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Discharge on the day of birth, parental response and health and schooling outcomes*

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Abstract

Exploiting the Danish roll-out of same-day discharge policies, we find that treated newborns have a higher probability of first-month hospital readmission. This result may suggest that parents substitute postpartum hospital stays with readmissions. However, a same-day discharge also increases the number of mother and child general practitioner contacts in the first three years and decreases children's ninth grade GPA. Longer-run effects are strongest for at-risk children. Complementing our analyses of administrative data with survey data, we show that a same-day discharge impacts health and schooling in the longer run through both its effects on children's health and on parental investments.

JEL Codes: I11, I12, I14, I18, I21

Keywords: Postpartum hospital stay, early investments, long-run health, schooling, parental response

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1 Introduction

Childbirth is expensive for health systems. Childbirth-related patients accounted for 23 percent of all discharged patients from U.S. hospitals in 2005 (Sakala and Corry, 2008). To contain costs, 26 OECD countries have reduced the average length of postpartum hospital stay (i.e., hospital stay after birth) in the period 2000-2009 (see appendix figure 6). However, a great degree of heterogeneity in the length of postpartum hospital stay—both across and within countries—remains. Factors explaining this variation include mothers' and children's underlying health, insurance status, and variation in administrative procedures across hospitals or regions.

Postpartum hospital care for a general population of mothers and infants has two main objectives: First, health professionals monitor infant and mother well-being, and identify the potential need for medical treatment. Second, health professionals provide guidance to new parents to improve their skills and confidence in early child-parent contact. Shorter hospital stays at birth may thus have a number of short- and longer-run consequences: It may lead parents to substitute hospital care with contacts to other health care professionals, such as general practitioners, or lead to hospital readmissions.[1] It may actually impact infants' and mothers' short- and longer-run health due to health problems that remain undiscovered. And finally, it may impact parental knowledge and self-confidence, and ultimately, parental investments in children's health and development.

Important for policy, we still lack evidence that links the variation in the duration of postpartum hospital stay to differences in health and well-being across mothers and children. Moreover, we know little about the impact of care around birth on parental investments. For example, post-birth hospital stay and related medical services do not explain much of the variation in infant health outcomes between Austria, Finland and the U.S. (Chen et al., 2014). Studying data from the U.S., Almond and Doyle (2011) find that discharging mothers after two (or one) nights instead of three (or two) nights does not impact short-run health outcomes for an average population of mothers and infants. However, as they exploit exogenous variation in post-birth hospitalizations of at least one or two nights, their analyses may not be at the relevant margin—in terms of its impacts on child and mother outcomes. Furthermore, Evans and Garthwaite (2012) exploit variation in hospitalization length caused by legislative changes and identify heterogeneous effects of being discharged within 48 hours. They find positive health effects of longer

[1] This substitution effect may also be supply side driven (i.e. by the general practitioner and recommendations at the hospital.

hospital stays for mothers and infants who experience complications. These findings taken together point to the importance of 1) the margin at which we evaluate the effect of a change in the length of postpartum hospital stay and 2) the population of mothers and infants that we consider.

Denmark makes an excellent case to study these two factors. First, 5 of 16 Danish counties, together accounting for 34 percent of all births, have introduced mandated discharge on the day of birth—same-day discharge—for all uncomplicated births by multiparous mothers (i.e., non-first time mothers) in the period 1990-2003. We exploit these policy changes in a difference-in-differences framework to evaluate the short- and long-run effects of the shortest possible hospital stay after birth on children and mothers. Second, by analyzing effects on a general and on at-risk populations of mothers and children, we are the first to study the potential heterogeneous effects of a population-wide policy that mandated same-day discharge. Our results can inform policies in Denmark and other countries about the potential costs related to such large-scale policies.

This paper contributes to a growing number of studies on the importance of early life health and interventions that target early life health for long-run health and economic outcomes (Black et al., 2007; Chay et al., 2009; Almond and Currie, 2011; Bharadwaj et al., 2013).[2] Our study contributes to the evidence on the impact of shortening postpartum hospital stay, a policy that is relevant in many developed countries. Given that previous studies on postpartum hospital stay have exclusively focused on short-run child outcomes, we still know very little about its longer-run effects. By using data on the universe of Danish births between 1985 and 2006, this paper considers longer-run impacts of postpartum hospitalization on child and mother hospital readmission and children's school achievement. Moreover, while the studies most similar to ours have focused on extreme measures such as readmission and mortality, we add more detailed and less severe measures of child and mother health, namely contacts to general practitioners (GP).

A final main contribution of our paper is our focus on the importance and nature of parental response. We use complementary survey data from the Danish National Birth Cohort (DNBC) and thus extend earlier work by studying potentially important mechanisms for the long-run effects of medical investments early in life. The sparse, earlier work on the impact of parental response to early-life health interventions has not found indication for the importance of parental investments as a mediating factor (Bharadwaj et al., 2013).

[2] Particularly relevant for our study are papers demonstrating the impact of medical treatment early in life: Bharadwaj et al. (2013) find that low birth weight infants treated with intensive medical care at birth do better than their untreated counterparts in terms of educational achievement. Chay et al. (2009) demonstrate that improved access to medical care for black children narrowed the black-white achievement gap observed in the U.S.

Our results show that rates of same-day discharge for multiparous mothers increased sharply and significantly in treated counties after the introduction of policies mandating same-day discharge. In treated counties, the percentage of mothers experiencing discharged on the day of birth increased by up to 300 percent. Exploiting the introduction of these policies as an instrument, we find that being discharged on the day of birth increases the probability of child hospital readmission in the first 28 days. This result suggests that parents substitute postpartum hospital stays with readmissions. However, we also find longer-run consequences of same-day discharge: Infants and mothers have more general practitioner contacts in the first three years of life. Examining schooling outcomes, we find that being discharged on the day of birth leads to a significantly lower GPA in grade nine.

While we find no heterogeneity of effects for hospital readmissions, we find important heterogeneity for longer-run outcomes, namely GP contacts and ninth grade GPA. Mothers and children who have a low a-priori probability of being discharged on the day of birth experience the strongest longer-run effects. Attempting to disentangle the importance of early life health and parental background for these heterogeneous effects, we show that the negative effects on child health outcomes appear strongest for children in poor initial health (as measured by their size for gestational age at birth). Children of at-risk mothers (defined by their age, educational status and income) appear to drive the negative effect of same-day discharge on schooling outcomes at age 15.

Finally, we highlight that changes in parental investments may be an important channel for the long-run effects of same-day discharge on child health and schooling outcomes. We show that mothers who are discharged on the day of birth are less likely to breastfeed exclusively at four months of their child's life. This effect is driven by at-risk mothers, who are also more likely to report that their child is in worse health than the average child at age seven. The changes in parental investments may result from a lack of adequate postnatal care for at-risk mothers who as a consequence lack either knowledge, skills or confidence in parenting. At the same time, well-off parents appear to be able to compensate for the reduced hospital stay at birth. In sum, the longer-run effects of being discharged on the day of birth are driven by both a direct health effect and by parental responses.

This paper is organized as follows. Section 2 describes relevant features of the Danish health care system and the development of same-day discharge-policies over time. Section 3 presents our empirical strategy. Section 4 describes the data used in our analysis. Section 5 presents our main results, an analysis of heterogeneity of effects, an analysis of potential mechanisms and a set of robustness checks. Section 6 concludes.

2 Background: Births and postpartum care in Denmark

2.1 Relevant features of the Danish health care system

The Danish health care system consists of a municipal primary sector encompassing general practitioners (GP), pharmacies, nursing homes, and the home visiting nurses for infants and new mothers; and a secondary sector covering public hospitals[3] under the responsibility of the Danish counties.

Standard prenatal care consists of three GP examinations throughout pregnancy and four to seven examinations by a midwife. All examinations are free of charge. During the first trimester, GPs refer mothers to a public hospital where the midwife consultations and ultrasound examinations by trained nurses take place, and where the mother will give birth.[4] While mothers can in principle freely choose among all public hospitals in Denmark, the norm is that mothers are referred to the closest hospital. The mothers' choice of hospital is further constrained by the hospitals' capacity, i.e. mothers can only choose other than the default hospital if the given (other) hospital has free slots. In Denmark, only public hospitals provide birth assistance. Most births in Danish hospitals are assisted by trained midwives, while obstetricians and other doctors participate only in the case of complications.

Standard postnatal care consists of a postpartum hospital stay and visits by a municipal home visiting nurse. The home visits start on average within 10 days after birth and end when the child is one to two years old.[5] Moreover, the mother and infant are entitled to scheduled GP examinations. The number of planned examinations within the children's first six years was reduced from eight to seven in 1995 (Sundhedsstyrelsen, 1995). Three of the scheduled examinations are in the first year after birth. However, also in 1995, the Danish National Board of Health suggested that children who were discharged on the day of their birth should be offered an additional GP visit. This change of recommendation may impact the interpretation of our

[3]Today, Denmark has approximately 60 public hospitals. This number is the result of many mergers and the closure of small hospitals over the past 30 years.

[4]Mothers in the 1980s and 1990s had no legal claim to ultrasound examinations. This claim was introduced in 2004. By that time, the majority of pregnant women received two ultrasound examinations during pregnancy (Jørgensen, 2003). From 2004 onwards, all women have been entitled to two ultrasound examinations, around week 12 and 20 of the pregnancy.

[5]The number of visits and whether any visits after the first year of life are provided depends on the municipal service level and has also changed considerably over time.

short-run health measure for GP contacts.

2.2 Postpartum hospital stay in Denmark 1985-2006

Figure 1 shows yearly means for the percentage of multiparous mothers in Denmark, who experienced a same-day discharge in the period 1985-2006. The figure shows—in line with existing small-scale studies—that voluntary same-day discharge in treated and never-treated counties accounted for less than five percent of all multiparous births in 1985 (Fabrin and Olsen, 1987; Fyns Amtskommune, 1987). As the vertical lines in Figure 1 illustrate, the counties that introduced mandatory same-day discharge in the period we consider see jumps around the timing of introduction of these policies. These jumps departed from the overall trend towards more same-day discharge from the early 1990s onwards.

Table 1 gives an overview of the policy changes in five out of 16 Danish counties that we use to identify the effect of same-day discharge (discharge within 24 hours) on child and mother outcomes. All policies were introduced by elected county governments at a centralized level, were motivated by the aim of cost containment, and were implemented without additional changes in other services at the county level. As illustrated in Figure 2, two counties in central Jutland (Aarhus and Ringkøbing county) were the first to introduce mandated early discharge for all uncomplicated multiparous mothers in 1990 (Kierkegaard, 1991; Kierkegaard et al., 1992; Lange, 1992; Kierkegaard and Monrad Hansen, 1993). Both counties left other county services for new mothers and their children unchanged. However, midwives provided a home visit to early-discharged mothers after birth and a few municipalities in the two counties provided additional home visits by home visiting nurses for early-discharged mothers (Kierkegaard et al., 1992). The county of Viborg introduced mandatory same-day discharge for multiparous mothers in 1993. Only one of 16 municipalities in Viborg county increased the resources for the home visiting program as a reaction to this policy change (Sundhedsplejerskegruppen, 1995).

In a second wave, the counties of Vejle and Ribe introduced mandatory same-day discharge policies in 2002 and 2003, respectively (Drevs, 2012; Jensen, 2013).[6] While other counties have also seen increases in same-day discharge rates, non of them introduced policies that led to sharp increases in the probability of experiencing a same-day discharge similar to the five treatment counties.

Finally, Figure 3 shows the distribution of hospital stays for mothers who gave birth one year

[6]From January 2002, the hospitals in Vejle county were to assign a same-day discharge to 80 percent of multiparous mothers with uncomplicated births and no other hospital resources were adjusted (Drevs, 2012).

before and after, respectively, in the treated counties. There is a clear shift in the distribution of hospital stays towards a larger percentage of mothers experiencing very short stays (from one to four nights to zero to one midnights). At the same time, the tail of the distribution remains unchanged. This finding suggests that the treatment of mothers and children with more complicated births' and other health needs—at least in terms of length of stay—remained unaffected by the policy changes. Together with the fact that counties implemented these policies to contain costs, this pattern indicates that no additional resources were used on mothers and children who were not discharged on the day of birth.

3 Empirical strategy

To estimate the effect of same-day discharge on the outcome y for individual i, born at time t, residing in county c, we may estimate a model such as:

$$y_{itc} = \alpha_0 + \alpha_1 SDD_{itc} + \alpha_2 \boldsymbol{X}_{itc} + \lambda_c + \theta_t + \omega_c \times f(year) + e_{itc} \tag{1}$$

where $\boldsymbol{X}_{itc}$ is a vector of child and mother covariates and ϵ_{itc} is a random error. As counties may vary systematically in their population of mothers, we include λ_c, a set of county indicators accounting for time-invariant differences across counties. θ_t is a set of year indicators, accounting for macro shocks. As mothers' and children's outcomes may develop differentially across counties (e.g., due to the faster adoption of new technologies in some hospitals or differential changes in the population of mothers), we include $\omega_h \times f(timetrend)$, which account for (flexible) county-specific time trends. SDD is an indicator for the child being discharged on the day of birth.

However, a comparison of outcomes for mothers and children who experience a same-day discharge to those who do not is most likely biased. On an individual level, the duration of hospital stay is not randomly assigned. Obstetricians and midwives decide on the length of postpartum hospitalization based on not only observed child and mother characteristics such as gestational length, birth weight and mother's age, but also characteristics unobserved by the researcher. Since mothers and children with more favorable unobserved characteristics may on average have more favorable health outcomes and be more likely to experience a same-day discharge, a comparison of births across different lengths of hospital stay may lead to biased estimates of the effect of being discharged on the day of birth.

To overcome this problem, we exploit variation in administrative rules over time and across

Danish counties in a difference-in-differences framework (DiD). While our setting has several attractive features that may encourage a regression discontinuity design (e.g., clear cut-offs in the forcing variable, administrative and daily data for a population of births), we lack power to locally exploit the policy changes.[7]

The sudden increase in the percentage of same-day discharge in five counties gives rise to exogenous variation in the probability of being discharged from hospital on the day of childbirth. Thus we compare the differences in outcomes of multiparous mothers who give birth before and after the implementation of new administrative policies in treated counties to the differences in outcomes of multiparous mothers who give birth in the same years in non-implementing counties. Our reduced form relationship is:

$$\begin{aligned} y_{itc} =& \gamma_0 + \gamma_1 Post_t \times County_c \\ & + \gamma_2 \boldsymbol{X}_{itc} + \lambda_c + \theta_t + \omega_c \times f(year) + \epsilon_{itc} \end{aligned} \tag{2}$$

Where $Post_t \times County_c$ indicates a birth in a treated county after the introduction of a same-day discharge policy in that county and, consequently, γ_1 measures the impact of the policy change on child and mother outcomes. We define our treatment variable at the county of residence×year-level. While the majority of mothers (over 90%) give birth in a hospital in their county of residence, we take out any potential impact of mothers' hospital choice by focusing on the county of residence.[8]

Given that we use across-county differences in administrative rules, we rely on the common trend assumption, i.e. that the differences in the outcomes of multiparous mothers and their infants, for example, in Aarhus county and the remaining counties would have remained constant over the period in the absence of the treatment. This assumption may be violated if, for example, other policies were implemented in Aarhus or the composition of the Aarhus county's population changed differentially (and if the time trends, that we specify, fail to account for this change). To examine the validity of the common trend assumption, we exploit information on children's parity. As the same-day discharge policies only impacted multiparous mothers, we compare differences in outcomes for primi- and multiparous mothers before and after the policy change

[7] We have estimated RDD models that use one year of pre- and post-treatment data for the treated counties. While results are qualitatively similar, given that we only use data from the five treated counties, our estimates are less precise. Estimates are available on request.

[8] We have also conducted all our analyses with a treatment variable defined at the hospital of birth×year-level. Our conclusions are unchanged and presented in Appendix Table 12.

in treated counties to the same differences in differences in untreated counties (difference-in-differences-in-differences).

To estimate the effect of same-day discharge on the mothers who are discharged on the day of birth due to the policy change, we exploit the administrative changes as an instrumental variable. Thus, in a first stage regression we estimate:

$$\begin{aligned} SDD_{itc} =& \beta_0 + \beta_1 Post_t \times County_c + \beta_2 \boldsymbol{X}_{itc} \\ &+ \lambda_c + \theta_t + \omega_c \times f(year) + \epsilon_{itc} \end{aligned} \tag{3}$$

β_1 measures the increased probability of being discharged on the day of birth that is due to the policy change.

The inference in our main analyses is based on standard errors that allow for arbitrary correlation within year×county-cells. Given the small number of counties (16), we cannot cluster at the level of the treatment. Thus to relax the assumption that the county×year-cells are equally alike and to allow for serial correlation inside counties, we follow Chetty et al. (2009) and conduct a non-parametric permutation test. In this test, we 10,000 times assign the treatment initiation (the same-day discharge policy) to random year×county-cells. For each assignment, we compute the point estimate from the reduced form regression of the outcomes on the treatment indicator. We compare the coefficient obtained in our main analysis to the empirical distribution of the placebo estimates. The p-value for the permutation test is defined by the fraction of placebo estimates below (or above) the estimate from our main analysis. Given the non-parametric nature of this test, we expect the resulting p-values to be somewhat larger than the ones in our main analysis. However, in section 5, we show that our main conclusions are robust to this test.

4 Data and summary statistics

4.1 Data sources and sample construction

To construct our main sample we use information on all registered live births in Denmark from 1985 to 2006 (see Appendix Table 10 for details on the sample construction). We restrict these data to multiparous births. We exclude 47,794 multiple births (3 percent of the gross sample) and another 24,204 observations with missing hospital information (home births or births outside Denmark, 1.7 percent of the gross sample). These restrictions result in a main dataset of 714,562 births.[9]

While we have data on hospital admissions for the period 1985-2006, other data sources are available only for subsets of this period (see also Appendix Table 11 for an illustration). We have GP and diagnoses data (for diagnoses given at hospitals) for all years from 1997 onwards.[10] Data on the ninth grade GPA is available for cohorts who completed ninth grade in the period 2002-2012 (which corresponds to the birth cohorts 1987-1997). We use data on the second grade test in Danish covering all children who attended second grade in the period 2009-2012 (which roughly corresponds to birth cohorts 2001 to 2004).

To assess potential mechanisms for long-run effects, we use survey data from the Danish National Birth Cohort (DNBC) (for details on this survey see, e.g., Olsen et al., 2001). This survey is linked to the administrative data and contains initially a sample of around 100,000 births from the period 1997-2003. For the DNBC data collection, pregnant women were invited to participate in two pre-birth and up to four post-birth surveys (at 6 and 18 months, 7 years and 11 years). The survey waves collected a broad set of measures, among them information on maternal health behaviors, maternal investments in children's health and development, and mother-reported child health. We use data from the 18 months and seven year interviews for all mothers and their children. Although the DNBC like most other surveys suffers from some attrition between waves and thus is not a representative sample of Danish mothers and children, at the last interview (currently at age 7) around 60 percent of mothers still participated (Jacobsen et al., 2010).

4.2 Variable definitions

We use hospital records from the Danish Inpatient Register to compute the length of hospital stay at birth. As we have daily (and not hourly) information on hospital admissions and discharges, we define a same-day discharge as a birth where the child is discharged from hospital on the calendar day of birth. Thus we underestimate the prevalence of same-day discharge. To account for children's direct admission to another hospital ward, we define all hospital stays with a

[9] We have also created a subsample of uncomplicated births as defined in Fonnest and Thranov (1998), i.e. only singleton births with a child of at least 2,500 grams, born after at least 37 weeks of gestation, and born by mothers of at least 18 years and without any birth complications, such as cesarean section. Results based on this sample confirm our main results and are available on request.

[10] Until 1997 children's contacts to GPs were registered as a parent visit (i.e., the visit was registered with the parent's personal identifier). Thus we can only distinguish between mother and child GP contacts for children of the cohorts from 1997 onwards. To create a consistent sample for our analyses, we use only information on diagnoses during pregnancy, birth and after birth for births after 1997 (the diagnoses data is available in the ICD10 scheme from 1994 onwards). We add indicators for missing information for all births before that year in regressions that control for pregnancy and birth complications.

same-day readmission as one single hospital spell.[11] Furthermore, we use the hospital data to construct measures for mother and child hospital readmissions within the first 28 days and within the first 365 days after birth.

To measure maternal and child health outcomes in greater detail, we use administrative data on mother and child post-birth diagnoses. We construct a measure of mother post-birth complications and operations within three months after birth.[12] Similarly, we construct indicators for diagnoses indicating problems in infants that may be related to poorer postnatal care and lead to readmissions: we consider diagnoses related to problems with infant nutrition and jaundice within 28 days after birth. We also construct an indicator for any of these problems being present.[13]

As existing studies have found very small effects of length of postpartum hospital stay on readmissions (Almond and Doyle, 2011; Evans and Garthwaite, 2012), we also evaluate less severe outcomes. Thus we examine the number of mother and child GP contacts within the first month and the first three year of the child's life. As we have data on GP contacts from 1997 onwards, we could include, e.g., children born in 1996 in our analysis for GP visits in the second year of life. Thus our analysis would be based on different data windows for each single GP outcome (no. of visits at a given age). To avoid these "rolling" samples, we constrain the analysis to GP visits in the first three years of life, where we have data for all children's GP contacts at all ages between 0-3. These records include one observation per GP "contact", each of which may contain several services. Given that the data are on GP reimbursements, we lack a precise measure of the timing of the contacts. Thus, to measure the timing of the GP contact, we use information on the week the GP claimed a reimbursement in the public payment system. We assume that this week is shortly after service provision.

To measure child school achievement, we use data on scores from the national test in second grade and primary school test data – when children are approximately 15 years old – from the Danish Ministry of Education. We create an unweighted and standardized (by school year) GPA based on all grades given in ninth grade (all subjects, tests, and teacher evaluations), as well as

[11]Children who get moved to another hospital ward get assigned a new admission date that in most cases is the same date as the discharge date from the previous ward. We regard these consecutive admission spells as a single hospital spell, as it is common to move children from the maternity ward to other wards in case of health issues.

[12]This measure includes frequent post-birth maternal complications (Danish National Board of Health, 2005). We use the ICD 10 diagnoses codes DO85, DO860, DO861C, DO862A, DK556H, DO871, DO882D, DO702, DF53, DO990A, and operation codes KMWA, KMWB, KMWC, KKCH00, KJFA70, KJFA80, KLCD00, KMBA, KMBB, KMBC00, KTAB30.

[13]This measure includes the ICD 10 diagnoses: Dehydration (DE869A, DE871A), child well-being (DR628A), jaundice (DP59), nutrition problems (DP92, DF982), and breastfeeding problems (DP925).

the average grade in mathematics and Danish (average over tests and teacher evaluations).

Additionally, we compute children's age at school start using information on when the children took their first national test in second grade. While children are supposed to start in school the year they turn 6, some parents do not comply with this norm. Non-compliance may be a sign of parental response to poor child health or other factors determining school readiness.

Using survey data from the DNBC, we add additional measures for parental investments and mother-reported measures for child health to the analysis. From the 18 month DNBC survey wave, we create an indicator for maternal breastfeeding of the child for at least four months (exclusive breastfeeding). As another proxy for parental health investments, we create an indicator for the child having received all scheduled vaccines at age 18 months. Furthermore, from the seven year interview we add mother-reported measures of child health to the analysis: indicators for whether the child has been diagnosed by a doctor with or treated for food allergies or asthma, and an indicator for the child being in poorer health than average children of the same age.

To account in detail for observed differences between mothers and children, we use administrative data on maternal background characteristics including employment status (indicator variables for whether the mother is in education, retired, self-employed or unemployed, all defined in November of each year), gross income, education (an indicator variable for whether the mother has completed an educational level higher than high school), and civil status. We measure all socio-economic background characteristics with a two year lag for births in the first six months of the year and with a one year lag for births in the last six months.[14] Furthermore, we control for mother's age at birth. For the child, we control for indicators for low birth weight and prematurity (gestational age at birth <37 weeks). Finally, for all analyses on post-1996 data, we further control for maternal pregnancy-related health (measured as a set of diagnoses), birth mode (an indicator for caesarean section), and the child's 5 minute APGAR score.

Table 2 provides summary statistics for selected outcome and control variables in our main samples, and sample means for selected years in the period considered (only administrative data). The table indicates that child readmission rates and the number of GP contacts have increased over the period considered, while the average number of postpartum hospital nights has decreased. Similarly, changes in the means for the percentage of caesarean section births and the percentage of uncomplicated births indicate the importance to control for trends in our

[14]For example, for births in December 1989 or January 1990 the background characteristics are measured in 1988. This shift ensures comparability in background characteristics around the timing of the policy change.

analyses.

5 Results

5.1 Graphical evidence

Figure 4 presents graphically the variation that we use to identify the effect of a same-day discharge. It shows the yearly share of early-discharged birth for multiparous mothers before and after the introduction of the five policies in treated and never-treated counties (the between county variation used in the DiD estimation). The figure shows 1) clear jumps in early discharge rates around the introduction of the policies in treated counties and 2) flat and parallel pre-treatment trends across treatment and (never-treated) control counties.[15]

Turning to central short- and longer-run outcomes of our analyses, Figures 5a to 5c show event graphs for multiparous mothers and their children in treated counties. The figures plot estimates and confidence intervals for indicators of time to treatment. We expect that event graphs show an impact of the introduction of the new policies only after time $t = -1$ (which is the reference category in all graphs). The graphs indicate a flat pre-trend and changes in mother and child readmission rates in the first year after the introduction of the policies. Moreover, for our long-run outcome—ninth grade GPA—we observe the same pattern.[16]

5.2 Main results

Given the graphical evidence, Table 3 presents our main results for the effect of a same-day discharge on mother and child health outcomes and child school achievement. Column (1) presents our first stage estimates (FS) and column (2) presents reduced form estimates (RF) for regressions of our outcome measures on an indicator for a post-treatment birth. Column (3) presents two-stage least squares estimates (2SLS). Each cell presents estimates and standard errors from a separate regression. All specifications account for our set of controls, county and

[15]Figures for the yearly early discharge rates for first-time mothers in treated and untreated counties do not show any jumps for the treated counties (figures available on request). To test the robustness of our results we use these mothers as an additional control group in a triple-difference regression that accounts for factors such as county-specific parallel policies that may confound our DiD analysis.

[16]Event graphs for all other (register data-based) outcomes are in Appendix Figure 7. Due to the availability of data we can only show two post-treatment years for the GP outcomes. Furthermore, the GP outcomes are the ones that are most sensitive to the specification of trends. Thus we see the least clear pattern in the event graphs for these outcomes. For one year readmissions and the GPA in math and Danish, our event graphs show a clear jump in year $t = 0$.

year fixed effects, as well as county-specific quadratic trends in birth year.[17]

As the samples vary across outcomes due to data availability, we present first stage regressions for all samples in the first row of panels A-D. In line with Figure 4, across samples we find a large and consistent jump of 24 percentage points in the probability of same-day discharge for multiparous mothers after the introduction of the policies.

For hospital readmission both reduced form and 2SLS estimates show that same-day discharge increases only the probability of infant readmission within the first 28 days after birth. Column (3) shows that early discharged children experience a three percentage points increase in early readmissions. At a sample mean of around four percent this estimate implies a 75 percent increase in infant hospital readmissions for marginal children. While we have examined a set of medical diagnoses given at readmission of infants during the first four days of life—diagnoses related to nutrition problems and jaundice—we lack power to have enough confidence in the results for these rare outcomes.[18] As our estimates do not detect an increase in these relevant diagnoses that may indicate a lack of proper postnatal care, the increase in very early readmission may indicate that parents (or hospitals) substitute postpartum hospital stays with readmissions to hospitals. Turning to hospitalizations after the first 28 days of life and up to the first year of the child's life, we do not find a persistent effect of same-day discharge. For mothers the estimate for readmission in the first 28 days is only close to significance at the 10% level.

If same-day discharge leads to lasting health problems for mothers or children, we should not only consider readmissions but we may also expect mothers and children to demand more contacts to other health professionals. As GPs are the primary access to the Danish health care system, the middle panel of Table 3 examines the number of GP contacts for children and mothers. As stated earlier, the GP data is only available for 1997 to 2010.[19] Thus were are not able to compute longer-run GP outcomes for the sample of children born 1997 to 2006. To obtain information on longer-run health outcomes, we complement the GP measure with a survey measure on mother-reported subjective health at age seven, which we discuss in section

[17] We assess the sensitivity of our results to the model specification in Table 8. In Appendix Table 12 we present the main analyses based on a treatment indicator defined at the hospital×year-level. These results are very similar to our preferred results presented in this section.

[18] Our results for infant diagnoses are imprecise and available on request. Only around 2-4 percent of readmitted infants are registered in the Inpatient Register with these diagnoses in the period we consider. Given that the registration of diagnoses at hospitals is changing over time, this finding suggests that the respective ICD codes were not routinely used. It may or may not reflect that the conditions were present.

[19] Recall that because of data constraints these regressions are based on the policy changes in Vejle county (2002) and Ribe county (2003).

5.4.

For the available measures of GP contacts we find that same-day discharged infants have 0.48 more contacts in their first month of life. However, as same-day discharge infants from 1995 onwards were granted an additional GP visit in the first month of life (Sundhedsstyrelsen, 1995), our result for short-run increases in GP contacts is partly driven by this change. Our estimate for GP visits in the first three years of the child's life is positive, but imprecisely estimated. Supplemental analyses (presented in Appendix Table 14) indicate that the effects in the first two years are insignificant, but in year three—where most scheduled contacts to health care professionals (GPs and home visiting nurses) are phased out—the same-day discharged children have significantly more GP visits.[20]

Turning to maternal short-run health outcomes, we find a one visit increase in mother GP visits in the first month of the child's life and an increase of around five visits in the first three years of the child's life.[21] For mothers we cannot rule out that some of the persistent effect on GP contacts may be driven by some mothers' subsequent fertility and related pregnancy checks at GPs.

Taking the results for child health as a point of departure, panel C of Table 3 examines the impact of same-day discharge on school achievement in grade nine. We find negative and large effects of same-day discharge on ninth grade GPA (interpretable as changes in standard deviations). Same-day discharge leads to a decrease in 9th grade GPA of around -0.1 standard deviations in our instrumental variable estimation. The result for grade nine achievement is driven by a negative impact of same-day discharge on the score in Danish of about -0.12 of a standard deviation.

Thus we see not only evidence for early discharge affecting health care usage of children in the time directly after birth, but also that same-day discharge impacts children's longer-run school achievement negatively. In subsection 5.3 we explore the heterogeneity of these effects across subgroups in the population. Subsection 5.4 turns to potential mechanisms for these observed effects.

[20] Given that we account flexibly for year fixed effects and trends, we can rule out that country-wide increases in, for example, the offered number of well-baby visits to GPs impacts this result. The offered number of scheduled GP visits is centrally determined by the Danish national board of health. As postnatal care in the first year consists of scheduled GP contacts as well as the home visiting nurse program, the weaker effects in the first two years may be because the institutionalized care is sufficient to capture health effects. For example, in both year one and year two the average number of visits at the GP is nine, but in year three it drops to six.

[21] There are no scheduled GP consultations for mothers beyond the first month after birth, which may explain our finding of increased mother GP contacts in year one and two of the child's life as well (when we examine the years separately, see appendix table 14).

5.3 Heterogeneity

The effect of being discharged on the day of birth may vary considerably among mothers and children of different characteristics. Following Evans and Garthwaite (2012), this section examines the heterogeneity of the effects of same-day discharge for subgroups of mothers and children. We proceed in two steps: First, we obtain an estimate for the likelihood of experiencing a same-day discharge for all mothers who give birth in treated counties in the pre-policy period. We predict this probability based on child and mother characteristics.[22] We then assign mothers in the post-treatment period a propensity score for experiencing a same-day discharge.

Second, we estimate our main specification on 3 subsamples of mothers/children defined by the propensity of being discharged on the day of birth. The first subset contains the observations with the 33 percent lowest propensity score for each year and parity group. This group has the lowest likelihood of experiencing a same-day discharge based on pre-implementation data. In contrast, the group with the 33 percent largest propensity scores has highest likelihood of experiencing a same-day discharge.

To illustrate the composition and differences in observable characteristics of mothers and children in the propensity score groups, Table 4 shows covariate means for mother and child characteristics in the three subsamples. As expected, in the low-propensity score group mothers are (on average) younger and less educated than the mothers in the other groups (and vice versa). These differences indicate that the propensity score divides our sample across relevant dimensions (with respect to mother and child characteristics that likely to matter for the doctors' discharge decisions).[23]

Table 5 presents our first stage and 2SLS results for the three subsamples defined by their propensity score. Illustrating the large-scale nature of the discharge policies, the first stage is strong for all propensity groups. Overall we see no large heterogeneity for the effects of same-day discharge on the outcomes measured very early in the child's life (on readmission and first month GP contacts).

[22] Specifically, we estimate the following probit model on all births in the treated counties *prior* to the introduction of mandatory same-day discharge:

$$Prob(SDDitc = 1) = P_{itc} = \Phi(\alpha + \boldsymbol{\eta}\boldsymbol{X}_{itc})$$

where X_{itch} contains indicator variables for whether the mother was married, unemployed, employed, in education, has a higher education, mother's age and for 20 percent quantiles of birth weight.

[23] Furthermore, as Appendix Figure 8 shows, pre- and post-policy change mothers are very similar in their distribution of the propensity scores. The figure suggests that the samples of mothers that we construct for the pre- and post-policy change are well balanced in terms of their observable characteristics (i.e., there is a common support for the propensity scores in the treated counties before and after the introduction of mandatory same-day discharge).

However, we find considerable heterogeneity in the effects of same-day discharge on GP outcomes for both mothers and children in the first three years after birth with the largest and significant effects in the low propensity score-group. Furthermore, the effects on school attainment in grade nine is largest in absolute size and more precise for children in the lowest propensity score-sample. For this group a same-day discharge reduces the ninth grade GPA by 0.19 standard deviation (from a lower mean than the other two groups). Moreover, also the effects on Danish and Math scores are significant and larger in the low propensity score group, i.e., the group of children that prior to policy introduction had the lowest probability of being discharged on the day of birth, based on their characteristics.

One weakness of this analysis based on the propensity score is that we pool mother and child characteristics to determine the probability of being discharged on the day of birth. Thus we cannot speak to the question as to whether parental characteristics *or* initial child health are important with respect to the heterogeneity that we observe. On the one hand, as many studies have illustrated the path dependency of health in childhood (see e.g., Case et al., 2005), children with poor initial health status may experience larger effects of same-day discharge. On the other hand, recent studies emphasize the impact of parental responses to initial health conditions, thereby highlighting that parental background may be the most important factor accounting for heterogeneity of effects (see e.g., Almond and Currie, 2011; Cunha et al., 2013; Bernardi, 2014; Heckman and Mosso, 2014).

To distinguish between the impact of mother and child characteristics, we alternatively divide our main sample into four groups defined by the combination of two dimensions: first, a propensity score only calculated by incorporating maternal characteristics (education, income, employment, unemployment, civil status and age). We then restrict our attention to the top and bottom 33% of mothers as defined by this propensity score. Second, as a measure of child health at birth, we use an indicator for being small for gestational age (SGA). This measure captures infants' maturity at birth and is therefore a better proxy for initial health as measures such as birth weight.[24] Appendix Table 15 presents the results from our heterogeneity analysis based on these samples and Appendix Figure 9 illustrates our results graphically for the child GPA.

Note that the four groups (defined by the mother propensity score and child SGA status) are not of equal size. Given that only around 10 % of all infants are classified as SGA, confidence

[24]We define an indicator for being SGA according to the sex-specific formula presented in Marsal et al. (1996). Around 10 percent of children in our sample are classified as SGA.

intervals for the groups defined as SGA are much wider. Nevertheless, similar to our findings in the "pooled" heterogeneity analysis (with one combined maternal and child characteristics propensity score), we find limited heterogeneity for child and mother readmissions when dividing our sample according to children's SGA status and maternal propensity score for experiencing an early discharge. However, children who are SGA appear to see stronger GP effects, i.e. e children with an initial health disadvantage are the ones who experience lasting health effects.

Finally, we find evidence (illustrated in Figure 9) for mothers' characteristics rather than children's SGA status impacting the effect of a same-day discharge on children's longer-run school achievement. For this outcome, only the estimates for children of low propensity score mothers are significantly estimated, large and negative. In other words, children of normal size at birth only experience a negative effect of early discharge on school achievement, if their mothers have a low predicted probability of being discharged early. We take this finding as indication for the importance of parental response to policies impacting early life health for longer-run children schooling outcomes.

In sum, our finding of limited heterogeneity in the effects of same-day discharge on early-life health and increasing heterogeneity in the effects on longer-run health and schooling outcomes support two potential explanations: first, first-month measures of health care usage may capture substitution of hospital care with contacts to other health care providers, which are free of charge in Denmark. This substitution may either be demand-driven or encouraged by health care professionals. Longer-run health (and education) effects only in the low-propensity score group may then reflect that only these children actually had an unmet need for more care. Second, as an alternative explanation, the short-run effects may capture actual health problems that occur across all groups. That we only see strong longer-run health and schooling effects for children in poor initial health and of at risk-mothers may indicate that parental responses play an important role and mediate how long-lasting these initial health problems end up being. Thus the next section turns to the question of the the ways in which parental behaviors may contribute to longer-run health and educational effects of same-day discharge.

5.4 Mechanisms

The analysis of the heterogeneous effects of a same-day discharge points to both the impact of infants' initial health status and the impact of parental background and potentially their responses for the effects of same-day discharge on children's well-being. This section further explores mechanisms that may account for the longer-run effects of same-day discharge that we find.

Prior evidence from small-scale studies on the Danish early discharge policies from the early 1990s show that women who experienced mandated same-day discharge perceived the breast-feeding support as inadequate to a higher degree than hospitalized mothers (Kierkegaard et al., 1992; Kierkegaard, 1993; Brinkmann, 2011). While these studies do not find differences in median breastfeeding duration, one study shows that early-discharged mothers were significantly less likely to breastfeed at four weeks after birth (Kierkegaard, 1993). Moreover, early-discharged mothers appeared to have more telephone contacts and personal contacts to other health professionals than their controls. While all these previous studies face small sample sizes and only use control mothers from inside the same county, they indicate that parental self-confidence and parental early investments may have been impacted by mandated same-day discharge.

Table 6 shows results from an analysis of complementary survey data on all mothers who gave birth between 1997-2003 and participated in the DNBC.[25] Table 7 adds a heterogeneity analysis using a propensity score based on mother and child characteristics, as in section 5.3. Given the smaller sample size in the DNBC data we do not divide the sample along child and mother characteristics separately.

In line with mothers' report of lack of breastfeeding support in earlier studies, we find that mothers that are discharged on the day of birth are less likely to breastfeed exclusively for at least four months.[26] At the mean of the dependent variable, early discharge decreases the probability of breastfeeding exclusively until month four by around 31 percent.

Same-day discharge does not impact the probability of having received all scheduled vaccines at age 18 months in the analysis based on the full sample. Thus the increase in GP visits that we find in the main analysis (which is especially strong for poor health children) is most likely not driven by an increased number of planned well-baby visits, but may reflect actual underlying health problems. Moreover, we find no clear pattern for the effects of same-day discharge on mother-reported health at age seven and somewhat counter-intuitive results for mother-reported specific diagnoses.

Although the heterogeneity results for our survey outcomes should be interpreted with more

[25] Given the timing of the survey, we can only use the 2002 and 2003 policy changes for these analyses. Furthermore, earlier analyses indicate that the survey represents a somewhat positively selected sample of mothers (increasingly so for the post-birth survey waves) (Jacobsen et al., 2010).

[26] We chose this margin as the official recommendations in Denmark suggest a four months period of exclusive breastfeeding. From around four months, Danish visiting nurses encourage mothers to introduce solid food.

caution due to the size and the (positively selected) characteristics of our survey sample, Table 7 suggests that the negative effects we see for breastfeeding duration are driven by the lower propensity score groups. Children from these group are less likely to be breastfed for four months. While this finding suggests that disadvantaged mothers reinforce the effect of lower health treatment at birth, parents from the high-propensity score group who experienced a same-day discharge, are not less likely to breastfeed for four months. Mothers in the low propensity score group are also significantly more likely to report poor health for their child at age seven. These finding indicate that parents respond differentially to early health shocks. However, the heterogeneity results for other mother-reported health measures are less clear-cut.

Finally, Tables 6 and 7 present the results from an analysis of administrative data for children's school starting age and second grade test scores. In line with other research from Denmark, we find that parents with higher socio-economic status may actively use their discretion with respect to their children's age at school start: early-discharged children from the high propensity score groups are older when they enter Kindergarten. Our results for the second grade test score are very imprecise and mostly very small. Part of this finding may be due to the close timing of the test to school entry, i.e. the decisions of parents to delay school start for some children (and thus increase age at test) may impact these test results more than the results of the test taken in grade nine.

In sum, we find suggestive evidence for parental response to same-day discharge. While some parents actively compensate (for example, by delaying school start), others appear to reinforce early life health shocks (for example, by reducing breastfeeding). Parental investments in the low propensity score group appear to decrease as a response to a same-day discharge, but the same is not true in the high propensity score group. These results suggest that a lack of postnatal hospital care for disadvantaged parents may decreases their subsequent investments. This decrease could be due to a lack of knowledge, skills or self-confidence.

5.5 Robustness

This section presents two sets of robustness tests. First, we assess the impact of the different samples and the functional form chosen for the results of our main analyses. Second, to test the robustness of our inference, we report the results from a permutation test that relaxes the assumptions we make by clustering our standard errors on the county×year-level.

All cells in Table 8 present estimates from separate 2SLS regressions based on different samples and specifications. In general, we find rather stable estimates for the impact of mandated same-day discharge on early child readmission, mother and child GP visits in the first month and year, and child school achievement measured as GPA at age 15. In contrast to our main results, some of our findings indicate that same-day discharge also increases mothers' probability of readmission in the first 28 days.

To test whether the policy changes in the first or second wave have differential impact on child and mother outcomes, we perform our analysis on data only around the early and late wave of introduction of early discharge policies (columns (1) and (2)). Overall the conclusions are very similar to the main results.

Column (3) in Table 8 shows that excluding mother and child control variables has negligible effect on the results.[27] Assessing the robustness of our main findings to different polynomials in birth year (linear and cubic trends), we show that our results are in general robust to the specification of trends (columns (4) and (5) of Table 8). Additionally, our results are very similar when we use the policy changes as five separate instruments (column 6).

To rule out that county-specific additional policy changes or shocks account for our findings, we next use primiparous mothers as an additional control group in a triple-differences specification (column 7). This specification compares differences in outcomes between primi- and multiparous mothers before and after the policy changes across treated and control counties. Across outcomes we find very similar results to the ones obtained by the simpler differences in differences version of our model. This finding indicates that differential trends across treated and untreated counties due to factors such as other parallel policies or changes in the counties' population of mothers do not appear to play an important role.[28]

In column (8) we use information on the mother from the Inpatient Registry to define the same-day discharge variable (instead of information on the child). Our conclusions remain unchanged. A strategy to make the sample more homogenous is to only consider second born children (instead of all higher non-first-born children as in our main analysis). Column (9) shows that this sample restriction has little impact on the main conclusions. In column (10) we show regression results from a specification where the treatment is the number of postpartum hospital nights (instead of a binary indicator for zero nights as in all other specifications). The conclusions from this analysis are in line with the main specification: Longer postpartum hospital

[27] Moreover, an analysis that uses mother and child characteristics as outcomes confirms that the policy changes in the given counties do not impact mother and child characteristics. Results are available on request.

[28] Appendix table 13 shows first stage and reduced form results for first time mothers (placebo). We see no first stage and no indication for effects on these non-treated mothers.

stays cause fewer child hospital readmissions, fewer child and mother GP contacts, and a better primary school GPA.

Finally, we examine the importance of clustering on our conclusions. Appendix Figure 10 shows the empirical CDF for placebo estimates for the outcome Danish GPA from our permutation test. As the figure shows, the majority of placebo estimates are around zero and the estimate from our main analysis (marked with a verical line) is a rather extreme value. Table 9 shows the p-values obtained in the permutation test and our main analyses for all outcomes. While the p-values from the conventional parametric specification (in column 1) are somewhat smaller than the p-values obtained from the permutation test (in column 2), the comparison of p-values from the permutation test and our main analysis suggests that our inference based on county×year-clusters is reasonable.

6 Conclusion

In this paper we exploit the county-by-county introduction of the shortest possible postpartum hospital stay—mandatory discharge on the day of birth—for multiparous mothers to estimate its causal effect on mother and child health and well-being. We find significant effects of same-day discharge on child hospital readmission in the first 28 days as well as on the number of child and mother general practitioner examinations in the first years of life. While the short-run readmission results may indicate that the health effects merely reflect substitution of default postpartum hospital care with other postpartum care, we find that especially at-risk populations of children experience lasting health effects—measured as general practitioner contacts and mother-reported health at age seven—and negative effects on test scores at age 15.

Examining data on parental investments and examining the heterogeneity of effects across children of different initial health conditions, we show that both path dependency of health status and parental responses appear to drive these longer-run effects. The finding that the infants in worst initial health have the strongest effects for measures of health care usage in childhood supports the idea that early life health impacts health during childhood. Same-day discharge may make it less likely that health problems are discovered and treated timely.

The finding that maternal characteristics matter for the strength of the effect on school achievement points to the crucial role of parental responses to early life health in explaining longer-run consequences for child well-being. Parental responses (such as breastfeeding and timing of school enrolment) to early life health shocks may explain some of the longer-run effects that we find. Thus while our findings are in line with recent research documenting effects of early life health interventions on longer-run educational outcomes (Bharadwaj et al., 2013), we point to the importance of parental responses, that appear to matter as mechanisms for these effects.

Mandated same-day discharge policies for large parts of the population may come at significant costs for at-risk mothers and children. Thus when evaluating the cost effectiveness of postpartum care, researchers and policy makers should consider these longer-run consequences. Early life health interventions have the potential to significantly impact parental investments, such as breastfeeding. Whether this impact is due to their effect on parental knowledge, parenting skills or self-confidence gives rise to rather different policy implications. Thus future research should consider in greater detail the impact of postpartum care on parents' behaviors.

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7 Figures and Tables

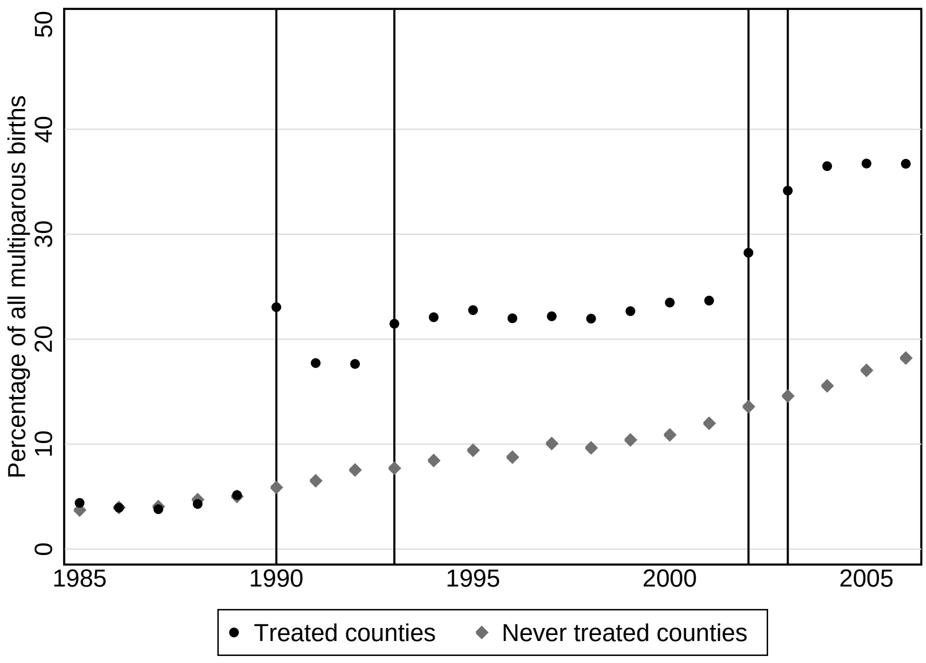


Figure 1: Percentage of multiparous mothers discharged on the day of birth.

Notes: The vertical lines show the policy change years. The data covers all multiparous mothers who gave birth at a Danish hospital.

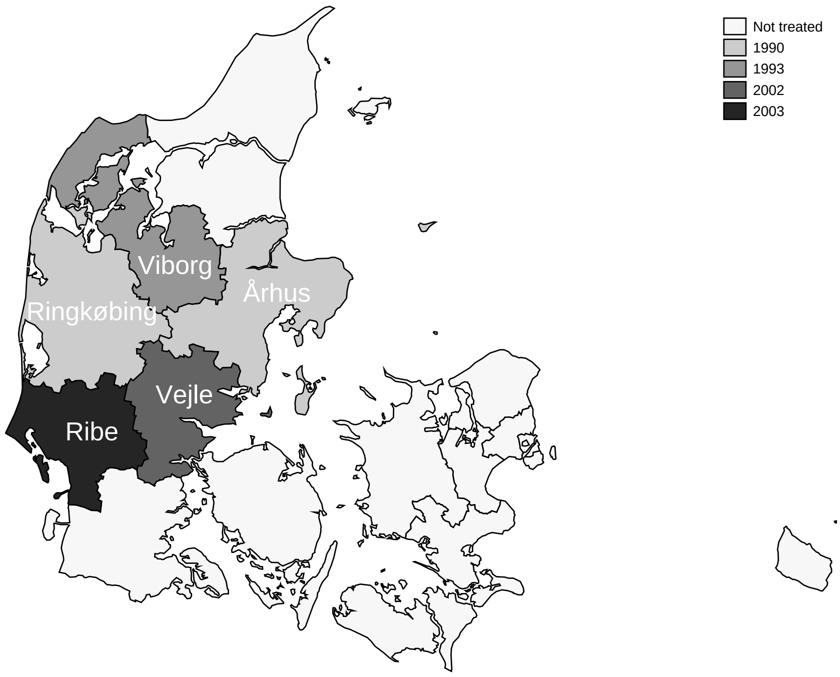


Figure 2: The introduction of same-day discharge policies across Danish counties.

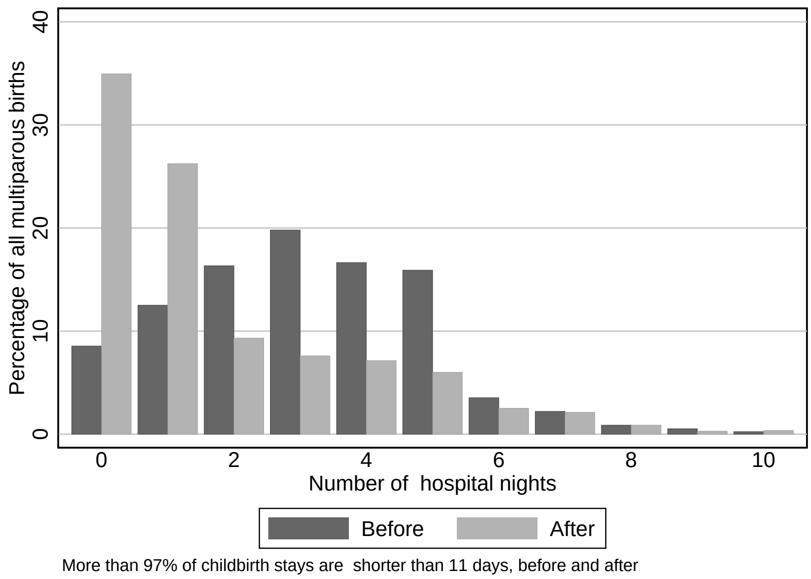
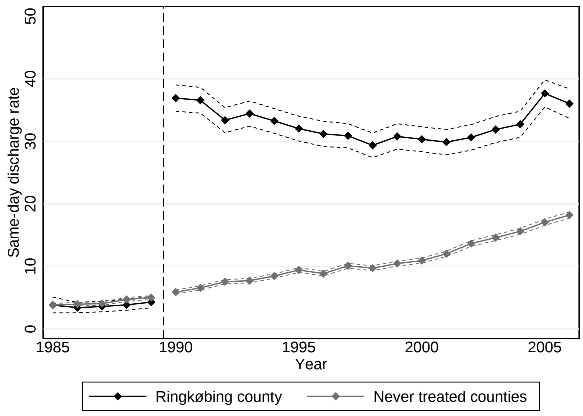


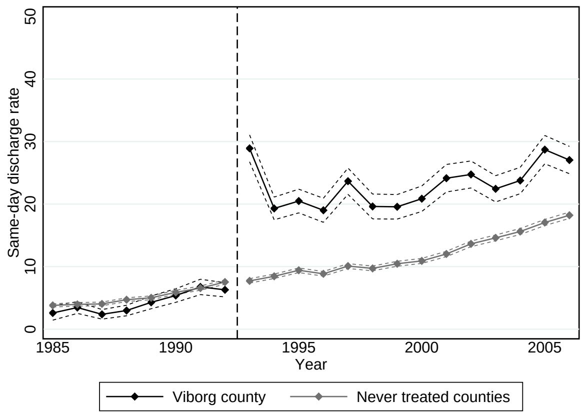
Figure 3: Pre- and post-policy distribution of hospitalization length for multiparous mothers.

Notes: The histogram includes data for births by multiparous mothers in a one year window around the policy implementation in treated counties.

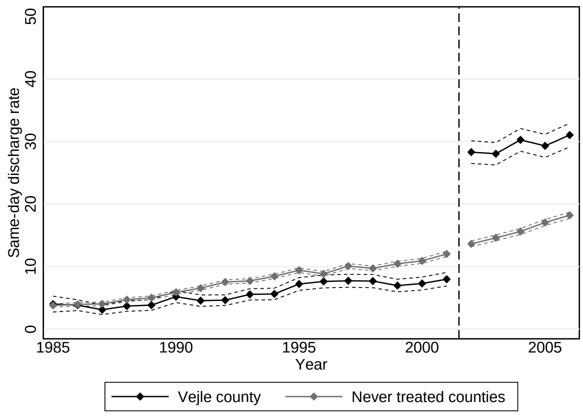
(a) Aarhus county 1990



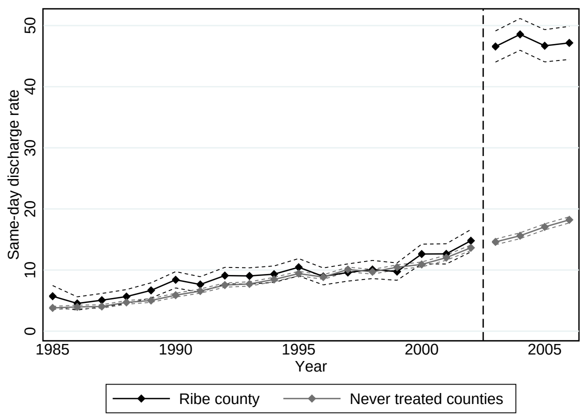
(b) Ringkøbing county 1990



(c) Viborg county 1993

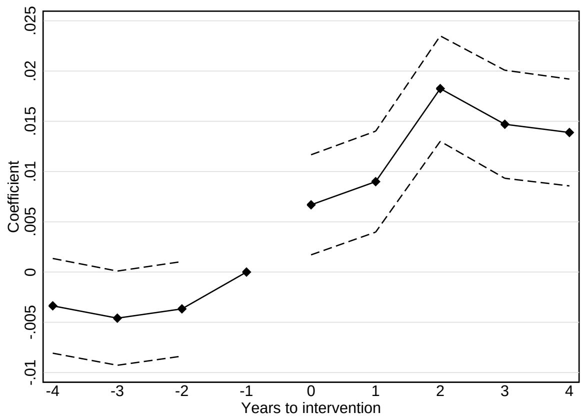


(d) Vejle county 2002

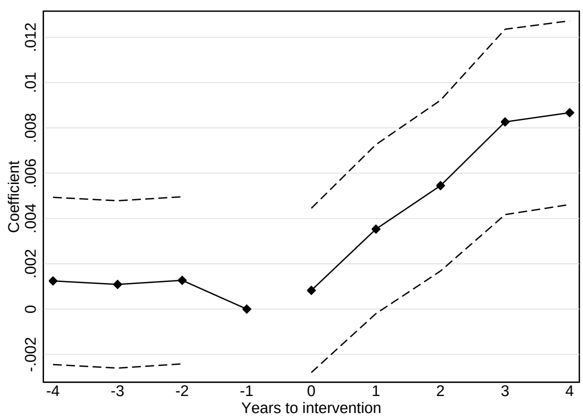


(e) Ribe county 2003

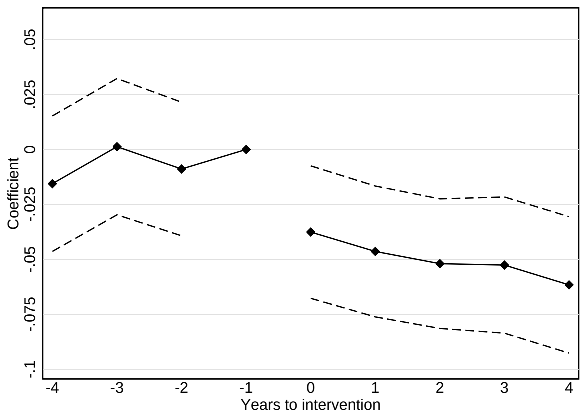
Figure 4: Early discharge rates for multiparous mothers in treated and never-treated counties, yearly means.



(a) Child readmitted $\leq$ 28 days



(b) Mother readmitted $\leq$ 28 days



(c) Ninth grade GPA

Figure 5: Event study graphs for child and mother outcomes.

Notes: The graphs are based on a regression (for the treated counties and multiparous mothers only) of the outcome on a set of year-to-intervention indicators and a full set of controls. Each graph shows point estimates and 95% confidence intervals for the year-to-intervention indicators. The reference category is the year before the to intervention ($t = -1$).

Table 1: Policy variation: Introduction of same-day discharge policies in Danish counties.

County	Date	Parity	Motivation	Primary source
Aarhus	1.1.1990	>1	Cost containment	(Aarhus Amtskommune, 1990)
Ringkøbing	1.1.1990	>1		(Kierkegaard, 1991)
Viborg	1.1.1993	>1		(Sundhedsplejerskegruppen, 1995)
Vejle	1.1.2002	>1		(Drevs, 2012)
Ribe	1.1.2003	>1		(Jensen, 2013)

Table 2: Summary Statistics, means and standard deviations.

	Mean	SD	N	–Yearly means– 1985	1998	2006
Same-day discharge	0.14	0.35	714,562	0.04	0.14	0.24
Number of hospital nights	3.43	6.14	714,562	5.27	3.11	2.25
Child readmitted day $\leq$ 28	0.04	0.20	714,562	0.03	0.04	0.06
Child readmitted day $\leq$365	0.21	0.40	714,562	0.18	0.20	0.24
Mother readmitted day $\leq$28	0.02	0.15	714,562	0.01	0.04	0.03
Mother readmitted day $\leq$365	0.09	0.29	714,562	0.10	0.10	0.08
Child GP cont. $\leq$ 28 days	0.38	0.89	345,769		0.12	0.59
Child GP cont. $\leq$ 3 years	23.43	16.49	345,769		22.56	23.08
Mother GP cont. $\leq$ 28 days	1.15	1.55	345,769		1.08	1.28
Mother GP cont. $\leq$ 3 years	24.68	19.22	345,769		24.00	25.84
Mother post birth compl	0.03	0.18	310,126		0.03	0.04
Child: Nut.rel.dia., day $\leq$ 28	0.03	0.18	345,769		0.03	0.04
Child: Nutrition, day $\leq$ 28	0.01	0.07	345,769		0.00	0.01
Child: Jaundice, day $\leq$ 28	0.03	0.17	345,769		0.03	0.03
Male child	0.51	0.50	714,562	0.51	0.51	0.51
Birthweight	3572	557	712,246	3482	3605	3611
Low birth weight	0.03	0.17	712,246	0.04	0.03	0.02
Gestation length in weeks	39.73	1.69	710,453	39.70	39.95	39.77
Preterm birth	0.04	0.19	710,453	0.04	0.04	0.04
APGAR	9.84	0.90	310,126		9.82	9.86
C-section	0.15	0.36	310,126		0.11	0.19
Uncomplicated birth	0.73	0.45	310,126		0.75	0.71
Mother's age	30.88	4.46	709,301	29.62	31.13	32.15
Taxable income (1,000 DKK)	168.8	90.8	709,279	156.6	172.3	186.3
Mother is married	0.63	0.48	709,301	0.64	0.64	0.64
Mother was unemployed	0.13	0.34	709,301	0.16	0.13	0.11
Mother was self-employed	0.03	0.16	709,301	0.03	0.02	0.02
Mother higher education	0.28	0.45	709,301	0.23	0.28	0.41
Mother was in education	0.02	0.14	709,301	0.02	0.01	0.03
Mother was self-employed	0.03	0.16	709,301	0.03	0.02	0.02
Mother is unknown	0.00	0.00	714,562	0.00	0.00	0.00

Notes: The data covers all multiparous births in Danish hospitals in the period 1985-2006.

Table 3: The effect of same-day discharge on health and schooling outcomes

	FS (1)	RF (2)	2SLS (3)	Mean
A. Hospital Readmission Outcomes - Sample: 1985-2006; N: 714,562				
Post × County	0.24*** (0.02)			
Child readmitted day ≤ 28		0.01*** (0.00)	0.03*** (0.01)	0.04
Child readmitted day ≤365		-0.01 (0.01)	-0.04 (0.02)	0.21
Mother readmitted day ≤28		0.00 (0.00)	0.02 (0.01)	0.02
Mother readmitted day ≤365		-0.01 (0.01)	-0.05 (0.04)	0.09
B. General Practitioner Outcomes - Sample: 1997-2006; N: 345,769				
Post × County	0.24*** (0.02)			
Child GP cont. ≤ 28 days		0.11*** (0.04)	0.48*** (0.16)	0.38
Child GP cont. ≤ 3 years		0.56 (0.38)	2.37 (1.50)	23.43
Mother GP cont. ≤ 28 days		0.18*** (0.03)	0.92*** (0.12)	1.15
Mother GP cont. ≤ 3 years		1.16** (0.46)	4.89*** (1.87)	24.68
C. 9th grade GPA Outcomes - Sample: 1987-1997; N: 314,880				
Post × County	0.24*** (0.02)			
9th grade GPA (standard score)		-0.03* (0.01)	-0.10* (0.06)	-0.05
9th grade Math (standard score)		-0.01 (0.01)	-0.05 (0.06)	-0.05
9th grade Danish (standard score)		-0.03** (0.01)	-0.12** (0.05)	-0.04

Notes: The data covers all births by multiparous mothers in Danish hospitals in the period 1985-2006. Each cell shows point estimates from a separate regression. All models are with covariates, year and county fixed effects, and county-specific quadratic trends. Column (1) provides the first stage coefficient. Column (2) provides the reduced form regression coefficient. Column (3) provides the 2SLS estimates. The included covariates are indicators for low birth weight and pre-term birth, mother's age at birth, employment status (indicators for being unemployed, self-employed, in education), taxable income and educational level. Clustered standard errors (at the county×year-level) in parenthesis. * p<0.1, ** p<0.05, *** p<0.01.

Table 4: Covariate means for the propensity score samples.

Propensity score sample	(1) 0-33	(2) 34-66	(3) 67-100
Birthweight	3,516.03	3,583.22	3,585.43
Mother's age	28.94	31.37	32.33
Mother is married	0.58	0.63	0.67
Mother has a higher education	0.01	0.37	0.46

Notes: The table presents variable means for three samples of mothers, defined by the propensity score for experiencing a same-day discharge.

Table 5: Heterogeneity of health and school achievement results.

	(1)	(2)	(3)
Sample	0-33	34-66	67-100
A. Hospital Readmission Outcomes - Sample: 1985-2006			
Post × County	0.24***	0.25***	0.21***
	(0.02)	(0.02)	(0.02)
Child readmitted day ≤ 28	0.03**	0.02	0.05***
	(0.01)	(0.02)	(0.02)
	[0.04]	[0.04]	[0.05]
Child readmitted day ≤365	-0.02	-0.06*	-0.04
	(0.03)	(0.03)	(0.04)
	[0.22]	[0.20]	[0.20]
Mother readmitted day ≤28	0.01	0.03**	0.02
	(0.01)	(0.01)	(0.02)
	[0.02]	[0.02]	[0.02]
Mother readmitted day ≤365	-0.04	-0.05	-0.05
	(0.04)	(0.04)	(0.05)
	[0.10]	[0.09]	[0.10]
B. General Practitioner Outcomes - Sample: 1997-2006			
Post × County	0.24***	0.25***	0.21***
	(0.02)	(0.02)	(0.02)
Child GP cont. ≤ 28 days	0.56***	0.30	0.57**
	(0.16)	(0.20)	(0.27)
	[0.40]	[0.37]	[0.37]
Child GP cont. ≤ 3 years	3.00*	3.56	-0.18
	(1.79)	(2.20)	(2.17)
	[25.45]	[23.05]	[21.90]
Mother GP cont. ≤ 28 days	0.87***	1.36***	0.59**
	(0.30)	(0.14)	(0.24)
	[1.17]	[1.13]	[1.15]
Mother GP cont. ≤ 3 years	7.85***	2.86	4.12
	(2.98)	(2.65)	(2.75)
	[25.56]	[23.53]	[25.02]
C. 9th grade GPA Outcomes - Sample: 1987-1997			
Post × County	0.24***	0.25***	0.21***
	(0.02)	(0.02)	(0.02)
9th grade GPA (standard score)	-0.18***	-0.14	0.04
	(0.06)	(0.11)	(0.11)
	[-0.21]	[-0.01]	[0.07]
9th grade Math (standard score)	-0.13**	-0.10	0.07
	(0.06)	(0.11)	(0.11)
	[-0.16]	[-0.01]	[0.04]
9th grade Danish (standard score)	-0.19***	-0.15*	-0.02
	(0.07)	(0.08)	(0.10)
	[-0.18]	[-0.00]	[0.07]

Notes: Each cell presents estimates from separate regressions based on the three propensity score groups. Subsample means are in square brackets. All models are with covariates, year and county fixed effects, and county specific quadratic trends. For details on model specification and table layout see the notes for Table 3. Clustered standard errors (at the county×year-level) in parenthesis. * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table 6: Mechanisms: The effect of same-day discharge on medium-run health and parental investments.

	FS (1)	RF (2)	2SLS (3)	Mean
A. Danish National Birth Cohort Survey - Sample: 1997-2003; N: 40,338				
Post × County	0.20*** (0.02)			
Breastfeeding ≥ 4 months		-0.05** (0.02)	-0.23** (0.10)	0.72
All 7 vaccines, 18 months		-0.00 (0.01)	-0.01 (0.05)	0.85
Food allergy, age 7		-0.00 (0.00)	-0.02 (0.02)	0.01
Asthma age 7, mother reported		-0.03*** (0.01)	-0.13*** (0.04)	0.13
Mother reported poor health, age 7		0.00 (0.00)	0.02 (0.02)	0.03
B. National Test Data - Sample: 2000-2003; N: 107,813				
Post × County	0.20*** (0.01)			
School starting age		0.03*** (0.00)	0.11*** (0.02)	6.26
2nd grade Danish (standard scores)		0.00 (0.02)	0.01 (0.07)	-0.07

Notes: Each cell shows point estimates from a separate regression. All models are with the full list of covariates (indicators for low birth weight and pre-term birth, mother's age at birth, employment status (indicators for being unemployed, self-employed, in education), taxable income and educational level), year and county fixed effects. We also account for the timing of the survey interviews by controlling for child's age in months (at interview scheduled for 18 month) and years (at interview scheduled for 7 years). Column (2) provides the reduced form regression coefficient. Column (3) provides the 2SLS estimates. Standard errors clustered at the county×year-level in parenthesis. * p<0.1, ** p<0.05, *** p<0.01.

Table 7: Heterogeneity of the effect of same-day discharge on medium-run health and parental investments

	(1)	(2)	(3)
Sample	0-33	34-66	67-100
A. Danish National Birth Cohort Survey - Sample: 1997-2003; N: 40,338			
Post × County	0.19***	0.22***	0.20***
	(0.01)	(0.02)	(0.03)
Breastfeeding ≥ 4 months	-0.37*	-0.28***	0.02
	(0.20)	(0.10)	(0.12)
	[0.65]	[0.75]	[0.78]
All 7 vaccines, 18 months	0.11	-0.05	-0.10
	(0.10)	(0.07)	(0.08)
	[0.87]	[0.85]	[0.82]
Food allergy, age 7	-0.06	0.00	0.00
	(0.04)	(0.03)	(0.01)
	[0.01]	[0.01]	[0.01]
Asthma age 7, mother reported	-0.10	-0.19***	-0.09
	(0.07)	(0.05)	(0.12)
	[0.15]	[0.12]	[0.12]
Mother reported poor health, age 7	0.12***	0.01	-0.09**
	(0.03)	(0.04)	(0.04)
	[0.03]	[0.03]	[0.03]
B. National Test Data - Sample: 2000-2003; N: 107,814			
Post × County	0.21***	0.20***	0.19***
	(0.01)	(0.01)	(0.01)
School starting age	0.11***	0.03	0.21***
	(0.04)	(0.03)	(0.06)
	[6.27]	[6.26]	[6.26]
2nd grade Danish (standard scores)	0.11	-0.03	-0.04
	(0.10)	(0.09)	(0.12)
	[-0.18]	[0.01]	[-0.04]

Notes: Each cell presents estimates from separate regressions based on the three propensity score groups. Subsample means in square brackets. All models are with covariates, year and county fixed effects. The included covariates are indicators for low birth weight and pre-term birth, mother's age at birth, employment status (indicators for being unemployed, self-employed, in education), taxable income and education level. We also account for the timing of the survey interviews by controlling for child's age in months (at interview scheduled for 18 month) and years (at interview scheduled for 7 years). Standard errors clustered at the county×year-level in parenthesis. * p<0.1, ** p<0.05, *** p<0.01.

Table 8: Robustness: The effect of same-day discharge on health and schooling outcomes.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Child readmitted day ≤ 28	0.04**	0.05***	0.03***	0.05***	0.04***	0.03***	0.03**	0.04***	0.03***	-0.01***
	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
Child readmitted day ≤365	0.03	-0.04	-0.03	-0.01	-0.01	-0.05*	0.01	-0.05	-0.05**	0.01*
	(0.02)	(0.03)	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.03)	(0.02)	(0.00)
Mother readmitted day ≤28	0.03***	-0.03***	0.02	0.01	0.01	0.02	0.03***	0.03	0.02*	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.00)
Mother readmitted day ≤365	0.06**	-0.12***	-0.05	-0.06**	-0.05	-0.05	-0.01	-0.06	-0.04	0.01
	(0.03)	(0.05)	(0.04)	(0.03)	(0.04)	(0.03)	(0.02)	(0.05)	(0.04)	(0.01)
Child GP cont. ≤ 28 days		0.33***	0.49***	0.26	0.25	0.40***	0.43***	0.59***	0.53***	-0.10***
		(0.11)	(0.17)	(0.19)	(0.16)	(0.14)	(0.10)	(0.20)	(0.17)	(0.03)
Child GP cont. ≤ 3 years		1.96*	2.58*	-1.18	3.19**	3.39**	0.52	2.89	3.88**	-0.49
		(1.03)	(1.54)	(2.41)	(1.30)	(1.58)	(1.59)	(1.82)	(1.71)	(0.34)
Mother GP cont. ≤ 28 days		1.11***	0.97***	1.01***	1.12***	0.90***	0.67***	1.18***	1.05***	-0.20***
		(0.29)	(0.20)	(0.17)	(0.26)	(0.16)	(0.21)	(0.25)	(0.23)	(0.04)
Mother GP cont. ≤ 3 years		5.48***	5.22***	5.74***	5.29**	5.31***	4.91***	5.97***	5.60**	-1.00***
		(1.06)	(1.79)	(1.66)	(2.25)	(1.75)	(1.81)	(2.26)	(2.81)	(0.37)
9th grade GPA (std. score)	-0.10**		-0.08	-0.07	-0.09*	-0.10**	-0.11	-0.13*	-0.12**	0.01*
	(0.04)		(0.05)	(0.05)	(0.05)	(0.05)	(0.09)	(0.07)	(0.06)	(0.01)
9th grade Math (std. score)	-0.01		-0.04	-0.03	-0.10**	-0.04	-0.09	-0.07	-0.08	0.01
	(0.04)		(0.06)	(0.05)	(0.04)	(0.05)	(0.08)	(0.08)	(0.06)	(0.01)
9th grade Danish (std. score)	-0.10**		-0.10**	-0.10**	-0.10**	-0.13***	-0.10	-0.17***	-0.14**	0.02**
	(0.05)		(0.05)	(0.05)	(0.05)	(0.05)	(0.08)	(0.07)	(0.06)	(0.01)
Sample	89-93	01-03	85-06	85-06	85-06	85-06	85-06	85-06	85-06	85-06
Trends	None	None	Quad	Lin	Cub	Quad	Quad	Quad	Quad	Quad
Controls	✓	✓		✓	✓	✓	✓	✓	✓	✓
Instruments	1	1	1	1	1	5	1	1	1	1
Specification	DiD	DiD	DiD	DiD	DiD	DiD	DiDiD	DiD	DiD	DiD
Treatment defined by C/M	C	C	C	C	C	C	C	M	C	C
Parity	> 1	> 1	> 1	> 1	> 1	> 1	*All*	> 1	= 2	> 1
Treatment	SDD	SDD	SDD	SDD	SDD	SDD	SDD	SDD	SDD	Nights

Notes: Each cell presents the estimates from a separate regression. Consult section 5.5 for details on model specifications. Standard errors clustered at the county×year-level in parenthesis. * p<0.1, ** p<0.05, *** p<0.01.

Table 9: Robustness: Permutation Test

	Main spec.	Permutation
Post × County	0.00***	0.00***
Child readmitted day ≤ 28	0.00***	0.01***
Child readmitted day ≤365	0.10	0.21
Mother readmitted day ≤28	0.11	0.18
Mother readmitted day ≤365	0.20	0.19
Child GP contacts ≤ 28 days	0.01***	0.14
Child GP contacts ≤ 3 years	0.15	0.20
Mother GP contacts ≤ 28 days	0.00***	0.00***
Mother GP contacts ≤ 3 years	0.01***	0.05**
9th grade GPA (standard score)	0.09*	0.13
9th grade Math (standard score)	0.33	0.27
9th grade Danish (standard score)	0.03**	0.09*

Notes: The table shows both the parametrically estimated p-values (Main) and non-parametrically estimated p-values (Perm) for the reduced form estimates. The p-values are obtained from a permutation test based on 10,000 estimates of the reduced form treatment indicator using the specification in equation (2). In these 10,000 estimates the treatment indicator is placed randomly in a year×county cell. * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

A Appendix for online publication

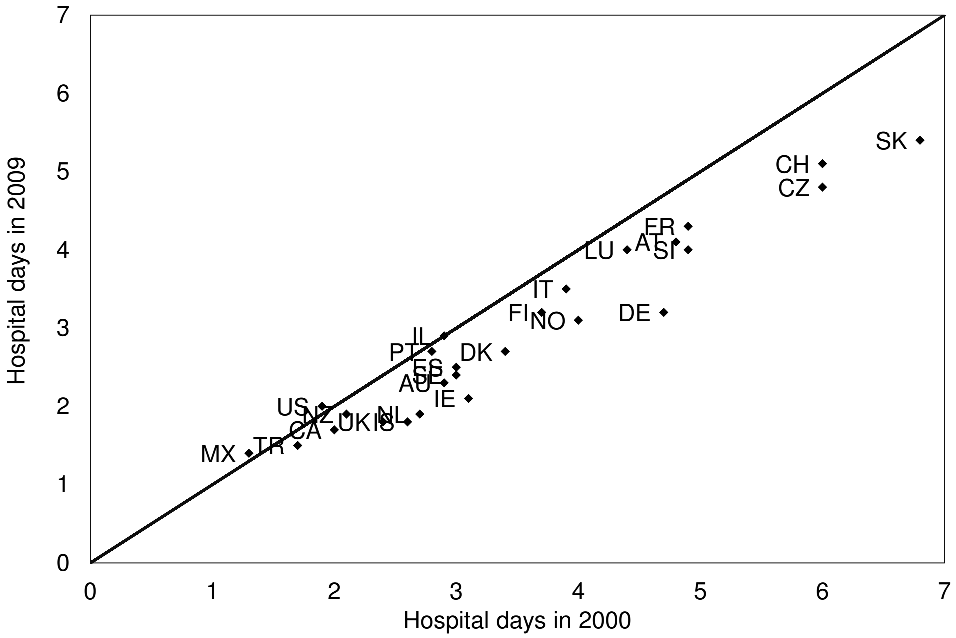
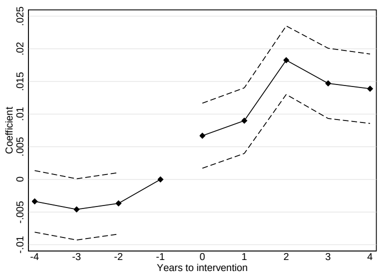
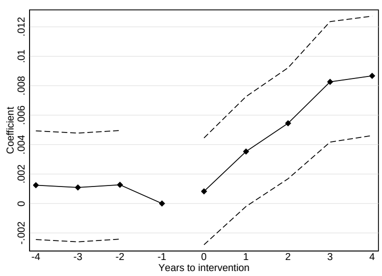


Figure 6: Average number of hospital days at childbirth in 2000 and 2009.

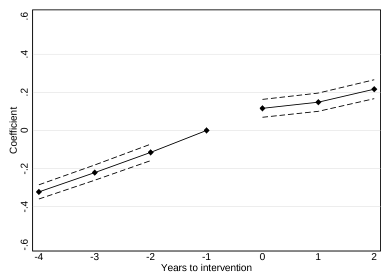
Notes: The data covers all mothers with a spontaneous delivery. Source: OECD (2012).



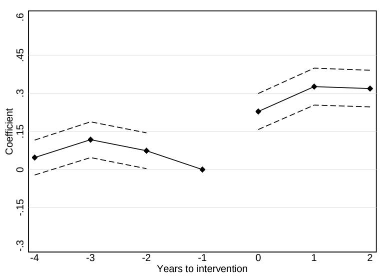
(a) Child readmitted ≤ 365 days



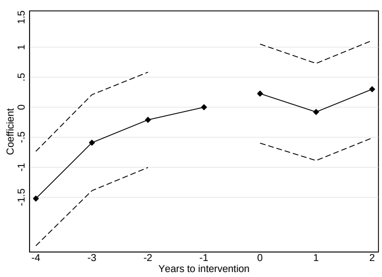
(b) Mother readmitted ≤ 365 days



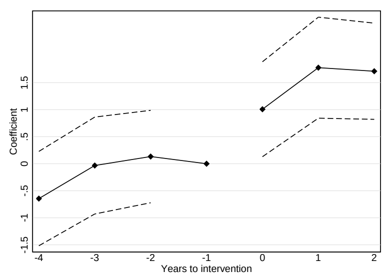
(c) Child GP contacts ≤ 28 days



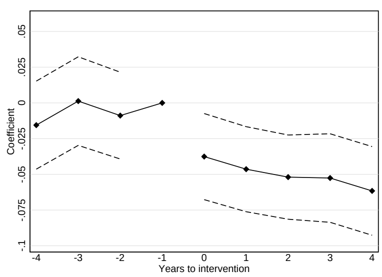
(d) Mother GP contacts ≤ 28 days



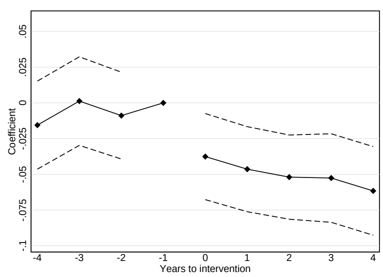
(e) Child GP contacts ≤ 3 years



(f) Mother GP contacts ≤ 3 years



(g) 9th grade Math



(h) 9th grade Danish

Figure 7: Event study graphs for outcome measures

Notes: The graphs show point estimates and 95 percent confidence intervals. The graphs are based on a regression (for the treated counties and multiparous mothers only) of the outcome on a set of year-to-intervention indicators and a full set of controls. Each graph shows point estimates for the year-to-intervention indicators. The reference category is the year before the to intervention ($t = -1$).

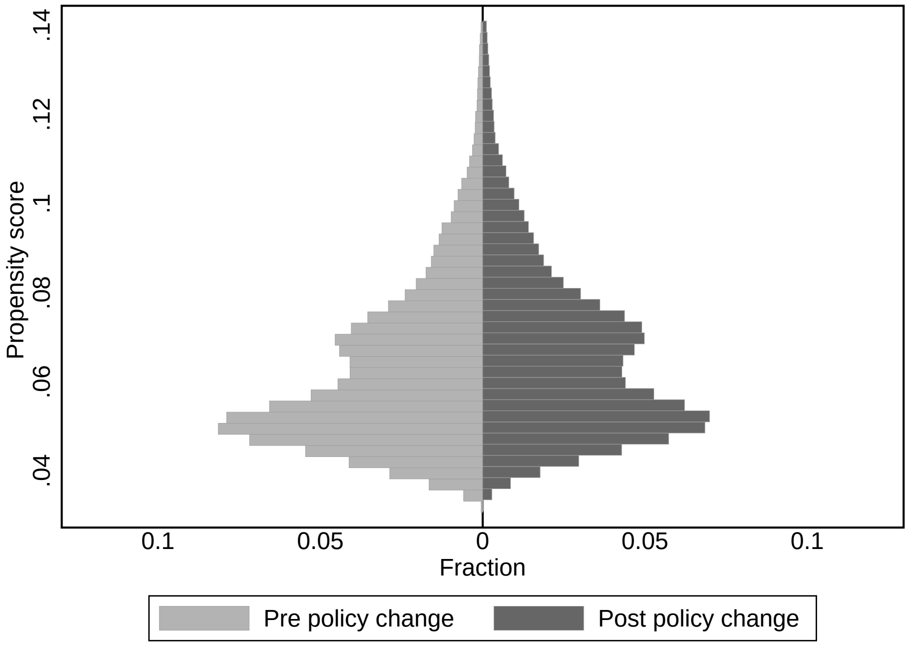


Figure 8: Common support of the propensity score in the pre- and post-policy change samples.

Notes: The figure displays the distribution of propensity scores in pre (control) and post (treated) policy change years for multiparous mothers in the five treated counties.

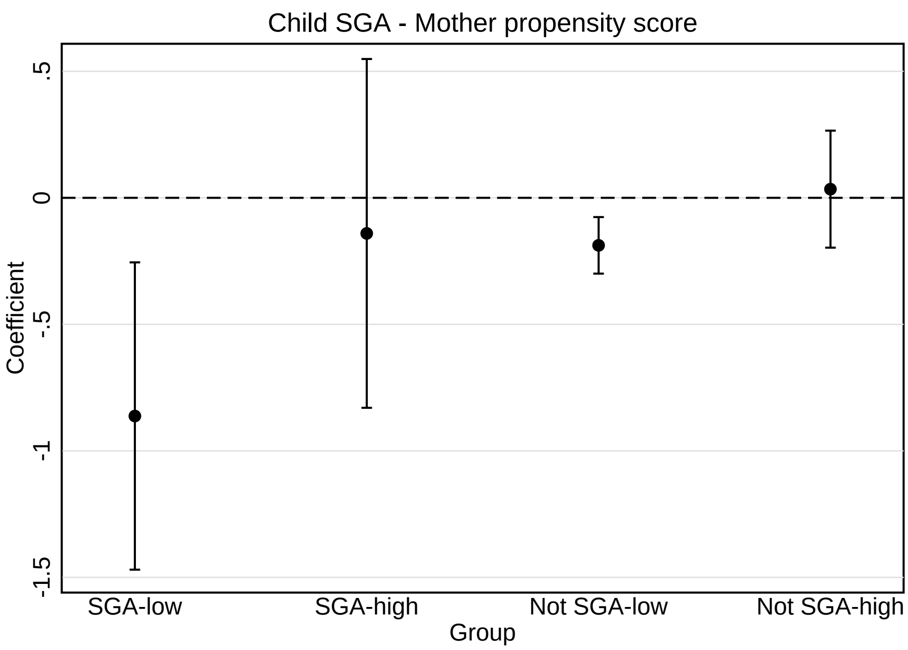


Figure 9: Hetergeneity of ninth grade GPA by mother and child characteristics

Notes: SGA stands for "small for gestational age". "Low" and "high" indicate the mother's propensity score group. The propensity score is based on mother characteristics only. The graph plots instrumental variable estimates and 95 percent confidence intervals from separate regressions for the effect of a same-day discharge on the ninth grade GPA for children in four groups defined by the children's SGA status and the mothers' propensity score. For more details consult section 5.3.

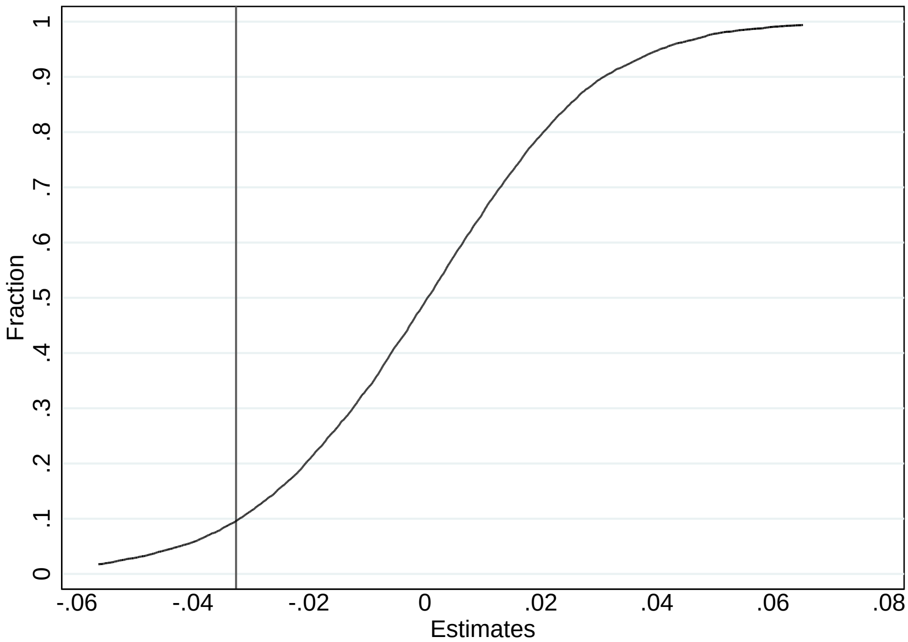


Figure 10: Distribution of Placebo Estimates: 9th grade Danish grade

Notes: The figure plots the empirical distribution of placebo effects for the ninth grade Danish grade from the permutation test. The CDF is constructed from 10,000 estimations of the reduced form effect of a post-policy introduction birth with the specification in equation (2). In these 10,000 estimations, the treatment indicator is placed randomly in a year×county-cell. The vertical line shows the reduced effect from our preferred specification, see Table 3.

Table 10: Data selection

		Observations
All births 1985-2006		1,407,272
Not singletons	-47,794	
Primiparous	-605,096	
Not born at a hospital	-23,843	
County is not known	-15,977	
(1) Full sample		714,562
(2) GP and diagnoses sample (born 97-06)		345,769
(3) GPA sample (completed 9th grade 02-12)		314,880
(4) 2nd grade test score sample (attended 2nd grade 09-12)		107,813
(5) DNBC survey (Born 1999-2003)		40,338

Table 11: Analysis samples, outcomes and data sources.

Counties (Policy change year)	Outcome data period (approx.)	Outcomes	Data source
Aarhus (1990), Ringkøbing (1990), Viborg (1993)	1985-2006	Hospital readmission, 9th grade GPA	Admin.
Vejle (2002), Ribe (2003)	1997-2006	Hospital readmission, GP contacts, Postbirth complications (mother), diagnoses for readmission (children)	Admin.
Vejle (2002), Ribe (2003)	2001-2004	2nd grade test scores	Admin.
Vejle (2002), Ribe (2003)	1997-2003	Breastfeeding duration, vaccine participation, mother-reported health at age 7	Survey

Table 12: The effect of same-day discharge on health and schooling outcomes - based on birth hospital

	FS (1)	RF (2)	2SLS (3)	Mean
A. hospital Readmission Outcomes - Sample: 1985-2006; N: 714,562				
Post × County	0.25*** (0.02)			
Child readmitted day ≤ 28		0.01*** (0.00)	0.03*** (0.01)	0.04
Child readmitted day ≤365		-0.00 (0.01)	-0.02 (0.02)	0.21
Mother readmitted day ≤28		0.01* (0.00)	0.02* (0.01)	0.02
Mother readmitted day ≤365		-0.01 (0.01)	-0.02 (0.03)	0.09
B. General Practitioner Outcomes - Sample: 1997-2006; N: 345,769				
Post × County	0.25*** (0.02)			
Child GP cont. ≤ 28 days		0.09** (0.04)	0.39** (0.17)	0.38
Child GP cont. ≤ 3 years		0.75 (0.46)	3.24* (1.87)	23.43
Mother GP cont. ≤ 28 days		0.24*** (0.04)	1.04*** (0.19)	1.15
Mother GP cont. ≤ 3 years		1.31*** (0.40)	5.67*** (1.73)	24.68
C. 9th grade GPA Outcomes - Sample: 1987-1997; N: 314,880				
Post × County	0.25*** (0.02)			
9th grade GPA (standard score)		-0.03* (0.01)	-0.10* (0.05)	-0.05
9th grade Math (standard score)		-0.01 (0.01)	-0.05 (0.05)	-0.05
9th grade Danish (standard score)		-0.03** (0.01)	-0.12** (0.05)	-0.04

Notes: The data covers all births by multiparous mothers in Danish hospital in the period 1985-2006. Each cell shows point estimates from a separate regression. All models are with covariates, year and hospital fixed effects, and hospital-specific quadratic trends. Column (1) provides the first stage coefficient. Column (2) provides the reduced form regression coefficient. Column (3) provides the 2SLS estimates. The included covariates are indicators for low birth weight and pre-term birth, mother's age at birth, employment status (indicators for being unemployed, self-employed, in education), taxable income and education level. Standard errors clustered at the county times year level in parenthesis. * p<0.1, ** p<0.05, *** p<0.01.

Table 13: First stage and reduced form results for primiparous mothers

	FS (1)	RF (2)	Mean
A. Hospital Readmission Outcomes - Sample: 1985-2006; N: 714,562			
Post × County	-0.00 (0.00)		
Child readmitted day ≤ 28		0.00 (0.00)	0.04
Child readmitted day ≤365		-0.01** (0.01)	0.19
Mother readmitted day ≤28		-0.00 (0.00)	0.02
Mother readmitted day ≤365		-0.01 (0.01)	0.08
B. General Practitioner Outcomes - Sample: 1997-2006; N: 345,769			
Post × County	-0.00 (0.00)		
Child GP contacts ≤ 28 days		-0.01 (0.03)	0.41
Child GP contacts ≤ 3 years		0.39 (0.44)	28.03
Mother GP contacts ≤ 28 days		0.05 (0.05)	1.10
Mother GP contacts ≤ 3 years		-0.13 (0.45)	26.30
C. 9th grade GPA Outcomes - Sample: 1987-1997; N: 314,880			
Post × County	-0.00 (0.00)		
9th grade GPA (standard score)		0.01 (0.02)	0.12
9th grade Math (standard score)		0.01 (0.02)	0.12
9th grade Danish (standard score)		-0.00 (0.02)	0.12

Notes: The data covers all births by primiparous mothers in Danish hospital in the period 1985-2006. Each cell shows point estimates from a separate regression. All models are with covariates, year and county fixed effects, and county-specific quadratic trends. Column (1) provides the first stage coefficient. Column (2) provides the reduced form regression coefficient. The included covariates are indicators for low birth weight and pre-term birth, mother's age at birth, employment status (indicators for being unemployed, self-employed, in education), taxable income and education level. Standard errors clustered on the county×year-level in parenthesis. * p<0.1, ** p<0.05, *** p<0.01.

Table 14: The effect of same-day discharge on GP contacts - annual levels

	FS (1)	RF (2)	2SLS (3)	Mean
Post × County	0.24*** (0.02)			
Child GP visits in year 1		0.11 (0.22)	0.47 (0.92)	8.92
Child GP visits in year 2		0.11 (0.20)	0.47 (0.82)	8.98
Child GP visits in year 3		0.34* (0.20)	1.43* (0.83)	5.53
Mother GP visits in year 1		0.68*** (0.20)	2.89*** (0.83)	8.73
Mother GP visits in year 2		0.34* (0.20)	1.42* (0.76)	8.03
Mother GP visits in year 3		0.14 (0.16)	0.59 (0.69)	7.92

Notes: The data covers all births by multiparous mothers in Danish hospital in the period 1985-2006. See Table 3 for details. Standard errors clustered at the county×year-level in parenthesis. * p<0.1, ** p<0.05, *** p<0.01.

Table 15: Heterogeneity of health and school achievement results: SGA and mother propensity score groups

	(1)	(2)	(3)	(4)
SGA	Yes	Yes	No	No
Mother SES	Low	High	Low	High
A. Hospital Readmission Outcomes - Sample: 1985-2006				
Post × county	0.18***	0.19***	0.27***	0.21***
	(0.02)	(0.02)	(0.02)	(0.02)
Child readmitted day ≤ 28	0.08	-0.03	0.03**	0.04**
	(0.07)	(0.06)	(0.01)	(0.02)
	[0.04]	[0.05]	[0.04]	[0.05]
Child readmitted day ≤365	-0.06	-0.31**	0.00	-0.04
	(0.12)	(0.13)	(0.03)	(0.04)
	[0.25]	[0.26]	[0.20]	[0.21]
Mother readmitted day ≤28	-0.06	0.03	0.02	0.02
	(0.05)	(0.06)	(0.01)	(0.02)
	[0.02]	[0.03]	[0.02]	[0.02]
Mother readmitted day ≤365	-0.07	-0.02	-0.03	-0.05
	(0.09)	(0.11)	(0.04)	(0.05)
	[0.11]	[0.12]	[0.09]	[0.10]
Observations	21,440	22,590	213,751	213,751
B. General Practitioner Outcomes - Sample: 1997-2006				
Post × county	0.18***	0.19***	0.27***	0.21***
	(0.02)	(0.02)	(0.02)	(0.02)
Child GP cont. ≤ 28 days	2.01***	0.75**	0.43***	0.51**
	(0.64)	(0.35)	(0.16)	(0.22)
	[0.33]	[0.32]	[0.40]	[0.37]
Child GP cont. ≤ 3 years	6.90	20.33	2.86	0.94
	(9.34)	(15.43)	(2.02)	(2.38)
	[25.84]	[23.35]	[25.17]	[21.81]
Mother GP cont. ≤ 28 days	1.46*	0.60	0.85***	0.50***
	(0.87)	(0.92)	(0.22)	(0.24)
	[1.09]	[1.11]	[1.17]	[1.16]
Mother GP cont. ≤ 3 years	8.27	-13.68	5.11**	7.67***
	(8.38)	(21.10)	(2.18)	(2.26)
	[25.70]	[28.00]	[25.05]	[25.14]
Observations	9,426	10,674	104,126	104,126
D. 9th grade GPA Outcomes - Sample: 1987-1997				
Post × county	0.18***	0.19***	0.27***	0.21***
	(0.02)	(0.02)	(0.02)	(0.02)
9th grade GPA (standard score)	-0.86***	-0.14	-0.19***	0.03
	(0.31)	(0.35)	(0.06)	(0.12)
	[-0.36]	[-0.23]	[-0.18]	[0.09]
9th grade Math (standard score)	-0.36	-0.00	-0.12**	0.02
	(0.37)	(0.33)	(0.05)	(0.12)
	[-0.36]	[-0.29]	[-0.12]	[0.06]
9th grade Danish (standard score)	-0.98***	-0.15	-0.20***	-0.03
	(0.33)	(0.36)	(0.07)	(0.12)
	[-0.30]	[-0.18]	[-0.16]	[0.09]
Observations	9,857	8,988	91,862	91,862

Notes: Each cell shows point estimates from a separate regression. All models are with covariates, year and county fixed effects, and county-specific quadratic trends. The included covariates are indicators for low birth weight and pre-term birth, mother's age at birth, employment status (indicators for being unemployed, self-employed, in education), taxable income and education level. Standard errors clustered at the county×year-level in parenthesis. * p<0.1, ** p<0.05, *** p<0.01.