Online Appendix for "Maternal Health Intervention and Sex Ratios: Evidence from the Village Midwife Program in Indonesia"

November 2022
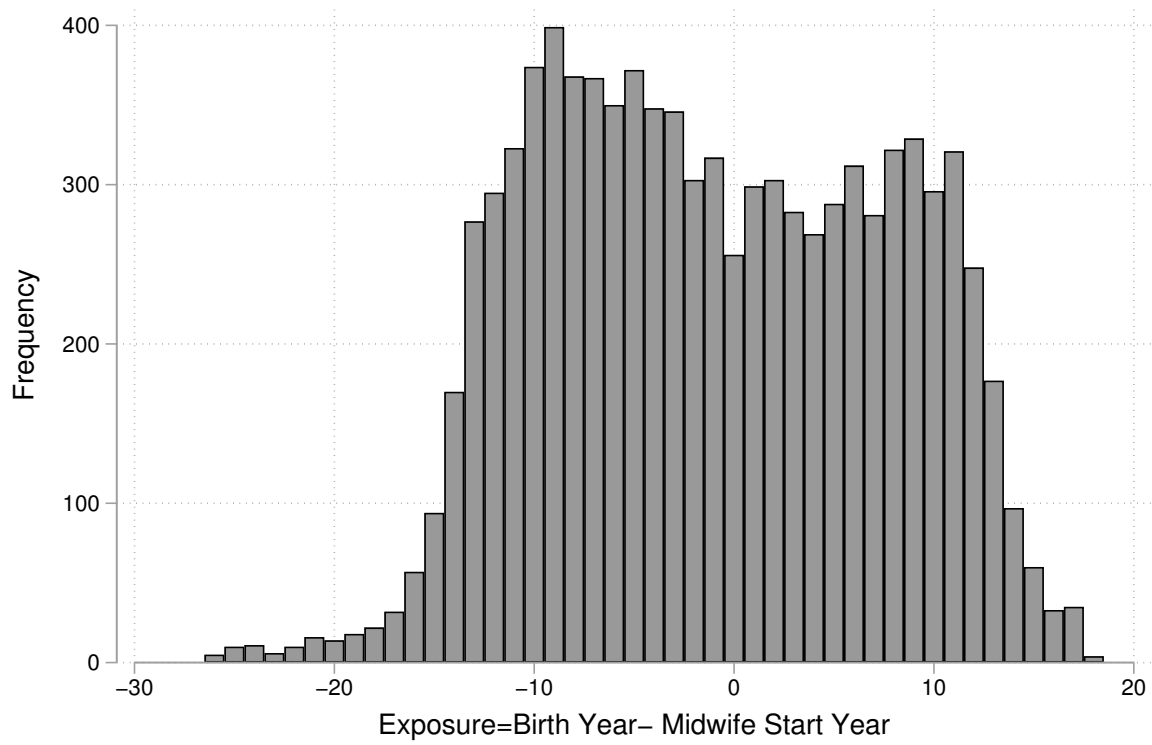
Figures

Figure A1: Histogram of years of exposure to a midwife

Impact of Midwife on the Likelihood of Live Birth Being Male

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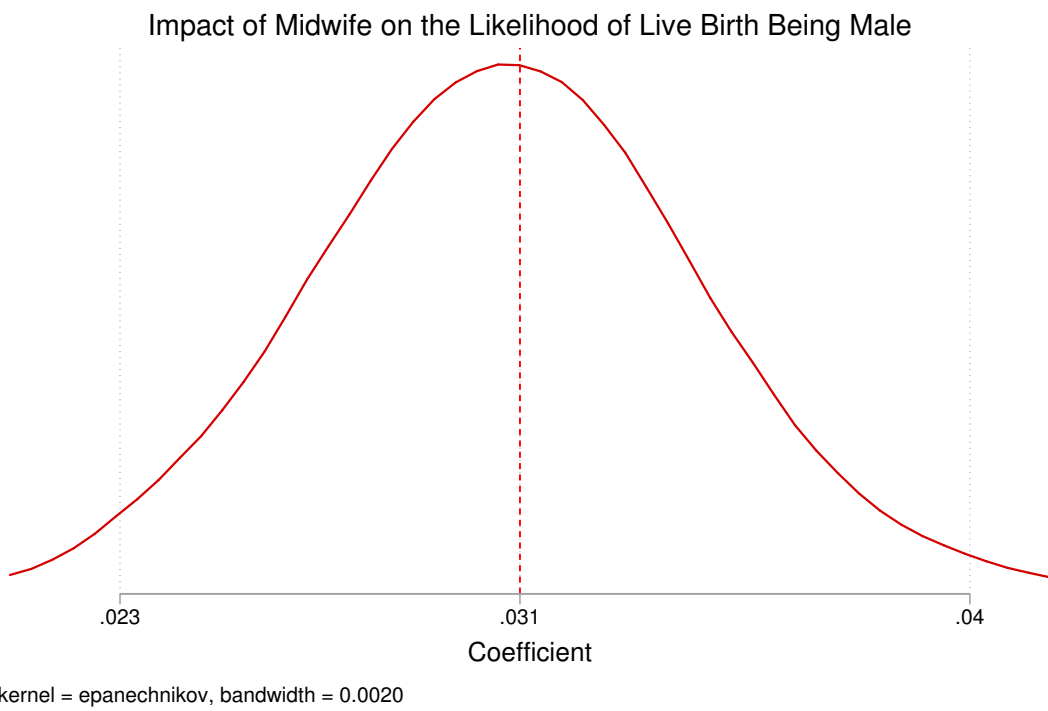
Figure A2: Impact estimates with random start month of program

Tables

Table A1: Comparison of characteristics between program and non-program communities

	Non-Program communities	Program communities	Difference	Standard deviation	Observations
Panel A: Community Characteristics in 1993					
Paved Road (=1)	0.8369	0.9176	0.081**	0.0367	311
Electricity (=1)	0.8794	0.9529	0.074**	0.0308	311
Urban(=1)	0.3191	0.7882	0.469***	0.0498	311
Distance to the Nearest Health Facility	1.5348	0.9112	-0.624**	0.3103	311
Distance to the Nearest Market	3.2312	1.3882	-1.843***	0.4028	311
Public Telephone (=1)	0.1560	0.6529	0.497***	0.0490	311
Number of Health Posts	5.7730	10.3176	4.545***	0.8536	311
Distance to the District Capital	27.2624	11.3106	-15.952***	3.0620	311
Panel B: Household and Maternal Characteristics (Birth Cohort 1981-1988)					
Male Child(=1)	0.5184	0.4876	0.031**	0.0138	5314
Mother's Years of Education	5.2757	4.0071	1.269***	0.0919	5314
Menstruation Age	14.4076	14.4246	-0.017	0.0463	5299
Mother Age at First Marriage	18.9806	17.8814	1.099***	0.1202	5164
Mother's Age at Birth	25.7247	25.2018	0.523***	0.1610	5314
Household Head Age in Years	40.1772	39.5337	0.643***	0.2317	5314
Household Head Male (=1)	0.9421	0.9339	0.008	0.0067	5314
Household Head Years of Education	6.3351	4.8601	1.475***	0.0996	5185

Notes: Panel A of the table compares baseline community characteristics of program areas and non-program areas. Program areas are communities which have received a midwife between 1989 and 2007 and non-program areas refer to the remaining communities. Panel B examines the maternal and household characteristics of the birth cohort 1981-1988–this is the cohort in our data which did not have any *in utero* exposure to a midwife, even if born in a program community.

Table A2: Comparison of characteristics between mother fixed-effects sample and the remaining sample

	Non-Mother FE Sample	Mother FE Sample	Difference	Standard Deviation	Observations
Male Child(=1)	0.5021	0.5144	-0.012	0.0097	15636
Mother's Years of Education	7.1237	5.5675	1.556***	0.0699	15636
Menstruation Age	13.9407	14.2941	-0.353***	0.0323	15565
Mother Age at First Marriage	20.4372	19.1211	1.316***	0.0860	15343
Mother's Age at Birth	25.5275	27.0177	-1.490***	0.1207	15636
Household Head Age in Years	42.3934	39.1096	3.284***	0.2137	15633
Household Head Male (=1)	0.8686	0.9229	-0.054***	0.0055	15636
Household Head Years of Education	6.3330	5.9319	0.401***	0.0736	15319

Notes: This table compares the characteristics of children included in the mother fixed effects sample with those not included in the same. See the text for greater details.

Table A3: Impact of the Village Midwife Program on Antenatal Care in the First Trimester: Birth cohort last five years from survey

	(1)
Presence of Midwife(=1)	0.0049
	(0.0200)
Observations	8796
Control Mean (Dep. Var.)	0.84

Notes: Standard errors are clustered at the community level (*** p<0.01, ** p<0.05, * p<0.1). The sample is restricted to children who are born within last five year of the survey. The variable $Presence$ of $Midwife$ is a dummy for the presence of a midwife during the birth year of a child. The individual controls include maternal years of education (splines with knots at 6,9, and 12) and maternal age at survey (splines with knots at 20, 25, 30, 35, 40, and 45). Community controls include time-varying characteristics at the community level: paved road status, electricity status, number of health posts, urban status, public phone status, distance to market, distance to the district capital center, and distance to the nearest health facility. All regressions include birth month fixed effects, birth year fixed effects, birth order fixed effects, and community fixed effects.

Table A4: Impact of midwife on the BMI of reproductive age mothers: Birth cohort 1981-2007

	(1)
Presence of Midwife(=1)	0.2291*
	(0.1229)
Observations	14435
Control Mean (Dep. Var.)	21.82

Notes: Standard errors are clustered at the community level (*** $p<0.01$, ** $p<0.05$, * $p<0.1$). The sample is restricted to mothers who are between 20-50 years of age at the time of survey and who have given birth between 1981-2007. The individual controls include maternal years of education (splines with knots at 6,9, and 12) and maternal age at survey (splines with knots at 20, 25, 30, 35, 40, and 45). Community controls include time-varying characteristics at the community level: paved road status, electricity status, number of health posts, urban status, public phone status, distance to market, distance to the district capital center, and distance to the nearest health facility.

Table A5: Comparison of characteristics between migrant and non-migrant sample

	Non-migrant sample	Migrant sample	Difference	Standard deviations	Observations
Years of Education	5.9011	8.7673	-2.866***	0.0671	19204
Maternal Age at Survey	31.0514	28.8321	2.219***	0.1220	19204
Menstruation Age	14.2184	13.8165	0.402***	0.0304	19114
Mother Age at First Marriage	19.4030	21.6282	-2.225***	0.0817	18889

Notes: This table compares characteristics of migrant and non-migrant mothers during the entire sample period in the paper. See the text for more details.

Table A6: Impact of midwife on migration

| | **Migration** |
	(1)
Presence of Midwife (=1)	0.0083
	(0.0155)
Observations	19204
Control Mean (Dep. Var.)	0.18

Notes: Standard errors are clustered at the community level (*** p<0.01, ** p<0.05, * p<0.1). The dependent variable *Migration* takes a value of 1 if the mother moved to a different community from original community and 0 otherwise. The variable $Presence\ of\ Midwife$ is a dummy for the presence of a midwife during the birth year of a child. Original communities are communities which were sampled in the first wave of the IFLS. The individual controls include maternal years of education (splines with knots at 6,9, and 12) and maternal age at survey (splines with knots at 20, 25, 30, 35, 40, and 45). The regression includes wave fixed effects and community fixed effects.

Table A7: Village Midwife Program and maternal, household, and community characteristics of the live birth sample: Birth cohort 1981-2007

	Mother-level characteristics							Household head characteristics			Community-level characteristics	
	Years of education	Age at first birth	Age at birth	Menarche age (in years)	Marriage age (in years)	Married	Height (in Centimeters)	Age (in years)	Male	Years of education	Number of births	Proportion of women giving birth
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Presence of Midwife(=1)	0.1554	-0.2749	0.0006	0.0265	-0.1906	0.0094	-0.3410	-0.1539	0.0096	0.0871	-0.0019	-0.0014
	(0.1135)	(0.2122)	(0.0114)	(0.0694)	(0.1585)	(0.0122)	(0.2341)	(0.4065)	(0.0102)	(0.1058)	(0.0905)	(0.0054)
Observations	15636	15081	15636	15565	15343	15635	14743	15633	15636	15319	6528	15494
Control Mean (Dep. Var.)	4.01	22.74	25.20	14.42	17.88	0.76	149.74	39.53	0.93	4.86	2.77	0.20

Notes: Standard errors are clustered at the community level (*** p<0.01, ** p<0.05, * p<0.1). The variable $Presence\ of\ Midwife$ is a dummy for the presence of a midwife during the birth year of a child. Regressions in columns (1)-(10) include birth month fixed effects, birth year fixed effects, birth order fixed effects, and community fixed effects. Regressions in columns (11) and (12) include birth year fixed effects and community fixed effects. Please refer to the main text for greater details.

Table A8: Impact of midwife on miscarriage or stillbirth

	With Community FE	With Mother FE
	(1)	(2)
Presence of Midwife(=1)	-0.0021	-0.0040
	(0.0090)	(0.0134)
Observations	17209	14029
Control Mean (Dep. Var.)	0.08	0.08

Notes: Standard errors are clustered at the community level (*** p<0.01, ** p<0.05, * p<0.1).The dependent variable takes the value of 1 if the outcome of the pregnancy was a miscarriage or stillbirth and 0 otherwise. The variable $Presence\ of\ Midwife$ is a dummy for the presence of a midwife during the birth year of a child. The individual controls include maternal years of education (splines with knots at 6,9, and 12) and maternal age at survey (splines with knots at 20, 25, 30, 35, 40, and 45). Community controls include time-varying characteristics at the community level: paved road status, electricity status, number of health posts, urban status, public phone status, distance to market, distance to the district capital center, and distance to the nearest health facility. All regressions include birth year fixed effects and community fixed effects.

Table A9: Comparison of characteristics between missing and non-missing birth month samples

	Birth months not missing	Birth months missing	Difference	Standard deviation	Observations
Male Child(=1)	0.5107	0.5234	-0.013	0.0141	15636
Mother's Years of Education	6.2268	2.4993	3.728***	0.0986	15636
Menstruation Age	14.2067	14.3442	-0.137***	0.0470	15565
Mother Age at First Marriage	19.5696	17.5715	1.998***	0.1275	15343
Mother's Age at Birth	26.6868	26.8224	-0.136	0.1761	15636
Household Head Age in Years	39.6728	41.2741	-1.601***	0.3123	15633
Household Head Male (=1)	0.9107	0.9174	-0.007	0.0080	15636
Household Head Years of Education	6.2597	3.4633	2.796***	0.1054	15319

Notes: This table compares the characteristics of children whose birth months are missing and whose birth months are non-missing in our main regression sample. See the text for greater details.

Table A10: Robustness checks–missing birth months

	All births	Excluding births with missing birth months
	(1)	(2)
Presence of Midwife(=1)	0.0310**	0.0304**
	(0.0141)	(0.0152)
Observations	15636	14268
Control Mean (Dep. Var.)	0.488	0.481

Notes: Standard errors are clustered at the community level (*** p<0.01, ** p<0.05, * p<0.1). The dependent variable is the likelihood of a live birth being male which takes a value of 1 if the child is male, and 0 otherwise. The variable $Presence\ of\ Midwife$ is a dummy for the presence of a midwife during the birth year of a child. The individual controls include maternal years of education (splines with knots at 6,9, and 12) and maternal age at survey (splines with knots at 20, 25, 30, 35, 40, and 45). Community controls include time-varying characteristics at the community level: paved road status, electricity status, number of health posts, urban status, public phone status, distance to market, distance to the district capital center, and distance to the nearest health facility. All regressions include birth month fixed effects, birth year fixed effects, birth order fixed effects, and community fixed effects.

Table A11: Impact of a midwife on the likelihood of a live birth being male–first birth order

	(1)
Presence of Midwife(=1)	0.0321
	(0.0206)
Observations	7373
Control Mean (Dep. Var.)	0.473

Notes: Standard errors are clustered at the community level (*** $p<0.01$, ** $p<0.05$, * $p<0.1$). The dependent variable takes a value of 1 if the child is male, and 0 otherwise. The variable $Presence\ of\ Midwife$ is a dummy for the presence of a midwife during the birth year of a child. The individual controls include maternal years of education (splines with knots at 6,9, and 12) and maternal age at survey (splines with knots at 20, 25, 30, 35, 40, and 45). Community controls include time-varying characteristics at the community level: paved road status, electricity status, number of health posts, urban status, public phone status, distance to market, distance to the district capital center, and distance to the nearest health facility. The regression specification also includes birth month and birth year fixed effects.

Table A12: Impact of a midwife on desire for additional children and son-preference

	Wants additional children	Son -preference
	(1)	(2)
Presence of Midwife (=1)	-0.0078	-0.0423**
	(0.0097)	(0.0173)
Observations	23871	9003
Control Mean (Dep. Var.)	0.40	0.30

Notes: Standard errors are clustered at the community level (*** $p<0.01$, ** $p<0.05$, * $p<0.1$). The variable $Presence\ of\ Midwife$ is a dummy for the presence of a midwife in the community during the survey wave and 0 otherwise. $Wants\ Additional\ Children$ takes a value of 1 if the mother wants at least one more child. $Son\ Preference$ takes a value of 1 if the mother wants more sons than daughters. The individual controls include maternal years of education (splines with knots at 6,9, and 12) and maternal age at survey (splines with knots at 20, 25, 30, 35, 40, and 45). Community controls include time-varying characteristics at the community level: paved road status, electricity status, number of health posts, urban status, public phone status, distance to market, distance to the district capital center, and distance to the nearest health facility. All regressions include wave fixed effects and community fixed effects.

Table A13: Impact of a midwife on the likelihood of a live birth being male–Birth Cohort 1988 to 2007

	(1)
Presence of Midwife(=1)	0.0276
	(0.0170)
Observations	11003

Notes: Standard errors are clustered at the community level (*** p<0.01, ** p<0.05, * p<0.1). The dependent variable takes a value of 1 if the child is male, and 0 otherwise. The variable $Presence\ of\ Midwife$ is a dummy for the presence of a midwife during the birth year of a child. The individual controls include maternal years of education (splines with knots at 6,9, and 12) and maternal age at survey (splines with knots at 20, 25, 30, 35, 40, and 45). Community controls include time-varying characteristics at the community level: paved road status, electricity status, number of health posts, urban status, public phone status, distance to market, distance to the district capital center, and distance to the nearest health facility. The regression specification also includes birth month and birth year fixed effects.

Table A14: Impact of the Village Midwife Program on the likelihood of live birth being male–Heterogeneity

	All Births	Lower than Median	Higher than Median
Panel A: By mother education			
	(1)	(2)	(3)
Presence of Midwife(=1)	0.0310**	0.0304	0.0118
	(0.0141)	(0.0194)	(0.0259)
Observations	15636	9837	5799
Control Mean (Dep. Var.)	0.488	0.488	0.484
p-value of coefficient difference between lower and higher			0.580
Panel B: By mother height			
	(1)	(2)	(3)
Presence of Midwife(=1)	0.0337**	0.0350*	0.0196
	(0.0149)	(0.0210)	(0.0234)
Observations	14743	7384	7359
Control Mean (Dep. Var.)	0.491	0.490	0.491
p-value of coefficient difference between lower and higher			0.401
Panel C: By distance to the nearest health facility			
	(1)	(2)	(3)
Presence of Midwife(=1)	0.0310**	-0.0057	0.0416*
	(0.0141)	(0.0268)	(0.0226)
Observations	15636	7053	8583
Control Mean (Dep. Var.)	0.488	0.510	0.480
p-value of Coefficient Difference between lower and higher			0.191

Notes: Standard errors are clustered at the community level (*** p<0.01, ** p<0.05, * p<0.1). The dependent variable takes a value of 1 if the child is male, and 0 otherwise. The variable $Presence\ of\ Midwife$ takes a value of 1 if the community received a midwife during the year or before the year a child in that community was born and 0 otherwise. The individual controls include maternal years of education (splines with knots at 6,9, and 12) and maternal age at survey (splines with knots at 20, 25, 30, 35, 40, and 45). Community controls include time-varying changes at the community level: paved road status, electricity status, number of health posts, urban status, public phone status, distance to market, distance to the district capital center, and distance to the nearest health facility. All regressions include birth month fixed effects, birth year fixed effects, birth order fixed effects, and community fixed effects.