Supporting Information

Currie and Schwandt 10.1073/pnas.1307582110

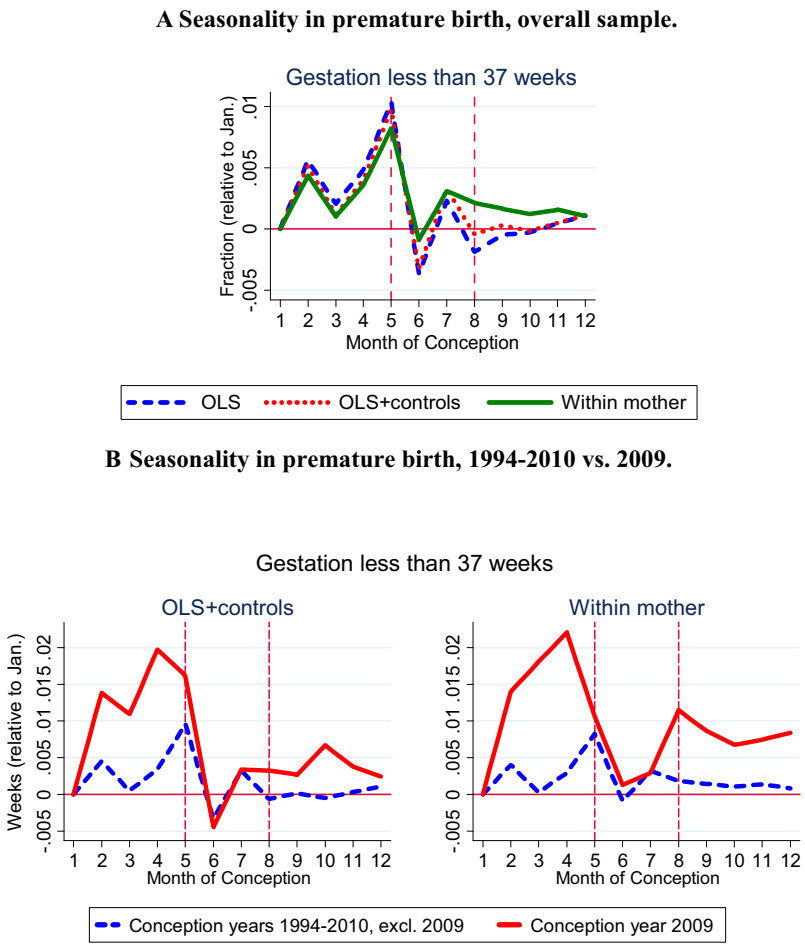

Fig. S1. (*A*) Seasonality in premature birth. The coefficients from regressions of a zero/one indicator variable for premature birth (less than 37 wk of gestation length) on month of conception indicator variables and additional controls are displayed. Fig. 1 has additional notes. The average rate of premature births in the data is 0.0763. (*B*) Seasonality in premature birth, 1994–2010 vs. 2009. The coefficients from regressions of a zero/one indicator variable for premature birth (less than 37 wk of gestation length) on month of conception indicator variables are displayed. The solid line shows the coefficients for the conception year 2009, and the dashed line is the estimated effect for the years 1994–2010 net of the 2009 effect. January serves as the reference month. The "OLS+controls" regression in *B* controls for a quadratic time trend, maternal race, education, age, marital status, and newborn's parity and sex, and the "within mother" regression adds mother indicators. OLS, ordinary least squares.

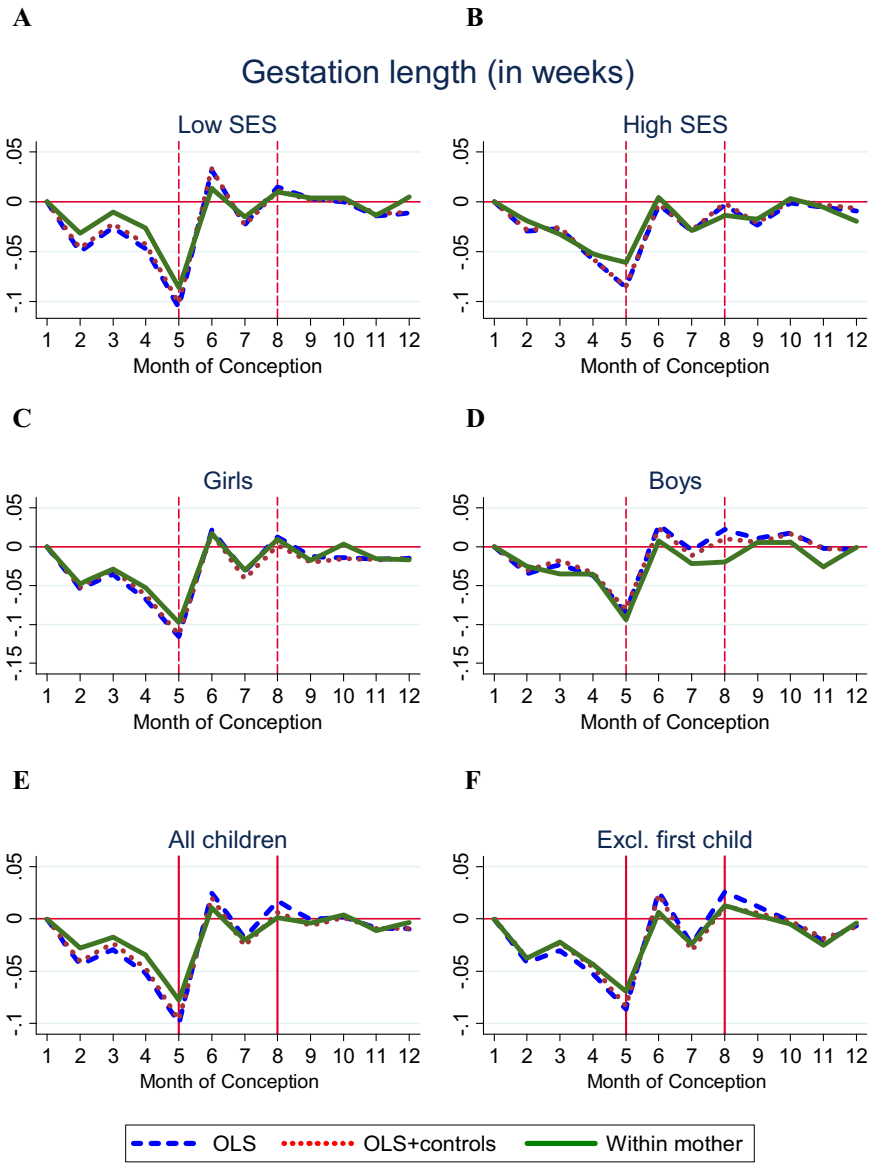

Fig. S2. Gestation length regressions including socioeconomic status (SES) and child sex and excluding first births. The dependent variable is gestation length in weeks. (*A* and *B*) A woman is high SES if she is white, has a college education, is married, and did not give birth below the age of 18 y, and a woman is low SES otherwise. (*C* and *D*) Girls/boys refers to the sex of the newborn. *E* displays the benchmark results. *F* excludes first births. Fig. 1 has additional notes.

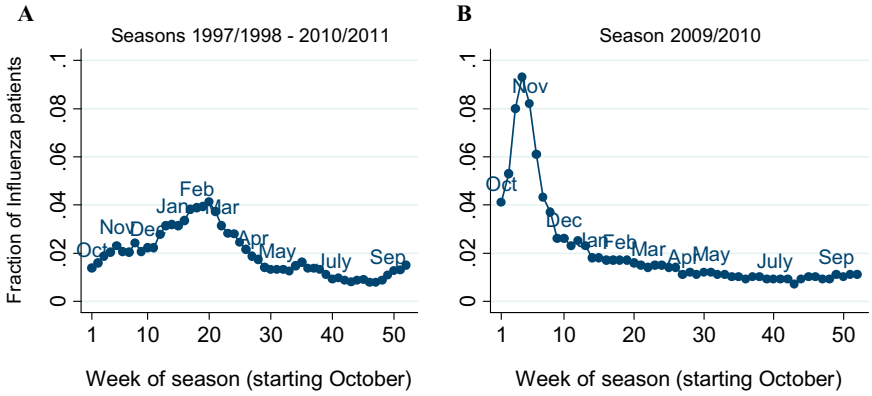

Fig. S3. Fraction of influenza patients by week of influenza season. The average fraction of patients with influenza-like illnesses is plotted over season weeks for the seasons 1997/1998-2010/2010 (*A*) and for the season 2009/2010 (*B*). The labels indicate the month and are placed at the first week that starts in each month (June and August omitted). The data come from the Center for Disease Control's US Outpatient Influenza-Like Illness Surveillance Network and cover the years 1997–2011. We restrict the data to US Department of Health and Human Services' regions 2 and 3, which include New Jersey, New York City, and Pennsylvania.

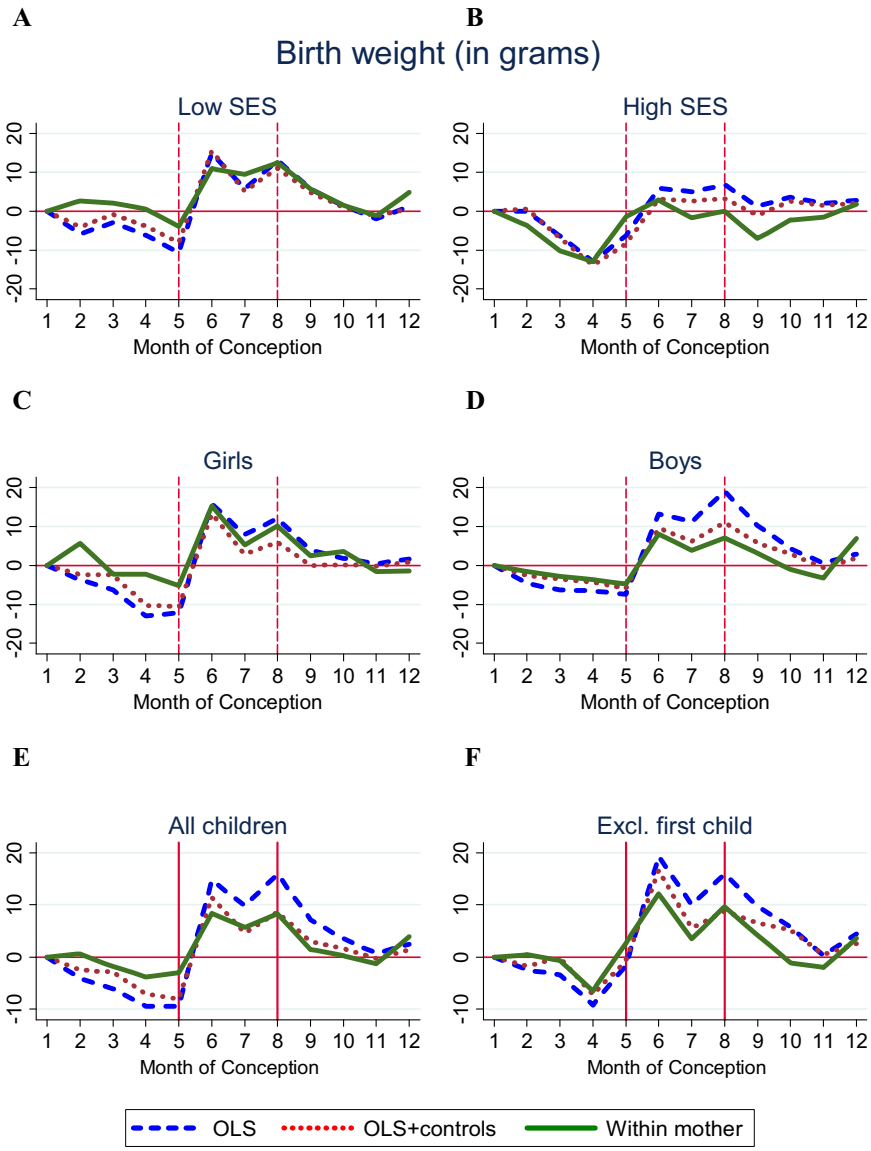

Fig. S4. Birth weight regressions including SES and child sex and excluding first births. The dependent variable is birth weight in grams. (*A* and *B*) A woman is high SES if she is white, has a college education, is married, and did not give birth below the age of 18 y, and a woman is low SES otherwise. (*C* and *D*) Girls/boys refers to the sex of the newborn. *E* displays the benchmark results. *F* excludes first births. Fig. 1 has additional notes.

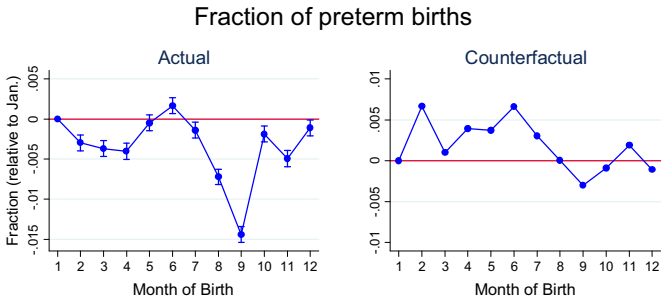

Fig. S5. Actual and counterfactual fractions of preterm births by months of birth. *Left* plots the coefficients of month zero/one indicator variables from an OLS regression of the observed fraction of preterm births (less than 37 wk of gestation) on month of birth zero/one indicator variables and year fixed effects; 95% confidence intervals are indicated. January is the reference group. *Right* plots the same regression coefficients as *Left* using a counterfactual dataset, in which prematurity rates are constant across conception months and only conception rates vary over time. This counterfactual dataset is constructed in the following way. First, we calculate the number of conceptions and the distribution of gestation lengths for each conception month in the sample. Then, we calculate the average distribution of gestation lengths for the overall sample and assign this average distribution to each month of conception. Hence, we eliminate any difference in gestation rates across conception months. Next, we multiply these (counterfactual) average gestation rates with the actual number of conceptions in each month to calculate how many babies would be born 7, 8, 9, and 10 mo after the respective month of conception. Finally, we sum up the number of babies with different gestation lengths who would be born in each month and calculate the counterfactual fraction of preterm births.

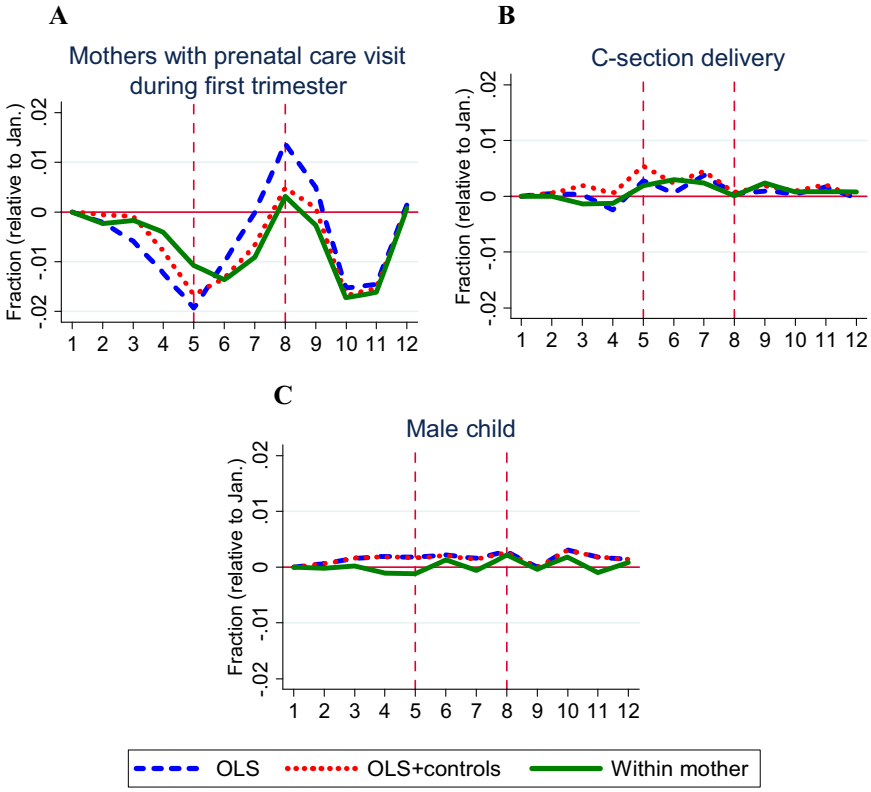

Fig. S6. Prenatal care, Cesarean sections (C-sections), and child sex by month of conception. The dependent variables are (*A*) the fraction of mothers with a prenatal care visit during the first trimester of pregnancy, (*B*) the fraction of newborns delivered by C-sections, and (*C*) the fraction of male children. None of the within-mother estimates in *C* are significantly different from zero. Fig. 1 has additional notes.

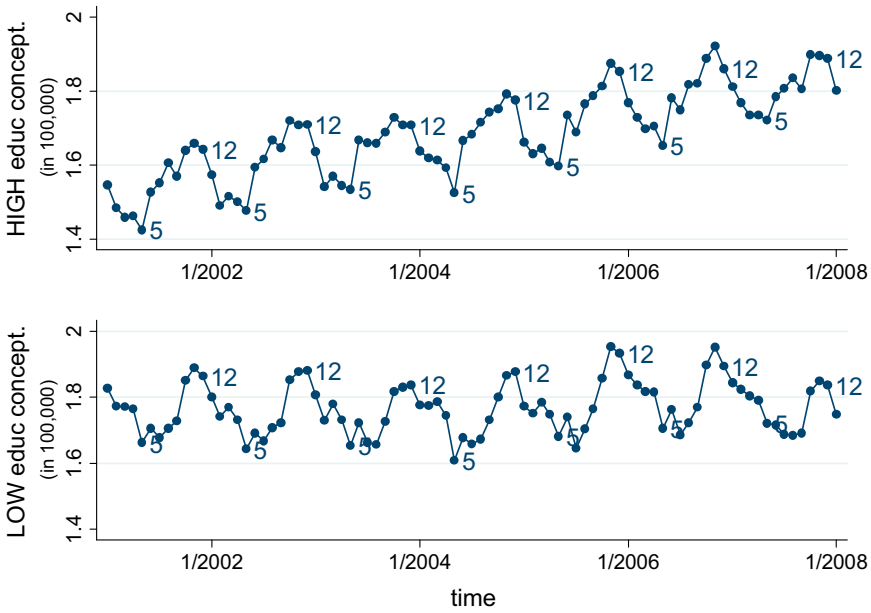

Fig. S7. Conceptions over time by maternal education (United States 2001–2008). The numbers of all conceptions that resulted in births in the United States between 2001 and 2008 are plotted by month of conception and maternal education. High education refers to mothers with more than 12 y of education. Low education refers to mothers with less than or equal to 12 y of education. The sample is the overall population of births in the United States, excluding twin births and births that do not report gestation length. Pre-2001 years are omitted to improve the visibility of seasonal patterns.

Table S1. Regressions of mother characteristics on month of conception indicators

	OLS		OLS + controls		Within mother	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Dependent variable: white (×100)						
January	Reference group		Reference group		Reference group	
February	−0.259	0.191	−0.057	0.171	−0.042	0.059
March	−0.901	0.193	−0.357	0.173	−0.009	0.060
April	−0.754	0.193	−0.523	0.173	−0.101	0.060
May	−0.588	0.196	−0.515	0.175	−0.067	0.061
June	0.829	0.187	0.235	0.167	−0.018	0.058
July	1.436	0.188	0.552	0.168	−0.069	0.059
August	2.024	0.186	0.878	0.166	−0.065	0.058
September	1.207	0.186	0.623	0.167	−0.044	0.058
October	0.406	0.184	0.233	0.165	−0.076	0.057
November	0.378	0.185	0.259	0.165	−0.004	0.058
December	0.302	0.185	0.235	0.166	−0.063	0.058
Dependent variable: >12 y education (×100)						
January	Reference group		Reference group		Reference group	
February	−0.140	0.202	0.079	0.172	0.034	0.125
March	−0.814	0.204	0.018	0.174	0.205	0.126
April	−0.704	0.204	0.121	0.174	−0.020	0.126
May	−0.119	0.207	0.488	0.176	0.232	0.128
June	1.317	0.197	1.019	0.169	0.085	0.122
July	1.945	0.199	1.134	0.169	−0.050	0.123
August	2.410	0.196	1.316	0.168	0.030	0.122
September	1.247	0.197	0.790	0.168	0.110	0.122
October	0.615	0.195	0.542	0.166	0.158	0.120
November	0.505	0.195	0.389	0.167	0.113	0.121
December	0.424	0.196	0.332	0.167	−0.016	0.121
Dependent variable: married (×100)						
January	Reference group		Reference group		Reference group	
February	-0.608	0.204	-0.237	0.161	-0.178	0.130
March	-1.566	0.206	-0.420	0.163	-0.104	0.132
April	-1.658	0.204	-0.364	0.161	-0.114	0.130
May	-1.425	0.207	-0.506	0.163	-0.121	0.132
June	0.177	0.198	-0.131	0.157	0.070	0.127
July	0.851	0.199	-0.078	0.157	0.184	0.127
August	1.436	0.197	0.034	0.156	0.051	0.126
September	0.606	0.198	-0.023	0.156	0.086	0.126
October	-0.278	0.196	-0.426	0.155	-0.001	0.125
November	-0.092	0.196	-0.202	0.155	0.145	0.125
December	-0.004	0.197	-0.111	0.155	-0.025	0.126
Dependent variable: smoking (×100)						
January	Reference group		Reference group		Reference group	
February	0.212	0.122	0.137	0.116	-0.109	0.102
March	0.438	0.123	0.187	0.117	-0.043	0.104
April	0.267	0.123	-0.052	0.117	-0.020	0.104
May	0.232	0.125	0.005	0.119	-0.069	0.105
June	-0.152	0.119	-0.127	0.114	-0.143	0.100
July	-0.364	0.120	-0.221	0.114	-0.156	0.101
August	-0.229	0.119	-0.012	0.113	-0.041	0.100
September	-0.193	0.119	-0.139	0.113	-0.128	0.100
October	0.127	0.118	0.087	0.112	-0.104	0.099
November	0.156	0.118	0.127	0.112	-0.067	0.099
December	0.127	0.118	0.095	0.113	0.014	0.099
Controls	—		✓		✓	
Mother indicators	—		—		✓	

The coefficients from regressions of zero/one variables indicating white mothers, mothers with more than 12 y of schooling, married mothers, and mothers smoking during pregnancy on month of conception zero/one indicator variables are displayed January serves as the reference month. OLS regressions control only for state-specific time trends. OLS + controls regressions further control—except if coinciding with the dependent variable—for maternal race, education, age, marital status, and newborn's parity and sex. Within-mother regressions further add mother indicators. Baseline sample: n = 1,435,213. Coefficients and SE are multiplied by 100 for better visualization.

Table S2. Regressions of birth outcomes on month of conception indicators

	OLS		OLS + controls		Within mother	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Dependent variable: gestation (×100)						
January	Reference group		Reference group		Reference group	
February	−4.402	0.830	−4.087	0.823	−2.769	0.952
March	−2.952	0.839	−2.327	0.832	−1.729	0.963
April	−5.218	0.838	−4.752	0.832	−3.482	0.963
May	−9.984	0.849	−9.669	0.842	−7.799	0.975
June	2.487	0.811	2.076	0.805	1.051	0.932
July	−1.781	0.815	−2.575	0.809	−2.013	0.938
August	1.722	0.807	0.642	0.800	0.148	0.929
September	−0.068	0.809	−0.650	0.803	−0.375	0.931
October	0.215	0.801	0.135	0.794	0.372	0.920
November	−0.883	0.802	−0.919	0.795	−1.091	0.921
December	−0.935	0.804	−0.894	0.798	−0.342	0.923
Dependent variable: birth weight						
January	Reference group		Reference group		Reference group	
February	−4.131	2.327	−2.496	2.262	0.637	2.312
March	−6.182	2.353	−2.943	2.288	−1.842	2.340
April	−9.460	2.351	−7.105	2.287	−3.832	2.340
May	−9.538	2.381	−8.145	2.316	−3.076	2.370
June	14.755	2.274	11.452	2.212	8.343	2.265
July	9.811	2.287	4.633	2.224	5.720	2.278
August	15.944	2.262	8.612	2.200	8.272	2.256
September	7.154	2.270	2.979	2.207	1.457	2.262
October	3.519	2.246	1.610	2.184	0.251	2.236
November	0.685	2.248	−0.298	2.186	−1.256	2.238
December	2.501	2.256	1.426	2.194	3.925	2.243
Dependent variable: birth weight conditional on gestation length						
January	Reference group		Reference group		Reference group	
February	4.237	1.768	3.297	1.823	4.449	1.829
March	−0.214	1.788	−2.363	1.844	−0.232	1.851
April	−0.328	1.787	−1.751	1.843	−0.423	1.850
May	7.504	1.810	6.888	1.866	7.656	1.874
June	6.780	1.729	9.132	1.782	7.023	1.791
July	8.440	1.738	12.107	1.792	8.910	1.802
August	6.762	1.719	11.910	1.773	8.952	1.785
September	3.502	1.725	6.482	1.779	2.336	1.789
October	0.860	1.706	2.512	1.760	0.096	1.769
November	0.693	1.708	1.563	1.762	−0.411	1.771
December	2.441	1.714	3.513	1.768	3.783	1.775
Dependent variable: Pregnancy weight gain (lb)						
January	Reference group		Reference group		Reference group	
February	0.234	0.059	0.239	0.058	0.243	0.064
March	0.345	0.060	0.382	0.059	0.457	0.065
April	0.476	0.059	0.503	0.059	0.517	0.065
May	0.662	0.060	0.674	0.059	0.681	0.065
June	0.989	0.058	0.959	0.057	0.909	0.063
July	0.988	0.058	0.933	0.057	0.785	0.063
August	0.926	0.057	0.866	0.056	0.870	0.062
September	0.652	0.057	0.639	0.057	0.651	0.062
October	0.420	0.057	0.415	0.056	0.314	0.062
November	0.047	0.057	0.036	0.056	−0.067	0.062
December	−0.051	0.057	−0.044	0.056	−0.096	0.062
Dependent variable: Prepregnancy weight (lb)						
January	Reference group		Reference group		Reference group	
February	−0.392	0.189	−0.442	0.184	−0.172	0.102
March	0.238	0.190	0.169	0.185	−0.123	0.103
April	−0.372	0.190	−0.493	0.185	−0.412	0.103
May	−0.241	0.192	−0.321	0.187	−0.288	0.104
June	−0.330	0.184	−0.323	0.179	−0.329	0.100
July	−0.461	0.185	−0.319	0.180	−0.170	0.100
August	−0.731	0.183	−0.605	0.179	−0.316	0.099

Table S2. Cont.

	OLS		OLS + controls		Within mother	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
September	−0.475	0.184	−0.391	0.179	−0.333	0.099
October	−0.412	0.182	−0.428	0.177	−0.316	0.098
November	−0.122	0.182	−0.169	0.177	−0.075	0.098
December	−0.053	0.182	−0.193	0.177	−0.027	0.098
Controls	—		✓		✓	
Mother indicators	—		—		✓	

The coefficients from regressions of gestation length, birth weight, birth weight conditional on gestation length, pregnancy weight gain, and prepregnancy weight on conception month indicators are displayed. Birth weight conditional on gestation length includes indicators for each week of gestation length. January serves as the reference month. OLS regressions control only for state-specific time trends. OLS + controls regressions further control—except if coinciding with the dependent variable—for maternal race, education, age, marital status, and newborn's parity and sex. Within-mother regressions further add mother indicators. Baseline sample: n = 1,435,213.