Appendix for

THE VALUE OF COMMUNICATION FOR MENTAL HEALTH

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JULY 2025

I Appendix

I.1 Global Review of Communication Programs – Motivating Evidence I

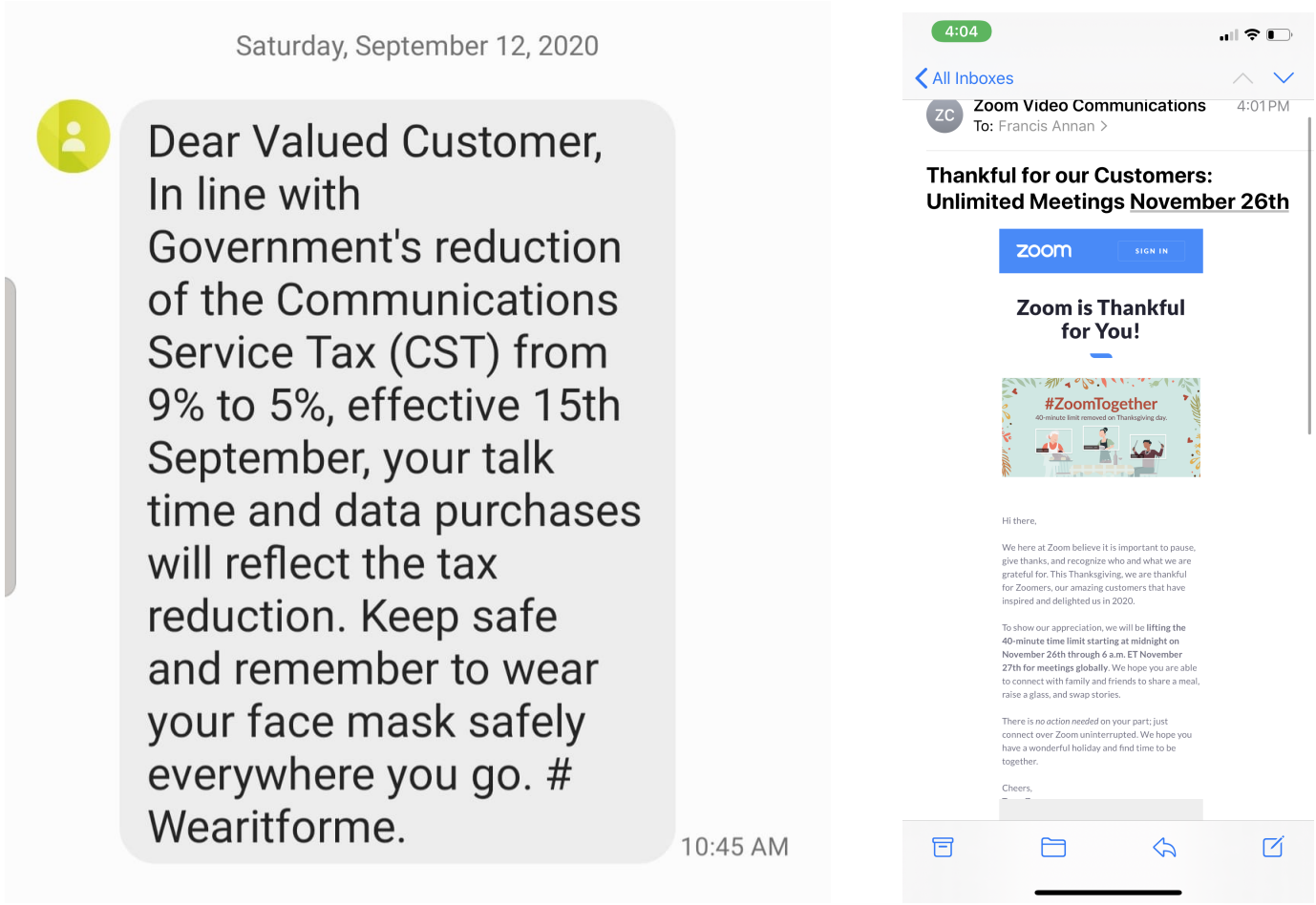
Table A1: **A Global review of COVID-19 communication interventions**

Setting	Entity	Details and source(s)	Date started	Date ended
United States	Government **FCC**	*FCC launched the program Keep Americans Connected in which communications companies agreed on not terminating the internet services of Americans in case they do not keep up to date with payments of internet and telephone bills in response to the COVID-19 crisis. The companies opened their Wi-fi hotspots for the population.	03/13/2020	06/30/2020
		*FCC also maintained other communication initiatives during the pandemic such as granting ATT to use additional spectrum in Puerto Rico and Virgin Islands in order to improve and expand the internet connectedness in these territories (60 days period).	03/26/2020	05/25/2020
		*FCC waived temporarily its rules to Inteliquent to Zoom and WebEx in order to stimulate and help consumers who now need strictly in these services to study and work. **Source:** https://www.fcc.gov/keep-americans-connected	03/27/2020	06/30/2020
	Companies	**ATT Inc.:** *Provided free 10GB of internet data per month for 60 days as a temporary relief to eligible customers to be able to stay connected during the difficult times, starting March 27, 2020. **Source:** https://about.att.com/newsroom/2020/covid_19_att_prepaid.html	03/27/2020	05/26/2020
		Comcast Corp.: Provided essential internet and mobile services without charge to low-income families, including seniors, veterans and people with disabilities in the United States. **Source:** https://corporate.comcast.com/covid-19	Not available	Not available
		Amazon: *Donated 8,200 laptops to students who attend public schools in Seattle and 4,000 laptops for high school students across the US through the Amazon Future Engineer program.	04/06/2020	–
		*Made many videos on Amazon Prime free for anyone during the stay at home orders period. Content included cartoons and family friendly movies. In addition to that, Amazon made many of its books free for the public who could download them as PDFs. **Source:** https://www.aboutamazon.com/news/company-news/amazons-covid-19-blog-updates-on-how-were-responding-to-the-crisis	03/04/2020	Not available
		Microsoft: *Microsoft has supported the local education of Washington state during the Pandemic by making the Virtual Classroom and Teams available for free. It has also created training sessions for teachers of the state and helped schools in the districts to increase their phone lines to accommodate more parents and students' phone calls. *Microsoft is also working with the Washington state's government to build more broadband spots around the state to help more people have access to the internet through the Airban initiative. The company also brought emergency coverage to 29 school districts of the state. **Source:** https://news.microsoft.com/on-the-issues/2020/04/17/microsoft-covid-19-washington-state/	03/16/2020	Not available
Ghana	Government	The Government reduced the Communication Service Tax (CST) from 9pct to 5pct which reflected a reduction in the cost of mobile talk time and data purchases, effective September 15, 2020 in response to COVID-19 **Source:** https://gra.gov.gh/domestic-tax/tax-types/communication-service-tax/	09/15/2020	Ongoing
Brazil	Government	*The government signed an agreement with Cisco in late May in order to launch the program "Brasil Digital e Inclusivo" (Digital and Inclusive Brazil) that has as its goal to accelerate the technological and digital development of the country. As a response to the COVID-19 crisis, the program aims to facilitate and accelerate telemedicine in the country.	05/27/2020	Ongoing
		*13.6 million of Brazilians live in the "favelas" (slums) and usually have restricted access to technology and communication systems. In this way, in order to bring awareness about the pandemic to the most vulnerable in Brazil, NGOs, journalists and activists have used alternative methods of communication in the population.	03/DD/2020	Ongoing
		*The Brazilian government launched a program to distribute technological equipment and access to the internet for students of the public school system in the country. The initiative will cost approximately R2.5 $billions and the Brazilian Agency of Communications (Anatel) will be responsible to implement it and$ distribute the materials. **Source:** https://newsroom.cisco.com/feature-content?type=webcontent&articleId=2076852	09/18/2020	Ongoing
Ecuador	Government	Similar to the most Favelas communities in Brazil, Ecuador also has a significant population that has limited access to technology and communication channels. These are indigenous communities in which the government and other organizations such as UNESCO have approached in regards to the pandemic in a very strategic way. They have been taking advantage of the communication channels that the indigenous communities have even though they are very scarce. Webpages directed to these communities that address COVID were created, audios and videos were produced by UNESCO and the organizations as well as others have been conducting cultural activities with the communities in order to bring awareness and information about the pandemic. **Source:** https://en.unesco.org/news/media-and-communications-indigenous-peoples-pandemic	03/DD/2020	Not available
Global /United States	Company-**Zoom**	**ZoomTogether** Zoom removed the 40 minutes time limit for free accounts during Thanksgiving as an initiative to help families and friends communicate during the holiday season even if they were distant to each other During Thanksgiving Day, anyone was able to make video conferences longer than 40 minutes through Zoom without being interrupted. **Source 1:** https://www.cnn.com/2020/11/17/tech/zoom-time-limit-thanksgiving-trnd-wellness/index.html	11/26/2020	11/27/2020

Table A2: **CONT'D: A Global review of covid-19 communication interventions**

Setting	Entity	Details and source(s)	Date started	Date ended
Global	Company- **Google**	*Google has donated USD10 million for Distance Learning Fund that supports organizations across the globe which help students who have had to adapt to online learning but do not have access to resources to do so *Google has also partnered with many universities around the world and distributed AI tools and mechanisms to help them keep track of the development of COVID-19 in the world and spread information about it for all. **Source 1:** https://www.google.org/covid-19/#distance-learning **Source 2:** https://blog.google/outreach-initiatives/google-org/google-supports-covid-19-ai-and-data-analytics-projects/	03/DD/2020 03/DD/2020	- Not available
Global	Company- **Transperfect**	*Transperfect has been translating and delivering materials and information about COVID-19 across the globe. The work has been so helpful that the company won the International Business Award for COVID-19 Communication Initiatives. *The company produced videos of COVID-19 prevention tips in more than 11 languages and personalized it for companies for free. **Source:** https://www.prnewswire.com/news-releases/transperfect-wins-international-business-award-for-covid-19-communications-initiatives-301134747.html	04/DD/2020	Not available
Europe and United States	Companies- **Netflix, Youtube, Streaming services**	These companies have been slowing down and decreasing the streaming quality of their videos since March in Europe and also in the US. The initiative is an attempt to help with the internet traffic and higher latency and packet loss caused by the high usage of the internet by households after stay at home orders took place in Europe and in the US (30 days period). **Source 1:** https://www.cnn.com/2020/03/19/tech/netflix-internet-overload-eu/index.html **Source 2:** https://latest-news-viral.blogspot.com/2020/03/streaming-in-time-of-covid-19-youtube.html	04/01/2020	04/30/2020
Global /India	Company- **Facebook**	*Facebook has been partnering with governments in order to spread accurate information about the pandemic. An interesting and important partnership was with India's government that has been relying a lot on social media in order to spread awareness and information about COVID-19. Other than social media, Indian local governments have also developed and used apps that monitor COVID-19 in the country, by using Information and Communications Technology (ICT) and Artificial Intelligence (AI). *These apps are helpful and very informative, but a significant part of the population in India does not have access to the internet which shows how the Digital Divide in India has deepened the social, health and educational inequalities in the country. **Source 1:** https://about.fb.com/news/2020/11/coronavirus/; **Source 2:** https://www.bbc.com/news/world-asia-india-53471749 **Source 3:** https://www.weforum.org/agenda/2020/10/how-covid-19-deepens-the-digital-education-divide-in-india/ **Source 4:** https://academiccommons.columbia.edu/doi/10.7916/d8-bbw6-yt70 *Download the paper to see all the apps created* **Source 5:** https://www.weforum.org/agenda/2020/10/how-covid-19-deepens-the-digital-education-divide-in-india/	03/DD/2020	Not available

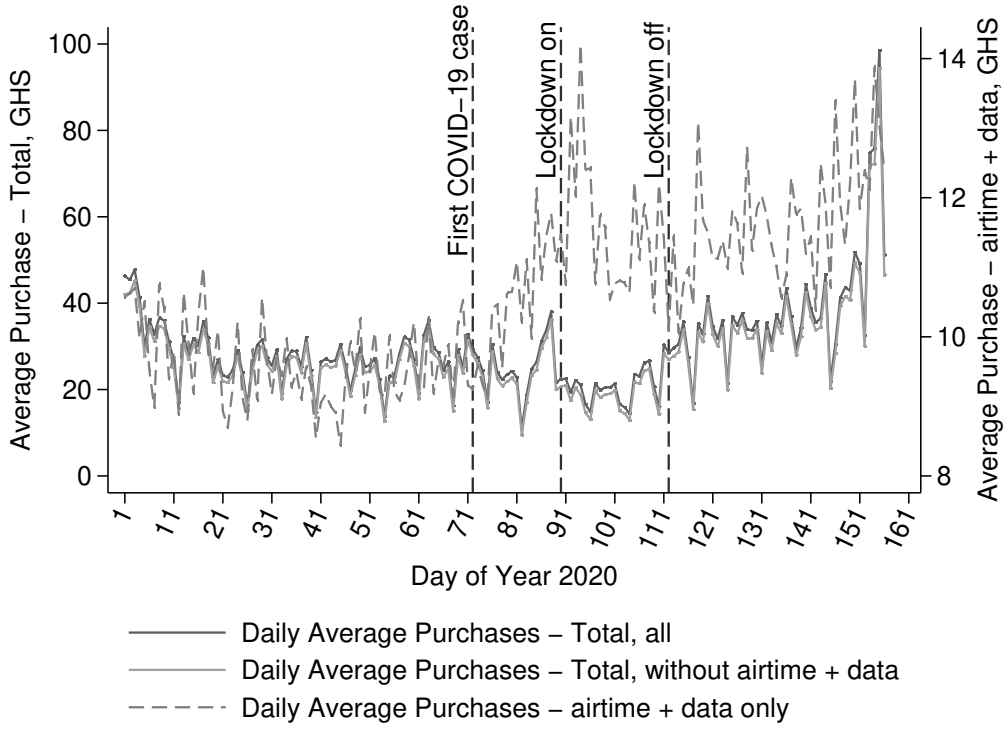
Figure A1: COMMUNICATION PROGRAMS



I.2 Exhibits – Motivating Evidence II

I.3 Administrative Data – Motivating Evidence III

Figure A2: **Mobile financial transactions during covid-19**



Note: Mobile financial transaction data from a major local telecommunications company and based on 694,695 transactions (2,0751 random unique subscribers). As displayed, average purchase (total and total without airtime + data) shown in the left vertical axis with solid lines, while average purchase for airtime-related activities (airtime + data only) shown in the right vertical axis with a dash line. Overall market activity decreased following the onset of the pandemic, but demand for mobile airtime-related activities sharply increased over the period. Pre-COVID-19, these two purchases (average totals versus average airtime) look similar.

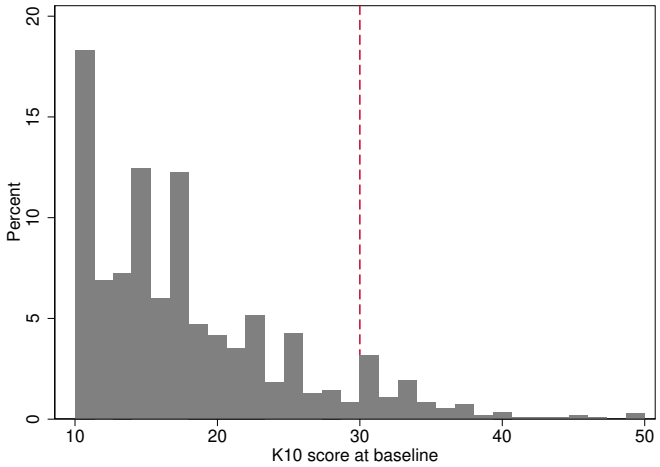
I.4 Descriptive Statistics

Table A3: **Summary statistics of relevant variables**

Variable	Mean	SD	N
Demographic Characteristics			
Female 0-1	0.147	0.354	1,130
Akan ethnic 0-1	0.363	0.481	1,130
Married 0-1	0.911	0.285	1,130
Attained Junior High School (JHS) 0-1	0.784	0.412	1,130
Household size (number)	6.907	4.088	1,107
Self-employed 0-1	0.763	0.426	1,130
Operates in informal sector 0-1	0.800	0.400	1,130
Personal income (1 to 5 scale) (monthly)	1.622	0.898	1,105
Staying together with mother 0-1 (Wave 0)	0.067	0.251	1,130
Has no religion 0-1 (Wave 0)	0.054	0.226	1,130
Staying together with spouse 0-1 (Wave 0)	0.869	0.338	1,130
Age at marriage (Years) (Wave 0)	24.935	4.971	1,083
Poverty			
Poverty rate (%) (Schreiner 2005) (Wave 0)	22.043	20.534	1,130
Pandemic Basics			
Aware of COVID-19 0-1	0.996	0.060	1,105
Trust Government's estimates about COVID-19 0-1	0.798	0.402	1,105
In previously lockdown region 0-1	0.183	0.387	1,130
Self does housework during pandemic 0-1	0.168	0.374	1,105
Has relocated / moved in past 7 days 0-1 (Wave 2)	0.014	0.119	977
Key Communication Constraints			
Need to connect increased due to pandemic 0-1	0.702	0.458	1,104
Unable to call in past 7 days 0-1	0.627	0.484	1,103
Unable to call due to COVID-19 0-1	0.549	0.498	1,104
Unable to make airtime transfers in past 7 days 0-1	0.474	0.500	1,103
Borrow airtime 0-1 (Wave 2)	0.319	0.466	977
Seek digital loan 0-1 (Wave 2)	0.088	0.283	977
Well-being Measures			
Total Expenditure (GHS) (weekly)	324.112	423.254	1,102
Threatened Partner (1 = never to 4 = very often)	1.194	0.701	1,102
Hit Partner (1 = never to 4 = very often)	1.134	0.670	1,102
log K10	2.820	0.369	1,102
Severe Distress 0-1	0.096	0.295	1,102
I'm tired (mentally, emotionally, or socially) of COVID-19 0-1	0.539	0.499	1,104
I'm depressed (1 = disagree to 5 = agree)	1.599	0.942	1,102
I'm relaxed (1 = disagree to 5 = agree)	2.886	1.383	1,102
I'm satisfied with life, all else equal (1 = disagree to 5 = agree)	2.534	1.319	1,102
I'm satisfied with finances, all else equal (1 = disagree to 5 = agree)	2.074	1.157	1,102

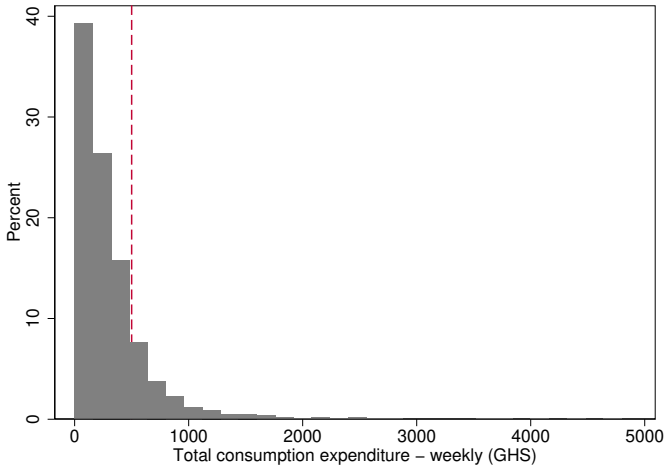
Note: Observations are at the individual level. Table reports the summary statistics of relevant variables from our baseline survey waves. This include information about demographics, poverty indicators, communication and well-being outcomes, respectively. The exchange rate during the baseline period is US$ 1.0 = GHS 5.80.

Figure A3: **K 10 SCORE AT BASELINE (WAVE 1)**



Note: Observations are at the individual level. Low (scores of 10-15, indicating little or no psychological distress). Moderate (scores of 16-21). High (scores of 22-29). Very high or severe distress (scores of 30-50). 11.5% rate of severe distress (indicated by the vertical dashed line).

Figure A4: **TOTAL CONSUMPTION EXPENDITURE AT BASELINE (WAVE 1)**



Note: Observations are at the individual level. Total consumption expenditure sums all expenses: food (inside and outside home), utilities, personal care, education, health, and durables. 81.7% rate of poor consumption ($\leq$ 500GHS per week and indicated by the dashed vertical line).

I.5 Balance

Table A4: **Balance test: pre-intervention treatment-control differences**

Variable	Constant	Lumpsum	Installments
Communication Measures (Wave 1)			
Unable to call in past 7 days 0-1	0.632***	-0.016	0.002
	(0.026)	(0.035)	(0.035)
Unable to call due to COVID-19 0-1	0.565***	-0.006	-0.044
	(0.028)	(0.037)	(0.039)
Borrow airtime 0-1 (Wave 2)	0.297***	0.031	0.040
	(0.028)	(0.037)	(0.036)
Seek digital loan 0-1 (Wave 2)	0.086***	0.002	0.005
	(0.016)	(0.024)	(0.023)
ll-being Measures (Wave 1)			
Total Expenditure (GHS) (weekly)	315.472***	27.986	-2.251
	(22.551)	(31.742)	(30.597)
Food expenses inside home (GHS)	143.205***	-8.441	-11.013
	(8.720)	(9.144)	(11.349)
Food expenses outside home (GHS)	50.872***	7.364	4.220
	(3.723)	(7.637)	(5.286)
Utilities expenses (GHS)	22.411***	11.264	-4.517
	(6.048)	(9.177)	(6.838)
Personal care expenses (GHS)	13.085***	3.793	-1.831
	(1.618)	(3.145)	(2.135)
Education expenses (GHS)	23.779***	-4.649	1.730
	(6.459)	(7.525)	(8.814)
Health expenses (GHS)	56.477***	13.818	5.794
	(12.243)	(17.491)	(17.465)
Durables expenses (GHS)	5.643**	4.837	3.366
	(2.465)	(6.845)	(4.281)
Threatened Partner (1 = never to 4 = very often)	1.195***	0.028	-0.030
	(0.038)	(0.047)	(0.047)
Hit Partner (1 = never to 4 = very often)	1.123***	0.024	0.011
	(0.033)	(0.047)	(0.041)
log K10	2.821***	-0.006	0.001
	(0.020)	(0.024)	(0.025)
Severe Distress 0-1	0.101***	-0.025	0.010
	(0.016)	(0.020)	(0.021)
I'm tired (mentally, emotionally, or socially) of COVID-19 0-1	0.523***	0.002	0.048
	(0.026)	(0.035)	(0.038)
Corroborative Mental Health Measures (Wave 1)			
I'm depressed (1 = disagree to 5 = agree)	1.616***	-0.052	0.004
	(0.050)	(0.064)	(0.072)
I'm relaxed (1 = disagree to 5 = agree)	2.885***	-0.053	0.053
	(0.082)	(0.092)	(0.090)
I'm satisfied with life, all else equal (1 = disagree to 5 = agree)	2.533***	-0.119	0.131
	(0.081)	(0.097)	(0.088)
I'm satisfied with finances, all else equal (1 = disagree to 5 = agree)	2.072***	-0.091	0.101
	(0.064)	(0.073)	(0.084)

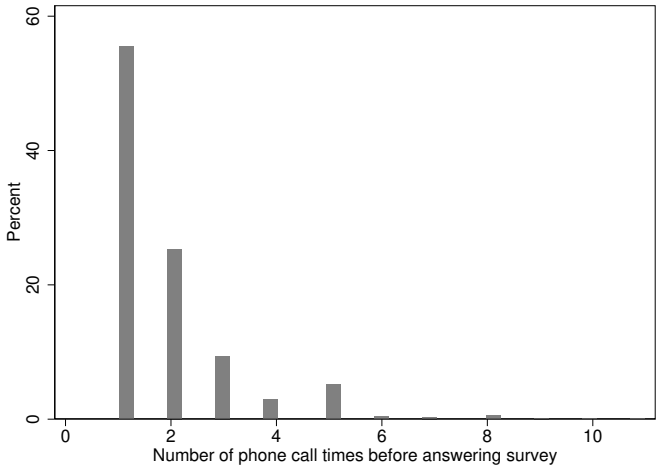
Note: Observations are at the individual level. Each row is a separate regression. Clustered standard errors (at the district level) are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.10. Mean baseline characteristics are also balanced across treatment arms. **Results are similar with and without controls for randomization strata dummies.**

Table A5: **Balance test: pre-intervention treatment-control differences**

Variable	Constant	Lumpsum	Installments
Baseline Controls (Wave 1)			
Female 0-1	0.146***	0.003	0.000
	(0.018)	(0.021)	(0.023)
Akan ethnic 0-1	0.378***	-0.029	-0.015
	(0.033)	(0.030)	(0.033)
Married 0-1	0.901***	0.027	0.002
	(0.016)	(0.019)	(0.021)
Attained Junior High School (JHS) 0-1	0.789***	0.003	-0.019
	(0.021)	(0.030)	(0.027)
Household size (number)	7.239***	-0.185	-0.829***
	(0.261)	(0.339)	(0.244)
Self-employed 0-1	0.786***	-0.050*	-0.022
	(0.022)	(0.028)	(0.029)
Operates in informal sector 0-1	0.807***	-0.028	0.006
	(0.021)	(0.028)	(0.026)
Personal income (1 to 5 scale) (monthly)	1.629***	-0.016	-0.007
	(0.055)	(0.070)	(0.070)
Self does housework during pandemic 0-1	0.173***	-0.014	-0.001
	(0.019)	(0.025)	(0.027)
In previously lockdown region 0-1	0.185***	0.001	-0.007
	(0.048)	(0.009)	(0.010)
Aware of COVID-19 0-1	0.995***	0.003	0.003
	(0.004)	(0.005)	(0.005)
Trust Government's estimates about COVID-19 0-1	0.805***	-0.019	0.000
	(0.022)	(0.027)	(0.028)
Has relocated / moved in past 7days 0-1 (Wave 2)	0.012*	0.003	0.003
	(0.007)	(0.008)	(0.007)
More Baseline Controls (Wave 0)			
Poverty rate (%) (Schreiner 2005) (Wave 0)	23.226***	-1.874	-1.710
	(1.524)	(1.245)	(1.333)
Staying together with mother 0-1 (Wave 0)	0.062***	0.007	0.008
	(0.013)	(0.017)	(0.018)
Has no religion 0-1 (Wave 0)	0.052***	0.006	-0.001
	(0.011)	(0.014)	(0.016)
Staying together with spouse 0-1 (Wave 0)	0.888***	-0.040*	-0.018
	(0.015)	(0.023)	(0.022)
Age at marriage (Years) (Wave 0)	24.680***	0.208	0.558
	(0.262)	(0.390)	(0.391)

Note: Observations are at the individual level. Each row is a separate regression. The F and Chi-squared tests are conducted using the pooled indicator **1(Communication Credit)** as the outcome and excluding all the communication and well-being outcomes. Clustered standard errors (at the district level) are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.10. Mean baseline characteristics are also balanced across treatment arms. **Results are similar with and without controls for randomization strata dummies.**

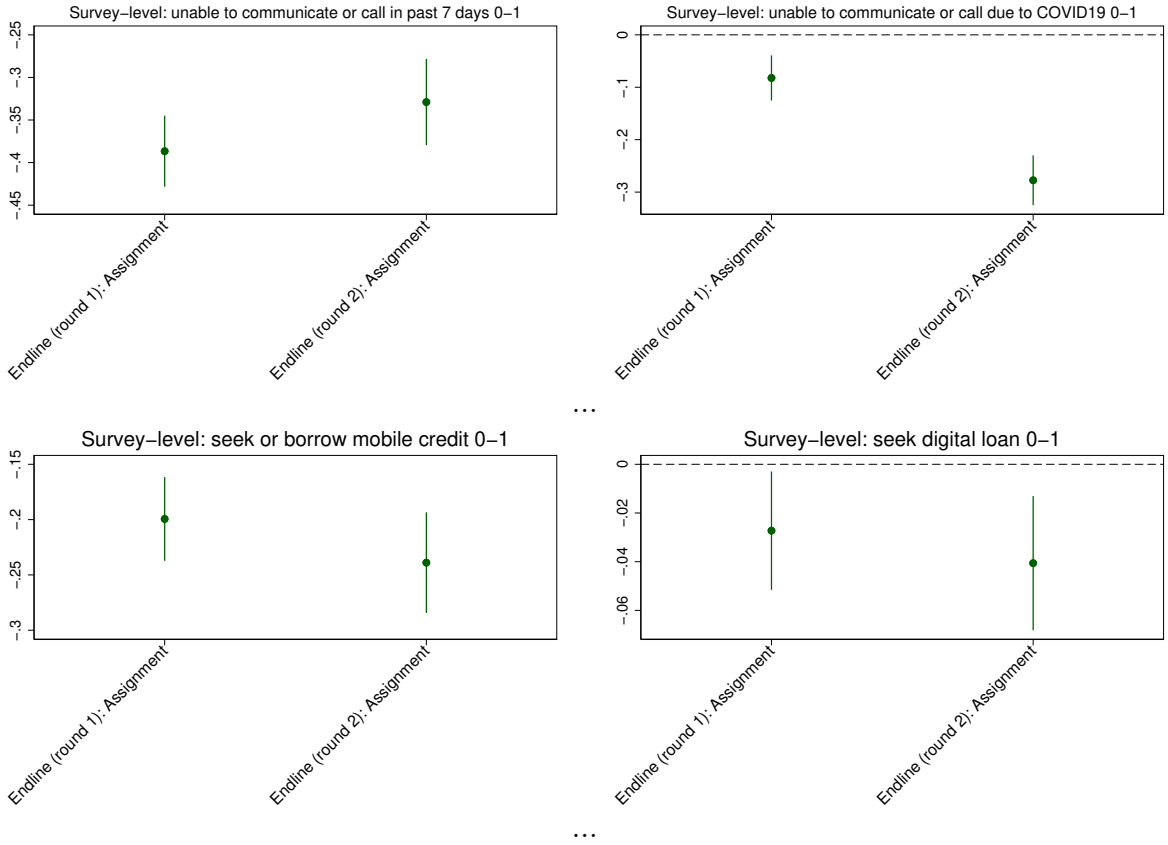
Figure A5: **Phone calls and reachability of individuals**



I.6 Further Results – Tables and Figures

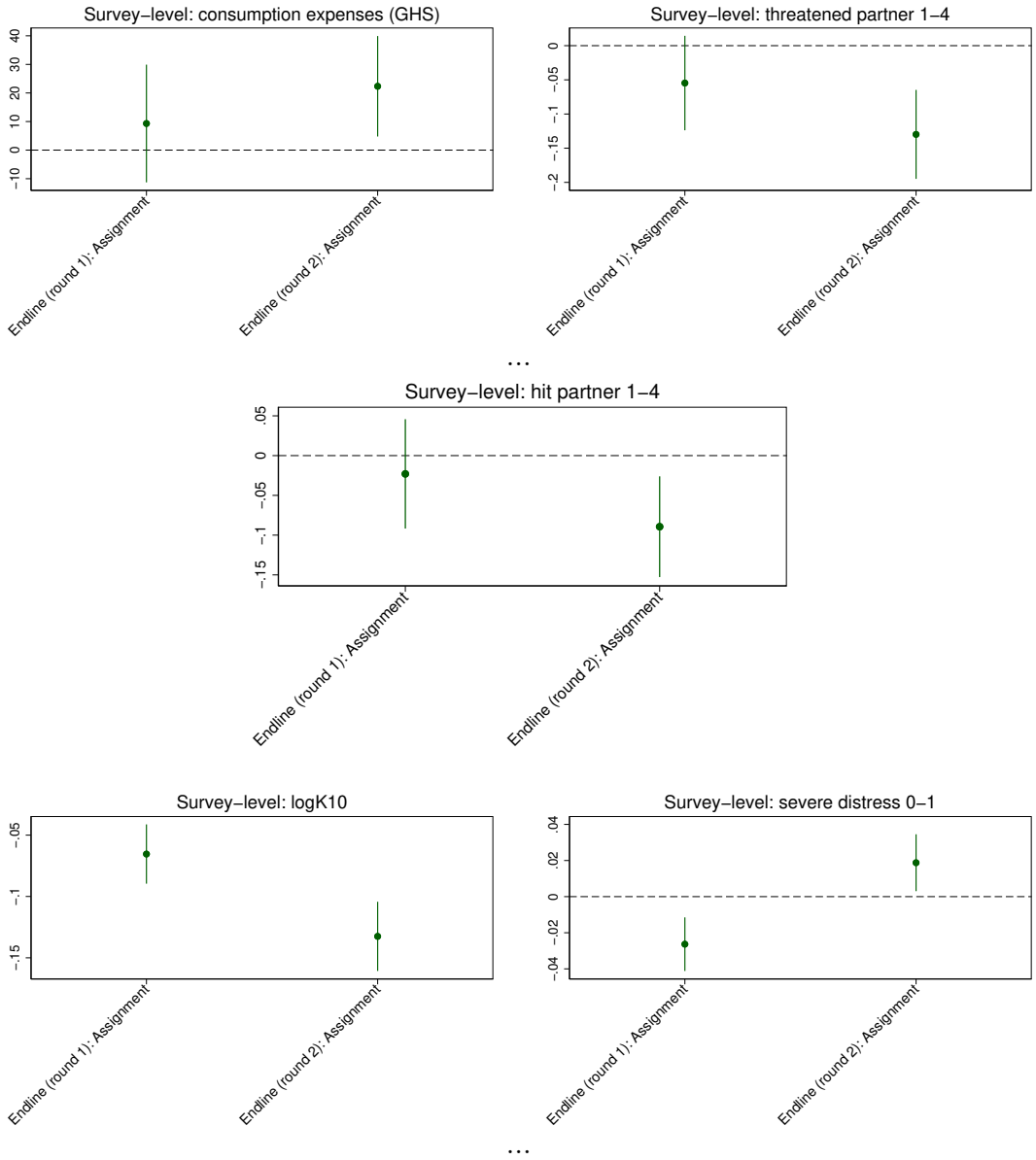
POOLED EFFECTS OVER TRAJECTORY

Figure A6: MITIGATION OF COMMUNICATION CONSTRAINTS



Note: Estimates are from a model that includes randomization strata (district) fixed effects, survey date fixed effects, and double-post LASSO specification which considers all individual controls, and individual district and survey date fixed effects in the possible control set. Controls include: individual's age, 0-1 indicator for whether married or not, 0-1 indicator for whether belongs to akan ethnic group or not, 0-1 indicator for whether self employed or not, household size, 0-1 indicator for whether operates in the informal sector, monthly personal income over an ordinal scale of 1 to 5, 0-1 indicator for whether attained junior high school (JHS) education, and individual's gender. Observations are at the subject $\times$ date level. Standard errors are clustered at the individual level (the level of treatment). 90% confidence intervals are displayed around the estimates. Table of coefficients and standard errors available upon request.

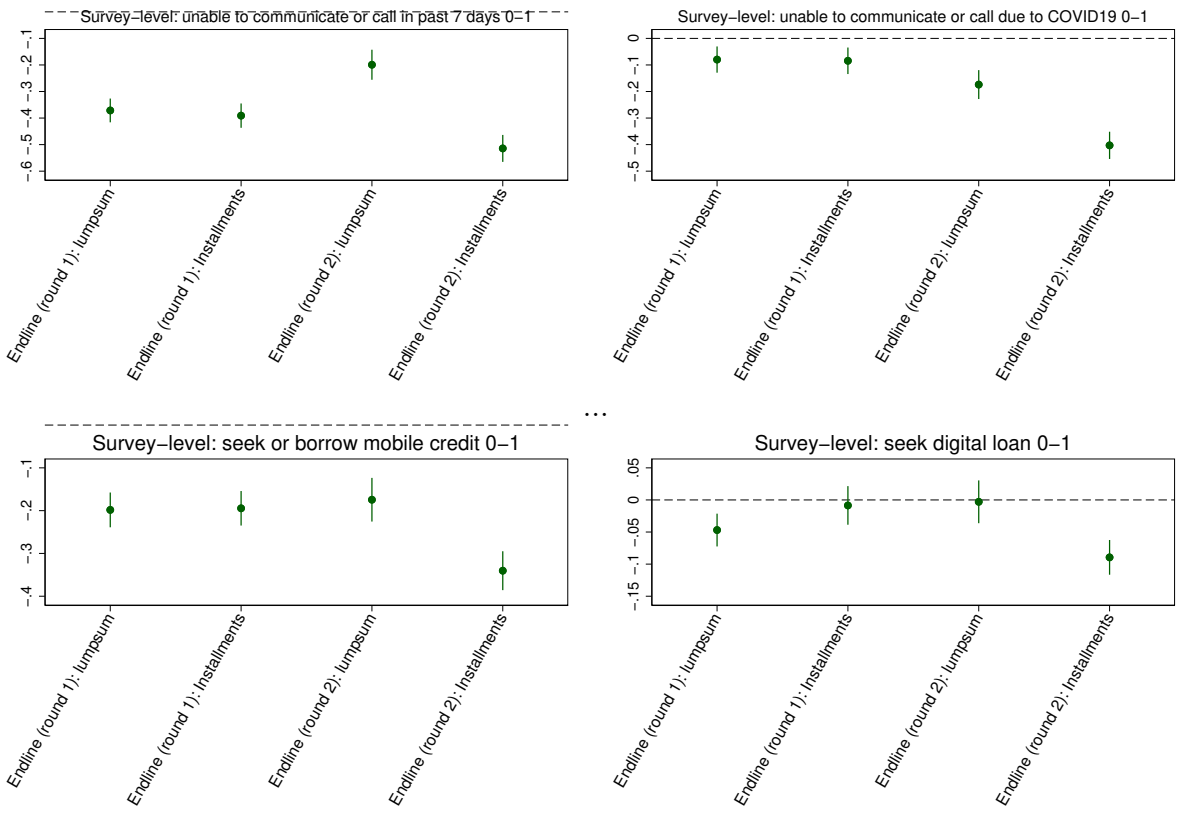
Figure A7: **IMPACTS OF COMMUNICATION PROGRAMS ON WELL-BEING MEASURES**



Note: Estimates are from a model that includes randomization strata (district) fixed effects, survey date fixed effects, and double-post LASSO specification which considers all individual controls, and individual district and survey date fixed effects in the possible control set. Controls include: individual's age, 0-1 indicator for whether married or not, 0-1 indicator for whether belongs to akan ethnic group or not, 0-1 indicator for whether self employed or not, household size, 0-1 indicator for whether operates in the informal sector, monthly personal income over an ordinal scale of 1 to 5, 0-1 indicator for whether attained junior high school (JHS) education, and individual's gender. Observations are at the subject $\times$ date level. Standard errors are clustered at the individual level (the level of treatment). 90% confidence intervals are displayed around the estimates. Table of coefficients and standard errors available upon request.

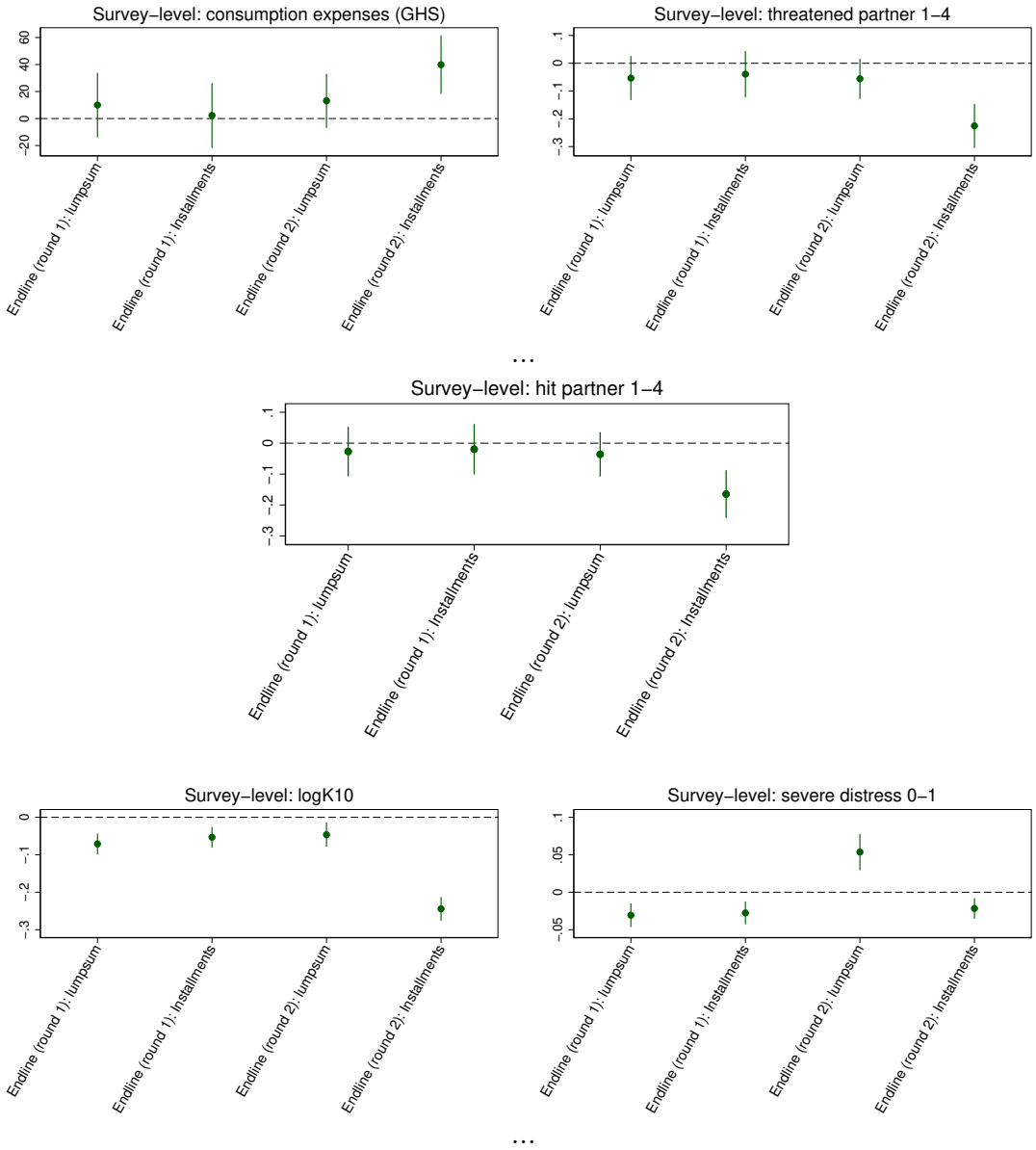
SEPARATE EFFECTS OVER TRAJECTORY

Figure A8: **MITIGATION OF COMMUNICATION CONSTRAINTS**



Note: Estimates are from a model that includes randomization strata (district) fixed effects, survey date fixed effects, and double-post LASSO specification which considers all individual controls, and individual district and survey date fixed effects in the possible control set. Controls include: individual's age, 0-1 indicator for whether married or not, 0-1 indicator for whether belongs to akan ethnic group or not, 0-1 indicator for whether self employed or not, household size, 0-1 indicator for whether operates in the informal sector, monthly personal income over an ordinal scale of 1 to 5, 0-1 indicator for whether attained junior high school (JHS) education, and individual's gender. Observations are at the subject × date level. Standard errors are clustered at the individual level (the level of treatment). 90% confidence intervals are displayed around the estimates. Table of coefficients and standard errors available upon request.

Figure A9: **IMPACTS OF COMMUNICATION PROGRAMS ON WELL-BEING**



Note: Estimates are from a model that includes randomization strata (district) fixed effects, survey date fixed effects, and double-post LASSO specification which considers all individual controls, and individual district and survey date fixed effects in the possible control set. Controls include: individual's age, 0-1 indicator for whether married or not, 0-1 indicator for whether belongs to akan ethnic group or not, 0-1 indicator for whether self employed or not, household size, 0-1 indicator for whether operates in the informal sector, monthly personal income over an ordinal scale of 1 to 5, 0-1 indicator for whether attained junior high school (JHS) education, and individual's gender. Observations are at the subject × date level. Standard errors are clustered at the individual level (the level of treatment). 90% confidence intervals are displayed around the estimates. Table of coefficients and standard errors available upon request.

Table A6: **Impacts of communication programs on well-being by poverty**

VARIABLES	(1) Total (GHS) Expenditure	(2) Threatened Partner 1-4	(3) Hit Partner 1-4	(4) log K10	(5) Severe Distress 0-1
Communication Credit (β)	19.05	0.0230	0.00926	-0.0821***	0.000935
	(16.31)	(0.0479)	(0.0486)	(0.0202)	(0.00973)
Poverty Likelihood	-0.730*	0.00232	0.000611	0.000457	-0.000516
	(0.394)	(0.00184)	(0.00184)	(0.000565)	(0.000327)
c.tmt_all#c.pov_likelihood	-0.305	-0.00435**	-0.00229	-0.000678	-0.000213
	(0.477)	(0.00208)	(0.00202)	(0.000638)	(0.000361)
Observations	2,019	2,019	2,019	2,019	2,019
Number of groups	0	0	0	0	0
District FE	Yes	Yes	Yes	Yes	Yes
Date FE	Yes	Yes	Yes	Yes	Yes
Controls	PD LASSO	PD LASSO	PD LASSO	PD LASSO	PD LASSO
Mean of dep. variable	219.573	1.247	1.166	2.704	0.025
p-value: Romano-Wolf Correction treatment	0.950	0.970	0.970	0.010	0.970
p-value: Romano-Wolf Correction poverty	0.010	0.010	0.030	0.010	0.733
p-value: Romano-Wolf Correction interaction	0.980	0.099	0.634	0.812	0.812

Note: District is the randomization strata. The double-post LASSO specification considers all individual controls, and individual district and survey date fixed effects in the possible control set. Controls include: individual's age, 0-1 indicator for whether married or not, 0-1 indicator for whether belongs to akan ethnic group or not, 0-1 indicator for whether self employed or not, household size, 0-1 indicator for whether operates in the informal sector, monthly personal income over an ordinal scale of 1 to 5, 0-1 indicator for whether attained junior high school (JHS) education, and individual's gender. Observations are at the subject $\times$ date level. Clustered standard errors (at the individual level; the level of treatment) are reported in parentheses. *** p<0.01 (1% level), ** p<0.05 (5% level), * p<0.1 (10% level). Romano-Wolf multiple hypothesis correction p-values (Romano and Wolf [2005]) reported separately for consumption expense outcomes family (Total (GHS) Expenditure; Food-In (GHS); Food-Out (GHS); Utilities (GHS); Personal care (GHS); Educ. (GHS); Health (GHS); Durables (GHS)), and for mental health and domestic violence outcomes family (Threatened Partner 1-4; Hit Partner 1-4; log K10; Severe Distress 0-1). NE denotes not estimable.

HETEROGENEOUS EFFECTS

Table A7: **Impacts of communication programs on well-being by informality**

VARIABLES	(1) Total (GHS) Expenditure	(2) Threatened Partner 1-4	(3) Hit Partner 1-4	(4) log K10	(5) Severe Distress 0-1
Communication Credit (β)	-25.10	-0.0729	-0.0990	-0.00841	0.0300**
	(26.17)	(0.0680)	(0.0669)	(0.0317)	(0.0120)
Informal Sector 0-1	-54.66**	0.126*	0.0695	0.0930***	0.0525***
	(25.93)	(0.0731)	(0.0682)	(0.0317)	(0.0149)
c.tmt_all#c.informal0	44.95	-0.00104	0.0649	-0.107***	-0.0417***
	(28.63)	(0.0818)	(0.0799)	(0.0348)	(0.0148)
Observations	2,019	2,019	2,019	2,019	2,019
Number of groups	0	0	0	0	0
District FE	Yes	Yes	Yes	Yes	Yes
Date FE	Yes	Yes	Yes	Yes	Yes
Controls	PD LASSO	PD LASSO	PD LASSO	PD LASSO	PD LASSO
Mean of dep. variable	219.573	1.247	1.166	2.704	0.025
p-value: Romano-Wolf Correction treatment	0.941	0.495	0.535	0.109	0.436
p-value: Romano-Wolf Correction informal	0.020	0.248	0.416	0.010	0.030
p-value: Romano-Wolf Correction interaction	0.941	0.941	0.871	0.119	0.238

Note: District is the randomization strata. The double-post LASSO specification considers all individual controls, and individual district and survey date fixed effects in the possible control set. Controls include: individual's age, 0-1 indicator for whether married or not, 0-1 indicator for whether belongs to akan ethnic group or not, 0-1 indicator for whether self employed or not, household size, 0-1 indicator for whether operates in the informal sector, monthly personal income over an ordinal scale of 1 to 5, 0-1 indicator for whether attained junior high school (JHS) education, and individual's gender. Observations are at the subject $\times$ date level. Clustered standard errors (at the individual level; the level of treatment) are reported in parentheses. *** p<0.01 (1% level), ** p<0.05 (5% level), * p<0.1 (10% level). NE denotes not estimable, which occurs due to insufficient sample from individuals in the informal sector with severe mental distress experiences. Romano-Wolf multiple hypothesis correction p-values (Romano and Wolf [2005]) reported separately for consumption expense outcomes family (Total (GHS) Expenditure; Food-In (GHS); Food-Out (GHS); Utilities (GHS); Personal care (GHS); Educ. (GHS); Health (GHS); Durables (GHS)), and for mental health and domestic violence outcomes family (Threatened Partner 1-4; Hit Partner 1-4; log K10; Severe Distress 0-1).

Table A8: **Impacts of communication programs on well-being by gender**

VARIABLES	(1) Total (GHS) Expenditure	(2) Threatened Partner 1-4	(3) Hit Partner 1-4	(4) log K10	(5) Severe Distress 0-1
Communication Credit (β)	11.61	-0.0880**	-0.0632*	-0.0899***	-0.00200
	(11.04)	(0.0360)	(0.0351)	(0.0139)	(0.00724)
Female 0-1	1.489	-0.0625	-0.142*	0.0216	0.00284
	(23.09)	(0.0776)	(0.0751)	(0.0344)	(0.0182)
c.tmt_all#c.female0	9.465	0.0623	0.132	-0.0637	-0.0125
	(27.49)	(0.0939)	(0.0917)	(0.0406)	(0.0225)
Observations	2,019	2,019	2,019	2,019	2,019
Number of groups	0	0	0	0	0
District FE	Yes	Yes	Yes	Yes	Yes
Date FE	Yes	Yes	Yes	Yes	Yes
Controls	PD LASSO	PD LASSO	PD LASSO	PD LASSO	PD LASSO
Mean of dep. variable	219.573	1.247	1.166	2.704	0.025
p-value: Romano-Wolf Correction treatment	0.752	0.257	0.752	0.010	0.752
p-value: Romano-Wolf Correction female	0.861	0.861	0.861	0.287	0.861
p-value: Romano-Wolf Correction interaction	0.970	0.970	0.970	0.267	0.970

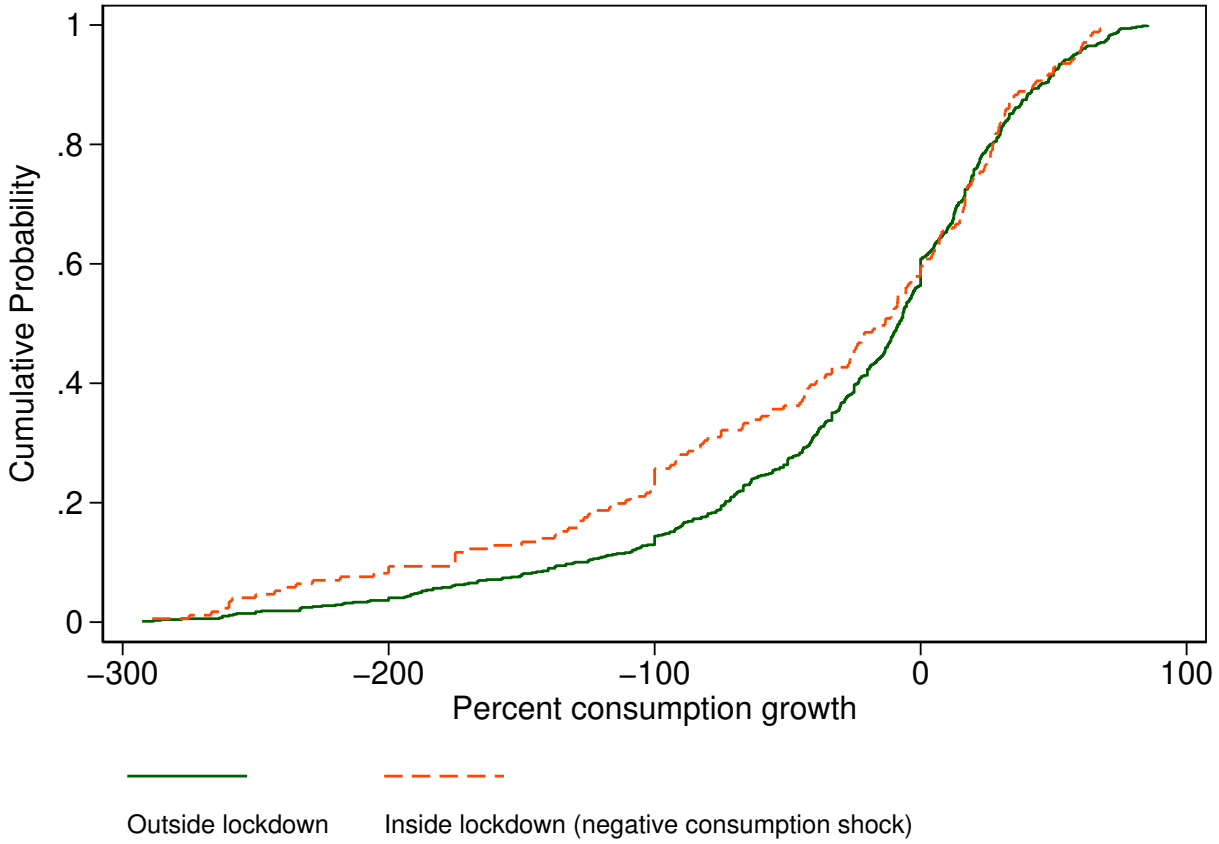
Note: District is the randomization strata. The double-post LASSO specification considers all individual controls, and individual district and survey date fixed effects in the possible control set. Controls include: individual's age, 0-1 indicator for whether married or not, 0-1 indicator for whether belongs to akan ethnic group or not, 0-1 indicator for whether self employed or not, household size, 0-1 indicator for whether operates in the informal sector, monthly personal income over an ordinal scale of 1 to 5, 0-1 indicator for whether attained junior high school (JHS) education, and individual's gender. Observations are at the subject $\times$ date level. Clustered standard errors (at the individual level; the level of treatment) are reported in parentheses. *** p<0.01 (1% level), ** p<0.05 (5% level), * p<0.1 (10% level). Romano-Wolf multiple hypothesis correction p-values (Romano and Wolf [2005]) reported separately for consumption expense outcomes family (Total (GHS) Expenditure; Food-In (GHS); Food-Out (GHS); Utilities (GHS); Personal care (GHS); Educ. (GHS); Health (GHS); Durables (GHS)), and for mental health and domestic violence outcomes family (Threatened Partner 1-4; Hit Partner 1-4; log K10; Severe Distress 0-1).

Table A9: **Impacts of communication programs on well-being by locked-down**

VARIABLES	(1) Total (GHS) Expenditure	(2) Threatened Partner 1-4	(3) Hit Partner 1-4	(4) log K10	(5) Severe Distress 0-1
Communication Credit (β)	0.466	-0.0856**	-0.0501	-0.0924***	-0.00684
	(11.05)	(0.0386)	(0.0377)	(0.0141)	(0.00729)
Locked-Down 0-1	199.0***	-0.00869	-0.0292	0.432***	-0.0119
	(60.61)	(0.0647)	(0.0660)	(0.0510)	(0.0192)
c.tmt_all#c.previouslock	64.46**	0.0406	0.0299	-0.0293	0.0151
	(25.07)	(0.0658)	(0.0661)	(0.0335)	(0.0185)
Observations	2,019	2,019	2,019	2,019	2,019
Number of groups	0	0	0	0	0
District FE	Yes	Yes	Yes	Yes	Yes
Date FE	Yes	Yes	Yes	Yes	Yes
Controls	PD LASSO	PD LASSO	PD LASSO	PD LASSO	PD LASSO
Mean of dep. variable	219.573	1.247	1.166	2.704	0.025
p-value: Romano-Wolf Correction treatment	0.871	0.198	0.871	0.010	0.871
p-value: Romano-Wolf Correction locked	0.050	0.030	0.406	0.406	0.693
p-value: Romano-Wolf Correction interaction	0.248	0.990	0.990	0.990	0.990

Note: District is the randomization strata. The double-post LASSO specification considers all individual controls, and individual district and survey date fixed effects in the possible control set. Controls include: individual's age, 0-1 indicator for whether married or not, 0-1 indicator for whether belongs to akan ethnic group or not, 0-1 indicator for whether self employed or not, household size, 0-1 indicator for whether operates in the informal sector, monthly personal income over an ordinal scale of 1 to 5, 0-1 indicator for whether attained junior high school (JHS) education, and individual's gender. Observations are at the subject $\times$ date level. Clustered standard errors (at the individual level; the level of treatment) are reported in parentheses. *** p<0.01 (1% level), ** p<0.05 (5% level), * p<0.1 (10% level). Romano-Wolf multiple hypothesis correction p-values (Romano and Wolf [2005]) reported separately for consumption expense outcomes family (Total (GHS) Expenditure; Food-In (GHS); Food-Out (GHS); Utilities (GHS); Personal care (GHS); Educ. (GHS); Health (GHS); Durables (GHS)), and for mental health and domestic violence outcomes family (Threatened Partner 1-4; Hit Partner 1-4; log K10; Severe Distress 0-1). NE denotes not estimable.

Figure A10: **Distribution of consumption growth among individuals inside and outside pandemic's lockdown areas**



Note: Figure plots the distribution (CDF) of consumption growth per week at endline for the different subsamples (lockdown areas vs non-lockdown areas). Observations are at the individual level. Median (mean) percent consumption growth is -13% (-45%) for individuals in lockdown areas and -8% (-27%) for those in non-lockdown areas. From a Kolmogorov–Smirnov (KS) test for the equality of distributions, p-value equals 0.020 (for equality test, we trimmed the individual consumption growth outcome at the 5% level). Equality tests reject the null that the distributional pairs are equal.

I.7 Definition of Relevant Select Variables – Questions

Communication constraints (un)mitigation:

Consider the last 7 days:

1. Unable to call in past 7days 0-1: `Were you confronted with the need to call others (i.e., family, friends or work) but unable to call because you/ household lacked enough communication resources to cover costs? 0=No, 1=Yes`
2. Borrow airtime 0-1: `Have borrowed airtime due to unexpected circumstances to make calls? 0=No, 1=Yes`
3. Seek digital loan 0-1: `Have taken a digital loan due to unexpected circumstances to make calls? 0=No, 1=Yes`
4. Unable to call due to COVID19 0-1: `Are you sometimes unable to see or communicate with your family and friends due to COVID19, its lockdown restrictions and other personal avoidance steps you have taken? 0=No, 1=Yes`

Gender and Domestic violence relations:

Consider last 7 days: Please indicate how often you act to the following:

USE CODES:

`1=Never (less than 1 time in 7 days), 2=Sometime (1-2 times in 7 days), 3=Often (3-4 times in 7 days), 4=Very often (5-7 times in 7 days), 5=No Answer (if you want/feel uncomfortable to say)`

1. Threatened Partner 1-4: `How often do you threaten to hurt your partner or someone close to your partner?`
2. Hit Partner 1-4: `How often do you hit or throw something at your partner?`

Mental Health (K10):

Consider last 7 days: Please indicate how often you feel about the following:

USE CODES:

1=None of the time (less than 1 time in 7 days), 2=A little of the time (1-2 times in 7 days), 3=Some of the time (3-4 times in 7 days) 4=Most of the time (5-6 times in 7 days), 5=All of the time (7 times in 7 days)

1. About how often did you feel tired out for no good reason?
2. About how often did you feel nervous?
3. About how often did you feel nervous that nothing could calm you down?
4. About how often did you feel hopeless?
5. About how often did you feel restless or fidgety?
6. About how often did you feel so restless you could not sit still?
7. About how often did you feel depressed?
8. About how often did you feel that everything was an effort?
9. About how often did you feel so sad that nothing could cheer you up?
10. About how often did you feel worthless?

Consumption Expenditures (weekly):

1. What is the total value (in GHS) of all food and beverage items your household (i) purchased and consumed, (ii) consumed from your own stock or production, or (iii) received as a gift and consumed over the last 7 days? NOTE: Please only include food and beverage items consumed in the 7 days ...GHS

2. What is the total value (in GHS) of all food and beverage items you or any member of your household purchased and consumed from outside the house over the last 7 days? NOTE: This includes items purchased outside the house in restaurants, cafeterias, canteens/kiosks, as well as products such as spirits, tobacco, stimulants, etc. ...GHS
3. What is the total value (in GHS) of house rents, house repair costs and utilities that were paid for, purchased, or acquired from other sources (ie gifts and in-kind) by your household over the last 7 days? NOTE: Utilities include sewerage, electricity, water, gas, cooking fuels, house servants, etc. ...GHS
4. What is the total value (in GHS) of products and services for personal use and care, that were paid for, purchased, or acquired from other sources (ie gifts and in-kind) over the last 7 days by your household? NOTE: Personal care products and services include barber services, electrical appliances for personal care, oils, soaps, etc. Personal use products and services include jewelry, accessories (watches, clocks, clothing, etc.), cultural services, mobile airtime services, financial service fees, transportation costs. ...GHS
5. What is the total value (in GHS) of education expenses (i.e., all tuition or fees including all educational scholarships) over the last 7 days by your household? ...GHS
6. What is the total value (in GHS) of consultation or treatment services, and pharmaceutical or therapeutic products purchased last 7 days by your household? ...GHS
7. What is the total value (in GHS) of durable products such as furniture, electronics and other household appliances, purchased over the last

7 days by your household? NOTE: This includes furniture, household appliances (large and small), repair of household appliances, miscellaneous accessories such as TVs, laptops, cars, mobile phones, bicycles, torches, batteries, solar lamps, etc. ...GHS

8. Total expenditure: add 1 to 8 ...GHS

I.8 Marginal Value of Public Funds (MVPF)

We use our causal estimates to compute the MVPF (Hendren and Sprung-Keyser 2020) for a policy that provides communication credit to low-income adults for two months. The MVPF is a ratio of society's willingness to pay (private benefit) for this policy to the net cost of the policy to the government (here, an "imagined" funder).

I.8.1 Society's Willingness to Pay (MVPF numerator)

We estimate this to include two main components.

First, is the averted (otherwise) social cost of mental health burden, ξ. Mental health disorders account for 13% of the overall global disease burden (Collins et al. [2011]), which is likely higher in low-income countries (Adhvaryu et al. [2019]); we assume 13%. Health expenditure per capita in Ghana is US$78 (World Bank [2018]). With a treatment effect of -10% reduced mental destress rate (or -25% for severe mental distress; we assume -10%), we conservatively estimate the averted social cost of mental health burden to be 0.10x0.13xUS$78=+US$1.014. This ξ estimate is very conservative: Addo et al. [2013] estimate that the average monthly household cost of mental healthcare in Ghana is US$60.24 (i.e., 2xUS$60.24=US$120.48 for two months), so with a treatment effect of -10% reduced mental destress rate and a national average household size of 4.5 people per household, this will imply 0.1xUS$120.48/4.5=+US$2.68 averted social cost, which is 2.6 times larger. Second, is the individual beneficiary's willingness to pay for not visiting the hospital or not getting mentally unwell, η. This includes three sub-components: (i) out-of-pocket health bill η_1 (0.10x0.13xUS$63=+US$0.82; out-of-pocket health expense is US$63 [World Bank 2018]); (ii) travel cost to health centers η_2 (assumed to be 20% of the estimated out-of-pocket health bill = 0.2xUS$0.82=+US$0.203; Addo et al. [2013]

suggest using 74% for such indirect costs but we assume 20%); and (iii) lost income from missed work η_3 (assumed to be only 5% of the average earnings of non-farm enterprises = 0.05xUS$231=+US$11.55 for two months; most individuals in our sample [around 80%] operate informal non-farm enterprises and the total average annual earnings of non-farm enterprises is US$1,385 in 2021 US$ [Ghana Statistical Service, GLSS 7 Table 9.6]; the treatment effects were all concentrated on individuals operating informal enterprises, see Table Table A7).[1]

Combining all the components, the MVPF's numerator = $\xi + \sum_{i=1}^{3} \eta_i$=US$13.590 for the average treated individual.[2].

I.8.2 Net Cost to the "imagined" Funder / Government (MVPF denominator)

We estimate this to include two main components.

First, is the cost of providing communication transfer for two months, G (+US$7.0). Second, is the missed communication services tax (CST) revenue if individuals do not communicate or stay connected, μ. In Ghana, the CST is used to finance the National Youth Employment Programme (NYEP) ($\geq$20% of the CST) and support other national development activities. Using the prevailing 5% CST rate (Ghana Revenue Authority [2020]), we estimate that the government loses 0.05xUS$7.0= -US$0.35. In computing the net cost to the government of this policy, it is important to note that (i) communication is a

[1]Informal non-farm business income may either be consumed in the household (where we find no impacts) or invested (where our impacts are concentrated given that our treatment effects were all concentrated on individuals operating informal enterprises).

[2]We drop the direct value of the communication subsidy to beneficiaries (+US$7.0) to avoid double counting. In standard maximization models, the willingness to pay would have just been the size of the subsidy *if* people are fully optimizing. Here, it is reasonable to assume that people are not fully optimizing (see e.g., our evidence that the installment program has larger and more sustainable effects compared to the lumpsum, with the exception of consumption, which may reflect either time inconsistency or social pressure problems from receiving one-time large transfers). Given this potential mis-optimization (the envelope theorem does not easily apply and so the benefits the subsidy delivers to people are not already captured by the subsidy), the willingness to pay includes the benefits on mental health and its associated cost reductions (ξ and η).

network good so the ultimate economic incidence of these communication transfers extends to other individuals: others might benefit from receiving mobile phone calls from the treated individual (positive externalities) but this might also create congestion hassle or traffic on the communication network (negative externalities). We assume (i) and (ii) to be equal. If the positive externalities dominate, as we would expect (see Björkegren [2019] for an example in Rwanda), then the total cost of this policy is over-estimated in this dimension. Further, we conservatively did not factor in the reduced fiscal cost from less hospital visits generally due to the reduced likelihood of mental health disorders.

Lastly, combining all the components, the MVPF's denominator = G+μ=US$6.65 for the average treated individual.

I.8.3 MVPF Estimate

Taking the ratio, we estimate a conservative MVPF of providing communication credit to be $\frac{13.590}{6.650} = 2.044$. Notice that in determining the MVPF, we intentionally bias the estimates to understate the benefits and overstate the costs. With a current total population of about 31,732,129 in Ghana, an adult population of 18,073,230 (57% of the total population), and the poverty rate of our study's sample of adults being 22%, the policy's total benefit will be US$54,035,343 (=0.22x18,073,230xUS$13.590) against a total cost of US$26,441,135 (=0.22x18,073,230xUS$6.650).