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Evaluation of a national program to distribute free face masks for COVID-19 prevention in Uganda: evidence from Mbale District

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Background
The slow rollout of vaccines in low- and middle-income countries (LMICs) and the emergence of new COVID-19 variants underscore the critical role masks continue to play two years into the pandemic. Given face masks' low cost and relative ease of use, a key question facing policymakers is whether populations are heeding the advice to wear masks, and what strategies are especially effective to encourage mask take-up. We evaluated a national program to distribute masks in Uganda, which reached the Mbale District in March 2021, to assess whether distribution of free masks alone or distribution paired with education about masks and COVID-19 encourages mask use.

Objective
To test whether distribution of free masks affected mask behavior and whether pairing mask distribution with education about masks and COVID-19 affected mask attitudes, knowledge, and behavior.

Methods
We collected data about mask behavior before (04th to 25th February 2021) and after (11th April 2021 to 30th April 2021) masks were distributed by volunteers in the Mbale district of Uganda. Trained enumerators directly observed mask wearing in public places and collected phone surveys about masks, COVID-19, and socio-economic functioning. We compared observed and self-reported mask behavior before and after masks were distributed. We also tested whether training volunteers from randomly selected villages to educate the public about COVID-19 and masks affected behavior, attitudes, and knowledge among mask recipients.

Results
We collected 6,381 direct observations of mask use at baseline and 19,855 observations at endline. We conducted a listing of 9,410 households eligible for phone surveys and randomly selected 399 individuals (4.2%) at baseline and 640 (6.8%) at endline. Fewer than 1% of individuals were observed wearing masks at baseline: 0.9% were seen with a mask and 0.5% wore masks over mouth and nose. Mask wearing significantly increased at endline but remained low: 1.8% of people were observed with masks and 1.1% were seen wearing masks correctly after the distribution campaign. At the same time, a high proportion of people reported using masks: 63.0% of people reported using masks at baseline and 65.3% at endline in villages; 94.7% of people reported using masks at baseline and 97.4% reported using masks at endline in public places. We found no differences in knowledge, behavior, or attitudes among mask recipients in villages where volunteers were tasked with conveying information about COVID-19 and masks during distribution.

Conclusion
Mask use remained low in Mbale district of Uganda during study observation period, February - April 2021, even after free masks were distributed. Encouraging new health behaviors may involve more intensive interventions that are provided directly to mask recipients.

Background

COVID-19 continues to pose a major threat to countries around the world, but countries in sub-Saharan Africa have so far avoided large outbreaks. In Uganda, the official case count as of 17th February 2022 are 162,932 confirmed infections and 3,582 coronavirus-related deaths.(*1*) One explanation for the relatively low spread of COVID-19 are strict lockdown measures that were imposed early but were eventually eased due to harsh socio-economic consequences.(*2*) But the slow distribution of vaccines in in low- and middle-income countries and the emergence of new variants such as Omicron underscore the critical role masks continue to play in reducing the burden of the SARS-CoV-2 virus.

Although conflicting recommendations about masks have been issued over time, recent evidence suggests that face masks significantly reduce the spread of SARS-CoV-2. A randomized trial in Bangladesh found that a 29 percentage-point increase in mask use led to a 9% reduction in symptomatic infections over a 10-week period (*3*). The reductions were especially large among the elderly, where infections fell by 15-35%. Given face masks' low cost and relative ease of use, a key question facing health policymakers is whether populations are heeding the advice to wear masks, and what strategies are especially effective to encourage take-up. We evaluated a national program to distribute free masks in Uganda to assess whether distribution of masks paired with education about masks and COVID-19 affected mask behavior, attitudes, and knowledge.

When measuring mask use, an important point is that people tend to overstate their compliance with mask rules because of social desirability bias. (*4*) In Kenya, 88% of survey respondents said they wear masks to public places but only 10% of people were observed with masks.(*5*) This gap illustrates that, although most people conform to the mask-wearing norm in survey responses, adopting this new health behavior in practice remains a challenge. When assessing the effectiveness of behavioral interventions, it is important to directly observe mask use, both to improve measurement accuracy and to capture any bias in social norms and adopted behavior.

Mask distribution alone may be effective, if lack of access to affordable masks is the main barrier, similar to what has been shown for other health goods.(*6, 7*) On the other hand, adoption

may be low because households' misperceptions of the severity of COVID-19 or of the effectiveness of masks.(*8*) If the principal reason for under-adoption is that masks are not salient or are often forgotten at home, a small behavioral nudge may lead to increased mask adoption.(*9*) Lastly, mask wearing is publicly observable, and mask-related policies have been a matter of political contention. Understanding and shifting the social dynamics behind mask adoption seems therefore crucial, as a nascent literature shows that social signaling can significantly increase the adoption of health goods.(*10*) Distinguishing between these mechanisms may shed light not only on mask use in Uganda, but on the mechanisms driving low adoption of publicly observable health behaviors more generally.

We evaluated mask use behavior in Mbale district, eastern Uganda, which was part of national program that aimed to distribute free face masks to all citizens of the country, or approximately 30 million masks. We measured whether the distribution effort alone affected mask take-up, or if pairing the distribution with education campaigns about the virus and masks affected take-up in study communities.

Methods

We measured mask use before and after mask distribution campaigns in the Mbale district of Uganda; 04th to 25th February 2021 and 11th April 2021 to 30th April 2021, respectively. We obtained non-causal estimates of the association between distribution campaigns and mask use by comparing directly observed and self-reported mask behavior before and after distribution took place. We then estimated the causal impact of pairing mask distribution with education by randomly assigning which communities received additional information about masks and COVID-19 through volunteers who delivered the masks to communities.

Setting

Mbale District is located in Eastern Region of Uganda near the border with Kenya and has a major trade route running through the district. The total population of Mbale is 465,000 people who live in 27 subcounties. We set to work in four subcounties (Busiu, Busiu Town Council, Bumasikye, Lukhonje) that have a total population of over 45,000 people who live in 173 villages, randomly selecting 90 villages to collect data. Due to implementation challenges we

dropped one of the subcounties, Busiu TC, from our study, which yielded a total sample of 57 villages where we conducted observations and phone surveys before and after the intervention.

National mask distribution campaign

The government of Uganda aimed to distribute a free face mask to all citizens over the age of 5, or approximately 30 million masks. Mask distribution started in June 2020, first prioritizing districts that were considered as highest risk for COVID-19 transmission: those on the borders with neighboring countries and highway districts where truck drivers moving from distinct corners of the country were possibly making contact with the local population. Districts with high concentrations of populations were also given higher priority. By November 2020, approximately half of the districts in Uganda had received masks, at which point the program slowed down ahead of the upcoming holidays and national elections. Following the elections in January 2021, the program resumed in February, and the Mbale district distributed them in early March.

Intervention

The national mask distribution program focused on delivering a cloth mask to all eligible citizens of Uganda who are 6 years or older. Last mile distribution logistics were left up to discretion of the district officials. In Mbale, district officials distributed masks to all residents on 13-14 March 2021 through the extensive network of village health teams (VHTs). We partnered with the Office of the Prime Minister, the Ministry of Health, and Mbale district officials to measure the impact of disturbing masks and combing the free mask distribution with additional training of volunteers who were tasked with distributing the masks in villages. Volunteers from a randomly selected set of villages participated in a training about COVID-19, how masks work, and proper ways to wear masks and were asked to convey this information to mask recipients. All volunteers received information that adhered to the Ministry of Health guidance.

Data

We make use of two main data sources: i) phone surveys with randomly selected respondents, ii) direct observations of mask behavior in public spaces.

Phone surveys

Prior to conducting the phone surveys, we conducted a listing of all households from the villages randomly selected to be used as the sampling frame for the phone surveys. Local village officials (including village health teams, councilmen, and village elders) were contacted by the study staff to compile lists of all households from each village.

Once sampling frame was established, we selected a simple random set of people from each study village to participate in phone surveys which were conducted two rounds, baseline and endline. The phone survey was designed to be population representative of the study area. Households in all villages were called in random order (stratified at the village level) to guarantee geographic representativeness over time. In each round, respondents are randomly allocated to enumerators. Baseline phone surveys were conducted prior to the experimental start date (04 February 2021 and 25 February 2021), targeting 7 respondents in each village. Households were called in random order, with replacement if respondents could not be reached after 6 attempts on three consecutive days, with at least one attempt during each of the following time slots (morning, midday, afternoon, evening). This survey captured information about household mask ownership, COVID-19 knowledge, and economic activity. Approximately 4 weeks after the experimental start (11 April 2021 and 30 April 2021), we collected endline phone surveys, targeting 10 households per village. Respondents were replaced if they could not be reached after 6 attempts on 3 consecutive days, with at least one attempt during each of the following time slots (morning, midday, afternoon, evening). Endline surveys re-collect information from the baseline phone surveys but also add in questions about mask distribution (e.g. whether the household was visited by VHTs, whether the household received masks, whether someone provided mask information, etc).

Mask Observations

Self-reports in phone surveys may overstate mask and social distancing behavior because of social desirability bias (Jakubowski et al. 2021). We therefore conducted more objective observation of publicly observable behavior: Enumerators observed public spaces from a safe distance and recorded mask use, type and features of mask wearing and social distancing by passersby. Each village was observed for at least three 60-minute time slots on different parts of

the day (morning, early afternoon, late afternoon). No human subjects data were collected as part of direct observations: the enumerators were not collecting any identifiable information and all observations took place in public spaces. Observations were conducted concurrently with the phone surveys, in two waves: baseline and endline. Given the implementation issues that prevented us from repeating observations in one subcounty, we expanded the set of villages observed in the remaining subcounties at endline to maintain our power for statistical testing.

Statistical Models

We tested whether there was an association between free mask distribution and mask using a pre-post design analysis. The estimate is non-causal since we are not able to account for any changes in mask use between baseline and endline (such as political situation, seasonal trends, changes in COVID-19 infections over time) that could have potentially affect mask use. The association between mask distribution and use was estimated with regression models in which the outcome variable was regressed on an indicator for whether the observation was from endline, controlling for a vector of individual characteristics of participants (sex, age, age-squared, marital status, whether household had any children under 5 years, and if the respondent did any non-agricultural work). Standard errors were clustered at the village level.

We then tested whether pairing the free mask distribution with education campaigns about masks and COVID improved mask uptake and changed attitudes and knowledge towards masks. We did this by fitting analysis of covariance (ANCOVA) regression models(*11*) in which the outcome variable was regressed on an indicator for intervention, set to 1 if respondent lived in a village that was randomly selected to receive COVID-19 and mask education, or set to 0 in a control villages. Models controlled for the baseline value of the outcome variable (set to mean if missing and had standard errors clustered at the village level) and standard errors were clustered at the village level.

Sensitivity Analysis

One subcounty was excluded from the analysis due to implementation issues. Consequently, we expanded the set of villages we observed at endline in the remaining subcounties to maintain our power for statistical analysis. We run the pre/post analysis using the full set of direct

observations and run sensitivity analysis of the same models using a restricted sample of observations from the same communities that were observed at baseline and endline.

Ethics statement

Study procedures were approved by the Makerere University School of Medicine Research and Ethics Committee (Uganda), the Ugandan National Council for Science and Technology (Uganda), and the University of California, Berkeley, Committee on Human Research (United States).

Results

We recorded 6,381 direct observations of mask use at baseline and 19,855 direct observations of mask use at endline (Table 1). Most observations were estimated to be conducted on males (63%) and nearly half on people who are middle aged (46% were in the 26-45 years old category). Approximately 16.3% of observations at baseline and 12.9% at endline were based on interactive activities and another 8.9% on shopping or vending. About 12.3% of observations at baseline and 16.0% of observations at endline were about commuting activities on public transportation, primarily boda bodas. Majority of the observations took place in crowded spaces.

We conducted a listing of 9,410 households eligible for phone surveys and randomly selected 399 individuals (4.2%) at baseline and 640 individuals (6.8%) at endline. Phone surveys were conducted with. The average age of respondents was 43 years at baseline and 42 years at endline and about half were female (47% at baseline and 45% at endline). Most people had basic education level of either no formal schooling or primary school (>60%) and majority were farmers (>80%). Vast majority of respondents' households had young children under 5 years in the household.

Directly observed mask use was very low in the study region at the time of data collection (Figure 1). Fewer than 1% of observed people had masks with them at baseline and 1.9% of observed people had a mask at endline (difference: 0.9 percentage points, 95% CI [0.4 – 1.5], $p<0.01$). Even fewer people were seen wearing masks correctly over their mouth and nose: 0.5% at baseline and 1.1% at endline (difference: 0.6 percentage points, 95% CI [0.2 - 0.9], $p<0.01$).

Study findings did not change when we restricted the sample to direct observations repeated in the same set of villages (Supplementary Appendix).

Mask use was reported by the vast majority of phone survey respondents: 94.7% said they always or sometimes wore masks to public places at baseline and 97.4% said they always or sometimes wore them at endline. Self-reported mask use increased significantly after mask distribution campaigns (Table 2 Panel B), with the largest increase in usage reported by participants who visited market centers (adjusted difference of 10.2 percentage points from baseline, 95% CI 4.3-16.1). Respondents reported different levels of mask wearing depending on the type of place they visited – mask use was highest when we asked generally about public places, followed by religious gatherings and public transportation. Mask use was the lowest when respondents were at work or visiting another household.

We found variation in observed mask use when we stratified direct observations by activity type (Figure 2). Mask use was highest among commuters. Before mask distribution 2.8% of commuters were observed wearing a mask correctly and 4.5% of commuters had a mask with them. After the intervention, mask use among commuters increased to 4.4% of people seen with a mask and 6.1% seen wearing the mask correctly over mouth and nose. Mask use was very low among all other activity types, including people who were seen talking or interacting with each other.

We found no statistically significant differences in mask behavior, attitudes, or knowledge in villages where volunteers who were trained about masks and COVID-19 were tasked to educate the public about these issues (Table 3). Only half of survey respondents (50.6%) knew that COVID-19 could be spread through breath. Nearly everyone (97.5%) said that masks reduce the spread of COVID. Majority of respondents (77.0%) believed that people in Uganda were at risk of COVID-19 infection. Among the most commonly cited new behaviors since the start of COVID were masks wearing (86.3%) and washing hands more frequently (93.0%). Only 32% of respondents said they avoided large group gathering since the start of the pandemic. About half of the respondents reported some flu-like symptoms in the past 30 days and 36% said they lost

time from work or usual activities due to illness. More than half of the surveyed respondents reported feeling anxious (56.1%), depressed (61.1%), or lonely (51.9%).

Discussion

Our pre- and post- intervention study evaluated the effect of free face masks alone and free masks paired with education in Mbale district, eastern Uganda, during a large-scale national campaign to deliver free masks to citizens of Uganda. We measured mask use through directly observing people in public places and through self-reports via phone surveys. We found very limited compliance with mask rules using direct observations and high compliance with masks mandates using self-reported data. At baseline, the proportion of mask use was very low: 0.5% of observed people were seen wearing a mask over their mouth and nose and 0.9% were seen carrying a mask but not wearing it at time of observation. Though mask use significantly increased by endline, it remained low with 1.1% seen using a mask correctly and 1.9% having a mask with them; an increase of only 0.6 percentage points and 0.9 percentage points, respectively. This suggests that having access to masks was not the main reason for low adoption of mask use in the region. Behavioral interventions that address social norms may be needed to alter mask behavior.

Among the main findings from this study is the vast discrepancy in self-reported vs observed mask use. Very few people who we observed in public wore masks, but a majority reported always or sometimes wearing masks to public places. This finding is in line with previous research in Kenya, where a similar discrepancy was found. (*5*) Using phone surveys to measure changes in health behaviors such as mask wearing suffers from social desirability bias. (*4*)

An important caveat to interpreting the study findings is that data collection was timed to coincide with when masks were being distributed in Mbale district rather than when COVID-19 surges occurred. Coincidentally, COVID-19 cases were quite low in Uganda in February - April 2021, when data were collected and masks were distributed. Subsequent surges resulted in significant morbidity and mortality in the country, which may have affected norms around mask wearing. Our study is a snapshot of mask wearing behavior in one district and for a limited amount of time; future research should explore whether heterogeneity in COVID-19 severity and

the norms around mask wearing, which may shift at times of surges, affects mask wearing behavior and attitudes.

Layered on top of the national campaign to deliver masks was a randomized intervention in which volunteers who were distributing masks were trained about COVID-19 and masks and asked to deliver messages from the training to mask recipients. We found no evidence that training volunteers to educate mask recipients about COVID-19 and masks affected survey respondents' knowledge or attitudes about masks.

Our study was subject to several limitations. Since mask distribution was not randomized, the increase in mask use from before to after masks were distributed is a non-causal estimate. In other words, multiple issues not related to mask distribution may have affected mask use, which could explain the change in mask use observed in the study. Second, although the volunteer training intervention was randomized, our study lacked the capacity to observe how well the volunteers conveyed the information from the training to mask recipients. It is possible that information was not conveyed as it was intended (or at all) when volunteers visited households to deliver masks. Third, mask use observations were subject to bias since we could not be certain whether people who we observed in villages lived there and if people carried masks in a place that was out of sight to the observers. Fourth, self-reported data, especially when it is related to socially-desirable behaviors, is known to suffer from bias.(*9, 12*) Expecting some level of reporting bias, we asked participants not only about their own mask use behavior but also the behaviors of others in the community. Although the proportion of others in the community wearing masks was lower than self-reported mask use, these estimates were still substantial overestimates of the independent observations.

As COVID-19 continues to pose a threat to countries around the world, policy officials are faced with finding the most effective ways to protect their citizens. Our study gives insight about where investments in interventions may yield the largest impact. We find that distributing free face masks alone did not meaningfully increase mask use. Behavioral interventions may be needed to affect change in mask usage, and focus should be on finding cost-effective solutions.

But relying on self-reports to convey information about the benefits of masks may not be the ideal solution.

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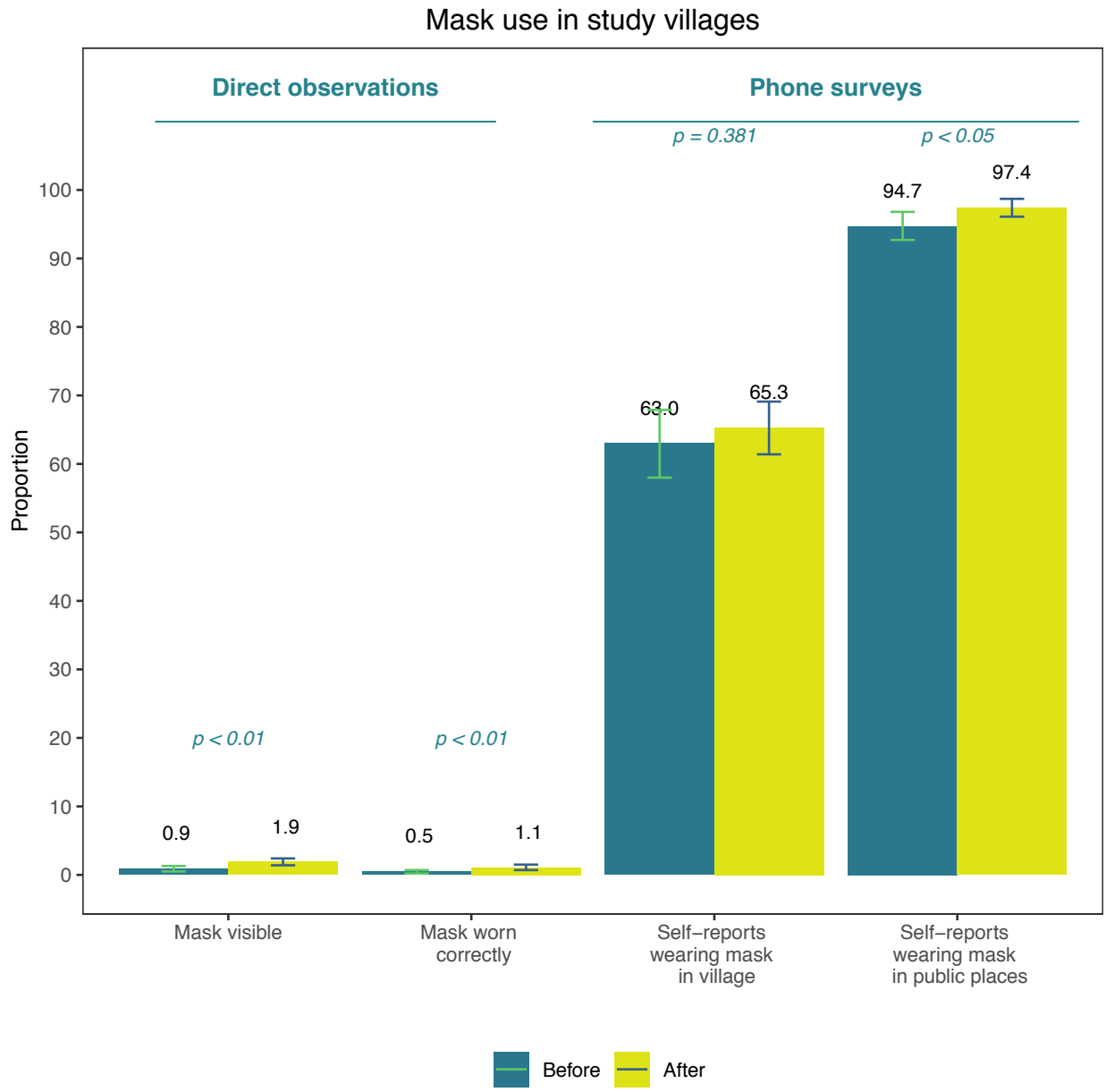
Table 1. Description of study sample

Panel A: Mask Observations	Baseline	Endline
	6,381	19,855
Number of villages in sample	54	87
Observed female sex	2368 (37.1%)	7,485 (37.7%)
Observed age categories		
18-25	1848 (29.0%)	5,506 (27.7%)
26-45	2960 (46.4%)	9,731 (49.0%)
46-60	1170 (18.3%)	3,599 (18.1%)
61+	403 (6.3%)	1,019 (5.1%)
Observed area is crowded / busy	4255 (66.7%)	11,887 (59.9%)
Observed activity		
Shopping / vending [a]	569 (8.9%)	1,771 (8.9%)
Walking by / sitting / spending time alone	2447 (38.3%)	7,235 (36.4%)
Working	1377 (21.6%)	4,699 (23.7%)
Commuting	785 (12.3%)	3,181 (16.0%)
Talking / interacting with others	1042 (16.3%)	2,565 (12.9%)
Other	161 (2.5%)	404 (2.0%)
Panel B: Phone Surveys	Baseline	Endline
	N=399	N=640
Age	43.2 (17.9)	42.3 (17.6)
Female sex	188 (47.1%)	288 (45.0%)
Married or living with partner	271 (67.9%)	446 (69.7%)
Education categories		
None	20 (5.0%)	49 (7.7%)
Primary	221 (55.4%)	350 (54.7%)
Secondary	133 (33.3%)	201 (31.4%)
Above secondary	25 (6.3%)	40 (6.2%)
Agricultural work	324 (81.2%)	568 (88.8%)
Non-agricultural work (self-employed or salary)	149 (37.3%)	186 (29.1%)
Household size	6.7 (3.2)	6.1 (3.1)
Household has children under 5 years	235 (58.9%)	341 (53.3%)
Household has school-age children	363 (91.0%)	558 (87.2%)

[a] Includes any activity that requires customer service interactions such as shops, barbers, restaurants, etc.

Figure 1. Mask behavior before and after free mask distribution



Notes: Based on a sample of 6,381 direct observations at baseline, 19,855 observations at endline, 399 phone surveys at baseline and 640 phone surveys at endline. Mask visible means the individual was observed with a mask but was not wearing it over mouth and nose. Mask worn correctly means the observed individual wore mask over mouth and nose. Phone survey respondents were asked about mask use in the last 7 days in any public places and when walking around their village.

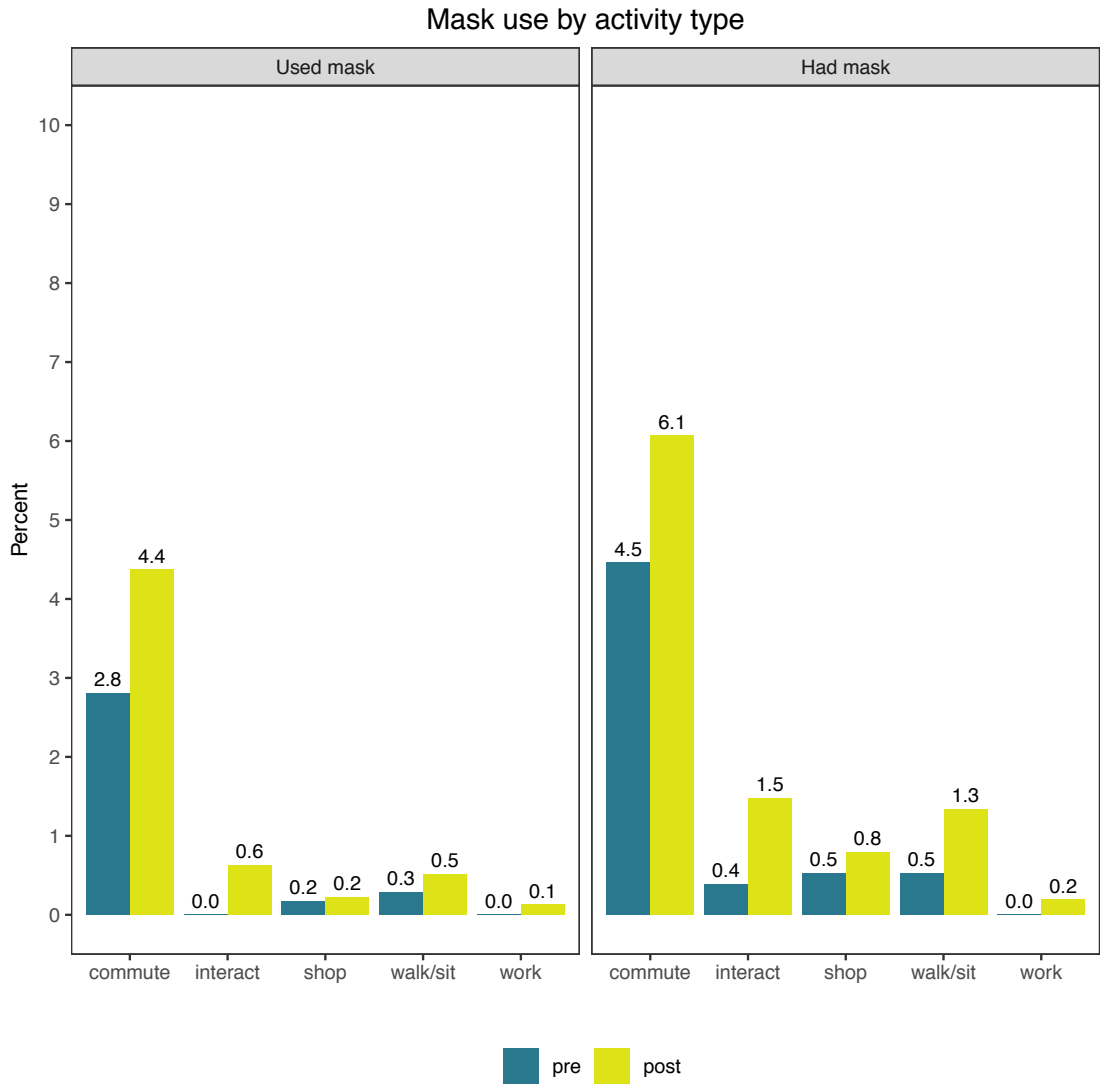
Table 2. Observed and self-reported mask behavior before and after mask distribution

Panel A: Mask Observations	Baseline (N=6,381)	Endline (N=19,855)	Adjusted difference	95% CI
	N (%)	N (%)		
Observed having a mask	57 (0.9%)	373 (1.9%)	0.9	[0.4 - 1.5]
Observed wearing a mask	30 (0.5%)	218 (1.1%)	0.6	[0.2 - 0.9]
Panel B: Phone Surveys	Baseline (N=399)	Endline (N=640)	Adjusted difference	95% CI
	N (%)	N (%)		
Self-reported wearing mask to locations: [a]				
public place	360 (94.7%)	606 (97.4%)	2.9	[0.6 - 5.3]
market centers	279 (70.8%)	504 (79.4%)	10.2	[4.3 - 16.1]
religious gatherings	356 (89.9%)	595 (93.4%)	4.1	[1.2 - 7.0]
public transportation	337 (84.7%)	561 (87.9%)	4.2	[0.0 - 8.5]
village store	250 (63.0%)	415 (65.3%)	3.1	[-3.2 - 9.3]
another household	224 (56.1%)	410 (64.3%)	9.2	[3.0 - 15.4]
at work	207 (52.8%)	366 (58.6%)	7.7	[1.5 - 13.9]

Notes: Direct observation models were adjusted for observed age and sex of observed person, whether the observed place was busy/crowded, and activity type. Phone survey data were adjusted for sex, age, age-squared, marital status, whether household had any children under 5 years, and if the respondent did any non-agricultural work.

[a] Includes any activity that requires customer service interactions such as shops, barbers, restaurants, etc.

Figure 1. Mask behavior before and after free mask distribution by activity type



Notes: Based on a sample of 6,381 direct observations at baseline, 19,855 observations at endline, Mask visible means the individual was observed with a mask but was not wearing it over mouth and nose. Mask worn correctly means the observed individual wore mask over mouth and nose.

Table 3. Impact of pairing education about COVID19 and masks with free mask distribution

Panel A: Mask Observations	Mean in control villages	Impact of volunteer training	95% CI
Observed having a mask	1.9	-0.1	[-1.2 – 1.1]
Observed wearing a mask	1.3	-0.3	[-1.2 – 0.6]
Panel B: Phone Surveys			
Self-reported wearing mask to locations: [a]			
public place	96.5 %	1.6	[-1.2 – 4.3]
market centers	76.4 %	5.7	[-0.4 – 11.8]
religious gatherings	92.1 %	2.7	[-0.9 – 6.2]
public transportation	86.9 %	2.8	[-1.6 – 7.2]
village store	65.3 %	0.6	[-7.8 – 8.9]
another household	65.0 %	-1.6	[-8.5 – 5.3]
at work	63.1 %	-6.1	[-13.5 – 1.4]
Says COVID-19 spreads through:			
surfaces	43.1 %	-0.6	[-8.9 – 7.8]
droplets	79.9 %	-4.4	[-9.7 – 0.9]
breath	50.6 %	2.7	[-6.7 – 12.0]
Beliefs about COVID-19 / masks			
People in Uganda are at risk of infection	77.0 %	1.9	[-4.7 – 8.5]
Masks reduce spread of COVID-19	97.5 %	0.7	[-1.6 – 2.9]
Number of positive attitudes towards masks (range 0-11) [b]	6.1	-5.6	[-9.9 – -1.3]
Behavior changes due to COVID			
Number of new behaviors (range 0-14) [c]	3.7	4.7	[-19.3 – 28.6]
Stayed home more	39.2 %	3.5	[-4.2 – 11.2]
Wore mask	86.3 %	-5.5	[-12.1 – 1.1]
Avoided groups	32.6 %	-3.1	[-10.0 – 3.8]
Washed hands more	93.0 %	-0.8	[-4.9 – 3.3]
Avoided handshakes	33.0 %	-4.2	[-11.3 – 3.0]
Social distancing			
Number of interactions outside household (range 0-300) [d]	5.4	1.44	[-0.5 – 3.4]
Visited religious gathering outside village	34.0 %	-1.8	[-11.5 – 7.9]
Visited political rally outside village	1.3 %	1.5	[-1.1 – 4.1]
Physical health			
Experienced any COVID-19 symptoms [d]	54.0 %	-2.5	[-11.2 – 6.2]
Lost time from usual activities due to illness	36.4 %	-3.0	[-12.5 – 6.5]
Mental health			
Score on mental health scale (range 0-12) [e]	3.8	-0.1	
Felt nervous, anxious, on edge	56.1 %	-3.8	[-11.2 – 3.5]
Felt depressed	61.1 %	-1.1	[-9.2 – 7.0]
Felt lonely	51.9 %	1.8	[-6.6 – 10.2]

Notes: Impact of intervention was estimated using endline data (11,657 direct observations and 640 phone interviews) and represents change from control mean. Models controlled for characteristics of individuals (observed age and female sex for observed data and age, age-squared, sex, education level, marital status, whether individual did any non-agricultural work in last 2 weeks and if the respondent lived in a household with children under age five). Standard errors clustered at village level. [a] Recall period past 7 days. [b] Number of positive statements about masks, range 0-11. Agrees with: (1) I get annoyed when others around me do not wear masks, (2) I speak out when others around me do not wear masks, (3) Others judge me for not wearing a mask in public spaces, (4) People that are not wearing masks are not good community members, (5) People that do not wear face masks should pay a fine, (6) Wearing a face mask is a moral (not only a legal) obligation, (7) God will judge those that are not wearing masks; Disagrees with: (8) Face masks are uncomfortable, 9) Face masks are unattractive, (10) I get annoyed when others around wear masks, (11) People judge me for wearing a mask in public spaces. [c] Number of new behaviors since respondent learned about COVID-19, range 0-14. [d] Experienced any of the following symptoms: fever, persistent cough; always feeling tired; muscle pain (myalgia); headache; diarrhea, nausea or vomiting; difficulty breathing or chest pain; runny nose; sore throat; pneumonia, loss smell or taste. [e] Higher score means worse mental health score, range: 0-12; How often felt: anxious; depressed; lonely; physical reaction like sweating or nausea; not hopeful