Immigration and the Short- and Long-Term Impact of Improved Prenatal Conditions*

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Abstract

This paper investigates the effects of immigration from a developing country to a developed country during pregnancy on offspring outcomes. We focus on intermediate and long-term outcomes, using quasi-experimental variation created by the immigration of Ethiopian Jews to Israel in May 1991. Individuals conceived before immigration experienced dramatic changes in their environmental conditions at different stages of prenatal development depending on their gestational age at migration. We find that females whose mothers immigrated at an earlier gestational age perform better in high school and higher post-secondary schooling. They also tend to work more as adults. In contrast, we do not find any effect among males.

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1 Introduction

A growing body of evidence suggests that where a child grows up influences their adult income, education, and social outcomes while moving to a more advantaged neighbourhood has large benefits, particularly for young children (Chetty et al., 2016, Chetty and Hendren, 2018, Chyn, 2018, Deutscher, 2020). This evidence has significant implications for developed countries hosting immigrants from developing countries. Studies on the economic integration of first- and second-generation low-skilled immigrants and refugees show that both children's age at immigration and years spent by parents in the host country play a central role in children's health, educational, and labour market outcomes (Böhlmark, 2008, Corak, 2012, Nielsen and Rangvid, 2012, Stillman et al., 2012, Van den Berg et al., 2014, Lemmermann and Riphahn, 2018, Basu, 2018). In light of the well-established literature on the importance of the intrauterine environment for health, cognitive and non-cognitive skills, and labor market outcomes later in life (see reviews by Almond and Currie, 2011, Currie and Vogl, 2013 and Almond et al., 2018), it is essential to understand how moving to more advantaged places even before birth, while in utero, affect long term outcomes. Evidence on this, however, is still scant.

This paper brings the "in-utero" literature to the migration context and provides new insights into migration's intergenerational effects. We examine how the timing of immigration in utero from a developing country to a developed country affects childhood and adulthood outcomes by following individuals through a long period using comprehensive administrative data. To this end, we exploit quasi-experimental variation generated by the large and sudden immigration of Ethiopian Jews to Israel in 1991. This immigration episode, named "Operation Solomon", was unexpected and swift, with more than 14,000 Ethiopian Jews airlifted to Israel over 36 hours on May 24-25, 1991.

Migration decisions, including the timing of migration, are usually endogenous and correlate with the immigrant's characteristics and potential outcomes, posing several challenges for identifying causal effects. Operation Solomon created a different setting, as it was an unexpected event completed in a short time. As detailed in section 2.1, the airlift was organized by the Israeli government, bringing to Israel almost the entire Jewish community still in Ethiopia at the time. Thus, the immigrants were not a selected group, and the sudden occurrence and timing of the operation did not allow families to plan or time pregnancies or immigration dates.[1] In this setting, variation in pregnancy timing relative to immigration can be regarded as random. These conditions provide a unique opportunity to evaluate the causal short-, intermediate- and long-term impacts of a shift from a low-income country to a high-income country.

The analysis focuses only on children whose mothers immigrated while pregnant. That is, they all were conceived in Ethiopia and born in Israel. Hence these children faced the same conditions at birth and later in life but experienced dramatic differences in prenatal conditions based on their gestational age upon arrival in Israel in May 1991. For example, children conceived earlier and were therefore in utero in Ethiopia for a more extended period faced micronutrient deficiencies, inadequate health care, a lower standard of living, and more maternal stress due to the conditions in Ethiopia at that time over more months of gestation. By contrast, children conceived not long before Operation Solomon were in utero in Israel for a longer period and benefited from better environmental conditions.[2]

Our empirical strategy compares intermediate and long-term human capital outcomes of individuals who immigrated in-utero at different stages of pregnancy under the assumption that immigration timing relative to conception date can be viewed as random. Since we focus on individuals born in a 9-month period, we also account for unobserved cohort, month of birth effects, and age-for-grade effects.[3] Hence, our identification strategy relies on the quasi-experimental variation in the length of exposure to the Israeli environment created by immigration and the inclusion of comparison groups that allows controlling for cohort, month of birth effects, and age-for-grade effects. For comparison groups, we use second-generation Ethiopian immigrants whose families arrived in Israel before 1989 (in Operation Moses) and were born during the same time window as the Operation Solomon group or during the same months but just one year before the Operation Solomon group.[4] Because all the children in

[1]It is reasonable to assume that there was no family planning within the Ethiopian Jewish population before immigration. The contraceptive prevalence rate in Ethiopia in 1990 was only 2.9% (Olson and Piller, 2013), while the total fertility rate among Ethiopian immigrants was 5.2 (Israel CBS, 2003).

[2]The migration event itself might have led to maternal stress. We consider it as a part of the impact of immigration in-utero. We further discuss this on section 7.1.3.

[3]See Bedard and Dhuey (2006), McEwan and Shapiro (2008), Elder and Lubotsky (2009), Cook and Kang (2016), and Dhuey et al. (2019) for evidence on age-for- grade effects on school performance.

[4]"Operation Moses" immigration was the covert evacuation of Ethiopian Jews during the famine in Ethiopia in 1984. It involved the air transport of about 8,000 Ethiopian Jews from Sudan via Brussels to Israel. Before the airlift, the Ethiopian Jews have to make their way to the Sudanese border, usually by foot, overcoming violence

these two comparison groups were conceived in Israel, they are not subject to any effect of age at immigration. Therefore, differences between individuals born in different months and years within the comparison groups reflect cohort effects, month of birth effects, and age-for-grade effects among Ethiopian-origin children that allow us to net out these confounders from the main length of exposure effect estimated for the Operation Solomon sample.

The sample includes children whose mothers arrived in Israel via Operation Solomon (May 24-25, 1991) and were born in Israel between May 27, 1991, and February 15, 1992, and children whose mothers arrived in Israel before Operation Solomon, in Operation Moses, and were born between May 27, 1991, and February 15, 1992, and between May 27, 1990, and February 15, 1991. For each individual in the Operation Solomon group, we compute gestational age at the time of immigration based on children's birth date and immigration date. We then classify gestational age into three trimesters, following the classification in the medical literature. Since we lack the conception date, our measure of gestational age is subject to measurement error. Hence, we also compute for each individual in the Operation Solomon group the number of weeks in-utero in Israel based on the difference between birth date and immigration date. For the Operation Moses children, we assign the corresponding gestational age, trimester indicators and weeks in-utero in Israel based on the day and month of birth.

We analyze the effect of immigration in utero from Ethiopia to Israel using either the trimester of pregnancy at the time of immigration or the weeks in-utero in Israel as the variables of interest. While the latter is not subject to measurement error we also use the former to allow for nonlinearities. The intermediate outcomes we examine are multiple measures of high school performance. The long-term outcomes are post-secondary schooling, employment, and earnings until the age of 28. We also estimate the impact on marriage and childbearing at ages 21 and 26 and on early life health outcomes - birth weight and child mortality. Using only the Operation Solomon group, we also analyze the effect of the timing of immigration in-utero on test scores and behavioural outcomes in primary and middle school.

Our specifications take the form of Differences–in–Differences model to allow the estimation of the causal effect of the timing of immigration in-utero, controlling for any confounder effects related to the timing of birth in the year. To assess the validity of our identification

and thievery along the way. We provide more details on Section 2.1 (footnote 8).

strategy, we show that there is no association between birth frequencies and the timing of immigration in-utero. In addition, individuals' background characteristics are not associated with the timing of immigration in-utero. We also show no differential selection in background characteristics by date of birth between Operation Solomon children and Operation Moses children. Moreover, the age distribution at first grade is similar in the two samples.

We perform a separate analysis by gender, motivated by prior research that found differential effects of prenatal conditions by sex due to biological and social factors. We find that females whose mothers immigrated at earlier pregnancy stages have substantially better medium- and long-term cognitive outcomes than those whose mothers arrived at later pregnancy stages. For females, spending more time in utero in Israel reduced the likelihood of repeating a grade. It increased the likelihood of completing high school and achievement in the matriculation exams. These effects persist into early adulthood, with a higher likelihood of obtaining post-secondary education and higher employment in terms of the number of months worked per year between the ages of 23 to 27. We do not find significant effects on birth weight or child mortality, although this might be due to a lack of power.

The results for males are less pronounced. Males who 'immigrated' in utero at earlier stages of gestation have slightly better birth outcomes (higher birth weight and lower mortality rate). Although, as for women, we lack the power to detect significant effects. In contrast to women, we do not find any long-term effects on high school achievement, post-secondary education, or labour market outcomes.

We discuss possible explanations for the differences in the results by gender, suggesting that son preferences among Ethiopian families might explain why females benefit most from immigration in-utero at an earlier stage of pregnancy.

We assess the robustness of the results as follows. First, we show that our results are not sensitive to misclassification of individuals who might have been born preterm and that unobserved miscarriages and stillbirths are unlikely to affect our results. Second, we show that our results are not driven by age-for-grade effects or seasonality in births. Third, we show that spending more time in Israel before giving birth by mothers who immigrated at earlier stages of pregnancy is unlikely to be a channel that drives our findings. Finally, we show that the effect of immigrating at an earlier stage of pregnancy is not present in an equivalent sample of children who immigrated in utero from the Former Soviet Union where prenatal conditions were similar to those of Israel at that time. This evidence mitigates also the concern that our results derive from a differential effect of stress at immigration.

Our study contributes to the emerging literature on the effects of "place" (e.g., migration or neighborhood effects) on various outcomes through an individual's life. Recent studies exploit within-family variation in children's age when families move, either within a country or between countries, from disadvantaged to more advantaged places (Böhlmark, 2008, Chetty and Hendren, 2018, Chyn, 2018, Lemmermann and Riphahn, 2018, Basu, 2018, Deutscher, 2020). These studies find that moving to a better area at a younger age is more beneficial, while this effect usually incurs both the impact of age at arrival and length of exposure. Other studies exploit a quasi-random assignment of immigrants across different areas to analyze the early childhood environment's effect on a large array of social and economic outcomes.[5]

Our study is the first to focus on immigration while in utero stressing the potential benefits of moving to a better place during this period. Our findings suggest that even a small difference in months of exposure during this critical early period can lead to significant differences equal in magnitude to serval years of exposure later in life.[6] Our study is also the first in the immigration literature that follows individuals for an extended period, from birth to adulthood, analyzing the effects on a wide range of outcomes at different ages.

This study also contributes to the extensive literature on the fetal origins hypothesis that shows that even relatively mild shocks in utero have short- and long-term effects on children's health and long-term human capital development (see reviews by Almond and Currie, 2011, Currie and Vogl, 2013 and Almond et al., 2018). Most studies focus on a specific domain (e.g., test scores, health, birth weight) at a particular age, while we present a comprehensive analysis of the effect of prenatal conditions and the implications for a variety of outcomes by

[5]Gould et al. (2004) exploit Operation Solomon to examine the extent to which the initial elementary school environment affected the high school outcomes of Ethiopian children. Gould et al. (2011) exploit variation in the living conditions experienced by Yemenite children immigrants who arrive in Israel in 1949 on education, labor market, and family outcomes. Damm and Dustmann (2014) investigate the effect of early exposure to neighborhood crime on subsequent criminal behavior of youth refugee immigrants in Denmark.

[6]For example, Basu (2018) find that immigrants who arrive in the US at the age 16-17 were 9% less likely to finish high school compared to infant immigrants. Lemmermann and Riphahn (2018) show that immigrating to Germany at age 15 vs. age 1 increases the risk of not graduating from secondary school by 47 percentage points.

following individuals through an extended period. Our data allow us to hone in on the timing of exposure during pregnancy and highlight heterogeneous effects of prenatal inputs during the critical periods of gestation.

The remainder of the paper is organized as follows. The next section outlines the historical background of Ethiopian Jews and the differences between the environmental conditions they experienced in Ethiopia and upon arrival in Israel. Section 3 describes our data, and section 4 outlines our empirical strategy. In Section 5, we report the results. In Section 6, we discuss measurement issues, and in section 7, we examine potential alternative interpretations and present a placebo test. Section 8 concludes.

2 Context

2.1 Immigration of Ethiopian Jews to Israel[7]

The Ethiopian Jewish community, also known as "Beta Israel", lived in the region of Northern Ethiopia called Gondar for several centuries. In 1975 they were recognized as Jewish by the State of Israel and were entitled to migrate to Israel as full citizens under the Law of Return. Since then, 92,000 Ethiopians have been brought to Israel in organized immigration projects and immediately become Israeli citizens.

Figure 1 presents the distribution of Ethiopian Jewish immigrants to Israel by immigration year. The peak in 1984 reflects the "Operation Moses" immigration, which began on November 21, 1984, and ended on January 5, 1985, and involved the air transport of about 8,000 Ethiopian Jews from Sudan via Brussels to Israel.[8]

Between 1985 and 1989, the Ethiopian authorities limited all citizens' movement, Jews included, making emigration almost impossible. The renewal of diplomatic relations between Israel and Ethiopia in November of 1989 and American and Canadian Jewish organizations' involvement, notably the American Association for Ethiopian Jews (AAEJ) and North American Conference on Ethiopian Jewry (NACEJ), opened new possibilities to renew immigration

[7]This section is based on Kaplan (1992)

[8]Following worsening conditions in Ethiopia (due to a major drought and consequent famine, and the unstable political situation) thousands of Beta Israel fled Ethiopia on foot for refugee camps in Sudan, a journey which took from two weeks to a month. It is estimated that as many as 4,000 died during the trek, due to violence and illness along the way. Sudan secretly allowed Israel to evacuate the refugees to Israel and stopped when the operation became public and Arab countries pressured Sudan to stop the airlift.

to Israel. In May 1990, the AAEJ hired buses to bring Jews from their villages in the north of the country to Addis Ababa, where the NACEJ operated a compound in which Jewish families could reside until they received permission to fly to Israel. They did not know when that permission would be granted, and they accepted that they would be living in Addis Ababa for the time being. However, following political and military turmoil in Ethiopia, culminating in the Ethiopian dictator Mengistu's flight from the country in May 1991, the Israeli government decided to airlift the Ethiopian Jews from the capital before rebel forces took it over. On May 24 and 25, 1991, over 14,000 Ethiopian Jews—all the Jewish population then living in Addis Ababa, and almost the entire Jewish population remaining in Ethiopia—were airlifted to Israel within 36 hours in Operation Solomon (see Figure 2). The only Jews left in Addis Abba were the Falas Mura, who were Christianized Jews and were allowed to immigrate to Israel later on.[9] Upon arrival in Israel, the immigrants were placed in absorption centers, where most stayed for several years until they could move to permanent housing.[10] Immigration from Ethiopia to Israel continued after Operation Solomon but in much smaller numbers. It was composed of small groups of Jews from remote rural areas in Ethiopia, mainly from Qwara and Gondar (Kaplan and Rosen, 1994) and the Falash Mura people.

2.2 Environmental Conditions of Operation Solomon Immigrants in Ethiopia and in Israel

Pregnant immigrant mothers were exposed to large environmental differences between Ethiopia and Israel. We conducted in-depth interviews with fifteen mothers of children from our base sample who were pregnant at the time of immigration. We asked them about conditions in five areas before and after immigration: living conditions, general medical care, nutrition, micronutrient supplements, antenatal care, and pre- and post-natal monitoring. Section A in the Online Appendix outlines the differences between Ethiopia and Israel based on these interviews, media reports from the period, and other relevant literature. The main features of these findings are summarized here.

In the year before Operation Solomon, a large part of the Ethiopian Jews population who

[9] Falash Mura is the name given to members of the Beta Israel community in Ethiopia who converted to Christianity under pressure from missionaries during the 19th and 20th centuries. In 2003, the Israeli government gave those with Jewish maternal lineage (through the Beta Israel) the right to immigrate to Israel under the Law of Return, but to obtain citizenship only if they converted to Orthodox Judaism.

[10] For more details, see Gould et al. (2004).

lived in small remote rural villages in northern Ethiopia migrated to Addis Ababa, where they were housed in refugee camps with inadequate housing scattered around the city. After they arrived in Israel, most immigrants (80%) were housed in absorption centers comprising furnished rooms or apartments, and the rest in mobile home camps (Gould et al., 2004). Upon arrival in Israel, immigrants underwent extensive medical examinations (Nahmias et al., 1993). In most of the absorption centers, they had access to a primary care clinic, staffed by a physician, a nurse, and an interpreter/mediator (Flatau et al., 1993; Sgan-Cohen et al., 1993; Shtarkshall et al., 2009; Levin-Zamir et al., 1993), which provided comprehensive health and immunization services (Yaphe et al., 2001 and Levin-Zamir et al., 1993). Women received access to pre- and postnatal monitoring for themselves and the newborns, and almost all births were at hospitals. They also received micronutrient supplements (i.e., iron and folic acid) following standard practice among Israeli pregnant women.[11] In contrast, the three micronutrient supplements essential for cognition and recommended for pregnant women—iron, iodine, and folic acid—were mostly unavailable in Ethiopia (DHS, 2000).[12] Immigrants' calorie intake almost doubled upon arrival in Israel. Also, its composition changed, as many traditional Ethiopian staples were not available in Israel at the time (Levin-Zamir et al., 1993).

3 Data Description

3.1 Data

Our study focuses on the Israeli population of Ethiopian ethnicity who were born in Israel between 1990-1992. In particular, our sample includes 1,424 individuals whose parents immigrated to Israel from Ethiopia and were born in Israel. This sample includes 570 individuals born to Operation Solomon immigrants between May 27, 1991, and February 15, 1992, who immigrated while in utero to Israel at different stages of their mother's pregnancy, and 854 individuals whose parents emigrated from Ethiopia before Operation Solomon, in 1989 (Operation Moses) and who were born between May 27, 1991, and February 15, 1992 (451 individuals) or May 27, 1990, and February 15, 1991 (403 individuals) - which we use as comparison groups.

[11] Iodine was not provided since the food chain in that period was considered to contain adequate amounts (Benbassat et al., 2004).

[12] Online Appendix B provides additional information on the importance of micronutrients for development.

We limited the sample to include only Operation Solomon offsprings who were born in the nine-month window following the airlift since for these individuals, the pregnancy was incepted in Ethiopia. We do not include children born beyond nine months after the airlift, as those children were conceived in Israel, and we cannot claim that the timing of conception relative to immigration was random for these children. We do not include children born just before the airlift since they faced very different conditions during birth in refugee camps in Addis Ababa compared to children born in Israeli hospitals.[13] In addition, we exclude twins from our sample because they tend to have different birth outcomes from singletons. Nevertheless, our results are virtually identical when we include twins in our sample (see Online Appendix Table A1).

For all the individuals in our sample, we obtain information from Israel's Population Registry, which provides the following variables: birth date, date of immigration, country of origin, the number of siblings, mother's place of residence upon arrival in Israel, date of death, marital status, and childbearing.[14] [15] We merge the population registry data with data from the Israel Central Bureau of Statistics (CBS) administrative records on birth weight and administrative records collected by the Israel Ministry of Education (MOE) and the Israel Tax Authority (ITA).

Administrative records collected by the Israel MOE include information on students' parental education, yearly schooling status (graduated, currently attending school, dropped out), high school outcomes, and post-secondary outcomes based on reports submitted to the CBS by all of Israel's tertiary education institutions. High school outcomes include schooling attainment (i.e., indicators for repeating a grade after primary school, completing high school, and receiving a matriculation certificate) and quality of schooling attainment (total credit units awarded in the matriculation certificate and credit units awarded in mathematics and English).[16] Post-

[13] Daysal et al. (2015) and Daysal et al. (2019) documented that physician supervision and conditions during births have significant effect on birth outcomes.

[14] Data on parents' first locality of residence upon immigration to Israel include the socio-economic index (SES) of the locality. The Israel CBS computes a socio-economic index of Israeli localities based on several demographic and economic variables, including dependency ratio, average years of schooling in the adult population, percentage of academic degree holders, employment and income levels, etc. Lower values correspond to lower socio-economic status.

[15] Registry data on marital status and childbearing are available to us until 2018, hence we measure these statuses for each individual at ages 21 and 26.

[16] High school in Israel runs from 10th grade to 12th grade. Students on an academic track are expected to obtain a matriculation certificate when they finish high school. A matriculation certificate is a prerequisite for higher education in Israel, and hence has a large impact on students' future prospects. Students take matriculation

secondary outcomes include information on the highest diploma obtained by 2020.[17] [18]

Administrative records collected by the ITA include information on the income and earnings of employees and self-employed individuals for 1995 and 2000 and for each year during the 2013—2019 window. We link the 1995 and 2000 earnings data to the parents of the individuals in our sample to measure parents' income four and nine years after immigration. The 2013—2019 data is used to construct our labour market outcomes. We focus on labour market outcomes at ages 23–27 by pooling individuals' annual records and define as outcome variables earnings (annual and monthly), number of months employed, and employment at each age.[19]

The key variable for our analysis is the gestational age of the child at immigration. Gestational age is measured as the difference between the date of immigration (May 24 or 25, 1991) and the individual's birth date, transformed into numbers of weeks, and then subtracted from 40 (the standard measure of gestation). We assume 38 weeks of post-conception pregnancy, equivalent to 40 weeks of gestational age. We are interested only in the 38 weeks after fertilization, rather than the traditional 40-week measure, because we do not want to include children whose mothers became pregnant upon arrival in Israel. We, therefore, drop from our analysis individuals who immigrated at weeks 0 and 1.[20]

We follow the medical literature and divide the duration of pregnancy into three trimesters: (1) first trimester—conception (week 2) through week 12; (2) second trimester—week 13

exams in basic, intermediate or advance levels, and receive credit units accordingly, between one and five. We assign zero units to students who do not achieve the basic level (either because they failed or because they did not take the test). We avoid using test scores as outcomes because not all students were tested in all subjects and test scores are not comparable across different proficiency levels of the same subject.

[17]For post-secondary information we use the education register which covers almost 90% of the population and construct indicators for latest degree obtained. The education register is updated yearly based on various administrative files from 30 years back. Since yearly updates also correct for past information, we cannot use the individual's changes between years as a reliable information. Hence we use the latest educational level registered in the data, which is for the year 2020.

[18]All schooling outcomes are binary indicators or count variables. Therefore, we assign a zero value to cases of missing outcomes due death. Including these observations in the sample avoids potential selection bias. In any case, this is not a major concern given that, as we discuss below, there is no association between length of exposure to the Israeli environment and mortality and there is a small number of deaths. In Online Appendix Table A2, we replicate the results for all outcomes after excluding from the sample children who died before age 6. Estimates are very similar to our main results.

[19]To account for outliers, we winsorize the top 5th percentile of earnings by gender. Since the number of months employed reported for self-employed individuals is less reliable we exclude 46 self-employed individuals from our sample in the labour market outcomes analysis.

[20]Gestational age is defined based on the number of weeks elapsed from the mother's last menstrual period. The average length of a pregnancy as computed by gestational age is 40 weeks, which means 38 weeks from the point of fertilization.

through week 26; and (3) third trimester—week 27 through birth.[21] These three trimesters can be mapped into three groups defined by the date of birth. We assume that children whose birth date is between December 4, 1991, and February 15, 1992, arrived in Israel during the first trimester. Children born between August 28 and December 3, 1991, are assumed to immigrate during the second trimester; and children born between May 27 and August 27, 1991, are assumed to immigrate during the third trimester (these dates assume an immigration date of May 24, 1991). Figure 3 graphically depicts the three trimesters by birth date and estimated conception date.

One potential challenge regarding our definition of the key variable of interest is that we do not have precise information on conception dates and instead estimate them based on birth dates. This means that we might misclassify some children regarding their timing of immigration in-utero. We discuss this issue in Section 4 and also use an alternative measure for treatment, which is the number of weeks in utero in Israel based on the difference between birth date and immigration date.

Our sample includes also a comparison group who did not immigrate while in utero. For each individual in the comparison group we assigned the corresponding gestational age at immigration or trimester indicator based on day and month of birth. That is, we define for each individual in the comparison group a hypothetical gestational age at immigration, which is equal to the gestational age at immigration of individuals from the Operation Solomon group born on the same day and month.

3.2 Descriptive Statistics

Table 1 presents summary statistics showing the background characteristics of our sample by group and gender. Among the Operation Solomon group, mothers were, on average, around 31 years of age upon giving birth, while fathers were about 41. In the comparison groups, mothers and fathers were younger when the child in our sample was born, 28 and 36, respectively. Families are relatively large, with 5.3 children on average in the Operation Solomon group

[21] The medical literature (e.g. (Cunningham et al., 2014) suggests that the first trimester is a period of rapid growth for both internal and external body systems and organs. By the end of the first trimester, even though the fetus is less than two inches long, all the major systems and organs are developed, including the brain. In the second trimester, the fetus grows considerably in size. By the beginning of the third trimester, the foetus may survive if born premature. In this period, growth slows down but there is substantial weight gain.

and 4.3 children in the comparison groups. Individuals in our sample were, on average, the third or fourth child in the family, and their parents tended to have little formal education (1–2 years of schooling in Operation Solomon group and 3-4 years of schooling in the comparison groups). The income of Operation Solomon's parents is less than half of the comparison groups. This is expected given their shorter time in Israel. Overall, there are no large differences in family background characteristics between females and males. The percentage of females in the Operation Solomon group is 48.6%, similar to the older cohort of the Operation Moses group (48.4%) and slightly lower compared to the younger cohort of Operation Moses (which is 50%).

Table 2 reports the means and standard deviations of the outcome variables by group and gender. Panel A shows the early life health outcomes (birth weight and child mortality), Panel B shows the high school outcomes, and Panel C shows the later life outcomes (post-secondary schooling, labour market outcomes, marriage, and fertility). The birth weight in our sample is about 3 kg and similar across all groups. The mortality rate group by age six among Operation Solomon is 1.2% and is slightly higher for males than females (1.4% versus 1.1%). The rates in the comparison groups are smaller in the cohort of 1991-1992 and higher in the cohort of 1990-1991, and in both cases, males have a higher mortality rate than females. During the same period, the Israeli population's equivalent rate was about 1% (World Bank data catalog, 1991).

While more than 80% of the individuals in our sample completed high school and did not repeat a grade, their academic achievement in high school is quite low. For example, the matriculation rate is 30% among Operation Solomon group and 35% among Operation Moses groups, while the rate for all Israeli twelfth-grade students was 59% in 2012.[22] The average of total matriculation units is 11.3 for Operation Solomon and around 12-13 for Operation Moses, while 21 is the minimum required to obtain a matriculation certificate. Females in all groups have higher high school academic achievement compared to males. Overall, the academic achievement of Operation Solomon children is slightly lower than that of Operation Moses children. This is somewhat expected given that the Operation Moses children were born 7-8 years after their parents immigrated to Israel, while Operation Solomon children were just born after their

[22]The matriculation rate is the percentage of 12th-grade students entitled to a matriculation certificate by the end of the academic year. For figures on the Israeli population, see the Statistical Abstract of Israel 2014: https://www.cbs.gov.il/he/publications/doclib/2014/shnatoneducation/st08_26.pdf.

parents immigrated. Nevertheless, differences between groups are relatively small compared to the achievement gap with the Israeli population. Concerning adulthood outcomes, 21% and 16% of Operation Solomon females and males, respectively, obtained any post-secondary education by 2020, while the rates among Operation Moses individuals are slightly higher. For comparison, in the Israeli population, about 80% obtained a post-secondary diploma by the age 29.[23] Marriage rates by age 21 and by age 26 are relatively low. Between 0.5% to 1.5% of females and less than 0.2% of males are married by the age of 21. About 1.5% of females and less than 1% of males are married and have children by age 26. Marriage and fertility patterns are similar between Operation Solomon and Operation Moses individuals.

At ages 23–27, the employment rate is about 90%, with an average of 9 months of employment per year in all groups. Females have higher employment rates and work more months per year than males. Monthly earnings are on average, NIS 4,500 (equivalent to about US $1,500). Despite their higher employment rate, females' monthly earnings are lower than those of males.

4 Empirical Strategy

4.1 The Empirical Methodology

The events and timing of Operation Solomon can be viewed as a quasi-experiment. Ethiopian immigrants' children who shared the same background characteristics and were born shortly after arrival in Israel experienced one important differential treatment: their mothers were at different pregnancy stages on the day of immigration. All these children faced the same general conditions at birth and later life but experienced dramatic differences in prenatal conditions given their gestational age upon arrival in Israel in May 1991.[24] Therefore, we estimate the causal effect of immigration in utero from Ethiopia to Israel on later life outcomes by comparing the outcomes of children who arrived in utero at different stages of pregnancy. Our primary identifying assumption is that children born in Israel but whose mothers were at various stages of pregnancy at the time of immigration have identical unobserved characteristics and the same

[23] For figures on the Israeli population, see the Statistical Abstract of Israel 2020: https://www.cbs.gov.il/he/publications/doclib/2021/4.shnatoneducation/st04_77.pdf.

[24] Given the sudden timing of arrival and large number of households, Ethiopian immigrants were placed in absorption centers across Israel in which they lived in for at least two years (Gould et al., 2004). As described by Kaplan and Rosen (1994) and Lazin (1997), the length of stay in the absorption centers varied across families but there is no evidence that this was related to mothers' stage of pregnancy upon immigration.

potential outcomes. In other words, we assume that the timing of conception in Ethiopia relative to the timing of immigration was random.

A potential concern is that the effect of immigration could be confounded by unobserved cohort, seasonality in births, or month of birth effects. Especially since we focus on individuals born in a 9-month period between May 1991 and February 1992, we should account for age-for-grade effects on school performance and later life outcomes (see Bedard and Dhuey, 2006, McEwan and Shapiro, 2008, Elder and Lubotsky, 2009, Cook and Kang, 2016 and Dhuey et al., 2019 for evidence on age-for-grade effects). In Israel, the school entrance cutoff until the cohort born in 2007 was on the first day of the fourth month of the Jewish calendar, which bounced around different dates in December for each Gregorian year (Attar and Cohen-Zada, 2018). For the cohort born in 1991, the entrance cutoff date was December 8th, which means that individuals who immigrated in-utero at earlier stages of the pregnancy are also more likely to start school one year later and to be among the oldest in their grade. In contrast, the individuals who immigrated in-utero at later stages of the pregnancy are more likely to start school one year earlier and to be below the median age in their classrooms.

To address these concerns, we include in our analysis two comparison groups of second-generation Ethiopian immigrants whose families arrived in Israel before 1989 (in Operation Moses) and were born during the same time window as the Operation Solomon group (i.e., individuals born between May 27, 1991, and February 15, 1992) or a one year before (i.e., born between May 27, 1990, and February 15, 1991).[25] Because all children in these groups were conceived in Israel, they are not subject to any effect of age at immigration. Differences between individuals born in different months and years within the comparison group reflect cohort effects, month of birth effects, and age-for-grade effects among Ethiopian-origin children and are used to net out the effect of age at immigration from these possible confounders among our main sample of interest. Our key identifying assumption is that any birth cohort effect, birth month effect, or age-for-grade effect of these groups are good proxies for the same effects among the Operation Solomon group.[26]

[25] The school entrance cutoff date for the 1990 cohort was December 18th.

[26] A possible confounder that might not be accounted by the inclusion of the Operation Moses comparison groups, could be a shock that affected pregnant women in the refugee camps differentially, depending on weeks of gestation. An example of such a shock is a violent attack in a specific date. While we cannot rule out such effect,

The Operation Solomon group and the comparison groups may differ in some dimensions. However, individuals in all groups originate in the same country, have the same genetic profile and culture, and were raised by immigrant parents. Moreover, they were all conceived and born during the same period and faced similar school entrance cutoff date in Israel. In Section 3.2, we showed that the Operation Solomon group is similar to the Moses Operation groups in their demographics and outcome variables.

Our key variable of interest is gestational age (in weeks) at immigration. Since we have a small sample, to reduce noise, and to allow for nonlinear effects, we use this variable to classify children into three trimesters as it is common in the medical literature (see Section 3.1). We define the trimester indicators for individuals in the comparison group according to their day and month of birth. Namely, they receive the trimester classification of Operation Solomon kids born in the day and month. Based on this definition, we examine the effect of "age-at-immigration" in utero by estimating the following model:

$$\begin{aligned} Y_i = \beta_0 + \beta_1 First\_Trimester_i \times Solomon_i + \beta_2 Second\_Trimester_i \times Solomon_i \\ + \beta_3 First\_Trimester_i + \beta_4 Second\_Trimester_i + \beta_5 Solomon_i \\ + \beta_6 YoungCohort_i + \gamma X_i' + u_i \end{aligned} \quad (1)$$

where Y_i is the outcome of individual i. The $First\_Trimester_i$ and $Second\_Trimester_i$ indicators are defined according to month and day of birth. Namely, the first trimester equals one if the child was born between December 4 and February 15; the second trimester equals one if the child was born between August 28 and December 3. $Solomon_i$ is an indicator for individuals born to parents who immigrated on Operation Solomon. $YoungCohort_i$ is an indicator for individuals born between May 27, 1991, and February 15, 1992. The key explanatory variables are the interactions between the trimester indicators and the *Solomon* indicator that denote arrival immigration to Israel during the first or second trimester of pregnancy respectively. The omitted category includes those who were born between May 27th 1991 and August 27th 1991 to parents who immigrated on Operation Solomon (individuals who immigrated in-utero at later stages of the pregnancy). The estimated parameters β_1 and β_2 reflect the difference between im-

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we note that this is the inherent concern of any difference-in-differences strategy. That is, the standard assumption in difference-in-differences strategy is that there are no time-specific shocks affecting the treated cohort.

migrating in utero during the first or second trimester, respectively, relative to the third trimester net of any seasonality, cohort, and age-for-grade effects.[27] X_i' is a vector of individual characteristics that includes a gender dummy, mother's age at birth, parents' age gap, birth order, parents' education, and the SES of the mother's first locality of residence upon immigration to Israel. Standard errors are clustered by calendar week to allow for correlation of the error term by the week of birth. We estimate equation (1) for females and males separately as a system of seemingly unrelated regressions to allow the coefficients to differ by gender but permit correlation between the error term of both genders.

We also estimate an alternative specification using weeks of pregnancy in Israel as our main treatment variable using the following model:

$$\begin{aligned} Y_i = \alpha_0 + \alpha_1 Weeks\_in\_Israel_i \times Solomon_i + \alpha_2 Weeks\_in\_Israel_i \\ + \alpha_3 Solomon_i + \alpha_4 YoungCohort_i + \gamma X_i' + u_i \end{aligned} \tag{2}$$

Where $Weeks\_in\_Israel_i$ is the number of weeks between birth date and immigration date for the Operation Solomon group. Individuals from the comparison group get the value of $Weeks\_in\_Israel$ from Operation Solomon children born on the same day and month. The interaction between $Weeks\_in\_Israel_i$ and $Solomon_i$ represents an alternative treatment that measures the length of exposure to the Israeli environment and is just a linear transformation of the gestational age (in weeks) at the time of immigration. However, it is not measured with error, as might be the case for gestational age, because the date of immigration and birth date are known.

4.2 Evidence for quasi-random variation in the timing of conception relative to immigration date

Our main identifying assumption is that the timing of pregnancy relative to immigration date can be seen as random among mothers who were already pregnant when airlifted to Israel on May 24 or 25, 1991. We support this assumption by showing that the timing of in-utero immigration does not correlate with background characteristics or the frequency of births or gender.

Table 3 presents balancing tests on background characteristics of the Operation Solomon group by gender. Columns 1 and 6 report means and standard deviations of background char-

[27] Other forms of specifications for the DID model that include also month of birth fixed effects, or an indicator for born in 1992 generate similar estimates as the those produced by equation (1).

acteristics for females and males, respectively, whose mothers arrived in Israel during the first trimester, and columns 2—4 and 7—9 report the differences in these characteristics between trimesters. Columns 5 and 10 report the coefficients from regressing background characteristics on the number of weeks in utero in Israel. We also report at the bottom of the table F-statistics and p-values for the joint significance of all covariates based on models that regress the trimester or weeks indicators on all covariates.

Overall, there are no marked differences in most background characteristics by mother's stage in pregnancy at the time of immigration for females or males. There are a few exceptions: for females, parents' education is lower for those who arrived in the first trimester of pregnancy than the rest. This leads to a low p-value for the test of jointly significant differences in covariates between the first and second trimester. However, this finding militates against our primary concern, which is the possibility of positive selection bias if better family background correlates with arrival in Israel at earlier pregnancy stages. We also find that covariates cannot jointly predict birth in the first or second-trimester groups versus the third-trimester group for females. In addition, there is no systematic association between covariates and time of immigration when using weeks in utero in Israel instead of trimester indicators. Therefore, we are not concerned that our results are confounded by differential selection into trimesters or weeks. It is also worth noting that there are no significant differences in family income by trimesters, both in 1995 and 2000, which implies that arriving early in pregnancy in Israel did not affect the parents' labour market outcomes. This eliminates a potential mechanism for our results and strengthens the claim that the arrival process for immigrants to Israel was the same for everyone, regardless of the pregnancy's visibility.

For males, there are some differences in parental schooling, parents' age gap, birth order and family income: males who immigrated in-utero earlier have a smaller age gap between their parents, higher parental education, and higher income of parents in 2000. They also come from lower birth orders. These differences may cause some positive selection bias among males. Nevertheless, as we show later, this is less of a concern given that we find no effect among males.

Given that our analysis is based on a DID specification that uses Operation Moses children born in the same period as a comparison group, we also examine whether there is any differential selection of children by trimesters (or weeks) between the treated and the comparison group. To do so, we estimate DID models similar to equations (1) and (2) using each background characteristic as a dependent variable (and no further covariates at the right hand side except for the trimester indicators and interactions with treatment). Estimates in Table A3 in the online Appendix show no evidence for differences in background characteristics by date of birth between the Operation Solomon sample and Operation Moses sample. The only exception is some disadvantage in mothers' education for girls in the first trimester relative to the third (that we also saw when using only the Operation Solomon sample), a fact that will go against finding any positive treatment effect for this group. For boys, the relative advantage of fathers' education in the first trimester no longer exists once we net out differences by trimesters relative to the Operation Moses sample. Overall, the findings above support the hypothesis that there was no differential selection of pregnancies by date of birth. Moreover, they enhance the validity of using children of Operation Moses as a comparison group.

The mean gestational age at the day of immigration is 6.7 and 7.7 weeks for females and males, respectively, who immigrated in-utero during the first trimester, 20 and 19.4 weeks for females and males who immigrated in-utero during the second trimester, and about 32.5 weeks both for females and males who immigrated in-utero during the third trimester. The mean is roughly in the middle of each group's range, so no group is over-represented. The proportion of females at birth is 47% in the first-trimester group, 51% in the second trimester group, and 46% in the third-trimester group. However, none of the differences between the trimesters is significant. Moreover, weeks in-utero in Israel does not correlate with gender (coefficient 0.0008 with standard error of 0.0017).

As an additional supporting evidence for the quasi-random variation in the timing of births, we plot in Figure 4 the frequency of births in our primary sample (Operation Solomon children) and the comparison group by month of birth and by immigration trimester (by date) for the whole sample (Panel A) and for females and males separately (Panels B and C). The frequency of births is similar across the three samples, and there is no clear evidence for selection of births at the trimester cutoffs. To further examine this issue, we plot in Figure 5 the share of births by gestational week upon immigration to Israel for our primary sample and the births distribution of the same calendar dates for the two cohorts of the comparison group. The vertical lines denote the trimesters. The figure shows two important points: (i) there is no apparent discontinuity around the trimester cutoffs in our primary analysis sample, and (ii) the share of births by week is not significantly different across the groups. To formally test this issue, we also estimated a model where the dependent variable is the share of births by week and examined whether there were significant differences by trimester groups between our primary sample and each of the two comparison groups. The results (available upon request) show no significant differences in any of the three-trimester groupings.

5 Results

5.1 High Schools Outcomes

Table 4 presents the results for high school outcomes by gender. Odd columns present estimates for differences between the first or second trimester and the third trimester (β_1 and β_2 of equation (1)). Even columns present estimates for the impact of weeks in utero at immigration (α_1 of equation (2)). Panel A reports estimates for females and Panel B for males. Panel C reports p-values from F-tests for the test of equality of parameters between females and males. We also report means and standard deviations of the reference group's outcome variables, individuals whose mothers arrived on Operation Solomon during the third trimester.

Estimates of immigration's effect at earlier stages of pregnancy on offspring's high school outcomes reveal an interesting differential pattern by gender. We observe a large positive and significant impact of immigrating in-utero at an earlier stage for females in all outcomes. In contrast, the impact for males is smaller and not statistically significant. The estimates from both specifications, trimesters and weeks, show the same pattern and magnitude of effect.

Estimates from equation (1) (odd columns) show that for females, immigration in the first trimester lowers the likelihood of repeating a grade by 18 percentage points (s.e.=0.045) compared to immigration in the third trimester. For males, this effect is much smaller, goes in the opposite direction, and is insignificant. Immigration in the second trimester also lowers grade repetition for females, but the effect is smaller (7.5 percentage points) and not statistically significant. According to the estimates of equation (2), each additional week of in-utero in Israel lowers the likelihood of repeating a grade by 0.6 percentage points (s.e.=0.002) for females. Given the mean difference of 26 weeks of gestation between those who arrived in the third trimester versus those who arrived in the first trimester, this effect implies an average advantage of 16 percentage points in "no grade repetition" for females who arrived in the first trimester relative to the third, an effect which is highly in line to the estimate we obtained using the specification based on trimesters (0.18). Consistent with our previous findings, we also find no effect for males using the specification based on weeks in utero in Israel. The effect on high school completion has the same pattern, where females arriving in the first trimester have an eight percentage point higher probability of completing high school. The average rate of high school completion among females in the third-trimester group is 89%; therefore, this absolute gain implies an 8% increase. This effect is similar to the effect of moving out of disadvantaged neighbourhoods in Chicago for children aged 7 to 12 found by Chyn (2018) for boys and girls together.[28]

Performance in matriculation exams among females is also improved by immigrating in-utero earlier. For example, immigrating in the first trimester compared to immigrating in the third trimester increases the matriculation rate by 20 percentage points (s.e.=0.100)—an improvement of about 66% relative to the mean of 31% for the third-trimester group. This gain amounts to 50% of the matriculation gap between non-Ethiopian Israeli Jewish females and Ethiopian immigrant females. This effect size is larger than attending a high versus low-quality primary school among Ethiopian students in Israel (Gould et al., 2004). Indeed, it is even larger than being exposed at age 15-16 to a large increase in the rate of return to schooling (Abramitzky and Lavy, 2014).

The above gains are accompanied by improvements in other measures relating to the high school matriculation study program's quality, as shown in columns 7 through 12. Females who arrived in the first trimester earned about five more matriculation credit units (s.e.=1.686)

[28] Our estimated effect is also similar to findings of other studies that estimated the effect of prenatal conditions on cognitive outcomes of females. For example, Field et al. (2009) find that intensive iodine supplementation for pregnant women in Tanzania increased schooling by half a year, a 6% increase. Almond (2006) found that prenatal exposure to an influenza pandemic reduced schooling by 0.25 years (2.3% relative to an average of 10.6 years of schooling), and the likelihood of completing high school by 0.03 percentage points (6% relative to an average rate of 48%).

than females who arrived in the third trimester, which is nearly a 50% increase. Credit units in math and English rose by about 0.8 and 1 units, respectively, implying gains of about 80% and 50%. These are considerable and important quality gains. Estimates for arrival in the second trimester relative to the third on the quality of the matriculation diploma are positive and significant (except for math credit units). While these are smaller than the first-trimester effect, we cannot reject the hypothesis of equality of coefficients in this subset of outcomes. Estimates for weeks of exposure are highly consistent with the pattern obtained by trimesters showing that each additional week in-utero of exposure to the Israeli conditions is associated with a gain of 0.16 in total matriculation credit units (s.e.=0.067) and 0.026 (s.e.=0.010) and 0.031 (s.e.=0.013) credit units in math and English, respectively.

Differences in the magnitude of the estimated effects between females and males all point to the same pattern: immigrating to a high-income country in utero at earlier stages of gestation dramatically improves females' outcomes but has no beneficial effects for males. This pattern is similar to findings from previous studies that examined the effects of in-utero and early childhood positive shocks.[29]

5.2 Early Adulthood Outcomes

Tables 5 and 6 present estimates for longer-term outcomes, following the same structure as Table 4. Table 5 reports the results for post-secondary education by 2020 and marriage and childbearing status by ages 21 and 26. We focus on marital and fertility status at two points in life: (1) an early age, i.e., 21, and (2) at the latest age available in our data, i.e., 26.

Females who immigrated in-utero at earlier stages of pregnancy are more likely to obtain a post-secondary degree. Immigrating in the first trimester increases the likelihood of obtaining any post-secondary degree by 23 percentage points (s.e.=0.078) and a BA degree by 19 percentage points (s.e.=0.074) compared to immigrating in the third trimester. The impact is also larger than the impact of various educational interventions in primary or secondary schools implemented in Israel. For example, they are larger than the effect of providing free school choice to middle school students (Lavy, 2020a) or paying teachers based on their students' performance (Lavy, 2020b). Alternatively, each week in-utero in Israel increases the likelihood

[29] See Field et al. (2009),Maccini and Yang (2009), Brown et al. (2019), Adhvaryu et al. (2019).

of obtaining any post-secondary degree by 0.8 percentage points (s.e.=0.003) and a BA degree by 0.7 percentage points (s.e.=0.003). There is no effect on the likelihood of being married or having children by age 21 or 26. However, it is worth noting that the decline in the probability of having children by age 21 or 26 for women who immigrated in-utero at an early stage of the pregnancy compared to women who immigrated in-utero at a later stage of the pregnancy is relatively large but with large standard errors.

Estimates for males on post-secondary schooling are small and insignificant and are statistically different from the estimated positive effects for females. There are also no effects on marriage and fertility and in this case, we cannot reject the hypothesis that estimates for males are equal to those for females.

Table 6 reports the results for labour market outcomes, including employment, number of months worked annual earnings, and monthly earnings. Since we observe labour market outcomes in each age from 23 to 27 for each individual, we estimate equations (1) and (2) using a pooled sample where each individual appears five times. Hence, we add to equations (1) and (2) age fixed effects and cluster the standard errors at the individual level.

The estimated effects on labour market outcomes for females are also large but noisier. Even though most of them are not statistically significant, they all point in the same direction suggesting that females who arrived earlier in utero have better labor market outcomes relative to those who arrived at a later stage.[30] Note that we obtained similar and more precise estimates when we include twins in the sample (see Online Appendix Table A1). For this sample, we obtain significant positive effects for most females' labour market outcomes.

For males, we do not observe sizable or significant differences in any of the post-secondary schooling or labour market outcomes examined. It is important to note that a significant proportion of individuals in our sample are likely to enter the labour market at these ages immediately following the compulsory military service, which typically lasts for an average of three years for males and two years for females. Consequently, we might not observe full-time employment and earnings, particularly for men. Therefore, our findings on labour market outcomes should be interpreted with caution.

[30] The results are similar when including self-employed individuals (see Table A4 in the online appendix).

5.3 Early Life Health Outcomes and Short-Term Effects on Test Scores and Own Behaviour

To further assess the impact of immigration in utero from a low-income country to a high-income country, we also examine two early life health outcomes: birth weight and child mortality. Table 7 presents estimates of the treatment effect on birth weight (measured in grams), on the probability of low birth weight (less than 2,500 grams), and child mortality (under age 6) estimating equations 1 and 2.[31] The estimates on birth weight for females are relatively large in magnitude, but they also have large standard errors, so we cannot reject the null of a zero effect. They also have inconsistent signs across outcomes. Estimates for males show some positive effects on birth weight and a negative effect on low birth weight for immigrating in the second trimester but no significant effects from the first trimester. A possible reason for the non-significant birth weight results could be a lack of power since our sample is relatively small. Previous studies that found effects on birth weight (e.g., Almond and Mazumder, 2011, Bozzoli and Quintana-Domeque, 2014, Black et al., 2016 and Persson and Rossin-Slater, 2018) report an effect size in the range of 10–30 grams. To detect such an effect (given the standard deviation of birth weight), we would need a sample of more than 6,600 children.[32] The effect examined in our study might be larger than in the cited studies since exposure to better conditions lasted for a more extended period and included a broader set of inputs.

The second health outcome we examine is child mortality (under age 6). The results reported in columns 5 and 6 show no effect of immigration in utero to Israel on child mortality. However, we are cautious with any firm statement about the effect on mortality because we might lack the power to detect such effects.

We also examine the impacts of mid-term outcomes based on test scores and behavioral outcomes collected for a representative sample of elementary and middle school students. Our analysis is limited with these data since we do not have information on the Operation Moses

[31]The sample size for the birth weight outcomes is smaller since there are a few observations with missing values for birth weight (1.5%). We found no correlation between missing birth weight and the three trimester-group indicators or the weeks in-utero in Israel, suggesting that these missing values are unlikely to affect our results. Moreover, replicating Tables 4–6 while excluding these observations from the sample does change our results (these estimates are available upon request)

[32]We compute the expected sample size needed to detect an increase of 30 grams based on the mean of the third trimester (3,027 grams) and the standard deviation of residualized birth weight (435 grams) of the Operation Solomon sample, where residuals come from a regression of birth weight on the list of controls included in equation (1). We take α=0.05 and power=0.8.

cohorts, and not all students were sampled. We discuss the data construction and the empirical analysis in Online Appendix C and report the results in Online Appendix Table A16. Consistent with our previous results, we find that immigration to Israel at earlier stages of pregnancy had beneficial effects on students' test scores and behavioral outcomes, mainly for girls.

5.4 Gender Differences

Our analysis reveals a significant difference by gender in the effects of length of exposure to the Israeli environment in utero on long-term outcomes, where girls benefited from the extended exposure but boys did not.

To address the issue of multiple hypothesis testing, summarize our findings, and increase precision, we also estimate equations (1) and (2) using as dependent variables three indexes that summarize high school outcomes, labor market outcomes, and early life health outcomes. To construct the indexes, we converted all outcomes into z-scores by gender and computed three indexes based on the standardized mean of the z-scores in that domain.[33] The high school index includes all high-school outcomes reported in Table 4. The labour market index includes all labour market outcomes reported in Table 6, and the early life health index summarizes all health outcomes reported in Table 7. Estimates reported in Table A5 in the Online Appendix strengthen our results. In particular, they show that the positive effect of immigration in-utero among females is unlikely by chance. Furthermore, despite the increase in precision, we do not find beneficial impacts for males on high school performance or labour market outcomes. The only exception is some suggestive evidence for beneficial effects for males in early life health manifested by positive estimates observed for the first and the second trimester and the marginally significant effect of weeks in utero (t=1.57).

In Table A6 in the Online Appendix, we provide an additional piece of evidence strengthening the causal interpretation of our DID estimates. The table reports controlled differences in high school outcomes between Operation Solomon and Operation Moses children who were conceived in the same trimesters. The table shows a clear pattern that explains our main results: females who immigrated in-utero during the third trimester during Operation Solomon

[33] For consistency, the outcomes low birth weight and child mortality were converted to indicators for birth weight greater than 2,500 grams and an indicator for survival by age 6.

have lower high school achievement compared to females who were born at the same time to Operation Moses parents (and were conceived in Israel). However, females who immigrated in-utero at an earlier stage of the pregnancy and spent more time in-utero in Israel succeeded in closing the gap with Operation Moses females. For males, there are no differences in outcomes between Operation Solomon and Operation Moses children who were born at the same time.

The fact that there are no differences in long-term human capital outcomes between males who were conceived in Israel and males who arrived in utero at different stages of pregnancy, while we do see some indication of an advantage in early health outcomes among males who immigrated at an earlier pregnancy stage, suggests that perhaps parents of boys who arrived to Israel at a later stage of pregnancy compensated their initial disadvantage after birth. In contrast, no equivalent compensation was performed by parents of girls. These findings could provide a possible explanation for the heterogeneity in the effects on long-term outcomes by gender. If Ethiopian immigrants have a strong preference for boys versus girls, then the male fetus would benefit relatively little (or not at all) from immigration in-utero to Israel. In contrast, females would extract larger benefits (especially those migrating earlier in pregnancy).

We lack data to examine son preferences among Ethiopian immigrants but using the earliest data from the Demographic Health Survey (DHS) conducted in 2000, we find that the desired male-female ratio reported by mothers is about 1.2, on average. Moreover, about 26 percent of the mothers reported an ideal number of boys that is larger than the ideal number of girls, while only 9 percent reported an ideal number of girls that is larger than the ideal number of boys. To further explore the existence of son preferences in Ethiopia, we perform an analysis similar to Barcellos et al. (2014) focusing on children aged 0 to 15 months. Our analysis (not reported here to save space) shows that boys are breastfed for longer than girls.[34] We do not observe evidence for son preference when examining sex ratios or the likelihood of having additional children as a

[34] We do not find any gender differences in the probability of receiving vitamin A supplements, having a vaccination card, or the number of immunizations. However, these outcomes are more likely to depend on the expansion of child health care services over time rather than solely parental decisions. In this regard, we note that the National Family and Fertility Survey Report of 1990 of Ethiopia reports a higher coverage in immunization for boys relative to girls, where about 37 percent of boys and 31 percent of girls have been fully immunized in 1990. Also, while there are no gender differences in the first dose of Polio and DPT among those who have a vaccination card, there are marked gender gaps in the second and the third dose. For example, among those having a health card, 69.5 percent of boys received the second dose of DPT, while the equivalent for girls is 62.8. The percentages for the third dose of DPT are 54.4 and 46.8 respectively (see Table 9.7 of the report: http://www.statsethiopia.gov.et/wp-content/uploads/2019/06/Family-Fertility-Survey-1990.pdf).

function of the sex composition of previous children based on our data on Ethiopian immigrants or the DHS data.[35]. But this result is expected given the high fertility rates and limited access to contraceptive methods among Ethiopian women. Son preference in high fertility societies mainly manifests in parental treatment after birth or stated sex preferences rather than fertility behavior.[36]

Our findings are consistent with Maccini and Yang (2009), who show that higher early-life rainfall leads to improved health, schooling, and socioeconomic status for women, implying an existing gender bias in the allocation of nutrition and other resources. Other studies on the effects of early childhood environmental conditions also show that girls and boys may respond differently, usually finding a larger impact on females than males (Kling et al., 2007, Gould et al., 2011, Sanbonmatsu et al., 2012, Ludwig et al., 2013).[37] Studies on the impact of age on immigration find either similar or stronger effects for females than males (Böhlmark, 2008, Van den Berg et al., 2014, Lemmermann and Riphahn, 2018).

Gender differences could also be explained by biological factors, as cited in the medical literature which highlights gender differences in the fetus that impart vulnerability or protection to the developing nervous system (see, e.g., Kraemer, 2000 and DiPietro and Voegtline, 2017). According to DiPietro and Voegtline (2017), converging evidence confirms that infant and early childhood developmental outcomes of male fetuses exposed to prenatal and perinatal adversities are more highly impaired than those of female fetuses. In contrast, most studies on positive shocks find larger benefits for females.[38] There are also studies on prenatal conditions

[35]Sex ratios at birth of children born in the past 12 months in rural areas reported at the Family Fertility Survey of 1990 are also within the normal range (National Family and Fertility Survey Report, 1990: `http://www.statsethiopia.gov.et/wp-content/uploads/2019/06/Family-Fertility-Survey-1990.pdf`)

[36]Son preference in Ethiopia is also documented by the DHS report on gender preferences in 40 countries, which uses the 2005 Ethiopian survey (see e.g. DHS, 2008). Other studies that point to son preferences in Ethiopia are Short and Kiros (2002) who analyze son preferences using data from the National Family and Fertility Survey conducted in Ethiopia in 1990 and by Koohi-Kamali (2008), who analyzed patterns of household consumption based on data from 2005. Ethiopia also scores low on various measures of gender equality, with a ranking of 141 out of 143 countries in the gender development index of 1998 (Human Development Report 2000: `https://hdr.undp.org/content/human-development-report-2000)`.

[37]Other studies include Hoynes et al. (2016), who find that increasing family resources during early childhood improves health in adulthood for both men and women but has a significant positive effect on economic self-sufficiency only for women. Brown et al. (2019) examine the long-term impacts of childhood Medicaid eligibility expansion on outcomes in adulthood and show stronger and larger effects on fertility and wages for females.

[38]For example, Field et al. (2009) and Adhvaryu et al. (2019) provide evidence for biological factors by showing that exposure in utero to iodine fortification results in better educational and labour market outcomes for women than for males.

that find no differences by gender (e.g., Currie and Schwandt, 2013 and Black et al., 2019) or even larger benefits for boys (e.g., Venkataramani, 2012). However, they focus on different shocks than those examined in this paper, such as exposure to radioactive fallout, flu, or malaria, respectively.

6 Measurement Issues

The treatment definition in our analysis is based solely on the birth date relative to the immigration date because we do not have data on clinical pregnancy records. Hence, we do not know if an individual was born preterm and do not observe miscarriages or stillbirths. In this section, we examine the sensitivity of our results to these data limitations.

6.1 Preterm Births

Since we do not observe the date of conception, we may assign the wrong trimester to children who were born preterm, or may refer to children who were born at the same week but at a different gestational age as equally treated. This is a concern if misclassification of preterm births is more likely in a particular trimester or week. To examine the robustness of our results to a possible misclassification due to preterm births, we re-estimate equations (1) and (2) but exclude children with very low birth weight ($<$2,500gr), which are more likely to have been born prematurely. The results based on this 'trimmed' sample (reported in Appendix Table A7) are very similar to our main results. Note that we are trimming the sample based on an outcome, so the results should only be seen as indicative of the robustness of our main results.

A second related concern is that children who were conceived in Israel and born preterm could be included in our sample and be classified as if they immigrated in-utero at an early stage of the pregnancy. These children are more likely to have been born in late January or early February 1992. We examine this issue by estimating equation (1) looking separately for the effect in each of the months of the first trimester (Columns 1—4 and 6—9 in Table A8 in the Online Appendix) and by estimating equation (2) excluding from the sample all the children who were born between January 15 and February 15 (Columns 5 and 10 in Table A8 in the Online Appendix). The results show that the positive effects of immigrating in-utero at an earlier stage of the pregnancy for females do not only stem from individuals who are classified as immigrating in-utero during the first month of pregnancy, thus alleviating the concern that our results are driven by individuals who were conceived in Israel but were born preterm.

We perform one additional test to assess the robustness of our results to misclassification of births by re-estimating equation (1) after imposing alternative restrictions on the sample. Given that our findings indicate an effect on females and not on males, and to save space, we report here the results for females. We experiment with various sample restrictions. First, we exclude from the sample cases where arrival was during the first two weeks of each trimester and the equivalent individuals from the comparison group who were born on the same dates (see Online Appendix Table A9). We thus exclude cases of possible late-term or post-term births. Next, we exclude cases where the date of immigration was during the last two weeks of each trimester and individuals from the comparison group who were born at the same dates. This restriction reduces the likelihood of misclassifying preterm births (see Online Appendix Table A10). Last, we re-assign births where arrival to Israel was in the first (last) two weeks of each trimester to the previous (next) trimester and re-assign the individuals in the comparison group accordingly (see Online Appendix Table A11). Overall, the estimates from these modified samples are very similar to the results obtained from the baseline sample. Our conclusion from this evidence is that our results are not driven by the misclassification of gestational age upon immigration.

6.2 Miscarriages or Stillbirths

Another concern is that we do not observe in our data miscarriages or stillbirths. If these events are more likely among mothers who arrived in Israel during the earlier stage of the pregnancy, our results might be biased upward. Medical research suggests that the first weeks (or first trimester) pregnancies are at higher risk for miscarriage than more progressed pregnancies to stress and traumatic events (Maconochie et al., 2007). The migration event itself likely led to stress among pregnant women, potentially leading to miscarriages among pregnant women in the first trimester.

While we do not have data on miscarriages, we follow several papers by examining the sex ratio as a signal of changes to miscarriage rates (e.g., Sanders and Stoecker, 2015 and Persson and Rossin-Slater, 2018). Males are more likely to be miscarried or die prematurely in hard times. Therefore, the existence of more miscarriages and stillbirths among mothers who arrived at the beginning of the pregnancy would lead to a lower sex ratio (males relative to females) in the first-trimester relative to the other two trimesters or a lower sex ratio among individuals who spent more weeks in utero in Israel relative to individuals who spent fewer weeks in utero in Israel. However, as we discussed in section 4.2, children's sex ratios at birth are similar across trimesters and do not correlate with the number of weeks in-utero in Israel. Also, as noted above in Figures 4 and 5, there are no significant differences in the share of births by calendar week between our primary analysis sample and the two comparison groups. Last, we claim that, if anything, the better environmental conditions upon arrival in Israel should have lowered the incidence of miscarriage among women who arrived at earlier stages of pregnancy relative to those who arrived at a later stage. This would lead to the inclusion of more marginal children born to mothers who arrived in the first trimester, which would work against finding a positive effect on longer-term outcomes.

7 Alternative Interpretations and Placebo Test

7.1 Alternative Interpretations

Our results show that individuals, particularly females, whose mothers arrived in Israel at earlier stages of pregnancy have better outcomes relative to those whose mothers arrived at more advanced pregnancy stages. We interpret this as a positive impact of immigration from a disadvantaged area to a more advantaged one. In this section, we provide evidence to rule out other interpretations.

7.1.1 Age for Grade Effect

As discussed in Section 4.1, the main concern is that our findings are confounded by the effect of being among the older students in the class and not the effect of immigrating in-utero at earlier gestational age to a developed country. To net out any potential bias due to age-for-grade effect, seasonality, or cohort effects, we use two comparison groups and estimate our main model in a DID framework. The comparison groups are expected to net out these effects if they provide a good counterfactual for differences in outcomes by date of birth of Operation

Solomon children. As discussed above, this assumption seems plausible given the similar background between the treated and comparison groups and the absence of differential selection in background characteristics by date of birth between the two groups.

Table A12 in the Online Appendix provides further evidence justifying the use of Operation Moses offspring to net out possible age-for-grade effects. Columns 1—2 of Table A12 examine differences in school entry age by trimesters or weeks-in-utero upon immigration for the Operation Solomon sample after controlling for the same background characteristics used for our main results. The estimates show that, indeed, both females (Panel A) and males (Panel B) who immigrated in-utero earlier start first grade at an older age. Columns 3—4 of Table A12, report DID estimates of the same models after adding the Operation Moses sample. All estimates are small and statistically insignificant, both for females and males, showing no differences in the school entry age distribution between children of Operation Solomon and the comparison group.

As a last check to rule out age-for-grade effects, we also re-estimate our main models after controlling for age (in months) at the beginning of first grade. Estimates reported in Appendix Table A13 are virtually identical to our main results.[39]

7.1.2 Time in Israel

An alternative interpretation to our results is that mothers who arrived at an earlier stage of pregnancy had more time to adjust, prepare for birth, and build social networks that would help them care for their newborns. This explanation is unlikely because all Ethiopian immigrants were housed in absorption centres for at least 24 months upon arrival. In these centres, they received assistance from social and health workers and interacted with others. Therefore, we can safely assume that all women who gave birth within our nine-month window upon arrival in Israel received the same postnatal care and had similar social networks. To further rule out this alternative interpretation, we examine the association between child outcomes and the mother's length of residence in Israel following immigration (in weeks) when the child was born, using a sample of children conceived in Israel shortly after their mothers immigrated from Ethiopia.

[39] Note that the sample is slightly smaller since we do not observe school entrance age for individuals who died before age 6.

Specifically, we examine outcomes for children born to Operation Solomon's mothers between March 1992 to February 1993, which is 10 to 22 months after their mothers' arrival in Israel.[40]

Even if the timing of conception in this sample is not random, we believe that, if anything, the results should be biased upward since waiting to conceive until one has gained familiarity and experience with Israeli life might be positively correlated with better unobservables. The results are presented in Online Appendix Table A14. Columns 1 and 3 show results from OLS regressions of the outcome variables on the number of weeks since the mother immigrated to Israel that include only individuals who were born to Operation Solomon immigrants. Columns 2 and 4 show the results from a DID specification similar to equation (2), adding children from Operation Moses who were born at the same calendar dates. In all specifications, we also include the same controls as our baseline models. The evidence reported in this table shows that the mother's length of residence in Israel when the child was born is not associated with children's outcomes: the estimates are very small, varying in sign, and not statistically significant. Only 2 of the 18 estimates are statistically significant, having opposite signs than expected, showing negative associations between mothers' length of residence and (i) birth weight for males and (ii) likelihood of completing high school for females. Moreover, no effects are significant after adding the Operation Moses sample. This evidence mitigates concerns that our results are driven by the more extended residence in Israel of mothers who arrived during the first trimester of pregnancy.

7.1.3 Maternal Stress

The treatment effect can potentially embed also a differential impact of maternal stress due to immigration. Evidence from various studies suggests that stress during the early stages of pregnancy has more detrimental effects (Camacho, 2008, Mansour and Rees, 2012, Brown et al., 2014, Quintana-Domeque and Ródenas-Serrano, 2017). This finding works against finding any beneficial effect of early exposure to the Israeli environment. In contrast, Currie et al. (2020) examine the impact of stress due to exposure to physical assault and find that it is more detrimental when occurring during the third trimester. Overall, it is not clear a priori how stress

[40] We include in this sample only children conceived less than a year after the immigration date to ensure that the mothers were still in absorption centres during the pregnancy, and therefore received similar prenatal care.

due to immigration could differentially affect individuals whose mothers were at different stages of pregnancy. In this respect, our setup is subject to the same concern that could arise in any study that examines the effect of age at immigration, where the estimated effects can potentially embed also a differential effect of stress at immigration by age.

7.2 Placebo Test

To test our research design's validity, we estimate the model based on a placebo treatment sample. We consider the following placebo treatment: immigration to Israel at the same time as Operation Solomon, but from a developed country where in-utero conditions were similar to those in Israel. The immigrants to Israel from the Former Soviet Union (FSU) in 1991—1992 form an appropriate sample for such a placebo estimation. In-utero conditions in the Soviet Union (especially in areas where the immigrants lived) were relatively similar to those in Israel.[41] In addition, parental background characteristics among FSU immigrants are similar to those of the Israeli native population. For example, the average parental years of schooling among FSU immigrants was about 11 years, close to the relevant Israeli population's respective mean. Therefore, we expect to find no effect of treatment defined by the length of gestation in Israel.

For this placebo test, we used data from the remotely accessed research lab of the Ministry of Education. The sample we use includes all children whose mothers were pregnant upon arrival in Israel from the FSU in 1990–1992. The data includes all high school outcomes and students' demographics. We follow the same definition of treatment groups and compute the gestational age at immigration as the difference between the mother's immigration date and the child's birth date, subtracted from 40.[42] The immigration from FSU was a steady flow over few years. Therefore, we cannot define the treatment group relative to a single specific immigration

[41] More than 80% of the FSU immigrants came from the previous Soviet European republics, mainly Russia and Ukraine, primarily from urban areas (Israel CBS, 2001). Infant and child mortality rates in these areas were 2% and 2.3% respectively (versus 1% and 1.2% in Israel and 12% and 20% in Ethiopia). Prenatal care in these countries was also relatively similar to that in Israel (The World Bank, 1991). Until the fall of the Soviet Union, salt was routinely iodized by government policy (van der Haar et al., 2011). Also, while anemia in pregnant women has increased significantly in the former Soviet Union, this change happened only after the collapse of the Soviet Union (Sedik et al., 2003).

[42] Because we only have administrative data from the Ministry of Education for the former Soviet Union sample, we cannot use the richer set of covariates that we used for the Ethiopian sample. Nevertheless, we find no evidence for differential selection according gestational age at time of immigration in any of the available covariates. It is then reasonable to assume that selection in other unobserved characteristics is also unlikely.

date. We do, however, control for cohort and month of birth effects in this sample.

Online Appendix Table A15 presents estimates of the high school outcomes regressed on the trimester indicators while controlling for year and birth-month fixed effects, parents' schooling, and the number of siblings. The results show no evidence for the beneficial effects of earlier exposure to the Israeli environment. Estimates for treatment effects of the first and second trimester are small and insignificant for both genders despite being more precisely measured relative to the results obtained for Ethiopian immigrants (except for one significant outcome for boys for the second trimester). The null effects reported in this table mitigate the concern that our results embed also differential effects of maternal stress due to immigration at different stages of pregnancy as long as immigration was also a stressful event for FSU pregnant women.

8 Conclusions

This paper shows that the benefits of growing up in a better place start exceptionally early when individuals are still in utero. We document this by examining the impact of gestational age at the time of immigration from a developing country to a developed country on a wide range of childhood and early adulthood outcomes. To isolate causality, we exploit exogenous variation in environmental conditions in utero caused by the sudden immigration of Ethiopian Jews to Israel in May 1991. Individuals in utero on immigration date were exposed to better environmental conditions regarding nutrition, access to health care services, and living standards as they arrived in Israel.

The results suggest that females whose mothers immigrated to a high-income country from a low-income country at an earlier stage of pregnancy had substantially improved educational outcomes throughout schooling stages relative to those who immigrated at later stages of pregnancy. The improvements are evident in lower grade repetition and dropout rates, a higher matriculation rate, and a higher quality matriculation diploma. These effects persist into early adulthood and manifest in obtaining post-secondary education and some suggestive evidence for better labour market outcomes, in particular, as measured by the number of months worked (although individuals are still too young to observe the full realization of labour market outcomes). For males, however, we find no benefits for immigration in utero earlier.

Our findings align with prior studies that highlight the significance of early-life conditions, indicating greater impacts on females. We contribute to this literature by showing that this is also true for improvements in in-utero conditions. This paper adds to the growing economic literature investigating the effect of "place" by providing compelling evidence from an unusual natural experiment. To the best of our knowledge, this is the first paper that estimates the effect of moving from a disadvantaged place, especially an impoverished African country, to an advantaged location in a Western economy, even before birth. The implications of these findings are relevant for many industrialized countries that experience large immigration waves from developing countries.

Our findings show that immigration to a developed country, even in-utero, at an earlier stage of the pregnancy has large and important benefits for female offsprings that persist beyond childhood and are reflected in human capital accumulation in the long run.

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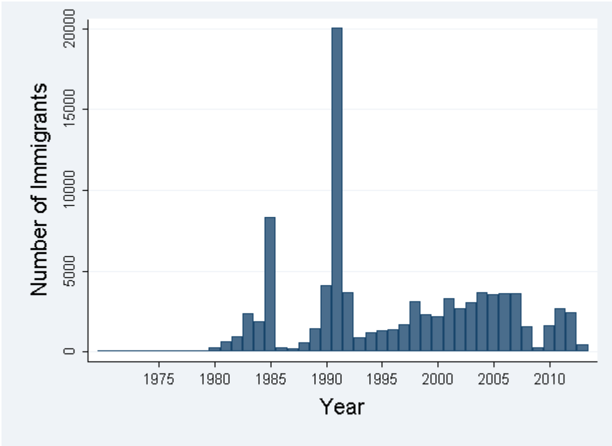
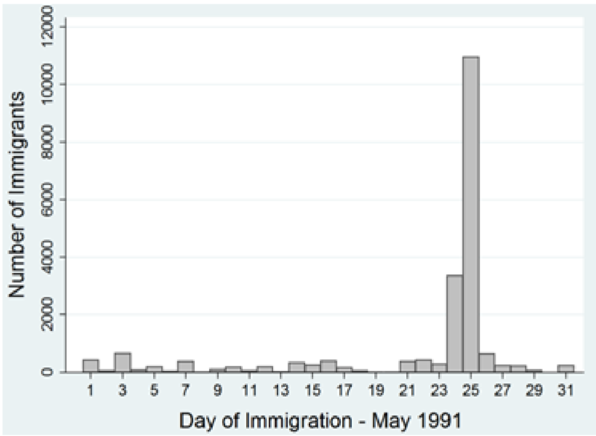
Figure 1: Immigration of Ethiopian Jews to Israel, 1975–2010



Notes: Distribution of Ethiopian immigrants to Israel by year. Source: CBS.

Figure 2: Immigration of Ethiopian Jews to Israel, May 1991



Notes: Distribution of Ethiopian immigrants to Israel in May 1991 by date. Source: CBS.

Figure 3: Definition of the Three Trimester Groups

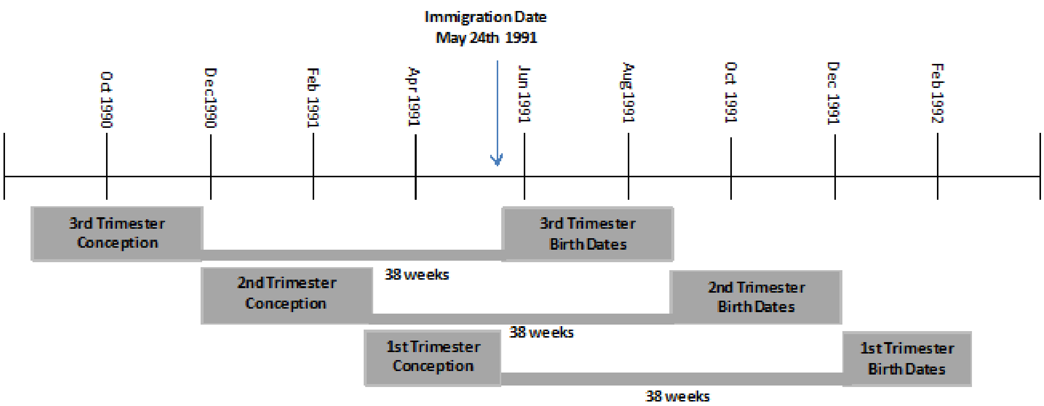
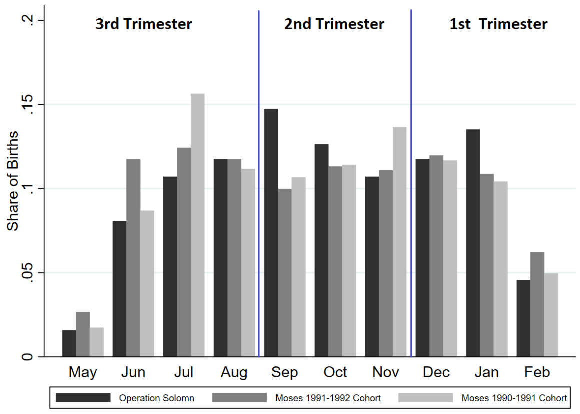
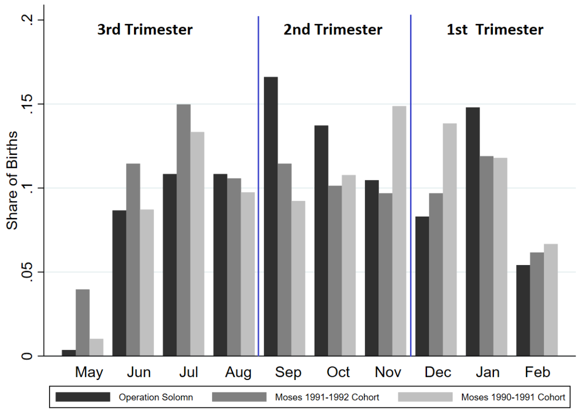


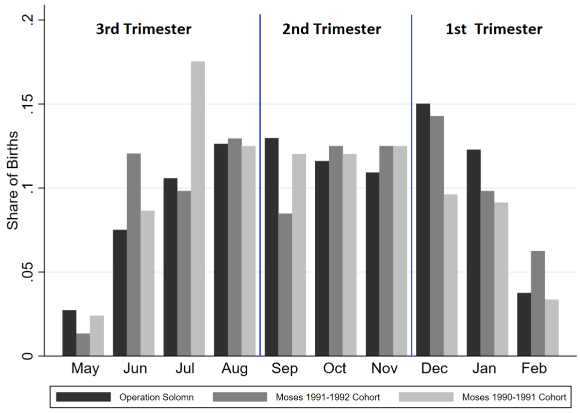
Figure 4: Birth Distribution of the Main Sample and the Comparison Group



(a) All



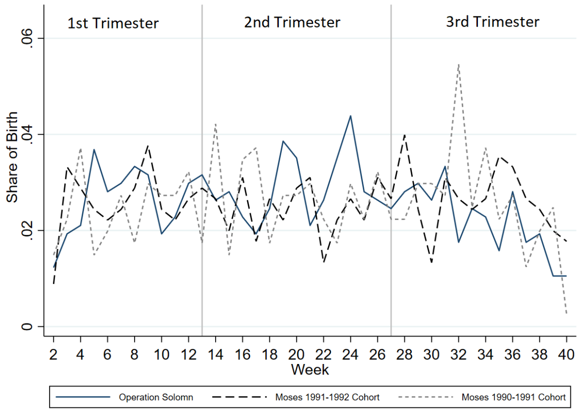
(b) Females



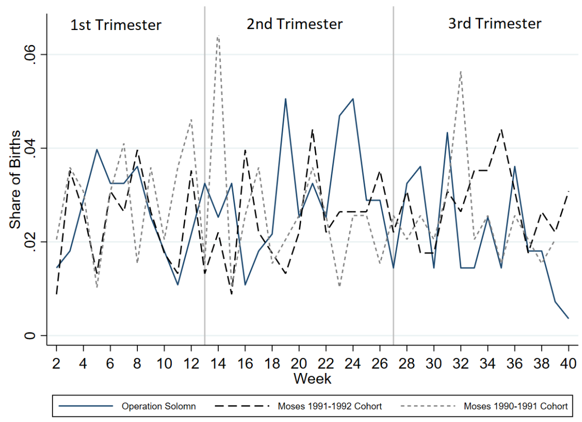
(c) Males

Notes: The figure reports the share of births (from the total number of births during that 9 months period) by month of birth for the main analysis sample (Operation Solomon children) and the comparison group. Vertical lines denote the trimester groups by month of birth. The comparison group comprises second-generation Ethiopian immigrants whose families arrived in Israel before 1989 (in Operation Moses). The Moses 1991-1992 Cohort includes 451 individuals born between May 27, 1991 and February 15, 1992. The Moses 1990-1991 Cohort includes 403 individuals born between May 27, 1990 and February 15, 1991.

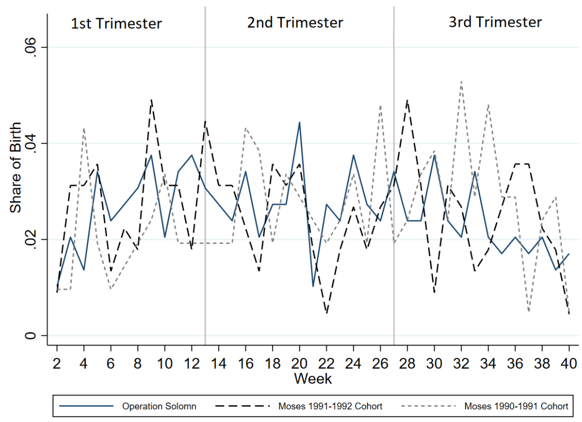
Figure 5: Share of Children by Gestational Week on Date of Immigration (May 24 or 25, 1991) for the Main Sample and by Equivalent Birth Date for the Comparison Group



(a) All



(b) Females



(c) Males

Notes: The figure plots the birth distribution of the main analysis sample and the comparison group. Births of the Operation Solomon sample are grouped by estimated gestational week upon immigration to Israel. Births of the comparison sample are grouped by estimated gestational week on May 25. The vertical lines denote the trimester cutoffs. The comparison group comprises second-generation Ethiopian immigrants whose families arrived in Israel before 1989 (in Operation Moses). The Moses 1991-1992 Cohort includes 451 individuals born between May 27, 1991 and February 15, 1992. The Moses 1990-1991 Cohort includes 403 individuals born between May 27, 1990 and February 15, 1991.

Table 1: Descriptive Statistics: Background Characteristics

	Operation Solomon			Moses 1991-1992 Cohort			Moses 1990-1991 Cohort		
	All	Females	Males	All	Females	Males	All	Females	Males
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Mother's age at birth	30.55	30.55	30.54	28.81	29.25	28.37	28.18	28.22	28.13
	[8.887]	[8.924]	[8.868]	[7.022]	[6.905]	[7.127]	[6.866]	[6.644]	[7.083]
Father's age at birth	41.48	41.27	41.68	35.79	36.13	35.44	36.00	35.61	36.36
	[12.16]	[12.19]	[12.16]	[9.412]	[9.428]	[9.404]	[9.494]	[8.897]	[10.03]
Mother's age at first birth	23.04	22.91	23.17	21.34	21.54	21.13	21.40	21.47	21.34
	[5.415]	[5.505]	[5.335]	[4.140]	[4.225]	[4.051]	[4.373]	[4.034]	[4.677]
Parents' age gap	10.94	10.71	11.14	6.978	6.885	7.071	7.819	7.385	8.226
	[7.384]	[7.389]	[7.385]	[5.827]	[5.818]	[5.847]	[6.302]	[5.955]	[6.599]
Number of siblings	5.304	5.318	5.290	4.350	4.282	4.420	4.221	4.123	4.313
	[1.913]	[1.965]	[1.866]	[1.863]	[1.912]	[1.815]	[1.961]	[1.981]	[1.942]
Birth order	3.658	3.671	3.645	3.406	3.374	3.438	3.189	3.179	3.197
	[2.207]	[2.159]	[2.254]	[1.902]	[1.911]	[1.898]	[1.767]	[1.745]	[1.792]
Birth spacing (years to the next birth)	2.565	2.573	2.559	2.926	2.811	3.042	3.397	3.447	3.349
	[2.187]	[2.263]	[2.116]	[2.803]	[2.707]	[2.898]	[3.125]	[3.332]	[2.926]
Father's years of schooling	1.316	1.509	1.133	4.016	4.115	3.915	3.494	3.559	3.433
	[3.097]	[3.319]	[2.864]	[5.300]	[5.374]	[5.234]	[5.110]	[5.169]	[5.066]
Mother's years of schooling	1.433	1.560	1.314	3.867	3.890	3.844	3.449	3.677	3.236
	[3.275]	[3.312]	[3.241]	[5.027]	[4.979]	[5.086]	[4.886]	[4.952]	[4.826]
Family income (NIS), 1995	16,280	16,035	16,512	47,211	49,781	44,606	46,621	48,477	44,882
	[14,336]	[14,223]	[14,461]	[33,946]	[37,156]	[30,210]	[40,374]	[43,513]	[37,214]
Family income (NIS), 2000	26,575	27,767	25,449	70,488	74,264	66,662	70,568	74,498	66,883
	[31,320]	[31,142]	[31,499]	[54,739]	[58,811]	[50,119]	[59,883]	[64,795]	[54,783]
SES of the mother's first locality of residence upon immigration	-0.028	-0.037	-0.020	-0.009	-0.012	-0.006	-0.067	-0.049	-0.085
	[0.543]	[0.526]	[0.560]	[0.553]	[0.541]	[0.565]	[0.491]	[0.486]	[0.495]
Observations	570	277	293	451	227	224	403	195	208

Notes: The table reports means and standard deviations (in brackets) of background characteristics for individuals in our sample by group and gender. Individuals in the Operation Solomon group were born in Israel between May 27, 1991, and February 15, 1992 and their parents immigrated in Operation Solomon (May 24-25, 1991). Individuals in the Moses 1991-1992 Cohort group were born in Israel between May 27, 1991, and February 15, 1992 and their parents immigrated in Operation Moses (before 1989). Individuals in the Moses 1990-1991 Cohort group were born in Israel between May 27, 1990, and February 15, 1991 and their parents immigrated in Operation Moses (before 1989). Family income is measured in Shekels in nominal terms. SES is a socio-economic index of Israeli localities based on several demographic and economic variables, including dependency ratio, average years of schooling in the adult population, percentage of academic degree holders, employment and income levels, etc. Lower values correspond to lower socio-economic status.

Table 2: Means and Standard Deviations of Outcome Variables

	Operation Solomon			Moses 1991-1992 Cohort			Moses 1990-1991 Cohort		
	All	Females	Males	All	Females	Males	All	Females	Males
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A. Early Life Health Outcomes									
Birth weight (*gr*)	3,099	3,043	3,152	3,130	3,111	3,149	3,142	3,091	3,190
	[460.2]	[479.2]	[435.5]	[540.6]	[520.8]	[560.6]	[513.3]	[477.3]	[541.4]
Low birth weight (<2500 *gr*)	0.075	0.091	0.059	0.087	0.067	0.108	0.076	0.094	0.058
	[0.263]	[0.288]	[0.236]	[0.283]	[0.250]	[0.311]	[0.265]	[0.293]	[0.235]
Child mortality (by age 6)	0.012	0.011	0.014	0.009	0.004	0.013	0.015	0.005	0.024
	[0.110]	[0.104]	[0.116]	[0.094]	[0.066]	[0.115]	[0.121]	[0.072]	[0.154]
B. High School Outcomes									
No grade repetition	0.807	0.884	0.734	0.827	0.907	0.746	0.809	0.908	0.716
(6th–12th grade)	[0.395]	[0.320]	[0.443]	[0.379]	[0.290]	[0.437]	[0.394]	[0.290]	[0.452]
Completed 12th grade	0.851	0.921	0.785	0.878	0.947	0.808	0.846	0.928	0.769
	[0.357]	[0.271]	[0.412]	[0.328]	[0.224]	[0.395]	[0.361]	[0.259]	[0.422]
Obtained a matriculation	0.300	0.397	0.208	0.359	0.463	0.254	0.345	0.472	0.226
diploma	[0.459]	[0.490]	[0.407]	[0.480]	[0.500]	[0.437]	[0.476]	[0.500]	[0.419]
Total matriculation units	11.30	14.18	8.573	12.95	16.00	9.871	12.04	15.62	8.697
	[11.04]	[10.97]	[10.42]	[10.88]	[10.50]	[10.40]	[11.16]	[10.87]	[10.37]
Math matriculation	1.258	1.520	1.010	1.483	1.841	1.121	1.449	1.923	1.005
units (0 to 5)	[1.509]	[1.545]	[1.432]	[1.507]	[1.538]	[1.388]	[1.597]	[1.627]	[1.436]
English matriculation	1.949	2.422	1.502	2.399	2.916	1.875	2.174	2.733	1.649
units (0 to 5)	[1.880]	[1.827]	[1.822]	[1.910]	[1.749]	[1.927]	[1.961]	[1.929]	[1.846]
C. Long-Term Human Capital Outcomes									
Post-secondary Education									
Any post-secondary diploma	0.183	0.209	0.159	0.244	0.279	0.208	0.230	0.294	0.168
	[0.387]	[0.407]	[0.366]	[0.430]	[0.449]	[0.407]	[0.421]	[0.457]	[0.375]
At least Bachclor's degree	0.105	0.190	0.024	0.163	0.265	0.0588	0.154	0.273	0.0396
	[0.307]	[0.393]	[0.154]	[0.370]	[0.443]	[0.236]	[0.361]	[0.447]	[0.196]
Marriage and Childbearing by Age 21									
Married	0.005	0.007	0.003	0.002	0.004	0.000	0.007	0.015	0.000
	[0.072]	[0.085]	[0.058]	[0.047]	[0.066]	[0.000]	[0.086]	[0.123]	[0.000]
has children	0.017	0.032	0.003	0.011	0.022	0.000	0.010	0.015	0.005
	[0.131]	[0.178]	[0.058]	[0.105]	[0.147]	[0.000]	[0.099]	[0.123]	[0.069]
Marriage and Childbearing by Age 26									
Married	0.095	0.144	0.048	0.098	0.159	0.036	0.109	0.154	0.067
	[0.293]	[0.352]	[0.213]	[0.297]	[0.366]	[0.186]	[0.312]	[0.362]	[0.251]
has children	0.100	0.152	0.051	0.095	0.150	0.040	0.077	0.113	0.043
	[0.300]	[0.359]	[0.221]	[0.294]	[0.358]	[0.197]	[0.099]	[0.317]	[0.204]
Observations	570	277	293	451	227	224	403	195	208
Labor Market Outcomes Between Ages 23 and 27									
Employed	0.896	0.907	0.885	0.888	0.918	0.858	0.868	0.901	0.837
	[0.306]	[0.290)]	[0.319]	[0.315]	[0.274]	[0.349]	[0.338]	[0.299]	[0.369]
Total months worked	9.044	9.202	8.897	8.845	9.236	8.457	8.605	8.988	8.239
	[4.121]	[4.018]	[4.211]	[4.235]	[3.972]	[4.449]	[4.397]	[4.143]	[4.599]
Monthly earnings (NIS)	4,494	3,961	4,991	4,401	3,974	4,825	4,171	3,896	4,434
	[2,916]	[2,461]	[3,206]	[2,659]	[2,225]	[2,970]	[2,689]	[2,306]	[2,987]
Annual earnings (NIS)	47,552	42,089	52,653	46,472	42,255	50,650	44,137	41,513	46,641
	[32,227]	[27,455]	[35,374]	[32,907]	[27,342]	[37,162]	[32,559]	[28,722]	[35,676]
Observations	2,765	1,335	1,430	2,190	1,090	1,100	1,935	945	990

Notes: The table reports means and standard deviations (in brackets) of the outcome variables by group and gender. Individuals in the Operation Solomon group were born in Israel between May 27, 1991, and February 15, 1992 and their parents immigrated in Operation Solomon (May 24-25, 1991). Individuals in the Moses 1991-1992 Cohort group were born in Israel between May 27, 1991, and February 15, 1992 and their parents immigrated in Operation Moses (before 1989). Individuals in the Moses 1990-1991 Cohort group were born in Israel between May 27, 1990, and February 15, 1991 and their parents immigrated in Operation Moses (before 1989). Labor market outcomes between ages 23 and 27 are observed for each individual once at each age. We excluded 46 individuals who are self-employed workers since the information on working months is not reliable. Earnings are measured in Shekels in real terms.

Table 3: Differences in Observable Characteristics by the Timing of In-Utero Immigration

	Females					Males				
	1st Trim.	Difference (t-test)			Weeks In-	1st Trim.	Difference (t-test)			Weeks In-
	Mean, SD	1st-2nd	1st-3rd	2nd-3rd	Utero in Israel	Mean, SD	1st-2nd	1st-3rd	2nd-3rd	Utero in Israel
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Mother's age at birth	31.30	0.626	1.632	1.006	0.074	30.40	0.427	-0.937	-1.363	-0.038
	[9.735]	(1.539)	(1.460)	(1.090)	(0.047)	[9.832]	(1.032)	(1.293)	(1.235)	(0.049)
Father's age at birth	40.95	-0.649	-0.138	0.510	0.024	40.45	-1.792	-1.679	0.113	-0.044
	[12.47]	(2.071)	(2.124)	(1.696)	(0.072)	[12.71]	(1.352)	(1.592)	(1.516)	(0.063)
Mother's age at first birth	22.83	-0.379	0.300	0.679	0.018	23.79	1.063	0.641	-0.422	0.031
	[6.144]	(0.928)	(0.894)	(0.726)	(0.033)	[5.982]	(0.744)	(0.716)	(0.733)	(0.025)
Parents' age gap	9.649	-1.275	-1.770	-0.495	-0.050	10.05	-2.218***	-0.742	1.476	-0.006
	[6.368]	(0.872)	(1.113)	(1.018)	(0.040)	[6.423]	(0.773)	(0.887)	(0.913)	(0.037)
Number of siblings	5.273	-0.223	0.174	0.397*	0.008	5.365	0.241	-0.056	-0.297	-0.007
	[1.903]	(0.243)	(0.267)	(0.226)	(0.010)	[1.981]	(0.229)	(0.277)	(0.269)	(0.010)
Birth order	3.831	0.134	0.350	0.216	0.016	3.341	-0.261	-0.627*	-0.367	-0.026*
	[2.197]	(0.329)	(0.306)	(0.273)	(0.010)	[2.207]	(0.228)	(0.373)	(0.354)	(0.015)
Birth spacing	2.876	0.462	0.357	-0.105	0.014	2.415	-0.026	-0.412	-0.386	-0.011
(years to the next birth)	[2.465]	(0.388)	(0.455)	(0.328)	(0.017)	[1.763]	(0.229)	(0.281)	(0.317)	(0.011)
Father's years of schooling	0.987	-0.803*	-0.606	0.197	-0.010	1.482	0.261	0.767**	0.505	0.022*
	[2.623]	(0.443)	(0.474)	(0.505)	(0.017)	[3.054]	(0.366)	(0.348)	(0.312)	(0.013)
Mother's years of schooling	0.844	-1.063**	-0.884**	0.179	-0.022	1.388	-0.275	0.557	0.832*	0.012
	[2.631]	(0.415)	(0.418)	(0.518)	(0.017)	[3.117]	(0.486)	(0.465)	(0.412)	(0.015)
Family income (NIS), 1995	16,046	-490.9	757.7	1,248	-1.360	18,182	2,760	1,868	-891.5	57.37
	[14,203]	(2,228)	(2,087)	(1,853)	(72.16)	[15,981]	(1,824)	(2,063)	(1,778)	(84.29)
Family income (NIS), 2000	27,277	-1,997	1,259	3,256	22.26	28,458	2,601	6,187	3,586	321.86*
	[30,243]	(3,657)	(4,119)	(3,373)	(131.7)	[33,015]	(4,682)	(4,629)	(4,298)	(130.3)
SES of the mother's first	-0.123	-0.137	-0.094	0.043	-0.005*	-0.006	0.018	0.023	0.005	0.001
locality of residence upon	[0.499]	(0.085)	(0.063)	(0.074)	(0.003)	[0.584]	(0.090)	(0.086)	(0.087)	(0.004)
immigration										
Joint Significance of all Covariates										
F Statistic		2.77	1.47	0.81	0.88		3.68	1.65	1.04	1.01
P-value		0.018	0.205	0.628	0.505		0.004	0.148	0.442	0.459
Observations	76	196	157	201	277	85	198	180	208	293

Notes: Means and standard deviations (in brackets) of first-trimester's background characteristics are presented in columns 1 and 6 for females and males in the Operation Solomon group respectively. Columns 2 and 7 report differences in means and standard errors between the first- and second-trimester for females and males respectively. Columns 3 and 8 report differences in means and standard errors between the first- and third-trimester for females and males respectively. Columns 4 and 9 report differences in means and standard errors between the second- and third-trimester for females and males respectively. Columns 5 and 10 report the coefficients and standard errors from regressing each background characteristic on the number of weeks in-utero in Israel. The last two rows report F statistics and p-values for the joint significance of all covariates. Family income is measured in Shekels in nominal terms. SES is a socio-economic index of Israeli localities based on several demographic and economic variables, including dependency ratio, average years of schooling in the adult population, percentage of academic degree holders, employment and income levels, etc. Lower values correspond to lower socio-economic status. The sample includes individuals in the Operation Solomon group who were born in Israel between May 27, 1991, and February 15, 1992 and whose parents immigrated in Operation Solomon (May 24-25, 1991). Individuals in the first trimester were born between December 4, 1991, and February 15, 1992, individuals in the second trimester were born between August 28 and December 3, 1991, and Individuals in the third trimester were born between August 28 and December 3, 1991.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4: Estimated Effect of Immigration In Utero on High School Outcomes by Gender

	No Grade Repetition (6th—12th grade)		Completed 12th Grade		Obtained a Matriculation Diploma		Total Matriculation Units		Math Matriculation Units		English Matriculation Units	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A. Females [N=699]												
1st-trimester	0.184^{***}		0.083^{*}		0.201^{**}		5.212^{***}		0.776^{***}		1.001^{***}	
	(0.041)		(0.046)		(0.095)		(1.814)		(0.280)		(0.364)	
2nd-trimester	0.075		0.017		0.087		3.877^{**}		0.292		0.818^{***}	
	(0.048)		(0.053)		(0.100)		(1.977)		(0.260)		(0.317)	
P-value: 1st = 2nd	0.006		0.083		0.180		0.433		0.054		0.563	
Weeks in-utero in Israel		0.006^{***}		0.003^{*}		0.006		0.163^{**}		0.026^{***}		0.031^{**}
		(0.002)		(0.002)		(0.004)		(0.066)		(0.010)		(0.013)
3rd-trimester Mean and SD	0.802 [0.401]		0.889 [0.316]		0.309 [0.465]		11.51 [10.68]		1.198 [1.528]		1.938 [1.880]	
Panel B. Males [N=725]												
1st-trimester	-0.053		-0.029		-0.026		-1.210		0.000		-0.267	
	(0.074)		(0.065)		(0.074)		(1.607)		(0.218)		(0.286)	
2nd-trimester	-0.103		-0.085		-0.024		-0.910		0.139		-0.274	
	(0.076)		(0.071)		(0.067)		(1.684)		(0.257)		(0.241)	
P-value: 1st = 2nd	0.397		0.308		0.984		0.862		0.559		0.982	
Weeks in-utero in Israel		-0.002		-0.002		-0.002		-0.085		-0.004		-0.017^{*}
		(0.003)		(0.002)		(0.003)		(0.054)		(0.008)		(0.010)
3rd-trimester Mean and SD	0.737 [0.443]		0.789 [0.410]		0.189 [0.394]		8.116 [9.882]		0.926 [1.362]		1.463 [1.737]	
Panel C. P-value for equality of the coefficient between females and males												
1st-trimester	0.017		0.207		0.035		0.000		0.009		0.002	
2nd-trimester	0.077		0.287		0.328		0.063		0.677		0.009	
Weeks in-utero in Israel		0.032		0.163		0.094		0.000		0.012		0.002
Total Observations	1,424	1,424	1,424	1,424	1,424	1,424	1,424	1,424	1,424	1,424	1,424	1,424

Notes: Standard errors reported in parentheses are clustered at the calendar week of birth. Odd columns report estimates for β_1 and β_2 of equation (1) and even columns report estimates for α_1 of equation (2). Both were estimated for females and males separately as a system of seemingly unrelated regressions. Panel A reports estimates for females and Panel B reports estimates for males. Panel C reports p-values from F-tests that check the difference between the coefficients of females and males. All specifications control for both parents' years of schooling, the mother's age at birth, parents' age gap, SES of first locality in Israel, and birth order. The sample includes 1,424 individuals (699 females and 725 males) born between May 27, 1991, and February 15, 1992, or between May 27, 1990, and February 15, 1991.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: Estimated Effect of Immigration In Utero on Post-Secondary Schooling, Marriage and Childbearing, by Gender

	Post-secondary Schooling				Marriage and Childbearing by Age 21				Marriage and Childbearing by Age 26			
	Any Post-secondary Diploma		At Least Bachelor's Degree		Married		has children		Married		has children	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A. Females [N=699]												
1st-trimester	0.232***		0.188***		-0.003		-0.030		-0.042		-0.108	
	(0.073)		(0.071)		(0.018)		(0.026)		(0.073)		(0.083)	
2nd-trimester	0.174***		0.140*		0.004		-0.016		0.029		0.019	
	(0.065)		(0.065)		(0.019)		(0.029)		(0.063)		(0.062)	
P-value: 1st = 2nd	0.396		0.499		0.591		0.595		0.324		0.066	
Weeks in-utero in Israel		0.008***		0.007**		0.000		-0.001		-0.002		-0.004
		(0.003)		(0.003)		(0.000)		(0.001)		(0.003)		(0.003)
3rd-trimester	0.148		0.148		0.012		0.049		0.173		0.185	
Mean and SD	[0.357]		[0.357]		[0.111]		[0.218]		[0.380]		[0.391]	
Panel B. Males [N=725]												
1st-trimester	-0.032		0.037		0.012		0.018		0.043		0.031	
	(0.090)		(0.032)		(0.011)		(0.013)		(0.041)		(0.038)	
2nd-trimester	-0.093		-0.010		-0.000		0.006		0.060**		0.052	
	(0.091)		(0.029)		(0.001)		(0.006)		(0.027)		(0.041)	
P-value: 1st = 2nd	0.391		0.190		0.287		0.320		0.690	0.658		
Weeks in-utero in Israel		0.000		0.002		0.000		0.001		0.002		0.002
		(0.003)		(0.001)		(0.000)		(0.001)		(0.002)		(0.001)
3rd-trimester	0.200		0.011		0.000		0.000		0.021		0.032	
Mean and SD	[0.402]		[0.103]		[0.000]		[0.000]		[0.144]		[0.176]	
Panel C. P-value for equality of the coefficient between females and males												
1st-trimester	0.016		0.028		0.482		0.132		0.358		0.135	
2nd-trimester	0.016		0.015		0.811		0.475		0.633		0.692	
Weeks in-utero in Israel		0.037		0.067		0.520		0.181		0.265		0.126
Observations	1,424	1,424	1,424	1,424	1,424	1,424	1,424	1,424				

Notes: Standard errors reported in parentheses are clustered at the calendar week of birth. Odd columns report estimates for β_1 and β_2 of equation (1) and even columns report estimates for α_1 of equation (2). Both were estimated for females and males separately as a system of seemingly unrelated regressions. Panel A reports estimates for females and Panel B reports estimates for males. Panel C reports p-values from F-tests that check the difference between the coefficients of females and males. All specifications control for both parents' years of schooling, the mother's age at birth, parents' age gap, SES of first locality in Israel, and birth order. The specifications in columns 1–4 controls also for year of birth. The sample includes 1,424 individuals (699 females and 725 males) born either between May 27, 1991, and February 15, 1992, or between May 27, 1990, and February 15, 1991.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: Estimated Effect of Immigration In Utero on Labor Market Outcomes by Gender

	Employment		No. of Months Employed		Annual Earnings		Monthly Earnings	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. Females [N=674×5=3,370]								
1st-trimester	0.063		0.966		4,318		386.1	
	(0.045)		(0.615)		(4,380)		(369.9)	
2nd-trimester	0.072		1.096*		3,138		211.4	
	(0.049)		(0.656)		(4,222)		(345.5)	
P-value: 1st = 2nd	0.828		0.817		0.777		0.607	
Weeks in-utero in Israel		0.002		0.043*		203.2		16.68
		(0.002)		(0.023)		(163.3)		(13.83)
3rd-trimester Mean and SD	0.855 [0.353]		8.535 [4.441]		39,692 [28,480]		3,749 [2,379]	
Panel B. Males [N=704×5=3,520]								
1st-trimester	0.003		-0.187		2,651		386.7	
	(0.054)		(0.706)		(5,909)		(482.8)	
2nd-trimester	0.007		-0.246		-563.6		175.86	
	(0.046)		(0.599)		(4,968)		(427.4)	
P-value: 1st = 2nd	0.944		0.933		0.564		0.650	
Weeks in-utero in Israel		-0.000		-0.017		25.15		7.955
		(0.002)		(0.026)		(220.6)		(18.10)
3rd-trimester Mean and SD	0.901 [0.299]		9.379 [3.964]		56,282 [34,145]		5,193 [2,787]	
Panel C. P-value for equality of the coefficient between females and males								
1st-trimester	0.391		0.218		0.821		0.999	
2nd-trimester	0.336		0.131		0.570		0.948	
Weeks in-utero in Israel		0.300		0.084		0.516		0.702
Observations	6,890	6,890	6,890	6,890	6,890	6,890	6,890	6,890

Notes: Standard errors reported in parentheses are clustered at individual level. Odd columns report estimates for β_1 and β_2 of equation (1) and even columns report estimates for α_1 of equation (2). Both were estimated for females and males separately as a system of seemingly unrelated regressions. Panel A reports estimates for females and Panel B reports estimates for males. Panel C reports p-values from F-tests that check the difference between the coefficients of females and males. All specifications control for age fixed effects, both parents' years of schooling, the mother's age at birth, parents' age gap, SES of first locality in Israel, and birth order. Labor market outcomes are observed for each individual between ages 23 and 27. We excluded 46 individuals who are self-employed since the information on months employed is not reliable. The sample includes 6,890 observations of 1,378 individuals (674 females and 704 males) born between May 27, 1991, and February 15, 1992, or between May 27, 1990, and February 15, 1991. Earnings are measured in Shekels in real terms.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 7: Estimated Effect of Immigration In Utero on Birth Weight and Child Mortality by Gender

	Birth Weight (*gr*)		Low Birth Weight (<2500 *gr*)		Child Mortality (by age 6)	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Females						
1st-trimester	150.7		0.051		0.003	
	(105.8)		(0.058)		(0.015)	
2nd-trimester	-39.63		0.073		0.005	
	(85.94)		(0.049)		(0.015)	
P-value: 1st = 2nd	0.071		0.664		0.810	
Weeks in-utero in Israel		4.210		0.003		0.000
		(3.610)		(0.002)		(0.000)
3rd-trimester	2,997		0.063		0.012	
Mean and SD	[438.7]		[0.245]		[0.111]	
Panel B. Males						
1st-trimester	70.91		-0.017		-0.030	
	(90.61)		(0.046)		(0.023)	
2nd-trimester	224.2**		-0.076*		-0.020	
	(66.21)		(0.039)		(0.020)	
P-value: 1st = 2nd	0.068		0.175		0.298	
Weeks in-utero in Israel		4.598		-0.001		-0.001
		(3.362)		(0.002)		(0.001)
3rd-trimester	3,054		0.085		0.032	
Mean and SD	[449.0]		[0.280]		[0.176]	
Panel C. P-value for equality of the coefficient between females and males						
1st-trimester	0.611		0.435		0.224	
2nd-trimester	0.013		0.040		0.018	
Weeks in-utero in Israel		0.941		0.216		0.125
Observations	1,405	1,405	1,405	1,405	1,424	1,424

Notes: Standard errors reported in parentheses are clustered at the calendar week of birth. Odd columns report estimates for β_1 and β_2 of equation (1) and even columns report estimates for α_1 of equation (2). Both were estimated for females and males separately as a system of seemingly unrelated regressions. Panel A reports estimates for females and Panel B reports estimates for males. Panel C reports p-values from F-tests that check the difference between the coefficients of females and males. All specifications control for both parents' years of schooling, the mother's age at birth, parents' age gap, SES of first locality in Israel, and birth order. The sample in columns 1–4 includes 1,405 individuals (691 females and 714 males). The sample in columns 5 and 6 includes 1,424 individuals (699 females and 725 males). All were born between May 27, 1991, and February 15, 1992, or between May 27, 1990, and February 15, 1991.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Online Appendix

Immigration and the Short- and Long-Term Impact of Improved Prenatal Conditions

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Appendix A Environmental Conditions of Operation Solomon Immigrants in Ethiopia and in Israel

We summarize here the main differences in environmental conditions experienced by mothers in our sample in Ethiopia and in Israel based on interviews, reports in the contemporary media, and other relevant literature.

Living conditions. Prior to Operation Solomon, the Ethiopian Jews lived in hundreds of small remote villages in northern Ethiopia. Their lifestyle, beliefs and occupations were typical of a traditional society. Less than 30% of the population was literate in their native tongue, and schools were not accessible to the majority of the population. In May 1990, a large part of this population migrated to Addis Ababa, where they were housed in refugee camps scattered around the city, in living conditions not better than in the rural areas they came from . After their arrival in Israel, most of the immigrants (80%) were housed for the first few years in absorption centers, and the remainder in mobile home camps (Gould et al., 2004).

General medical care. In rural villages, local traditional practitioners provided most medical care, utilizing traditional medications and treatments. Standard Western perceptions of disease causation were uncommon. For many, their first exposure to Western medical practices was through medical clinics established by the American Jewish Joint Distribution Committee (AJDC) in Addis Ababa, where the immigrants were housed before their evacuation to Israel. These clinics were established in August 1990 following an increase in the incidence of malaria, hepatitis and tuberculosis after the refugees' arrival in Addis Ababa. The AJDC developed a comprehensive medical program that included immunization and training of Ethiopian health practitioners by Israeli doctors, and that served approximately 4,000 families. These health services significantly reduced the death rate in the following months (Myers, 1993).

Following their arrival in Israel, the immigrants were registered in family groups according to date of arrival, age and sex. The immigrants' weight and height were recorded, and physical examinations were carried out by medical teams.[1] Blood samples were obtained for complete blood count, VDRL, HBsAg, GCPD and SMA-12. Urinalysis and thick film examination for malaria and borreliosis were also performed, along with chest X-rays and tuberculin tests (Nahmias et al., 1993).

Most of the absorption centers had access to a primary care clinic on location or nearby. These provided medical services to the immigrants. All clinics were staffed by a physician, a nurse, and an interpreter/mediator (Flatau et al., 1993; Sgan-Cohen et al., 1993; Shtarkshall et al., 2009; Levin-Zamir et al., 1993). They provided care for acute and chronic illness and preventive care, along with mother and child health care and immunizations (Yaphe et al., 2001). The Israeli health authorities developed an educational program to bridge the cultural gaps between immigrants and health care practitioners, and to promote the transfer of skills to the immigrants regarding proper health care, nutrition, prescribed medications, and personal hygiene (Levin-Zamir et al., 1993).

Nutrition. The International Food Policy Research Institute (IFPRI) reports that in 1993 the calorie supply per capita in Ethiopia was 1,516, while in Israel it was twice as large, 3,089 (Israeli CBS, 2008). The traditional Ethiopian diet consisted of unrefined flours, grains, vegetables, refined sugars, and processed foods, and was limited in meat. These eating habits changed upon arrival in Israel, as many of the traditional Ethiopian staples were not available at the time in Israel (Levin-Zamir et al., 1993).

Micronutrient supplements for pregnant women. Three main micronutrient supplements are

[1] Unfortunately, these data are not available.

important for cognition and recommended for pregnant women: iron, iodine and folic acid.[2] The 2011 Ethiopian Demographic and Health Survey reports that 83% of women did not take iron tablets during their last pregnancy, and less than 1% took them for 90 days or more during their last pregnancy.[3] Furthermore, a situational analysis carried out by the Ministry of Health (MOH) and the United Nations Children's Fund (UNICEF) in Ethiopia in 1993 reports that 78% of the population are exposed to iodine deficiency and 62% are iodine-deficient (Taye and Argaw, 1997). In a 2004 WHO report, Ethiopia was categorized among moderately iodine-deficient countries, with only 20% of households having access to adequately iodized salt.[4]

In Israel, in contrast, it was a standard practice at the time to prescribe vitamin and iron supplements to pregnant women. Ethiopian women who arrived in Operation Solomon agreed to take these supplements even though many believed that in Ethiopia this was not needed because "the food was better, it contains more vitamins than the food in Israel" (Granot et al., 1996). No iodine deficiency disorders are found among pregnant women in Israel, largely because Israel's food chain contains adequate amounts of iodine (Benbassat et al., 2004).

Antenatal care and monitoring. Ethiopian women who lived in rural areas shared the view that pregnancy does not require medical attention. They gave birth at home with assistance from family and neighbors, and a traditional birth attendant or lay midwife. In contrast, in Israel, pregnancies among Ethiopians were closely monitored, the baby and mother were examined periodically before and after birth, and almost all births were in hospitals. In 1990-1991, the infant mortality rate was 12% in Ethiopia and 1% in Israel, and the child mortality rate was 20% in Ethiopia but only 1.2% in Israel (The World Bank, 1991). All the women we surveyed attested that in Ethiopia they had received no pregnancy-related medical care, while in Israel their pregnancies were medically monitored, with blood tests, ultrasound, and vitamin supplement prescriptions (mainly iron and folic acid).

[2]In Appendix B we provide additional information on the importance of micronutrients for development.
[3]Ethiopia Demographic and Health Survey 2011, p. 187.
[4]Ethiopia Demographic and Health Survey 2005, p. 151.

Appendix B Micronutrient Deficiencies During Pregnancy

Vitamins and minerals, referred to collectively as micronutrients, have important influences on the health of pregnant women and the growing fetus. A recent joint statement by the World Health Organization (WHO), the World Food Program, and the United Nations Children's Fund (2007) estimates that more than two billion people in the world are deficient in key vitamins and minerals, particularly vitamin A, iodine, iron and zinc. Most of these people live in low-income countries and are typically deficient in more than one micronutrient. Iron, iodine and folic acid are among the most important micronutrients for in-utero cognition and brain development. A 2008 WHO report on the worldwide prevalence of anemia in 1993–2005 estimates that Africa contains the highest proportion of individuals affected by anemia. In Ethiopia, anemia is a severe problem affecting both pregnant (62.7%) and non-pregnant women of childbearing age (52.3%). According to the WHO report, more than half of this anemia burden is due to iron deficiency (ID), with the rest partly due to deficiency of folic acid, vitamin B12, and vitamin A, along with parasitic infections.

Many important developmental processes, including myelination, dendritogenesis, synaptogenesis, and neurotransmission, are highly dependent on iron-containing enzymes and hemoproteins (Lozoff, 2007). ID disrupts these processes in a regionally specific manner, depending on which brain areas are most rapidly developing at the time of the deficiency (Kretchmer et al., 1996). Longitudinal studies in humans have concluded that fetal or neonatal iron deficiency anemia is associated with diminished general autonomic response, motor maturity and self-regulation (Hernández-Martínez et al., 2011), higher levels of negative emotionality and lower levels of alertness and suitability in infants (Wachs et al., 2005), slower neuronal conduction (Amin et al., 2010), worse learning ability and memory at 3 to 4 years, and poorer performance (Riggins et al., 2009). The irreversibility of maternal iron deficiency was demonstrated by reports on cognitive and behavioral alterations that persisted into childhood and adolescence despite iron treatment in infancy (Grantham-McGregor and Ani, 2001; Lozoff et al., 2000).

Researchers have hypothesized that there exists a "window of vulnerability" to the harmful effects of iron deficiency. In an animal study, Mihaila et al. (2011) demonstrated that maternal exposure to an iron-deficient diet either prior to conception, at the start of the first trimester, or at the onset of the second trimester had a significant negative impact on the offspring's nervous system, placing the window of vulnerability for the fetus in the first two trimesters of gestation.

An additional critical micronutrient deficiency in developing countries is iodine deficiency.The 2004 WHO report mentioned above estimates that almost two billion people (260 million of them in Africa) are at risk of iodine deficiency. Iodine deficiency is now recognized by the WHO as the most common preventable cause of brain damage in the world today (Preedy et al., 2009). Populations who live in areas with low iodine content in the soil and water are at highest risk for iodine deficiency. Dairy foods and certain fruits and vegetables can be rich in iodine, but only if they originate from iodine-rich areas where the nutrient can be absorbed into foods (Ahmed et al., 2012).

Humans require iodine for the biosynthesis of thyroid hormones, especially thyroxine. These hormones affect development of the central nervous system, which is required for intellectual functioning, and regulate many other physiological processes. In utero, development of the central nervous system depends critically on an adequate supply of these hormones, which influence the density of neural networks established in the developing brain (Lamberg, 1991). Up to mid-gestation, the mother is the only source of iodine for the developing brain of the fetus. An inadequate supply of iodine during gestation, if not corrected by timely intervention to reverse the accompanying maternal hypothyroxinemia, results in damage to the fetal brain that is irreversible by mid-gestation. Even mild to moderate maternal hypothyroxinemia may result in suboptimal neurodevelopment (De Escobar et al., 2007).

Indeed, a longitudinal study in China showed that iodine supplementation in the first and second trimesters of pregnancy decreased the prevalence of moderate and severe neurological abnormalities and increased developmental test scores through age 7, compared with supplementation later in pregnancy or treatment after birth (Cao et al., 1994). Results from a long-term follow-up of this intervention suggest that iodine supplementation before the third trimester predicted higher psychomotor test scores for children relative to those who were provided with iodine later in pregnancy or at 2 years of age (O'Donnell et al., 2002). Other studies similarly found that iodine treatment late in pregnancy or afterwards had no benefits on children's IQ at up to 5 years of age, but treatment early in pregnancy or prior to conception improved IQ (see review by Bougma et al., 2013). Overall, the consensus in the literature is that cognition is sensitive to iodine deficiency exclusively during early fetal life (prior to mid-gestation), while growth and psychomotor development are believed to be most affected by deficiency in infancy (Cao et al., 1994; Isa et al., 2000).

Folic acid deficiency in pregnant women is a major public health problem in developing countries. Adequate folic acid (folate) is critical to embryonic and fetal growth at developmental stages characterized by accelerated cell division. It plays an important part in the development of the central nervous system (the spinal cord and brain). In particular, folate is needed for closure of the neural tube—the embryonic precurser to the brain and spinal cord—early in pregnancy (Czeizel and Dudás, 1992; Czeizel et al., 2004). Folic acid deficiency in early pregnancy dramatically increases the risk of neural tube defects and problems with brain development. Therefore, folic acid supplementation is advised for at least the first 12 weeks of pregnancy for all women, even if they are healthy and have a good diet. Folic acid supplementation that begins after the first trimester of pregnancy will not help to prevent these poor birth outcomes. Several human studies have also demonstrated improved cognitive performance in children following maternal folic acid supplement use during the first trimester of pregnancy (Villamor et al., 2012; Chatzi et al., 2012; Roth et al., 2011; Julvez et al., 2009).

Appendix C The Effect of Immigration In-Utero on Mid-Childhood Outcomes

We also examine mid-childhood outcomes using data on students' national standardized tests and students' questionnaires administered by the Ministry of Education for the years 2002—2005 (GEMS - Growth and Effectiveness Measures for Schools). Due to privacy restrictions, we could not merge it to our sample at the student level stored at the CBS. Instead, we merged it with the Population Registry data, which is stored in the research room of the National Insurance Institute of Israel (NII) where we had all the information on our Solomon group sample but not on the comparison groups. Hence, in this section, we present the effect of immigration in-utero on students' test scores and behavioral outcomes using only the Solomon group sample based on simpler OLS models similar to equations (1) and (2) that do not include interactions between the trimesters or weeks-in-utero and the operation Solomon group. We therefore, interpret the results here with caution since we cannot control for the age-for-grade effect.

Annually since 2002, a representative sample of elementary and middle schools in Israel participate in standardized national tests and complete questionnaires on behavioural outcomes and the school environment. The GEMS student data includes test scores of fifth- and eighth-graders in math, science, Hebrew, and English and responses of fifth- through ninth-grade students to questionnaires. In the GEMS data sets for 2002—2005, we found 470 of our sample of 570 children in utero during Operation Solomon. In the GEMS test scores data, we have 260 fifth-graders and 111 eighth-graders, and in the GEMS questionnaires data, we have 234 fifth-graders, 209 sixth-graders, 201 seventh-graders, and 95 eighth-graders.[5] To estimate the treatment effect on test scores and behavioural outcomes, we use only test scores of fifth-graders and questionnaires of fifth- to seventh-graders, as there is pronounced selection in the eighth-grade data.[6] To address the issue of multiple hypothesis testing, we first converted test scores into z-scores by subject and year and stacked data for the four subjects.

We regress the fifth-grade standardized test scores (by subject and year) on the first and second trimester indicators or on the number of weeks of pregnancy in Israel. We include controls for parents' schooling, the number of siblings, the mother's age at birth, parents' age gap, and year and subject fixed effects. We use the stacked data on all four subjects and weight observations by the inverse of the number of times each student appears in the data.[7]

To examine the impact on behavioural outcomes, we focus on all questions where the child reports his/her behaviour and feelings. We pool in this analysis the samples of fifth-, sixth- and seventh-graders. We grouped seven items in the student questionnaires that relate to students' feelings or self-reported behaviour into one category by computing z-scores for each item and averaging all z-scores within each student, creating a standardized index for the average score. These seven items are as follows: (1) I have a good understanding of my teacher's scholastic requirements; (2) I know what behaviour is allowed or forbidden in school; (3) This year, I

[5] Some students in our sample took the GEMS tests and questionnaires more than once in different grades.

[6] Children whose mothers arrived in Israel during the third trimester are older. Hence, their likelihood of appearing in the GEMS tests and questionnaires in eighth grade during the years 2002–2005 is significantly higher. In contrast, we do not observe significant differences by trimester group for the probability of appearing in the GEMS tests and questionnaires in the fifth, sixth or seventh grade during the same period. We do not include students' questionnaires from 9th grade given that the students in our sample are too young to be in 9th grade between the period covered in our GEMS data (2002-2005).

[7] Estimates for each subject are qualitative similar though noisier due to much smaller sample size compared to our baseline sample.

was involved in many fights [reversed]; (4) Sometimes I'm scared to go to school because there are violent students [reversed]; (5) I feel well-adjusted socially in my class; (6) When I have a problem at school there is always someone I can turn to from the teaching staff, and (7) I feel good in school. Students were asked to rate the extent to which they agreed with each statement on a 6-point scale where 1 refers to "strongly disagree" and 6 refers to "strongly agree". We use the same specification as for the test scores with the addition of an indicator for the grade.

Table A16 reports the results for fifth-grade test scores (columns 1 and 2) and own behaviour (columns 3 and 4). Panel A reports the results for females and Panel B for males. Consistent with our findings for high school achievement, we find beneficial effects of earlier immigration in-utero to Israel only for females. Test scores of females whose mothers arrived during the first trimester are 0.631 standard deviations (s.e.=0.199) higher than those of females whose mothers arrived in the third trimester. The effect for males is about half this magnitude, 0.314 standard deviations (s.e.=0.247), and is not statistically significant. Estimates based on weeks-in-utero suggest that for females, each additional week in utero in Israel increases test scores by 0.02 standard deviations (s.e.=0.007), while for males, the coefficient is negative and insignificant.

Table A1: Estimated Effect of Immigration In Utero Including Twins in the Sample

	Females			Males		
	By trimester		By week	By trimester		By week
	1st-trimester	2nd-trimester	Weeks in-utero in Israel	1st-trimester	2nd-trimester	Weeks in-utero in Israel
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. High School Outcomes						
No grade repetition (6th–12th grade)	0.196***	0.092*	0.006***	-0.007	-0.075	0.000
	(0.042)	(0.050)	(0.002)	(0.073)	(0.078)	(0.003)
Completed 12th grade	0.100**	0.036	0.004**	0.018	-0.054	0.001
	(0.048)	(0.055)	(0.002)	(0.065)	(0.073)	(0.003)
Obtained a matriculation diploma	0.229**	0.102	0.007**	0.008	-0.014	0.000
	(0.096)	(0.097)	(0.004)	(0.077)	(0.068)	(0.003)
Total matriculation units	5.745***	4.201**	0.188***	-0.184	-0.222	-0.038
	(1.861)	(1.963)	(0.066)	(1.553)	(1.751)	(0.053)
Math matriculation units	0.836***	0.322	0.029***	0.161	0.189	0.003
	(0.280)	(0.249)	(0.010)	(0.209)	(0.254)	(0.008)
English matriculation units	1.070***	0.836***	0.035***	-0.171	-0.161	-0.012
	(0.364)	(0.316)	(0.013)	(0.263)	(0.251)	(0.009)
Observations		716			754	
Panel B. Long Term Outcomes						
Post-secondary Education						
Any post-secondary diploma	0.224***	0.165***	0.007***	-0.026	-0.078	0.000
	(0.064)	(0.064)	(0.002)	(0.089)	(0.090)	(0.003)
At least Bachclor's degree	0.178***	0.136**	0.006***	0.034	-0.001	0.002
	(0.064)	(0.062)	(0.002)	(0.031)	(0.030)	(0.001)
Observations		716			754	
Marriage and Childbearing						
Married by 21	-0.003	0.004	0.000	0.011	0.000	0.000
	(0.018)	(0.019)	(0.000)	(0.010)	(0.001)	(0.000)
has children by 21	-0.031	-0.017	-0.001	0.017	0.006	0.001
	(0.026)	(0.029)	(0.001)	(0.012)	(0.006)	(0.001)
Married by 26	-0.050	0.028	-0.002	0.074*	0.060**	0.003**
	(0.073)	(0.062)	(0.003)	(0.041)	(0.028)	(0.001)
has children by 26	-0.109	0.021	-0.004	0.049	0.050	0.002
	(0.079)	(0.061)	(0.003)	(0.045)	(0.041)	(0.002)
Observations		716			754	
Labor Market Outcomes Between Ages 23 and 27						
Employed	0.079*	0.090*	0.003*	0.016	0.020	0.000
	(0.045)	(0.049)	(0.002)	(0.054)	(0.046)	(0.002)
Total months employed	1.206**	1.346**	0.052**	0.025	-0.135	-0.006
	(0.611)	(0.656)	(0.022)	(0.694)	(0.595)	(0.026)
Annual earnings (NIS)	6,592	4,870	294.2*	3,588	-194.0	78.18
	(4,341)	(4,217)	(161.6)	(5,802)	(4,924)	(215.4)
Monthly earnings (NIS)	571.6	353.5	24.08*	433.4	211.4	10.07
	(365.6)	(346.0)	(13.66)	(476.0)	(423.1)	(17.73)
Observations		3,455			3,665	
Panel C. Early Life Health Outcomes						
Birth weight (*gr*)	127.9	-32.33	3.576	57.08	244.1***	3.932
	(99.38)	(87.67)	(3.457)	(88.05)	(68.40)	(3.303)
Low birth weight (<2500 *gr*)	0.057	0.074	0.002	-0.004	-0.084**	-0.001
	(0.060)	(0.047)	(0.002)	(0.050)	(0.041)	(0.002)
Observations		706			743	
Child mortality (by age 6)	-0.014	-0.012	-0.001	-0.046**	-0.036	-0.002**
	(0.023)	(0.023)	(0.001)	(0.023)	(0.024)	(0.001)
Observations		716			754	

Notes: Standard errors reported in parentheses are clustered at the calendar week of birth for all outcomes except the standard errors for the labor market outcomes, which are clustered at the individual level. Panel A replicates the results in Table 4, Panel B replicates the results in Tables 5 and 6 and Panel C replicates the results in Table 7, while including also twins in the sample. The sample includes 1,470 individuals (716 females and 754 males) born between May 27, 1991, and February 15, 1992, or between May 27, 1990, and February 15, 1991. All specifications were estimated for females and males separately as a system of seemingly unrelated regressions and control for both parents' years of schooling, the mother's age at birth, parents' age gap, SES of first locality in Israel, birth order, and an indicator for twins. The specifications for post-secondary education include also controls for year of birth and the specifications for labor market outcomes include also controls for age. Labor market outcomes between ages 23 and 27 are observed for each individual once at each age. Earnings are measured in Shekels in real terms.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A2: Estimated Effect of Immigration In Utero Excluding Individuals Who Died Before Age 6

	Females			Males		
	By trimester		By week	By trimester		By week
	1st-trimester	2nd-trimester	Weeks in-utero in Israel	1st-trimester	2nd-trimester	Weeks in-utero in Israel
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. High School Outcomes						
No grade repetition (6th–12th grade)	0.189***	0.081*	0.006***	-0.076	-0.118	-0.003
	(0.043)	(0.048)	(0.002)	(0.073)	(0.076)	(0.003)
Completed 12th grade	0.088**	0.023	0.003**	-0.054	-0.101	-0.003
	(0.043)	(0.049)	(0.002)	(0.066)	(0.072)	(0.003)
Obtained a matriculation diploma	0.205**	0.089	0.006	-0.038	-0.029	-0.002
	(0.095)	(0.100)	(0.004)	(0.071)	(0.064)	(0.003)
Total matriculation units	5.324***	4.015**	0.166**	-1.551	-1.058	-0.097*
	(1.784)	(1.920)	(0.065)	(1.546)	(1.667)	(0.053)
Math matriculation units	0.792***	0.302	0.026***	-0.031	0.129	-0.005
	(0.280)	(0.256)	(0.010)	(0.211)	(0.253)	(0.008)
English matriculation units	1.024***	0.847***	0.032**	-0.331	-0.301	-0.019
	(0.361)	(0.309)	(0.013)	(0.281)	(0.244)	(0.010)
Observations		694			713	
Panel B. Long Term Outcomes						
Post-secondary Education						
Any post-secondary diploma	0.235***	0.176***	0.008***	-0.042	-0.099	-0.000
	(0.073)	(0.064)	(0.003)	(0.094)	(0.094)	(0.003)
At least Bachelor's degree	0.190***	0.141**	0.007***	0.036	-0.010	0.002
	(0.071)	(0.064)	(0.003)	(0.033)	(0.029)	(0.001)
Observations		694			713	
Marriage and Childbearing						
Married by 21	-0.003	0.005	0.000	0.012	-0.000	0.001
	(0.018)	(0.019)	(0.001)	(0.011)	(0.001)	(0.000)
has children by 21	-0.030	-0.016	-0.001	0.018	0.006	0.001
	(0.027)	(0.029)	(0.001)	(0.013)	(0.006)	(0.001)
Married by 26	-0.042	0.031	-0.002	0.043	0.061**	0.002
	(0.072)	(0.063)	(0.003)	(0.042)	(0.027)	(0.001)
has children by 26	-0.109	0.020	-0.004	0.031	0.053	0.002
	(0.082)	(0.062)	(0.003)	(0.038)	(0.042)	(0.001)
Observations		694			713	
Labor Market Outcomes Between Ages 23 and 27						
Employed	0.066	0.078	0.002	-0.028	-0.012	-0.001
	(0.043)	(0.048)	(0.002)	(0.050)	(0.043)	(0.002)
Total months employed	0.998	1.168*	0.043*	-0.525	-0.460	-0.029
	(0.607)	(0.645)	(0.022)	(0.673)	(0.580)	(0.025)
Annual earnings (NIS)	4,515	3,536	204.7	462.9	-1,897	-50.35
	(4,375)	(4,187)	(162.8)	(5,826)	(4,905)	(218.3)
Monthly earnings (NIS)	403.6	246.9	16.80	193.8	59.65	1.296
	(368.6)	(342.7)	(13.74)	(471.9)	(419.9)	(17.73)
Observations		3,345			3,460	
Panel C. Early Life Health Outcomes						
Birth weight (*gr*)	117.0	-68.73	3.043	33.427	205.2***	2.866
	(97.15)	(76.36)	(3.369)	(80.95)	(68.08)	(3.192)
Low birth weight (<2500 *gr*)	0.069	0.082**	0.003*	-0.007	-0.067	-0.001
	(0.052)	(0.041)	(0.002)	(0.045)	(0.038)	(0.002)
Observations		686			703	

Notes: Standard errors reported in parentheses are clustered at the calendar week of birth for all outcomes except the standard errors for the labor market outcomes, which are clustered at the individual level. Panel A replicates the results in Table 4, Panel B replicates the results in Tables 5 and 6, and Panel C replicates the results in Table 7 excluding individuals who died before age 6. The sample includes 1,407 individuals (694 females and 713 males) born either between May 27, 1991, and February 15, 1992, or between May 27, 1990, and February 15, 1991. All specifications were estimated for females and males separately as a system of seemingly unrelated regressions and control for both parents' years of schooling, the mother's age at birth, parents' age gap, SES of first locality in Israel, and birth order. The specifications for post-secondary education include also controls for year of birth and the specifications for labor market outcomes include also controls for age. Labor market outcomes between ages 23 and 27 are observed for each individual once at each age. Earnings are measured in Shekels in real terms.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A3: Differences in Observable Characteristics by Date of Birth between the Operation Solomon sample and the Operation Moses sample

	Females			Males		
	By trimester		By week	By trimester		By week
	1st-trimester	2nd-trimester	Weeks in-utero in Israel	1st-trimester	2nd-trimester	Weeks in-utero in Israel
	(1)	(2)	(3)	(4)	(5)	(6)
Mother's age at birth	0.910	1.340	0.046	-0.016	-1.254	-0.020
	(1.615)	(1.423)	(0.055)	(1.634)	(1.450)	(0.061)
Father's age at birth	-0.872	1.811	-0.003	-0.752	0.721	-0.043
	(2.079)	(2.160)	(0.075)	(2.014)	(1.690)	(0.076)
Mother's age at first birth	0.215	0.252	0.014	0.899	0.090	0.045
	(0.998)	(0.929)	(0.036)	(0.852)	(0.897)	(0.031)
Parents' age gap	-1.782	0.471	-0.049	-0.736	1.974**	-0.023
	(1.406)	(1.212)	(0.045)	(1.147)	(0.866)	(0.040)
Number of siblings	0.451	0.975***	0.014	-0.135	-0.737*	-0.017
	(0.321)	(0.356)	(0.011)	(0.420)	(0.381)	(0.017)
Birth order	0.289	0.474	0.012	-0.505	-0.743	-0.028
	(0.328)	(0.368)	(0.011)	(0.479)	(0.456)	(0.019)
Birth spacing (years to the next birth)	0.966*	0.535	0.033*	-0.123	0.034	-0.006
	(0.499)	(0.426)	(0.018)	(0.305)	(0.402)	(0.012)
Father's years of schooling	-0.944	-0.403	-0.032	-0.288	0.049	-0.007
	(0.871)	(0.683)	(0.030)	(0.737)	(0.625)	(0.028)
Mother's years of schooling	-1.816**	-0.734	-0.061**	-0.680	0.126	-0.019
	(0.733)	(0.659)	(0.029)	(0.730)	(0.564)	(0.025)
Family income (NIS), 1995	2,790	8,174*	134.8	5,775	-435.0	224.2
	(4,802)	(4,811)	(165.2)	(5,280)	(5,407)	(202.6)
Family income (NIS), 2000	4,779	3,658	251.1	5,900	6,562	379.3
	(7,510)	(8,138)	(284.9)	(9,429)	(1,0078)	(335.6)
SES of the mother's first locality of residence upon immigration	-0.075	0.126	-0.004	0.027	-0.076	-0.000
	(0.101)	(0.103)	(0.004)	(0.101)	(0.105)	(0.004)
Observations		699			725	

Notes: Standard errors reported in parentheses are clustered at the calendar week of birth. Odd columns report estimates for β_1 and β_2 of equation (1) using background characteristics as the outcome variables. Even columns report estimates for α_1 of equation (2) using background characteristics as outcome variables. Both equations were estimated for females and males separately as a system of seemingly unrelated regressions. No further covariates at the right hand side are included except for the trimester indicators and interactions with treatment. The sample includes 1,424 individuals (699 females and 725 males) who were born between May 27, 1991, and February 15, 1992, or between May 27, 1990, and February 15, 1991.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A4: Estimated Effect of Immigration In Utero on Labor Market Outcomes Including Self-Employed Individuals in the Sample

	Employment		No. of Months Employed		Annual Earnings		Monthly Earnings	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. Females [N=699×5=3,495]								
1st-trimester	0.061		0.904		4,006		486.1	
	(0.044)		(0.605)		(4,316)		(398.7)	
2nd-trimester	0.063		0.903		1,858		219.4	
	(0.048)		(0.636)		(4,142)		(351.2)	
Weeks in-utero in Israel		0.002		0.039*		192.1		19.94
		(0.002)		(0.022)		(160.6)		(14.60)
Panel B. Males [N=7254×5=3,625]								
1st-trimester	-0.008		-0.446		1,931		679.6	
	(0.053)		(0.690)		(5,774)		(538.0)	
2nd-trimester	-0.006		-0.441		-1,493		119.3	
	(0.045)		(0.593)		(4,938)		(434.2)	
Weeks in-utero in Israel		-0.001		-0.026		20.00		22.68
		(0.002)		(0.026)		(216.3)		(20.74)
Observations	7,120	7,120	7,120	7,120	7,120	7,120	7,120	7,120

Notes: Standard errors reported in parentheses are clustered at individual level. The Table replicates the results in Table 7, while including also self-employed workers. The sample includes 1,424 individuals (699 females and 725 males) born between May 27, 1991, and February 15, 1992, or between May 27, 1990, and February 15, 1991. All specifications were estimated for females and males separately as a system of seemingly unrelated regressions and control for both parents' years of schooling, the mother's age at birth, parents' age gap, SES of first locality in Israel, birth order, and age. The independent variables are labor market outcomes between ages 23 and 27, which are observed for each individual once at each age. Earnings are measured in Shekels in real terms.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A5: Estimated Effect of Immigration In Utero on Indexes of High School, Labor Market, and Early Life Health Outcomes

	High School Index		Labor Market Index		Early Life Health Index	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Females						
1st-trimester	0.603***		0.225		0.040	
	(0.176)		(0.162)		(0.227)	
2nd-trimester	0.311		0.207		-0.191	
	(0.195)		(0.169)		(0.203)	
P-value: 1st = 2nd	0.057		0.915		0.211	
Weeks in-utero in Israel		0.019***		0.010		-0.000
		(0.007)		(0.006)		(0.008)
3rd-trimester	-0.385		-0.148		-0.073	
Mean and SD	[1.060]		[1.132]		[1.189]	
Panel B. Males						
1st-trimester	-0.105		0.053		0.225	
	(0.158)		(0.169)		(0.164)	
2nd-trimester	-0.131		0.003		0.418***	
	(0.156)		(0.141)		(0.115)	
P-value: 1st = 2nd	0.871		0.766		0.240	
Weeks in-utero in Israel		-0.007		-0.000		0.011*
		(0.006)		(0.006)		(0.007)
3rd-trimester	-0.072		0.166		-0.179	
Mean and SD	[0.942]		[0.905]		[0.992]	
Panel C. P-value for equality of the coefficient between females and males						
1st-trimester	0.000		0.460		0.547	
2nd-trimester	0.086		0.351		0.011	
Weeks in-utero in Israel		0.001		0.259		0.280
Observations	1,424	1,424	6,890	6,890	1,405	1,405

Notes: Standard errors reported in parentheses are clustered at the calendar week of birth for all outcomes except the standard errors for the labor market outcomes, which are clustered at the individual level. Odd columns report estimates for β_1 and β_2 of equation (1) and even columns report estimates for α_1 of equation (2). Both were estimated for females and males separately as a system of seemingly unrelated regressions. Panel A reports estimates for females and Panel B reports estimates for males. Panel C reports p-values from F-tests that check the difference between coefficients of females and males. All specifications control for both parents' years of schooling, the mother's age at birth, parents' age gap, SES of first locality in Israel, and birth order. In columns 3 and 4 the specifications also control for age. The independent variable in columns 1 and 2 is the z-score of the mean of the following outcomes' z-scores: repeating a grade after primary school, completing high school, receiving a matriculation certificate, total credit units awarded in the matriculation certificate, and credit units awarded in mathematics and English. The independent variable in columns 3 and 4 is the z-score of the mean of the following outcomes' z-scores: employment, months employed, annual earnings, and monthly earnings between ages 23 and 27. The independent variable in columns 4 and 5 is the z-score of the mean of the following outcomes' z-scores: birth weight, birth weight greater than 2,500 grams, and survival by age 6. The sample in columns 1–4 includes 1,424 individuals (699 females and 725 males) and the sample in columns 5 and 6 includes 1,405 individuals (691 females and 714 males). All individuals were born between May 27, 1991, and February 15, 1992, or between May 27, 1990, and February 15, 1991.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A6: Differences in High School Outcomes Between Operation Solomon and Operation Moses Children by Trimester Groups

	Controlled Differences (Operation Solomon-Operation Moses)		
	1st-Trimester	2nd-Trimester	3rd-Trimester
	(1)	(2)	(3)
Panel A. Females			
No grade repetition (6th–12th grade)	0.073*	-0.028	-0.086*
	(0.044)	(0.041)	(0.050)
Completed 12th grade	0.047	-0.028	-0.033
	(0.038)	(0.034)	(0.041)
Obtained a matriculation diploma	0.048	-0.016	-0.081
	(0.082)	(0.069)	(0.072)
Total matriculation units	1.472	0.354	-3.434**
	(1.781)	(1.515)	(1.542)
Math matriculation units (0 to 5)	0.156	-0.175	-0.529**
	(0.256)	(0.217)	(0.228)
English matriculation units (0 to 5)	0.353	0.046	-0.816***
	(0.293)	(0.253)	(0.268)
Observations	202	265	232
Panel B. Males			
No grade repetition (6th–12th grade)	0.021	-0.047	0.072
	(0.068)	(0.060)	(0.064)
Completed 12th grade	0.029	-0.040	0.032
	(0.064)	(0.054)	(0.060)
Obtained a matriculation diploma	-0.037	-0.028	-0.003
	(0.071)	(0.058)	(0.057)
Total matriculation units	-0.995	-0.592	0.219
	(1.789)	(1.434)	(1.411)
Math matriculation units (0 to 5)	-0.154	0.129	-0.078
	(0.234)	(0.196)	(0.200)
English matriculation units (0 to 5)	-0.303	-0.378	0.044
	(0.307)	(0.259)	(0.258)
Observations	196	274	255

Notes: The table reports controlled differences in means and standard errors between the Operation Solomon sample and the Operation Moses sample by trimester group and gender. Individuals in the Operation Solomon sample were born in Israel between May 27, 1991, and February 15, 1992 and their parents immigrated in Operation Solomon (May 24-25, 1991). Individuals in the Operation Moses sample were born in Israel between May 27, 1991, and February 15, 1992 or between May 27, 1990, and February 15, 1991 and their parents immigrated in Operation Moses (before 1989).
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A7: Estimated Effect of Immigration In Utero Excluding Low Birth Weight Children

	Females			Males		
	By trimester		By week	By trimester		By week
	1st-trimester	2nd-trimester	Weeks in-utero in Israel	1st-trimester	2nd-trimester	Weeks in-utero in Israel
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. High School Outcomes						
No grade repetition (6th–12th grade)	0.143***	0.076	0.005**	-0.091	-0.133*	-0.003
	(0.047)	(0.055)	(0.002)	(0.080)	(0.076)	(0.003)
Completed 12th grade	0.045	0.010	0.002	-0.058	-0.107	-0.002
	(0.054)	(0.061)	(0.002)	(0.072)	(0.068)	(0.003)
Obtained a matriculation diploma	0.171*	0.064	0.005	-0.056	-0.029	-0.003
	(0.088)	(0.101)	(0.003)	(0.075)	(0.065)	(0.003)
Total matriculation units	3.855**	3.444*	0.118*	-1.978	-1.134	-0.106*
	(1.843)	(2.045)	(0.070)	(1.704)	(1.739)	(0.058)
Math matriculation units	0.633**	0.283	0.022**	-0.081	0.111	-0.006
	(0.277)	(0.264)	(0.010)	(0.218)	(0.253)	(0.008)
English matriculation units	0.842**	0.740**	0.026*	-0.416	-0.324	-0.022**
	(0.365)	(0.328)	(0.014)	(0.316)	(0.245)	(0.011)
Observations		641			672	
Panel B. Long Term Outcomes						
Post-secondary Education						
Any post-secondary diploma	0.219***	0.193***	0.007**	-0.067	-0.139	-0.002
	(0.075)	(0.069)	(0.003)	(0.091)	(0.091)	(0.003)
At least Bachclor's degree	0.171**	0.155**	0.005**	0.031	-0.019	0.001
	(0.070)	(0.067)	(0.003)	(0.032)	(0.030)	(0.001)
Observations		641			672	
Marriage and Childbearing						
Married by 21	-0.002	0.006	0.000	0.013	-0.000	0.001
	(0.019)	(0.020)	(0.001)	(0.012)	(0.001)	(0.000)
has children by 21	-0.031	-0.016	-0.001	0.019	0.006	0.001
	(0.029)	(0.031)	(0.001)	(0.014)	(0.006)	(0.001)
Married by 26	-0.085	0.009	-0.003	0.030	0.050	0.001
	(0.075)	(0.064)	(0.003)	(0.045)	(0.031)	(0.002)
has children by 26	-0.132	0.018	-0.005	0.023	0.048	0.001
	(0.096)	(0.068)	(0.004)	(0.039)	(0.044)	(0.002)
Observations		641			672	
Labor Market Outcomes Between Ages 23 and 27						
Employed	0.052	0.067	0.002	0.008	0.010	-0.000
	(0.046)	(0.050)	(0.002)	(0.056)	(0.048)	(0.002)
Total months employed	0.716	0.927	0.033	-0.145	-0.259	-0.016
	(0.641)	(0.673)	(0.024)	(0.734)	(0.629)	(0.028)
Annual earnings (NIS)	2,980	1,356	157.7	3,667	257.2	75.60
	(4,607)	(4,381)	(172.2)	(6,120)	(5,174)	(230.0)
Monthly earnings (NIS)	300.1	78.76	13.59	484.6	261.1	12.93
	(391.2)	(358.8)	(14.63)	(500.0)	(444.8)	(18.92)
Observations		3,090			3,260	
Panel C. Early Life Health Outcomes						
Birth weight (*gr*)	167.4**	28.98	5.661**	34.74	131.7**	2.569
	(76.59)	(74.67)	(2.572)	(71.401)	(62.505)	(2.695)
Observations		633			661	
Child mortality (by age 6)	0.019**	0.011	0.001**	-0.016	-0.011	-0.000
	(0.010)	(0.009)	(0.000)	(0.024)	(0.022)	(0.001)
Observations		641			672	

Notes: Standard errors reported in parentheses are clustered at the calendar week of birth for all outcomes except the standard errors for the labor market outcomes, which are clustered at the individual level. Panel A replicates the results in Table 4, Panel B replicates the results in Tables 5 and 6, and Panel C replicates the results in Table 7 for our main analysis sample excluding individuals whose birth weight was less than 2,500 grams. The sample includes 1,313 individuals (641 females and 672 males) born between May 27, 1991, and February 15, 1992, or between May 27, 1990, and February 15, 1991. All specifications were estimated for females and males separately as a system of seemingly unrelated regressions and control for both parents' years of schooling, the mother's age at birth, parents' age gap, SES of first locality in Israel, and birth order. The specifications for post-secondary education include also controls for year of birth and the specifications for labor market outcomes include also controls for age. Labor market outcomes between ages 23 and 27 are observed for each individual once at each age. Earnings are measured in Shekels in real terms.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A8: Estimated Effect of Immigration In Utero Stratifying the First Trimester

	Females					Males				
	By trimester				By week	By trimester				By week
	1st-trimester					1st-trimester				
	1st-month	2nd-month	3rd-month	2nd-trimester	Weeks in-utero in Israel	1st-month	2nd-month	3rd-month	2nd-trimester	Weeks in-utero in Israel
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A. High School Outcomes										
No grade repetition (6th–12th grade)	0.181***	0.197***	0.202***	0.074	0.006***	-0.126	-0.075	0.016	-0.104	-0.002
	(0.058)	(0.047)	(0.051)	(0.048)	(0.002)	(0.087)	(0.082)	(0.090)	(0.076)	(0.003)
Completed 12th grade	0.088	0.092*	0.098*	0.017	0.003*	-0.153*	-0.011	0.043	-0.086	-0.001
	(0.067)	(0.049)	(0.051)	(0.053)	(0.002)	(0.084)	(0.072)	(0.060)	(0.071)	(0.003)
Obtained a matriculation diploma	0.236**	0.212	0.134	0.086	0.004	-0.044	-0.113	0.088	-0.025	-0.002
	(0.099)	(0.130)	(0.153)	(0.100)	(0.005)	(0.117)	(0.089)	(0.104)	(0.067)	(0.003)
Total matriculation units	6.462***	4.379*	5.685***	3.873*	0.153*	-2.058	-3.481*	1.858	-0.929	-0.097
	(1.781)	(2.550)	(2.070)	(1.977)	(0.082)	(1.764)	(1.862)	(1.922)	(1.686)	(0.066)
Math matriculation units	0.985***	0.578	0.733**	0.294	0.021*	-0.224	0.026	0.132	0.137	-0.002
	(0.290)	(0.437)	(0.319)	(0.261)	(0.013)	(0.357)	(0.230)	(0.283)	(0.257)	(0.009)
English matriculation units	1.053**	1.152**	0.762**	0.816**	0.035**	-0.389	-0.670	0.323**	-0.276	-0.019
	(0.466)	(0.482)	(0.307)	(0.317)	(0.015)	(0.273)	(0.452)	(0.153)	(0.241)	(0.013)
Observations		699			631		725			661
Panel B. Long Term Outcomes										
Post-secondary Education										
Any post-secondary diploma	0.223**	0.208**	0.293**	0.174***	0.009***	0.071	-0.046	-0.124	-0.093	-0.002
	(0.096)	(0.099)	(0.117)	(0.065)	(0.003)	(0.090)	(0.093)	(0.124)	(0.091)	(0.003)
At least Bachelor's degree	0.204***	0.174	0.215**	0.140**	0.007**	0.085	0.048	0.003	-0.010	0.001
	(0.078)	(0.106)	(0.108)	(0.065)	(0.003)	(0.069)	(0.046)	(0.027)	(0.029)	(0.001)
Observations		699			631		725			661
Marriage and Childbearing										
Married by 21	0.008	-0.016	0.006	0.005	-0.000	0.046	-0.000	-0.000	0.000	-
	(0.019)	(0.022)	(0.014)	(0.019)	(0.018)	(0.030)	(0.001)	(0.001)	(0.001)	-
has children by 21	0.007	-0.066**	-0.025	-0.016	-0.002*	0.054*	0.004	0.006	0.006	-
	(0.041)	(0.026)	(0.021)	(0.029)	(0.001)	(0.032)	(0.004)	(0.006)	(0.006)	-
Married by 26	0.028	-0.130	0.080	0.029	-0.002	0.062	-0.013	0.079*	0.061**	0.002
	(0.076)	(0.114)	(0.080)	(0.063)	(0.003)	(0.048)	(0.083)	(0.041)	(0.027)	(0.002)
has children by 26	0.003	-0.194**	-0.108	0.020	-0.006*	0.076*	-0.000	0.026	0.052	0.001
	(0.127)	(0.092)	(0.133)	(0.063)	(0.003)	(0.045)	(0.055)	(0.060)	(0.041)	(0.002)
Observations		699			631		725			661
Labor Market Outcomes Between Ages 23 and 27										
Employed	0.099*	0.054	0.034	0.072	0.002	0.041	-0.084	0.085	0.006	-0.001
	(0.055)	(0.045)	(0.086)	(0.049)	(0.002)	(0.083)	(0.087)	(0.074)	(0.046)	(0.002)
Total months employed	1.558*	0.980	0.127	1.097*	0.040	0.340	-1.083	0.633	-0.256	-0.023
	(0.826)	(0.688)	(1.073)	(0.656)	(0.027)	(1.075)	(1.021)	(1.065)	(0.599)	(0.030)
Annual earnings (NIS)	9,469	5,887	-6,127	3,158	121.7	2,691	432.6	7,519	-634.7	62.60
	(6,467)	(5,234)	(7,020)	(4,221)	(184.7)	(8,958)	(8,026)	(9,144)	(4,966)	(249.9)
Monthly earnings (NIS)	715.1	654.9	-575.3	213.3	11.59	341.9	209.9	828.0	171.2	12.57
	(521.4)	(467.8)	(550.1)	(346.3)	(16.17)	(721.5)	(682.9)	(725.4)	(427.4)	(20.65)
Observations		3,370			3,045		3,520			3,210
Panel C. Early Life Health Outcomes										
Birth weight (*gr*)	32.44	161.6	313.1	-39.57	6.511	195.136**	-2.359	2.304	223.8***	3.360
	(135.2)	(127.2)	(208.3)	(85.64)	(4.187)	(98.13)	(153.6)	(116.1)	(66.38)	(4.268)
Low birth weight (<2500 *gr*)	0.147*	0.016	-0.028	0.073	0.001	-0.038	0.012	-0.028	-0.076*	-0.001
	(0.077)	(0.067)	(0.084)	(0.049)	(0.002)	(0.049)	(0.083)	(0.064)	(0.039)	(0.001)
Observations		691			623		714			650
Child mortality (by age 6)	0.019	-0.002	-0.018	0.005	-0.000	-0.010	-0.041	-0.039	-0.020	-0.001
	(0.022)	(0.013)	(0.022)	(0.015)	(0.000)	(0.031)	(0.030)	(0.024)	(0.020)	(0.002)
Observations		699			631		725			661

Notes: Standard errors reported in parentheses are clustered at the calendar week of birth for all outcomes except the standard errors for the labor market outcomes, which are clustered at the individual level. Panel A replicates the results in Table 4, Panel B replicates the results in Tables 5, and 6 and Panel C replicates the results in Table 7. Columns 1–4 and 6–9 replicate the odd Columns of these tables stratifying the first trimester into three months. Columns 5 and 10 replicate the even columns of these tables while excluding individuals who were born between January 15th to February 15th. The sample in Columns 1–4 and 6–9 includes 1,424 individuals (699 females and 725 males) born between May 27, 1991, and February 15, 1992, or between May 27, 1990, and February 15, 1991. The sample in Columns 5 and 10 includes 1,292 individuals (631 females and 661 males) born between May 27, 1991, and January 15, 1992, or between May 27, 1990, and January 15, 1991. All specifications were estimated for females and males separately as a system of seemingly unrelated regressions and control for both parents' years of schooling, the mother's age at birth, parents' age gap, SES of first locality in Israel, and birth order. The specifications for post-secondary education include also controls for the year of birth and the specifications for labor market outcomes include also controls for age. Labor market outcomes between ages 23 and 27 are observed for each individual once at each age. Earnings are measured in Shekels in real terms. There are no estimates for marriage and fertility for males since none of them were married or had children by age 21.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A9: Estimated Effect of Immigration In Utero for Females, Excluding the First Two Weeks of Each Trimester

	Excluding the First Two Weeks of 1st Trimester		Excluding the First Two Weeks of 2nd Trimester		Excluding the First Two Weeks of 3rd Trimester		Excluding First Two Weeks of All Trimesters	
	1st-trimester	2nd-trimester	1st-trimester	2nd-trimester	1st-trimester	2nd-trimester	1st-trimester	2nd-trimester
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. High School Outcomes								
No grade repetition (6th–12th grade)	0.216***	0.075	0.186***	0.096**	0.190***	0.084*	0.223***	0.107**
	(0.041)	(0.048)	(0.041)	(0.046)	(0.044)	(0.051)	(0.045)	(0.049)
Completed 12th grade	0.109**	0.017	0.085*	0.029	0.118***	0.055	0.146***	0.068
	(0.047)	(0.053)	(0.046)	(0.053)	(0.046)	(0.051)	(0.047)	(0.051)
Obtained a matriculation diploma	0.203***	0.087	0.202**	0.092	0.244**	0.136	0.244**	0.139
	(0.099)	(0.100)	(0.095)	(0.101)	(0.107)	(0.110)	(0.111)	(0.111)
Total matriculation units	5.546***	3.877**	5.189***	4.420**	6.239***	5.062**	6.474***	5.577***
	(1.868)	(1.964)	(1.822)	(1.904)	(1.960)	(2.054)	(2.030)	(1.980)
Math matriculation units	0.858***	0.291	0.790***	0.348	0.956***	0.488*	1.047***	0.543*
	(0.294)	(0.260)	(0.278)	(0.258)	(0.284)	(0.260)	(0.298)	(0.258)
English matriculation units	1.010***	0.821***	0.986***	0.901***	1.069***	0.917***	1.049***	0.999***
	(0.362)	(0.316)	(0.368)	(0.314)	(0.393)	(0.342)	(0.394)	(0.338)
Observations	675		673		672		622	
Panel B. Long Term Outcomes								
Post-secondary Education								
Any post-secondary diploma	0.233***	0.173***	0.236***	0.177***	0.262***	0.204***	0.266***	0.206***
	(0.076)	(0.065)	(0.074)	(0.067)	(0.079)	(0.070)	(0.083)	(0.073)
At least Bachelor's degree	0.185**	0.139*	0.190***	0.141**	0.214***	0.167**	0.212***	0.167**
	(0.074)	(0.065)	(0.072)	(0.068)	(0.078)	(0.069)	(0.082)	(0.073)
Observations	675		673		672		622	
Marriage and Childbearing								
Married by 21	-0.004	0.005	-0.003	0.006	0.009	0.018	0.008	0.019
	(0.017)	(0.019)	(0.018)	(0.020)	(0.014)	(0.013)	(0.014)	(0.014)
has children by 21	-0.044**	-0.016	-0.030	-0.014	-0.026	-0.011	-0.040*	-0.008
	(0.022)	(0.029)	(0.027)	(0.031)	(0.026)	(0.028)	(0.022)	(0.030)
Married by 26	-0.024	0.030	-0.038	0.020	-0.023	0.051	0.003	0.044
	(0.080)	(0.063)	(0.073)	(0.067)	(0.074)	(0.063)	(0.081)	(0.067)
has children by 26	-0.127*	0.021	-0.108	0.014	-0.113	0.014	-0.131	0.011
	(0.077)	(0.063)	(0.082)	(0.063)	(0.088)	(0.069)	(0.083)	(0.071)
Observations	675		673		672		622	
Labor Market Outcomes Between Ages 23 and 27								
Employed	0.056	0.073	0.064	0.087*	0.050	0.056	0.043	0.072
	(0.046)	(0.049)	(0.045)	(0.049)	(0.046)	(0.052)	(0.048)	(0.051)
Total months employed	0.863	1.122*	0.998	1.306*	0.685	0.794	0.607	1.026
	(0.629)	(0.655)	(0.617)	(0.666)	(0.637)	(0.680)	(0.652)	(0.690)
Annual earnings (NIS)	3,237	3,382	4,943	4,881	2,375	1,081	1,867	2,955
	(4,468)	(4,210)	(4,379)	(4,331)	(4,540)	(4,408)	(4,628)	(4,502)
Monthly earnings (NIS)	311.4	227.9	433.8	347.7	227.0	40.33	195.73	182.5
	(380.0)	(345.4)	(370.1)	(354.2)	(385.8)	(364.6)	(396.1)	(370.4)
Observations	3,255		3,250		3,240		3,005	
Panel C. Early Life Health Outcomes								
Birth weight (*gr*)	184.4*	-40.98	150.7	-78.23	143.4	-46.07	179.6	-84.55
	(111.8)	(85.64)	(107.42)	(81.93)	(112.7)	(92.91)	(120.7)	(88.97)
Low birth weight (<2500 *gr*)	0.026	0.073	0.055	0.092*	0.037	0.060	0.016	0.079
	(0.058)	(0.049)	(0.059)	(0.052)	(0.064)	(0.055)	(0.065)	(0.057)
Observations	667		665		664			
Child mortality (by age 6)	0.006	0.005	0.003	0.006	-0.000	0.002	0.002	0.002
	(0.015)	(0.015)	(0.015)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Observations	675		673		672		614	

Notes: Standard errors reported in parentheses are clustered at the calendar week of birth for all outcomes except the standard errors for the labor market outcomes, which are clustered at the individual level. The table reports estimates of equation (1) based on samples that exclude births from the first two weeks of each trimester. Panel A replicates the results of the odd columns in Panel A of Table 4. Panel B replicates the results of the odd columns in Panel A of Tables 5 and 6. Panel C replicates the results of the odd columns in Panel A of Table 7. The sample includes 1,424 individuals (699 females and 725 males) born between May 27, 1991, and February 15, 1992, or between May 27, 1990, and February 15, 1991. Labor market outcomes between ages 23 and 27 are observed for each individual once at each age. Earnings are measured in Shekels in real terms. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A10: Estimated Effect of Immigration In Utero for Females, Excluding the Last Two Weeks of Each Trimester

	Excluding the Last Two Weeks of 1st Trimester		Excluding the Last Two Weeks of 2nd Trimester		Excluding the Last Two Weeks of 3rd Trimester		Excluding Last Two Weeks of All Trimesters	
	1st-trimester	2nd-trimester	1st-trimester	2nd-trimester	1st-trimester	2nd-trimester	1st-trimester	2nd-trimester
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. High School Outcomes								
No grade repetition (6th–12th grade)	0.185***	0.075	0.183***	0.088*	0.195***	0.087*	0.196***	0.100**
	(0.042)	(0.049)	(0.041)	(0.048)	(0.040)	(0.047)	(0.042)	(0.048)
Completed 12th grade	0.081*	0.017	0.082*	0.031	0.082*	0.016	0.079	0.030
	(0.048)	(0.053)	(0.046)	(0.052)	(0.047)	(0.054)	(0.048)	(0.053)
Obtained a matriculation diploma	0.224**	0.084	0.201**	0.102	0.195**	0.083	0.220**	0.097
	(0.096)	(0.100)	(0.094)	(0.099)	(0.097)	(0.103)	(0.097)	(0.101)
Total matriculation units	5.395***	3.819*	5.154***	4.260**	5.386***	4.101**	5.526***	4.430**
	(1.884)	(1.965)	(1.812)	(2.068)	(1.863)	(2.005)	(1.933)	(2.079)
Math matriculation units	0.812***	0.287	0.770***	0.332	0.772***	0.296	0.804***	0.331
	(0.293)	(0.260)	(0.282)	(0.274)	(0.285)	(0.265)	(0.300)	(0.277)
English matriculation units	1.069***	0.807**	0.984***	0.848***	1.050***	0.872***	1.103***	0.892***
	(0.373)	(0.316)	(0.361)	(0.326)	(0.370)	(0.324)	(0.376)	(0.332)
Observations	679		669		688		638	
Panel B. Long Term Outcomes								
Post-secondary Education								
Any post-secondary diploma	0.244***	0.177***	0.223***	0.210***	0.238***	0.181***	0.242***	0.222***
	(0.077)	(0.065)	(0.073)	(0.062)	(0.075)	(0.067)	(0.079)	(0.064)
At least Bachelor's degree	0.188***	0.144**	0.178**	0.184***	0.194***	0.147**	0.185**	0.196***
	(0.072)	(0.065)	(0.070)	(0.062)	(0.073)	(0.067)	(0.073)	(0.064)
Observations	679		669		688		638	
Marriage and Childbearing [N=1,313]								
Married by 21	-0.003	0.004	-0.003	0.006	-0.003	0.004	-0.003	0.006
	(0.018)	(0.019)	(0.018)	(0.020)	(0.018)	(0.020)	(0.019)	(0.021)
has children by 21	-0.031	-0.017	-0.030	-0.007	-0.037	-0.025	-0.037	-0.015
	(0.028)	(0.029)	(0.027)	(0.030)	(0.026)	(0.028)	(0.028)	(0.030)
Married by 26	-0.059	0.025	-0.042	0.028	-0.050	0.023	-0.066	0.018
	(0.074)	(0.063)	(0.073)	(0.069)	(0.074)	(0.065)	(0.075)	(0.071)
has children by 26	-0.095	0.017	-0.107	0.020	-0.109	0.018	-0.095	0.015
	(0.086)	(0.062)	(0.083)	(0.065)	(0.084)	(0.064)	(0.087)	(0.067)
Observations	679		669		688		638	
Labor Market Outcomes Between Ages 23 and 27								
Employed	0.052	0.073	0.062	0.078	0.062	0.070	0.049	0.077
	(0.045)	(0.049)	(0.045)	(0.050)	(0.046)	(0.050)	(0.046)	(0.051)
Total months employed	0.909	1.118*	0.953	1.335**	0.931	1.049	0.862	1.315*
	(0.629)	(0.656)	(0.617)	(0.672)	(0.625)	(0.668)	(0.640)	(0.684)
Annual earnings (NIS)	4,929	3,313	4,467	4,527	3,783	2,302	4,205	3,978
	(4,565)	(4,252)	(4,420)	(4,381)	(4,456)	(4,303)	(4,609)	(4,441)
Monthly earnings (NIS)	329.2	253.1	296.5	329.3	243.9	173.4	269.3	282.9
	(367.3)	(344.8)	(355.7)	(354.9)	(359.1)	(349.8)	(371.3)	(360.7)
Observations	3,270		3,225		3,315		3,070	
Panel C. Early Life Health Outcomes								
Birth weight (*gr*)	127.2	-35.62	148.1	-37.85	144.3	-47.70	117.1	-41.68
	(102.4)	(85.83)	(105.7)	(89.93)	(107.7)	(88.20)	(103.7)	(91.95)
Low birth weight (<2500 *gr*)	0.051	0.071	0.051	0.055	0.055	0.078*	0.056	0.059
	(0.060)	(0.049)	(0.058)	(0.048)	(0.059)	(0.050)	(0.060)	(0.049)
Observations	671		661		680		630	
Child mortality (by age 6)	0.007	0.005	0.004	-0.003	0.003	0.006	0.008	-0.003
	(0.015)	(0.015)	(0.015)	(0.014)	(0.015)	(0.016)	(0.016)	(0.015)
Observations	679		669		688		638	

Notes: Standard errors reported in parentheses are clustered at the calendar week of birth for all outcomes except the standard errors for the labor market outcomes, which are clustered at the individual level. The table reports estimates of equation (1) based on samples that exclude births from the last two weeks of each trimester. Panel A replicates the results of the odd columns in Panel A of Table 4. Panel B replicates the results of the odd columns in Panel A of Tables 5 and 6. Panel C replicates the results of the odd columns in Panel A of Table 7. The sample includes 1,424 individuals (699 females and 725 males) born between May 27, 1991, and February 15, 1992, or between May 27, 1990, and February 15, 1991. Labor market outcomes between ages 23 and 27 are observed for each individual once at each age. Earnings are measured in Shekels in real terms. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A11: Estimated Effect of Immigration In Utero for Females, with Trimester Reassignments (Arrival in First or Last Two Weeks of Each Trimester Reassigned to Previous or Next Trimester)

	First Two Weeks Reassigned to Previous Trimester		Last Two Weeks Reassigned to Next Trimester	
	1st-trimester	2nd-trimester	1st-trimester	2nd-trimester
	(1)	(2)	(3)	(4)
Panel A. High School Outcomes				
No grade repetition (6th–12th grade)	0.165***	0.109**	0.189***	0.096**
	(0.058)	(0.046)	(0.045)	(0.046)
Completed 12th grade	0.112**	0.098*	0.100**	0.040
	(0.054)	(0.051)	(0.046)	(0.047)
Obtained a matriculation diploma	0.190	0.164	0.155	0.045
	(0.116)	(0.107)	(0.095)	(0.095)
Total matriculation units	5.121**	6.310***	5.052***	3.535*
	(2.154)	(1.890)	(1.620)	(1.879)
Math matriculation units	0.819***	0.645**	0.790***	0.292
	(0.309)	(0.253)	(0.233)	(0.258)
English matriculation units	0.955**	1.075***	1.097***	0.721**
	(0.371)	(0.338)	(0.326)	(0.301)
Observations	675		688	
Panel B. Long Term Outcomes				
Post-secondary Education				
Any post-secondary diploma	0.217***	0.169**	0.247***	0.170***
	(0.080)	(0.073)	(0.078)	(0.065)
At least Bachelor's degree	0.182**	0.144**	0.191***	0.153**
	(0.074)	(0.071)	(0.071)	(0.065)
Observations	675		688	
Marriage and Childbearing				
Married by 21	0.013	0.028*	-0.006	0.006
	(0.012)	(0.017)	(0.016)	(0.018)
has children by 21	-0.033	-0.001	-0.026	-0.003
	(0.022)	(0.030)	(0.027)	(0.027)
Married by 26	0.023	0.069	-0.089	0.018
	(0.074)	(0.066)	(0.060)	(0.061)
has children by 26	-0.087	0.004	-0.085	-0.003
	(0.084)	(0.070)	(0.077)	(0.063)
Observations	675		688	
Labor Market Outcomes Between Ages 23 and 27				
Employed	0.029	0.060	0.066	0.080*
	(0.050)	(0.052)	(0.042)	(0.044)
Total months employed	0.420	0.833	0.936*	1.254**
	(0.658)	(0.692)	(0.567)	(0.601)
Annual earnings (NIS)	-228.4	3,081	5,892	3,655
	(4,479)	(4,503)	(4,059)	(3,910)
Monthly earnings (NIS)	14.59	238.4	547.8	222.8
	(382.4)	(371.4)	(344.4)	(318.7)
Observations	3,255		3,315	
Panel C. Early Life Health Outcomes				
Birth weight (*gr*)	170.0	-125.3	140.1*	42.92
	(104.0)	(85.54)	(96.89)	(88.15)
Low birth weight ($<$2500 *gr*)	0.020	0.070	0.050	0.002
	(0.059)	(0.055)	(0.063)	(0.048)
Observations	667		680	
Child mortality (by age 6)	-0.006	-0.010	-0.007	-0.019
	(0.014)	(0.018)	(0.017)	(0.016)
Observations	675		688	

Notes: Standard errors reported in parentheses are clustered at the calendar week of birth for all outcomes except the standard errors for the labor market outcomes, which are clustered at the individual level. The table reports estimates of equation (1) based on a sample where births from the first (last) two weeks of each trimester group are reassigned to the previous (next) trimester. Panel A replicates the results of the odd columns in Panel A of Table 4. Panel B replicates the results of the odd columns in Panel A of Tables 5 and 6. Panel C replicates the results of the odd columns in Panel A of Table 7. The sample includes 1,424 individuals (699 females and 725 males) born between May 27, 1991, and February 15, 1992, or between May 27, 1990, and February 15, 1991. Labor market outcomes between ages 23 and 27 are observed for each individual once at each age. Earnings are measured in Shekels in real terms.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A12: Estimated Effect of Immigration In Utero on School Entry Age (in Months)

	Only Solomon Sample (OLS)		Solomon and Moses Sample (DID)	
	(1)	(2)	(3)	(4)
Panel A. Females				
1st-trimester	2.566***		-1.369	
	(0.852)		(0.869)	
2nd-trimester	-1.401		-0.976	
	(0.972)		(1.288)	
Weeks in-utero in Israel		0.109***		-0.001
		(0.036)		(0.037)
3rd-trimester Mean and SD		89.28 [8.429]		
Observations	274		694	
Panel B. Full Sample (DID)				
1st-trimester	4.212***		1.020	
	(0.872)		(1.095)	
2nd-trimester	-0.003		-0.220	
	(0.839)		(1.120)	
Weeks in-utero in Israel		0.133***		0.028
		(0.043)		(0.041)
3rd-trimester Mean and SD		89.14 [5.717]		
Observations	288		711	

Notes: Standard errors reported in parentheses are clustered at the calendar week. The table reports the effect of immigration in utero and age (in months) in 1st grade. Columns 1 and 2 are estimated using OLS models that include only the Operation Solomon sample. Columns 3 and 4 are estimated using DID models (equation (1)) that include both Operation Solomon and Operation Moses cohorts. oth were estimated for females and males separately as a system of seemingly unrelated regressions.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A13: Estimated Effect of Immigration In Utero Controlling for School Entry Age (in months)

	Females			Males		
	By trimester		By week	By trimester		By week
	1st-trimester	2nd-trimester	Weeks in-utero in Israel	1st-trimester	2nd-trimester	Weeks in-utero in Israel
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. High School Outcomes						
No grade repetition (6th–12th grade)	0.185***	0.079	0.006***	-0.066	-0.110	-0.002
	(0.043)	(0.048)	(0.002)	(0.073)	(0.075)	(0.002)
Completed 12th grade	0.088**	0.023	0.003**	-0.044	-0.091	-0.002
	(0.044)	(0.050)	(0.002)	(0.066)	(0.070)	(0.002)
Obtained a matriculation diploma	0.194**	0.082	0.006	-0.031	-0.026	-0.002
	(0.095)	(0.099)	(0.004)	(0.072)	(0.065)	(0.003)
Total matriculation units	5.101***	3.856**	0.166**	-1.342	-0.969	-0.093*
	(1.820)	(1.930)	(0.065)	(1.559)	(1.701)	(0.053)
Math matriculation units	0.758***	0.278	0.026***	-0.002	0.138	-0.005
	(0.287)	(0.261)	(0.010)	(0.209)	(0.261)	(0.008)
English matriculation units	0.980***	0.815***	0.032**	-0.281	-0.288	-0.018*
	(0.367)	(0.312)	(0.014)	(0.287)	(0.246)	(0.010)
Observations		694			711	
Panel B. Long Term Outcomes						
Post-secondary Education						
Any post-secondary diploma	0.229***	0.172***	0.008***	-0.038	-0.097	-0.000
	(0.072)	(0.063)	(0.003)	(0.092)	(0.093)	(0.003)
At least Bachelor's degree	0.185***	0.138**	0.007***	0.038	-0.010	0.002
	(0.071)	(0.063)	(0.003)	(0.033)	(0.029)	(0.001)
Observations		694			711	
Marriage and Childbearing						
Married by 21	-0.002	0.005	0.000	0.012	-0.000	0.001
	(0.018)	(0.019)	(0.001)	(0.012)	(0.001)	(0.000)
has children by 21	-0.029	-0.015	-0.001	0.018	0.006	0.001
	(0.027)	(0.029)	(0.001)	(0.013)	(0.006)	(0.001)
Married by 26	-0.043	0.031	-0.002	0.044	0.062**	0.002
	(0.072)	(0.063)	(0.003)	(0.042)	(0.027)	(0.002)
has children by 26	-0.112	0.018	-0.004	0.033	0.053	0.002
	(0.082)	(0.062)	(0.003)	(0.039)	(0.042)	(0.001)
Observations		694			711	
Labor Market Outcomes Between Ages 23 and 27						
Employed	0.062	0.075	0.002	-0.021	-0.009	-0.001
	(0.044)	(0.048)	(0.002)	(0.050)	(0.043)	(0.002)
Total months employed	0.958	1.139*	0.043*	-0.432	-0.443	-0.028
	(0.609)	(0.645)	(0.022)	(0.670)	(0.577)	(0.025)
Annual earnings (NIS)	4,195	3,323	204.3	1,280	-1,846	-36.99
	(4,383)	(4,179)	(162.2)	(5,781)	(4,855)	(215.9)
Monthly earnings (NIS)	375.9	228.4	16.76	266.5	69.64	2.463
	(369.5)	(342.3)	(13.69)	(467.3)	(414.6)	(17.49)
Observations		3,345			3,460	
Panel C. Early Life Health Outcomes						
Birth weight (*gr*)	110.8	-72.85	3.054	36.93	194.1***	3.118
	(96.65)	(75.59)	(3.346)	(83.42)	(68.25)	(3.253)
Low birth weight (<2500 *gr*)	0.071	0.083**	0.003*	-0.013	-0.065*	-0.001
	(0.053)	(0.040)	(0.002)	(0.047)	(0.038)	(0.002)
Observations		694			711	

Notes: Standard errors reported in parentheses are clustered at the calendar week of birth for all outcomes except the standard errors for the labor market outcomes, which are clustered at the individual level. Panel A replicates the results in Table 4, Panel B replicates the results in Tables 5 and 6, and Panel C replicates the results in Table 7. All specifications control for school entrance age (in months). The sample includes 1,405 individuals (694 females and 711 males) born between May 27, 1991, and February 15, 1992, or between May 27, 1990, and February 15, 1991. All specifications were estimated for females and males separately as a system of seemingly unrelated regressions and control for both parents' years of schooling, thee mother's age at birth, parents' age gap, SES of first locality in Israel, and birth order. The specifications for post-secondary education include also controls for the year of birth and the specifications for labor market outcomes include also controls for age. Labor market outcomes between ages 23 and 27 are observed for each individual once at each age. Earnings are measured in Shekels in real terms.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A14: Estimated Effect of Mothers' Length of Residence in Israel Before Birth on Child Outcomes for Children Conceived in Israel

	Females		Males	
	Weeks in Israel		Weeks in Israel	
	OLS	DID	OLS	DID
	(1)	(2)	(3)	(4)
Panel A. High School Outcomes				
No grade repetition (6th–12th grade)	-0.0006	-0.0004	-0.0006	-0.0018
	(0.0011)	(0.0016)	(0.0013)	(0.0018)
Completed 12th grade	-0.0011	-0.0015	-0.0003	-0.0010
	(0.0008)	(0.0012)	(0.0012)	(0.0016)
Obtained a matriculation diploma	-0.0012	-0.0007	-0.0009	-0.0025
	(0.0018)	(0.0025)	(0.0013)	(0.0016)
Total matriculation units	-0.0207	-0.0407	-0.0029	-0.0280
	(0.0420)	(0.0494)	(0.0418)	(0.0488)
Math matriculation units	-0.0017	-0.0055	0.0015	0.0005
	(0.0050)	(0.0075)	(0.0056)	(0.0073)
English matriculation units	-0.0036	-0.0057	-0.0061	-0.0055
	(0.0060)	(0.0094)	(0.0071)	(0.0076)
Observations	351	621	326	638
Panel B. Long Term Outcomes				
Any post-secondary diploma	-0.0027**	0.0007	-0.0010	0.0003
	(0.0013)	(0.0020)	(0.0019)	(0.0016)
At least Bachelor's degree	-0.0035***	0.0010	-0.0014	-0.0006
	(0.0012)	(0.0018)	(0.0006)	(0.0009)
Observations	351	621	326	638
Marriage and Childbearing				
Married by 21	-0.0002	-0.0007	-	-
	(0.0002)	(0.0558)	-	-
has children by 21	0.000	-0.0001	-0.0001	-0.0002
	(0.0006)	(0.0010)	(0.0001)	(0.0003)
Married by 25	0.0006	-0.0004	0.0001	0.0007
	(0.0009)	(0.0017)	(0.0006)	(0.0011)
has children by 25	0.0007	0.0000	-0.0002	0.0009
	(0.0010)	(0.0017)	(0.0007)	(0.0009)
Observations	351	621	326	638
Labor Market Outcomes Between Ages 23 and 26				
Employed	0.0003	0.0002	0.0009	-0.0005
	(0.0009)	(0.0013)	(0.0009)	(0.0014)
Total months employed	0.0019	-0.0018	0.0168	0.0009
	(0.0114)	(0.0172)	(0.0113)	(0.0179)
Annual earnings (NIS)	17.163	-63.827	120.00	-14.955
	(77.559)	(122.50)	(96.396)	(147.55)
Monthly earnings (NIS)	3.3517	-2.2425	8.8592	-4.9825
	(6.5750)	(10.136)	(7.7308)	(12.242)
Observations	1,388	2,420	1,276	2,512
Panel C. Early Life Health Outcomes				
Birth weight (*gr*)	-0.8358	-3.7375	-0.2023	1.9921
	(1.7320)	(3.0622)	(1.5109)	(2.1763)
Low birth weight (<2500 *gr*)	0.0004	0.0013	-0.0003	-0.0003
	(0.0012)	(0.0017)	(0.0006)	(0.0009)
Observations	349	612	321	630
Child mortality (by age 6)	-0.0005	-0.0006	-0.0003	-0.0003
	(0.0004)	(0.0006)	(0.0003)	(0.0004)
Observations	351	621	326	638

Notes: Standard errors reported in parentheses are clustered at the calendar week of birth for all outcomes except the standard errors for the labor market outcomes, which are clustered at the individual level. Odd columns report estimates from regressing each outcome variable on the number of weeks since the mother's immigration to Israel when the child was born. Even columns report estimates of an equation similar to equation (2) with the number of weeks since the mother's immigration to Israel when the child was born as the main explanatory variable. The sample includes only individuals born between March 1992 and February 1993 to mothers who immigrated from Ethiopia in Operation Solomon. The equations are estimated for females and males separately as a system of seemingly unrelated regressions. All specifications control for both parents' years of schooling, the mother's age at birth, parents' age gap, SES of first locality in Israel, and birth order. The specifications in Panel C with the labor market outcomes include also controls for age. The sample in odd columns includes 677 individuals (351 females and 326 males) born to Operation Solomon immigrants between March 1992 and February 1993. The sample in even columns includes 1,259 individuals (621 females and 638 males) born to Operation Solomon and Operation Moses immigrants between March 1992 and February 1993. There are no estimates for marriage for males since none of them were married or had children by age 21.

Table A15: Estimated Effect of Prenatal Environment on High School Outcomes by Gender Among Former Soviet Union Immigrants

	No Grade Repetition (6th–12th Grade)	Completed 12th Grade	Obtained a Matriculation Diploma	Total Matriculation Units	Math Matriculation Units	English Matriculation Units
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Females						
1st-trimester	0.024	-0.004	0.022	-0.177	0.092	-0.027
	(0.030)	(0.020)	(0.035)	(0.806)	(0.133)	(0.133)
2nd-trimester	0.035	-0.003	-0.024	-0.529	0.011	0.051
	(0.030)	(0.020)	(0.035)	(0.808)	(0.134)	(0.133)
P-value: 1st = 2nd	0.721	0.962	0.241	0.692	0.587	0.591
3rd-trimester	0.715	0.92848	0.374	22.23	2.751	3.648
Mean and SD	[0.452]	[0.258]	[0.484]	[10.93]	[1.816]	[1.807]
Panel B. Males						
1st-trimester	-0.015	0.014	0.008	0.679	0.048	0.097
	(0.037)	(0.030)	(0.038)	(0.969)	(0.150)	(0.160)
2nd-trimester	0.053	0.020	0.023	0.943	0.059	0.272*
	(0.033)	(0.028)	(0.036)	(0.940)	(0.145)	(0.158)
P-value: 1st = 2nd	0.078	0.844	0.722	0.802	0.948	0.314
3rd-trimester	0.643	0.837	0.385	18.17	2.348	3.041
Mean and SD	[0.480]	[0.370]	[0.487]	[12.98]	[1.967]	[2.182]

Notes: Standard errors reported in parentheses are clustered at week of pregnancy in immigration. The table reports estimates from regressing high school outcomes on indicators whether the individual immigrated in-utero to Israel from the Former Soviet Union during the first trimester of the pregnancy and during the second trimester of the pregnancy (relative to the third trimester), estimated for females and males separately. Panel A reports estimates for females and Panel B reports estimates for males. All specifications control for both parents' years of schooling, number of siblings, year of birth fixed effects, and month of birth fixed effects. The sample includes 2039 individuals (915 females and 1128 males) born between 1990 and 1992.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A16: Estimated Effect of Prenatal Environment on Test Scores and Own Behavior in Elementary and Middle School

	GEMS Test Scores (Fifth Grade)		Own Behavior at School (Fifth to Seventh Grade)	
	(1)	(2)	(3)	(4)
Panel A. Females				
1st-trimester	0.631***		0.235**	
	(0.199)		(0.093)	
2nd-trimester	0.294**		0.007	
	(0.138)		(0.070)	
P-value: 1st = 2nd	0.048		0.007	
Weeks in-utero in Israel		0.020***		0.007**
		(0.007)		(0.004)
3rd-trimester Mean and SD	-0.026 [0.939]		0.026 [0.494]	
Panel B. Males				
1st-trimester	0.314		0.206*	
	(0.247)		(0.123)	
2nd-trimester	-0.081		-0.032	
	(0.207)		(0.111)	
P-value: 1st = 2nd	0.089		0.060	
Weeks in-utero in Israel		-0.008		0.009*
		(0.008)		(0.005)
3rd-trimester Mean and SD	-0.187 [0.954]		-0.094 [0.650]	
Panel C. P-value for equality of the coefficient between females and males				
1st-trimester	0.358		0.812	
2nd-trimester	0.136		0.767	
Weeks in-utero in Israel		0.263		0.696
Observations	956	956	576	576

Notes: Standard errors reported in parentheses are clustered at the week of pregnancy. Odd columns report estimates for β_3 and β_4 of equation (1) and even columns report estimates for α_2 of equation (2). Both were estimated for females and males separately as a system of seemingly unrelated regressions. Panel A reports estimates for females and Panel B reports estimates for males. Panel C reports p-values from F-tests that check for the equality of coefficients of females and males. The dependent variable in columns 1 and 2 is the standardized GEMS test score (by year and subject) of fifth-grade students in math, Hebrew, science, and English. The sample in columns 1 and 2 stacks all GEMS subjects and includes 956 tests (504 from females and 452 from males) taken by 260 fifth-grade students (135 females and 125 males), out of 557 overall in the sample. Estimates are weighted by the inverse number of appearances of each student. Controls in columns 1 and 2 include both parents' years of schooling, number of siblings, mother's age at birth, parents' age gap, test year fixed effects, and indicators for the subject of the test. The dependent variable in columns 3 and 4 is the mean of the standardized answers to the seven items that relate to students' feelings or self-reported behavior in the student questionnaire. The sample in columns 3 and 4 pools data for students from the fifth, sixth, and seventh grades (the same student may appear more than once) and includes 576 questionnaires (307 from females and 269 from males) filled in by 470 students (269 females and 201 males), out of 570 students from the sample. Estimates are weighted by the inverse number of appearances of each student. Controls in columns 3 and 4 include both parents' years of schooling, number of siblings, the mother's age at birth, parents' age gap, and year and grade dummies. The sample in all columns includes only individuals born between May 27, 1991, and February 15, 1992, whose parents immigrated to Israel in Operation Solomon.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

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