Long-Term Consequences of Access to Well-child Visits*

Aline Bütikofer † Katrine V. Løken‡ Kjell Salvanes§

October 9, 2014

Abstract: This paper uses the rollout of mother and child health care centers starting in the 1930s to study the long-term consequences of increasing access to well-child visits for infants. These well-child visits included a physical examination and the provision of information about normal development, sleep, safety, diseases, and nutrition. Our results indicate that access to mother and child health care centers has a positive effect on education and earnings: access to well-child visits in the first year of life increases the completed years of schooling by 0.12-0.18 years and earnings by 1-2 percent.

Keywords: Early interventions, Child-well visits, long-term effects
JEL codes:

*Financial support from the Norwegian Research Council (xxxxx) is gratefully acknowledged. We thank colleagues and seminar participants at several universities and conferences for valuable feedback and suggestions.

†Department of Economics, Norwegian School of Economics, Helleveien 30, 5045 Bergen, Norway; email: aline.buetikofer@nhh.no

‡Department of Economics, University of Bergen, Postboks 7802, 5020 Bergen, Norway; email: katrine.loken@econ.uib.no

§Department of Economics, Norwegian School of Economics, Helleveien 30, 5045 Bergen, Norway; email: kjell.salvanes@nhh.no

I. Introduction

Many of the public health policies considered fundamental today in developed countries were established not so long ago to deal with health threats the developing world still faces - malnutrition, infant mortality and infectious diseases. Universal access to infant health care is an example of a public health policy, which was built up in the early 20th century when public concern over children's health increased in the U.S. and Western Europe. Governments and philanthropic organizations invested more into policies improving infants' health conditions and thereby began a quasi-experiment in the provision of health care services to infants. Neuroscience literature describes the three first year of life as the most critical and rapid period of human brain development (see, e.g., Johnson (2001)). Early-life exposure to disease and malnutrition therefore has long-term consequences on education, labor market outcomes, and mortality (see Currie and Almond (2011) for an overview) and infant health care provision may be key to adult health and human capital investment. A growing literature documents that policy-induced improvements in early-life health and nutrition has positive long-term effects: Hoynes, Schanzenbach, and Almond (2012), for example, present evidence that access to the food stamp program during yearly childhood improved adult health as well as self-sufficiency for women. In addition, breastfeeding advices are shown to improve children's cognitive development in a large randomized experiment (Kramer, Aboud, Mironova, and et al (2008)) and in quasi-experimental settings (Fitzsimons and Vera-Hernandez (2013)). Bharadwaj, Loken, and Neilson (2013) show that extra medical care given to very low birth-weight children in Chile and Norway decrease mortality rates and increase schooling performance. Chay, Guryan, and Mazumder (2009) find that the racial integration of hospitals in the U.S. South during the 1960s and thereby increased access to health care for black infants affected the test performance of black teenagers in the 1980s. Bhalotra and Venkataramani (2012) provide empirical evidence that cohorts born after the introduction of the first antibiotics were less exposed to pneumonia in the first year of their life and experienced increases in schooling and income later in life. This evidence demonstrates that appropriate health care services to infants and nutrition have the potential to mitigate the negative effects of disease exposure, poverty or low birth weight. While the literature often focuses on hospital provided care or programs directed to specific groups, we advance the literature in this paper by studying the long-term consequences of the provision of universal well-child visits – a more basic (and often cheaper) form of infant health care, which may be relevant for a large share of the population.

In this paper, we use unique historical data to examine the long-term consequences of an expansion of health care infrastructure directed to infants. In particular, we focus on the national rollout of mother and child health care centers in Norway starting in the 1930s. Analyzing this rollout provides the first evidence on the long-term economic effects of such centers and, more

generally, the impact of increasing the availability of well-child visits for the poor. From 1930 and onwards centers were established on local initiatives by philanthropic institutions all over the country (see Schiotz (2003)) and in 1946 about 26 percent of the municipalities had a functioning mother and child health care center. The mother and child health care centers increase the availability and convenience of infant health care while reducing its cost as the service was free of charge and the centers were established in differet neighborhoods in cities and in small villages to minimize travel expenses for young mothers. The well-child visits at mother and child health care centers include a physical examination, but they were also a mean to provide information about normal development, sleep, safety, diseases, or nutrition.

Our paper builds on earlier studies relating child-well visits to infant health and thereby providing a positive "first stage" effect. Wuest (2012) shows that infant care provided by home visiting nurses has an impact on short-term effects as infant mortality and maternal health after pregnancy. In addition, Chen, Oster, and Williams (2013) provide evidence that pediatric well-child visits are likely to be a very important factor explaining the gap in infant mortality rates between Europe and the United States. In developing countries, randomized control trials on neonatal care in form of home visits by community health workers are associated with reduced neonatal mortality (see, e.g., Gogia and Sachdev (2010)). In addition, our work fits into the growing literature on the importance of information about health. In a recent review, Dupas (2011) suggests that the provision of information about health and health care may affect health behavior significantly. In the context of information on infant nutrition, Fitzsimons, Malde, Mesnard, and Vera-Hernandez (2012) present experimental evidence that such information for poor families may result in large increases in household consumption of protein-rich foods by children. It is, however, still not known whether well-child visits improve children's outcomes in the long-run. As discussed by Chetty, Friedman, Hilger, Saez, Schanzenbach, and Yagan (2011) in the context of Project STAR, short-term and long-term outcomes may not necessarily be the same. It is therefore important to analyze whether the impact of well-child visits goes far beyond immediate outcomes and has benefits for the child's health that can spillover to educational and long-term labor market outcomes.

Our analysis is based on historical data from different archives documenting the exact timing of the rollout of mother and child health care centers. These data are then linked to Norwegian register data allowing us to follow all births in Norway and outcomes later in life. The historical aspect allows us to evaluate the impact of well-child visits 30 or more years after the first centers were established. Our estimation strategy is based on a differences-in-differences strategy using timing of rollout across municipalities and time. This allows us to compare municipalities receiving a center early in the period with municipalities where a center was introduced later in the period. Some municipalities never introduced mother and child health care centers in the period we study and will serve as pure control municipalities. This estimation strategy will enable us to study the

effect of well-child visits on long-term outcomes such as educational and labor market outcomes.[1]

We find evidence that access to well-child visits lead to a statistically significant increase in school attainment and lifetime earnings. We find, however, that access to infant health care does not affect mortality before the age of 50 (conditioned on being alive in 1967), marital status at the age of 40 or completed fertility. To analyze further, whether the roll out of mother and child health care centers had heterogeneous effects, we ... Our results are robust to adding a set of municipality control variables as well as excluding births in the largest cities in Norway. In addition, municipality-specific time trends and event study models support the validity of the research design (might have to be changed if we do not include the event study). Our findings contribute to the literature by establishing a link between access to well-child visits and long-term economic outcomes and show that policies targeting infant health may have long-lasting effects. Compared to many previous studies focusing on extreme events such as diseases and natural disasters or policies targeted to underprivileged families, the policy analyzed in this paper is particularly interesting as it may be relevant for a larger population. In addition, our paper shows that child-well visits not only affect infants in the short-run (Chen, Oster, and Williams (2013); Wuest (2012)) but that the total benefits of infant care might be realized much later.

The remainder of the paper is structured as follows. Section 2 provides some historic background on the mother and child health care centers. Section 3 describes the data. Section 4 describes the identification strategy and Section 5 presents the empirical findings. Section 6 presents three robustness checks, which corroborate the main results. Section 7 concludes. (this part needs to be adapted when paper is finished)

II. Historical Background

In the late 19th century, public concern over children's health increased in Europe and the United States. In particular, the high infant mortality rate intensified the public debate.[2] This so-called infant welfare movement led governments to invest more into social and population policies improving infant's health conditions. Therefore, information centers for mothers of newborns were established

[1]The empirical strategy of exploiting a program rollout links our paper to a brother literature analyzing the introduction of U.S. programs targeted to poverty reduction. Examples here are Bailey (2012) who analyzes the county-level rollout of family planning programs from 1964 to 1973 and its effects on U.S. fertility rates, Hoynes, Page, and Stevens (2011) who study the county-level rollout of the Supplemental Program for Women Infants and Children (WIC) to estimate the impact of the program on infant health, Hoynes, Schanzenbach, and Almond (2012) who exploit the county-level rollout of the food stamp program, and Bailey and Goodman-Bacon (2014) who analyze the the rollout of community health centers and its effect on mortality of older Americans.

[2]Infant mortality was very high in the beginning of the 20th century all over Europe and the United States. In Norway, more than 80 out of 1000 children would not survive their first year of life in 1900. Increased hygiene and living standards let the infant mortality rate decrease steadily. The decrease was however much slower during the First World War and the economic crises in the 1920s and picked up again in the 1930s where 45 out 1000 died within a year (Backer (1963)).

in connection to birth clinic in many European countries in the late 19th and early 20th century. In Norway, mother and child health care centers were established on local initiatives by philanthropic institutions. Most influential was the Norwegian Women's Public Health Association (NKS),[3] which opened the first center in 1914 in Oslo and ran the majority of the 400 center existing in 1946. Centers led by NKS were opened on local initiatives and ran by local NKS chapters. The national NKS governing body provided local chapters with financial support. NKS ran also intense outreach activities to inform women about the service. Although the centers were mainly targeted at poor families, the centers were open to everyone. In the beginning, the uptake was rather low and centers tried to encourage mothers to examine her infant by serving coffee and pastry. The mother and child health centers became however fast widely popular and by 1930, the take-up rate was 60 % of all babies born in Oslo (Schiotz (2003)). The centers had two main goals: first, the centers provided medical check-ups for the infants and their mothers by doctors and nurses free of charge. Infants were measured and examined during each visit and doctors and nurses at the centers were keeping records of infants' health status on standard forms. Ill infants were referred to doctors or hospitals. On average, a child would visit a mother and child health care center three to four times during his first years of life. Some center even provided services of medical specialist as pediatricians, gynecologists and home visits. Second, the centers provided mothers with advice on adequate infant nutrition and tools to decrease the infant mortality such as infant hygiene and adequate infant clothing. Breastfeeding rates between 1920 and the late 1960s were relatively low and declining in Norway (Liestol, Rosenberg, and Walloe (1988)) as milk formulas, a mix of cow's milk, water, cream, and sugar or honey, became more and more popular and evaporated milk began to be widely available at low prices. However, formula-fed babies exhibited vitamin C and D deficiencies and bacterial infections due to diluted water. Due to the increased risk of gastrointestinal diseases, breastfeeding was promoted in particular among poor women and single mothers (Styr (1937)).[4] In addition, mothers were taught to make adequate milk formulas and some of the centers supplied them with milk and with cod liver oil to reduce diseases related to vitamin deficiencies. Fröhlich, the first Norwegian professor of pediatrics, was interested in the research on child nutrition, and in particular research on vitamins. He was also actively involved in the initiative to establish the first mother and child health care center in Norway (Toverud (1945)).

[3]The Norwegian Women's Public Health Association (NKS) is the largest women's organization. Established in 1896, it is mostly involved in humanitarian work. The association has about 750 local chapters and after World War II about 250,000 members. The mother and child health care centers were not the only way the NKS tried to improve living conditions in Norway: as tuberculosis was a very large heath threat in Norway during the early 1900, the NKS involved in infection control primarily by strengthening hygiene measures and opened the first tuberculosis sanatoria in 1903. In 1919, the NKS also started establishing nursing schools and later also orphanages. During World War II, the NKS distributed food and established military hospitals.

[4]The situation of children born to single mothers and children born out of wedlock was of special concern as these children had 70 to 100 percent higher mortality rates than children born in marriage.

Fröhlich describes that proper nutrition was an important focus of the health care centers: "The cause behind the high mortality rate is almost solely inappropriate nutrition, leading to intestinal sickness, rickets, skin diseases and cramps. Children raised with milk formulas have little resistance against children's diseases and horrifying many children die every year – because of their mother's illness or ignorance. The mother and child health care centers shall first and foremost give young and inexperienced mothers competent guidance and then also, through encouragement and reward give the women inspiration to breastfeed their own children." The mother and child health care center also focused on pregnancy hygiene for mother: the centers provided pregnant women with advice on nutrition and code of conduct during pregnancy. In addition, the centers also provided smallpox and later diphtheria vaccination.

Doctors and nurses were paid on an annual salary and their traveling expenses were reimbursed. Besides philanthropic contributions, the health care centers were mostly financed by funds from the state lottery and some received additional financial support from the local governments, counties and the state. In 1972, municipalities were given the obligation to run mother and child health care centers. The service of the centers was regulated by the Health Directorate through official guidelines and handbooks. The municipalities gradually took over the 1400 mostly privately run centers (Ludvigsen and Elvbakken (2005)). The goal was to reach out to everyone and to establish a unitary primary health care system for infants and small children. Although the mother and child health care centers have changed considerably over time, they are still in place today as a universal offer to all infants and their mothers. The services from the centers are free of charge and targeted to all infants and small children during the first six years of life. The centers offer health controls, vaccination and health education. A child visits the center about 10 to 15 times during the first six years of life. The municipalities are responsible for the services. Centers are mainly staffed with medical doctors, nurses and midwives, but also physiotherapists and psychologists. [5]

III. Data

This paper links unique historical data on the roll out of mother and child health care centers with individual administrative data from various sources. Our primary data source is the Norwegian Registry Data, a linked administrative data set that covers the population of Norwegians up to 2012. These data are maintained by Statistics Norway and are a compilation of different administrative registers as the central population register, the family register, the education register, and the tax and earnings register. The data provide information about place of birth and residence, educational attainment, labor market status, earnings, a set of demographic variables as well as information on families. The historical data on the mother and child health care centers is collected from public and

[5] Similar types of mother and child health care centers with universal access also exist in other European countries such as xxx and Switzerland.

private archives. The following sections describe our data and present empirical evidence motivating our research design.

A. Historical Data

We use a variety of data sources to document the roll out of mother and child health care centers from 1936 to 1955. We have attempted to collect all available records from the health care centers during this period. Our efforts have yielded records from approximately 400 different centers for up to seven years. The year each center is established is collected from two surveys the Norwegian Women's Public Health Association (NKS) sent out the all mother and child health care centers in 1939 and in 1955. The surveys included a question on the date of establishment of the center. In addition, the survey also provides information and the exact address of the center and the community it served, the founder of the station, the number and qualification of employees and the approximate budget of the center. Not all centers were operating continuously. We wherefore use yearly reports from the centers on how many infants, small children and pregnant mothers visited the center in order to exclude not operating centers. We also collected data on the centers' yearly expenses and on what type of service they provide. All centers provide well-child visits for infants, but some centers also provide check-ups for small children and for pregnant women as well as dental appointments. In addition, the data are verified using other primary sources as local NKS sections yearly budget. Our final database on the health care center's operation contains information on (1) the year and the municipality mother and child health centers were established and in which year they were actively providing services, and (2) more detailed information on the type of service the centers provided in 1941, 1943, 1947, 1948, and 1951. Figure 1 shows the roll out of the mother and child health care centers between 1935 and 1955 by the year and the municipality of establishment. For presentational purposes, the openings dates are grouped into four periods: municipalities with centers established before 1935, municipalities with centers established between 1936 and 1945, municipalities with centers established between 1946 and 1955, and municipalities without centers in 1955. The first station was opened in Oslo in 1914. In 1927, the city of Kristiansand in southern Norway established a center and in 1933, a center was established in Lillehammer what was a small town by then. As the NKS expanded its numbers of service providers, well-child visits achieved broad geographic coverage. The first center in the most northern county was for example established in 1936 in Hammerfest. Note that there is considerable within-state variation in establishment dates. Anecdotal evidence shows that it took few years after the opening of a center until the majority of the infants were checked.

B. Administrative Data

The central population register contains the municipality of birth. We allocate a municipality of residence during the first year of life to each individual by assuming that they are residing in the municipality of birth. The central population register includes identifiers for parents what enables us to identifying socioeconomic background and an individual's siblings. Educational attainment is taken from the1980 Census. Census data are self-reported. The information is, however, considered very accurate (see, e.g.,Black, Devereux, and Salvanes (2005)). We consider the completed years of education as our measures of education achievement. Lifetime income is measured by average, discounted earnings from 1967 to 2010. The earnings measure is not top-coded and includes labor earnings, taxable sick benefits, unemployment benefits, parental leave payments, and pensions. The age at death occurring after 1968 is taken from the cause of death registry provided by the Norwegian Institute of Public Health. Note that this measure is therefore contingent on having survived past 1968 and only capture older age mortality at the top of any effects on infant and child mortality.

C. Municipality Level Data

Several specifications include municipality level data such as the numbers of inhabitants per doctors and per midwife in the municipality of birth in the year of birth. The data on the population size as well as the numbers of doctors and midwifes in each municipality are collected from Statistics Norway's historical yearly health statistics. The number of inhabitants with a high school diploma and the average income per municipality are collected from the Census in 1930. The 1930 Census is the second Census in Norway after 1910 collecting data on income, wealth, tax and unemployment. A municipality is defined as an urban area if Statistics Norway classifies the municipality as a city in 1935.

D. Health Data

The data on an individual's health status comes from the Cohort of Norway (CONOR) data and the National Health Screening Service's Age 40 Program data. These are two population-based and nationwide surveys carried out from 1988 to 2003 by the National Institute of Public Health. The information contained in both surveys has been gathered through questionnaires and short health examinations. For the most part, the same information was collected in both surveys. In particular, questions are asked about general health and specific diseases. The goal of the Age 40 Program was to survey all men and women aged 40 to 42 between 1988 and 1999. It covers all counties in Norway except Oslo and the response rate is between 55 and 80 percent, yielding 374,090 observations. In addition, we use data from the CONOR dataset which includes Oslo,

Norway's capital and largest city. CONOR is a research collaboration network that includes several large Norwegian health surveys, which were carried out by the National Health Screening Service between 1994 and 2003. This data source includes 56,863 respondents.[6] The oldest cohorts in the health data are born in 1942. We are therefore only able to look at center openings after 1942 when focusing on health outcomes.

From the health surveys, we observe an individual's health status when they are about 40 years old. Both health surveys include measures for height, weight and blood pressure and questions on whether respondents have diabetes, or experienced heart problems. As previous research suggests that better nutrition early in life decreases the incidence of obesity, high blood pressure, diabetes and cardiac events (see, e.g., Hoynes, Schanzenbach, and Almond (2012)), we include the following health measures: an individual is defined as obese by the age of 40 if its body mass index is higher as 30. Hypertension is a chronic medical condition in which the blood pressure in the arteries is elevated. High blood pressure is mostly defined as at or above 140mmHG systolic and 90 mmHg diastolic. We define an individual having hypertension if both the systolic and the diastolic blood pressure are above the threshold. Whether an individual has type II diabetes by the age of 40 is taken from the survey. Furthermore, we define an individual having a cardiac even if it had either a heart attack or an obstruction or spasm of the coronary arteries. In addition, adult height is also sensitive to nutrition and health in childhood. The period from birth to age three is critical to adult height. The speed of growth is very rapid during the three first years of life (see Paxson (2008)). We therefore also include height in centimeters among our health measures.

E. Sample Selection

For our analysis, we include data for cohorts born between 1936 and 1955 in Norway, who are still alive by 1967. Individuals born outside of Norway are excluded because our identification strategy relies on knowing the municipality of birth. We do not impose further sample restriction, however there are some individuals with missing information on outcome variables that naturally drop out. For life time earnings (average of earnings between 1967 and 2010) we have observations for all individuals while for years of education we have missing information for 12.8 % of the sample. When there are missing observations on backgound characteristics we include a dummy variable for missing to keep the sample constant across specification with and without control variables.Table xxx contains summary statistics of the various outcomes.

[6]Black, Devereux, and Salvanes (2012) provide a more detailed description of the dataset and of the representativeness of the sample of respondents.

IV. Identification Strategy

Our identification strategy aims to overcoming the inherent endogeneity between health care access, health and adult outcomes. We use the variation in exposure to infant health care services that is driven by mother and child health care center openings and the scope of the services provided. We use a difference-in-difference method exploiting the rollout of new established mother and child health care center. In particular, we estimate the following reduced form model:

$$y_{ict} = \alpha + \gamma D_{ct} + \beta X_{ict} + \lambda_c + \theta_t + \varepsilon_{ict},$$

where y_{ict} are the outcomes of interested for individual i born in municipality c in time t. D_{ct} is an indicator variable equal to 1 if an individual is born in or after the year of a center opening in the municipality of birth and zero otherwise. X_{ict} is a set of individual characteristics such as gender and background characteristics of the parents such as the mother's education, age and marital status and the father's education and age. λ is a set of municipality fixed effects and θ is a set of cohort fixed effects. Hence, common time shocks are controlled by the year fixed effects; unobservable determinants of the long-term outcomes, which are fixed at the municipality level, are absorbed by the municipality fixed effects. The variable of interest is γ, which shows the effect of the access to child-well visits on various outcomes such as schooling and earnings.

Our empirical strategy uses variation in when and where mother and child health care centers were established to evaluate their effects on long-term economics outcomes. Hence, we assume that the timing of the opening of the mother and child health care centers is uncorrelated with other determinants of changes in long-term economic outcomes. As an empirical test for the key identifying assumption, we analyze whether 1930 demographics of municipalities receiving a center may predict when a center was established. Table1 shows that most of the municipality characteristics fail to predict the opening date. Exceptions are an indicator variable for urban areas, a municipality's population, and the number of doctors per municipality population. Hence, more densely populated places and municipalities with more doctors per inhabitants were more likely to establish mother and child health care centers very early. These are classical supply side driven factors. There appears however not to be a significant correlation between the timing of the openings of the centers and these three variables from 1940 onwards. Importantly, the rollout of infant health care centers does not seem to be correlated with background variables such as average schooling and income in a municipality which could be important predictors of our main outcome. Nevertheless, we include the number of doctors per inhabitants in the year of birth in our specification and exclude individuals born in the two largest cities (Oslo and Bergen) from our sample in our baseline specifications. We will show robustness analysis to both these restrictions.

One might still worry that non-random migration might change the composition of people in the municipality over time or that even when controlling for doctors per inhabitants the location choice might be endogenous. We therefore estimates specification that include sibling fixed effects:

$$y_{ict} = \alpha + \gamma D_{ct} + \lambda_c + \theta_t + \eta_f + \varepsilon_{ict},$$

where η is a set of family fixed effects. Variation is then based on differences in access within families across children, thereby differencing out any factors, which are constant within families such as socio-economic status.

Of particular concern is whether mother and child health care centers are put into municipalities where for example the education level is increasing. If so, the estimation equations above will not be able to distinguish the effect of an opening from differential secular trends. As we are not able to observe the factors that influence funding decisions and the location of a new mother and child health care center that drive our identifying variation, we test for the existence of pre-opening trends as a function of a future opening of a center with the following two alternative specifications. First, we use an event study specification (see, e.g., Jacobson, LaLonde, and Sullivan (1993); Autor (2003); Bailey and Goodman-Bacon (2014)):[7]

$$y_{ict} = \alpha + \sum_{\tau=0}^{m} \lambda_{-\tau} D_{c,t-\tau} + \sum_{\pi=1}^{q} \lambda_{+\tau} D_{c,t+\tau} + \beta X_{ict} + \lambda_c + \theta_t + \varepsilon_{ict},$$

The specification allows for m post-treatment effects ($\delta_{-1}, \delta_{-2}, ..., \delta_{-m}$) and q anticipatory effects ($\delta_{+1}, \delta_{+2}, ..., \delta_{+q}$) and enables us to test whether contemporaneous and lagged values of the center openings predict the outcome variables, while lead values do not. In addition, the pattern of lagged effects is of interest as it shows whether the causal effects grow or fade over time.

Second, we allow for municipality-specific linear (and quadratic) trends:

$$y_{ict} = \alpha + \gamma D_{ct} + \beta X_{ict} + \lambda_c + \theta_t + \rho_c t + \varepsilon_{ict},$$

where ρ_c is a municipality-specific trend coefficient multiplying the linear trend variable, t.

A further potential methodological issue is the presence of measurement error in our treatment measure. We consider centers operated by the Norwegian Women's Public Health Association (NKS). Although this includes the majority of centers in Norway in the period of interest, it might not be a complete coverage in every year as similar centers might be built up by other private or

[7] The specification is also known as a Granger causality test.

philanthropic initiatives. Thus, it is possible there are health care centers providing well-child visits, which we do not observe in our data. The fact that some municipalities are more heavily treated than our data show should attenuate our results. We however include specifications, which only include municipalities that eventually open a NKS-run mother and child health station.

V. Results

The results presented in this section suggest that the access to mother and child health care centers had substantial long-term consequences. Table 2 presents the baseline estimates of the effect of access to a mother and child health care health center on education and earnings using regression equation (1). In column (i), we show the average pre-reform vales. In column (ii), we present the estimates for the effect on completed years of education and average, discounted earnings from 1967-2010. The specification includes a dummy variable indicating the gender of the individual and background characteristics of the parents such as the mother's education, age and marital status and the father's education and age. Moreover, a full set of municipality and cohort fixed effects are included. The specification in column (iii) includes no individual control variables and the sample in column (iv) includes only individuals born in municipalities where a center was opened between 1936 and 1955. Each cell in the table comes from a separate regression. Because education and earnings are likely to be serially correlated within municipalities over time, all standard errors are clustered at the municipality level.

The first row of Table 2 shows estimates of λ in equation (1) for the completed years of education. Across different specifications and samples, the estimated coefficients show a consistent positive effect of the access to a mother and child health care center on the completed years of education. Thus, having access to well-child visits in the first year of life increases education by about 0.12 years. The estimates are all statistically significantly different from zero at a 1% level and they are sizable in magnitude. As the average years of education for the cohorts born before the opening of a center was 11.6, the effect of access to well-child visits amounts to an increase in education of about 1 percent. There are several reasons why mother and child health care centers could lead to increased educational attainment. First, there could be a direct biological effect of health on cognitive ability. Second, children may miss less school due to poor health. Third, there could be a parental response to the improved infant health. That is, parents may reinforce the positive health shock by investing more in their children. The three proceeding rows of Table 2 show estimates of λ in equation (1) for different earning variables. First, we consider average, discounted earnings from 1967 to 2010. We also restrict the sample to individuals with non-missing education and in addition, we analyze the natural logarithm of all positive earnings. We find a significantly positive effect of the access to a mother and child health care center on earnings in most cases. Thus, having

access to well-child visits in the first year of life increases adult earnings by about NOK 3000 or one to two percent compared to the pre-reform cohorts.

The estimated effects in column (iv) where we restrict the sample to individuals born in municipalities, which eventually open a center, are larger. As discussed in Section IV., the difference might be explained by the presence of measurement error in our treatment measure. Our collected that focuses on centers operated by NKS, which is the majority of centers in Norway in the period of interest. It is however possible there are health care centers providing well-child visits, which we do not observe in our data. The fact that some municipalities are more heavily treated than our data show should attenuate the results in column (ii). Consequently, when excluding the municipalities where we do not observe an opening in column (iv), the estimated effects of access to well-child visits on education and earnings increase.

It is important to note that the estimates in Table 2 are intent-to-treat estimates. That is, these estimates average across individuals with a higher and lower likelihood of receiving care at a mother and child health care center. Not all mothers took their newborn to a mother and child health care center. The uptake two to three years after the center opening was on average about 60 percent in the late 1930s. Later, the uptake was substantially higher. Hence, to convert our estimates to the treatment on the treated, one should divide the estimated effects by 0.6 to 0.8.

The upper panel of Figure 2 plots the time trend in education before and after the opening of a center. The figure includes the average education in municipalities who eventually open a mother and child health care center. The data is re-centered such that the opening happens at time zero. The plotted values are residual from a regression on time and municipality fixed effects. The figure provides no evidence of a positive trend in education in treated locations before the opening of a center. Following the establishment of a mother and child health care center, average education increases. The sharp increase after the reform could be due to increased takeup over time. Evidence from records support a takeup rate gradually increasing over time. The lower panel ofigure 2 plots the time trend for average earnings. Again, the figure provides no evidence of an increasing trend in earnings in treated locations before the opening of a center. As for education, the average earnings increase after the center opening.

Table 3 displays the results for equation (2), which includes mother-specific fixed effects. That is, our effect is identified by comparing infants exposed to mother and child health care centers with their older siblings who had no center access. The estimates of λ from equation (2) are slightly higher than the estimates from equation (1) and underline that the access to mother and child health care centers had substantial long-term consequences even when comparing siblings. Note that these results do not rely on the assumption of an exogenous opening and location decision of health care centers as we are comparing the access to well-child visits within families.

Table 4 summarized the findings for other outcomes such as mortality before 50, whether

individuals were married or divorced by the age of 40 and the number of children. We do not find significant effects of the access to a center on most of the other outcomes. Only for the specifications including mother fixed effects we find that individuals which had access to well-child visits in their first year of life are slightly less likely to be married at the age of 40 and that they have on average less children.

VI. Sensitivity Analysis

We present a variety of sensitivity analysis. First, we use specifications including linear and quadratic municipality-specific time trends. Second, we use infant mortality to compute a lower bound for our estimates.

When adding municipality-specific time trends, the identification of the effects of access to well-child visits comes from whether such an opening lead to deviations from pre-existing municipality specific trends. Table 5 shows that the effect of the access to better infant care is still apparent and significant for both education and earnings when using linear or quadratic municipality-specific time tends. Thus, differences in time trends are not driving the effect of the center opening on education and earnings.

Include robustness test with bounds here.

VII. Mechanisms

As described in Section II., well-child visits at mother and child health care centers had two main components. First, medical check-ups for infants and second advice to the mother on adequate infant care and nutrition. To analyze which of the components might be more important, we study whether the effect is larger for individuals in municipalities with a center providing a larger variety of health care services and whether we find effects on different health outcomes that are most likely affected malnutrition early in life.

Although the mother and child health care centers were not primarily targeted to nutrition, the centers might have contributed to a decrease in malnutrition through different channels. First, directly by providing mothers with nutritional advice and by promote breastfeeding. Moreover, some centers provided dentist services, which may reduce disparities in dental health and thereby improve the economic prospects of low-income individuals. Last, infections may generate an inflammatory immune response, which directs nutrition away from physical and mental development (see, e.g., Finch and Crimmins (2004); Crimmins and Finch (2006)). There are specific mechanisms by which nutrition as a child may affect long-term health outcomes. Malnutrition among children may for example lead to diseases such as anemia. In addition, malnutrition as an infant may change the developmental trajectory of a child's body. Based on early-life periods with malnutrition, an infant's

body may predict what situations it is expected to be confronted with later in life and adapts its development to handle future malnutrition episodes better (see Gluckman and Hanson (2004)). Are there no hunger episodes later in life, problem may arise. Barker (1992), for example shows that the lack of nutrition in early life may impair development and increases the incident of so-called metabolic disorders such as high blood pressure, type II diabetes, obesity and cardiovascular diseases.

We examine effect on adult health of the establishment of mother and child health stations, which may have improved the nutrition for infants and lowered the probability of gastrointestinal diseases among infants. ts.[8]If the nutrition channel is an important mechanism, we expect that infants who were exposed to a center after birth will be less likely to have mis-adapted to future episodes of malnutrition. Thus, we presume that the individuals exposed to a mother and child health care center experience lower incidence of obesity, high blood pressure, type II diabetes, and cardiac events by the age of 40. The age of 40 might be rather early to measure type II diabetes, cardiac events, or hypertension, obesity should however serve as a good indicator for an increased risk of health problems related to the metabolic syndrome. Table 6 displays the effect of a center opening on different health outcomes. We do not find any effect on health measures for women. On the other hand, men have significantly lower probability of being obese or experiencing cardiac events until the age of 40 when exposed to a mother and child health station as an infant. That is, the probability of being obese is decreased by 19% for men if they had access to a mother and child health care center as in infant. The probability of experiencing a cardiac event is even decreased by 80%. Thus, we find some evidence that the mother and child health care centers increased the quality of nutrition for male infants and thereby the prevalence of obesity and cardiac events for men.

The mother and child health stations varied in the health services they offered. From the yearly reports, the health care centers sent to the main organization we are able to evaluate three different forms of extra health care offers. First, about half of the centers reported that they tested infants for tuberculosis. Tuberculosis was still a large health threat during the period when the mother and child health care centers were built up. In 1945, the disease still caused 5 percent of all deaths in Norway. As early detection of tuberculosis is instrumental for successful treatment and for hindering the disease spread, testing infants for tuberculosis could have important long-term consequences. Second, some health stations offered immunization. That is, children would return until they reached the age of seven to the center to be vaccinated. The offered vaccinations included small pox vaccines and later also diphtheria vaccines and the BCG vaccine against tuberculosis. Previous literature

[8]In the context of developing countries, there is evidence that information campaigns about oral rehydration therapy for infants suffering from diarrhea decreased infant diarrhea deaths dramatically (Levine, Group, and Kinder (2004)), and that campaigns promoting hand washing with soap lead to a sustained reduction in diarrhea episodes (Wilson and Chandler (1993)).

presents evidence that childhood exposure to infectious diseases potentially affects cognitive ability: Bloom, Canning, and Shenoy (2012), for example, use data from vaccination programs in the Philippines and show that childhood vaccination for measles, polio, tuberculosis, diphtheria, and pertussis significantly increases cognitive test scores. Moreover, Lee (2012) shows that mandatory school vaccination laws in the U.S. also affect adult outcomes such as educational attainment, the overall labor force participation positively. Access to immunization might therefore be an important contribution of the mother and child health stations. Third, few centers also offered advice and health checks for pregnant women. Previous literature underlines the importance of mother's health and conduct during pregnancy (see, e.g., Almond (2006); Bharadwaj, Loken, and Neilson (2013); Fertig and Watson (2009)). Hence, we expect the centers, which offer more health care services to have a larger impact.[9]

Table 7 compares the effect of an opening of a center with a larger offer in health care services to an opening of a center that only offered simple health controls for infants. For all three types of extended health care services, the effect of an opening and thereby access to infant health care is substantially larger for centers with an extended range of services. This indicates that besides the nutrition advice, also the extend of health care services was important. Hence, both main components of the mother and child health care centers, the medical check-ups and nutrition advice, may have contributed to the positive long-term effects of access to well-child visits on economic outcomes..

VIII. Discussion

As we are the first, to our knowledge, to measure the long-term economic consequences of access to mother and child health care centers for infants, comparing our results to the literature is not easy. We may however compare our results to other studies analyzing long-term effects of various policy-induced variations in early-life health.

Chay, Guryan, and Mazumder (2009)examine a somewhat related increase in infant health care by looking at the hospital integration in the U.S. South in the 1960s. They show that a black child who gained hospital admission as an infant faced a 0.75 to 0.95 standard deviation increase in Armed Forces Qualifying Test score. Our estimated effect on years of education is smaller and about 0.1 standard deviations. As IQ tests and education are not perfectly correlated, a direct

[9] As discussed in Section IV., we use the variation in when and where mother and child health care centers with extended medical services were established to identify the effects of interest. We apply the same empirical test as in Section IV. for the key identifying assumption and analyze whether 1930 demographics of municipalities receiving a center offing extra health care services may predict when such a center was established. We find very similar results as in Table 1. Importantly, we find that the rollout of infant health care centers with extra services does not seem to be correlated with background variables such as average schooling and income in a municipality. Results are available on request.

comparison is difficult. Lee (2012) studies the long-term effects of the implementation of mandatory school vaccination laws in the U.S. on adult educational attainment and wages. She finds that the introduction of the mandatory school vaccination laws increased the years of schooling by 0.12 years. The estimates found in this paper are slightly larger in magnitude but comparable to the effects of the implementation of mandatory school vaccination laws in the 1970s.

Our results indicate that nutrition advice for mothers and breastfeeding promotion may have played an important role. The estimates found in this paper are mostly smaller in magnitude but still comparable to policy changes and interventions increasing breastfeeding or improving the nutritional situation early in life. In a randomizing breastfeeding promotion intervention in Belarus, Kramer, Aboud, Mironova, and et al (2008) find that cognitive ability at age 6.5 years is increased by about one standard deviation if the infant was in the treatment group. As we look at outcomes more than 20 to 40 years later in life, it is not surprising that our effects on education are substantially smaller. Paid maternity leave might also increase the breastfeeding rates. In the context of Norway, Carneiro, Loken, and Salvanes (2015) examine the impact of the introduction of four months of paid maternity leave in 1977 on children. They find that children's educational attainment increases by 0.4 years and earnings at age 30 increase by 5 %. Again, our effects are smaller, however since the takeup rates in their paper is close to 100 percent, the effects should also be higher than in our setting. When analyzing the health effects of early access to food stamps, Hoynes, Schanzenbach, and Almond (2012) find an increase in the likelihood for metabolic syndrome that is mostly driven by obesity. This finding matches well with our results for male health outcomes at age 40.

IX. Conclusion

In this paper, we present evidence that access to well-child visits for infants can improve long-term economic outcomes significantly. In particular, we use the rollout of mother and child health stations in Norway starting in the 1930s. We find that access to free well-child visits in the first year of life leads to a significant increase in education and lifetime earnings and, for men, a significant reduction in obesity and cardiac events. These results pass several robustness tests including controlling municipality-specific time trends, mother-specific fixed effects, and event study models. In general, the results imply that improved infant health has long-term effects on human capital accumulation, labor market success and adult health.

An important strength of our analysis is at the same time a drawback as well. To study long-term effects of well-child visits, we need to study reforms that happen a long time ago. Today's health situation for infants in the developed world is dramatically different. This makes it difficult to generalize our results to current policies (see Ludwig and Miller (2007) for a discussion). We may however say that the infant mortality rate in Norway in the 1930s and 1940s was comparably high

as in developing countries today and infectious diseases were a main cause of death in the first year of life. It is therefore likely that infants in developing countries would benefit from well-child visits also in the long run.

References

ALMOND, D. (2006): "Is the 1918 Influenza Pandemic Over? Long-Term Effects of In Utero Influenza Exposure in the Post-1940 U.S. Population," *Journal of Political Economy*, 114(4), 672–712.

AUTOR, D. H. (2003): "Outsourcing at Will: The Contribution of Unjust Dismissal Doctrine to the Growth of Employment Outsourcing," *Journal of Labor Economics*, 21(1), 1–42.

BACKER, J. (1963): *Dodeligheten og dens arsaker i Norge 1856 til 1955*. Central Bureau of Statistics, Oslo.

BAILEY, M. (2012): "Reexamining the Impact of Family Planning Programs on U.S. Fertility: Evidence from the War on Poverty and Early Years of Title X," *American Economic Journal: Applied Economics*, 4(2), 62–97.

BAILEY, M., AND A. GOODMAN-BACON (2014): "The War on Poverty's Experiment in Public Medicine: The Impact of Community Health Centers on the Mortality of Older Americans," *American Economic Review*.

BARKER (1992): *Fetal and infant origins of adult disease*. British Medical Journal, London.

BERTRAND, M., E. DUFLO, AND S. MULLAINATHAN (2004): "How Much Should We Trust Differences-In-Differences Estimates?," *The Quarterly Journal of Economics*, 119(1), 249–275.

BHALOTRA, S. R., AND A. VENKATARAMANI (2012): "The captain of the men of death and his shadow: Long-run impacts of early life pneumonia exposure," Discussion paper.

BHARADWAJ, P., J. V. JOHNSEN, AND K. V. LÃ¸KEN (2014): "Smoking bans, maternal smoking and birth outcomes," *Journal of Public Economics*, 115(C), 72–93.

BHARADWAJ, P., K. LOKEN, AND C. NEILSON (2013): "Early life health interventions and academic achievement," *American Economic Review*.

BLACK, S. E., P. J. DEVEREUX, AND K. G. SALVANES (2005): "The More the Merrier? The Effect of Family Size and Birth Order on Children's Education," *The Quarterly Journal of Economics*, 120(2), 669–700.

BLACK, S. E., P. J. DEVEREUX, AND K. G. SALVANES (2007): "From the Cradle to the Labor Market? The Effect of Birth Weight on Adult Outcomes," *The Quarterly Journal of Economics*, 122(1), 409–439.

BLACK, S. E., P. J. DEVEREUX, AND K. G. SALVANES (2012): "Losing Heart? The Effect of Job Displacement on Health," Discussion Paper Working Paper 18660, National Bureau of Economic Research.

BLOOM, D. E., D. CANNING, AND E. S. SHENOY (2012): "The effect of vaccination on children's physical and cognitive development in the Philippines," *Applied Economics*, 44(21), 2777–2783.

CARNEIRO, P., K. V. LOKEN, AND K. G. SALVANES (2015): "A Flying Start? Maternity Leave Benefits and Long Run Outcomes of Children," *Journal of Political Economy*.

CASE, A., AND C. PAXSON (2009): "Early Life Health and Cognitive Function in Old Age," *American Economic Review*, 99(2), 104–09.

CHAY, K. Y., J. GURYAN, AND B. MAZUMDER (2009): "Birth Cohort and the Black-White Achievement Gap: The Roles of Access and Health Soon After Birth," Discussion Paper 15078, National Bureau of Economic Research.

CHEN, A., E. OSTER, AND H. WILLIAMS (2013): "Why is Infant Mortality in the US Higher than in Europe," Discussion paper.

CHETTY, R., J. N. FRIEDMAN, N. HILGER, E. SAEZ, D. W. SCHANZENBACH, AND D. YAGAN

(2011): "How Does Your Kindergarten Classroom Affect Your Earnings? Evidence from Project Star," *The Quarterly Journal of Economics*, 126(4), 1593–1660.

CRIMMINS, E. M., AND C. E. FINCH (2006): "Infection, inflammation, height, and longevity," *Proceedings of the National Academy of Sciences of the United States of America*, 103(2), 498–503.

CURRIE, J., AND D. ALMOND (2011): "Chapter 15 - Human capital development before age five," vol. 4, Part B of *Handbook of Labor Economics*, pp. 1315 – 1486. Elsevier.

DUPAS, P. (2011): "Health Behaviour in Developing Countries," *Annual Review of Economics*, 3.

FERTIG, A. R., AND T. WATSON (2009): "Minimum drinking age laws and infant health outcomes," *Journal of Health Economics*, 28(3), 737 – 747.

FINCH, C. E., AND E. M. CRIMMINS (2004): "Inflammatory Exposure and Historical Changes in Human Life-Spans," *Science*, 305(5691), 1736–1739.

FITZSIMONS, E., B. MALDE, A. MESNARD, AND M. VERA-HERNANDEZ (2012): "Household responses to information on child nutrition: experimental evidence from Malawi," Discussion Paper 12/07, IFS Working Paper.

FITZSIMONS, E., AND M. VERA-HERNANDEZ (2013): "Food for Thought? Breastfeeding and Child Development," Discussion Paper W13/31, Institute for Fiscal Studies.

GLUCKMAN, P., AND M. HANSON (2004): *The Fetal Matrix: Evolution, Development and Disease*. Cambridge University Press, Cambridge.

GOGIA, S., AND H. S. SACHDEV (2010): "Home visits by community health workers to prevent neonatal deaths in developing countries: a systematic review," *Bulletin of the World Health Organization*.

HOYNES, H., M. PAGE, AND A. H. STEVENS (2011): "Can targeted transfers improve birth outcomes?: Evidence from the introduction of the WIC program," *Journal of Public Economics*, 95(7-8), 813–827.

HOYNES, H. W., D. W. SCHANZENBACH, AND D. ALMOND (2012): "Long Run Impacts of Childhood Access to the Safety Net," Discussion Paper 18535, National Bureau of Economic Research.

JACOBSON, L. S., R. J. LALONDE, AND D. G. SULLIVAN (1993): "Earnings Losses of Displaced Workers," *The American Economic Review*, 83(4), 685–709.

JOHNSON, M. H. (2001): "Functional Brain Development in Humans," *Nature Reviews Neuroscience*, 2, 475–483.

KRAMER, M., F. ABOUD, E. MIRONOVA, AND ET AL (2008): "Breastfeeding and child cognitive development: New evidence from a large randomized trial," *Archives of General Psychiatry*, 65(5), 578–584.

LEE, D. N. (2012): "The Impact of Childhood Health on Adult Educational Attainment: Evidence from Modern Mandatory School Vaccination Laws," Working Papers 1202, Department of Economics, University of Missouri.

LEVINE, R., W. W. W. GROUP, AND M. KINDER (2004): *Millions Saved: Proven Successes in Global Health*. Center for Global Development, Washington DC.

LIESTOL, K., M. ROSENBERG, AND L. WALLOE (1988): "Breast-Feeding Practice in Norway 1860-1984," *Journal of biosocial science*, 20, 45–58.

LUDVIGSEN, K., AND K. T. ELVBAKKEN (2005): "The Public, the Mother and the Child: Public Health Initiatives Promoting the Strong and Happy Child. Focusing on Food and Mental Health," Discussion Paper 11, Stein Rokkan Center for Social Studies.

LUDWIG, J., AND D. L. MILLER (2007): "Does Head Start Improve Children's Life Chances? Evidence from a Regression Discontinuity Design," *The Quarterly Journal of Economics*, 122(1), 159–208.

PAXSON, C. (2008): "Stature and status: Height, ability, and labor market outcomes," *Journal of Political Economy*, pp. 499–532.

SCHIOTZ, A. (2003): *Det offentlige helsevesenets historie: Folkets helse, landets styrke*. Universitetsforlaget, Oslo.

STYR, F. (1937): "Barnepleiestasjoner i Norge," Social Haandbok for Norge. Norsk forening for Socialt Arbeide.

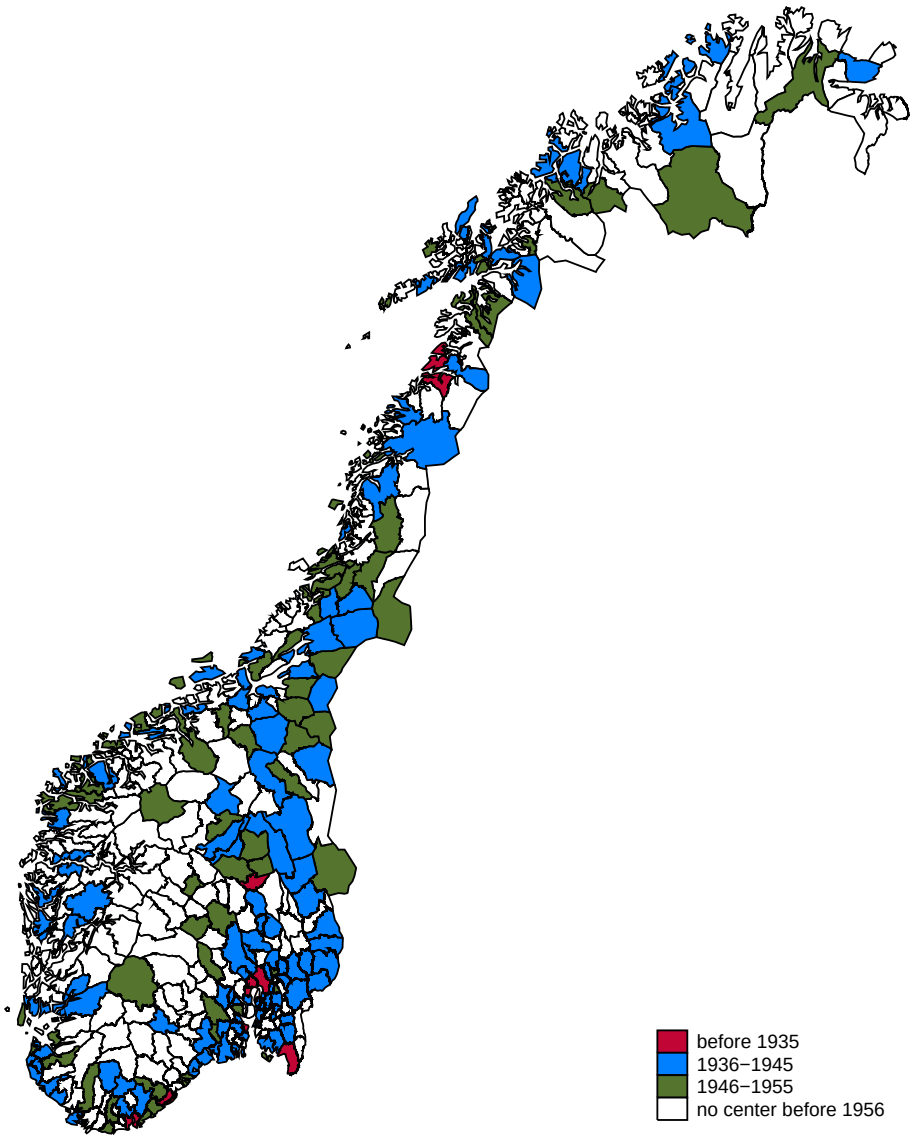
TOVERUD, K. U. (1945): *Beretning om de forste 6 ars arbeid ved Oslo kommunes helsestasjon for mor og barn pa Sagene (1939 til 1944)*. Fabritius, Oslo.

WILSON, J. M., AND G. N. CHANDLER (1993): "Sustained improvements in hygiene behaviour amongst village women in Lombok, Indonesia," *Transactions of the Royal Society of Tropical Medicine and Hygiene*, 87(6), 615 – 616.

WUEST, M. (2012): "Early interventions and infant health: Evidence from the Danish home visiting program," *Labour Economics*, 19(4), 484–495.

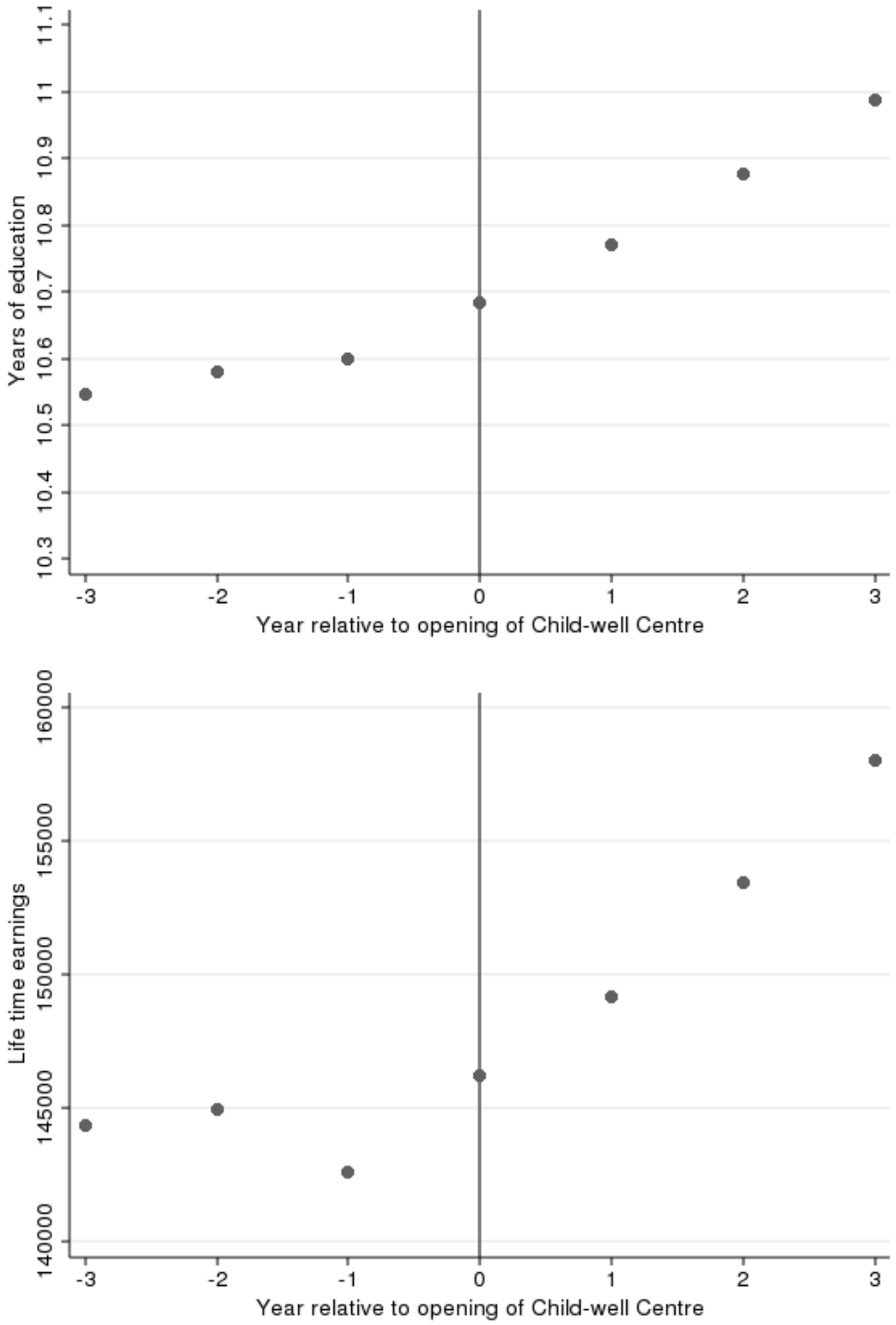
Appendix

Figure 1. Rollout of Mother and Child Health Care Centers



Notes: ...

Figure 2. TBD



Notes: For each municipality that opens a center between 1936 and 1955 we recenter the data such that openings happens at time zero. Variables are residuals from a regression on time and municipality fixed effects.

Table 1. Test of identifying assumption

	Opening before 1935	Opening between 1935 and 1940	Opening between 1940 and 1945
High school 1930	0.098	-0.563	-0.768
	(0.364)	(1.112)	(0.951)
Some high school 1930	-0.082	-0.086	0.523
	(0.147)	(0.448)	(0.383)
Income men 1930	0.022	0.055	-0.030
	(0.016)	(0.049)	(0.042)
Income women 1930	-0.012	0.050	0.077
	(0.044)	(0.135)	(0.116)
Doctors per inhabitants	-0.006*	-0.017*	0.003
	(0.002)	(0.007)	(0.006)
Midwifes per inhabitants	0.005	0.010	0.019
	(0.004)	(0.013)	(0.011)
Urban	0.0292	0.134**	-0.013
	(0.015)	(0.046)	(0.040)
Population	0.003**	-0.001	-0.000
	(0.000)	(0.001)	(0.001)
Constant	-0.020	0.051	-0.002
	(0.017)	(0.051)	(0.044)
Number of observations	617	617	617

Table 2. Long-term Effects on Education and Earnings

	Mean pre-reform (i)	Baseline (ii)	Nocontrols (iii)	Municipalities opening center (iv)
Years of education	11.63	.121***	.086**	.188***
		(.044)	(.033)	(.039)
Obs.		707,755	707,755	441,406
Earnings 1967-2010	160,570	2754***	2412***	3871***
		(947)	(912)	(1177)
Obs.		789,920	789,920	492,342
Earnings 1967-2010	166,689	3145***	2859***	4580***
cond. on obs. education		(1066)	(1029)	(1310)
Obs.		707,765	707,765	441,413
Log earnings 1967-2010	11.7	.007	.006	.021*
		(.010)	(.009)	(.012)
Obs.		785,840	785,840	489,764

Note: We include birth cohorts 1936-1960. Child-well visits open from 1937-1955. Years of education is measured in 2010, replaced by 2009-1986 if missing in 2010. Earnings is average, discounted earnings from 1967-2010. Control variables in column (ii) and (iv): mother's education, age and marital status, father's education and age and gender.

Table 3. Mother Fixed Effects Model

	Mean pre-reform	Baseline
Years of education	11.02	.125***
		(.031)
Obs		372,802
Earnings 1967-2010	153,212	3243***
		(1052)
Obs		407,495
Earnings 1967-2010	158,948	3667***
cond. on obs. education		(1141)
Obs.		372,802
Log earnings 1967-2010	11.63	.014
		(.011)
Obs		406,116

Table 4. Further Long-term Consequences

	Mean pre-reform	Baseline	Mother fixed effects
Dead by age 50	0.016	-.000	-.000
		(.001)	(.001)
Obs.		789,920	407,495
Married	0.77	-.003	-.018***
		(.003)	(.005)
Obs.		599,693	274,223
Divorced	0.08	-.003	-.003
		(.002)	(.003)
Obs.		599,693	274,223
Fertility	2.43	-.020	-.044**
		(.014)	(.019)
Obs.		351,106	156,537

Note: We include birth cohorts 1936-1960. Child-well visits open from 1937-1955. Years of education is measured in 2010, replaced by 2009-1986 if missing in 2010. Control variables: mother's education, age and marital status, father's education and age and gender.

Table 5. Municipality-specific Time Trends

	Mean pre-reform	Municipality specific time trends		
		Baseline	Linear	Quadratic
Years of education	11.63	.121***	.111**	.106**
		(.044)	(.044)	(.042)
Obs.		707,755	707,755	707,755
Earnings 1967-2010	160,570	2754***	2696***	2668***
		(947)	(952)	(953)
Obs.		789,920	789,920	789,920
Earnings 1967-2010	166,689	3145***	3068***	3046***
cond. on obs. education		(1066)	(1072)	(1072)
Obs.		707,765	707,765	707,765
Log earnings 1967-2010	11.7	.007	.007	.007
		(.010)	(.009)	(.009)
Obs.		785,840	785,840	785,840

Note: We include birth cohorts 1936-1960. Child-well visits open from 1936-1955. Years of education is measured in 2010, replaced by 2009-1986 if missing in 2010. Earnings is average, discounted earnings from 1967-2010. Control variables: mother's education, age and marital status, father's education and age and gender.

Table 6. Health Outcomes

	Men			Women		
	Mean pre-reform	Baseline	Municipalities opening center	Mean pre-reform	Baseline	Municipalities opening center
Obese	0.102	-0.019**	-0.018*	0.096	-0.003	-0.001
		(0.009)	(0.009)		(0.009)	(0.009)
Obs.		122577	77750		133654	85517
Diabetes	0.009	0.002	0.003	0.008	-0.001	-0.001
		(0.002)	(0.003)		(0.002)	(0.002)
Obs.		122359	77616		133402	85354
Hypertension	0.152	0.012	0.011	0.070	-0.000	-0.0001
		(0.011)	(0.011)		(0.007)	(0.008)
Obs.		122577	77750		133654	85517
Heart attack	0.010	-0.008**	-0.008**	0.003	-0.000	0.000
		(0.003)	(0.003)		(0.002)	(0.002)
Obs.		122438	77667		133468	85394
Height	178.6	-0.235	-0.264	165.9	-0.010	-0.084
		(0.167)	(0.170)		(0.187)	(0.197)
Obs.		122418	77648		133464	85397

Table 7. Extra Health Care Services

	Extra services		No extra services	
	Mean pre-reform	Baseline	Mean pre-reform	Baseline
		Panel A: Tuberculosis testing		
Years of education	11.30		11.13	
Obs.				
		Panel B: Immunization		
Years of education	11.42		11.12	
Obs.				
		Panel C: Pregnancy check-up		
Years of education	11.39		11.12	
Obs.				