother's well-being and mental health. We exploit regional variation in home care allowance (cash-for-care subsidy) that increases the replacement rate of home care

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allowance but also affects mother's length of home care and disposable income (Kosonen, 2014; Gruber et al. 2023; Österbacka & Räsänen, 2022).

Home care allowance (HCA), our policy instrument in this paper, is a monetary benefit that parents receive if their under-3-year-old child does not attend any publicly subsidized daycare. Parents become eligible for home care allowance after the parental leave period ends, usually when the child is 9 to 10 months old. The level of the benefit is modest and has not changed much during the 2000s. For instance, in 2000 the benefit was € 252 per month, in 2015 the level of home care allowance was €343 per month, and in 2025 the level was € 378 per month. While the level of benefit is relatively low–only 12 percent of median wages in 2015–around 9 out of 10 mothers use home care allowance.

Municipalities can opt for an additional home care allowance for their residents called municipal supplements. Regional variation across more than 300 municipalities in the 2000s offers research design to identify how higher home care allowance affects parents' labor market and health behavior. Indeed, many studies from several Nordic and European countries have found that higher home care allowance reduces the employment rate of women with small children (see, e.g., Drange & Rege 2013; Kosonen 2014; Österbacka & Räsänen 2022).

Contrary to the near-saturated research on the effects of home care allowance on female employment, other outcomes, such as fertility, health, marital stability or child outcomes, are less studied. Our contribution to the new literature is threefold. First, we provide causal evidence on the effects of longer childcare leaves on maternal mental health when children are 1–2 years old. It is well established in the literature that short maternity leaves and extensions have beneficial effects on mothers' health, both physical and mental. However, when compared to postpartum depression, relatively little is known of the causal effects of

later childcare leaves on parents' mental health. For instance, Chuard (2023) finds for Austrian women that 2.5 years rather than 1.5 years of maternity leave increases mothers' mental health problems, measured by inpatient visits and antidepressant consumption in outpatient care. In this study, we seek to confirm these findings on the negative impact of longer leaves on maternal mental health but also take a step further to investigate income effects and other psychotropic medicine use.

Second, we show that a higher benefit replacement rate may have positive effects on families whose income is near poverty line, which is a stark contrast to earlier studies reporting negative effects of long childcare leaves (see, e.g., Österbacka & Räsänen 2022; Chuard 2023). We find that an increase in income is followed by corresponding health behavior. We observe health-seeking behavior from mothers who gain a higher net income after home care allowance is increased; mothers are more likely to purchase psychotropic medicines if they gain additional income. We find that women with basic education also benefit most from higher benefit levels: they gain, on average, 250 € additional annual net income, are less likely to receive financial social assistance, and are more likely to have psychotropic medicine purchases after benefit increases.

Third, we show that mixed or near insignificant results in the previous literature other than labor market outcomes are explained by selection and heterogeneous treatment effects. We find that while all groups are affected by higher home care allowance and increased duration of home care, only some groups have increased psychotropic medicine purchases. Moreover, women who do not react to increases or decreases in the level of home care allowance, have the highest increase in psychotropic medicine purchases and the highest increase in disposable net income.

Lastly, instead of focusing on a small geographic area, our data includes a sample of families residing all over Finland in more than 300 municipalities. The dataset consists of unit-level register data on families, labor market outcomes, and prescribed psychotropic medicine purchases. We use a sample from full-population register data from the Social Insurance Institution (Kela) from the mid-1990s to 2017 on family leave benefits and prescribed medicine purchases, supplementing these with data from Statistics Finland. The dataset spanning almost 20 years is merged with Statistics Finland's longitudinal population register data, which contains demographic information on all residents in Finland since the late 1980s and links between children, parents, and cohabiting or married persons. Leveraging our rich data, we also contribute by studying heterogeneity in parents' outcomes. This approach enables us to move beyond average effects, offering a more nuanced understanding of the impacts and effectiveness of family leave policies and childcare.

Institutional context and policy reform

Health care and services for new mothers

All mothers and their newborn children are covered by public health care and they attend regular visits to National public maternity and child health clinics (Neuvola). The visits include regular checks for the mother and for the child and continue until the child is 6 years old. Mothers visit designated clinics during pregnancy and postpartum period and health problems, such as diabetes and postpartum depression, are monitored. In case of health problems, mothers receive admission note to public primary or specialized (out-patient) health care. In addition to public health care, mothers who have an employment contract can use occupational health care services or purchase private outpatient health day care. In addition, statutory occupational health care must be provided during absence, such as maternity or parental leave.

Prescriptions and medicine reimbursements in Finland

With a few exceptions, National Health Insurance covers all medicines used in outpatient care. Outpatient medicines can be prescribed in primary or specialized healthcare in occupational, private, or public healthcare. Medical practitioners are advised to prescribe medicines that are covered by the medicine reimbursement scheme.

All permanent residents in Finland are entitled to medicine reimbursements for outpatient prescription medicines. The medicine reimbursement scheme has three reimbursement categories. The universal basic reimbursement rate is 40% of the retail price. Two additional categories for special reimbursement rates exist, but the eligibility is based on diagnosed severe or chronic diseases. (Rättö et al., 2024) Psychotropic medicines in this study are covered by a reimbursement rate of 40% of the retail price.

Family policies in Finland

Finland can be characterized as a Nordic welfare state providing all mothers and fathers residing in Finland universal parental leave benefits after the birth of a child, as well as high-quality subsidized early childhood education and care services (ECEC) for all children below school age. These policies aim to increase gender equality both in family life and work life. Increasing female employment has also been one of the key targets in the development of family policies. Furthermore, increasing children's attendance in ECEC has been a strong political goal in many countries, including Finland (Ministry of Education and Culture 2017).

Until August 2022, the Finnish parental leave scheme (see Fig. 1) included earnings-related maternity leave, paternity leave, and parental leave. Paid parental leave period ended when the child was 9 to 10 months old. Fathers were entitled to three weeks paternity leave at the same time when the mother was on her leave (usually taken around childbirth). From the beginning of 2003 fathers were also entitled to father's independent parental leave quota. The

length of the father's quota was gradually increased from two weeks in 2003 to nine weeks in 2013. The proportion of fathers using the father's quota reached 45 percent after 2013. However, fathers still use only 10 percent of total paid parental leave days. (Saarikallio-Torp & Miettinen, 2021.)

After the parental leave period families are entitled to home care allowance (HCA) until the child turns three. This cash-for-care scheme is an alternative to ECEC services and it offers families a choice in how they arrange childcare; families can receive HCA when choosing child home care over using ECEC services. Children under the age of three are entitled to HCA if they are taken care of at home and are not participating in ECEC. In addition, older siblings of the youngest child (receiving HCA), if in home care, are also entitled to a sibling's allowance (sibling supplement) before starting compulsory education. Families can use HCA until the youngest child turns three years and the job-protection period ends.

The amount of flat-rate HCA was €343 per month for children under three years in 2015 (median income among salaried employees working full-time was €2,963 per month in 2015). On top of the flat-rate HCA, low-income families can also receive care supplement (max. €183 per month) and all families with additional siblings in homecare could receive sibling supplements. The sibling supplement was €103 per month/child for siblings under three years and €66 month/child for other siblings under school age (in 2015).

Figure 1. Parental leaves and subsidized childcare in Finland.
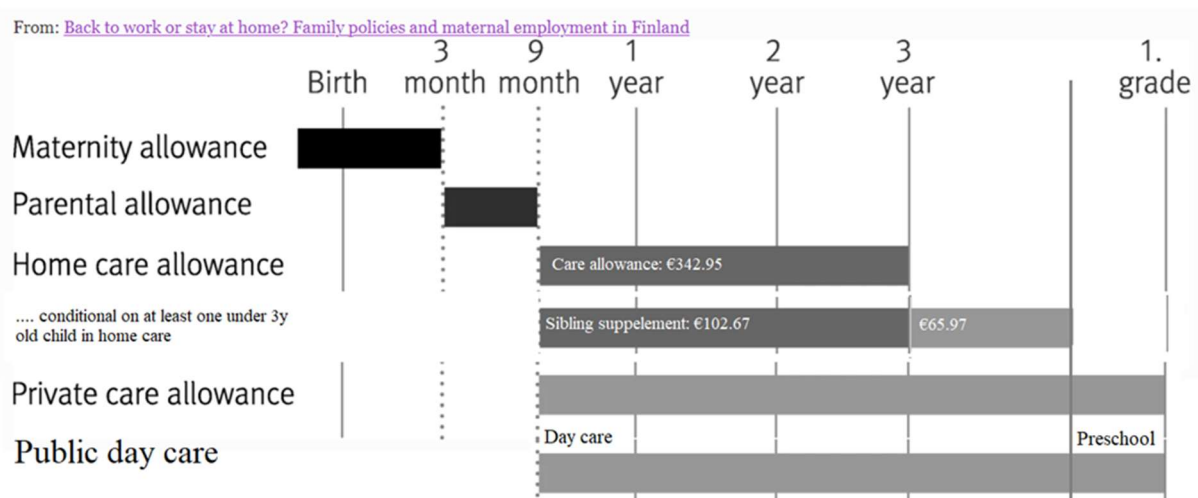
Notes: Source: Österbacka & Räsänen (2022), Social Insurance Institution of Finland, and own modifications.

Both HCA and ECEC services are funded by the municipalities. For ECEC services, all families are subject to relatively modest childcare fees, which are means-tested by family income and the size of the household. Maximum childcare fees are set at the state-level and maximums are the same in all municipalities. The use of ECEC services is free of charge for families in the very lowest income groups.

# Data, method and identification

Identification strategy

Municipalities may pay municipal supplement on top of the statutory home care allowance. As municipalities also fund ECEC services they have a strong incentive to pay the HCA supplement to encourage children's home care, especially when the provision of ECEC places doesn't meet the demand (e.g., Mahon et al. 2012). The number of municipalities offering municipal HCA supplement steadily increased from early 2000s until early 2010s after which it started to decrease (Lahtinen & Selkee 2016; Österbacka & Räsänen, 2022). In

2016, 23 percent of the municipalities offered municipal HCA supplement (Lahtinen &

Selkee 2016).

In this paper, we exploit the changes in municipal supplements to identify the causal effect of

higher home care allowance on families. Figure 2 shows the number of municipalities

offering supplements and the average amount of municipal HCA supplement. A large share

of municipalities opted to pay supplements between 2000 and 2017. In 2001 over 40

municipalities paid supplements, while in 2011-2013 approximately 100 municipalities paid

supplements. Number of municipalities decreased from 448 in 2001 to 317 in 2015, since

small rural municipalities were merged to larger municipalities.

Figure 2. The number of municipalities offering supplements, and the average municipal
supplement for the youngest child (nominal prices).
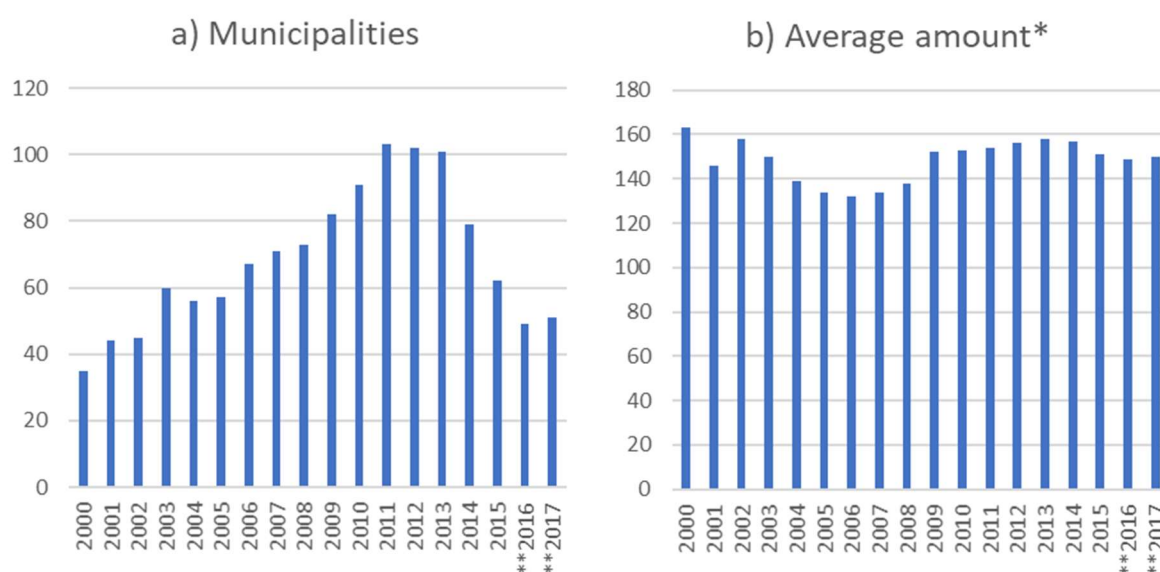
Footnote: *The average supplement column includes municipalities that have automated the
payment of the supplements to SII. **We have excluded 2016-2017 from our sample, since
municipalities could adopt additional restrictions for formal childcare for non-employed
mothers. The sample is included in some robustness tests in the Appendix.

Figure 3 and 4 compare mothers who live in control municipalities to mothers who live in

municipalities that adopted the supplement early (om 2003 or before) or middle of our

research period (2004–2008). Mothers who live in municipalities that adopted the supplement early, in 2003 or before, are most likely to use home care allowance and to have prescribed psychotropic purchases. Figure 3 shows that a higher share of mothers who have 12–35-month-old children use home care allowance in municipalities that have adopted supplements when compared to control municipalities that never adopt supplements. Figure 3 shows parallel trends between municipalities that adopted the supplement early, late and control municipalities. Similarly, there are parallel trends in the share of mothers who have 12–35-month-old children and have prescribed psychotropic medicine purchases in Figure 4.

Figure 3. Share of mothers using home care allowance among mothers who have 12–35-month-old child in the sample in municipalities that pay supplement and control municipalities.
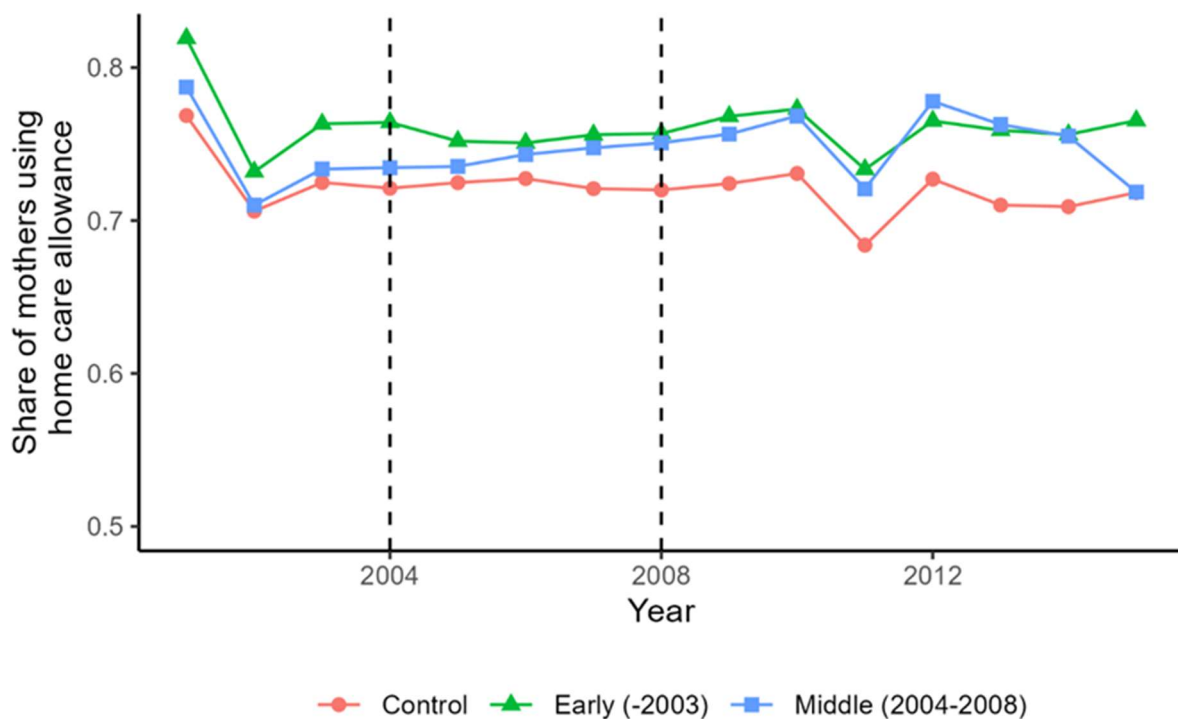
Note: The sample includes all mothers who have 12–35-month-old children. Municipalities that started to payout the supplement after 2008 excluded from the figure.

Figure 4. Share of mothers with any psychotropic medicine purchases among mothers who have 12–35-month-old child in the sample in municipalities that pay supplement and control municipalities.
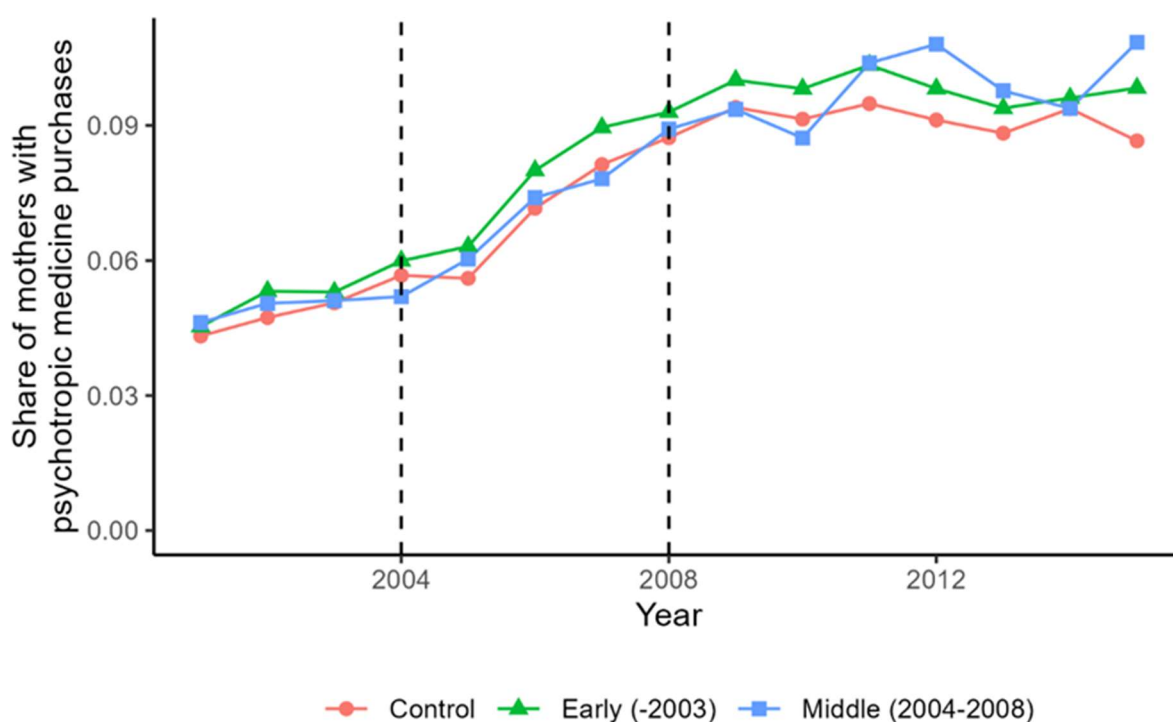
Note: The sample includes all mothers who have 12–35-month-old children. Municipalities that started to payout the supplement after 2008 excluded from the figure.

Data

Our data includes a sample of women who had their first child between 2000–2009. Our main sample includes women with at least one child that is 12 to 35 months old at the end of the year (i.e. mother was eligible for home care allowance during the year) between 2001 and 2017. The original sample includes a 70 percent simple random sample of all new maternity allowance payments from 1997 to 2017.

The dataset spanning for 20 years is merged with Statistics Finland's longitudinal population register data, which contain demographic information on all residents in Finland since late the 1980s and links between children, parents and cohabiting or married persons. The datasets have detailed information on various measures, e.g., educational and employment histories of

individuals (including occupation, sector, workplace/company and workplace/job characteristics, such as overtime and hours worked), as well as on earnings and income from various benefits.

Outcome variables

We use a sample from full-population register data from the Social Insurance Institution (Kela) from 1997 to 2017 on family leave benefits and prescribed medicine purchases. Kela's register data on family leave benefits covers in practice all parents of children born in Finland since 1997 and prescribed medicine purchase data (1995–2017) cover all outpatient care sectors and regions in Finland, including detailed information on the Anatomical Therapeutic Chemical classification codes, at day-event-level. Compared to data from inpatient and outpatient specialized care, the data also cover less severe cases.

Use of home care allowance is our first-stage outcome variable. We apply and extend Andresen and Havnes's (2019) and Räsänen & Österbacka (2024) methods and identify which children attend public daycare and which are taken care of at home and receive parental care. Similarly, we can deduce whether all or only some siblings are in home care or attend public daycare from the payment registers. We measure how many months an individual mother used home care allowance annually and how many children were in home care.

Our outcome variables include number of psychotropic medicine purchases annually. The variables are drawn from prescribed medicine purchase data. We include all psychotropic medicine purchases from categories N05 and N06. In addition, we separately analyze changes in antidepressant (group N06A) and anxiolytic purchases (group N05A). Variables for mother's employment and disposable net income originate from Statistics Finland's longitudinal population register data.

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Control variables

Previous research has shown that higher home care allowance influences mothers' labor force participation, social security use and earnings (see, e.g., Kosonen, 2014; Österbacka & Räsänen, 2022; Räsänen, 2023). To avoid endogenous regressors, we measure control variables one year before the first child. Our control variables include mothers' education, age, labor market status, and earned income before first childbirth. We also include controls for any psychotropic medicine purchase before the first childbirth for all women in the sample.

Table 1. Mother's descriptive statistics and background variables measured one to two years before first childbirth.

Variable	All	Single parent	Immigrant	Basic	Secondary	Tertiary education
Age	30.743	28.24	30.198	26.231	29.635	33.401
Married (0/1)	0.421	0.155	0.598	0.225	0.338	0.569
Tertiary education (1/0)	0.435	0.189	0.239	0.000	0.000	1.000
Employed before childbirth	0.743	0.531	0.484	0.385	0.709	0.902
Number of children	1.764	1.579	1.698	1.804	1.796	1.719
Immigrant (0/1)	0.060	0.091	1.000	0.182	0.043	0.033
Any psychotropic before childbirth (0/1)	0.075	0.133	0.054	0.114	0.073	0.063
Any anxiolytic before childbirth (0/1)	0.017	0.033	0.012	0.027	0.017	0.014
Any antidepressant before childbirth (0/1)	0.059	0.109	0.040	0.095	0.059	0.045
Number of observations in sample	626,247	66,073	37,618	97,209	256,884	272,154

Notes: The sample includes all mothers with at least one 12–36-month-old child. Except for psychotropic medicine purchases (including anxiolytics and antidepressants), mother's background variables are measured one year before the first childbirth. Medicine purchases are measured one to two years before first childbirth; if a mother had at least one purchase in the corresponding category during the two years before first childbirth then the variable equals to one and otherwise zero.

Descriptive statistics

Table 1 presents descriptive statistics for the analytical sample of women who have at least one 12-35 month old child. Women in the sample are on average 32 years old, have 2.2 children, half have tertiary education, and 8 percent are foreign born. Furthermore, 7 percent of mothers are single parents during the year.

Method

To analyze the impact of home care allowance on family well-being, we exploit variation in the design of the policies, using differences-in-difference. The research design allows us to compare families who are otherwise nearly similar, but the treatment group is under a different reimbursement level. Our dataset covers all mothers with at least one 12–36-month-old child in the sample from 2001 to 2015.

To identify the causal effect of long childcare leaves on maternal mental health, we use well-established research design that uses regional variation in home care allowance supplements (see Kosonen, 2014; Österbacka & Räsänen, 2022; Gruber et al. 2023). The strategy adopted here similarly uses regional variation in municipal supplements. We estimate the following differences-in-differences specification:

$$Y_i = \alpha M_{mtj} + X_i\beta + \gamma_m + \lambda_t + \varepsilon_i$$

Variable M_{mtj} is the amount of municipal supplement to home care allowance in municipality m in year t for families whose youngest child is j months old.

We control for socioeconomic background and previous antidepressant or anxiolytic purchases before childbirth and include municipal and year fixed effects, γ_m and λ_t. We omit family income and mother's employment status from both specifications, and all means-

tested components from M_{mtj}, since including them could cause endogeneity, rendering estimates meaningless. Instead, we measure control variables at the same year as treatment, or one year before childbirth to prevent endogeneity with outcome variables. We estimate short-run outcomes 1 to 3 years after the family is exposed to the treatment with the same controls using event-study specification.

Since early education attendance rates and employment rate of women may develop over time differently and municipalities have different time-invariant characteristics, we have included both year and municipal fixed effects in equation (1). Year fixed effects control for law changes, such as changes in day care fees, which affected all municipalities and their residents in Finland during 2000 to 2015. We also include municipal fixed effects that control for time-invariant differences in public services, day care availability, public healthcare and labor markets between municipalities.

There may also be temporal changes in outcome variables after a municipality adopts a higher home care allowance. We estimate the following event-study specification where we compare changes in outcomes variables 1–3 years before and 0–3 after a municipality starts paying the supplement:

$$Y_i = \sum_{k \neq -1} \alpha_k D_k + X_i \beta + \gamma_m + \lambda_t + \varepsilon_i$$

where $D_k = 1$ for period k and otherwise 0. Omitted time period in estimation (2) is $k = -1$ years before the supplement was adopted. We also include control municipalities (municipalities that never adopt a supplement to home care allowance) in the estimation; the coefficients in the pre-treatment period can be used to compare if outcome variables develop

differently in municipalities that adopt a supplement versus municipalities that never adopt a supplement to home care allowance.

For transparency's sake, we test several potential threats to identification in Robustness and identification assumptions section. We find that there is sufficient between-group variation in the treatment variable, and that the differential timing of treatment is not likely to affect estimates. Common trends assumption holds on average outcomes but also on subgroups. Lastly, our sample is relatively well balanced with respect to control variables. Detailed discussion of identification assumptions can be found in Robustness and identification assumptions section.

Results

Longer home care and mental health

We study if higher home care allowance affects how families with 0–2-year-old children arrange childcare, and if home care is linked to maternal mental health. First, we show that municipal supplement causes more mothers to remain at home and provide parental care for their children. Figure 5 shows first-stage results for mothers in municipalities that adopt the supplement during the 2000s. Before municipalities start paying out supplements to top off home care allowance, treated municipalities have parallel trends when compared to control municipalities. However, mothers are more likely to use home care allowance immediately after a municipality adopts municipal supplements. The share increases by 3 to 4 percentage-points one to three years after the policy change.

Figure 5. Increase in mother's home care allowance use 1–3 years before and 0–3 years after the municipality starts paying supplement.
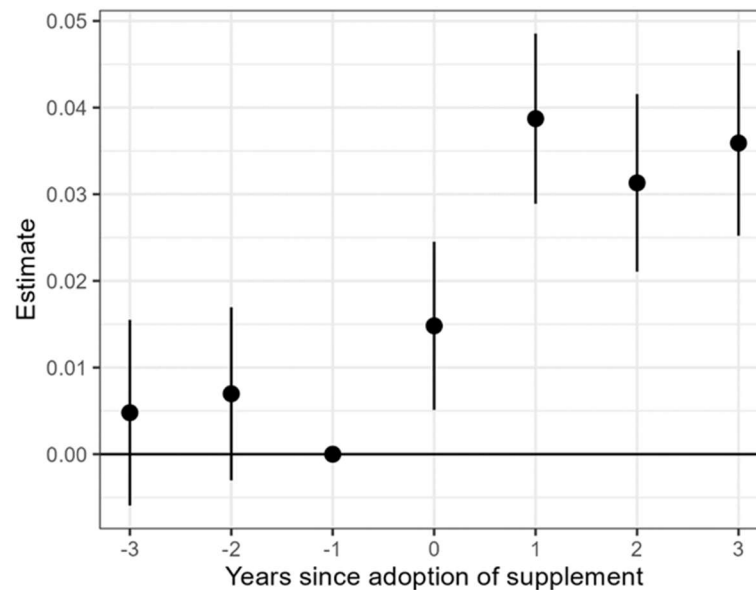
Notes: The sample includes all mothers who have 12–35-month-old children and who live in control municipalities or municipalities that will adopt the supplement in 3 years or have adopted the supplement during 3 years. All models include full controls and year and municipality fixed effects. Points represent point estimate for the effect before and after the adoption of the supplement. Vertical lines represent 95% confidence intervals.

Next, we examine if longer home care is linked to maternal mental health. We apply a standard difference-in-differences, where families living in the municipalities offering municipal supplements constitute the treatment group, and families living in municipalities not offering municipal supplements are included in the control group. Table 2 reports the average effects for any psychotropic medicine, antidepressant or anxiolytic purchase. Panel A in Table 2 shows that, on average, the introduction of supplement has no effect on probability of mother buying psychotropic medicine. Similarly, Panel B in Table 2 shows no effect on the number of annual psychotropic medicine purchases. However, anxiolytic purchases slightly on a 10% confidence level.

Table 2. Effect of supplement on psychotropic medicine, antidepressant and anxiolytic purchases among women who have 12–35-month-old children.

	Any psychotropic medicine	Antidepressants	Anxiolytics
	(1)	(2)	(3)
Panel A: At least one purchase (0/1)			
Supplement (0/1)	-0.001	0.001	0.0004
	(0.001)	(0.001)	(0.001)
Mean	0.081	0.067	0.014
Observations	626,247	626,247	626,247
R^2	0.105	0.092	0.058
Panel B: Number of purchases			
Supplement (0/1)	0.0004	0.004	0.006*
	(0.008)	(0.005)	(0.003)
Mean	0.355	0.042	0.245
Observations	626,247	626,247	626,247
R^2	0.105	0.092	0.058

Note: The sample includes all mothers who have 12–35-month-old children between 2001 and 2015 in the sample. All models include mother's full controls and year and municipality fixed effects. *$p<0.1$; **$p<0.05$; ***$p<0.01$

Heterogeneity

Near insignificant results on maternal mental health may be explained by selection and heterogeneous treatment effects. For instance, some mothers may select to use home care allowance regardless of benefit level. Previous research has shown that mother's labor market status before childbirth and other socioeconomic background may affect their decision to use home care allowance (see Österbacka & Räsänen, 2022; Miettinen & Saarikallio-Torp, 2023).

Table 3 reports results by mother's socioeconomic background. Table 3 shows the effect on immigrant and single parent mothers, and mother's education. Around 15 % of single parents use any psychotropic medication and more than one out of then single parent use antidepressants. They also have the largest increase in psychotropic medicine purchases in

treatment group: share of single parents purchasing antidepressants increases by 1 percentage points after a municipality starts paying a supplement.

Regardless of mother's education, higher home care allowance increases the share of mothers that use home care allowance (see Table 4). The increase does not have any effect on mothers with at least secondary education, however, mothers with basic education are more likely to have psychotropic medicine purchases. Mothers are 0.7 percentage-points more likely to have at least one psychotropic medicine purchase. Likelihood of antidepressant purchases increase by 0.4 percentage-points and anxiolytic purchases by 0.6 percentage-points. Similarly, the annual number of psychotropic purchases increases by 0.09 purchases.

Table 3. Effect of the supplement by mother's background on psychotropic medicine, antidepressant and anxiolytic purchases among women who have 12–35-month-old children.

	All Mothers	Single parent	Immigrant	Basic (1)	Secondary (2)	Tertiary education (3)
Panel A: Any psychotropic (0/1)						
Supplement (0/1)	-0.001	0.011**	-0.008	0.007*	-0.004**	-0.0003
	(0.001)	(0.005)	(0.005)	(0.004)	(0.002)	(0.002)
Mean	0.081	0.153	0.062	0.111	0.083	0.067
Panel B: Any antidepressant (0/1)						
Supplement (0/1)	0.001	0.010**	-0.004	0.006*	-0.001	0.001
	(0.001)	(0.005)	(0.004)	(0.004)	(0.002)	(0.002)
Mean	0.067	0.129	0.050	0.095	0.071	0.054
Panel C: Any anxiolytic (0/1)						
Supplement (0/1)	0.0004	0.004	0.004*	0.004**	0.0002	-0.001
	(0.001)	(0.003)	(0.002)	(0.002)	(0.001)	(0.001)
Mean	0.014	0.033	0.011	0.024	0.013	0.011
N	626,247	66,073	37,618	97,209	256,884	272,154

Note: The sample includes all mothers who have 12–35-month-old children between 2001 and 2015 in the sample. All models include mother's full controls and year and municipality fixed effects. *p<0.1; **p<0.05; ***p<0.01

Income and employment effects

Several mechanisms might explain why higher home care allowance increases mothers' psychotropic medicine purchases. In this paper, we study two potential mechanisms: employment and income effects. First, opting out from employment may have a negative effect on mother's mental health. Previous studies have shown that higher home care allowance reduces mothers' employment, mothers are less likely job seekers, and children are more likely taken care at home (Kosonen, 2014; Österbacka & Räsänen, 2022; Jauhiainen et al. 2024). Second, since some mothers use home care allowance regardless of the level of home care allowance, they practically receive higher benefits which may have a positive effect on their well-being.

Table 4 reports the effect of supplement on employment, use of home care allowance, disposable income and probability of receiving social assistance. Disposable income is net income including after deducting taxes and social insurance contributions from labor income from work, social security benefits, and other sources. All mothers have a slight, positive increase in their disposable income after a treatment municipality starts paying out supplement to home care allowance. Among mothers with different backgrounds, adoption of the supplement decreases employment rate by 1.3 to 2.6 percentage points. At the same time, mothers are more likely to have used home care allowance during the year.

Table 4 also reports the share of mother's families that received any financial social assistance during the year. Social assistance is a means- and wealth-tested minimum level benefit. Essentially, families who receive social assistance are often below the official poverty line and do not have savings or they have temporary financial difficulties that require financial assistance. For instance, while only 10% of families in the sample received social assistance, almost 44 % of single parents received social assistance. In addition, families with

immigrant mothers and mothers who have basic education are more likely to receive social assistance than other families.

Table 4. Effect of the supplement by mother's background on employment, income and probability of receiving social assistance among women who have 12–35-month-old children.

	All Mothers	Single parent	Immigrant (1)	Basic (2)	Secondary	Tertiary education (3)
Panel A: Employment (0/1)						
Supplement (0/1)	-0.024***	-0.013**	-0.023***	-0.021***	-0.023***	-0.026***
	(0.002)	(0.006)	(0.008)	(0.005)	(0.003)	(0.003)
Mean	0.408	0.296	0.274	0.222	0.375	0.514
Panel B: Any homecare during the year (0/1)						
Supplement	0.022***	0.025***	0.022***	0.017***	0.026***	0.020***
	(0.002)	(0.006)	(0.008)	(0.004)	(0.003)	(0.003)
Mean	0.741	0.754	0.784	0.805	0.752	0.705
Panel C: Disposable income, €/year						
Supplement	32.161	101.321	107.047	30.075	79.926	87.762
	(39.911)	(99.406)	(157.900)	(71.868)	(51.866)	(71.408)
Mean	17020.54	17129.53	14501.60	13648.59	15234.35	20074.92
Panel C: Any social assistance (0/1)						
Supplement	-0.005***	0.010	-0.009	-0.018***	-0.002	-0.001
	(0.001)	(0.007)	(0.008)	(0.005)	(0.002)	(0.001)
Mean	0.105	0.438	0.257	0.356	0.093	0.014
N	626,247	66,073	37,618	97,209	256,884	272,154

Note: The sample includes all mothers who have 12–35-month-old children between 2001 and 2015 in the sample. All models include mother's full controls and year and municipality fixed effects. *p<0.1; **p<0.05; ***p<0.01

Around 60% of mothers in the sample choose home care allowance (or non-employment) over employment whereas adoption of the supplement causes 2–3 % of mothers to choose home care instead of employment. Naturally, women who have selected home care gain higher income when a municipality adopts a supplement. Offering a supplement causes more mothers to choose home care, but next Table 5 relaxes identification assumptions by limiting the sample only to mothers who have not yet returned to employment (their employment outcome Y = 0). The association between higher supplement and income is more apparent in

Table 5. Higher home care allowance (a municipality paying a supplement) is linked to higher disposable net income.

Table 5. Effect of the supplement by mother's background on psychotropic medicine purchases, income and probability of receiving social assistance among women who have 12–35-month-old children.

	All Mothers	Single parent	Immigrant	Basic (1)	Secondary (2)	Tertiary education (3)
Panel A: Any psychotropic (0/1)						
Supplement (0/1)	0.001	0.016***	-0.008	0.011**	-0.003	0.002
	(0.002)	(0.006)	(0.006)	(0.004)	(0.003)	(0.003)
Mean	0.085	0.157	0.061	0.115	0.084	0.067
Panel B: Any antidepressant (0/1)						
Supplement (0/1)	0.003*	0.014**	-0.004	0.010**	0.0004	0.002
	(0.002)	(0.006)	(0.005)	(0.004)	(0.002)	(0.002)
Mean	0.072	0.133	0.05	0.097	0.073	0.055
Panel C: Any anxiolytic (0/1)						
Supplement (0/1)	0.0003	0.005	0.003	0.003	0.0001	-0.001
	(0.001)	(0.003)	(0.003)	(0.002)	(0.001)	(0.001)
Mean	0.016	0.036	0.011	0.026	0.014	0.011
Panel C: Disposable income, €/year						
Supplement (0/1)	253.017***	169.812*	268.508*	148.728**	262.019***	425.329***
	(43.457)	(99.980)	(149.117)	(72.681)	(57.104)	(89.207)
Mean	13,595.61	15,295.58	12,060.63	12,219.90	12,734.90	15,532.56
Panel C: Any social assistance (0/1)						
Supplement (0/1)	-0.010***	0.009	-0.016	-0.024***	-0.006**	-0.001
	(0.002)	(0.008)	(0.011)	(0.006)	(0.003)	(0.002)
Mean	0.151	0.528	0.323	0.408	0.119	0.022
N	368,194	46,316	27,318	75,278	160,551	132,365

Note: The sample includes all mothers who are not employed and have 12–35-month-old children between 2001 and 2015 in the sample. All models include mother's full controls and year and municipality fixed effects. *p<0.1; **p<0.05; ***p<0.01

Overall, it appears that income effect explains the health effect among low educated mothers: they gain more financial resources and are able to purchase more psychotropic medication. Additionally, they are less likely to rely on financial social assistance which may also link to their wellbeing.

All in all, mothers with basic education have increased in psychotropic medicine purchases. It is unclear if this effect is due to increased income or decreased employment. On the one hand, opting out from employment and choosing home care of children may negatively affect mothers. On the other hand, mothers afford more medical treatment if their disposable income increases, which is a more likely explanation considering results in Table 5.
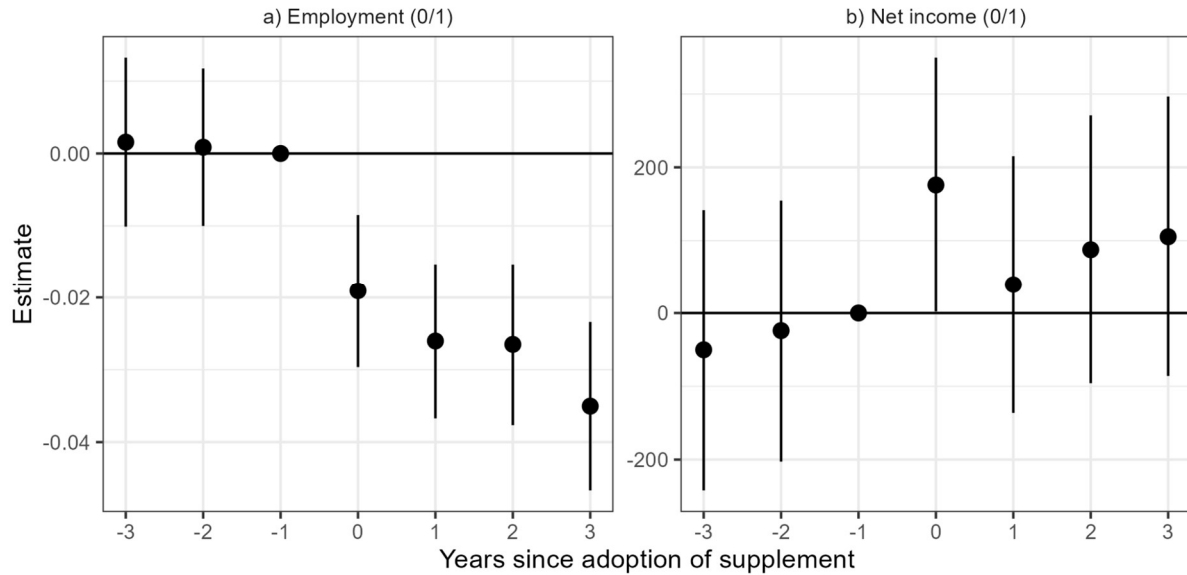
Changes in employment and income effects

Figure 6 shows mothers' annual disposable income and employment before and after a municipality adopts home care allowance supplement. When compared to mothers living in control municipalities, mothers in treatment municipalities have a decrease in employment rate—in line with previous literature. However, there is also a slight increase in mothers' disposable income immediately after an increase in the supplement. The increased supplement affects disposable income temporarily when the supplement is adopted at year t=0. However, coefficient for disposable income remains positive one to three years after the increase. Difference-in-differences estimation provides similar, but not statistically significant results. Mothers gain, on average, 32 € more annual net income (see Table 3).

Next, we test if results remain consistent by mother's socioeconomic background. We observed the largest increase in psychotropic medicine purchases by mothers' education, and Figure A.1 in the appendix reports employment and disposable income by mother's education.

Mothers' employment rate and disposable income are centered around zero 1–3 years before the municipality starts paying a supplement to home care allowance. Effect on employment rate is clear and all educational groups have consistently lower employment rate in the post treatment period. Employment rate is reduced 0–3 years after a supplement is adopted in all

educational groups by 2 to 4 percentage points. However, the relative change is the largest among mothers with basic education who have the lowest employment rate in the sample.

Figure 6. Changes in mothers' employment rate and net income 1–3 years before and 0–3 years after the municipality starts paying supplement.

Note: The sample includes all mothers who have 12–35-month-old children and who live in control municipalities or municipalities that will adopt the supplement in 3 years or have adopted the supplement during 3 years. All models include full controls and year and municipality fixed effects. Points represent point estimates for the effect before and after the adoption of the supplement. Vertical lines represent 95% confidence intervals.

Figure A.1 also shows that a mother's disposable income increases by 50 to almost 300 € per year after a municipality adopts a supplement, however, the effect is statistically insignificant among all educational groups. Still, mothers with lower levels of education are most affected. Coefficients for mothers with tertiary education are centered around zero, while mothers with basic education gain 150 to over 200 € and mothers with basic education gain 50 to almost 300 € when compared to mothers living in control municipalities.

Robustness and identification assumptions

We were able to rule out some alternative explanations and mechanisms that may explain the observation that mothers have more psychotropic medicine purchases after the municipality

adopts a supplement to home care allowance. However, there remain some threats to our identification strategy; recent literature shows that results from two-way fixed effects (2FE) estimators are often biased and only equal to ATT under additional assumptions (De Chaisemartin & d'Haultfoeuille, 2020; Goodman-Bacon 2021; Imai & Kim, 2021). Some of these concerns are applicable to our study. For example, by including 2FE we may lose a large portion of the variation in the treatment. In addition, since some municipalities adopt the policy rule early and some late, we have differential treatment timing. Furthermore, if common trends assumption is violated, 2FE estimators may be biased (Goodman-Bacon 2021), and results are less reliable if the composition of the treatment and control groups change over time.

First, there is sufficient between-group variation in the main treatment variable and level of home care allowance supplement, as seen from Figure 2. Since some families live in municipalities that adopt policy early, they receive the treatment early, some receive the treatment late and some families never receive the treatment. This differential treatment timing (some municipalities adopt the supplement) may affect ATT results, as pointed out by Goodman-Bacon (2021).

Second, two-way fixed effects estimator is a weighted average of all different ATTs under different treatment timing (Goodman-Bacon, 2021). Group sizes (treatment and control group) and also variance in treatment affect the resulting 2FE estimator (Goodman-Bacon, 2021). In our case, panel length may affect the weighted estimate, since some municipalities spend different time in treatment and control groups. For example, as seen from Figure 2, some municipalities spend less time in the treatment group and thus receive less weight. Some municipalities adopted the rule relatively late in the 2000s and received smaller weights for the treatment effect.

Regarding the second concern, it is possible that lengthening the panel, for example, including observations after 2015, would increase the weights for the late adopters and result in much larger estimates than presented in the main tables. However, we have chosen a panel from 2000 to 2015 for two major reasons. First, by including post-treatment periods we can capture the municipality specific trends and by increasing the sample we gain more accurate point estimates. Secondly, increasing panel length to include years from 2016 on would potentially introduce new type of bias (multiple treatment bias), since families might be exposed to multiple treatments (some municipalities restricted access to childcare for unemployed or stay-at-home parents in 2016-2019 by limiting the maximum number of hours in ECEC per week to 20h instead of full-time participation).

Third, we need to verify that common trends assumption holds, since non-parallel trends between treatment and control group would cause bias in two-way FE estimators (Goodman-Bacon 2021; Imai & Kim, 2021). We have some evidence that common trends assumption holds for some estimates while some estimates may include bias from non-parallel trends. Figures 5 and 6 show slightly declining or insignificant effects 3 to 1 years before increases in supplement, which suggests that common trends assumption holds for take-up and outcomes. In addition, figures A.2 and A.3 on psychotropic medicine purchases before and after an increase in HCA suggest similarly common trends.

Common trends assumption likely holds for subgroups; Figures A.1 and A.4 show that main outcome variables develop similarly before municipality adopts a supplement in all educational groups. Prescribed medicine purchases, employment rate and net income of women with under 3 year old children develops similarly in treatment municipalities to control municipalities until a municipality starts paying a supplement. After the homecare allowance use is increased, employment rate decreases in all education groups, net income

slightly increases while likelihood of psychotropic medicine purchases increases among women with basic education.

Fourth, our sample is relatively well balanced with respect to control variables. Individual mothers in our treatment and control municipalities change over time, so the composition of the panel in before and after comparison can change. We test this possibility by examining all background variables 3 years before and 3 years after a municipality adopts a supplement, and comparing municipalities in treatment group to control group. Figure A.5 in Appendix shows that background characteristics remain stable before and after a municipality adopts a supplement. In addition, background variables in municipalities in the treatment group develop similarly when compared to municipalities in the control group.

Conclusion and discussion

Long childcare leaves may have a negative effect on maternal mental health while short extensions to maternity leaves improve mother's overall physical and mental health (see e.g., Bullinger, 2019; Chuard, 2023). There is also evidence that longer childcare leaves increase mental health problems among mothers (Chuard, 2023), however, mother's from disadvantaged backgrounds may benefit more from parental leave extensions than other mothers (Canaan et al., 2022).

After parental leaves, children often enter day care. Some studies find a strong positive effect of formal childcare on maternal well-being, usually linked to better labor market attachment, but some studies find negative effects on the parent-child relationship and maternal well-being in general. For instance, increasing access to early childcare had negative effect on mothers self-assessed health (Krauß & Rott, 2024). Childcare arrangements outside home can also increase parental stress, harsh parenting and mental health problems of parents (Baker et al., 2008; Herbst and Tekin, 2014). Other studies report contrasting findings, that use of

formal childcare or non-parental care arrangements can also improve parental well-being (Richardson et al,. 2018; Yamaguchi et al., 2018; Somogyj et al., 2022). As such, evidence on effects of longer childcare leaves is not conclusive.

In this paper, we study how higher childcare subsidies for parents of 1-2 year old children affect their health-seeking and labor market behavior, and if changes in income explain health differences between parents. We investigated if longer home care as such affects mother's mental health exploiting regional variation in the municipal home care allowance supplement. We found that an increase in the municipal supplement lengthened the period mothers' stayed at home with their children. However, we find no support that a modest increase to duration of home care would have positive or negative effects on maternal mental health. Instead, our results show that while higher cash-for-care benefits have negative employment effects, some families have advantageous outcomes caused by the income effects. Mothers who not attached to the labor market and small disposable income—near poverty line—would have chosen home care instead of employment regardless of the benefit level. They also have the largest income and health effects from an increase in home care allowance.

Our study contributes to literature on effects of longer childcare leaves and higher childcare subsidies. Apart from Chuard (2023), the majority of recent studies on health effects of parental leave extensions have focused on relatively short extensions and parental leave schemes. We contribute to this literature by studying the potential effects of extending parental leaves beyond 1–2 years after childbirth.

Secondly, most studies focus on the overall effects on maternal mental health although the conflicting results from the literature imply that various positive and negative mechanisms might have a role in the process. Use of formal childcare services reduces particularly mothers' workload at home and allows them to engage in other activities, such as (finding)

employment. However, extra strain from early childcare may have negative effect on mothers self-assessed health (Krauß & Rott, 2024). Instead, we find that the average effect of delaying employment entry has no observable effect on mothers' mental health, as such average mental health effects of early childcare in Finland do not differ from home care of children.

Thirdly, we contribute to the discussion on potential benefits of increasing the replacement rate of low-level family benefits. Higher family benefits for parents may increase life satisfaction and reduce depression (see Kwon & Nam, 2022). Internationally, home care allowance is relatively low family benefit, 250 € per month in 2015. The replacement rate of home care allowance was approximately 12 percent of median wages in 2015 without additional municipal supplements and 19 percent with average supplements (140 € in 2015). Our results also implicitly confirm that longer parental leaves may have health benefits for mothers in lowest socioeconomic groups but not for women in highest socioeconomic groups (see Canaan et al. 2022).

Providing formal childcare and early education services has been an important policy goal in many countries, including Finland. Children's participation in early education is considered beneficial for the children. Mixed results from different subgroups and countries with different institutional backgrounds could be explained by heterogeneity in treatment effects; some parents react more strongly to the changes in family policies while some do not react, which should be taken into account when designing new policies.

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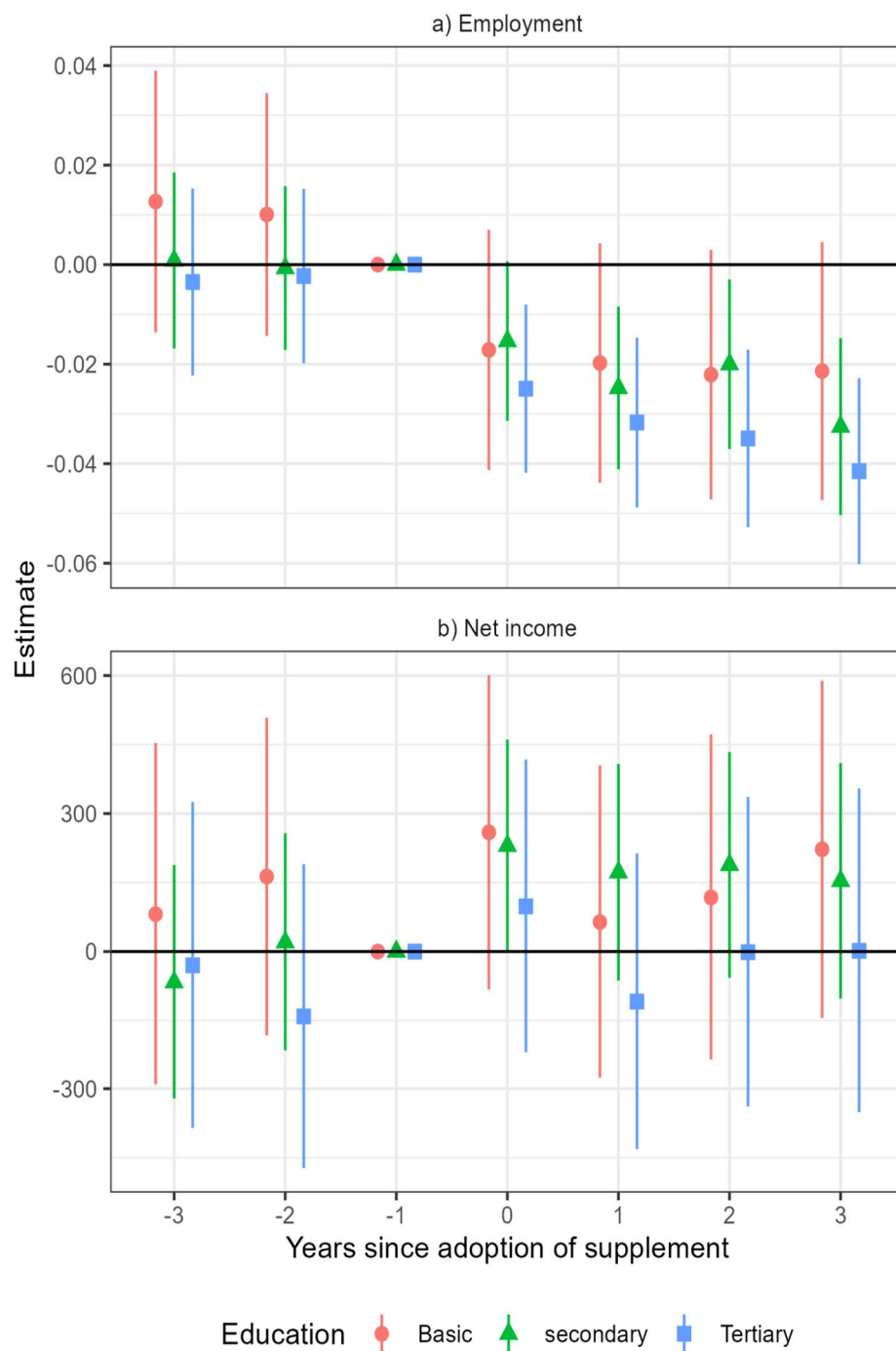
Appendix A: additional results and causality tests

Table A.1. Effect of the supplement by mother's education-level on number of psychotropic medicines, antidepressant and anxiolytic purchases among women who have 12–35-month-old children.

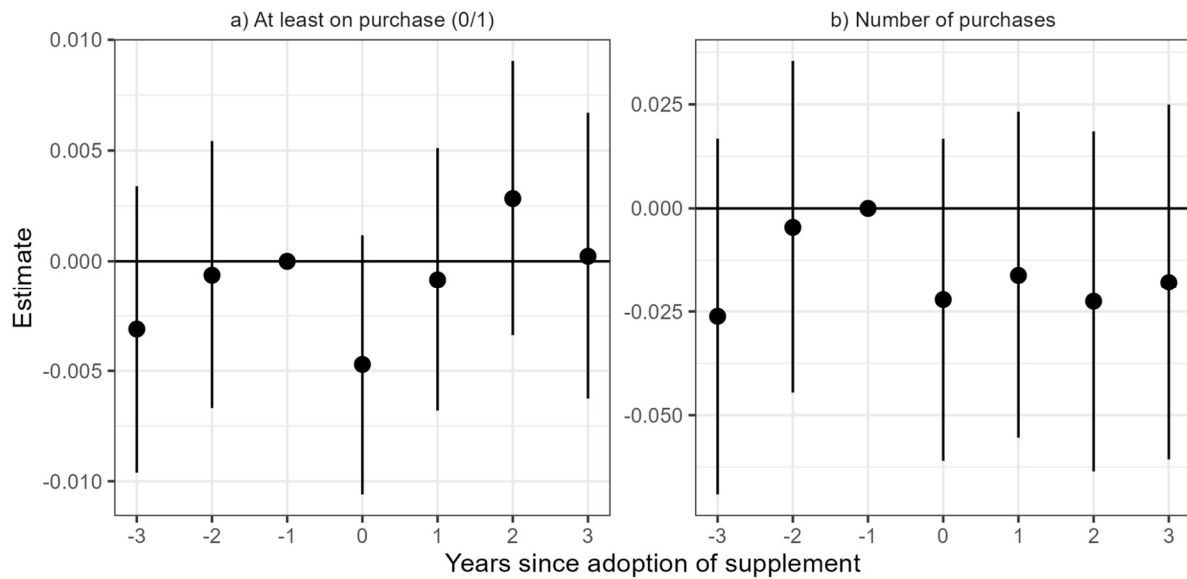|	Basic (1)	Secondary (2)	Tertiary (3)
Panel A: Number of psychotropic purchases			
Supplement (0/1)	0.090***	-0.020	-0.010
	(0.029)	(0.013)	(0.010)
Mean	0.538	0.370	0.266
Panel B: Number of anxiolytic purchases			
Supplement (0/1)	0.043***	-0.0001	-0.002
	(0.013)	(0.004)	(0.003)
Mean	0.094	0.038	0.023
Panel C: Number of antidepressant purchases			
Supplement (0/1)	0.041**	-0.005	0.001
	(0.017)	(0.009)	(0.007)
Mean	0.340	0.265	0.186
N	97,209	256,884	272,154

Note: The sample includes all mothers who have 12–35-month-old children between 2001 and 2015 in the sample. All models include mother's full controls and year and municipality fixed effects. *p<0.1; **p<0.05; ***p<0.01

Figure A.1. Mothers' employment rate and net income 1–3 years before and 0–3 years after the municipality starts paying supplement by mothers' education-level.
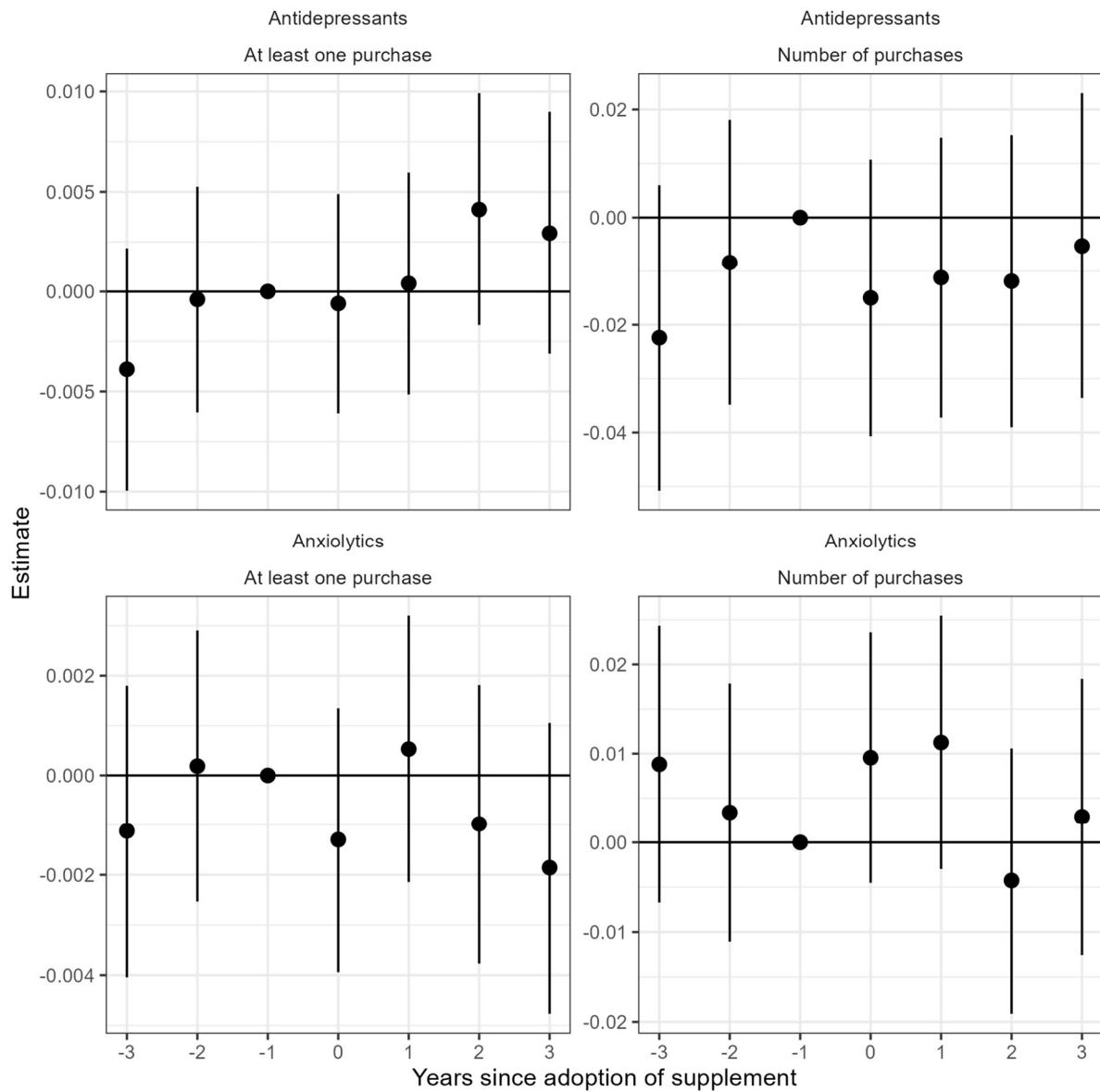

Note: The sample includes all mothers who have 12–35-month-old children and who live in control municipalities or municipalities that will adopt the supplement in 3 years or have adopted the supplement during 3 years. All models include full controls and year and municipality fixed effects. Points represent point estimate for the effect before and after the adoption of the supplement. Vertical lines represent 95% confidence intervals.

Figure A.2. Mothers' psychotropic medicine purchases 1–3 years before and 0–3 years after the municipality starts paying supplement.

Note: The sample includes all mothers who have 12–35-month-old children and who live in control municipalities or municipalities that will adopt the supplement in 3 years or have adopted the supplement during 3 years. All models include full controls and year and municipality fixed effects. Points represent point estimate for the effect before and after the adoption of the supplement. Vertical lines represent 95% confidence intervals.

Figure A.3. Mothers' antidepressant and anxiolytic purchases 1–3 years before and 0–3 years after the municipality starts paying supplement.
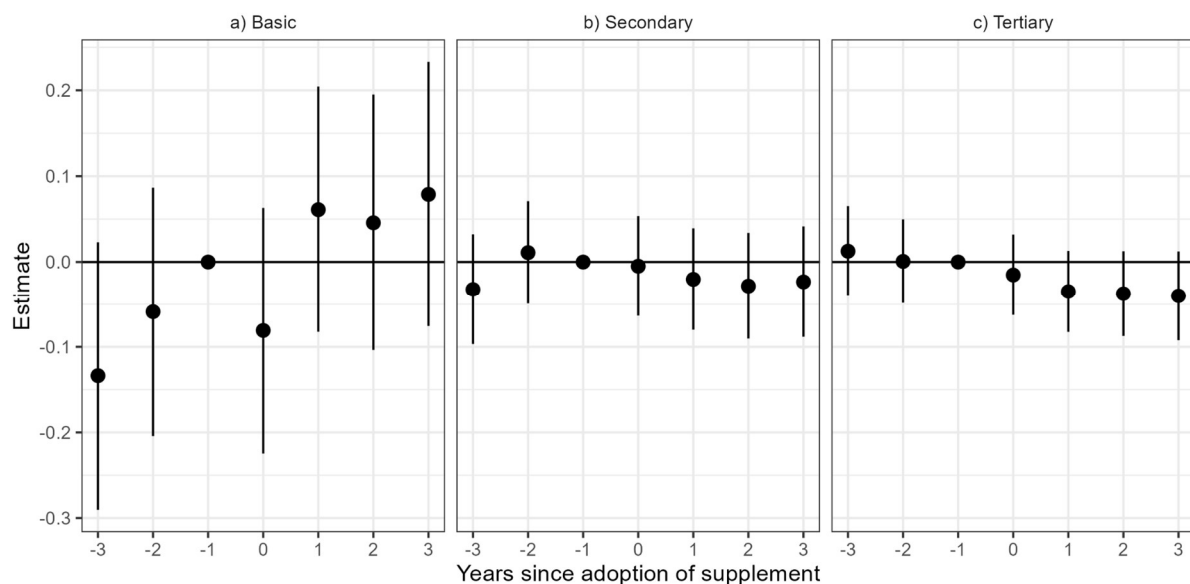

Note: The sample includes all mothers who have 12–35-month-old children and who live in control municipalities or municipalities that will adopt the supplement in 3 years or have adopted the supplement during 3 years. All models include full controls and year and municipality fixed effects. Points represent point estimate for the effect before and after the adoption of the supplement. Vertical lines represent 95% confidence intervals.

Figure A.4. Mothers' psychotropic medicine purchases 1–3 years before and 0–3 years after the municipality starts paying supplement by mother's education-level.

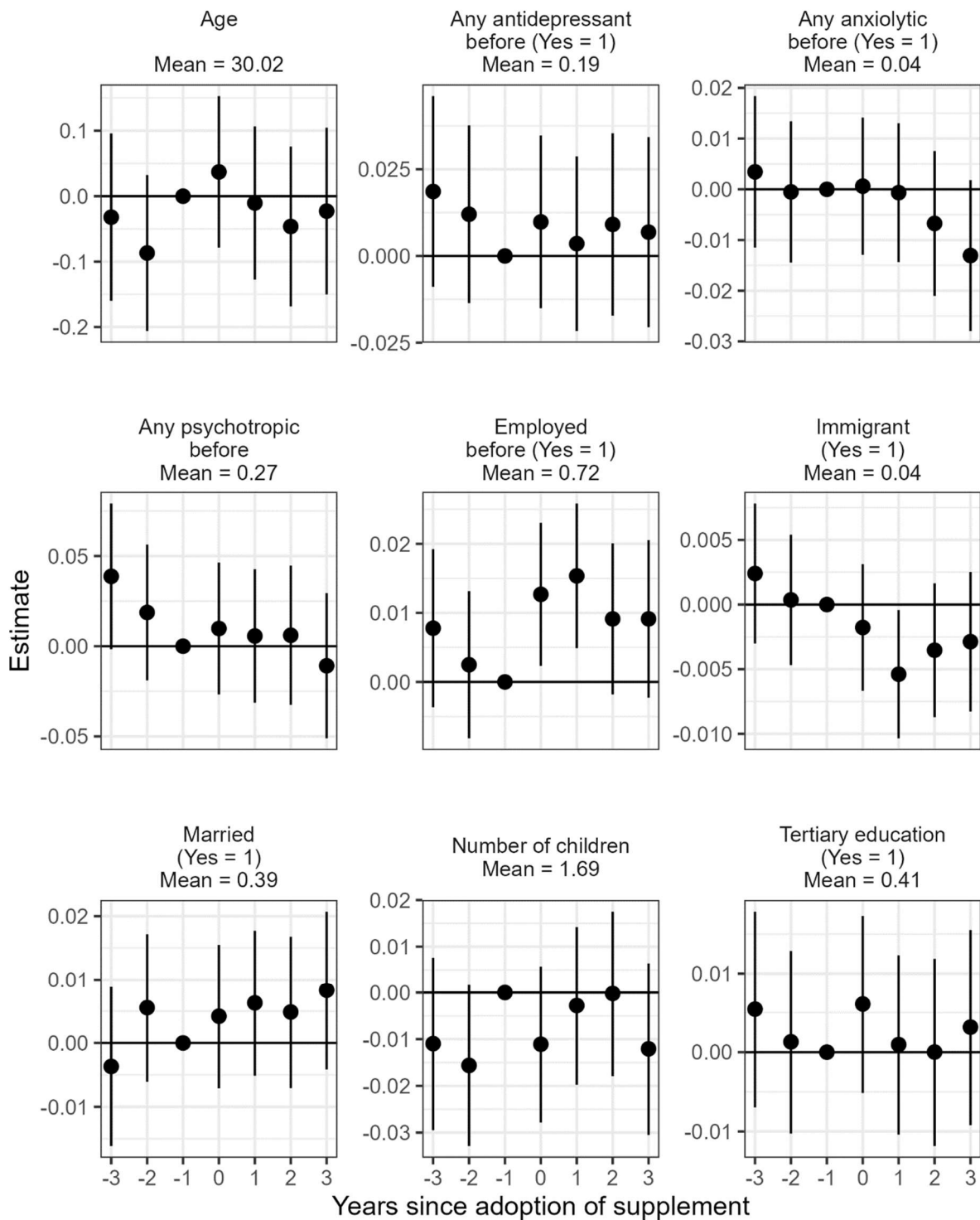a)   At least one purchase (0/1)
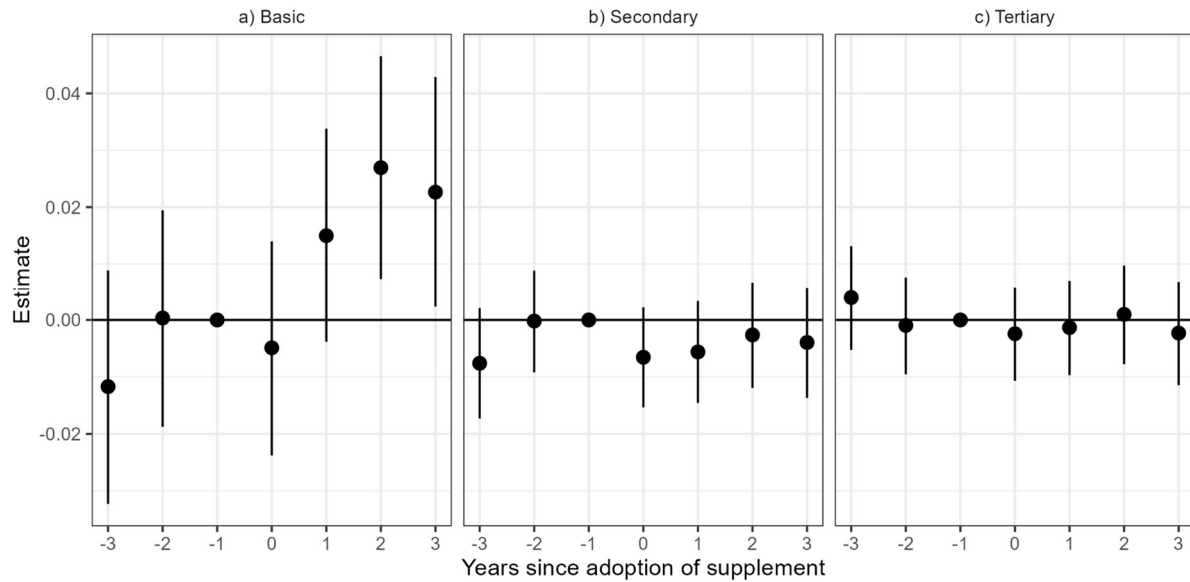
a) Number of purchases

Note: The sample includes all mothers who have 12–35-month-old children and who live in control municipalities or municipalities that will adopt the supplement in 3 years or have adopted the supplement during 3 years. All models include full controls and year and municipality fixed effects. Points represent point estimate for the effect before and after the adoption of the supplement. Vertical lines represent 95% confidence intervals. Mean, number of observations.

Figure A.5. Covariance balance before and after a municipality adopts a supplement.

Note: The figures present estimates of background variables regressed by time group before or after a municipality adopted a change; the figure represents if sample composition remains similar before and after the change when compared to control municipalities. The sample includes all mothers with 12–35-month-old children and who live in control municipalities or municipalities that will adopt the supplement in 3 years or have adopted the supplement during 3 years. All models include year and municipality fixed effects. Points represent point estimates for the effect before and after the adoption of the supplement. Vertical lines represent 95% confidence intervals.