

SUPPLEMENTAL APPENDIX

For Online Publication

Alcohol, Labor, and Agriculture

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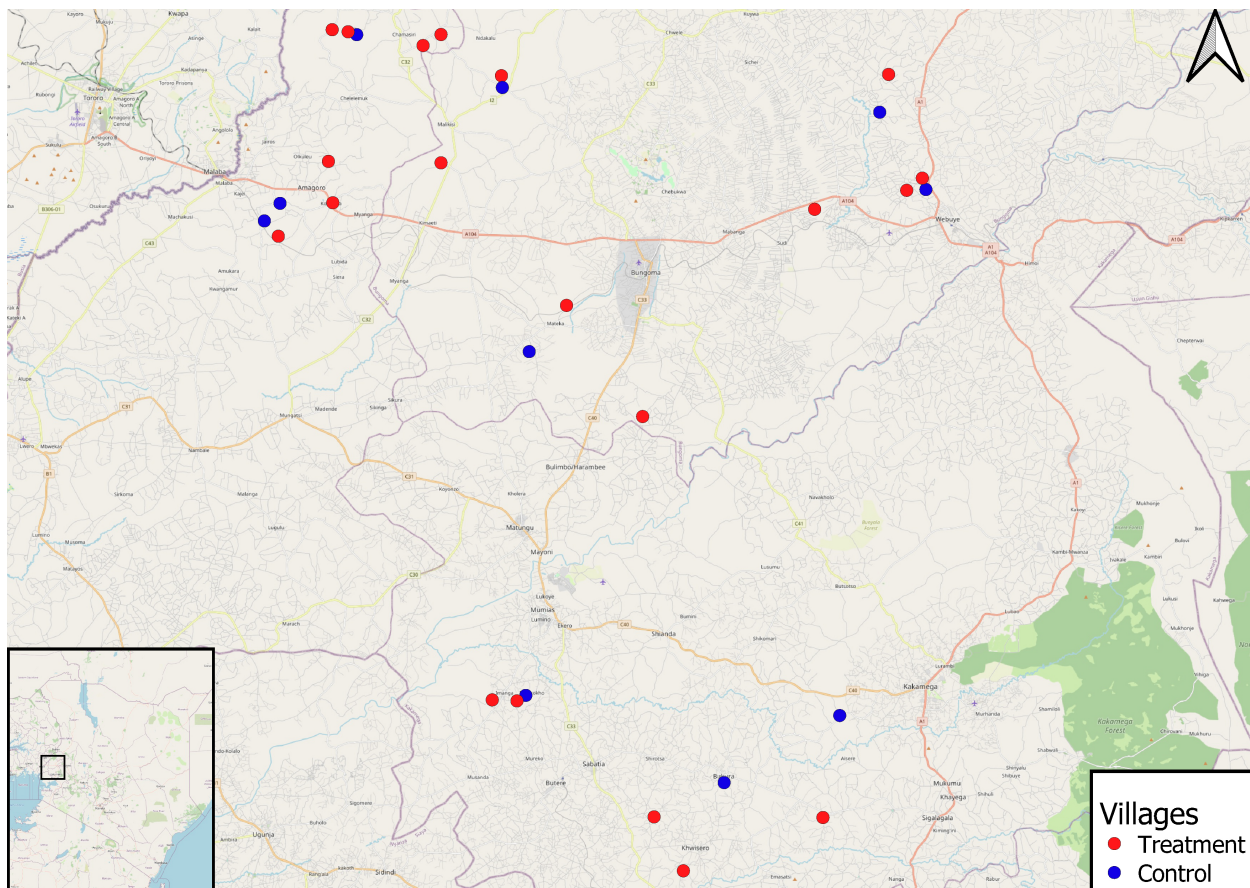


FIGURE A1: Map of Project Area

Notes: Map indicates village locations, with locations differentiated by whether they were treatment or control.

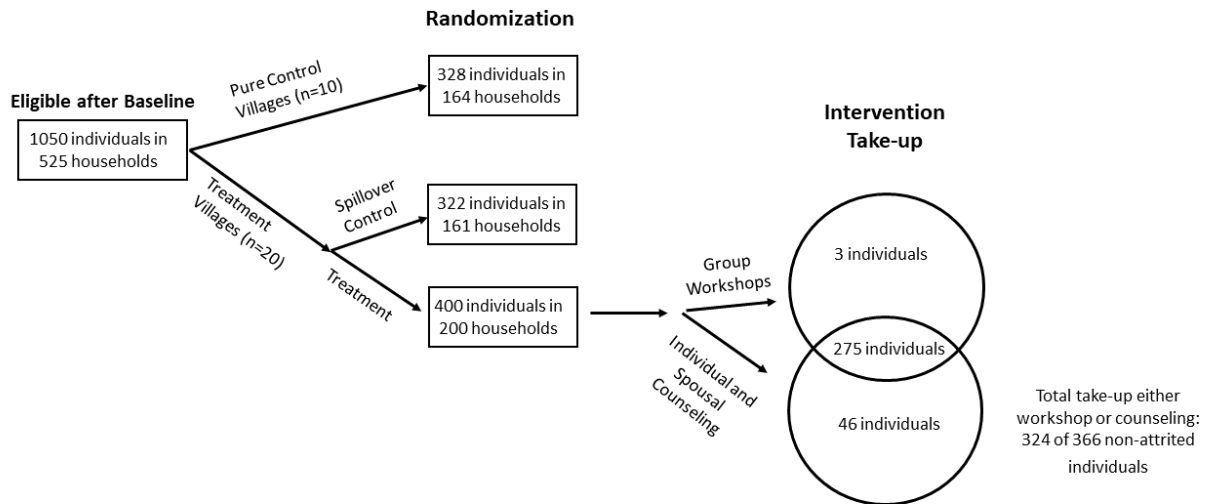


FIGURE A2: Illustration of Randomization

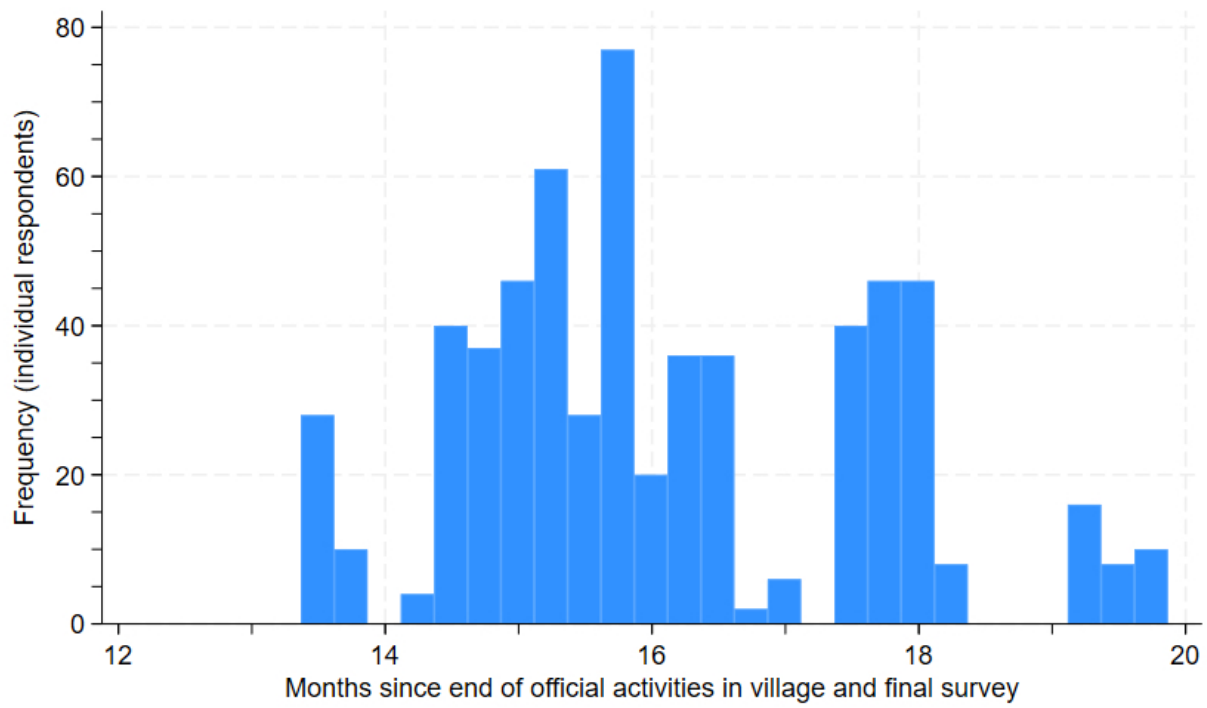


FIGURE A3: Time between End of Intervention and Medium-run Endline Survey

Notes: Histogram includes project participants in treatment villages (i.e., in treatment and spillover control groups).

TABLE A1
DIRECT BALANCE TESTS

	Number drinks past week			Age			Housework hours		
	(1) BL	(2) SR	(3) MR	(4) BL	(5) SR	(6) MR	(7) BL	(8) SR	(9) MR
Assigned to treatment	0.017 (0.135)	0.042 (0.138)	0.010 (0.142)	-0.984 (0.679)	-0.822 (0.709)	-1.161 (0.730)	0.438 (0.898)	0.497 (0.938)	0.824 (0.973)
Spillover control	-0.140 (0.142)	-0.116 (0.144)	-0.187 (0.149)	-0.936 (0.715)	-1.049 (0.739)	-1.209 (0.768)	0.396 (0.946)	0.417 (0.977)	0.155 (1.024)
Constant	1.445 (0.100)	1.409 (0.102)	1.427 (0.105)	37.909 (0.504)	38.029 (0.522)	38.441 (0.541)	18.349 (0.666)	18.232 (0.691)	18.254 (0.721)
Observations	1050	982	899	1050	982	899	1050	982	899
	Male			Own farm hours			Non ag hours		
	(1) BL	(2) SR	(3) MR	(4) BL	(5) SR	(6) MR	(7) BL	(8) SR	(9) MR
Assigned to treatment	0.000 (0.037)	0.000 (0.039)	-0.001 (0.040)	0.858 (1.271)	0.541 (1.315)	1.354 (1.343)	0.486 (1.656)	0.185 (1.712)	1.270 (1.781)
Spillover control	0.000 (0.039)	0.000 (0.040)	0.005 (0.042)	-0.554 (1.339)	-0.325 (1.371)	0.352 (1.413)	1.645 (1.744)	1.737 (1.784)	2.872 (1.875)
Constant	0.500 (0.028)	0.500 (0.029)	0.498 (0.030)	26.457 (0.942)	26.484 (0.969)	26.210 (0.995)	18.134 (1.228)	17.938 (1.262)	17.320 (1.320)
Observations	1050	982	899	1050	982	899	1050	982	899

Notes: Direct balance tests on baseline variables. Results indicate simple difference in means with no controls or adjustments. Column 1 for each dependent variable (“BL”) is the full baseline sample, Column 2 (“SR”) is the sample in the short-run survey round, and Column 3 (“MR”) is the sample in the medium-run survey round. “Number of drinks past week” indicates the number of drinks consumed the last time the respondent drank in the past week at baseline. Hours variables are hours worked in the past week in the following capacities at baseline: hours worked doing housework (“Housework hours”), hours worked on own farm (“Own farm hours”), hours worked in non-agricultural wage labor (“Non ag hours”).

TABLE A2
NUMBER OF COUNSELING SESSIONS

Number of counseling sessions attended	No.	Row %
0	79	19.75
1	7	1.75
2	17	4.25
3	22	5.50
4	12	3.00
5	20	5.00
6	19	4.75
7	39	9.75
8	166	41.50
9	6	1.50
10	7	1.75
11	5	1.25
12	1	0.25
Total	400	100.00

Notes: Table reports number of therapy sessions participated in by individuals in the treatment group. Included in the totals are individuals who eventually attrited and were not resurveyed in future data collection rounds. The intervention goal was eight sessions per household. Individuals receiving more than eight sessions was due to efforts to revisit households that had only one spouse in attendance during some sessions.

TABLE A3
SURVEY MONTH AND TREATMENT STATUS

Month (2022)	May	June	July	August	Sept.	Oct.	Total
Treatment	47	71	76	26	96	26	342
Spillover Control	32	65	69	26	72	12	276
Pure Control	16	52	45	92	42	34	281
Total	95	188	190	144	210	72	899

Notes: Table shows distribution of when a non-attrited individual was surveyed by month (2022) in the medium-run survey. Enumerators surveyed villages and households in a random order.

TABLE A4
ATTRITION: OLS ESTIMATES

	Tracked between baseline and short-run survey			Tracked between baseline and medium-run			Tracked between baseline and breathalyzer test (Men)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Assigned to treatment (Treat)	-0.024 (0.023)	-0.021 (0.023)	-0.020 (0.024)	-0.002 (0.040)	0.003 (0.042)	0.006 (0.038)	-0.016 (0.043)	-0.010 (0.043)	0.028 (0.073)
Spillover control (SC)	[0.324]	[0.371]	[0.413]	[0.963]	[0.954]	[0.881]	[0.724]	[0.840]	[0.736]
	0.017 (0.023)	0.019 (0.022)	0.019 (0.023)	0.000 (0.040)	0.003 (0.041)	0.006 (0.038)	0.003 (0.040)	0.006 (0.043)	0.050 (0.069)
Baseline: Age	[0.470]	[0.413]	[0.447]	[0.993]	[0.939]	[0.896]	[0.945]	[0.901]	[0.544]
		0.002 (0.001)	0.002 (0.002)		0.005 (0.001)	0.007 (0.002)		0.003 (0.002)	0.003 (0.005)
Male		[0.049]	[0.425]		[0.000]	[0.020]		[0.182]	[0.571]
		-0.000 (0.017)	0.004 (0.042)		0.000 (0.027)	-0.030 (0.053)			
Baseline: Alcoholic drinks		[0.985]	[0.973]		[0.997]	[0.613]			
		-0.008 (0.006)	-0.014 (0.016)		-0.015 (0.009)	-0.009 (0.020)		-0.016 (0.010)	0.008 (0.022)
Baseline: Hours worked own farm		[0.222]	[0.545]		[0.129]	[0.805]		[0.127]	[0.746]
		-0.000 (0.001)	-0.000 (0.001)		0.000 (0.001)	-0.002 (0.001)		0.002 (0.001)	-0.000 (0.002)
Baseline: Hours non-farm wage work		[0.634]	[0.862]		[0.606]	[0.124]		[0.091]	[0.805]
		-0.001 (0.000)	-0.001 (0.000)		-0.000 (0.001)	-0.002 (0.001)		-0.000 (0.001)	-0.001 (0.001)
Baseline: Hours engaged in housework		[0.089]	[0.266]		[0.636]	[0.099]		[0.634]	[0.693]
		-0.001 (0.001)	-0.001 (0.001)		0.000 (0.001)	-0.001 (0.002)		-0.001 (0.002)	-0.003 (0.005)
Treat × Baseline: Age		[0.216]	[0.394]		[0.981]	[0.511]		[0.570]	[0.512]
			0.002 (0.003)			-0.002 (0.004)			0.001 (0.006)
SC × Baseline: Age			[0.511]			[0.543]			[0.819]
			-0.002 (0.002)			-0.004 (0.003)			-0.000 (0.006)
Treat × Male			[0.481]			[0.251]			[0.955]
			-0.008 (0.050)			0.048 (0.068)			
SC × Male			[0.878]			[0.523]			
			-0.004 (0.045)			0.028 (0.061)			
Treat × Baseline: Alcoholic drinks			[0.947]			[0.686]			
			0.008 (0.019)			-0.001 (0.024)			-0.034 (0.027)
SC × Baseline: Alcoholic drinks			[0.679]			[0.957]			[0.253]
			0.007 (0.017)			-0.022 (0.025)			-0.038 (0.025)
Treat × Baseline: Hours worked own farm			[0.712]			[0.407]			[0.167]
			-0.001 (0.001)			0.002 (0.002)			0.005 (0.002)
SC × Baseline: Hours worked own farm			[0.428]			[0.235]			[0.023]
			0.001 (0.001)			0.004 (0.002)			-0.000 (0.003)
Treat × Baseline: Hours non-farm wage work			[0.393]			[0.031]			[0.987]
			-0.001 (0.001)			0.002 (0.001)			0.000 (0.002)
SC × Baseline: Hours non-farm wage work			[0.491]			[0.104]			[0.917]
			0.000 (0.001)			0.003 (0.001)			0.001 (0.002)
Treat × Baseline: Hours engaged in housework			[0.600]			[0.064]			[0.581]
			0.001 (0.002)			0.004 (0.002)			0.001 (0.006)
SC × Baseline: Hours engaged in housework			[0.674]			[0.172]			[0.827]
			0.000 (0.001)			-0.001 (0.002)			0.003 (0.006)
Constant	0.939 (0.016)	0.937 (0.016)	0.938 (0.016)	0.857 (0.031)	0.854 (0.033)	0.850 (0.029)	0.811 (0.031)	0.807 (0.040)	0.772 (0.061)
	[0.000]	[0.001]	[0.000]	[0.000]	[0.001]	[0.000]	[0.001]	[0.000]	[0.000]
Mean of dep. variable		0.935			0.856			0.806	
Observations	1050	1050	1050	1050	1050	1050	525	525	525

Notes: Treat=Assigned to treatment. SC=Spillover control. The reference group is those in the pure control. Breathalyzer tests only conducted among men in the sample. Heteroskedasticity-robust standard errors are clustered at the village level and wild bootstrap p-values are shown in brackets below estimated coefficients and standard errors.

TABLE A5
HOUSEHOLD-LEVEL ATTRITION: OLS ESTIMATES

	Tracked between baseline and short-run survey			Tracked between baseline and medium-run		
	(1)	(2)	(3)	(4)	(5)	(6)
Assigned to treatment	-0.024 (0.023) [0.324]	-0.020 (0.023) [0.400]	-0.019 (0.024) [0.457]	0.014 (0.042) [0.744]	0.019 (0.044) [0.674]	0.022 (0.039) [0.575]
Spillover control	0.017 (0.023) [0.470]	0.020 (0.022) [0.385]	0.020 (0.024) [0.435]	-0.002 (0.041) [0.962]	0.000 (0.043) [0.996]	0.002 (0.039) [0.949]
Baseline: Age		0.001 (0.001) [0.040]	0.001 (0.001) [0.412]		0.003 (0.001) [0.000]	0.004 (0.001) [0.007]
Baseline: Alcoholic drinks past week§		-0.007 (0.005) [0.218]	-0.010 (0.012) [0.549]		-0.012 (0.008) [0.136]	-0.010 (0.015) [0.720]
Baseline: Hours worked own farm		-0.000 (0.000) [0.660]	-0.000 (0.001) [0.873]		0.000 (0.001) [0.456]	-0.001 (0.001) [0.271]
Baseline: Hours non-farm wage work		-0.001 (0.000) [0.083]	-0.001 (0.000) [0.298]		-0.000 (0.000) [0.522]	-0.002 (0.001) [0.079]
Baseline: Hours engaged in housework		-0.001 (0.001) [0.229]	-0.001 (0.001) [0.371]		0.000 (0.001) [0.674]	0.000 (0.001) [0.924]
Treat × Baseline: Age			0.001 (0.002) [0.615]			-0.002 (0.002) [0.380]
Treat × Baseline: Alcoholic drinks past week§			0.006 (0.015) [0.747]			0.006 (0.019) [0.770]
Treat × Baseline: Hours worked own farm			-0.001 (0.001) [0.486]			0.001 (0.001) [0.223]
Treat × Baseline: Hours non-farm wage work			-0.000 (0.001) [0.594]			0.002 (0.001) [0.109]
Treat × Baseline: Hours engaged in housework			0.000 (0.002) [0.814]			0.003 (0.002) [0.152]
SC × Baseline: Age			-0.001 (0.001) [0.472]			-0.002 (0.002) [0.215]
SC × Baseline: Alcoholic drinks past week§			0.005 (0.014) [0.721]			-0.018 (0.020) [0.394]
SC × Baseline: Hours worked own farm			0.001 (0.001) [0.447]			0.002 (0.001) [0.091]
SC × Baseline: Hours non-farm wage work			0.000 (0.001) [0.553]			0.002 (0.001) [0.083]
SC × Baseline: Hours engaged in housework			0.000 (0.001) [0.893]			-0.003 (0.002) [0.268]
Constant	0.939 (0.016) [0.001]	0.937 (0.016) [0.001]	0.937 (0.017) [0.000]	0.866 (0.031) [0.000]	0.863 (0.034) [0.001]	0.858 (0.029) [0.000]
Mean of dep. variable		0.935			0.870	
Observations	525	525	525	525	525	525

Notes: Treat=Assigned to treatment. SC=Spillover control. The reference group is those in the pure control. Household-level demographic variables created by adding husband and wife characteristics (e.g., “Household age” is combined husband and wife ages). §Variable measures the most each individual drank in one day over the past week prior to the baseline survey, and for the household-level, summed between both spouses. Heteroskedasticity-robust standard errors are clustered at the village level and wild bootstrap p-values are shown in brackets below estimated coefficients and standard errors.

TABLE A6
ALTERNATIVE ESTIMATIONS: SPOUSE-REPORTED ALCOHOL USE PAST WEEK

	Extensive margin: Short run						Extensive margin: Medium run					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Assigned to treatment	-0.173 (0.056) [0.012]	-0.177 (0.048) [0.002]	-0.287 (0.069) [0.000]	-0.305 (0.057) [0.000]	-0.060 (0.056) [0.340]	-0.045 (0.049) [0.413]	-0.123 (0.042) [0.018]	-0.122 (0.037) [0.007]	-0.177 (0.050) [0.005]	-0.187 (0.044) [0.002]	-0.070 (0.053) [0.270]	-0.052 (0.051) [0.358]
Spillover control	-0.101 (0.057) [0.135]	-0.092 (0.049) [0.108]	-0.136 (0.067) [0.083]	-0.116 (0.058) [0.082]	-0.065 (0.060) [0.310]	-0.068 (0.052) [0.239]	-0.066 (0.043) [0.164]	-0.054 (0.038) [0.194]	-0.128 (0.057) [0.031]	-0.109 (0.051) [0.041]	-0.004 (0.058) [0.944]	0.001 (0.056) [0.995]
Constant	0.474 (0.050) [0.000]	0.474 (0.042) [0.001]	0.779 (0.057) [0.000]	0.782 (0.046) [0.000]	0.169 (0.049) [0.022]	0.165 (0.044) [0.000]	0.500 (0.030) [0.000]	0.499 (0.027) [0.001]	0.856 (0.025) [0.000]	0.859 (0.015) [0.000]	0.144 (0.045) [0.007]	0.138 (0.045) [0.000]
Sample	M,W	M,W	M	M	W	W	M,W	M,W	M	M	W	W
Estimation [†]	ANA	ACV	ANA	ACV	ANA	ACV	ANA	ACV	ANA	ACV	ANA	ACV
Pure control mean	0.474	0.474	0.779	0.779	0.169	0.169	0.500	0.500	0.856	0.856	0.144	0.144
b[Treat]=b[SC] (p-val)	0.038	0.006	0.007	0.000	0.862	0.440	0.112	0.017	0.342	0.094	0.100	0.158
Treatment lower bound	-0.186	-0.187	-0.308	-0.323	-0.064	-0.049	-0.125	-0.125	-0.183	-0.195	-0.070	-0.052
Treatment upper bound	-0.159	-0.164	-0.282	-0.300	-0.037	-0.026	-0.122	-0.121	-0.176	-0.186	-0.070	-0.052
Treat: MHT (p-val) [‡]	0.086	0.051	0.018	0.008	0.509	0.597	0.055	0.038	0.015	0.000	0.532	0.624
Observations	982	982	491	491	491	491	874	874	437	437	437	437

	Heavy drinker: Short run						Heavy drinker: Medium run					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Assigned to treatment	-0.142 (0.036) [0.000]	-0.145 (0.030) [0.000]	-0.259 (0.062) [0.000]	-0.277 (0.054) [0.000]	-0.026 (0.021) [0.278]	-0.021 (0.019) [0.324]	-0.114 (0.033) [0.006]	-0.112 (0.034) [0.008]	-0.180 (0.056) [0.007]	-0.192 (0.058) [0.007]	-0.047 (0.038) [0.270]	-0.034 (0.035) [0.487]
Spillover control	-0.065 (0.036) [0.108]	-0.058 (0.030) [0.071]	-0.091 (0.068) [0.206]	-0.071 (0.059) [0.252]	-0.039 (0.020) [0.095]	-0.040 (0.018) [0.042]	-0.069 (0.038) [0.085]	-0.057 (0.037) [0.138]	-0.147 (0.060) [0.021]	-0.125 (0.058) [0.037]	0.009 (0.045) [0.877]	0.013 (0.042) [0.802]
Constant	0.312 (0.027) [0.002]	0.312 (0.020) [0.002]	0.565 (0.044) [0.002]	0.568 (0.037) [0.000]	0.058 (0.017) [0.001]	0.057 (0.015) [0.004]	0.367 (0.020) [0.000]	0.366 (0.022) [0.003]	0.662 (0.027) [0.000]	0.666 (0.031) [0.000]	0.072 (0.036) [0.032]	0.068 (0.035) [0.015]
Sample	M,W	M,W	M	M	W	W	M,W	M,W	M	M	W	W
Estimation [†]	ANA	ACV	ANA	ACV	ANA	ACV	ANA	ACV	ANA	ACV	ANA	ACV
Pure control mean	0.312	0.312	0.565	0.565	0.058	0.058	0.367	0.367	0.662	0.662	0.072	0.072
b[Treat]=b[SC] (p-val)	0.015	0.002	0.010	0.001	0.392	0.211	0.228	0.081	0.607	0.258	0.052	0.069
Treatment lower bound	-0.151	-0.152	-0.274	-0.290	-0.027	-0.022	-0.115	-0.114	-0.185	-0.196	-0.047	-0.034
Treatment upper bound	-0.124	-0.126	-0.247	-0.265	-0.001	0.004	-0.112	-0.111	-0.178	-0.190	-0.047	-0.034
Treat: MHT (p-val) [‡]	0.009	0.000	0.004	0.000	0.501	0.631	0.015	0.019	0.021	0.020	0.420	0.481
Observations	982	982	491	491	491	491	874	874	437	437	437	437

Notes: [†]ANOVA (ANA) and ANCOVA (ACV) estimations are calculated using linear probability models. Dependent variable for extensive margin (top panel) is whether any alcohol was consumed in the week prior to the survey (spouse-reported). “Baseline: Alcohol past week (binary)” measures whether the respondent drank in the past week in the baseline survey (self-reported). Heavy drinker (bottom panel) defined as consumption of at least 15 (8) US standard drink equivalents per week for men (women). Sample refers to pooled gender (M,W), Men (M), or Women (W). Demeaned variables included but not shown: control for male drinker in pooled gender estimates, baseline alcohol consumption. “b[Treat]=b[Sp. control]” reports the p-value for a Wald test on whether the estimated coefficient of the treatment is statistically different from the estimated coefficient of the spillover control. I calculate upper and lower bounds following Lee (2009) and McKenzie (2017). Medium-run estimations only include sample that was nonattreated in short-run (i.e., excludes those found and surveyed in 2022 but not 2021). [‡]I calculate multiple hypothesis test p-values following List, Shaikh and Xu (2019) and Steinmayr (2020), which control for the familywise error rate using bootstrapped resampling and allows for p-values to be correlated. Heteroskedasticity-robust standard errors are clustered at the village level, and wild bootstrap p-values shown in brackets below estimated coefficients and standard errors.

TABLE A7
AGRICULTURAL OUTCOMES - BASELINE ANALYSIS

	Harvest Value 1000s KSh			Inorganic Fertilizer Kg			Organic Inputs Kg			Hired Labor (Quantity)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Assigned to treatment	0.034 (0.225)	0.047 (0.152)	0.043 (0.138)	-0.020 (0.190)	-0.025 (0.114)	-0.051 (0.109)	-0.815 (0.304)	-0.775 (0.322)	-0.789 (0.285)	-0.027 (0.178)	-0.020 (0.184)	-0.011 (0.218)
Spillover control	0.011 (0.204)	0.024 (0.139)	0.044 (0.128)	-0.042 (0.192)	-0.037 (0.114)	-0.125 (0.108)	-1.185 (0.332)	-1.157 (0.340)	-1.483 (0.299)	0.072 (0.175)	0.082 (0.184)	0.041 (0.212)
Constant	3.505 (0.178)	3.376 (0.126)	3.364 (0.115)	4.463 (0.130)	4.301 (0.078)	4.333 (0.071)	5.103 (0.201)	5.052 (0.197)	5.073 (0.180)	2.019 (0.106)	1.883 (0.122)	1.896 (0.136)
Estimation†	ANA	ACV	AHV	ANA	ACV	AHV	ANA	ACV	AHV	ANA	ACV	AHV
Pure control mean	33.277	33.277	33.277	86.757	86.757	86.757	164.545	164.545	164.545	7.532	7.532	7.532
Observations	491	491	491	491	491	491	491	491	491	491	491	491

Notes: [†]ANOVA (ANA), ANCOVA (ACV), and ANHECOVA (AHV) estimations after Ye et al. (2023) are calculated using Poisson QMLE (Correia, Guimarães and Zylkin, 2020). Coefficients can be interpreted as a percent change using the incidence rate ratio ($e^{\beta} - 1$). Outcomes are annual (two season) totals. Demeaned variables included but not shown: plot size and its square in ANCOVA estimates, which are additionally interacted with treatment group assignment in ANHECOVA estimates. Heteroskedasticity-robust standard errors are clustered at the village level.

TABLE A8
ALTERNATIVE ESTIMATIONS: HOURS WORKED YESTERDAY & WAGES PAST
MONTH

	Hours worked own farm			Hours worked self employ			Hours worked for wages		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Assigned to treatment	0.024 (0.126)	-0.049 (0.179)	0.139 (0.180)	0.177 (0.163)	0.221 (0.175)	0.111 (0.231)	-0.244 (0.152)	-0.155 (0.150)	-0.467 (0.295)
Spillover control	0.019 (0.107)	-0.035 (0.163)	0.099 (0.176)	0.247 (0.187)	0.328 (0.220)	0.094 (0.216)	-0.349 (0.154)	-0.298 (0.149)	-0.490 (0.314)
Constant	0.666 (0.090)	0.893 (0.149)	0.372 (0.143)	0.461 (0.131)	0.666 (0.121)	0.203 (0.161)	0.784 (0.086)	1.114 (0.074)	0.287 (0.220)
Sample	M,W	M	W	M,W	M	W	M,W	M	W
Pure control mean	1.946	2.443	2.443	1.586	1.946	1.225	2.189	3.046	1.332
Treat: MHT (p-val)‡	0.995	0.995	0.959	0.875	0.884	0.994	0.670	0.959	0.630
Observations	885	442	443	885	442	443	885	442	443

	Any wage earnings			Any non-farm wage earnings			Total labor earnings†		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Assigned to treatment	-0.056 (0.048)	0.001 (0.040)	-0.109 (0.068)	-0.012 (0.035)	-0.002 (0.049)	-0.018 (0.046)	-0.120 (0.114)	-0.088 (0.116)	-0.238 (0.209)
Spillover control	-0.076 (0.048)	-0.031 (0.044)	-0.123 (0.067)	-0.006 (0.036)	-0.013 (0.044)	-0.002 (0.057)	-0.082 (0.154)	-0.114 (0.142)	0.029 (0.269)
Constant	0.696 (0.040)	0.829 (0.030)	0.564 (0.055)	0.411 (0.024)	0.636 (0.032)	0.186 (0.038)	1.994 (0.072)	2.485 (0.066)	0.987 (0.178)
Sample	M,W	M	W	M,W	M	W	M,W	M	W
Pure control mean	0.696	0.829	0.564	0.696	0.636	0.186	7.344	12.003	2.684
Treat: MHT (p-val)‡	0.809	0.999	0.556	0.995	0.999	0.995	0.955	0.987	0.875
Observations	885	442	443	885	442	443	885	442	443

Notes: ANOVA estimations. Top panel estimations and estimates for total labor earnings in bottom panel use Poisson QMLE (Correia, Guimarães and Zylkin, 2020). These coefficients can be interpreted as a percent change using the incidence rate ratio ($e^{\beta} - 1$). Sample refers to pooled gender (M,W), Men (M), or Women (W). †I calculate “Total earnings from labor” as earnings from self employment (calculated after Agness et al. (2025)) and actual market wages over the past 30 days in thousands of Kenyan Shillings. “Hours worked” outcomes use data collection adapted from Field et al. (2023), in which respondents were asked to divide up their last 24 hours into nine categories, including sleeping, working on own farm, self employment, unpaid household work, etc. ‡I calculate multiple hypothesis test p-values here following Romano and Wolf (2016) and Clarke, Romano and Wolf (2020), which control for the familywise error rate and uses bootstrapped resampling to allow for dependence among the p-values. Heteroskedasticity-robust standard errors are clustered at the village level.

TABLE A9
RANDOMIZATION INFERENCE

Outcome Variable	Cluster robust p-value	Rand. Inference p-value
Positive value on breathalyzer	0.000	0.007
Spouse reported alcohol consumed past 7 days SR survey (male - binary)	0.000	0.000
Spouse reported heavy drinking SR survey (male - binary)	0.000	0.000
Spouse reported alcohol consumed past 7 days MR survey (male - binary)	0.001	0.002
Spouse reported heavy drinking MR survey (male - binary)	0.005	0.003
Harvest value 1000s KSh	0.005	0.013
Organic fertilizer Kg	1.840	0.885
Inorganic fertilizer Kg	0.006	0.008
Hired labor (quantity)	0.021	0.022

Notes: Table reports results of randomization inference p-value compared to the original cluster-robust p-value for the primary outcomes in this study. I re-conduct the two stages of the randomization (village level, then household level) 1000 times and the primary results re-estimated for each new iteration to generate placebo estimates. The randomization inference p-value is then calculated as the proportion of times the placebo estimate has a greater magnitude than the original ITT estimate. Specifications correspond to ANHECOVA estimates in Tables 2, 4, and 5. Cluster robust standard errors for alcohol outcomes are calculated using a wild bootstrap.

TABLE A10
MECHANISMS

1. Intervention → Lower Alcohol Consumption	
Potential Mechanism	Evidence
[1.1] The individual learns that returns to consumption are low/negative.	Qualitative data from counselor reports (Appendix C).
[1.2] The individual updates their own ability to stop drinking.	Qualitative data from counselor reports (Appendix C).
[1.3] Spouse or other members of community help individual commit to not drinking/hold them accountable for not drinking.	Analysis of social network data (Murphy, 2023).
[1.4] If drinking social, peer effects reduce need/desire to drink.	Analysis of social network data. (Murphy, 2023).
[1.5] The program affects religious attitudes, increasing self-control.	Empirical analysis discounts plausibility of this potential mechanism. (?).
[1.6] Withdrawal medication given by the nurse decreases urge to drink.	Statistics show more than 10% of those in treatment received withdrawal medication.
2. Lower Alcohol Consumption → Positive Economic Outcomes	
[2.1] Reallocation of spending from alcohol to productive inputs or hired labor.	Empirical analysis of expenditure data (Table 7).
[2.2] Improved health leads to greater labor productivity.	Cannot observe directly, but lower spending on healthcare provides suggestive evidence (Table 7).
[2.3] More clearheaded and able to make smarter choices about inputs.	Possible mechanism, but not able to conclude based on available data.
[2.4] More willingness to take risks and therefore more willing to use fertilizer.	Possible mechanism, but not able to conclude based on available data.
3. Intervention → Positive Economic Outcomes	
[3.1] Improved relationship with spouse leads to happier individual, more willing to work, better decision-making.	Results from Castilla, Aqeel and Murphy (2025) show decrease in intimate partner violence.
[3.2] Counseling leads to happier individuals in general.	Results from Castilla, Aqeel and Murphy (2025) show decrease in intimate partner violence.
[3.3] Conversations with peers from group workshops lead to sharing of productive agricultural information.	Analysis of social network data (Murphy, 2023).
[3.4] Medication/vitamins make individual healthier, or nurse visits allow other health problems to be addressed.	Cannot observe directly, but lower spending on healthcare provides suggestive evidence (Table 7).
[3.5] Incentive payments lead to more resources that can be invested in agriculture.	No relationship between incentive payments received and agricultural outcomes (Appendix Table A11).
4. Intervention → Positive Economic Outcomes → Lower Alcohol Consumption	
[4.1] Recommendations by counselors to use work on farm as way to control urge to drink.	Qualitative data from counselor reports (Appendix C). Empirical analysis is inconclusive (Tables A12 and A13).

TABLE A11
AGRICULTURAL OUTCOMES: INCENTIVE PAYMENTS

	Harvest Value 1000s KSh			Inorganic Fertilizer Kg			Organic Inputs Kg			Hired Labor (Quantity)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Incentive payments received (1000s KSh)	0.148 (0.194)	-0.041 (0.132)	-0.032 (0.130)	0.020 (0.213)	0.015 (0.078)	-0.000 (0.088)	-0.298 (0.238)	-0.262 (0.245)	-0.440 (0.253)	-0.231 (0.187)	-0.301 (0.230)	-0.290 (0.206)
Assigned to treatment	0.183 (0.207)	0.338 (0.133)	0.304 (0.125)	0.202 (0.264)	0.209 (0.106)	0.270 (0.127)	-0.097 (0.382)	-0.030 (0.421)	-0.047 (0.387)	0.396 (0.262)	0.438 (0.278)	0.655 (0.268)
Spillover control	0.129 (0.199)	0.169 (0.063)	0.086 (0.072)	-0.001 (0.186)	-0.039 (0.077)	0.024 (0.089)	-0.467 (0.312)	-0.332 (0.331)	-0.439 (0.272)	0.128 (0.193)	0.072 (0.160)	0.156 (0.185)
Constant	3.584 (0.162)	3.380 (0.048)	3.410 (0.059)	4.138 (0.134)	3.935 (0.064)	3.875 (0.068)	4.785 (0.218)	4.639 (0.216)	4.710 (0.170)	1.907 (0.129)	1.692 (0.112)	1.486 (0.138)
Estimation [†]	ANA	ACV	AHV	ANA	ACV	AHV	ANA	ACV	AHV	ANA	ACV	AHV
Pure control mean	36.171	36.171	36.171	63.282	63.282	63.282	118.915	118.915	118.915	6.944	6.944	6.944
Observations	448	448	448	448	448	448	448	448	448	448	448	448

Notes: Incentive payments are in 1000s of KSh. 161 households received incentive payments from lotteries of between 500 and 2000 KSh, with the average amount, conditional on receiving any, of 1000 KSh. [†]ANOVA (ANA), ANCOVA (ACV), and ANHECOVA (AHV) estimations after Ye et al. (2023) are calculated using Poisson QMLE (Correia, Guimarães and Zylkin, 2020). Coefficients can be interpreted as a percent change using the incidence rate ratio ($e^{\beta} - 1$). Outcomes are annual (two season) totals. Agricultural price data in 2022 is deflated to 2020 levels using Kenya Agricultural PPI (allias?). Demeaned variables included in ANCOVA but not shown: baseline of outcome, an indicator for whether farmers had fully completed the 2022 long rains harvest (see text for additional information on this variable), plot area and its square. These variables are interacted with treatment group assignment in ANHECOVA estimations. Heteroskedasticity-robust standard errors clustered at the village level.

TABLE A12
AGRICULTURAL OUTCOMES: COUNSELOR NOTES

	Harvest Value 1000s KSh			Inorganic Fertilizer Kg			Organic Inputs Kg			Hired Labor (Quantity)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Counselor notes show discussion of agriculture	0.022 (0.219)	-0.080 (0.175)	-0.073 (0.179)	0.082 (0.168)	0.127 (0.119)	0.101 (0.121)	-0.544 (0.409)	-0.622 (0.394)	-0.904 (0.432)	0.131 (0.226)	0.469 (0.172)	0.331 (0.179)
Assigned to treatment	0.299 (0.213)	0.341 (0.124)	0.312 (0.143)	0.178 (0.227)	0.161 (0.106)	0.219 (0.122)	-0.107 (0.370)	0.025 (0.396)	-0.052 (0.320)	0.144 (0.222)	-0.034 (0.226)	0.251 (0.221)
Spillover control	0.129 (0.199)	0.169 (0.063)	0.086 (0.072)	-0.001 (0.186)	-0.039 (0.077)	0.024 (0.089)	-0.467 (0.312)	-0.329 (0.333)	-0.439 (0.272)	0.128 (0.193)	0.065 (0.158)	0.156 (0.185)
Constant	3.584 (0.162)	3.381 (0.048)	3.410 (0.059)	4.138 (0.134)	3.933 (0.064)	3.875 (0.068)	4.785 (0.218)	4.633 (0.217)	4.710 (0.170)	1.907 (0.129)	1.683 (0.109)	1.486 (0.138)
Estimation [†]	ANA	ACV	AHV	ANA	ACV	AHV	ANA	ACV	AHV	ANA	ACV	AHV
Pure control mean	36.171	36.171	36.171	63.282	63.282	63.282	118.915	118.915	118.915	6.944	6.944	6.944
Observations	448	448	448	448	448	448	448	448	448	448	448	448

Notes: Counselor disc. farming is equal to “1” if the counselor recorded ever discussing farm/agricultural work with the household in their reports. [†]ANOVA (ANA), ANCOVA (ACV), and ANHECOVA (AHV) estimations after Ye et al. (2023) are calculated using Poisson QMLE (Correia, Guimarães and Zylkin, 2020). Coefficients can be interpreted as a percent change using the incidence rate ratio ($e^{\beta} - 1$). Outcomes are annual (two season) totals. Agricultural price data in 2022 is deflated to 2020 levels using Kenya Agricultural PPI (*alias?*). Demeaned variables included in ANCOVA but not shown: baseline of outcome, an indicator for whether farmers had fully completed the 2022 long rains harvest (see text for additional information on this variable), plot area and its square. These variables are interacted with treatment group assignment in ANHECOVA estimations. Heteroskedasticity-robust standard errors clustered at the village level.

TABLE A13
AGRICULTURAL BASELINE OUTCOMES: COUNSELOR NOTES

	Harvest Value 1000s KSh			Inorganic Fertilizer Kg			Organic Inputs Kg			Hired Labor (Quantity)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Counselor notes show discussion of agriculture	0.198 (0.133)	0.165 (0.113)	0.151 (0.118)	0.109 (0.111)	0.033 (0.127)	0.028 (0.126)	0.302 (0.432)	0.345 (0.425)	0.354 (0.427)	-0.391 (0.286)	-0.461 (0.253)	-0.444 (0.259)
Assigned to treatment	-0.064 (0.214)	-0.032 (0.158)	-0.029 (0.150)	-0.073 (0.191)	-0.040 (0.142)	-0.064 (0.138)	-0.968 (0.338)	-0.946 (0.349)	-0.968 (0.336)	0.138 (0.213)	0.168 (0.221)	0.170 (0.241)
Spillover control	0.011 (0.204)	0.025 (0.139)	0.044 (0.128)	-0.042 (0.192)	-0.037 (0.114)	-0.125 (0.108)	-1.185 (0.332)	-1.156 (0.340)	-1.483 (0.299)	0.072 (0.175)	0.078 (0.184)	0.041 (0.212)
Constant	3.505 (0.178)	3.375 (0.126)	3.364 (0.115)	4.463 (0.130)	4.301 (0.078)	4.333 (0.071)	5.103 (0.201)	5.050 (0.198)	5.073 (0.180)	2.019 (0.106)	1.886 (0.120)	1.896 (0.136)
Estimation [†]	ANA	ACV	AHV	ANA	ACV	AHV	ANA	ACV	AHV	ANA	ACV	AHV
Pure control mean	33.277	33.277	33.277	86.757	86.757	86.757	164.545	164.545	164.545	7.532	7.532	7.532
Observations	491	491	491	491	491	491	491	491	491	491	491	491

Notes: Baseline variables are outcomes. Counselor disc. farming is equal to “1” if the counselor recorded ever discussing farm/agricultural work with the household in their reports. [†]ANOVA (ANA), ANCOVA (ACV), and ANHECOVA (AHV) estimations after Ye et al. (2023) are calculated using Poisson QMLE (Correia, Guimarães and Zylkin, 2020). Coefficients can be interpreted as a percent change using the incidence rate ratio ($e^{\beta} - 1$). Outcomes are annual (two season) totals. Demeaned variables included in ANCOVA but not shown: plot area and its square. These variables are interacted with treatment group assignment in ANHECOVA estimations. Heteroskedasticity-robust standard errors clustered at the village level.

B Intervention Details, Participation Incentives, and Safety Protocols

1 Intervention Stages

Stage 1: Contact and Screening: The team of counselors and social workers first worked with village guides to meet and introduce themselves to each treatment household. At this time, the team conducted an initial screening to determine the family structure and alcohol consumption pattern of the household. The household was then informed about and invited to the community workshops. At this time, the team also informed the participants about the financial incentives to attend (further discussed below). This stage lasted between two and three days per village.

Stage 2: Workshops and Discussions: In each village, the implementation team held three days of structured counseling and discussions at a central location (often a church or school, which was rented for the occasion). Only those assigned to the treatment were invited and allowed to attend these workshops. The social workers and counselors divided each day into three parts:

1. *Sharing of personal problems, slips, frustrations, as well as success and growth:* The first part involved brief presentations by each member in the group, with a focus on “personal problems, constraints, negative encounters, and pressures to use alcohol or drugs since the last group meetings.” Other members at this point shared how they coped with similar experiences, and the counselors underlined skills to overcome difficulties to achieve rehabilitation.
2. *Whole group discussion based on the topic of the day:* These topics varied, but included: coping with social/family pressure, identifying personal triggers, the value of productive activities to diminish urges to drink, understanding psychological dependence, etc. This segment included both presentation and discussion of the topic.
3. *Defining next steps and specific tasks to achieve rehabilitation:* At this stage, the counselors assigned specific tasks to individual members according to their specific challenges. Their efforts to complete these tasks and overcome the associated challenges serve as a basis for discussion at successive meetings.

These sessions were confidential – the group counselors and social workers never shared what was discussed at these meetings with those who were not in attendance. It was also voluntary – attendance was not required, and those in attendance were not required to speak. The workshops and discussions, however, provided a platform for mutual support through discussions with the group counselors and others in the community that had alcohol problems. These workshops were not necessarily held on consecutive days during the team’s time in a village, but were spread across five or more days to better accommodate participants’ schedules. If participants paid for transport to the workshop they were reimbursed for their travel, and all participants received lunch while there.

Stage 3: Individual and Spousal Counseling: Each intervention team visited the treatment households at least eight times to complete individual and spousal sessions consisting of psychosocial

counseling as described above (using a MET framework). As reported in notes recorded by counselors as part of this program, the counselors also would develop both individual and joint spousal strategies to help control alcohol urges, for example, to focus on agricultural work as a distraction from drinking.²³ During this time, a staff nurse would visit the households to monitor withdrawal symptoms, and if needed, would prescribe vitamins and/or medication.

2 *Incentives for Participation*

The study included incentives for treatment individuals to participate in the program. While direct costs of attendance, such as transportation to the workshops, were reimbursed, there was also an opportunity cost to the treatment individuals for participation. The project therefore provided the opportunity to receive incentives if an individual participated. If an individual attended at least two workshop sessions, they were entered into a lottery to win 500 KSh (approximately one day's wage in the area). Each individual's chance of winning the 500 KSh was 50 percent. A second lottery was held after the completion of the counseling stage. If an individual had attended at least four sessions, they were entered to win another 500 KSh. The probability of winning was again 50 percent, and the outcome of the second lottery was independent of the first lottery. Therefore, the expected value of winnings for an individual who participated in at least half of both stages was 500 KSh. The results in Appendix Table A2, which do not show a large drop-off in counseling sessions attended after the minimum number to be entered into the lottery, suggest that the primary driver of participation was not this incentive, but a demand for sobriety.

3 *Safety Protocols*

When a person is an alcoholic, the body becomes chemically dependent on ethanol. This means that cessation or significant reductions in alcoholic drink can trigger withdrawal symptoms. Usually, these symptoms are relatively mild. However, in rare cases, serious and adverse medical effects can occur from reductions in alcohol consumption. This includes *delirium tremens*, which can lead to hallucinations, seizures, and death. Because this study's primary goal was reduction in alcohol consumption in the treated sample, this study took precautions on two fronts. First, it limited the sample to those 55 years old or younger and excluded those with known comorbidities or underlying diseases from participating, as older age and other underlying health conditions are known to increase the chance of onset of delirium tremens (Wetterling et al., 1994; Palmstierna, 2001; Jesse et al., 2017). Second, it employed a full-time nurse practitioner who visited all treated households, provided vitamins to all, and prescribed withdrawal medication to those experiencing symptoms. The nurse and counselors recorded 44 individuals (out of 400 assigned to the treatment) as requiring medication for withdrawal symptoms. Those with minor symptoms that did not require medication (e.g., headaches, light nausea, etc.) are not included in this total.

²³Appendix C contains anonymized excerpts from counselor notes relating to this strategy.

C Counselor Notes

In this program, counselors took detailed reports during visits to households.

Examples of Mechanisms 1.1 and 1.2: Individual learns that returns to consumption are low/negative; Individual updates beliefs in their own ability to stop drinking: •“M— feels proud of having being able to stay for almost a week now without alcohol. He says he is out for change and is not ready to relapse after realizing how harmful alcohol can be. We pondered on what he thinks about his drinking. M— says that he was having a problem with alcohol probably because he had no information about drugs and alcohol. He thought alcohol was the only way out to relieve stress but realized he was all wrong.” •“I clarified to W— that the decision to quit drinking chang’aa basically relied upon him and not any other person, neither a counselor nor the wife should push him to quit drinking. I further personalized the risks of drinking chang’aa to W—. These included death from effects caused by drinking that includes, liver cirrhosis, high blood pressure, heart attack and stroke. Poverty as most of the money he has been spending on buying chang’aa and not development.” •“C— has reduced alcohol intake from daily consumption to a cup after every two days. I congratulated him for the step made. He has formed a group of friends to sensitize on effects of alcohol. He has demonstrated strong will to stop taking alcohol.” •“Personalizing the risks alcohol has had on his life. After a recap of these topics covered during the training, E— was able to identify the following as his social economic effects: Marital conflict, R— says they used to fight a lot but it never got physical. During his drinking days he was unemployed, therefore getting employment was least of his concerns his major concern being where he would get his next drink. R— says the fights would happen in the presence of their children therefore E— wasn’t setting a good example for them. R— also says he could not save up to start a business because he would spend everything on alcohol. E— says that he is now fully involved in his business, he understands that alcohol cannot go hand in hand with business and this is the major reason he reduced his consumption.” •“After the training, this was an eye opener for him. He decided to quit alcoholism. His drinking habits have led to economic instability. All the money he gets from his Boda-Boda business gets wasted on alcohol. He admitted he is an addict, which has also caused domestic violence in his marriage” •“During the three day training organized prior to the family therapy, M— came to know of the adverse health effects of alcohol. This changed M—’s perspective of alcohol, informing her decision to recover from addiction. M— has observable and elaborate plan to quit alcoholism.” •“To him,it has been his toxic friends,life stresses and even poverty that has made him abuse alcohol.He says he has sold almost everything in the house and that he does not own even a bed to lie on.He regrets how much alcohol has costed him and the number of times he slept in a police cell.M— breaks down while at it and shows how remorseful he is to his dear wife.” •“The client has also realised that he uses a lot of money in buying alcohol and can use this money to pay school fees for his children and also put savings that can help start a business for his wife.” •“Alcoholism has reduced their economic growth.He uses almost all his finances to support changaa and Busaa drinking.He admitted being an addict. His family has suffered from domestic violence,incurred injuries and loss of valuable properties to alcohol.He is already in contemplation stage. He chose to quit drinking alcohol and with my support I expressed empathy,praise,show validation and encouragement during the contemplation stage and guided clients towards examining the benefits of the barriers to change.”

Examples of Mechanism 4.1: Recommendations by counselors to use work on farm as a way to control urge to drink: •“Taking up farm responsibilities after work to keep them busy so as to avoid drinking buddies;” •“He identified idleness as an obstacle to his recovery journey. I encouraged him to involve himself in farming and other things that can benefit his family;” •“As a family they have agreed to concentrate in their half acre farm to maximize the production. In my therapy session today I stressed on the need to have a short achievable economic plan to kill idleness.” •“His point of action included....Concentrate on his farm work that he abandoned because of alcoholism.” •“Involving herself in farming to forget the changaa intake;”

Other reports indicate success from this strategy. For example: • “B—— has been more focused on farm work.” • “Has stayed focused on Recovery by keeping busy with work and farm activities.” •“S—— has not used any alcoholic drink since the session started. He is quite committed to following the road to sobriety. He was at the farm when I arrived indicating that he is keeping busy and keeping the mind off alcohol;” •“R—— has been able to avoid toxic friends, concentrate on farm work, avoid free alcohol offers and unnecessary hangouts;” •“Has had a total behavior change as he helps a lot around the house and in the family farm which was not the case when he used to drink;” •“The client has made remarkable changes in that today he reported that he did not take any alcohol and was confirmed by his wife J——. He has been in line following to the latter [sic] the solutions he had come up with to abstain from taking a drink. He, for example has been keeping busy with his farm work engaging him so much hence abstinence;” •“P—— and E—— show satisfactory changes. The couple confirmed they have not taken any alcohol and they have engaged fully in their farming activities, avoided influential [sic] friends.”

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