Online appendix to:

Childbirth Effects of the 2004 Indian Ocean Tsunami

Appendix A Additional robustness and specification tests

Subsection A.1 Alternative assignment of control and treated cohorts

We test whether the timing effects in our main results are robust to various definition of the control group by comparing pregnancies whose gestation period overlaps with the Tsunami against pregnancies beginning in other periods. The setups of Equations (1) and (2) in the main text effectively puts those conceived after the Tsunami into the treatment group, as they are being compared to pregnancies before second quarter of 2004 and the first quarter of 2004, respectively. We now alter our control group by including those conceived after the Tsunami into the control group. In addition, we also expand the group of pregnancies that is expected to terminate before the Tsunami by including those conceived in a broader sample of periods. In order to do so, we run the following regression.

$$y_{ict} = \phi_c + \lambda_{QOC} + \lambda_{YOC} + \gamma X_{ict} + \sum_{q=2}^{4} \beta_q \mathbb{1}[QOC = q] \times \mathbb{1}[YOC = 2004] + \epsilon_{ict} \tag{A1}$$

Here, $\mathbb{1}[QOC = q]$ indicates that individual i is conceived on the q'th quarter in year t, where q can range from 1 to 4. $\mathbb{1}[YOC = 2004]$ equals 1 for those conceived in 2004 and 0 otherwise. λ_{QOC} is a collection of dummy variables for each quarter of conception within a given year. Thus, there are four dummy variables. λ_{YOC} is a collection of year of conception dummies. Other variables are identical to the ones that are used in the main text.

Our coefficient of interest is β_q, which indicates the birth effect on those conceived in quarter q in 2004 compared to periods other than the second through fourth quarters of 2004. In estimating β_q, the indicator for first quarter is excluded since those conceived on the first quarter of 2004 is not expected to be exposed to the Tsunami in utero and thus not considered part of the treatment group. Given the negative birth effects for those exposed to the Tsunami in utero at the first trimester of pregnancy, we focus our interest on β_q when $q = 4$. We expect that β_4 to be negative for the livebirth and gestation length outcomes, and positive for the miscarriage and preterm birth outcomes.

In regressing Equation (A1), we utilize the following samples. We start out with those conceived

from 1999 to 2005. Then, we re-run Equation (A1) on those conceived in 2000-2005, 2001-2005, 2002-2005, and 2003-2005 respectively, the last being our main sample. As the sample narrows down, there is a risk of losing statistical power as our observation decreases. Thus, our primary interest is to check whether the coefficients for β_4 are numerically similar across different sampling periods.

We present our results for Equation (A1) in Table A6. Overall, the results are qualitatively similar to those from our main regressions and thus corroborate the findings in the main text. The birth effects on those not conceived in the fourth quarter of 2004 are statistically zero at the 5% level. For the outcomes on gestation length and preterm birth, the birth effects for those conceived in the fourth quarter of 2004 is not significant at the 5% level. On the other hand, the same for the livebirth and miscarriage outcomes are significant at a conventional level. Livebirth, in particular, decreases by around 5-6 pp across the samples, while miscarriage increases by 4-5 pp. These patterns show two things; 1) livebirth and miscarriage results are robust to different assignment of control and treatment groups. 2) The differences in birth outcomes across cohorts is the most pronounced for livebirth and miscarriage, as suggested in the placebo results.

Subsection A.2 Regression on conception patterns pre- and post-Tsunami

A.2.1 Regression on the reduced sample

One could be concerned that mothers beginning pregnancy after the Tsunami may alter their fertility decisions, which can affect the credibility of our results. We address this problem in two ways. First, we show that composition of mothers becoming pregnant and total conceptions are not different across the sample period. Second, we show that the results are robust even if we drop those conceived after the Tsunami. We show this by regressing Equations (2) in the main text on pregnancies beginning in the years 2003 and 2004 only, whose results are presented in Figure A2. As with our original regression, the Tsunami effect is statistically significant only for those conceived in the fourth quarter of 2004. The coefficient values and standard errors are also largely similar throughout the regressions, indicating that leaving out those conceived after the Tsunami does not alter the results.

Subsection A.3 Testing for possible selection biases

The main text presents several tests for selection bias. Here we provide additional detail for those exercises that rely on specifications differing from Equations (1) and (2).

A.3.1 Testing for changes in type of mothers in conception post-Tsunami

We test for the changes in the type of mothers becoming pregnant by regressing the covariates onto the dummies for conception periods and cluster of residence. While the balance tables in Tables 2-3 of the main text addresses the selection into treatment and control group at a *group level*, it is silent when it comes to picking up differences in sample selection across *each* period. To address this, we run regressions where our dependent variables are the observable covariates X_{ict} and independent variables are the set of dummies for each period and cluster of residence, largely keeping the structure of Equations (1) and (2) intact.

The results are graphically presented in Figures A4 for the event-study, with results based on Equation (1) reported in Table A8. The estimated coefficients for almost all event indicators for those exposed to Tsunami in utero are statistically insignificant at the 5% level. The same holds for the estimates for those conceived after the Tsunami, except for the years of schooling reported at Table A8. These results suggest that changes in the type of pregnant mothers are unlikely to drive our main findings for the in utero cohort.

A.3.2 Pre- and post-Tsunami conceptions

The main text introduced a event-study specification where this regression equation is used:

$$c_{ict} = \alpha + \phi_c + \sum_t \theta_t \mathbb{1}[t \leq 2003Q4] + \sum_t \beta_t \mathbb{1}[t \geq 2004Q2] + \epsilon_{ict} \tag{A2}$$

where c_{ict} is the outcome variable. For our exercise, this is either raw or log of total conception. Other variables retain the same meaning from the main text.

The results from the above regression is reported in Figure2. We find that the year-quarter dummies are indistinguishable from zero at a 5% level.

Subsection A.4 Using alternative measures of the extent of damage for cross-cluster variation

In this section, we use alternative definitions of treatment assignment at a cross-sectional level. The data-provided measures categorize different clusters into the same group if the extent of damage is considered identical. To check whether the relation between different intensity exposure and birth outcomes is consistent, we introduce several alternative measures. To do this, we utilize the respondents' report on whether their houses were damaged by the Tsunami. In the survey, respondents could answer that their houses were either unaffected, damaged, or destroyed by the Tsunami. We aggregate those that reported that their houses were either damaged or destroyed into a single category. Table A13 shows that more houses are destroyed on average as damage extent becomes greater. As such, they can serve as a proxy for the indicators for the extent of damage used in conjunction with the data-provided measures.

We then derive a new variable that indicates the intensity of the Tsunami damage for each cluster. We refer to this treatment intensity variable as 'house damage rate' and define it as

$$\text{House damage rate in cluster } c = \frac{\text{Total damaged houses in cluster } c}{\text{Total houses in cluster } c} \tag{A4}$$

Based on this measure, we re-classify low (lowest one-third), medium, and high (highest one-third) affected areas by splitting the shares into terciles. The tercile specification imposes a step function on what is a continuous measure. To allow the relationship between damage intensity and birth outcomes to vary smoothly, we also fit a restricted cubic spline in the house damage rate. Let d_c denote the house damage rate in cluster c and let $k_1 < k_2 < k_3$ denote three knots, placed at the tenth, fiftieth, and ninetieth percentiles of the distribution of d_c ($k_1 = 0.02$, $k_2 = 0.16$, $k_3 = 0.50$). The spline is represented by two basis terms, $s_1(d_c) = d_c$ and

$$s_2(d_c) = \frac{(d_c - k_1)_+^3 - (d_c - k_2)_+^3 \frac{k_3 - k_1}{k_3 - k_2} + (d_c - k_3)_+^3 \frac{k_2 - k_1}{k_3 - k_2}}{(k_3 - k_1)^2} \tag{A5}$$

where $(u)_+ = \max(u, 0)$. The cubic terms are constrained to be linear beyond the outer knots, which prevents the fit from being driven by the sparse upper tail of the damage distribution. We interact both basis terms with the first-trimester exposure indicator and evaluate the implied effect at four points: zero damage and the mean damage share within lightly, moderately, and heavily affected

clusters (0.104, 0.206, and 0.491). The joint significance of the two interaction terms tests whether the first-trimester effect varies with damage intensity.

We can also change the treatment unit to a household and leverage the cross-sectional variation of damages experienced by each household as alternative measure of exposure intensity. We use the dummy variable taking 1 if a house was damaged or destroyed by the Tsunami to assign treatments.

The results are in Tables A14–A20. As with the main results, the harmful birth effects of the Tsunami are concentrated on those conceived in the fourth quarter of 2004. No damage interaction is statistically significant at the 5% level under any of the alternative measures. Pre-trend diagnostics differ across measures: the pre-Tsunami interactions are jointly insignificant under the tercile parameterization but significant for livebirth under the household-level measure. Together with the differential post-Tsunami aid flows documented in Section 6.3.4, this is why the cross-sectional comparison is treated as descriptive in Section 6.3.

Subsection A.5 Addressing potential problems from coarse measurement of gestation duration

Gestation duration is reported in weeks for only 4.86% of pregnancies (105 observations) and in months for the remaining 2,054. For the latter, conception timing is recovered only to the nearest month, so pregnancies close to a trimester boundary may be assigned to the wrong exposure group. We address this by re-estimating on the month-recorded observations alone, and by assessing how far the first-trimester estimate could move under misassignment of this magnitude.

Table A21 compares covariate means across the two groups. None of the differences is significant at the 5% level, though husband's enrollment differs at the 10% level and the week-recorded group is somewhat more educated (10.1 versus 8.3 years of schooling) and less rural. With 105 observations across 45 clusters these comparisons are imprecise, so we do not read the table as establishing that the groups are identical. Table A22 reports estimates of Equation (1) on the month-recorded sample. All four coefficients are close to the main estimates, with livebirth, miscarriage, and preterm birth significant at the 5% level and gestation length at the 10% level, reflecting the smaller sample rather than a change in magnitude. The corresponding regression on the 105 week-recorded observations is severely under-powered and we do not report it.

We then assess sensitivity to potential misassignment. Because we cannot identify which pregnancies are misassigned, we treat those least well explained by the model as the candidates. Follow-

ing Isen et al. (2017), we estimate Equation (1) on the full sample, recover the residuals, and drop the month-recorded observations in the top 4.86% of the residual distribution to obtain one estimate and those in the bottom 4.86% to obtain the other. The trimming share equals the share of pregnancies for which finer measurement is available. The exercise is loosely analogous to trimming bounds for contaminated data (Horowitz and Manski 1995), though we trim residuals rather than the outcome distribution and therefore do not obtain sharp bounds.

Table A23 reports the results. The sign of every effect is preserved. In the reinforcing direction the trimmed estimates are similar to or larger than the originals and remain significant. In the attenuating direction, they fall below conventional significance for livebirth, miscarriage, and gestation length, and remain significant for preterm birth. This is expected, since fetal loss is relatively rare and trimming removes a substantial share of the events identifying the effect. The exercise therefore indicates how far the estimates could move under adverse misassignment rather than telling against the effects. Figure A8 shows the corresponding event-study profiles, which track the original series throughout.

Appendix B Variables on mechanisms behind the main results

The mechanism analysis uses three sets of variables from the STAR data. Household finances include employment status and income, expenditures on health-related items including prenatal care, receipt of transfers, and household assets. Health care use is measured by whether the respondent used any outpatient care in the month before the survey, recorded across facility types ranging from public and private hospitals to village care centers. Mental and physical distress is measured by self-reported symptoms, each recorded as a yes-or-no response. Summary statistics are reported in Table A24, with mechanism results in Tables 7, A25, and A26.

References

Horowitz, Joel L., and Charles F. Manski. 1995. "Identification and Robustness with Contaminated and Corrupted Data." *Econometrica* 63 (2): 281–302.

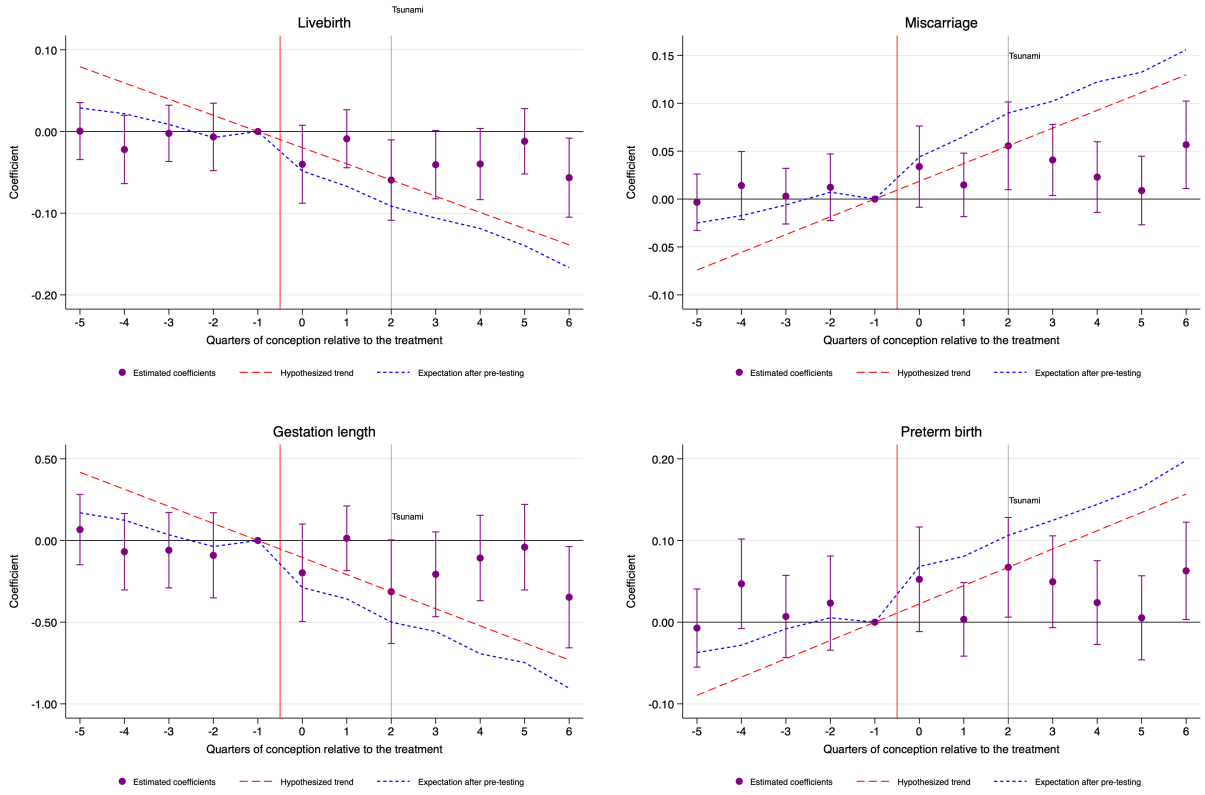
Isen, Adam, Maya Rossin-Slater, and W. Reed Walker. 2017. "Every breath you take - every dollar you'll make: The long-term consequences of the clean air act in 1970." Tex.date-added: 2021-11-21 15:05:22 -0500 tex.date-modified: 2021-11-21 15:08:15 -0500, *Journal of Political Economy* 126 (3): 848–902.

Roth, Jonathan. 2022. "Pretest with Caution: Event-Study Estimates after Testing for Parallel Trends." *American Economic Review: Insights* 4 (3): 305–322.

Appendix C Figures and Tables

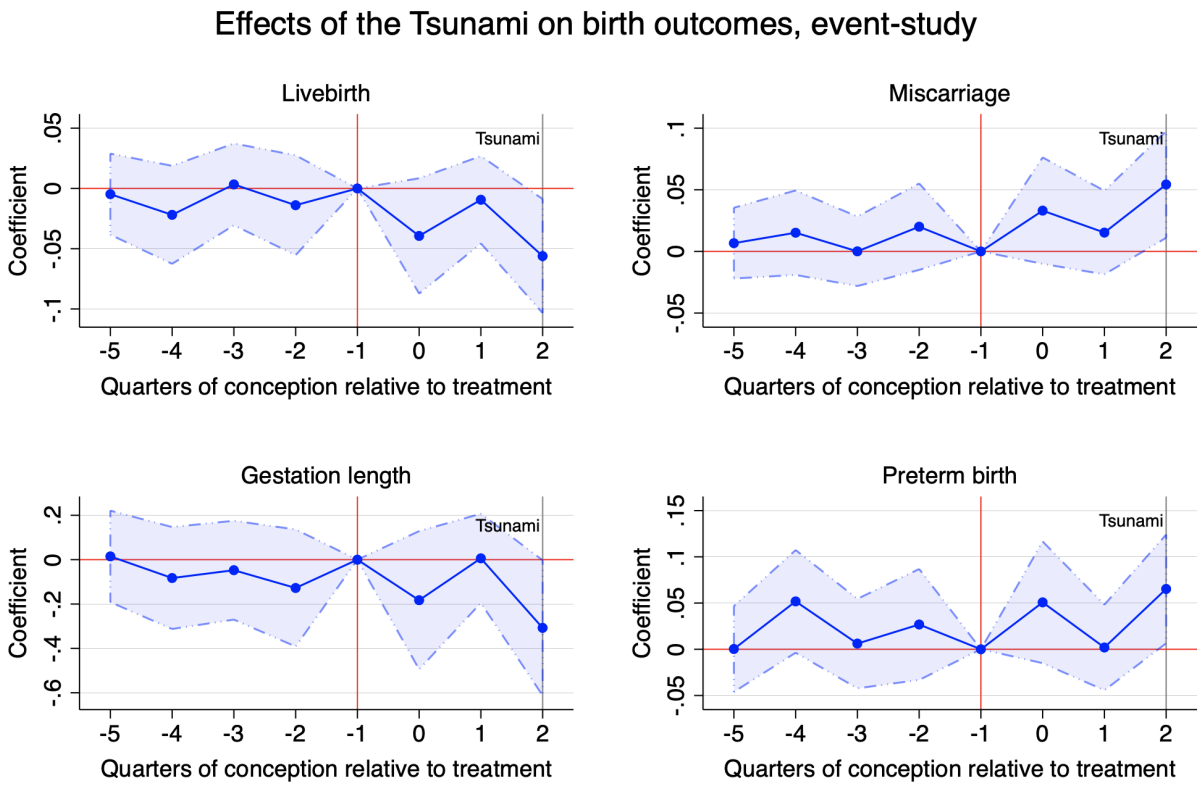
Subsection C.1 Figures

Figure A1: Birth effects of the Tsunami, event-study and parallel trends test



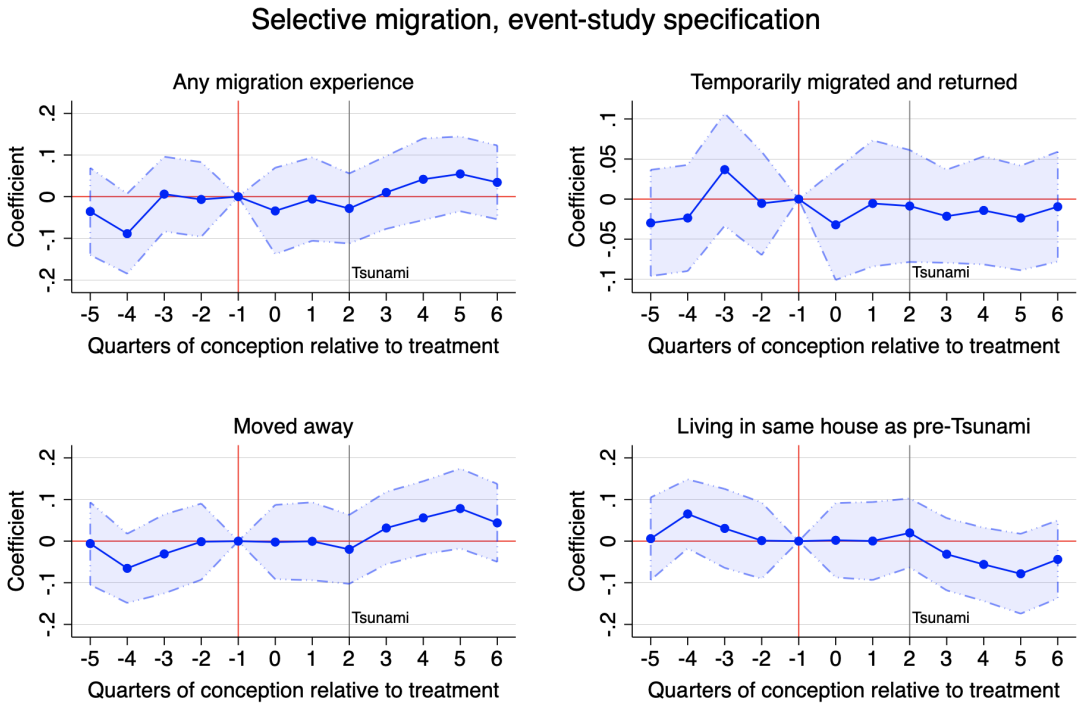
Note: Period 0 indicates those conceived in 2004Q2 and in the 3rd trimester of pregnancy at the point of the Tsunami, 95% confidence interval is included, where the circle markers indicate point estimates. Regression includes controls for mother's age at birth (level and squared), years of schooling (mother and father), birth order indicators, and cluster fixed effects. Standard errors are clustered at cluster-level. Joint F-test that the pre-Tsunami coefficients are zero: p = 0.82, 0.78, 0.61, 0.32 for live birth, miscarriage, gestation, and preterm. The red line traces the pre-trend that would generate our estimated effect. The blue line traces the coefficient path one would expect should such pre-trend violations exist but undetected by the pre-trends test. Observations: 2,159, Clusters: 108

Figure A2: Birth effects of the Tsunami for the reduced sample, event-study



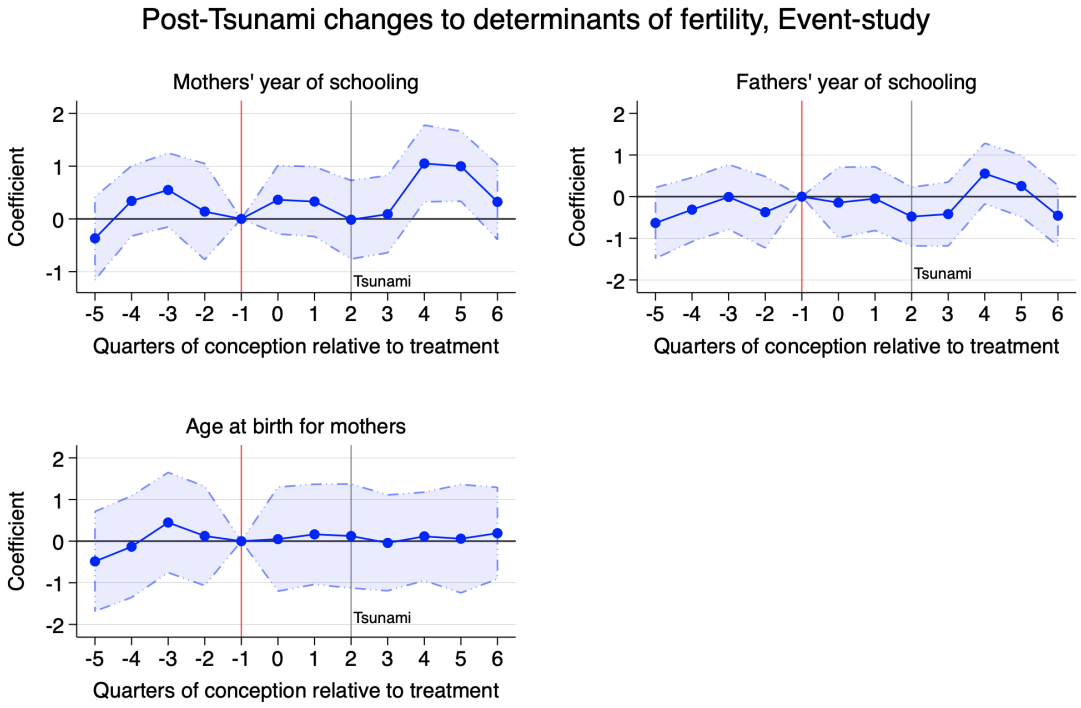
Note: Period 0 indicates those conceived on 2004Q2 and in the third trimester of pregnancy at the point of the Tsunami. 95% confidence interval is included, where the circle marker indicates point estimates. Regression includes controls for mother's age at birth (level and squared), years of schooling (mother and father), birth order indicators, and cluster fixed effects. Standard errors are clustered at cluster-level. Observations: 1,355, Clusters: 108

Figure A3: Testing for selective migration patterns, event-study



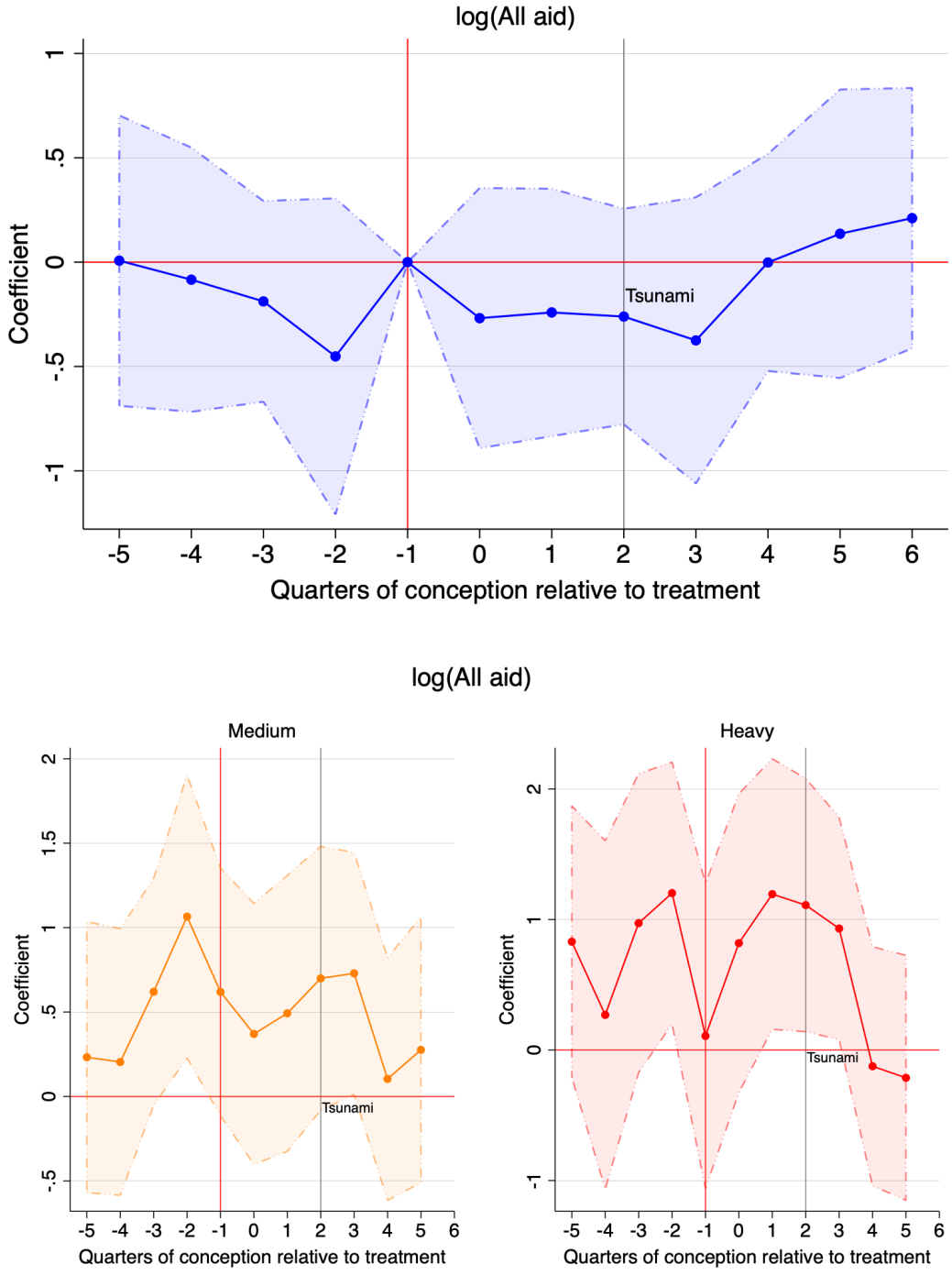
Note: Period 0 indicates those conceived on 2004Q2 and in the third trimester of pregnancy at the point of the Tsunami. 95% confidence interval is included, where the circle marker indicates point estimates. Regression includes controls for cluster fixed effects and others used in the main specifications. Standard errors are clustered at cluster-level. Observations: 2,159, Clusters: 108

Figure A4: Testing for selection into fertility based on types, event-study



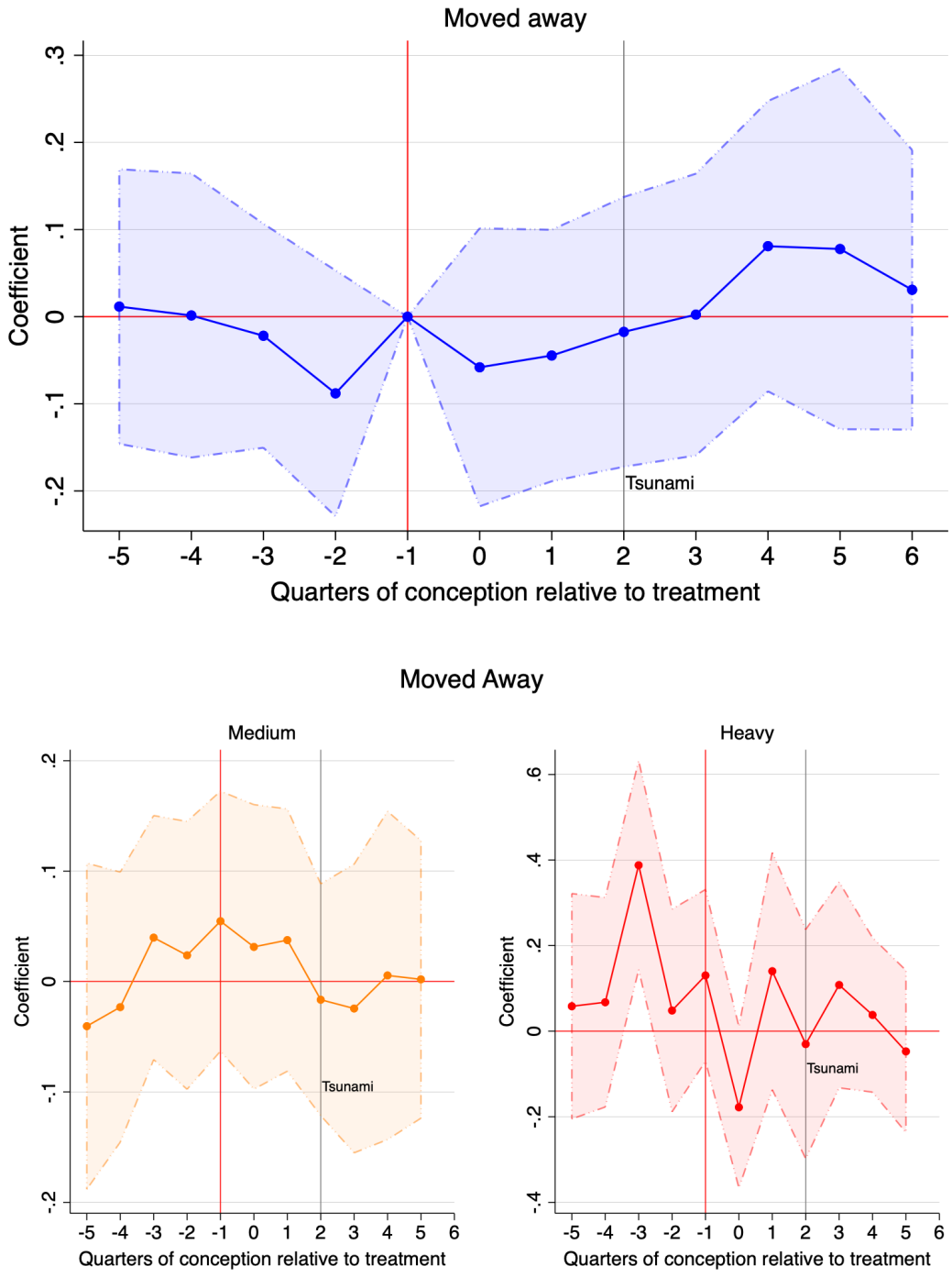
Note: Period 0 indicates those conceived on 2004Q2 and in the third trimester of pregnancy at the point of the Tsunami. 95% confidence interval is included, where the circle marker indicates point estimates. Regression includes controls for cluster fixed effects and others used in the main specifications. Standard errors are clustered at cluster-level. Observations: 2,159, Clusters: 108

Figure A5: Total aid flow across time and clusters



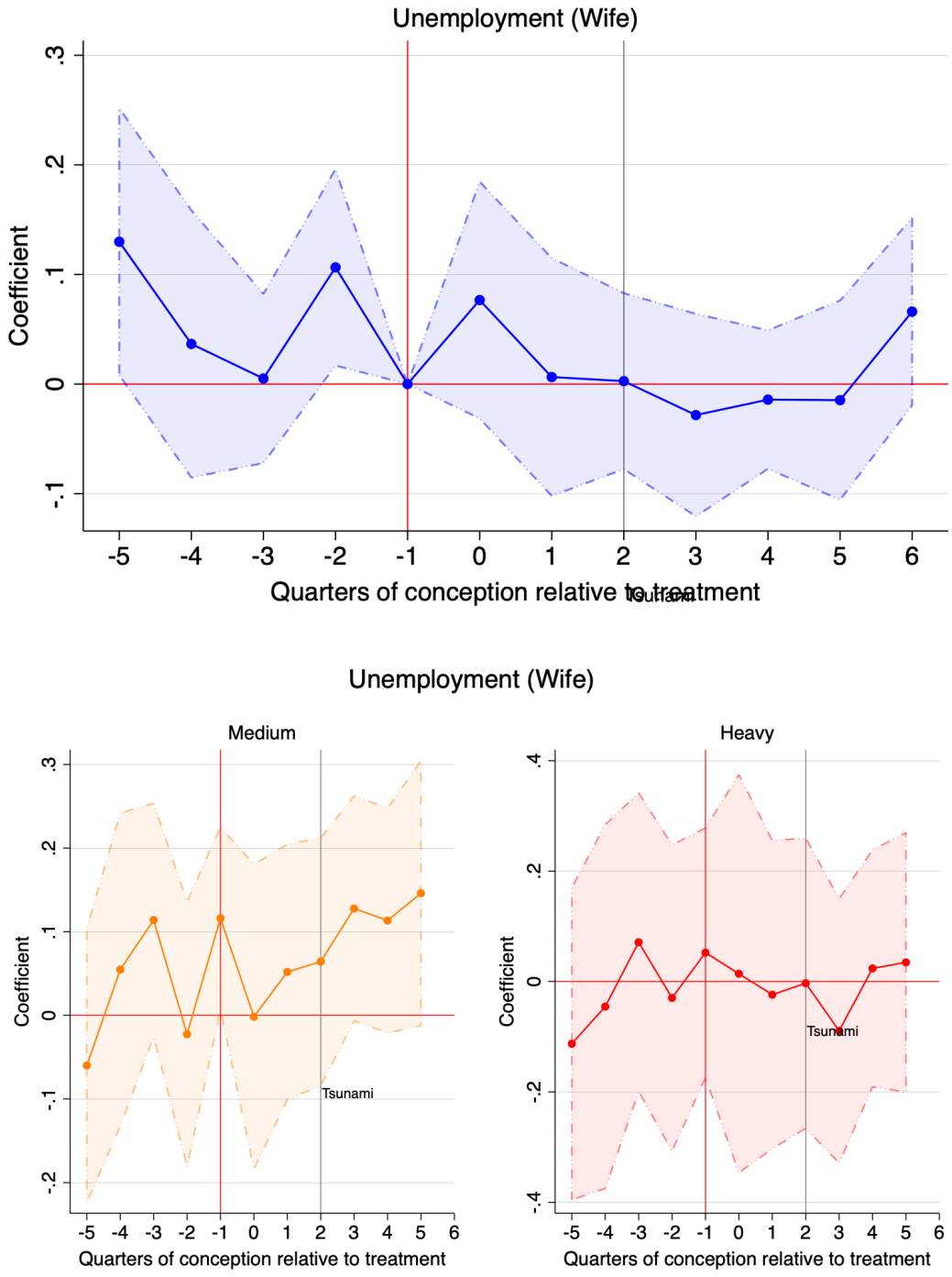
Note: Period 0 indicates those conceived on 2004Q2 and in the third trimester of pregnancy at the point of the Tsunami. 95% confidence interval is included, where th markers indicate point estimates for the time effect and the differential effect by the treatment intensity. Regressions include the same controls used in Section 5.2. Standard errors are clustered at cluster-level.

Figure A6: Long-run migration pattern across time and clusters



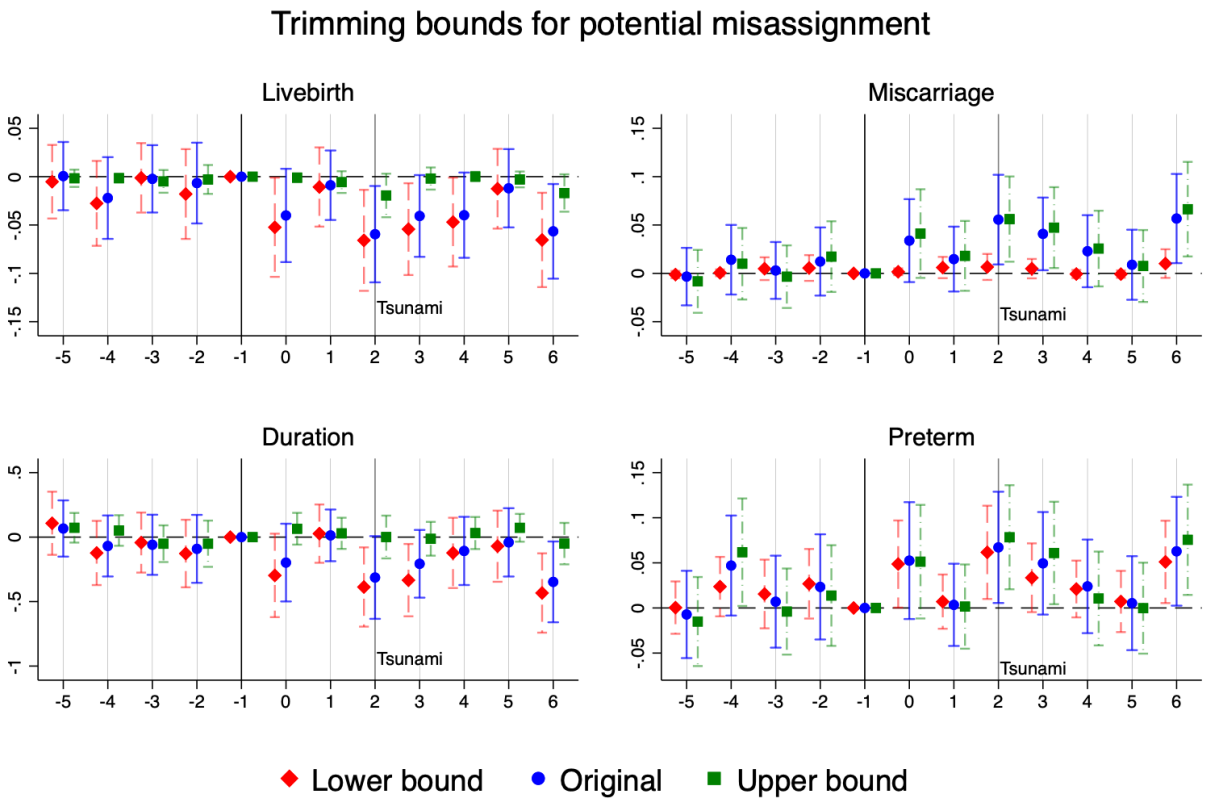
Note: Period 0 indicates those conceived on 2004Q2 and in the third trimester of pregnancy at the point of the Tsunami. 95% confidence interval is included, where th markers indicate point estimates for the time effect and the differential effect by the treatment intensity. Regressions include the same controls used in Section 5.2. Standard errors are clustered at cluster-level.

Figure A7: Unemployment of women across time and clusters



Note: Period 0 indicates those conceived on 2004Q2 and in the third trimester of pregnancy at the point of the Tsunami. 95% confidence interval is included, where th markers indicate point estimates for the time effect and the differential effect by the treatment intensity. Regressions include the same controls used in Section 5.2. Standard errors are clustered at cluster-level.

Figure A8: Trimming exercises for measurement quality issues



Note: Each panel reports estimates from the event-study specification in Equation (2), with the first quarter of 2004 as the omitted period. Period 0 corresponds to conceptions in the second quarter of 2004, whose pregnancies were in the third trimester when the Tsunami struck. Blue circles reproduce the estimates from the main text. Red diamonds report the lower bound, obtained by dropping month-recorded observations in the top 4.86 percent of the residual distribution; green squares report the upper bound, obtained by dropping those in the bottom 4.86 percent. The trimming share equals the share of pregnancies for which gestation duration is recorded in weeks. Point estimates and 95 percent confidence intervals are shown, offset horizontally for legibility. Regressions include controls for mother's age at birth (level and squared), years of schooling of both parents, birth-order indicators, and cluster fixed effects. Standard errors are clustered at the cluster level. There are 2,159 observations and 108 clusters in the untrimmed regressions.

Table A1: Sensitivity Analysis for Pre-Existing Trends (Roth 2022)

	(1) First-trimester Estimates	(2) Joint Pre-period Significance	(3) 80% Power Slope	(4) Power test for Detection	(5) Likelihood Ratio
Livebirth	-0.0595	0.8168	0.0116	0.9959	<0.001
Miscarriage	0.0556	0.7820	0.0099	0.9989	<0.001
Gestation Length	-0.3133	0.6062	0.0722	0.9775	0.0047
Preterm Births	0.0672	0.3237	0.0159	0.9704	0.0004

Note: This table presents the pre-trend sensitivity diagnostics proposed by Roth (2022). Column (1) reports the estimated DiD coefficient at 2004Q4, those in the first trimester of pregnancy at the time of teh Tsunami. Column (2) shows the p-value from a conventional joint F-test of the pre-treatment coefficients ($t = -5$ to $t = -2$). Column (3) identifies the minimum linear pre-trend slope required to achieve 80% statistical power of rejection in a conventional pre-test. Column (4) reports the statistical power of our specific design to reject a hypothesized linear pre-trend that could entirely account for the point estimate observed in Column (1). Column (5) reports the likelihood ratio comparing the relative likelihood of the observed coefficients under the hypothesized trend violation versus under true parallel trends- small values indicate that our data are significantly more compatible with the parallel trends assumption.

Table A2: Birth effects of the Tsunami by timing of exposure (full post-Tsunami cohort)

Conception period	(1) Livebirth	(2) Miscarriage	(3) Duration	(4) Preterm birth
2004Q2	-0.0343*	0.0288	-0.167	0.0389
	(0.0204)	(0.0194)	(0.124)	(0.0247)
2004Q3	-0.00313	0.00978	0.0436	-0.00989
	(0.0149)	(0.0145)	(0.0745)	(0.0155)
2004Q4	-0.0537**	0.0506**	-0.283**	0.0538**
	(0.0216)	(0.0203)	(0.134)	(0.0243)
2005Q1	-0.0349*	0.0358**	-0.176	0.0361
	(0.0182)	(0.0165)	(0.114)	(0.0221)
2005Q2	-0.0340	0.0177	-0.0746	0.0102
	(0.0208)	(0.0160)	(0.108)	(0.0192)
2005Q3	-0.00626	0.00375	-0.00847	-0.00820
	(0.0180)	(0.0158)	(0.108)	(0.0189)
2005Q4	-0.0508**	0.0515**	-0.315**	0.0493**
	(0.0213)	(0.0210)	(0.136)	(0.0238)
Obs.	2159	2159	2159	2159
No. of Clusters	108	108	108	108

* $p < .10$, ** $p < .05$, *** $p < .01$

Each column regresses the birth outcome on indicators for in-utero exposure by trimester (conception in 2004Q2 to 2005Q4). The omitted category is the pooled pre-tsunami control (conceptions 2003Q1 to 2004Q1). Mother's age at birth (level and square), years of schooling of mother and father, birth-order indicators, and cluster fixed effects are included in the covariates. Romano-Wolf p-value for correcting multiple hypotheses tests are reported for 2004Q4 conceptions. Standard errors are clustered at the cluster level and reported in parentheses.

Table A3: Birth effects of the Tsunami by timing of exposure (pre-tsunami control, post-period binned and flexible covariates)

Conception period	(1) Livebirth	(2) Miscarriage	(3) Duration	(4) Preterm birth
2004Q2 (3rd trimester)	-0.0405	0.0345	-0.202	0.0537
	(0.0244)	(0.0217)	(0.152)	(0.0327)
2004Q3 (2nd trimester)	-0.00893	0.0150	0.0107	0.00401
	(0.0182)	(0.0170)	(0.102)	(0.0231)
2004Q4 (1st trimester)	-0.0597**	0.0558**	-0.316*	0.0680**
	(0.0252)	(0.0234)	(0.162)	(0.0312)
Post-Dec 2004	-0.0466	0.0416	-0.233	0.0561
	(0.0284)	(0.0252)	(0.185)	(0.0413)
Obs.	2159	2159	2159	2159
No. of Clusters	108	108	108	108

* $p < .10$, ** $p < .05$, *** $p < .01$

Each column regresses the birth outcome on indicators for in-utero exposure by trimester (conception in 2004Q2 to Q4). The omitted category is the pooled pre-tsunami control (conceptions 2003Q1 to 2004Q1). Post-tsunami conceptions (2005Q1 to Q4) are absorbed by a separate indicator (not shown). Mother's age at birth (level and square), years of schooling of mother and father, and birth-order indicators are all interacted with conception years. Cluster fixed effects are included in the covariates. Standard errors are clustered at the cluster level and reported in parentheses.

Table A4: Birth effects of the Tsunami by timing of exposure (pre-tsunami control, post-period and cluster-specific linear trends)

Conception period	(1) Livebirth	(2) Miscarriage	(3) Duration	(4) Preterm birth
2004Q2 (3rd trimester)	-0.0383	0.0276	-0.116	0.0387
	(0.0243)	(0.0223)	(0.158)	(0.0318)
2004Q3 (2nd trimester)	-0.00879	0.0109	0.0970	-0.00683
	(0.0218)	(0.0204)	(0.126)	(0.0273)
2004Q4 (1st trimester)	-0.0636**	0.0533*	-0.229	0.0619*
	(0.0305)	(0.0283)	(0.192)	(0.0344)
Post-Dec 2004	-0.0427	0.0287	-0.0534	0.0299
	(0.0312)	(0.0279)	(0.199)	(0.0392)
Obs.	2159	2159	2159	2159
No. of Clusters	108	108	108	108

* $p < .10$, ** $p < .05$, *** $p < .01$

Each column regresses the birth outcome on indicators for in-utero exposure by trimester (conception in 2004Q2 to Q4). The omitted category is the pooled pre-tsunami control (conceptions 2003Q1 to 2004Q1). Post-tsunami conceptions (2005Q1 to Q4) are absorbed by a separate indicator (not shown). Mother's age at birth (level and square), years of schooling of mother and father, and birth-order indicators are included as covariates. Cluster fixed effects and cluster-specific linear trends are included. Standard errors are clustered at the cluster level and reported in parentheses.

Table A5: Birth effects of the Tsunami by timing of exposure (Observation from 2003-04)

Conception period	(1) Livebirth	(2) Miscarriage	(3) Duration	(4) Preterm birth
2004Q2 (3rd trimester)	-0.0324	0.0251	-0.135	0.0344
	(0.0204)	(0.0200)	(0.130)	(0.0261)
2004Q3 (2nd trimester)	-0.00242	0.00732	0.0526	-0.0141
	(0.0151)	(0.0147)	(0.0766)	(0.0161)
2004Q4 (1st trimester)	-0.0492**	0.0463**	-0.260*	0.0492**
	(0.0213)	(0.0197)	(0.132)	(0.0241)
	[0.017]	[0.017]	[0.020]	[0.020]
Obs.	1355	1355	1355	1355
No. of Clusters	108	108	108	108

* $p < .10$, ** $p < .05$, *** $p < .01$

Each column regresses the birth outcome on indicators for in-utero exposure by trimester (conception in 2004Q2 to Q4). The omitted category is the pooled pre-tsunami control (conceptions 2003Q1 to 2004Q1). Mother's age at birth (level and square), years of schooling of mother and father, birth-order indicators, and cluster fixed effects are included in the covariates. Romano-Wolf p-value for correcting multiple hypotheses tests are reported for 2004Q4 conceptions in square brackets. Standard errors are clustered at the cluster level and reported in parentheses.

Table A6: Alternate treatment effect estimates

Panel A. ***Livebirth Results***					
Conception	(1)	(2)	(3)	(4)	(5)
2004q2	-0.0376	-0.0366	-0.0388	-0.0366	-0.0353
	(0.0243)	(0.0242)	(0.0250)	(0.0268)	(0.0291)
2004q3	-0.0181	-0.0180	-0.0228	-0.0218	-0.0316
	(0.0182)	(0.0186)	(0.0195)	(0.0215)	(0.0237)
2004q4	-0.0603**	-0.0567**	-0.0643**	-0.0579**	-0.0538*
	(0.0267)	(0.0271)	(0.0278)	(0.0288)	(0.0305)
Panel B. ***Miscarriage Results***					
Conception	(1)	(2)	(3)	(4)	(5)
2004q2	0.0312	0.0292	0.0310	0.0318	0.0348
	(0.0228)	(0.0229)	(0.0237)	(0.0250)	(0.0269)
2004q3	0.0130	0.0127	0.0143	0.0147	0.0258
	(0.0182)	(0.0182)	(0.0190)	(0.0207)	(0.0226)
2004q4	0.0488*	0.0473*	0.0504**	0.0445*	0.0381
	(0.0248)	(0.0250)	(0.0253)	(0.0264)	(0.0286)
Panel C. ***Gestation Length Results***					
Conception	(1)	(2)	(3)	(4)	
2004q2	-0.191	-0.182	-0.207	-0.211	-0.239
	(0.0144)	(0.145)	(0.150)	(0.161)	(0.169)
2004q3	-0.0257	-0.00826	-0.0407	-0.0478	-0.103
	(0.106)	(0.109)	(0.114)	(0.127)	(0.133)
2004q4	-0.288*	-0.265	-0.307*	-0.253	-0.225
	(0.163)	(0.165)	(0.170)	(0.177)	(0.190)
Panel D. ***Preterm Birth Results***					
Conception	(1)	(2)	(3)	(4)	
2004q2	0.0366	0.0346	0.0395	0.0406	0.0399
	(0.0348)	(0.0356)	(0.0371)	(0.0395)	(0.0408)
2004q3	-0.0110	-0.0107	-0.00439	0.000155	0.0140
	(0.0257)	(0.0266)	(0.0269)	(0.0283)	(0.0302)
2004q4	0.0344	0.0328	0.0426	0.0384	0.0420
	(0.0317)	(0.0323)	(0.0329)	(0.0336)	(0.0361)
Sample period	99-05	00-05	01-05	02-05	03-05
Obs.	4661	4047	3416	2811	2159
No. of Clusters	108	108	108	108	108

* $p < .10$, ** $p < .05$, *** $p < .01$

Year-quarters in the first column indicate the period of conception. Coefficients for the quarter dummies for second through fourth quarter interacted with indicator for those conceived on 2004 are reported. There are controls for age of mother (level and squared) at birth, year of schooling of both the mother and the father, indicators for birth order, and cluster fixed effects. Standard errors are in the parentheses and are clustered at the cluster zone level.

Table A7: Migration experience and residence

	Different home	Same home
No move	0	1320
Moved	542	297

Note: The vertical axis categorizes the observations into those with experience of migration that are two weeks or longer and those without such experience. The horizontal axis categorizes observations into those residing in the same home before the Tsunami and those living in different residence.
Movers: All those who moved, thus 542+297 = 839
Short-term migrants: Those who have moved but currently in the same home, thus 297
Long-term migrants: Those who have moved and currently in different home, thus 542
Same home residents: Those currently in the same home regardless of migration, thus 1329+297 = 1626

Table A8: Selection into fertility based on types

	(1) Yrs of schooling	(2) Yrs of schooling, husband	(3) Age at birth
2004Q2 (3rd trimester)	0.220	0.106	0.0417
	(0.280)	(0.324)	(0.532)
2004Q3 (2nd trimester)	0.199	0.211	0.165
	(0.238)	(0.257)	(0.499)
2004Q4 (1st trimester)	-0.147	-0.219	0.121
	(0.308)	(0.256)	(0.564)
Post-Dec 2004	0.479***	0.248	0.0673
	(0.179)	(0.171)	(0.247)
Obs.	2159	2159	2159
No. of Clusters	108	108	108

* $p < .10$, ** $p < .05$, *** $p < .01$

Each column represents the regression results with year of schooling for mothers and fathers, along with age for mothers giving births across cohorts exposed to the Tsunami (2004Q2-Q4). The omitted category is the pooled pre-tsunami control (conceptions 2003Q1 to 2004Q1). Post-tsunami conceptions (2005Q1 to Q4) are captured with a single indicator. Mother's age at birth (level and square), years of schooling of mother and father, birth-order indicators, and cluster fixed effects are included in the covariates. Standard errors are clustered at the cluster level and reported in parentheses.

Table A9: Birth effects of the Tsunami by timing of exposure, Mother FE analysis

Conception period	(1) Livebirth	(2) Miscarriage	(3) Duration	(4) Preterm birth
In utero Exposure	-0.136**	0.150***	-0.813***	0.150**
	(0.0574)	(0.0480)	(0.293)	(0.0597)
Post-Dec 2004	0.0230	-0.0194	0.151	-0.0442*
	(0.0277)	(0.0241)	(0.154)	(0.0254)
Obs.	473	473	473	473
No. of Clusters	77	77	77	77

* $p < .10$, ** $p < .05$, *** $p < .01$

Mother fixed-effects estimates comparing pregnancies within the same woman.Maternal age controls are excluded, as they are collinear with pregnancy sequence with each mother. Identification rests on the 79 mothers contributing pregnancies both inside and outside the exposure window.

Table A10: Birth effects of the Tsunami by timing of exposure, Mother FE analysis with quarterly breakdown

Conception period	(1) Livebirth	(2) Miscarriage	(3) Duration	(4) Preterm birth
2004Q2 (3rd trimester)	-0.138	0.142	-1.028	0.0814
	(0.118)	(0.119)	(0.803)	(0.129)
2004Q3 (2nd trimester)	-0.105	0.108	-0.345	0.0619
	(0.0861)	(0.0844)	(0.425)	(0.0810)
2004Q4 (1st trimester)	-0.158*	0.187**	-1.062**	0.254***
	(0.0949)	(0.0775)	(0.462)	(0.0864)
Post-Dec 2004	0.0228	-0.0194	0.145	-0.0454*
	(0.0277)	(0.0243)	(0.154)	(0.0251)
Obs.	473	473	473	473
No. of Clusters	77	77	77	77

* $p < .10$, ** $p < .05$, *** $p < .01$

Mother fixed-effects estimates comparing pregnancies within the same woman.Maternal age controls are excluded, as they are collinear with pregnancy sequence with each mother. Identification rests on the 79 mothers contributing pregnancies both inside and outside the exposure window.

Table A11: Birth effects of the Tsunami by timing of exposure, inverse probability weights

Conception period	(1) Livebirth	(2) Miscarriage	(3) Duration	(4) Preterm birth
2004Q2 (3rd trimester)	-0.0298	0.0278	-0.185	0.0386
	(0.0206)	(0.0193)	(0.140)	(0.0247)
2004Q3 (2nd trimester)	-0.00353	0.0124	0.0362	-0.00840
	(0.0159)	(0.0154)	(0.0772)	(0.0168)
2004Q4 (1st trimester)	-0.0466**	0.0466**	-0.294**	0.0583**
	(0.0210)	(0.0199)	(0.135)	(0.0256)
Post-Dec 2004	-0.0266**	0.0259**	-0.132*	0.0170
	(0.0122)	(0.0107)	(0.0718)	(0.0135)
Obs.	2159	2159	2159	2159
No. of Clusters	108	108	108	108

* $p < .10$, ** $p < .05$, *** $p < .01$

Each column regresses the birth outcome on indicators for in utero exposure by trimester (conception in 2004Q2 to Q4). The omitted category is the pooled pre-Tsunami control (conceptions 2003Q1 to 2004Q1). Post-Tsunami conceptions (2005Q1 to Q4) are absorbed by a separate indicator. Mother's age at birth (level and square), years of schooling of mother and father, and birth-order indicators are included as covariates. Cluster fixed effects are included, and standard errors are clustered at the cluster level. Observations are weighted by the inverse probability of maternal survival, proxied at the cluster level by $1/(1 - m_c)$, where m_c is the share of respondents in cluster c reporting that their biological mother died in the Tsunami. The share ranges from 0 to 0.72 (median 0.03) and is computed from at least 16 respondents in every cluster. Because it is reported by surviving children, it understates maternal mortality in communities where entire families were lost.

Table A12: Birth effects of the Tsunami by timing and extent of exposure

Conception period	(1) Livebirth	(2) Miscarriage	(3) Duration	(4) Preterm birth
2004Q2	-0.0277	0.0329	-0.229	0.0419
	(0.0308)	(0.0341)	(0.214)	(0.0527)
2004Q2 × Medium	-0.0245	0.00372	0.105	0.00484
	(0.0422)	(0.0436)	(0.262)	(0.0612)
2004Q2 × High	0.0702*	-0.0549	-0.0176	-0.0545
	(0.0422)	(0.0399)	(0.631)	(0.0839)
2004Q3	0.0101	-0.00502	0.111	-0.0567***
	(0.0125)	(0.00999)	(0.0788)	(0.0216)
2004Q3 × Medium	-0.0186	0.0188	-0.0753	0.0663**
	(0.0261)	(0.0248)	(0.139)	(0.0308)
2004Q3 × High	-0.0168	0.0288	-0.176	0.0541
	(0.0387)	(0.0358)	(0.196)	(0.0462)
2004Q4	-0.114**	0.121***	-0.698**	0.102**
	(0.0466)	(0.0447)	(0.308)	(0.0489)
2004Q4 × Medium	0.0705	-0.0898*	0.570	-0.0666
	(0.0543)	(0.0514)	(0.348)	(0.0577)
2004Q4 × High	0.152***	-0.144***	0.618	-0.0641
	(0.0536)	(0.0491)	(0.435)	(0.0868)
Obs.	2159	2159	2159	2159
No. of Clusters	108	108	108	108

* $p < .10$, ** $p < .05$, *** $p < .01$

Each column regresses the birth outcome on trimester-of-exposure indicators (conception in 2004Q2-Q4) interacted with data-provided indicator of damage intensity. The omitted category is the low-damage indicator in the pooled pre-tsunami period. The interaction terms on medium and high give the *additional* effect in medium- and high-damage clusters relative to low. The indicators of damage levels are interacted with the single indicator for all post-Tsunami conceptions, which is not reported in this table. Mother's age at birth (level and square), years of schooling of mother and father, birth-order indicators, and cluster fixed effects are included as controls. Standard errors clustered at the cluster level in parentheses.

Table A13: Summary statistics, characteristics of clusters with different extent of damage

Category	Light	Medium	Heavy
Total number of clusters	31	53	24
Total respondents	583	1,269	307
Respondents whose house were damaged	80	463	208
Total households	583	1269	307
House damage rate	0.1540	0.3652	0.6879

There are total of 2,159 respondents and 108 clusters in the sample, with 4 respondents not specifying whether their house was damaged or not. House damage rate is defined as the the proportion of the number of damaged households that are damaged within a given cluster and is used to characterize the treatment intensity on each cluster.

Table A14: Birth effects of the Tsunami by timing and extent of exposure (by tercile of % houses damaged per cluster)

	(1)	(2)	(3)	(4)
Conception period	Livebirth	Miscarriage	Duration	Preterm birth
2004Q2	-0.0279	0.0357	-0.149	0.0457
	(0.0345)	(0.0363)	(0.193)	(0.0489)
2004Q2 × Medium	-0.0479	0.0273	-0.117	0.0281
	(0.0517)	(0.0539)	(0.303)	(0.0638)
2004Q2 × High	0.0273	-0.0490	0.0569	-0.0490
	(0.0437)	(0.0380)	(0.288)	(0.0587)
2004Q3	-0.00415	0.0119	0.0114	-0.0142
	(0.0293)	(0.0283)	(0.141)	(0.0371)
2004Q3 × Medium	0.00568	-0.0101	0.113	0.0159
	(0.0407)	(0.0397)	(0.204)	(0.0447)
2004Q3 × High	-0.00232	0.00339	-0.0149	-0.00338
	(0.0355)	(0.0343)	(0.169)	(0.0416)
2004Q4	-0.0550	0.0650*	-0.350	0.0671*
	(0.0364)	(0.0355)	(0.229)	(0.0390)
2004Q4 × Medium	-0.0610	0.0393	-0.216	0.0406
	(0.0709)	(0.0684)	(0.448)	(0.0804)
2004Q4 × High	0.0456	-0.0643	0.322	-0.0641
	(0.0427)	(0.0391)	(0.262)	(0.0461)
Obs.	2159	2159	2159	2159
No. of Clusters	108	108	108	108

* $p < .10$, ** $p < .05$, *** $p < .01$

Each column regresses the birth outcome on trimester-of-exposure indicators (conception in 2004Q2-Q4) interacted with damage intensity indicators generated based on the cluster-level share of houses damaged split by terciles. The omitted category is the low-damage indicator in the pooled pre-tsunami period. The interaction terms on medium and high give the *additional* effect in medium- and high-damage clusters relative to low. A full set of conception-quarter dummies and their interactions is included but omitted from the table. Mother's age at birth (level and square), years of schooling of mother and father, birth-order indicators, and cluster fixed effects are included as controls. Standard errors clustered at the cluster level in parentheses.

Table A15: Birth effects of the Tsunami by timing and extent of exposure (house damaged)

Conception period	(1) Livebirth	(2) Miscarriage	(3) Duration	(4) Preterm birth
2004Q2	-0.0469*	0.0331	-0.220	0.0646*
	(0.0260)	(0.0240)	(0.159)	(0.0333)
2004Q2 × Damaged	0.0401	-0.0114	0.163	-0.0824
	(0.0483)	(0.0441)	(0.268)	(0.0500)
2004Q3	-0.0151	0.0191	0.0939	-0.0103
	(0.0203)	(0.0198)	(0.0941)	(0.0220)
2004Q3 × Damaged	0.0346	-0.0271	-0.145	0.000938
	(0.0285)	(0.0275)	(0.174)	(0.0405)
2004Q4	-0.0759***	0.0731***	-0.374**	0.0813**
	(0.0287)	(0.0278)	(0.186)	(0.0320)
2004Q4 × Damaged	0.0597	-0.0596	0.243	-0.0757
	(0.0408)	(0.0365)	(0.245)	(0.0498)
Obs.	2155	2155	2155	2155
No. of Clusters	108	108	108	108

* $p < .10$, ** $p < .05$, *** $p < .01$

Each column regresses the birth outcome on trimester-of-exposure indicators (conception in 2004Q2-Q4) interacted with damage intensity indicators generated based on the cluster-level share of houses damaged spilt by terciles. The omitted category is the low-damage indicator in the pooled pre-tsunami period. The interaction terms on medium and high give the *additional* effect in medium- and high-damage clusters relative to low. A full set of conception-quarter dummies and their interactions is included but omitted from the table. Mother's age at birth (level and square), years of schooling of mother and father, birth-order indicators, and cluster fixed effects are included as controls. Standard errors clustered at the cluster level in parentheses.

Table A16: Non-linear birth effects by damage intensity (restricted cubic spline)

Conception period	(1) Livebirth	(2) Miscarriage	(3) Duration	(4) Preterm birth
Effect at no damage	-0.0433	0.0625	-0.4264	0.0518
	(0.0519)	(0.0515)	(0.3401)	(0.0577)
Effect at light-cluster mean	-0.0666	0.0696	-0.3459	0.065
	(0.0284)	(0.0279)	(0.1872)	(0.0328)
Effect at medium-cluster mean	-0.0561	0.0539	-0.2935	0.0559
	(0.0225)	(0.0214)	(0.1411)	(0.0251)
Effect at heavy-cluster mean	0.0229	-0.0144	-0.2519	-0.0044
	(0.0760)	(0.0738)	(0.5547)	(0.0949)
Joint p (gradient)	0.414	0.195	0.751	0.715
Obs.	2159	2159	2159	2159
No. of Clusters	108	108	108	108

* $p < .10$, ** $p < .05$, *** $p < .01$

Each column reports the estimated first-trimester (2004Q4) effect evaluated at four levels of the share of houses damaged within each cluster: zero, and the mean share within lightly, moderately, and heavily damaged clusters (0.104, 0.206, 0.491). Effects are computed from a fixed-effects regression in which the first-trimester exposure indicator is interacted with a restricted cubic spline (knots at 0.02, 0.16, 0.50) in the share of houses damaged, allowing a non-linear dose-response. The joint p-value tests the spline-by-exposure interaction terms. Mother's age at birth (level and square), years of schooling of mother and father, birth-order indicators, and cluster fixed effects are included as controls. Standard errors clustered at the cluster level and reported in the parentheses.

Table A17: Birth effects of the Tsunami by timing and extent of exposure (full year-quarter format)

Conception period	(1) Livebirth	(2) Miscarriage	(3) Duration	(4) Preterm birth
2004Q2	-0.0237	0.0249	-0.125	0.0423
	(0.0404)	(0.0410)	(0.301)	(0.0776)
2004Q2 × Medium	0.00413	-0.0305	0.397	-0.0299
	(0.0523)	(0.0507)	(0.323)	(0.0623)
2004Q2 × Heavy	0.154**	-0.105*	0.165	-0.0183
	(0.0684)	(0.0609)	(0.700)	(0.0929)
2004Q3	0.0139	-0.0128	0.211	-0.0567
	(0.0234)	(0.0232)	(0.211)	(0.0508)
2004Q3 × Medium	0.0102	-0.0155	0.222	0.0323
	(0.0431)	(0.0418)	(0.269)	(0.0565)
2004Q3 × Heavy	0.0634	-0.0202	0.0165	0.0914
	(0.0705)	(0.0630)	(0.370)	(0.0733)
2004Q4	-0.110**	0.114**	-0.600	0.102
	(0.0506)	(0.0502)	(0.371)	(0.0702)
2004Q4 × Medium	0.0995*	-0.125**	0.869**	-0.101
	(0.0573)	(0.0546)	(0.368)	(0.0706)
2004Q4 × Heavy	0.232***	-0.194***	0.801	-0.0259
	(0.0711)	(0.0635)	(0.565)	(0.111)
Obs.	2159	2159	2159	2159
No. of Clusters	108	108	108	108
Pre-trend p	0.562	0.748	0.654	0.571
Post p	0.0112	0.00417	0.603	0.333
Post Mid p	0.510	0.143	0.186	0.111
Post High p	0.00669	0.00454	0.668	0.629

* $p < .10$, ** $p < .05$, *** $p < .01$

Each column regresses the birth outcome on trimester-of-exposure indicators (conception in 2004Q2-Q4) interacted with data-provided indicator of damage intensity. The omitted category is the low-damage indicator. The interaction terms on medium and high give the *additional* effect in medium- and high-damage clusters relative to low. A full set of conception-quarter dummies and their interactions is included in the regression but omitted from the table. The pre-trend F and p report a joint test that the damage interactions in the pre-Tsunami conception quarters are zero; the post F and p report the analogous joint test for the post-Tsunami interactions. Mother's age at birth (level and square), years of schooling of mother and father, birth-order indicators, and cluster fixed effects are included as controls. Standard errors clustered at the cluster level in parentheses.

Table A18: Birth effects of the Tsunami by timing and extent of exposure (by tercile of % houses damaged per cluster and full year-quarter format)

	(1)	(2)	(3)	(4)
Conception period	Livebirth	Miscarriage	Duration	Preterm birth
2004Q2	-0.0343	0.0525	-0.168	0.0552
	(0.0422)	(0.0383)	(0.255)	(0.0650)
2004Q2 × Medium	-0.0480	0.0211	-0.178	0.0538
	(0.0686)	(0.0673)	(0.440)	(0.0763)
2004Q2 × Heavy	0.0212	-0.0256	-0.298	0.0555
	(0.0555)	(0.0470)	(0.378)	(0.0586)
2004Q3	-0.0100	0.0285	-0.00774	-0.00487
	(0.0358)	(0.0311)	(0.197)	(0.0509)
2004Q3 × Medium	0.00580	-0.0166	0.0547	0.0406
	(0.0644)	(0.0640)	(0.403)	(0.0791)
2004Q3 × Heavy	-0.00935	0.0266	-0.369	0.102
	(0.0502)	(0.0480)	(0.312)	(0.0650)
2004Q4	-0.0611	0.0819**	-0.372	0.0773
	(0.0432)	(0.0387)	(0.275)	(0.0582)
2004Q4 × Medium	-0.0612	0.0328	-0.273	0.0654
	(0.0835)	(0.0821)	(0.549)	(0.0974)
2004Q4 × Heavy	0.0388	-0.0415	-0.0301	0.0398
	(0.0599)	(0.0562)	(0.384)	(0.0689)
Obs.	2159	2159	2159	2159
No. of Clusters	108	108	108	108
Pre-trend p	0.684	0.882	0.495	0.251
Post p	0.751	0.168	0.472	0.546
Post Mid p	0.806	0.540	0.514	0.713
Post High p	0.808	0.253	0.732	0.606

* $p < .10$, ** $p < .05$, *** $p < .01$

Each column regresses the birth outcome on trimester-of-exposure indicators (conception in 2004Q2-Q4) interacted with terciles of the cluster-level share of houses damaged due to the tsunami. The omitted category is the low-damage tercile in the pooled pre-tsunami period. The interaction terms on medium and high give the *additional* effect in medium- and high-damage clusters relative to low. A full set of conception-quarter dummies and their tercile interactions is included but omitted from the table. The pre-trend F and p report a joint test that the damage interactions in the pre-Tsunami conception quarters are zero; the post F and p report the analogous joint test for the post-Tsunami interactions. Mother's age at birth (level and square), years of schooling of mother and father, birth-order indicators, and cluster fixed effects are included as controls. Standard errors clustered at the cluster level in parentheses.

Table A19: Birth effects of the Tsunami by timing of exposure (pre-tsunami control, post-period binned and flexible damage trends)

Conception period	(1) Livebirth	(2) Miscarriage	(3) Duration	(4) Preterm birth
2004Q2 (3rd trimester)	-0.0351	0.0251	-0.105	0.0389
	(0.0236)	(0.0215)	(0.151)	(0.0301)
2004Q3 (2nd trimester)	-0.00434	0.00465	0.127	-0.00981
	(0.0210)	(0.0200)	(0.122)	(0.0258)
2004Q4 (1st trimester)	-0.0552*	0.0441	-0.177	0.0539
	(0.0291)	(0.0276)	(0.185)	(0.0329)
Post-Dec 2004	-0.0333	0.0171	0.0151	0.0223
	(0.0304)	(0.0282)	(0.195)	(0.0380)
Obs.	2159	2159	2159	2159
No. of Clusters	108	108	108	108
p-value of Damage-specific trend	0.843	0.527	0.658	0.422

* $p < .10$, ** $p < .05$, *** $p < .01$

Each column regresses the birth outcome on indicators for in-utero exposure by trimester (conception in 2004Q2 to Q4). The omitted category is the pooled pre-tsunami control (conceptions 2003Q1 to 2004Q1). Post-tsunami conceptions (2005Q1 to Q4) are absorbed by a separate indicator (not shown). Mother's age at birth (level and square), years of schooling of mother and father, birth-order indicators and cluster fixed effects and cluster-specific linear trends are included. Interaction between indicators of damage and all year-quarter dummies are included. Standard errors are clustered at the cluster level and reported in parentheses.

Table A20: Birth effects of the Tsunami by timing and extent of exposure (house damaged in full year-quarter format)

Conception period	(1) Livebirth	(2) Miscarriage	(3) Duration	(4) Preterm birth
2004Q2	-0.0577*	0.0470*	-0.275	0.0806*
	(0.0294)	(0.0248)	(0.182)	(0.0409)
2004Q2 × Damaged	0.00535	0.0158	-0.0276	-0.0210
	(0.0450)	(0.0425)	(0.262)	(0.0517)
2004Q3	-0.0255	0.0332	0.0367	0.00597
	(0.0230)	(0.0209)	(0.117)	(0.0285)
2004Q3 × Damaged	0.000321	-0.00137	-0.326*	0.0611
	(0.0261)	(0.0259)	(0.178)	(0.0397)
2004Q4	-0.0864***	0.0872***	-0.430**	0.0973**
	(0.0318)	(0.0290)	(0.201)	(0.0401)
2004Q4 × Damaged	0.0247	-0.0335	0.0581	-0.0148
	(0.0455)	(0.0432)	(0.285)	(0.0565)
Obs.	2155	2155	2155	2155
No. of Clusters	108	108	108	108
Pre-trend p	0.0364	0.0789	0.239	0.0844
Post p	0.764	0.526	0.350	0.359

* $p < .10$, ** $p < .05$, *** $p < .01$

Each column regresses the birth outcome on trimester-of-exposure indicators (conception in 2004Q2-Q4) interacted with damage intensity indicators generated based on the cluster-level share of houses damaged spilt by terciles. The omitted category is the low-damage indicator in the pooled pre-tsunami period. The interaction terms on medium and high give the *additional* effect in medium- and high-damage clusters relative to low. A full set of conception-quarter dummies and their interactions is included but omitted from the table. Mother's age at birth (level and square), years of schooling of mother and father, birth-order indicators, and cluster fixed effects are included as controls. Standard errors clustered at the cluster level in parentheses.

Table A21: Balance table: Pregnancy in weeks vs months

	(1) Weeks		(2) Months		T-test Difference
Variable	N/[Clusters]	Mean/SE	N/[Clusters]	Mean/SE	(1)-(2)
Literate	105	0.981	2054	0.916	0.065
	[45]	(0.013)	[107]	(0.014)	
Literate, husband	105	0.981	2054	0.951	0.030
	[45]	(0.013)	[107]	(0.008)	
Enrollment	105	0.990	2054	0.956	0.034
	[45]	(0.010)	[107]	(0.011)	
Enrollment, husband	105	1.000	2054	0.988	0.012*
	[45]	(0.000)	[107]	(0.004)	
Yrs of schooling	105	10.095	2054	8.333	1.763
	[45]	(0.475)	[107]	(0.259)	
Yrs of schooling, husband	105	10.048	2054	8.699	1.348
	[45]	(0.514)	[107]	(0.192)	
Rural	105	0.533	2054	0.737	-0.204
	[45]	(0.090)	[107]	(0.046)	
Age at birth	105	27.638	2054	27.602	0.036
	[45]	(0.536)	[107]	(0.150)	
House damaged	105	0.248	2050	0.354	-0.106
	[45]	(0.052)	[107]	(0.032)	

Notes: The value displayed for t-tests are the differences in the means across the groups. Standard errors are clustered at variable cluster. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table A22: Birth effects of the Tsunami by timing of exposure, months sample

Conception period	(1) Livebirth	(2) Miscarriage	(3) Duration	(4) Preterm birth
2004Q2 (3rd trimester)	-0.0378*	0.0327	-0.228*	0.0478*
	(0.0210)	(0.0201)	(0.129)	(0.0256)
2004Q3 (2nd trimester)	-0.00248	0.00918	0.0123	-0.00717
	(0.0146)	(0.0141)	(0.0728)	(0.0148)
2004Q4 (1st trimester)	-0.0531**	0.0488**	-0.251*	0.0518**
	(0.0216)	(0.0201)	(0.129)	(0.0238)
Post-Dec 2004	-0.0318**	0.0269**	-0.151**	0.0217
	(0.0126)	(0.0113)	(0.0744)	(0.0146)
Obs.	2054	2054	2054	2054
No. of Clusters	107	107	107	107

* $p < .10$, ** $p < .05$, *** $p < .01$

The results presented in this table reproduces the Equation (1) on the sample of respondents who recorded their conception duration in months, not weeks. There are controls for age of mother (level and squared) at birth, year of schooling of both the mother and the father, indicators for birth order, cluster fixed effects. Standard errors are in the parentheses and are clustered at the cluster zone level.

Table A23: Lee (2009) bounds for the 2004Q4 conception cohort

	(1) Original	(2) Lower bound	(3) Upper bound
Livebirth	-0.0536**	-0.0572***	-0.0170
	(0.0216)	(0.0212)	(0.0113)
	[-0.0964,-0.0109]		
Obs.	2159	2065	2062
No. of Clusters	108	108	108
Miscarriage	0.0504**	0.00456	0.0511***
	(0.0203)	(0.0072)	(0.0182)
	[0.0102,0.0907]		
Obs.	2159	2061	2063
No. of Clusters	108	108	108
Duration	-0.282**	-0.341***	-0.0178
	(0.134)	(0.128)	(0.0723)
	-0.5487,-0.0156]		
Obs.	2159	2062	2068
No. of Clusters	108	108	108
Preterm	0.0537**	0.0537**	0.0660***
	(.0243)	(.0226)	(.0232)
	[0.0055,0.1018]		
Obs.	2159	2064	2064
No. of Clusters	108	108	108

* $p < .10$, ** $p < .05$, *** $p < .01$

The estimation equations are based on Equation (1) in the main text. First column indicates the dependent variables. Original column reproduces the event-study outcomes in the main text. The regression in the lower bound column drops top 4.86 percent of individuals based on the distribution of residuals of main regressions for each outcome. The regression in the upper bound column drops bottom 4.86 percent of individuals on the same distribution. Coefficients indicate the point estimates for those conceived on 2004Q4. There are controls for age of mother (level and squared) at birth, year of schooling of both the mother and the father, indicators for birth order, cluster fixed effects. Standard errors are in the parentheses and are clustered at the cluster zone level. Square brackets on the first column are the 95 percent confidence intervals for the original point estimates.

Table A24: Summary statistics, Mechanism variables

Panel A. *Averages for key statistics*			
Category	Unit	Average	Std.dev
Health spending	Indonesian Rupiah	457,269	1,173,517
Prenatal care spending	Indonesian Rupiah	172,460	346,252
Prenatal care visits	Number	6.37	3.56
Birthweight	Kg	3.2	.693
All transfers	Indonesian Rupiah	1,072,472	3,820,265
Gov't transfers	Indonesian Rupiah	466,174	1,897,235
NGO transfers	Indonesian Rupiah	477,793	2,966,257
Loss in housing value	Indonesian Rupiah	2,793,957	12,902,459
Panel B. *Proportions of those belonging to each categories*			
Category	Total respondents	Respondents	Proportion(%)
Birth at own or family's house	2,055	1333	64.86
Disturbing memories	2,159	1072	49.65
Anxiety about future	2,159	549	25.43
Fear of death	2,159	1579	73.14
Fear of injury	2,159	1749	81.01
Parent death	2,159	82	3.80
Same health	2,159	1822	84.39
Worse health	2,159	237	10.98
Outpatient care	2,159	443	20.52
Wife unemployed	1,065	242	22.72
Husband unemployed	2,090	711	34.02
Brick wall	2,103	801	38.09
Wooden wall	2,103	1273	60.53
Iron roof	2,103	1532	72.85
Dirt floor	2,102	153	7.28

Panel A collects averages and standard deviations of continuous outcome variables used in mechanism tests. The units of each statistics are specified in the second column. Panel B collects the summary statistics of the binary variables used in the mechanism tests. The proportion on the last column refers to the total share of respondents who answered "yes" to each of the variables.

Table A25: Regression on maternal health indicators

	(1) Fear of death	(2) Fear of injury	(3) Disturbed	(4) Anxiety	(5) Parent death	(6) same	(7) deteriorate	(8) outpatient
2004Q2 (3rd trimester)	-0.0396	-0.0362	0.0243	0.0375	-0.00165	-0.0444	0.0190	0.0137
	(0.0350)	(0.0340)	(0.0494)	(0.0407)	(0.0140)	(0.0377)	(0.0282)	(0.0296)
2004Q3 (2nd trimester)	0.0270	0.0124	-0.00539	0.0123	0.0226	-0.0319	0.0519**	-0.0255
	(0.0356)	(0.0380)	(0.0379)	(0.0271)	(0.0167)	(0.0272)	(0.0244)	(0.0289)
2004Q4 (1st trimester)	0.0553	0.0307	0.00503	0.0182	-0.0188*	-0.0282	0.0377	0.0416
	(0.0373)	(0.0364)	(0.0364)	(0.0352)	(0.0107)	(0.0273)	(0.0236)	(0.0359)
post_dec2004	0.0301	0.0375*	-0.0421*	-0.00211	-0.00996	-0.0367**	0.0274*	0.0101
	(0.0198)	(0.0190)	(0.0214)	(0.0209)	(0.00799)	(0.0177)	(0.0141)	(0.0206)
Obs.	2159	2159	2159	2159	2159	2159	2159	2159
No. of Clusters	108	108	108	108	108	108	108	108

* $p < .10$, ** $p < .05$, *** $p < .01$

The following outcomes are used: Fear of death, fear of injury, being disturbed, anxiety about future, death of a parent, same health condition, worse health condition, and outpatient services usage one month before. The omitted category is the pooled pre-tsunami control (conceptions 2003Q1 to 2004Q1). Post-tsunami conceptions (2005Q1 to Q4) are captured with a single indicator. Mother's age at birth (level and square), years of schooling of mother and father, birth-order indicators, and cluster fixed effects are included in the covariates. Standard errors are clustered at the cluster level and reported in parentheses.

Table A26: Socioeconomic status and effects of the Tsunami

	(1) log(house loss)	(2) Wife unemp	(3) husb. unemp	(4) Brick wall	(5) Wood wall	(6) Iron roof	(7) Dirt floor	(8) log(all aid)	(9) log(govt aid)	(10) log(ngo aid)
2004Q2 (3rd trimester)	-0.473	-0.000631	-0.00134	0.0336	-0.0547	0.0952***	0.0286	-0.222	-0.266*	0.405
	(0.305)	(0.0288)	(0.0436)	(0.0378)	(0.0386)	(0.0312)	(0.0284)	(0.156)	(0.140)	(0.288)
2004Q3 (2nd trimester)	-0.119	-0.0423*	-0.0296	0.0267	-0.0203	0.0262	0.0105	-0.0678	-0.198	0.296
	(0.180)	(0.0237)	(0.0330)	(0.0365)	(0.0369)	(0.0310)	(0.0221)	(0.128)	(0.126)	(0.185)
2004Q4 (1st trimester)	0.152	-0.0369	-0.00365	0.00265	-0.00501	0.0330	-0.0106	0.0178	-0.118	0.187
	(0.251)	(0.0278)	(0.0343)	(0.0353)	(0.0348)	(0.0319)	(0.0184)	(0.126)	(0.111)	(0.179)
post_dec2004	-0.0496	-0.0183	0.0465**	-0.0207	0.0216	0.0341	0.00257	-0.135	-0.224***	-0.0283
	(0.132)	(0.0165)	(0.0193)	(0.0223)	(0.0221)	(0.0206)	(0.0133)	(0.0945)	(0.0839)	(0.145)
Obs.	446	2159	2159	2103	2103	2103	2102	1508	1341	470
No. of Clusters	72	108	108	108	108	108	108	108	107	79

* $p < .10$, ** $p < .05$, *** $p < .01$

The first column is the regression result with loss of housing value due to the Tsunami as outcome variable. Columns (2) and (3) regress the post-Tsunami unemployment for mother and father. The outcome variable Columns (4) - (7) are housing material. The last three columns represent results from the regression with the log of all aid, log of government aid, and log of aid from NGO as outcomes. The omitted category is the pooled pre-tsunami control (conceptions 2003Q1 to 2004Q1). Post-tsunami conceptions (2005Q1 to Q4) are captured with a single indicator. Mother's age at birth (level and square), years of schooling of mother and father, birth-order indicators, and cluster fixed effects are included in the covariates. Standard errors are clustered at the cluster level and reported in parentheses.