Preferences Versus Bargaining Power: The Effects of Targeting Mothers or Fathers to Improve Child Health*

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Abstract

Research on intrahousehold decision-making generally finds that fathers have more decision-making power than mothers, but mothers put more weight on children's well-being. This suggests a tradeoff when targeting policies to improve children's well-being such as parenting classes: Fathers have more power to change household behavior to implement the learnings, but mothers may have a stronger desire to do so. This paper compares health and nutrition classes in rural Uganda that enrolled either mothers or fathers. We find that educating mothers leads to greater adoption of health-promoting behaviors by the household. Part but not all of the differential mother-father effect is due to higher class attendance by mothers; mothers also implement more of what they learn. Thus, in this context, the fact that mothers care more (or have more time to implement the newly-acquired knowledge) outweighs the fact that fathers have more control over household decisions.

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1 Introduction

Research on intrahousehold decision-making often finds that fathers have more decision-making power than mothers, but mothers put more weight on children's well-being. One policy response to these patterns has been to try to shift decision-making power toward mothers, for example by making mothers the recipient of transfers aimed at improving children's welfare (Lundberg, Pollak, and Wales, 1996).

However, shifting decision-making in the family is not always feasible or advisable. In that case, the divergent preferences and decision-making of parents suggest a tradeoff when targeting policies to improve children's well-being. On the one hand, fathers have more power to change household behavior in ways that help children. On the other hand, mothers might have a stronger desire to do so.

We study this tradeoff in the context of parenting classes aimed at teaching parents ways to improve child health. Many inexpensive ways to improve child health such as boiling drinking water, exclusively breastfeeding newborns, spacing births, and using antimalarial bednets have low take-up, and increasing their adoption is the low-hanging fruit to reduce child malnutrition and mortality (Bhutta, Das, Rizvi, et al., 2013). This paper examines the impact of teaching parents about child and maternal nutrition and health via village-level classes. We compare classes for mothers and classes with fathers. For the reasons above, it is a priori ambiguous whether targeting the classes to mothers or fathers will be more effective.

The broader project also compares health and nutrition classes for women (WHN) and health and nutrition classes for men (MHN) to a third intervention: health and nutrition classes for women paired with "empowerment" training that taught mothers how to communicate their preferences and knowledge to their husbands effectively. This draft focuses on the WHN and MHN interventions only. The full results of the paper are (will be) reported in Björkman and Jayachandran (2017).

Our study is set in Uganda which, despite strong economic growth over the past few decades, continues to struggle with child malnutrition. The most recent figures indicate a child mortality rate of 55 per 1,000 live births (World Bank, 2015), and 33% rate of child stunting (Uganda Bureau of Statistics and ICF, 2012).

This work contributes to several strands of the literature. First, this paper adds to previous work on female bargaining power within the household and its effect on child health. Thomas (1990) and Duflo (2003) are among the seminal works in this literature. In addition, Beegle, Frankenberg, and Thomas (2001) examines the effect of women's relative power on use of prenatal and delivery care in Indonesia. Maitra (2004) uses data from India and examines the relationship between the status of women in the household, healthcare use, and child mortality. She finds that woman's education and control over household resources has a positive effect on child health care usage. Recent field experiments in which the gender of the recipient of cash transfers was randomized find little evidence for any effect of the recipient's gender on outcomes related to expenditures on food, health, or education, although one of them find a positive effect on female empowerment (Akresh, De Walque, and Kazianga, 2012; Benhassine, Devoto, Duflo, Dupas, and Pouliquen, 2015; Haushofer and Shapiro, 2016).

Our study is also closely related to a literature on information interventions and the effect on child health and nutrition. Several non-experimental studies find improvements from interventions focused on nutrition and child health care on health-promoting behavior and health outcomes, although other studies report null results.[1] Manandhar, Osrin, Shrestha, et al. (2004) use a randomized controlled trial to evaluate a participatory intervention in Nepal where women's groups focused on issues around childbirth and care behaviors. They found a 30% decrease in neonatal mortality rates in the intervention group but no difference in stillbirths. In a recent paper, Fitzsimons, Malde, Mesnard, and Vera-Hernández (2016) evaluate a randomized intervention in rural Malawi that over a six-month period provided mothers of young infants with information on child nutrition. They find that the intervention improved child nutrition, household food consumption and child height.

To our knowledge, this project is the first to rigorously study whether mothers' versus fathers' knowledge has different impacts on nutrition and health of young children.[2]

[1] Alderman (2007); Galasso and Umapathi (2009) and Linnemayr and Alderman (2011) find positive effects on child weight-for-age. Bolam, Manandhar, Shrestha, Ellis, and Anthony (1998) evaluate impact of postnatal health education for mothers on infant care and postnatal family planning practices in Nepal. They find no effects on infant feeding, health, and care but contraceptive use increased slightly. Glewwe (1999) finds an association between mother's health knowledge and children's nutritional status in Morocco.

[2] A related paper is Aslam and Kingdon (2012) who use data from Pakistan to estimate the association between mother's and father's knowledge and child health and health-seeking behavior. They also instrument for knowledge with parents' education. Parents' education could affect child health outcomes through multiple channels including knowledge about how best to improve child health—which is our focus—but also labor supply and the amount of time spent with children and intrahousehold bargaining power. In addition,

The rest of the paper is organized as follows. Section 2 describes the study design, and section 3 describes the data and empirical strategy. Section 4 presents the results, and then section 5 offers concluding remarks.

2 Study design

The setting for our experimental study—the southwest region of Uganda—is characterized by food insecurity, malnutrition, and poor maternal and child health. Our experiment is implemented in the four rural districts of Mitooma, Ntungamo, Rukungiri and Sheema (see Figure 1). Baseline data reveal that 41% of the boys and 33% of the girls are stunted and roughly 40% of the children in the sample are anemic. Girls appeared to have slightly better health status than boys on average at baseline.

The project took place from 2012 to 2014. The baseline survey was finished in January 2013. Project implementation started immediately thereafter and lasted for 10 months. The endline survey took place in 2014, finishing in November 2014.

2.1 Description of the interventions

The interventions we study are village-level training sessions that provided parents of young children with skills and knowledge to improve their children's health. The overall project involved three interventions: women's health and nutrition classes (WHN), men's health and nutrition classes (MHN), and women's health and nutrition classes paired with women's empowerment/communication training (WEMP). This paper presents results for the WHN and MHN arms.

Each course consisted of 19 classes lasting one hour each (WEMP classes lasted one hour, 45 minutes each.) The sessions were held bi-weekly over 10 months from March to December 2013. The interventions were designed and implemented by Innovations for Poverty Action. Men and women with a background in public health were recruited to be the teachers and received extensive training on the curricula. The teachers participated in 10 days of training prior to implementation of the program and refresher training at the midpoint of the intervention.

The women's health and nutrition (WHN) intervention consisted of classes with mothers

parents' education is not an exogenous instrument.

and was taught by female teachers, while MNH consisted of classes with fathers taught by male teachers. The classes were aimed at increasing take-up of affordable behaviors (as opposed to health-promoting behaviors that required a sizable financial outlay by the family). Both interventions followed the same curriculum, and the topics were as follows: (1) Introduction (2) Maternal health and child nutrition (3) Prenatal nutrition (4) Breastfeeding (5) Complementary feeding (6) Food groups (7) Micronutrients for mothers and children (8) Safe water and sanitation practices (9) food preparations and recipes (10) Midpoint review (11) HIV/AIDS (12) Contraception and family planning (13) preconception (14) Pre- and postnatal practices in your community (15) Birthing (16) Infant illness and preventative health practices (17) Post-natal care and birth spacing (18) infant growth monitoring and promotion and (19) Review and graduation ceremony.

The third treatment arm was the women's health and nutrition plus empowerment (WEMP) arm in which mothers where trained on the same health and nutrition curriculum as above joint with sessions focused on enhancing skills related to dialogue and communication within the household. The empowerment session taught general skills and engaged participants in role-playing conversations with their husbands about topics taught in the health and nutrition portion.[3]

The curriculum was developed based on extensive literature reviews as well as meetings and consultations with local health professionals and advocacy organizations. All sessions were field-tested in pilot villages in a neighboring district prior to the start of the intervention. A local firm specialized in designing learning materials for illiterate people developed teaching material for the program. The material included flip charts with color illustrations of a range of concepts and topics covered in the curricula as well as a set of flash cards with various local foods.

Class size varied from 5 to 16 invited participants. In addition to the study sample mothers or fathers, in some villages members outside of the selected baseline sample who fit the eligibility criteria requested permission to participate in the intervention and were allowed to do so. Participants were given a small monetary incentive for participation; males

[3]The WEMP sessions were as follows: general communication strategies; decision-making process; communication infant needs; general negotiation strategies; power and preventing conflicts; health relationships/healthy families; gender relations; financial negotiations; self esteem and goal setting; HIV/AIDS prevention; negotiating family planning use; resources in my community; household budgeting; healthy children; fatherhood; domestic violence.

received 1,000 UGX (approximately $0.40) and female participants received 500 UGX per class attended. [4] The teachers recorded attendance and distributed incentive payments. The teachers were monitored by two supervisors.

2.2 Sample and experimental design

The unit of randomization (cluster) for the interventions is the village. The total sample size, inclusive of the 3 treatment arms and control group, is 412 villages and on average 13.7 households per village, with a total sample of 5,616 households. The number of eligible households varied across villages, so to reach our target sample size, we enrolled up to 18 households per village; the minimum (median) per village in our sample is 4 (14) households.

This paper focuses on three of the four treatment groups: WHN, MHN, and control. These comprise 314 villages and 4,248 households. Of these households, we have endline data for 4,182 or 98.4% of the sample, although in some cases, some components of the endline data (most commonly, the men's survey) are missing.

The sample population for the baseline survey was determined by identifying the universe of villages in the four study districts. Parishes and individual villages that were deemed urban were excluded from the sample frame. Of the over 2,000 villages remaining, we selected the final sample of 412 villages, stratified by parish, using a sampling strategy that yielded more average spacing between sample villages than pure random sampling would yield (to minimize spillovers).

When there were more than 18 eligible households in a village, we randomly selected those to enroll in the study. Household eligibility was determined through a household listing exercise conducted in each study village prior to the baseline survey. A brief questionnaire was administered to the village LC1 (elected village leader) to obtain a list of eligible households. Households were eligible if they included a married or cohabiting couple where both individuals resided full-time in the village and they either had a child under age two or the woman was pregnant at the time of listing. These eligibility criteria were also verified at the

[4] The rationale for this difference in incentives between men and women was that, in the absence of financial incentives, men were less likely to participate than women (according to the pilot study); this difference may be due to men having less flexible employment or a lower interest level in the topics. In an ideal world, fathers would be intrinsically motivated enough to attend as much as mothers do, but in reality, it appears that giving them a larger financial incentive to attend is necessary to obtain attendance rates that are comparable to those for mothers.

start of the baseline survey, and sampled household were replaced if the original households were deemed ineligible.

The 412 study villages were randomized into Women's Health & Nutrition (105 villages), Men's Health & Nutrition (105 villages), Women's Health & Nutrition plus Women's Empowerment (98 villages), or the control group (104 villages). The randomization was stratified along two village characteristics measured at baseline: women's decision-making power and child and maternal health. Women's decision-making power is an index of several survey questions about household decision-making, and child and maternal health is an index of child anthropometric measures (height-for-age, weight-for-age, middle upper arm circumference (MUAC), and hemoglobin) and maternal anthropometric measures (body mass index, MUAC, and hemoglobin). We stratified on indicators for being above or below the sample median for each of the two characteristics.

3 Data and empirical strategy

3.1 Data

The data collection included two surveys and anthropometric measurement of women and children at both baseline and endline. The two surveys were to the woman in the eligible household and to the man. Each was interviewed separately, with a longer survey to the mother/pregnant woman and a shorter questionnaire to the male partner. The survey questionnaires covered topics such as: fertility history, self-reported child health (e.g., illness, child survival); health-care utilization (e.g., health clinic visits, immunization coverage); household consumption; health and nutrition knowledge of mothers and fathers; and proxies for women's empowerment and decision-making. Anthropometric measurements were recorded for all woman and all children less than or equal to 28 months at baseline who were living in the household. Anthropometric measurements included height, weight, middle upper arm circumference (MUAC), and hemoglobin levels as determined by a finger prick blood draw. At endline, children up to age 7 years were measured. Prior to administering the baseline survey, informed consent was obtained and all communication was done in the local language.

To reduce the number of hypotheses tested, we aggregate variables into indices. Our main categories of outcomes are health and nutrition knowledge; health behaviors, and health outcomes. For knowledge, we combine questions related to child health knowledge (e.g., causes of kwashiorkor), maternal health knowledge (e.g., nutritional needs of pregnant women), and general hygiene and health knowledge (e.g., how long to boil water so that it is safe to drink). We also construct a comprehensive health knowledge index. Throughout, we use variance-based weights when constructing indices, following Anderson (2008).

For behavior, we use the same three subcategories and create an overall health behavior index. Health behaviors are self-reported and include prenatal care visits, exclusive breast-feeding, feeding of colostrum to a newborn, and hand-washing before eating. As health outcomes, we examine infant mortality, child anthropometrics (weight-for-age, height-for-age, MUAC, and hemoglobin), and mother's anthropometrics (BMI, MUAC, and hemoglobin).

We also create an index for gender norms in the household based on questions related to decision-making over different domains and attitudes toward female equality and gender-based violence. Other variables used in the analysis include men's and women's hours worked and earnings, household income, and an index of men's engagement level regarding their children's health based on questions such as whether the woman discussed where to give birth with her husband.

Our baseline sample for the WHN, MHN, and control group comprises 4,248 households, and we have at least partial endline data for 4,182 households. In many cases, we are missing the women's survey, men's survey, or anthropometric data; the attrition rate is highest for the men's survey data.

Table 1 reports summary statistics for the different treatment arms. Some noteworthy patterns are that women's knowledge is higher than men's knowledge at baseline, by about 0.2 standard deviations. This patterns implies another reason that classes for men might be more valuable than classes for women: Their starting-point knowledge about maternal and child health is lower.[5] Not surprisingly, women make fewer decisions in the household than men; the responses reported are for women, and while men do not report as strong a gender gap as women, they also report that they make more decisions than their wives.

[5]In focus group discussions we held at the start of the project, some women said that they do more than their husbands to improve maternal and child health, but it is because they have more knowledge, not because they have different preferences over child health. This viewpoint would suggest that increasing men's knowledge might be more needed than increasing women's knowledge and might be a substitute for increasing women's bargaining power.

Also not surprisingly, women earn less than men (the median female-male earnings ratio is about 80%) and report working fewer and more flexible hours. This difference in labor supply might also affect program impacts if women are more able to attend the classes. The baseline characteristics are balanced overall across the treatment groups.

3.2 Hypotheses and empirical strategy

Average effects

The main outcome variables are attendance at the trainings, health and nutrition knowledge, health behaviors, and health outcomes. We start by assessing the causal effect of each intervention, i.e., we compare mean outcomes after accounting for stratification and any differences between the groups in baseline characteristics, by estimating,

$$Y_{ijk} = \alpha + \beta Treat_k + \gamma Y^0_{ijk} + X_{ijk} \cdot \delta + \varepsilon_{ijk}. \tag{1}$$

The outcome Y is measured for individual i in household j in village k. We control for the baseline value of the outcome, or an analog of it, denoted Y^0, as well as other baseline covariates X. Throughout, we cluster standard errors at the village level. Some of our outcomes are at the parent level (e.g., knowledge), others are at the household level (e.g., use of prenatal care), and others are at the child level (e.g., child anthropometrics).

We estimate impacts on infant mortality using a Poisson model that essentially estimates a hazard rate for mortality and accounts for the different ages of children at the time of observation.

Heterogeneous effects

The motivating hypotheses are that MHN might work better because (if) women do not have power in the household to implement knowledge and WHN might work better because (if) fathers are not as engaged with child health. To test the first mechanism, we estimate heterogeneous effects based on a measure of baseline decision-making of mothers and based on the mother's relative earnings. To test the second mechanism, we examine heterogeneity based on a measure of the father's engagement level with his children's health.

Another factor that might differ between mothers and fathers is their available time to attend the classes or implement what they learn, so we also test for heterogeneity by time availability.

4 Results

Our theory of change is that eligible participants attend the health classes, learn about health and nutrition, and adopt the recommended health-promoting behaviors, and in turn, child and maternal health improves. It is theoretically ambiguous, at each step, whether the effects will be larger when mothers are the target students or when fathers are.

Take-up of the classes

Table 2 shows the first step in this causal chain: class attendance. Attendance here is the proportion of the 19 sessions that the individual attended. In the women's intervention, attendance is 76%, while in the men's intervention it is 58%. We report the results as two separate regressions because we will later use them as two first stage equations in an instrumental variables model, but in a single regression, the difference is highly statistically significant.

Knowledge

Table 3 examines how much participants learned from the classes, as well as spillover effects on their spouses' knowledge. The outcome is based on a series of health knowledge questions on the endline survey. Columns 1 to 4 examine mothers' knowledge. WHN increased knowledge in each of the three domains of child health, maternal health, and general hygiene and nutrition, as well as overall knowledge. The positive and mostly statistically significant coefficients on the indicator for MHN villages imply that the wives of MHN participants also learned from the program, presumably because their husbands shared the information with them. Not surprisingly, the knowledge gains from directly participating are larger than the indirect learning.

Table 3, columns 5 to 8, are the parallel regressions examining men's knowledge. In MHN villages, men's knowledge increases, but comparing columns 4 and 8, the coefficient is smaller than was seen for women's knowledge in WHN villages. In addition, there is no evidence of spillovers to men from the WHN program.

Columns 9 and 10 recast these results using the participant's knowledge and then the spouse's knowledge as the outcome. These specifications use two observations per household in control villages, both the woman and the man, and they control for the respondent's gender. Column 9 shows that the point estimate for knowledge gained by participants in WHN villages is larger than the point estimate for MHN villages, but the difference is not statistically significant. Similarly, while the spillover to spouses is statistically significantly different from the control group for MHN but not WHN villages, we cannot reject that the spillover effect is the same for both interventions.

The results discussed thus far indicate that women attend sessions more and, based on point estimates, learn more. Table 4 asks whether women's higher attendance quantitatively explains their greater learning; the answer is yes. Using an instrumental variables specification, the effect of attendance on knowledge is very similar for women and men. Column 3 suggests that, with full attendance, the score on the health and nutrition knowledge questions would have increased by 0.39 standard deviations for both male and female program participants.

Health-promoting behaviors

We next examine household behaviors, again grouping them into maternal health, general hygiene and nutrition, and child health. Table 5 shows that WHN improves behaviors related to general health and nutrition and child health, and overall, but there appear to be no improvements from MHN. The gap between WHN and MHN is statistically significant. Columns 5 to 8 instrument for attendance with assignment to treatment, and attendance differences do not explain the gap; per session attended, WHN has larger effects on household behavior.

One potential reason that WHN might have led to take-up of healthier behaviors by the household is if it also increased women's decision-making; perhaps the woman becoming more knowledgeable causes her husband to cede some decision-making power to her. Table 6 examines this possibility. The first 2 columns examine impacts on the woman's decision-making power over child health and nutrition, and the second examines a more comprehensive index of female decision-making power. The interventions did not affect these outcomes.

The next three columns of Table 6 test for impacts on a related set of outcomes, namely whether woman reports that she and her husband discuss health and nutrition, whether he offers suggestions about food, and whether he offers suggestions about other aspects of health and nutrition. The last column combines these into a single index about husbands and wives' dialogue about health and nutrition. Both interventions lead to increased input by men, according to their wives. While this is not a surprising outcome of MHN, it is somewhat surprising that WHN also generates this effect. One possibility is that WHN caused women to engage their husbands more, or husbands were intrigued (or threatened) by their wives' participation in the WHN classes. In any case, dialogue between husbands and wives does not readily explain the differential impact of WHN on take-up of health-promoting behaviors, as MHN caused even more increased dialogue.

To recap, women have higher attendance at the classes than men, and while this explains why they learn more, it does not explain why offering classes to women leads to larger improvements in healthy behaviors. We next examine how the effect of the program on behavior varies with baseline characteristics as a way to understand why WHN and MHN had different effects. Table 7 presents these results.

A first hypothesis is that MHN works better when fathers are more interested in the topic of their children's health. Perhaps MHN was less effective than WHN because the overall level of engagement was low. We should note that engagement is a somewhat ambiguous concept. One interpretation is that it measures fathers caring about their children's health (our interpretation), but another is that they exert power over them. Column 1 shows that neither the effects of MHN nor WHN vary with men's engagement at baseline.

We next test whether WHN is relatively more effective when women have more decision-making power. If women care more and also have sufficient power, then no tradeoff exists and educating women might be most effective. Columns 2 to 4 use three different measures of women's decision-making; in all cases, a higher value of the variable implies an increase in the woman's power. The first measure is the mother's decision-making power specifically related to child health, the second is a more comprehensive measure of her decision-making power and attitudes about women's roles, and the third is her relative earning power (specifically, an indicator for earning more than 80% of what her husband earns). The prediction is that coefficients on the interactions with WHN should be positive or, more specifically, the difference between the coefficients on the WHN and MHN interactions should be positive. We do not find supporting evidence here; the interaction coefficients statistically insignificant.

It is surprising that women who earn more and presumably have more influence do not convert their class participation into larger behavioral changes for the household. One possibility is that earning more, if it comes via longer hours, is a double-edges sword. The women might have less time to attend the classes or implement what they learn. This then raises another hypothesis about why WHN worked better than MHN. In general, women work less and have more flexible hours than men. The last two columns of Table 7 test this idea. We find some evidence that women working fewer hours or having a flexible work schedule (which is coded based on her employment status) leads to larger gains in healthy behaviors. Meanwhile, women have more flexible schedules than men and work fewer hours. The last column shows that, quantitatively, this difference in work status cannot explain the treatment effect gap for behavior. Note that Appendix Table 1 shows the same heterogeneity results with attendance as the outcome. As one would expect, working fewer hours and especially having a flexible schedule leads to higher attendance. However, even though women have more flexible schedules than men, again this does not explain the higher attendance of women, as shown in the last column.

Health outcomes

Finally, we examine child and maternal health outcomes. Column 1 examines infant mortality using a Poisson regression that accounts for the different age (i.e., time at risk) of children. There is a marginally significant reduction in mortality in WHN villages relative to control villages. Columns 2 and 3 examine an index of anthropometric outcomes for children, either all those under age 5 or those under age 2; the program focused on health behaviors for children under age 2. The index comprises weight-for-age, height-for-age, middle upper arm circumference (MUAC), and blood hemoglobin. We find no improvement in this aggregate measure of child health. The last column shows that neither intervention improved mother's health based on an index of BMI, MUAC, and hemoglobin.

5 Conclusion

TO BE WRITTEN

References

Akresh, R., D. De Walque, and H. Kazianga (2012): "Alternative Cash Transfer Delivery Mechanisms: Impacts on Routine Preventative Health Clinic Visits in Burkina Faso," Discussion paper, National Bureau of Economic Research.

Alderman, H. (2007): "Improving Nutrition through Community Growth Promotion: Longitudinal Study of the Nutrition and Early Child Development Program in Uganda," World Development, 35(8), 1376–1389.

Anderson, M. (2008): "Multiple Inference and Gender Differences in the Effects of Early Intervention: A Reevaluation of the Abecedarian, Perry Preschool, and Early Training Projects," Journal of the American Statistical Association, 103(484), 1481–1495.

Aslam, M., and G. G. Kingdon (2012): "Parental Education and Child HealthUnderstanding the Pathways of Impact in Pakistan," World Development, 40(10), 2014–2032.

Beegle, K., E. Frankenberg, and D. Thomas (2001): "Bargaining Power within Couples and Use of Prenatal and Delivery Care in Indonesia," Studies in Family Planning, 32(2), 130–146.

Benhassine, N., F. Devoto, E. Duflo, P. Dupas, and V. Pouliquen (2015): "Turning a Shove into a Nudge? A Labeled Cash Transfer for Education," American Economic Journal: Economic Policy, 7(3), 86–125.

Bhutta, Z. A., J. K. Das, A. Rizvi, et al. (2013): "Evidence-Based Interventions for Improvement of Maternal and Child Nutrition: What Can Be Done and at What Cost?," The Lancet, 382(9890), 452–477.

Björkman, M., and S. Jayachandran (2017): "Preferences Versus Bargaining Power: A Comparison of Targeting Mothers or Fathers to Improve Child Health," unpublished working paper.

Bolam, A., D. S. Manandhar, P. Shrestha, M. Ellis, and M. d. L. Anthony (1998): "The Effects of Postnatal Health Education for Mothers on Infant Care and Family Planning Practices in Nepal: A Randomised Controlled Trial," BMJ, 316(7134), 805–811.

Duflo, E. (2003): "Grandmothers and Granddaughters: Old-Age Pensions and Intrahousehold Allocation in South Africa," The World Bank Economic Review, 17(1), 1–25.

Fitzsimons, E., B. Malde, A. Mesnard, and M. Vera-Hernández (2016): "Nutrition, Information and Household Behavior: Experimental Evidence from Malawi," Journal of Development Economics, 122(C), 113–126.

Galasso, E., and N. Umapathi (2009): "Improving Nutritional Status through Behavioral Change: Lessons from Madagascar," Journal of Development Effectiveness, 1(1), 60–85.

Glewwe, P. (1999): "Why Does Mother's Schooling Raise Child Health in Developing Countries? Evidence from Morocco," Journal of Human Resources, 34(1), 124–159.

Haushofer, J., and J. Shapiro (2016): "The Short-Term Impact of Unconditional Cash Transfers to the Poor: Evidence from Kenya," The Quarterly Journal of Economics, forthcoming.

Linnemayr, S., and H. Alderman (2011): "Almost Random: Evaluating a Large-Scale Randomized Nutrition Program in the Presence of Crossover," Journal of Development Economics, 96(1), 106–114.

Lundberg, S. J., R. A. Pollak, and T. J. Wales (1996): "Do Husbands and Wives Pool Their Resources? Evidence from the United Kingdom Child Benefit," Journal of Human Resources, 32(4), 463–480.

Maitra, P. (2004): "Parental Bargaining, Health Inputs and Child Mortality in India," Journal of Health Economics, 23(2), 259–291.

Manandhar, D. S., D. Osrin, B. P. Shrestha, et al. (2004): "Effect of a Participatory Intervention with Women's Groups on Birth Outcomes in Nepal: Cluster-Randomised Controlled Trial," The Lancet, 364(9438), 970–979.

Thomas, D. (1990): "Intra-Household Resource Allocation: An Inferential Approach," Journal of Human Resources, University of Wisconsin Press, pp. 635–664.

Uganda Bureau of Statistics and ICF (2012): "Uganda Demographic and Health Survey 2011," Kampala and Claverton: Uganda Bureau of Statistics and ICF International Inc.

World Bank (2015): The Growth Challenge: Can Ugandan Cities Get to Work? World Bank, Washington, D.C.

Figure 1: Study area

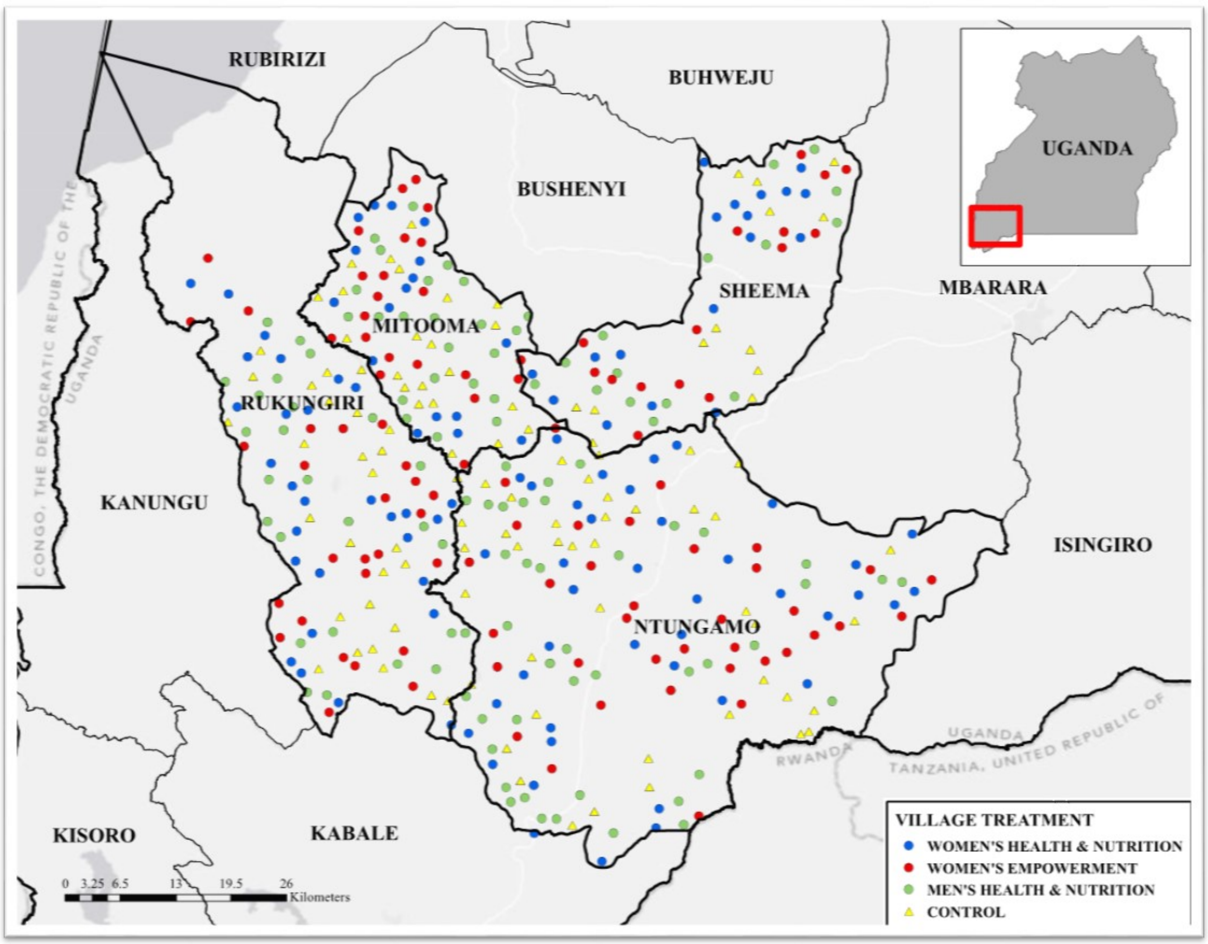

Figure 2: Experimental design

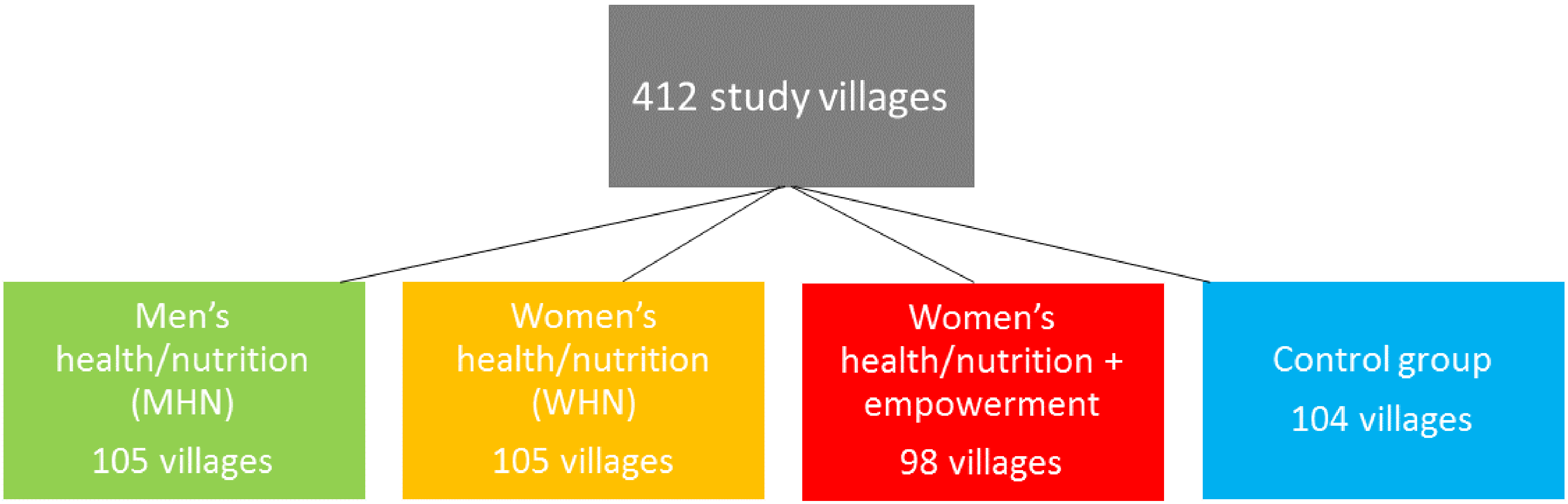

Table 1: Baseline characteristics of the sample

	WEMP (1)	WHN (2)	MHN (3)	Control (4)
Women's health knowledge	0.085	0.100	0.115	0.127
	[0.949]	[0.922]	[0.960]	[0.972]
Men's health knowledge	-0.175	-0.078	-0.103	-0.127
	[1.017]	[0.974]	[1.001]	[1.012]
Proportion of decisions woman makes	0.291	0.294	0.291	0.299
	[0.187]	[0.193]	[0.192]	[0.197]
Proportion of decisions man makes	0.532	0.523	0.511	0.511
	[0.244]	[0.248]	[0.247]	[0.252]
Female decision-making over child health/nutrition	0.054	0.070	0.056	0.086
	[0.430]	[0.418]	[0.434]	[0.436]
Woman's earnings per week	3.302	2.672	2.932	3.024
	[6.157]	[5.068]	[5.297]	[5.815]
Men's earnings per week	4.090	3.394	3.376	3.925
	[6.873]	[5.073]	[4.986]	[6.907]
Woman earns >80% what man earns	0.494	0.485	0.519	0.497
	[0.500]	[0.500]	[0.500]	[0.500]
Woman's work hours per week	35.402	36.430	36.988	36.577
	[13.926]	[14.396]	[13.432]	[13.621]
Men's work hours per week	43.679	43.185	43.522	44.657
	[17.996]	[17.351]	[17.466]	[18.208]
Woman has flexible work hours	0.975	0.983	0.969	0.977
	[0.156]	[0.131]	[0.173]	[0.151]
Man has flexible work hours	0.842	0.831	0.834	0.825
	[0.365]	[0.375]	[0.372]	[0.380]
Log of HH income	11.119	11.046	11.062	11.114
	[1.323]	[1.215]	[1.288]	[1.230]
Gender norm index	0.642	0.643	0.642	0.643
	[0.115]	[0.118]	[0.120]	[0.124]
Child's health index	-0.167	-0.178	-0.072	-0.152
	[1.627]	[1.477]	[1.496]	[1.531]
Woman's health index	-0.019	0.008	0.062	-0.034
	[1.327]	[1.373]	[1.342]	[1.237]
Men's engagement index	-0.405	-0.322	-0.423	-0.438
	[0.979]	[0.967]	[0.987]	[1.000]
Joint significance of differences in means with WHN	0.010			
Joint significance of differences in means with MHN	0.001	0.177		
Joint significance of differences in means with control	0.846	0.135	0.280	
Observations	1,330	1,435	1,368	1,379

Notes: 1. Table reports variable means and standard deviations (in brackets) by subsample at baseline. 2. Columns 4-6 show the p-value of a test of equality between the means in the two columns in parenthesis; the p-values are calculated using regressions that include stratum fixed effects and standard errors clustered by village. 3. Health knowledge indices, as well as *Gender norm index*, *Child's health index*, *Woman's health index* and *Men's engagement index* are indices that use Anderson's optimal weighting. 4. Proportion of decisions variables are reported by the woman. 5. *Female decision-making over child health/nutrition* is the average over two variables that signal who makes these decisions; they are equal to 1 if the woman makes it, -1 if the man makes it, and 0 if someone else in the household makes it. 6. Flexible work hours is a binary variable equal to one if the wife reported the specified spouse works on a farm; is unemployed; is retired; is a student; is self-employed, trades crops and animals, or does not work; or works less than 15 hours a week.

Table 2: Attendance rates for intervention classes

	Session attendance		
	WEMP	WHN	MHN
	(1)	(2)	(3)
WEMP	0.780***	-0.001	-0.000
	[0.010]	[0.001]	[0.003]
WHN	-0.001	0.758***	-0.001
	[0.002]	[0.012]	[0.003]
MHN	0.000	0.001	0.575***
	[0.002]	[0.001]	[0.016]
Control mean of outcome	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Observations	5,512	5,512	5,512

Notes: 1. Standard errors are clustered by village and are shown in brackets. 2. All regressions include stratum and district fixed effects. 3. Controls include woman's health index, gender norms index and log of household income. 4. In all columns, missing control values have been imputed with the village mean and flags for missing values are included in the regression.

Table 3: Treatment effects on health and nutrition knowledge

	Woman's health knowledge				Man's health knowledge				Overall health
	Child health	Maternal health	Hygiene/ general health	Overall	Child health	Maternal health	Hygiene/ general health	Overall	Participant
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
WEMP	0.284***	0.244***	0.220***	0.369***	-0.022	-0.022	0.038	-0.007	0.370***
	[0.041]	[0.043]	[0.045]	[0.039]	[0.046]	[0.047]	[0.040]	[0.041]	[0.039]
WHN	0.227***	0.186***	0.182***	0.292***	-0.007	0.022	0.048	0.018	0.291***
	[0.038]	[0.040]	[0.043]	[0.038]	[0.044]	[0.045]	[0.038]	[0.042]	[0.038]
MHN	0.058	0.080*	0.088**	0.095**	0.133***	0.232***	0.136***	0.220***	0.223***
	[0.041]	[0.042]	[0.043]	[0.040]	[0.046]	[0.046]	[0.039]	[0.044]	[0.045]
Women's baseline knowledge	0.164***	0.024*	0.086***	0.158***	0.014	-0.008	0.026*	0.018	
	[0.014]	[0.014]	[0.017]	[0.015]	[0.016]	[0.015]	[0.015]	[0.015]	
Men's baseline knowledge	0.018	0.026*	0.038**	0.030**	0.195***	0.028*	0.070***	0.175***	
	[0.013]	[0.014]	[0.015]	[0.013]	[0.015]	[0.015]	[0.016]	[0.015]	
Participant's baseline knowledge									0.174***
									[0.013]
Participant spouse's baseline knowledge									0.020
									[0.013]
Control mean of outcome	-0.005	-0.059	-0.109	-0.077	-0.165	-0.126	-0.071	-0.171	-0.123
	(0.930)	(0.980)	(1.060)	(0.973)	(1.042)	(1.023)	(0.995)	(1.018)	(0.997)
p-value: WEMP=WHN	0.169	0.127	0.400	0.048	0.738	0.344	0.812	0.544	0.043
p-value: WEMP=MHN	0.000	0.000	0.003	0.000	0.001	0.000	0.016	0.000	0.008
p-value: WHN=MHN	0.000	0.004	0.027	0.000	0.002	0.000	0.024	0.000	0.217
Observations	5,288	5,288	5,288	5,288	5,176	5,176	5,176	5,176	6,536

Notes: 1. Standard errors are clustered by village and are shown in brackets. 2. All regressions include stratum and district fixed effects. 3. The sample in columns 9-10 includes the treated spouse from treatment households and both spouses from all control households. 4. Controls include woman's health index, gender norms index, log of household income and overall health knowledge at baseline for both spouses; columns 9-10 also include a binary variable equal to one if the spouse is a woman. 5. In all columns, missing control values have been imputed with the village mean and flags for missing values are included in the regression.

Table 4: Does the gender gap in attendance explain the gender gap in knowledge attained?

	IV: Overall health knowledge			
	Women's	Men's	Participant	Participant's spouse
	(1)	(2)	(3)	(4)
Attendance: WEMP	0.467***	-0.009	0.468***	-0.012
	[0.049]	[0.053]	[0.049]	[0.052]
Attendance: WHN	0.382***	0.024	0.381***	0.027
	[0.049]	[0.055]	[0.050]	[0.055]
Attendance: MHN	0.162**	0.370***	0.376***	0.158**
	[0.068]	[0.075]	[0.075]	[0.068]
Women's baseline knowledge	0.157***	0.019		
	[0.015]	[0.015]		
Men's baseline knowledge	0.031**	0.175***		
	[0.013]	[0.015]		
Participant's baseline knowledge			0.172***	0.031**
			[0.013]	[0.013]
Participant spouse's baseline knowledge			0.021*	0.161***
			[0.013]	[0.014]
Control mean of outcome	-0.077	-0.171	-0.123	-0.123
	(0.973)	(1.018)	(0.997)	(0.997)
p-value: WEMP Att.=WHN Att.	0.082	0.533	0.074	0.465
p-value: WEMP Att.=MHN Att.	0.000	0.000	0.271	0.034
p-value: WHN Att.=MHN Att.	0.000	0.000	0.953	0.105
Observations	5,288	5,176	6,536	6,536

Notes: 1. Standard errors are clustered by village and are shown in brackets. 2. All regressions include stratum and district fixed effects. 3. All columns use WHN and MHN binary treatment variables to instrument WHN and MHN attendance. 4. The sample in columns 3-4 includes the treated spouse from treatment households and both spouses from all control households. 5. Controls include woman's health index, gender norms index, log of household income and overall health knowledge at baseline for both spouses; columns 3-4 also include a binary variable equal to one if the spouse is a woman. 6. In all columns, missing control values have been imputed with the village mean and flags for missing values are included in the regression.

Table 5: Treatment effects on health-promoting behaviors

	Household health behavior				IV: Household health behavior			
	Child health	Maternal health	Hygiene/ general health	Overall	Child health	Maternal health	Hygiene/ general health	Overall
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
WHN	0.224***	0.169***	0.256***	0.318***				
	[0.069]	[0.058]	[0.048]	[0.057]				
MHN	0.033	0.083	0.123***	0.098				
	[0.074]	[0.060]	[0.045]	[0.063]				
Attendance: WHN					0.295***	0.227***	0.339***	0.421***
					[0.091]	[0.077]	[0.064]	[0.076]
Attendance: MHN					0.056	0.154	0.211***	0.175
					[0.128]	[0.106]	[0.078]	[0.110]
Baseline health behavior	0.105***	0.190***	0.311***	0.199***	0.104***	0.192***	0.310***	0.200***
	[0.016]	[0.017]	[0.019]	[0.017]	[0.016]	[0.017]	[0.019]	[0.017]
Control mean of outcome	-0.078	-0.079	-0.141	-0.139	-0.078	-0.079	-0.141	-0.139
	(1.068)	(1.020)	(1.014)	(1.028)	(1.068)	(1.020)	(1.014)	(1.028)
p-value: WHN=MHN	0.003	0.133	0.005	0.000				
p-value: WHN Att.=MHN Att.					0.019	0.421	0.076	0.005
Observations	4,165	4,172	4,182	4,165	4,165	4,172	4,182	4,165

Notes: 1. Standard errors are clustered by village and are shown in brackets. 2. All regressions include stratum and district fixed effects. 3. Columns 5-8 use WHN and MHN binary treatment variables to instrument WHN and MHN attendance. 4. Controls include woman's health index, gender norms index and log of household income. 5. In all columns, missing control values have been imputed with the village mean and flags for missing values are included in the regression.

Table 6: Treatment effects on gender norms and on health-related discussion between spouses

			H & N discussion with husband index			
	Female decision-making over child health/ nutrition	Gender norm index	Discusses H & N very often with husband	Husband very often suggests types of food to eat	Husband very often makes suggestions about child health care	H & N discussion with husband index
	(1)	(2)	(3)	(4)	(5)	(6)
WEMP	-0.031	0.004	0.071***	0.057***	0.064***	0.179***
	[0.019]	[0.007]	[0.020]	[0.018]	[0.020]	[0.044]
WHN	-0.017	-0.003	0.022	0.011	0.072***	0.088**
	[0.019]	[0.007]	[0.018]	[0.018]	[0.021]	[0.042]
MHN	-0.028	0.009	0.010	0.057***	0.049**	0.107**
	[0.020]	[0.007]	[0.019]	[0.018]	[0.020]	[0.043]
Control mean of outcome	0.086	0.691	0.650	0.715	0.518	-0.517
	(0.436)	(0.154)	(0.477)	(0.452)	(0.500)	(1.023)
p-value: WEMP=WHN	0.452	0.292	0.008	0.012	0.687	0.033
p-value: WEMP=MHN	0.887	0.498	0.002	0.962	0.453	0.099
p-value: WHN=MHN	0.560	0.087	0.514	0.013	0.248	0.649
Observations	5,512	5,512	5,191	5,191	5,191	5,191

Notes: 1. Standard errors are clustered by village and are shown in brackets. 2. All regressions include stratum and district fixed effects. 3. *H & N* stands for "Health and Nutrition". 4. Controls include woman's health index, gender norms index and log of household income. 5. In all columns, missing control values have been imputed with the village mean and flags for missing values are included in the regression.

Table 7: Treatment effect heterogeneity based on baseline characteristics

	Heterogeneous treatment effects on overall household health behavior by:						
	Men's engagement index	Female decision-making over child health/ nutrition	Gender norm index	Woman's earnings are greater than 80% of man's earnings	Work hours per week	Flexible work hours	Flexible work hours
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
WHN × Characteristic	0.014	0.153	0.106	-0.067	-0.056**	0.225	
	[0.037]	[0.098]	[0.310]	[0.075]	[0.024]	[0.174]	
MHN × Characteristic	-0.017	0.166	-0.108	-0.024	-0.002	-0.052	
	[0.037]	[0.104]	[0.306]	[0.080]	[0.019]	[0.085]	
WHN	0.307***	0.304***	0.250	0.360***	0.535***	0.106	0.328***
	[0.057]	[0.057]	[0.207]	[0.064]	[0.100]	[0.176]	[0.057]
MHN	0.098	0.083	0.168	0.125*	0.112	0.132	0.088
	[0.063]	[0.064]	[0.206]	[0.073]	[0.107]	[0.094]	[0.063]
Characteristic	0.088***	-0.196**	0.201	0.038	0.027**	-0.127**	-0.137***
	[0.026]	[0.080]	[0.226]	[0.055]	[0.011]	[0.056]	[0.041]
p-value: WHN × Char.=MHN × Char.	0.413	0.888	0.467	0.590	0.047	0.120	
p-value: WHN = MHN							0.000
Observations	4,165	4,165	4,163	4,036	5,269	5,534	5,534

Notes: 1. Standard errors are clustered by village and are shown in brackets. 2. The sample in columns 5-7 includes the treated spouse from treatment households and both spouses from all control households. 3. All regressions include stratum and district fixed effects. 4. Controls include woman's health index, gender norms index, log of household income and health behavior at baseline. 5. In all columns, missing control values have been imputed with the village mean and flags for missing values are included in the regression.

Table 8: Treatment effects on infant mortality, child health, and maternal health

		Child health index		
	Child mortality <1 year (1)	Children aged 5 or under (2)	Children 24 months or under (3)	Maternal health index (4)
main				
WEMP	-0.537	-0.021	-0.030	-0.001
	[0.330]	[0.045]	[0.061]	[0.058]
WHN	-0.548*	0.001	0.003	0.033
	[0.327]	[0.044]	[0.059]	[0.056]
MHN	-0.069	-0.057	-0.055	0.014
	[0.291]	[0.040]	[0.053]	[0.059]
Control mean of outcome	0.024	-0.000	-0.082	-0.047
	(0.155)	(1.000)	(1.084)	(1.303)
p-value: WEMP=WHN	0.976	0.633	0.613	0.567
p-value: WEMP=MHN	0.138	0.429	0.675	0.804
p-value: WHN=MHN	0.135	0.174	0.309	0.757
Observations	4,003	8,013	3,100	5,129

Notes: 1. Standard errors are clustered by village and are shown in brackets. 2. Column 1 is estimated using a Poisson model; exposure is not included in the regression. 3. All regressions include stratum and district fixed effects. 4. The sample in column 1 is children born and excludes stillbirths; the sample in columns 2-3 is children aged as specified in the table header at endline; the sample in column 4 is mothers. 5. In column 1, the outcome variable is a binary variable equal to one if the child died within one year after birth; in columns 2-3 it's the health index for children aged as specified in the table header at endline. 6. Controls include woman's health index, gender norms index, log of household income and both spouse's overall health knowledge at baseline. Furthermore, column 1 includes baseline village-level average of mortality and the village-level child health index, while columns 2-4 include the average child health index for children under 28 months old at baseline and a quartic of the child's age in months interacted with a binary variable equal to one if the child is female (with main effects). 7. In all columns, missing control values have been imputed with the village mean and flags for missing values are included in the regression.

Appendix Table 1: Heterogeneity results for attendance

	Heterogeneous treatment effects on session attendance by:						
	Men's engagement index	Female decision-making over child health/ nutrition	Gender norm index	Woman's earnings are greater than 80% of man's earnings	Work hours per week	Flexible work hours	Flexible work hours
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
WEMP × Characteristic	0.006	-0.015	0.032	-0.009	0.006	0.196***	
	[0.008]	[0.018]	[0.060]	[0.012]	[0.006]	[0.054]	
WHN × Characteristic	0.014*	-0.010	0.108	-0.013	-0.001	0.166**	
	[0.008]	[0.015]	[0.074]	[0.012]	[0.007]	[0.074]	
MHN × Characteristic	-0.004	-0.025	0.041	0.004	-0.015***	0.082***	
	[0.010]	[0.022]	[0.073]	[0.020]	[0.006]	[0.029]	
WEMP	0.782***	0.780***	0.759***	0.787***	0.759***	0.588***	0.779***
	[0.011]	[0.010]	[0.040]	[0.011]	[0.022]	[0.054]	[0.010]
WHN	0.760***	0.756***	0.686***	0.762***	0.761***	0.593***	0.756***
	[0.012]	[0.012]	[0.054]	[0.013]	[0.031]	[0.072]	[0.012]
MHN	0.575***	0.578***	0.550***	0.581***	0.646***	0.508***	0.575***
	[0.017]	[0.016]	[0.048]	[0.019]	[0.031]	[0.027]	[0.016]
Characteristic	-0.000	-0.000	0.003	0.002	-0.000	0.000	0.054***
	[0.001]	[0.003]	[0.012]	[0.002]	[0.001]	[0.003]	[0.013]
p-value: WEMP × Char.=WHN × Char.	0.489	0.839	0.411	0.810	0.377	0.747	
p-value: WEMP × Char.=MHN × Char.	0.425	0.725	0.921	0.574	0.008	0.060	
p-value: WHN × Char.=MHN × Char.	0.147	0.580	0.509	0.467	0.125	0.286	
p-value: WEMP = WHN							0.124
p-value: WEMP = MHN							0.000
p-value: WHN = MHN							0.000
Observations	5,512	5,512	5,508	5,339	6,541	6,891	6,891

Notes: 1. Standard errors are clustered by village and are shown in brackets. 2. The sample in columns 5-7 includes the treated spouse from treatment households and both spouses from all control households. 3. All regressions include stratum and district fixed effects. 4. Controls include