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Care around birth, infant and mother health and maternal health investments – Evidence from a nurse strike

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A B S T R A C T

Care around birth may impact child and mother health and parental health investments. We exploit the 2008 national strike among Danish nurses to identify the effects of care around birth on infant and mother health (proxied by health care usage) and maternal investments in the health of their newborns. We use administrative data from the population register on 39,810 Danish births in the years 2007–2010 and complementary survey and municipal administrative data on 8288 births in the years 2007–2009 in a differences-in-differences framework. We show that the strike reduced the number of mothers' prenatal midwife consultations, their length of hospital stay at birth, and the number of home visits by trained nurses after hospital discharge. We find that this reduction in care around birth increased the number of child and mother general practitioner (GP) contacts in the first month. As we do not find strong effects of strike exposure on infant and mother GP contacts in the longer run, this result suggests that parents substitute one type of care for another. While we lack power to identify the effects of care around birth on hospital readmissions and diagnoses, our results for maternal health investments indicate that strike-exposed mothers—especially those who lacked postnatal early home visits—are less likely to exclusively breastfeed their child at four months. Thus reduced care around birth may have persistent effects on treated children through its impact on parental investments.

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1. Introduction

Evidence on the effect of care around birth on mothers' and children's health is important for at least two reasons. First, universally accessible care around birth may play an instrumental role for promoting population health and preventing downstream costs to the health system. These costs can arise from untreated conditions that result in serious health issues and, consequently, the uptake of care from more specialized health care providers. Second, a central objective of care around birth is to promote parental health investments, such as breastfeeding. Given a recent emphasis on the importance of early investments for short- and longer-run child outcomes (for an overview, for example, Almond and Currie, 2011), knowledge on the impact of care around birth on parental investment decisions is important for policy.

This paper exploits a national strike among all Danish nurses in spring 2008 to identify the effect of care around birth for a low-risk population of mothers and infants on mother and child health and maternal health investments. Care around birth consists of midwife consultations, a postpartum hospital stay, and home visits by trained nurses. The strike impacted all three types of preventive and non-emergency nurse services, which were available on a lower level during the strike period. We exploit this supply-side shock to circumvent the endogeneity problems that flaw analyses of the effect of care around birth, i.e., we account for selection of mothers and children into more intensive care based on characteristics that are unobserved to the researcher.

Using population data on Danish births from 2007 to 2010, we show that the 2008 strike caused clear departures from overall trends in care provision. By focusing on mothers locally around the 2008 strike period, we furthermore illustrate that the *timing of birth relative to the strike* resulted in different degrees of treatment intensity (see Fig. 1 for an illustration): As an example, mothers who gave birth during the first days of the strike received all midwife consultations but were discharged from hospital early and did not receive early home visits. Similarly, mothers who gave birth towards the end of the two-months strike did not receive all regular

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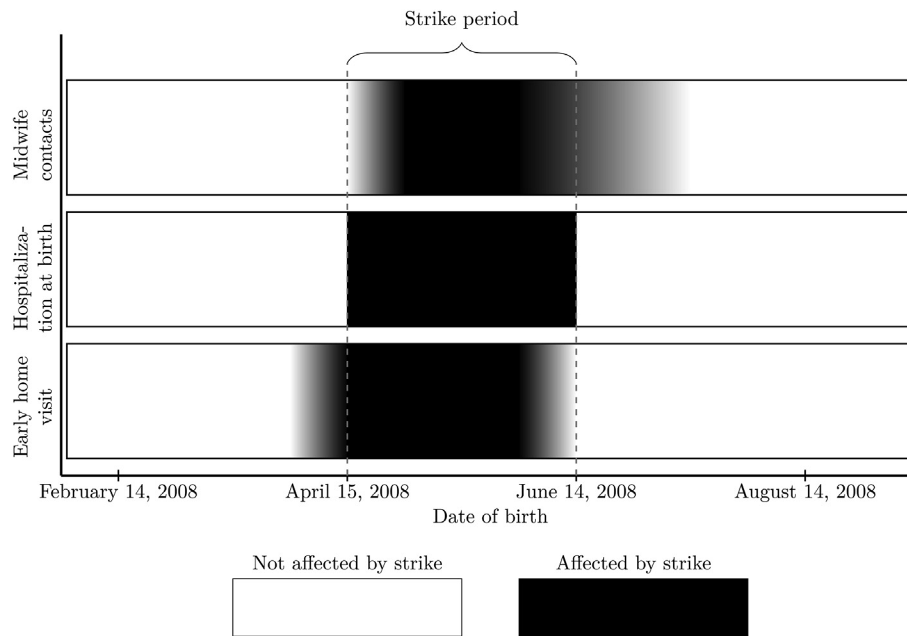

Fig. 1. Treatment exposure by date of birth.

midwife contacts, were discharged early, but received early home visits after discharge (as the strike was finished by the time they were discharged). These observations justify our identification strategy: We compare the differences in outcomes for children and mothers in a set of periods defined relative to the 2008 strike, to the same differences in outcomes of mothers and children in the same periods in 2009 (difference-in-differences framework).

Children and mothers who were impacted by the strike have more general practitioner (GP) contacts in the first month of the child's life. This increase in health care usage may indicate both, underlying health problems of treated mothers and children and substitution of one health care service with another in the setting of universal health insurance in Denmark (i.e., a setting were GP visits are free of charge.) Exploiting the variation in treatment intensity, we show that especially for children, this increase of GP visits appears to be driven by a lack of early home visits by trained nurses, who usually monitor children's health and advise parents on infant care. We find no strong persistent effects on longer-run health care usage (GP contacts). Moreover, we find no effects on hospital readmissions or a set of relevant diagnoses (child nutritional problems, postpartum maternal complications). Unfortunately, these results are imprecise, likely due to power issues. Additionally, nurses managed to keep up a minimum level of care, and we do not observe which women were exposed to lower levels of care because of the strike, i.e., we present intent-to-treat effects of strike exposure.

Taken together, our findings suggest that the initial GP effect may mainly reflect substitution of one type of care with another in the general population of mothers and children without health risks and this substitution may have been instrumental in preventing longer-run health problems for strike-exposed mothers and children. However, turning to an analysis of the impact of the strike on maternal investment decisions, we find indication for the strike impacting mothers' probability of breastfeeding exclusively for at least four months. This finding gives further credibility to earlier studies—based on smaller samples and less comprehensive data—on the impact of the 2008 strike (Kronborg et al., 2012). Furthermore, because we find effects on breastfeeding, an issue GPs typically do not provide counseling on, our results point to the importance of the content of postnatal care visits. Thus reduced care and topic-specific guidance around birth may have potential longer-run consequences on children through their effect on parental investments.

Our findings contribute to the relatively small literature on the short-run effects of care around birth. A number of studies has examined the benefits of highly specialized care, such as prenatal care for at risk-populations (Joyce, 1999; Abrevaya and Dahl, 2008), neonatal medical interventions (Almond et al., 2010; Bharadwaj et al., 2013; Freedman, 2012) or targeted home visits by health professionals (Olds et al., 1997, 1998; Eckenrode et al., 2010; Gertler et al., 2013). Most papers suggest important positive effects of these targeted interventions.

However, our understanding of the returns to care that is provided to low-risk mothers and infants, is still limited. While some studies on the impact of care around birth for a general population of mothers find very limited or no health effects (Fiscella, 1995; Evans and Lien, 2005; Currie and MacLeod, 2008; Almond and Doyle, 2011), two recent studies from Denmark and the Netherlands suggest that there may be important short- and longer run effects in these universal health care settings: Daysal et al. (2015) show that hospital (vs home births) for complying, low-risk mothers and their children has important infant mortality benefits in the Netherlands. Additionally, recent evidence from Denmark demonstrates negative longer-run consequences of mandated shorter postpartum hospital stay (for all multiparous mothers) on health and schooling outcomes of children (Sievertsen and Wüst, 2014). Importantly, Sievertsen and Wüst (2014) show that both a direct health channel and a parental response channel account for longer-run negative impacts of early discharge on child outcomes: At risk-mothers who are discharged early are less likely to breastfeed exclusively for four months and their children are less likely to receive all scheduled vaccines. Our finding of shorter breastfeeding durations for strike-exposed mothers confirms this earlier finding that early postnatal care impacts parental investments.

Moreover, while studies exploiting historical records on universal home visiting in Denmark have demonstrated positive short- and long-run health benefits of the program (Hjort et al., 2014; Wüst, 2012), we know little about the causal effects of contemporary, universal home visiting programs. Guldager (1992) has

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