The Value of Communication During a Pandemic

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NBER COVID-19 and Health Outcomes Conference
Spring 2021

Roadmap

1. Motivation
2. Experiment: Design
3. Experiment: Results
4. Conclusion
5. Connections to the Literature

Motivation

- SIMPLY IMAGINE THAT YOU'RE UNABLE TO COMMUNICATE - MAKE A PHONE CALL, USE THE WEB, ACCESS THE SOCIAL MEDIA, ETC - WHEN THE NEED ARISES UNEXPECTEDLY
  - Does such (unmitigated) communication barriers matter, particularly during a pandemic? on individuals' psychological and economic well-being?
  - Should communication interventions come in as a one-time large transfer or many small tranches?
- **Fact 1:** Throughout the world, major communication interventions have been initiated in response to unexpected arrival of COVID19
  - E.G. ATT Inc. (free 10GB for 60 days), Gov't of Ghana (Communication Service Tax CST $\downarrow$ 9% to 5%), #ZoomTogether, etc. (In paper: global review of programs)
  - Such programs more crucial in developing ctrs: large informal sectors + COVID19 crisis threatens individuals who face constraints by credit, by savings, and by psychology (Banerjee-Niehaus-Suri [2019])
- Yet, poor evidence on impacts of such programs during a pandemic

Motivation

- **Fact 2:** Administrative data on mobile financial transactions illuminates potential value of communication:
  - $\downarrow$ Overall market activity but $\uparrow$ Demand for mobile airtime/ purchases during difficult times of COVID19
- **Fact 3:** Baseline COVID19 survey data (low-income, Ghana)
  - 68% of subjects indicated need to call or connect with others (family, friends, employers) increased due to COVID19's disruptions
  - Yet, over 52-62% indicated sometimes when the unexpected need arises, they unable to call or connect due to COVID-19's hardships
- Thus, programs that directly mitigate such communication barriers will likely have larger impacts

Overview: Design and Results

- **Field Experiment:** Design and deploy two communication programs:
  - Lumpsum: 40GHS (US$7.0) lump-sum mobile calling credit
  - Installments: 20GHS (US$3.5) monthly tranches of mobile credit (2X)
- Nationally representative set of 1131 low-income individuals in Ghana

- **Results:** Dramatic decrease in unexpected communication constraints:
  - interventions mitigate subjects' inability to meet unexpected communication needs and stay connected: -44% to -78%
- Meaningful well-being improvements:
  - $\downarrow$ Mental distress: -9.8%
  - $\downarrow$ Severe mental distress: -2.7pp=-26%
  - Domestic Violence: $\downarrow$ Threaten partners (-6.3%) but **n.s.** Hitting partners
  - **N.s.** impacts on consumption expenditures
- Installment credit program has larger more sustainable effects compared to lumpsum

Experiment: Design

Context

Study set in Ghana

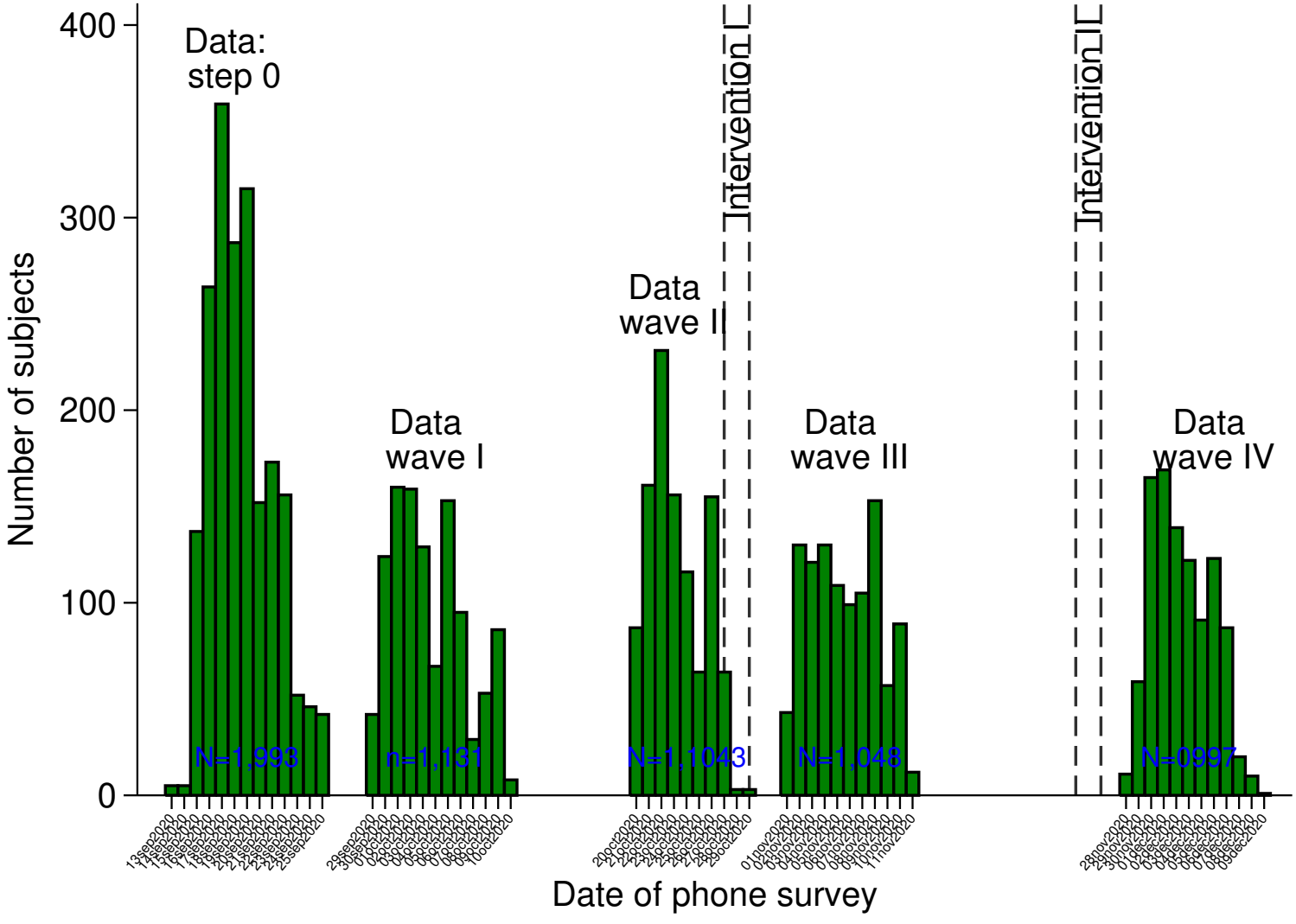
- Very high mobile cellular subscription rate: 134% (World Bank 2020)
- Draw on existing nationally representative baseline frame (GLSS7) (kept by our research partner - Ghana Statistical Service)
- Focus on poor individuals (22%+ poverty rate) and largely married (91%)

Pandemic: COVID19

- Economic impacts well beyond health due to restrictions on mobility + interactions:
  - March 30, lockdown in two most economic regions: Accra + Kumasi Metropolitan Areas
  - later nation-wide closing of all schools and ban on other activities
  - Inter-city travel (except for essentials) suspended
  - Intra-city travel vehicles reduced passengers to observe social distancing
  - Over April 20, lockdown removed, some restrictions were relaxed, yet individuals continue to battle
  - Nearly 100% of subjects indicated being aware of COVID19 and its restrictions

Timetable

Figure: **DATA COLLECTION AND TIMETABLE**



Intervention

- Set total value of communication credit for each subject to 40GHS (21% of median monthly purchase)
- We use a 1x3 factorial design, randomizing 1131 representative subjects into:
  - **Trt Program (Lump-sum):** individuals received 40GHS as mobile credit for one time (not discounted) (376 individuals)
  - **Trt Program (Installments):** 40GHS was split into two and subjects received this as mobile credit in tranches (20GHS for two times) (371 individuals)
  - **Control Program:** individuals received no mobile credit (384 individuals)
- We partnered with a major Telecommunication company to directly deliver the mobile credits

Measurements

- Communication constraints mitigation:
  - ask whether subjects' unexpectedly confronted with need to call or connect with others but **unable** to because they lacked enough communication resources to remedy the costs
  - incidence of **borrowing** SOS airtime, or seeking **digital loan** due to unexpected circumstances to connect with others
- Consumption expenditures: food, utilities, personal care, education, health, durables
- Mental health:
  - incidence of **mental distress**: using Kessler Psychological Distress Scale (K10) $\in [10, 50]$
  - **severe** mental distress: K10 values ≥ 30 (Adhvaryu et al. [2019])
- Gender relations (DV): elicit directly from subject whether **Threatened** or **Hit** his/her partner in past 7 days

Experiment: Results

Treatment Effects

- We report
  - Meta effect of communication credit assignment (unsaturated) +
  - Separate effects for different treatments (saturated model)
- Subject i in district d at date t to the random treatment variable(s) M_{id}:

$$y_{idt} = \beta \mathbf{M}_{id} + \mathbf{X}'_{id}\xi + \eta_d + \mu_t + \epsilon_{idt}$$

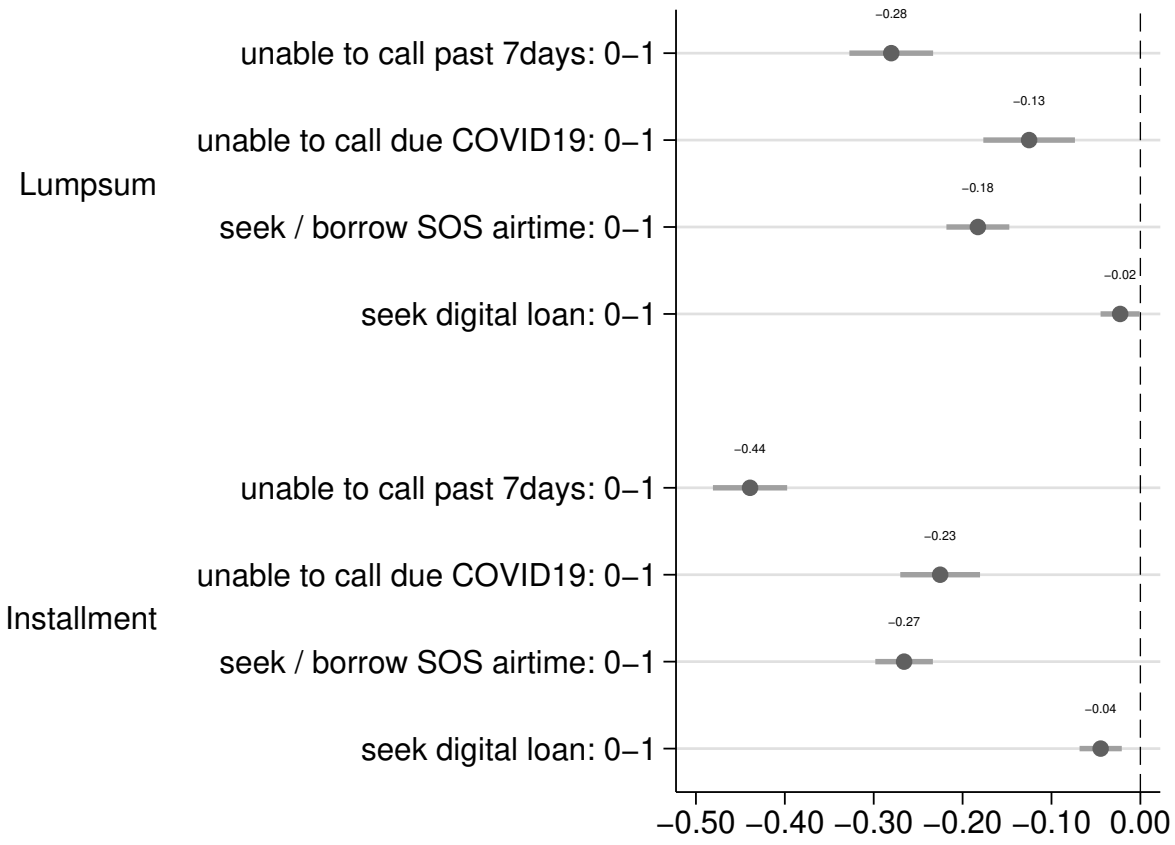
- **Inference:** all errors clustered at the district level (stratification unit) (Cameron-Miller 2015)
- **Attrition:** Lee (2009) attrition bounds + Imbens-Manski (2004) confidence sets
- **Select $\mathbf{X}'_{ivd}$** using post-double-selection LASSO (to minimize researcher DF and p-hacking possibility; Belloni et al. 2014)

Un-Mitigated Communication ↙: saturated model

Treatments Mitigated Communication Constraints? yes

- Very large decrease (-44% to -78%), particularly Installment program
- **Effects over trajectory:** sustained larger impacts for Installment relative to Lumpsum program

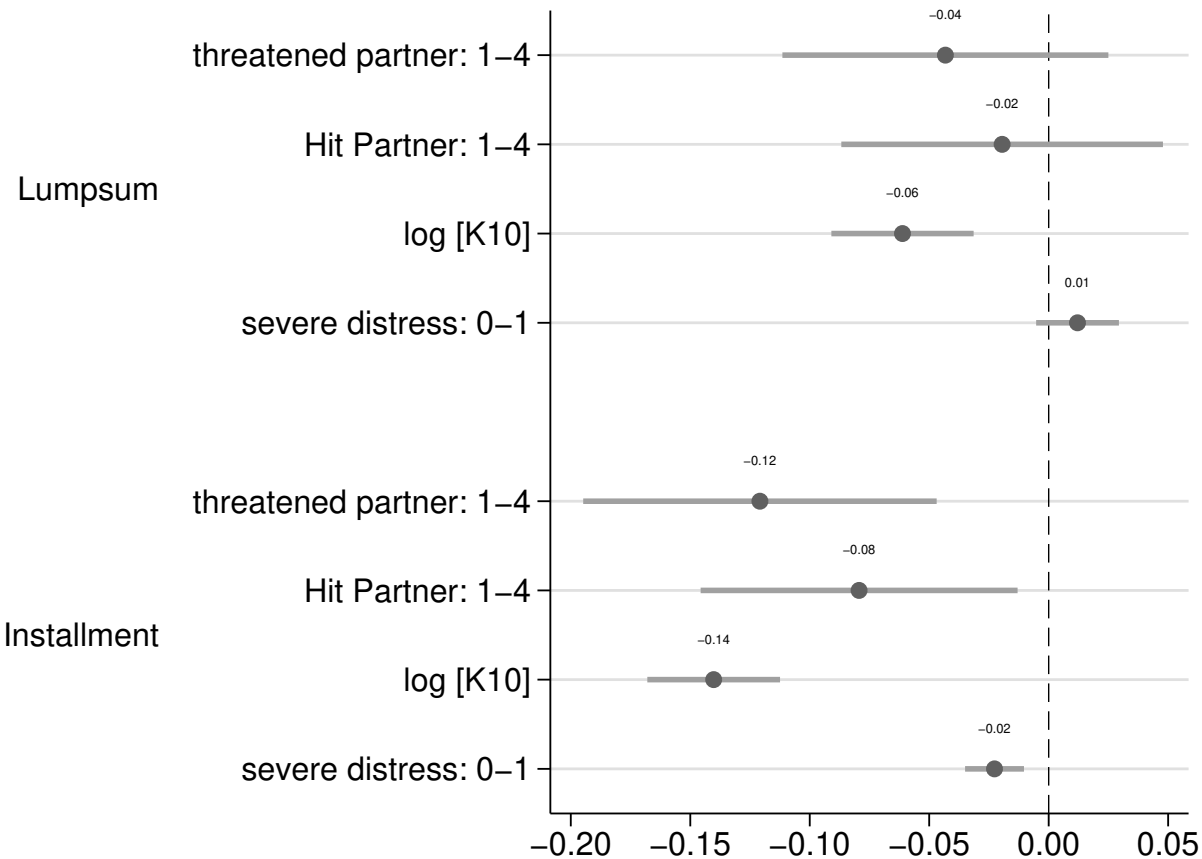
Figure: **TREATMENT EFFECT ON UNMITIGATED COMMUNICATION CONSTRAINTS**



District (randomization strata) FEs, baseline outcomes, controls $\mathbf{X}_{id}$ from post-double-selection LASSO. Clustered SEs (district level). N=2019

Real Effects ↗: saturated model

Figure: **TREATMENT EFFECTS OF COMMUNICATION PROGRAMS**



Market district (randomization strata) FEs, baseline outcomes, controls $\mathbf{X}'_{id}$ from post-double selection LASSO. Clustered SEs (district level). N=2019

Meaningful Improvements across outcomes:

- ↓ Mental distress: -9.8%
- ↓ Severe mental distress: -2.7pp =-26%
- Domestic Violence: ↓ Threaten partners (-6.3%) but **n.s.** Hitting partners
- **N.s.** impacts on consumption expenditures
- **Effects over trajectory:** sustained larger impacts for Installment program
- **Heterogeneity**: Much impacts on
  - (i) Extremely poor,
  - (ii) Individuals in informal sector,
  - (iii) Individuals in previously lockdown regions,
  - (iv) Female experiences better mental health but **n.s.**

Conclusion

COVID19 pandemic uncovered a lot of economic + mental health crises – particularly for people bound by internal constraints

- We provide new experimental evidence on impact of providing communication transfers during a pandemic:
- (Dramatic) $\downarrow$ in unexpected communication constraints:
  - Subjects' better able to mitigate their inability to meet unexpected communication needs + stay connected
- Meaningful well-being improvements:
  - $\uparrow$ mental health, (modestly) on domestic violence, but null on consumption expenditures
- Policy and design:
  - Pandemics-triggered communication initiatives (widespread) improve psychological and (likely) economic well-being
  - Programs are more valuable *if* they come in as installments of communication transfers rather than one-time

Connections to the Literature

- Interpersonal Transfers post semi-covariate unexpected shocks
  - Blumenstock-Eagle-Fafchamps *JDE* (2015), Pulver *WP* (2009), Jack-Suri *SC* (2016)
  - We look at fully-covariate-prolonged shock + randomize communication transfers
- Mental health and economic impacts of ICT
  - Jensen *QJE* (2007)
  - We offer a short-run view of what ICT does during a pandemic (ICT-mental health connection)
  - Non-existent: mental health - ICT
- Mental health and economic impacts of COVID-19 pandemic + disease epidemics
  - Adhvaryu et al *JPE* (2019), Berkouwer et al *WP* (2020), Banerjee et al *WP* (2020), Archibong-Annan *WP* (2020)
  - We cleanly isolate ICT and document how to rely on it to mitigate impacts of pandemics-epidemics
- Policy aspects: We add to the space of potentially resilient policy initiatives aimed at tackling pandemics (mitigating their impacts)