

# The Impact of Community Masking on COVID-19: A Cluster-Randomized Trial in Bangladesh

ipa INNOVATIONS FOR POVERTY ACTION

Stanford MEDICINE

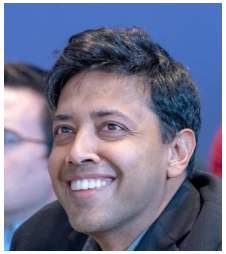
Yale

2041 a2i innovate for all

GREEN VOICE

GiveWell

# Team


ipa INNOVATIONS FOR POVERTY ACTION

Stanford MEDICINE

Yale

GiveWell

IREEN VOiCE

2041 a2i innovate for all

brac

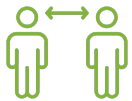
YALE Y-RISE RESEARCH INITIATIVE ON INNOVATION & SCALE

# Motivation

***Until the virus is eradicated globally, mask-wearing remains critical***

Lab and quasi-experimental evidence: face masks slow spread of COVID-19
**How to increase mask-wearing?**
**How effective in practice?**

**Widespread vaccination in low-income countries may be more than a year away.** New strains continue to emerge.



Critics: Mask wearers will engage in compensatory behaviors e.g. not physically distance.
**Is this true?**

Are mask distribution and promotions strategies scalable and cost-effective?

# Two-Stage Research

## Stage 1

**Which mask strategies, if any, lead to increased mask wearing?**

- Does this lead to any compensatory behavior e.g. reducing distancing?
- Are cloth or surgical masks more likely to be worn?

## Stage 2

**What is the impact of our mask wearing intervention on COVID-19?**

Cluster randomized trial involving ~350,000 adults in 600 villages
1.2 million masks distributed

# Why Bangladesh?

## Density of population

Eighth most **populous** country and one of the most densely populated in the world

## Decline in mask-wearing

- May 2020: **51%** observed wearing mask
- June 2020: **26%** observed wearing masks, 20% wearing correctly

## Strong local capacity

12 year presence of IPA. Strong **existing relationships** with relevant Bangladeshi policymakers.

# The NORM Model To Increase Mask-wearing

**No-cost**
free masks distributed door-to-door

**Offering information**
on mask wearing via video and brochures

**Reinforcement**
in-person and in public

**Modeling**
and endorsement by trusted leaders

# Measuring mask-wearing behavior

***Plain-clothed staff discreetly record mask wearing behavior***

appropriately wearing our project's cloth/surgical mask

appropriately wearing a mask that was not distributed by our project

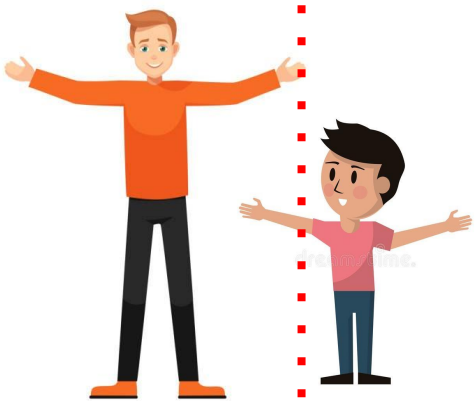
inappropriately wearing a mask/other face covering

not wearing a face covering at all

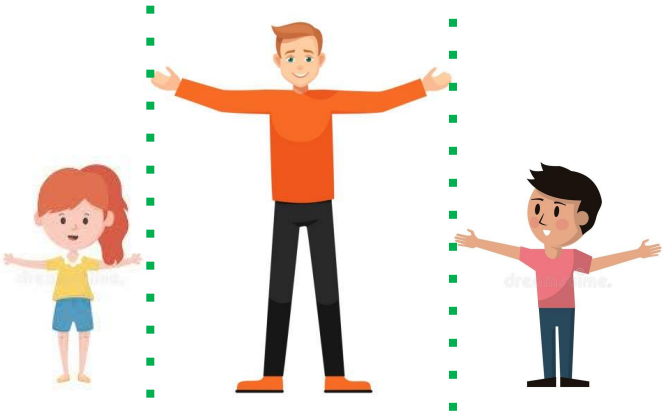
# Measuring physical distancing

- For a person to be counted as physically distancing, she/he needs to be **one arm's length** away from all other people.
- We also measured "social distancing" -- how many people do we see in public?

Not maintaining physical distancing



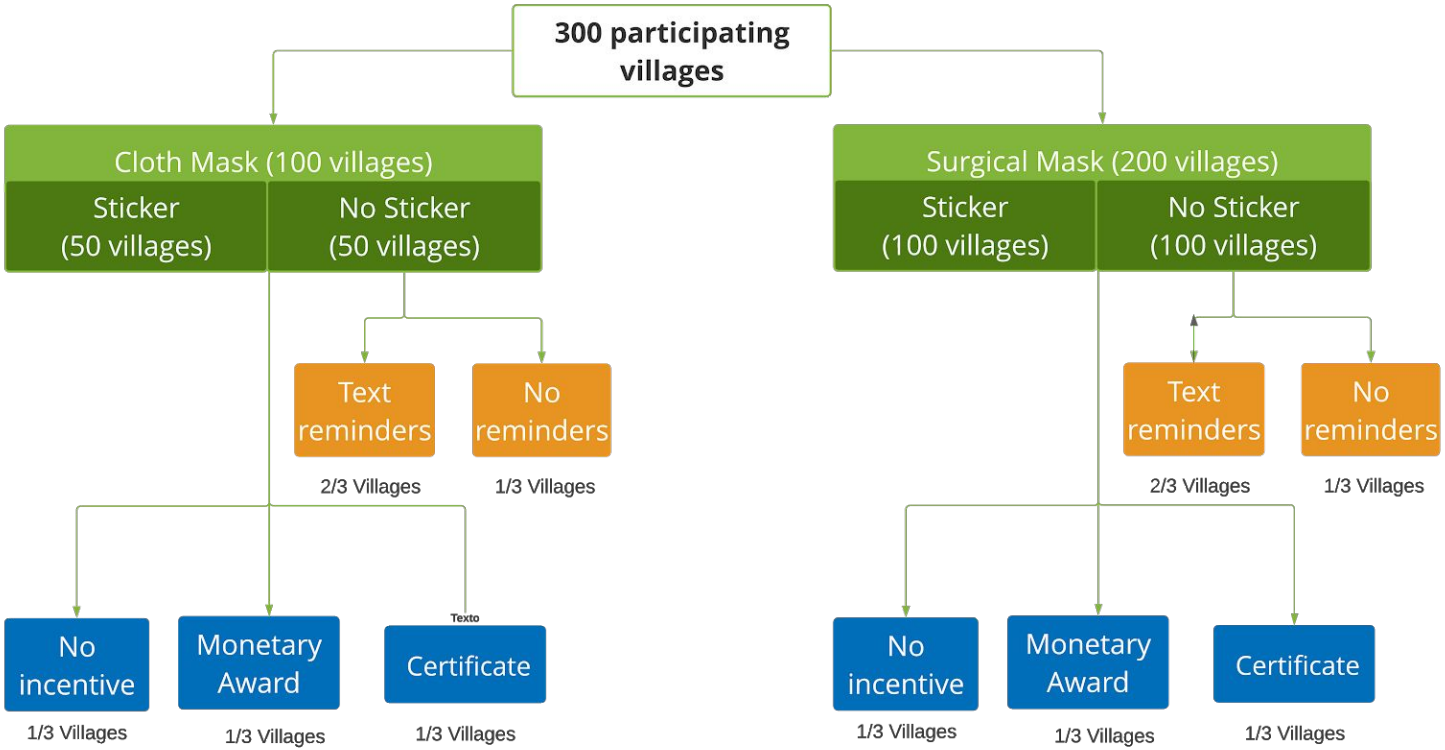
Maintaining physical distancing



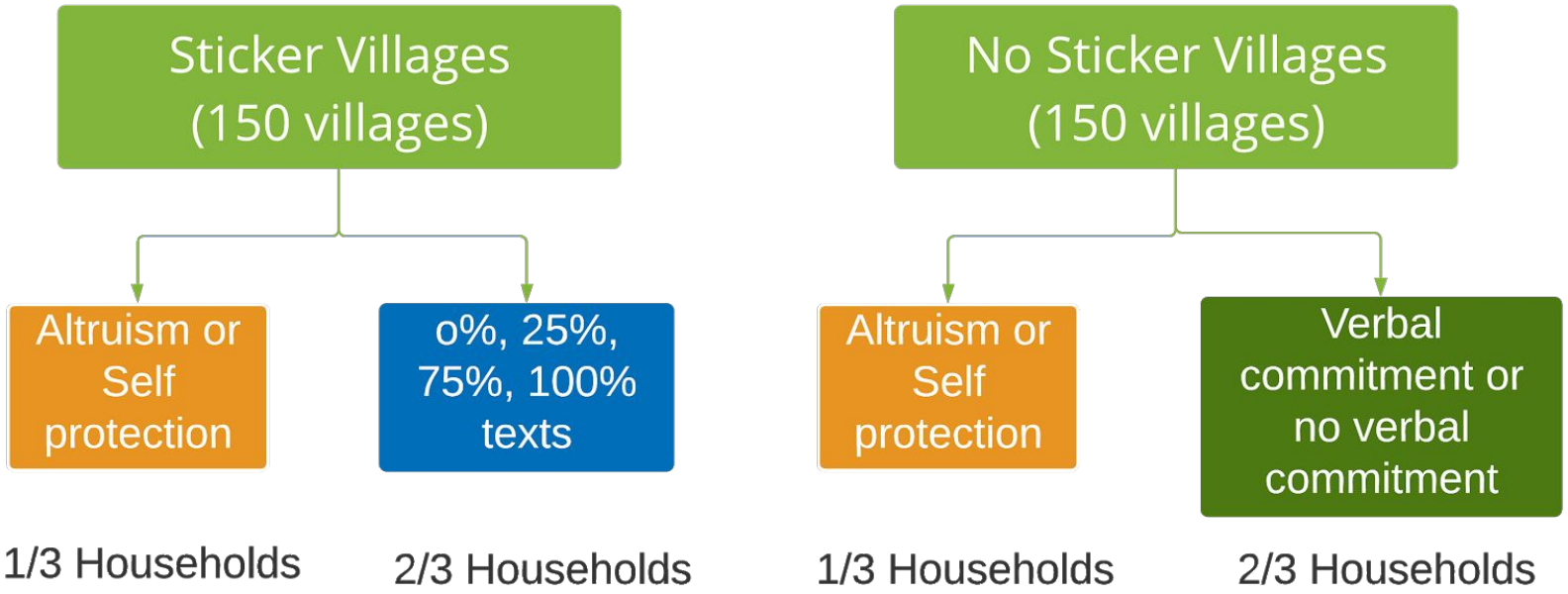
# Measuring COVID

- At 5 and 9 weeks into the intervention, we revisited households and surveyed people, eliciting symptoms
- WHO surveillance def'n of COVID, any one of:
    - Fever and cough
    - Three or more of (fever, cough, general weakness/fatigue, headache, myalgia, sore throat, coryza, dyspnea, anorexia/nausea/vomiting, diarrhea, altered mental status)
    - Loss of taste or smell
- For symptomatic people who consented (40%), we collected their blood and conducted serological testing for SARS-CoV-2 antibodies (primary outcome: symptomatic seropositivity)

# Village-Level Randomization



# Household Level Randomization



# Timeline

## July 22-31, 2020

**Pilot 1**

- Masks in mosques and markets
- Engagement with community leaders
- 2 rounds of observation data
- 1 round of phone follow-up surveys

## August 13-26

**Pilot 2**

- Pilot 1 interventions
- Mask promoters for in-person reinforcement

## Nov 17-18

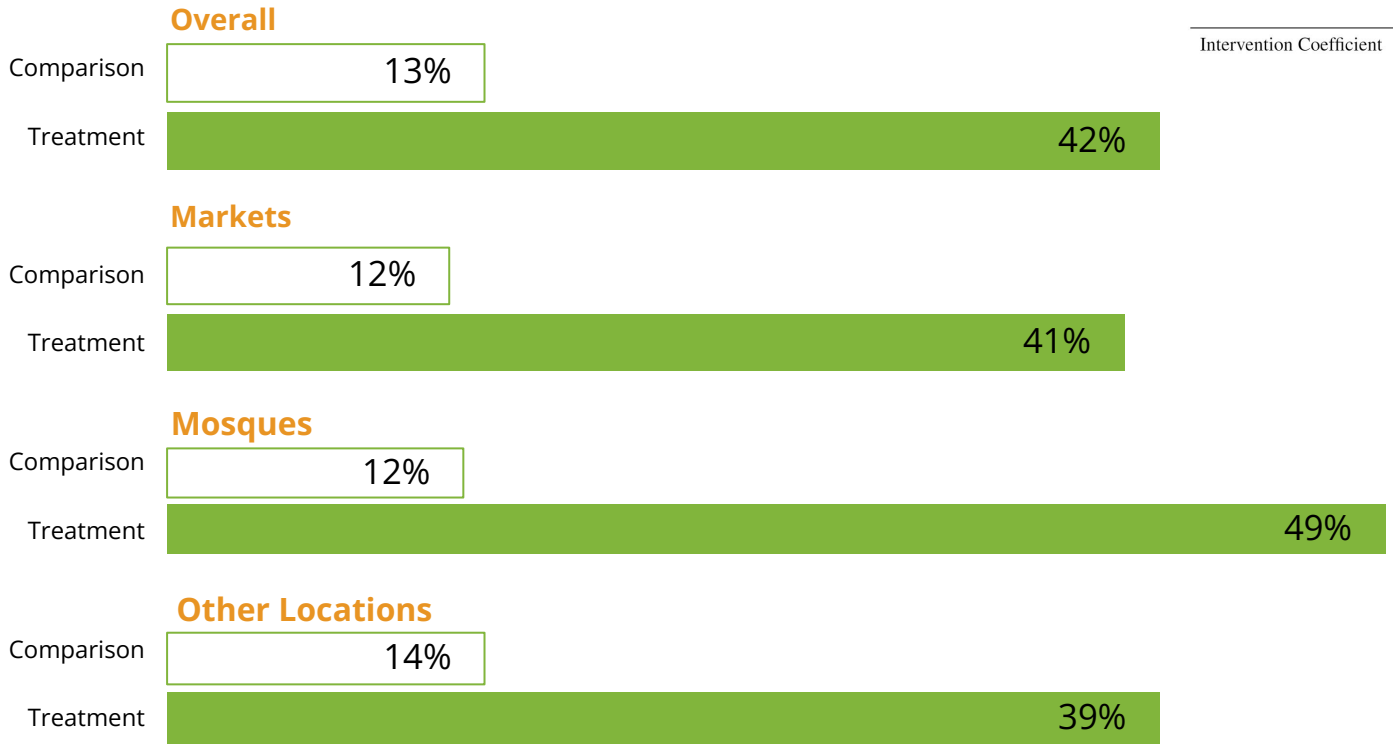
**1st wave of intervention**

## Jan 5-6 2021

**7th (last) wave of intervention**

# Free mask distribution & promotion increased mask wearing by 29 percentage points.

The largest increase in mask use was in **mosques**

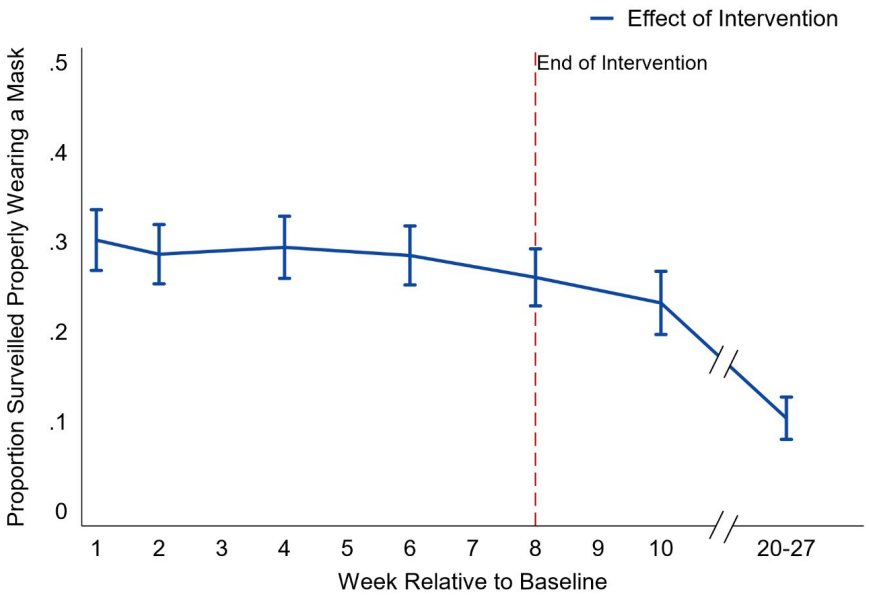



| | Full | No Active Promotion | Mosques |
|---|---|---|---|
| | *No Baseline Controls* | | |
| Intervention Coefficient | 0.288*** (0.012) | 0.279*** (0.012) | 0.371*** (0.016) |

# Mask use was significantly higher 20-27 weeks into the trial

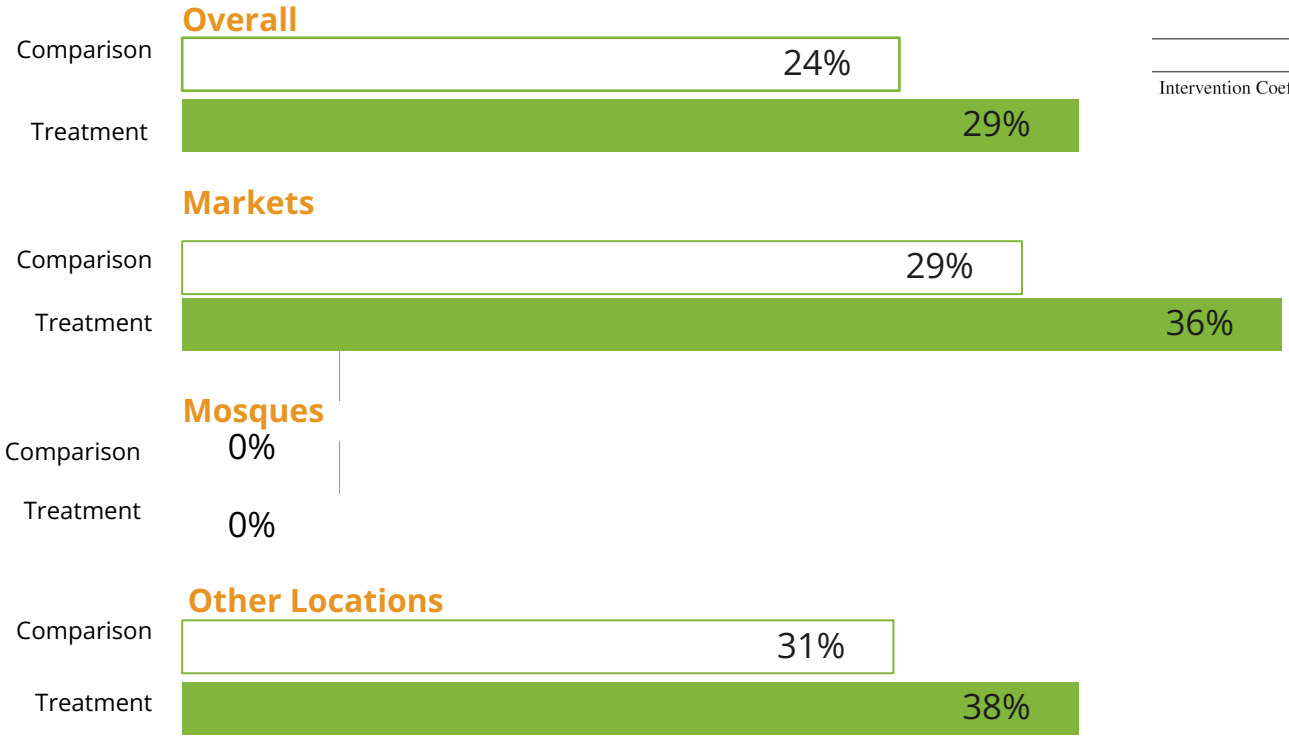
Proportion of people properly wearing a mask

Figure A2: Persistence of Mask Wearing



# No change in social distancing; physical distancing increased

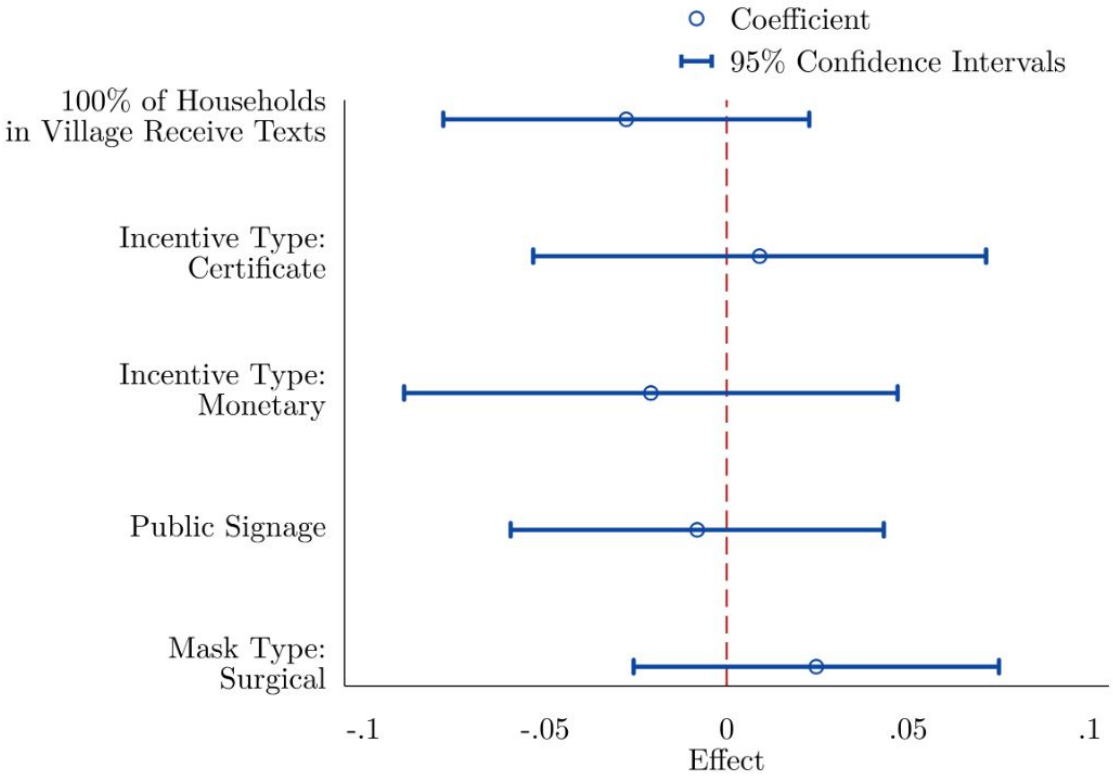
Effect was larger in markets; group prayer rituals inelastic to physical distancing




| | Full | No Active Promotion | Mosques | Markets |
|---|---|---|---|---|
| | *No Baseline Controls* | | | |
| Intervention Coefficient | 0.050*** (0.005) | 0.056*** (0.005) | 0.000 (0.000) | 0.073*** (0.007) |

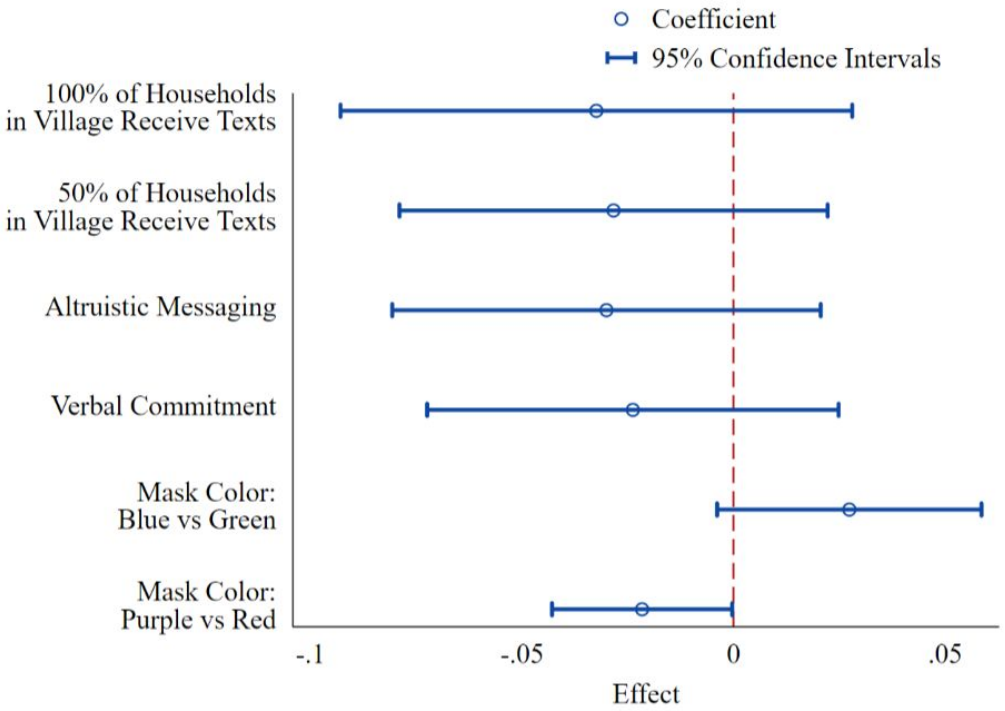
# Village-Level Cross-Randomizations

Figure 1: Village-Level Cross Randomizations



# Household-level Cross-Randomizations

Figure S2: Household-Level Cross Randomizations



# First-Stage Results on Mask-Wearing

More details: https://tinyurl.com/Banglamask

NORM intervention more than **tripled mask usage** (13% to 42%)


Impact was **sustained** at least **10 weeks** into the trial, including *after* intervention activities ended

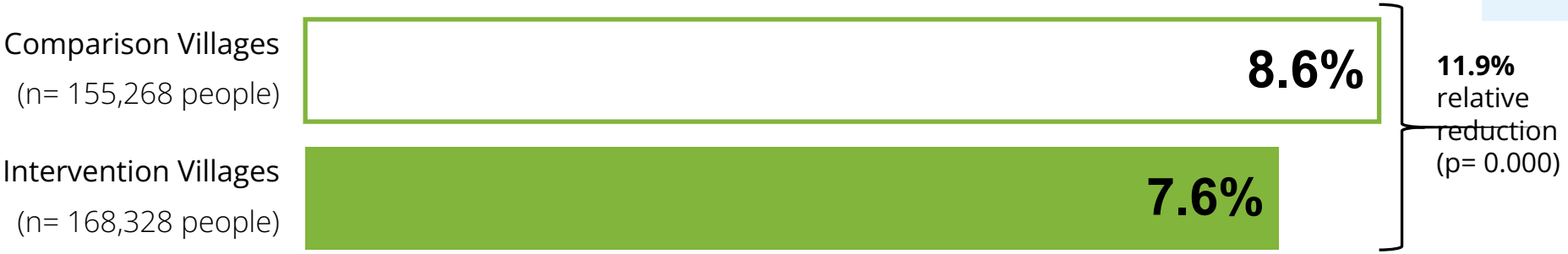
NORM model **increased physical distancing**

Reusable **surgical masks** ($0.05/mask) were **as likely** to be adopted as **cloth masks** ($0.40/mask)

**In-person Reinforcement, and monitoring** is an essential part of the NORM intervention

# The NORM model decreased symptomatic COVID-19 infections by at least 9%

## Percentage of people that reported COVID-19 symptoms




## Percentage of people with Covid-19 symptoms and positive COVID-19 serology

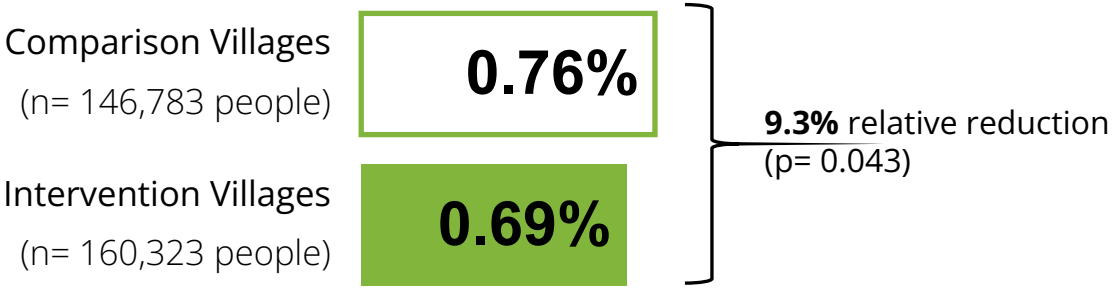


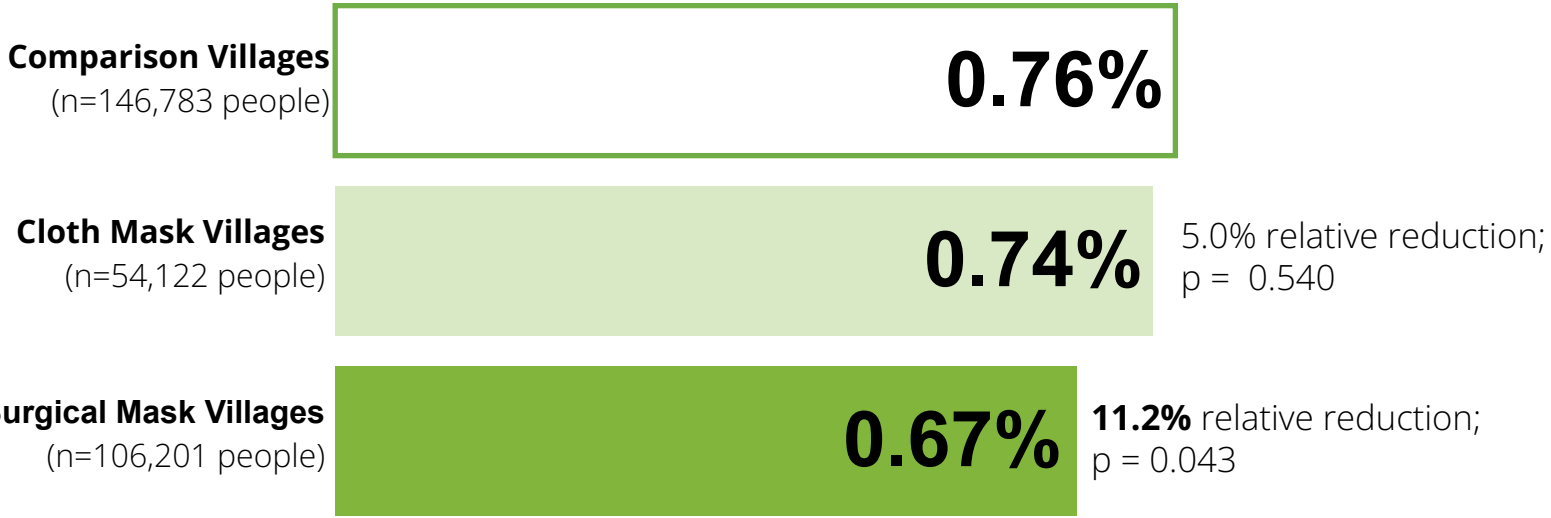

Table A7: Symptomatic Seroprevalence, Expressed in Prevalence Ratios

| | Intervention Effect | Intervention Effect by Mask Type |
|---|---|---|
| *No Baseline Controls* | | |
| Intervention Prevalence Ratio | 0.906** [0.814, 0.997] | |

* Analysis ongoing.

# Surgical masks reduced symptomatic COVID-19 by 11%

Percentage of people with COVID-19 symptoms and positive COVID-19 serology

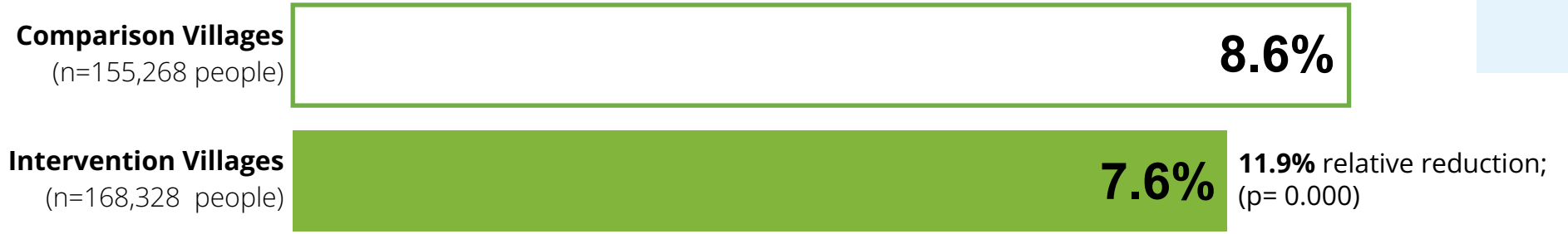



| | |
|---|---|
| Intervention Prevalence Ratio for Surgical Mask Villages | 0.894* [0.782,1.006] |
| Intervention Prevalence Ratio for Cloth Mask Villages | 0.933 [0.776,1.089] |

* Analysis ongoing.

# The NORM model decreased COVID-like symptoms by at least 11%

## Overall Effect




## Effect by Mask Types

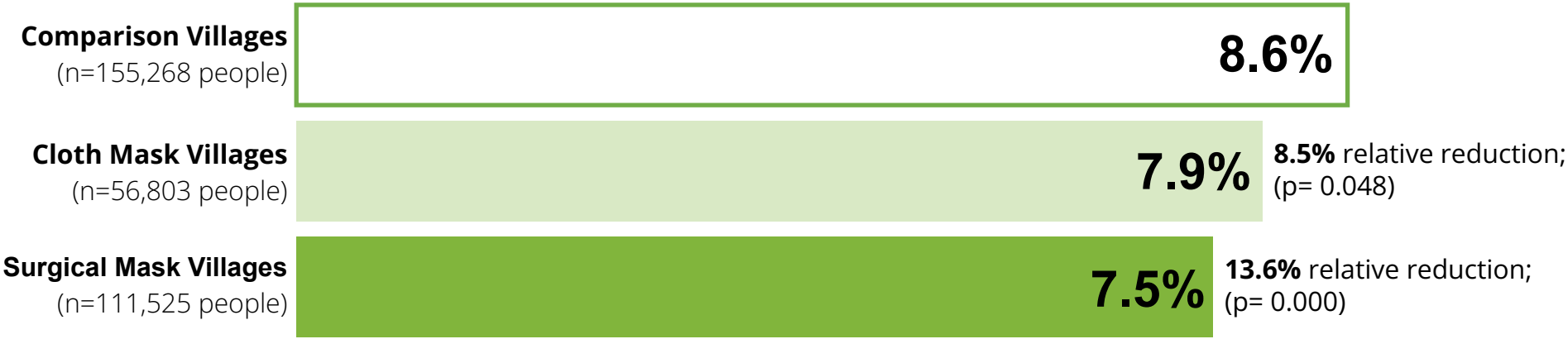


Table 4: Symptomatic Seroprevalence by Age Groups and Mask Type, Expressed in Prevalence Ratios

| | All | < 40 Y.O. | 40-49 Y.O. | 50-59 Y.O. | ≥ 60 Y.O. |
|---|---|---|---|---|---|
| *Pre-Registered Sample: Drop Individuals Without Blood Draws* | | | | | |
| Intervention Prevalence Ratio for Surgical Mask Villages | 0.888** [0.780, 0.997] | 0.966 [0.833, 1.099] | 1.002 [0.813, 1.191] | 0.770** [0.593, 0.948] | 0.653*** [0.458, 0.849] |
| Intervention Prevalence Ratio for Cloth Mask Villages | 0.950 [0.791, 1.109] | 1.075 [0.890, 1.261] | 0.698** [0.447, 0.949] | 0.815 [0.502, 1.128] | 1.119 [0.804, 1.435] |
| Avg. Symptomatic-Seroprevalence in Paired Control Villages§ | 0.0076 | 0.0055 | 0.0095 | 0.0108 | 0.0103 |
| N Individuals | 288,612 | 147,954 | 36,002 | 24,282 | 28,103 |
| N Villages | 536 | 482 | 382 | 348 | 360 |
| *Imputing Symptomatic-Seroprevalence for Missing Blood Draws* | | | | | |
| Intervention Prevalence Ratio for Surgical Mask Villages | 0.871*** [0.799,0.943] | 0.923 [0.829,1.017] | 0.883** [0.775,0.991] | 0.768*** [0.656,0.881] | 0.846** [0.718 ,0.975] |
| Intervention Prevalence Ratio for Cloth Mask Villages | 0.885** [0.783,0.988] | 0.934 [0.826,1.042] | 0.878 [0.705,1.051] | 0.861 [0.656,1.066] | 0.793** [0.628,0.959] |
| Avg. Symptomatic-Seroprevalence in Paired Control Villages§ | 0.0187 | 0.0149 | 0.0226 | 0.0237 | 0.0240 |
| N Individuals | 323,031 | 177,208 | 52,267 | 38,037 | 42,041 |
| N Villages | 570 | 560 | 532 | 508 | 512 |

Table A19: WHO-Defined COVID-19 Symptoms by Age Groups, Expressed in Prevalence Ratios

| | All | ≤ 40 Y.O. | Between 40-50 Y.O. | Between 50-60 Y.O. | ≥ 60 Y.O. |
|---|---|---|---|---|---|
| | | | *No Baseline Controls* | | |
| Intervention Coefficient for Surgical Mask Villages | 0.871*** [0.807,0.936] | 0.871*** [0.794,0.948] | 0.901*** [0.829,0.972] | 0.877*** [0.803,0.951] | 0.834*** [0.755,0.912] |
| Intervention Coefficient for Cloth Mask Villages | 0.901** [0.816,0.986] | 0.907** [0.828,0.987] | 0.979 [0.873,1.084] | 0.828*** [0.709,0.947] | 0.884** [0.770,0.998] |
| Average Symptomatic-Seroprevalence in Paired Control Villages[§] | 0.0859 | 0.0716 | 0.0981 | 0.1057 | 0.1082 |
| | | | *With Baseline Controls* | | |
| Intervention Coefficient for Surgical Mask Villages | 0.864*** [0.801,0.926] | 0.861*** [0.786,0.936] | 0.896*** [0.826,0.965] | 0.868*** [0.795,0.940] | 0.828*** [0.753,0.904] |
| Intervention Coefficient for Cloth Mask Villages | 0.915** [0.831,0.999] | 0.916** [0.836,0.996] | 0.996 [0.893,1.099] | 0.849** [0.732,0.966] | 0.903* [0.790, 1.016] |
| N Individuals | 323,596 | 179,882 | 55,465 | 41,759 | 46,245 |
| N Villages | 572 | 572 | 572 | 570 | 570 |

# Second Stage Result on COVID-19 transmission

## Symptomatic infections decreased by 9%


The research team asked all participants if they had **COVID-19 symptoms** in the past month

**9%**

Preliminary results suggest the intervention **reduced symptomatic SARS-CoV-2** by ~9%

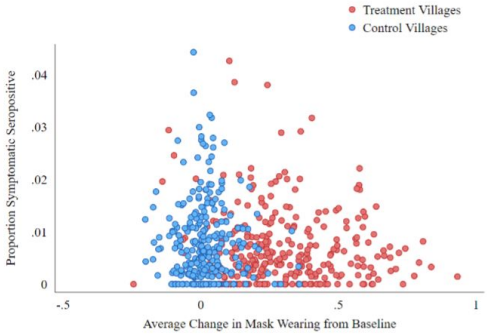
Among the people who self-reported symptoms, the research team conducted **serology tests** to detect the presence of COVID antibodies

**Surgical masks** reduced COVID infections by a11-13%

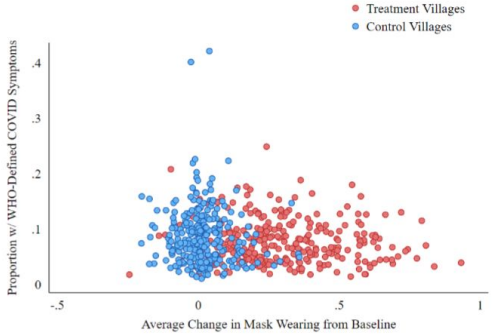
Surgical masks were **more effective** among **older people**

Figure S7: Variation of Effect within Treatment Arms

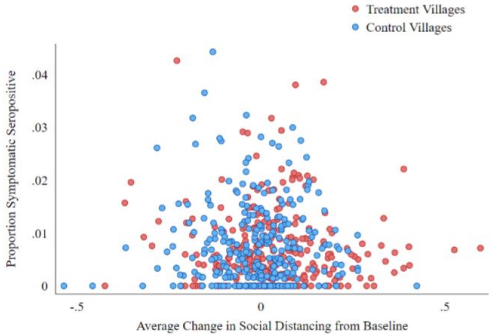
(a) Symptomatic Seroprevalence by Change in Mask Wearing




(b) Symptoms by Change in Mask Wearing




(c) Symptomatic Seroprevalence by Change in Physical Distancing




(d) Symptoms by Change in Physical Distancing

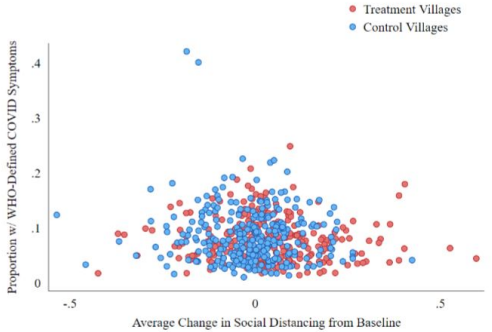


Table S29: Symptomatic Seroprevalence & COVID Symptoms by Mask Wearing & Physical Distancing

| | Mask Wearing | Physical Distancing | Mask Wearing & Physical Distancing |
|---|---|---|---|
| *WHO-Defined COVID Symptoms* | | | |
| Coefficient on Change in Mask-Wearing from Baseline | -0.0278*** | | -0.0240*** |
| | (0.0081) | | (0.0081) |
| Coefficient on Change in Social-Distancing from Baseline | | -0.0304* | -0.0179 |
| | | (0.0157) | (0.0159) |
| N Individuals | 323,596 | 323,596 | 323,596 |
| N Villages | 572 | 572 | 572 |
| *Symptomatic-Seropositivity* | | | |
| Coefficient on Change in Mask-Wearing from Baseline | -0.0031** | | -0.0027** |
| | (0.0013) | | (0.0014) |
| Coefficient on Change in Social-Distancing from Baseline | | -0.0032 | -0.0017 |
| | | (0.0023) | (0.0025) |
| N Individuals | 307,106 | 307,106 | 307,106 |
| N Villages | 572 | 572 | 572 |

# Interpretation

- Is the mechanism filtration or distancing?
  - We don’t see a change in social distancing
  - See smallish impact on physical distancing
  - Huge change in masking
  - Masking change is observationally correlated with reductions
  - No change in distancing in mosques?
- Magnitude: ~10% reduction overall
  - Remember, that is intent to treat from 30 pp increase in masking
  - Effect is larger (35%) among elderly, w/ bulk of morbidity and mortality
- Assume from filtration and extrapolated to US: 600-2500 people wearing masks for a year prevents one death

# The NORM Model could have averted 60,000+ official deaths and 1.2+ million official cases in four countries where we are working

| | Cases | Deaths | Intervention impact | Cases averted | Deaths averted |
|---|---|---|---|---|---|
| COVID cases over the last 3 months for India, Bangladesh, Pakistan, and Nepal | 14,833,479 | 247,401 | | | |
| 50-60 | 14.8% of 14.8m | 20% of 247k | 0.2321 | 509,542 | 11,484 |
| >60 | 15.2% of 14.8m | 63% of 247k | 0.3303 | 744,724 | 51,481 |
| **Total** | | | | 1,254,266 | 62,965 |

# Conclusion

- Possible to increase mask-wearing by a lot
- Strong evidence that masking can reduce COVID
- Interpreting magnitude depends on mechanism, but large effects for elderly
- Benefits are large where people are dying (e.g. where vaccines unavailable or vaccination rates low)
- We’re scaling this up around the world
- Maybe western norms about not wearing masks when you are coughing and sneezing are dumb

**Based on our positive results, we are scaling the NORM Model worldwide**

# The NORM team is a multi-organizational coalition that supports governments & NGO to rapidly scale-up the model

- Advise on high quality **surgical mask procurement** and design
- Provide a step by step **implementation toolkit** to guide implementation & monitoring
- Toolkit contains all contextualized **communication materials** including scripts for promoters
- **Advisory** support for planning and implementing NORM
- **Monitoring support** to course-correct and adjust NORM to local conditions

# Step-by-step “Implementation Toolkit” for partners & governments

Each step hyperlinked to detailed protocols

Example scripts, videos and brochures, HR training materials used in Bangladesh,

Research team available for technical support:

- review of mask design,
- localisation of messaging
- planning of monitoring & surveillance activities

**NORMalizing Community Mask-Wearing: Protocol**

**Date Updated:** Jul 27, 2021

**This document is continually updated. Please check back for the latest updates.**

## Introduction

This implementation toolkit is designed to assist implementers in implementing the NORM intervention. The toolkit is based on an intervention that worked to sustainably increase mask-wearing by 30 percentage points, while increasing social distancing. This intervention was run as a large-scale (~350,000 adults around 600 villages) cluster-randomized evaluation in rural Bangladesh.

In the first stage of the study, various strategies were tested to increase mask-wearing. Two kinds of masks were tried: reusable surgical and cloth.

The intervention comprised four critical components to NORMalize community mask-wearing:

- **N**o cost: free masks distributed door-to-door
- **O**ffering Information on mask-wearing via video and brochures
- **R**einforcement in-person in public: having people stand in public places and intercept those not wearing a mask or wearing it correctly, handing out masks if they needed it
- **M**odelling and endorsement by trusted leaders

# Step-by-Step Guide

## 1.Preparation
2-6 weeks before fieldwork

- 1.1 Identify Implementation Areas
- 1.2 Estimate & procure masks
- 1.3 Produce communication materials
- 1.4 Align on COVID-19 safety protocols

## 2. Field preparation
3-4 weeks before fieldwork

- 2.1 Plan reinforcement
- 2.2 Plan Surveillance
- 2.3 Plan and Recruit Team
- 2.4 Purchase equipment
- 2.5 Train Team
- 2.6 Identify community leaders
- 2.7 Complete Baseline Surveillance

## 3. Field Activity
Week 1-2

- 3.1 Meet community leaders
- 3.2 Complete Household Distribution
- 3.3Start in-person reinforcement

## 4. Field Activity
Week 3-8+

- 4.1 Complete midline surveillance
- 4.2 Complete reinforcement activity
- 4.3 Complete endline surveillance

For examples of the detailed protocol in the guide, click on the hyperlinked boxes

# Bangladesh

**Location**
High-risk rural districts and urban Dhaka

**People being reached**
81 million people

**Implementing Partner**
BRAC

**Next Steps**
1) Effect of varying intensity
2) **effect of masks against asymptomatic delta infection**

# BRAC is implementing the NORM model in 35 districts in Bangladesh, covering 81M people

# India


**Location**
Bihar

**People to be reached**
6-13 million people

**Implementing Partner**
Jeevika

**Next Steps**
**Assess NORM + methods to increase vaccination rates**

# India


**Location**
Gujarat and parts of Rajasthan

**People to be reached**
4-5 million people

**Implementing Partner**
Self Employed Women's Association (SEWA)

**Next Steps**
In talks to implement in other states of India

# Nepal

**Location**
Kathmandu, Lalitpur, Kaki, Rupandehi, Morang, Bhaktapur

**People to be reached**
0.5 million people

**Implementing Partner**
COVID-19 Rapid Action Taskforce

**Next Steps**
Launching this week!

# Pakistan

**Location**
Lahore

**People to be reached**
5 million people

**Implementing Partner**
Lahore Division, Government Of Punjab, Pakistan

**Next Steps**
Policy written to implement throughout Pakistan

Commissioner Lahore Division | PAKISTAN POST | Yale | Stanford MEDICINE | ipa | Mahbub Ul Haq Research Center

From: Commissioner Lahore Division

Name :

Address :

Contact No.

# #LahoreWearsMasks

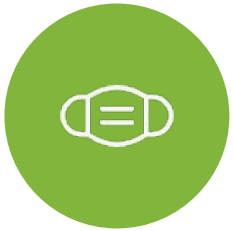
AN INITIATIVE BY COMMISSIONER LAHORE DIVISION



# Other coalitions are emerging in around the world to reach millions more

# BUT SCALE UPS NEED MANY MORE SURGICAL MASKS

# Global Strategy Against COVID-19



## Masks are first line of defense

necessary to slow spread until vaccines are widely available

## Intensive mask promotion campaign needed

All countries with low vaccination rates should be engaged in intensive mask promotion campaign

## This gives needed time to get population vaccinated

And offers a way to supplement gaps in vaccine efficacy

# Many questions remain...

1. How can we make the **NORM program** even more **cost-effective** as it is scaled worldwide?
2. Can we leverage the lessons of successful mask promotion to **improve vaccine rollout?**
3. Do masks ultimately reduce asymptomatic transmission, especially with **new variants**?

**Contact:**

Layla Kwong, lakwong@berkeley.edu

More information: https://osf.io/vzdh6/
To join us or view the pre-print (coming Wednesday): https://www.poverty-action.org/masks

Berkeley Public Health
ipa INNOVATIONS FOR POVERTY ACTION
Stanford MEDICINE
Yale
2041 a2i innovate for all
GREEN VOICE
Give Well
brac

# How the NORM team helps scale-up partners

# The NORM team is a multi-organizational coalition that supports governments & NGO to rapidly scale-up the model

- Advise on high quality **surgical mask procurement** and design
- Provide a step by step **implementation toolkit** to guide implementation & monitoring
- Toolkit contains all contextualized **communication materials** including scripts for promoters
- **Advisory** support for planning and implementing NORM
- **Monitoring support** to course-correct and adjust NORM to local conditions

# Mask Procurement |Companies

Companies known to the research team to have high-quality surgical masks (there may be many other companies that produce high-quality surgical masks)

**Bangladesh**
Katex General
Contact: Yasser Choudhury
<yasser@katex-bd.com>

**India**
Magnum (Viroguard surgical mask)
Contact: Rakesh Bhagat
<rakesh@magnumohs.com>

# Mask Procurement |Other Resources

- For more details on mask specifications click here.
- For support on the technical specification of the masks you are considering, please email Laura Kwong: <kwong.laura@gmail.com>
- Masks can be tested by a number of companies, such as SGS (+91 875 442 0204). Ask for Filtration efficiency testing for masks using the US CDC National Institute for Occupational Safety and Health (NIOSH) protocol. Masks for the Bangladesh study were tested by the Tata Institute of Fundamental Research.
- For more guidance on filtration efficiency contact Arnab Bhattacharya <arnab@tifr.res.in> and Shailabh Kumar <shailabh@stanford.edu>.
- Surgical mask procurement contract template here.
- Cloth mask procurement contract template here.

# Step-by-step “Implementation Toolkit” for partners & governments

Each step hyperlinked to detailed protocols

Example scripts, videos and brochures, HR training materials used in Bangladesh,

Research team available for technical support:

- review of mask design,
- localisation of messaging
- planning of monitoring & surveillance activities

**NORMalizing Community Mask-Wearing: Protocol**

**Date Updated:** Jul 27, 2021

**This document is continually updated. Please check back for the latest updates.**

## Introduction

This implementation toolkit is designed to assist implementers in implementing the NORM intervention. The toolkit is based on an intervention that worked to sustainably increase mask-wearing by 30 percentage points, while increasing social distancing. This intervention was run as a large-scale (~350,000 adults around 600 villages) cluster-randomized evaluation in rural Bangladesh.

In the first stage of the study, various strategies were tested to increase mask-wearing. Two kinds of masks were tried: reusable surgical and cloth.

The intervention comprised four critical components to NORMalize community mask-wearing:

- **N**o cost: free masks distributed door-to-door
- **O**ffering Information on mask-wearing via video and brochures
- **R**einforcement in-person in public: having people stand in public places and intercept those not wearing a mask or wearing it correctly, handing out masks if they needed it
- **M**odelling and endorsement by trusted leaders

# Step-by-Step Guide

## 1.Preparation
2-6 weeks before fieldwork

- 1.1 Identify Implementation Areas
- 1.2 Estimate & procure masks
- 1.3 Produce communication materials
- 1.4 Align on COVID-19 safety protocols

## 2. Field preparation
3-4 weeks before fieldwork

- 2.1 Plan reinforcement
- 2.2 Plan Surveillance
- 2.3 Plan and Recruit Team
- 2.4 Purchase equipment
- 2.5 Train Team
- 2.6 Identify community leaders
- 2.7 Complete Baseline Surveillance

## 3. Field Activity
Week 1-2

- 3.1 Meet community leaders
- 3.2 Complete Household Distribution
- 3.3Start in-person reinforcement

## 4. Field Activity
Week 3-8+

- 4.1 Complete midline surveillance
- 4.2 Complete reinforcement activity
- 4.3 Complete endline surveillance

For examples of the detailed protocol in the guide, click on the hyperlinked boxes

# Mask Design & Procurement Guide

## Mask Design and Procurement Guide

Date Updated: 29 April 2021

### Introduction & Overview of Guide

This guide is based on rigorous testing of a number of types of cloth & surgical masks in a randomized controlled trial in Bangladesh between Nov 2020 and Feb 2021.

### The Study

The study was a large-scale (~350,000 adults across 600 villages in rural Bangladesh) cluster-randomized evaluation. In this stage of the study, various strategies were tested to increase mask-wearing. Two kinds of masks were tried: surgical and cloth.

The intervention comprised four critical components to NORMalize community mask-wearing:

- **N**o cost: free masks distributed door-to-door
- **O**ffering Information on mask-wearing via video and brochures
- **R**einforcement in-person in public
- **M**odelling and endorsement by trusted leaders

Other encouragement strategies such as nudges (signaling, verbal commitment, text reminders) and incentives (monetary and non-monetary social rewards) were also tested.

**Results**:

- The core intervention (NORM outlined above) **more than tripled mask-wearing from 13% (in control villages) to 42% in treatment villages.**
  - Reinforcement in person, in public was critical to the success of the intervention.
- Impact was sustained 10 weeks into the trial, even after the intervention ended.
- The intervention increased physical distancing
- Surgical masks (which were one-third the cost of cloth masks and provided better filtration efficiency) were equally likely to be adopted as cloth masks.
- Nudges and incentives had no effect on mask-wearing.

More information on the study design and results can be found here:
https://tinyurl.com/Banglamask

For principles around scaling-up and some learnings from the trial in Bangladesh, see
https://tinyurl.com/maskpromotion

1

### Overview of Guide

This guide covers learning as well as recommendations from the Bangladesh mask-wearing study. It may be continually updated as new information comes in, so please check back for the latest updates. The contents are:



### 1. Recommended Mask Type: Surgical

Based on the input from the Bangladesh study and preliminary investigations into cost and time, we recommend surgical masks for the following reasons:

1. **Filtration efficiency of the material:** triple-layer polypropylene (surgical mask material) has three times higher filtration efficiency (~95%) than triple-layer cloth masks (~30%)
2. **Comfort:** users in the study reported the surgical mask was more comfortable, especially in hot and humid weather. Cloth masks also tended to lose smoothness and shine after a few washes.
3. **Washable:** surgical masks have higher filtration efficiency even after 20 washes
4. **Close fitting:** longer ear loops can be tied to improve the fit
5. **Production cost:** At scale, we estimate that the surgical masks could cost ₹4.35 (USD 0.058) instead of ₹30 (USD 0.40) [1]
6. **Production Time**: Factory production is much faster for surgical masks. We estimate that factory capacity for surgical masks is around 65,000-86,000 per 12 hour day, versus 70-120 masks/12 hour day for cloth masks.

Back to Overview

Back to slide

# Mask Design & Procurement Guide

## 2. Design specifications

While we strongly recommend surgical masks, there may be a requirement for cloth masks (for livelihood reasons, starting immediately etc). Therefore we have given design specifications for cloth masks as well in this document.

### 2.1 Surgical Masks (recommended)

#### 2.1.1 Material

| | |
|---|---|
| Exterior Layer | 100% spunbond, non-woven polypropylene |
| Middle Layer | 100% meltblown, non-woven polypropylene |
| Interior Layer | 100% spunbond, non-woven polypropylene |
| Filtration | ~95% Filtration Efficiency of 0.3 um particles |
| Style | 3D Mask |
| Formable nose bridge | 2.5 in |

**Note:** Given demand for 100% meltblown polypropylene, some companies are starting to blend their polypropylene with other materials, which substantially reduces the filtration efficiency. **Companies should provide third-party certification that they are using 100% meltblown and 100% spunbond polypropylene materials.**

#### 2.1.2 Features

Standard model produced by machines (standardized)

- Flat, pleated masks
- Two elastic loops for head attachment
- Colour: Ideally, this should be fixed after consulting with the community. In Bangladesh, local preferences mattered: where surgical masks were distributed, blue surgical masks were 2.9 percentage points more likely to be observed than green surgical masks.
- Sticker - in Bangladesh, a sticker was affixed on each surgical mask. It had the logo of a mask with an outline of the Bangladeshi flag and a phrase in Bengali that noted that the mask could be washed and reused.
- Lengthening the ear loops by 1-2 cm would allow them to be knotted before being looped around the ears, a method recommended by the CDC (US government centre for disease control and prevention) to improve fit.

#### 2.1.3 Improving Fit

- Tie earloops - this method does not work if ear loops are too short
- Double-masking: wear a cloth mask over a surgical mask.

(Source: CDC guidance on how to improve mask fit, April 25, 2021)

### 2.2. Cloth Masks

*Though we strongly recommend surgical masks, in case there is a requirement for cloth masks (e.g. for livelihood reasons, or starting implementation immediately then these could be a good option).*

#### 2.2.1 Material

| | |
|---|---|
| Exterior Layer | 100% non-woven polypropylene |
| Middle Layer | Interlocking knit 60% cotton / 40% polyester |
| Interior Layer | Interlocking knit 60% cotton / 40% polyester |
| Filtration | ~35% Filtration Efficiency of 0.3 um particles |
| Style | Flat, Pleated |
| Formable nose bridge | 2.5 in |

**Note:** Cloth masks can be substantially improved by replacing the middle layer of interlocking knit with 100% meltblown non-woven polypropylene (the cloth masks described above were made at a time when meltblown polypropylene was not available).

Back to slide

# Mask Design & Procurement Guide

### 2.2.2 Features

- Standardize masks according to the figure given in Appendix 1- this was selected based on focus group discussions in Bangladesh regarding mask fit (to minimize leakage while talking and not talking) and comfort.
- Colour - take local preferences into account. In the Bangladesh study, violet cloth masks were 5.8 percentage points more likely to be observed than red masks.
- Adjustable elastic tie for head attachment. This type of tie allows the mask to hang around the neck when not in use.

If you need support on the technical specification of the masks you are considering, please email Laura Kwong <kwong.laura@gmail.com>.

Back to Overview

## 3. Filtration Efficiency

### 3.1 Testing filtration efficiency

Masks were tested when brand new and again after hand-washing **20 times** with a detergent bar. [2]

The process for handwashing was as follows:

- Rubbing vigorously with hands on both sides for 2 minutes, making sure to open pleats
- Rinsing with water, making sure to open pleats
- Squeezing (not wringing) to remove excess water.

**Filtration Efficiency of Brand New Surgical Masks**

| | Higher quality surgical masks | Lower quality surgical masks |
|---|---|---|
| Before washing | 97-98% | 62-65% |
| After hand-washing 20 times | 81% | 47% |

[2] The method that the project used to test masks was as accurate as the standard National Institute for

### 3.2 Where to test for filtration efficiency

**In India:** Masks can be tested by a number of companies, such as SGS (+91 875 442 0204). Ask for Filtration efficiency testing for masks using the US CDC National Institute for Occupational Safety and Health (NIOSH) protocol. Masks for the Bangladesh study were tested by the Tata Institute of Fundamental Research.

For more guidance on filtration efficiency contact Arnab Bhattacharya <arnab@tifr.res.in> and Shailabh Kumar <shailabh@stanford.edu>.

Back to Overview

## 4. Mask procurement

### 4.1 Estimated Production Cost and Time

| | Surgical | Cloth |
|---|---|---|
| **Cost per mask (for ~100 million masks)** | Approximately USD 0.058 (₹4.35) without sticker | Approximately USD 0.40 (₹30) |
| **Production method** | Automated machines | Sewn by hand |
| **Production time** | 64,800-86,400 masks per 12-hour day (90-120 masks/minute) | 70-120 masks per 12-hour day |

Source: the estimates based on observations of factory production in Bangladesh, and estimates reported by NGOs in Bangladesh and India regarding hand-stitching.

### 4.2 Template contracts

Surgical mask procurement contract template:
https://tinyurl.com/surgicalmasktemplatecontract

Cloth mask procurement contract template
https://tinyurl.com/clothmasktemplatecontract

Back to slide

# Mask Design & Procurement Guide

### 4.3 Where to procure

The following companies are known to the study team to produce high-quality surgical masks (filtration efficiency > 95%).

| Country | Companies known to the research team to have high-quality surgical masks (there may be many other companies that produce high-quality surgical masks) |
|---|---|
| India | Magnum (Viroguard surgical mask)<br>Contact: Rakesh Bhagat <rakesh@magnumohs.com> |
| Bangladesh | Katex General<br>Contact: Yasser Choudhury <yasser@katex-bd.com> |

Back to Overview

Back to slide

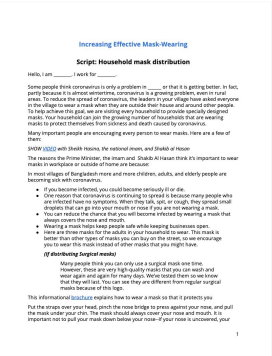
# Implementation Toolkit - Example
## 3.2 Complete Household Distribution

### 3.2.1 BEFORE GOING TO THE FIELD

Supervisors should ensure the following kit is complete every day:

- **Mask-wearing:** Every promoter is wearing a project mask over the nose and mouth, for their own protection and role-modelling.
- **Hand Sanitizer:** Every promoter has a sufficient alcohol-based hand rub/hand sanitizer (supplied by the project) to use between each household visit.
- **Masks for distribution:** Every promoter has sufficient masks for the day to distribute to every household as required. Distribute at least one mask per person in the household so around 3-4 /HH. The promoter can record the number of masks he/she had at the beginning of the day and then record the number of masks he/she has at the end of the day, to keep track of how many masks were distributed throughout the day.
- **Video:** Every promoter has a working and fully charged tablet/smartphone and charger so that they are able to display the video. Video is working.
    - Promoters should charge their tablet/smartphone the night before and should make sure their device is fully charged before heading to the field.
- **Brochures**: Every promoter has enough brochures for distribution. If leaving behind, should have at least 50 brochures (one per household).
- **Letter of Authorization**: Every promoter has at least one clean, non-torn copy of the letter of authorization/support.
- **Script**: Every promoter has 111_Script for mask distribution at households and has read the script carefully.


Link to materials


Increasing Effective Mask-Wearing

Script: Household mask distribution

Link to scripts

Back to slide

# Implementation Toolkit - Example
## Section 3.2 Household Distribution - Linked materials and scripts

### Script

**Increasing Effective Mask-Wearing**

**Script: Household mask distribution**

Hello, I am _____. I work for _____.

Some people think coronavirus is only a problem in _____ or that it is getting better. In fact, partly because it is almost wintertime, coronavirus is a growing problem, even in rural areas. To reduce the spread of coronavirus, the leaders in your village have asked everyone in the village to wear a mask when they are outside their house and around other people. To help achieve this goal, we are visiting every household to provide specially designed masks. Your household can join the growing number of households that are wearing masks to protect themselves from sickness and death caused by coronavirus.

Many important people are encouraging every person to wear masks. Here are a few of them:

*SHOW VIDEO with Sheikh Hasina, the national imam, and Shakib al Hasan*

The reasons the Prime Minister, the imam and Shakib Al Hasan think it's important to wear masks in workplace or outside of home are because:

In most villages of Bangladesh more and more children, adults, and elderly people are becoming sick with coronavirus.

- If you become infected, you could become seriously ill or die.
- One reason that coronavirus is continuing to spread is because many people who are infected have no symptoms. When they talk, spit, or cough, they spread small droplets that can go into your mouth or nose if you are not wearing a mask.
- You can reduce the chance that you will become infected by wearing a mask that always covers the nose and mouth.
- Wearing a mask helps keep people safe while keeping businesses open.
- Here are three masks for the adults in your household to wear. This mask is better than other types of masks you can buy on the street, so we encourage you to wear this mask instead of other masks that you might have.

***(If distributing Surgical masks)***

> Many people think you can only use a surgical mask one time. However, these are very high-quality masks that you can wash and wear again and again for many days. We've tested them so we know that they will last. You can see they are different from regular surgical masks because of this logo.

This informational brochure explains how to wear a mask so that it protects you

Put the straps over your head, pinch the nose bridge to press against your nose, and pull the mask under your chin. The mask should always cover your nose and mouth. It is important not to pull your mask down below your nose--If your nose is uncovered, your

1

### Material: Video


Back to slide

# But vaccines are the end game

# Covid-19 Vaccine Acceptance And Hesitancy In Low- And Middle-income Countries

## Nature Medicine Paper here

Article | Open Access | Published: 16 July 2021

### COVID-19 vaccine acceptance and hesitancy in low- and middle-income countries

Julio S. Solís Arce, Shana S. Warren, Niccolò F. Meriggi, Alexandra Scacco, Nina McMurry, Maarten Voors, Georgiy Syunyaev, Amyn Abdul Malik, Samya Aboutajdine, Opeyemi Adeojo, Deborah Anigo, Alex Armand, Saher Asad, Martin Atyera, Britta Augsburg, Manisha Awasthi, Gloria Eden Ayesiga, Antonella Bancalari, Martina Björkman Nyqvist, Ekaterina Borisova, Constantin Manuel Bosancianu, Magarita Rosa Cabra García, Ali Cheema, Elliott Collins, Filippo Cuccaro, Ahsan Zia Farooqi, Tatheer Fatima, Mattia Fracchia, Mery Len Galindo Soria, Andrea Guariso, Ali Hasanain, Sofía Jaramillo, Sellu Kallon, Anthony Kamwesigye, Arjun Kharel, Sarah Kreps, Madison Levine, Rebecca Littman, Mohammad Malik, Gisele Manirabaruta, Jean Léodomir Habarimana Mfura, Fatoma Momoh, Alberto Mucauque, Imamo Mussa, Jean Aime Nsabimana, Isaac Obara, María Juliana Otálora, Béchir Wendemi Ouédraogo, Touba Bakary Pare, Melina R. Platas, Laura Polanco, Javaeria Ashraf Qureshi, Mariam Raheem, Vasudha Ramakrishna, Ismail Rendrá, Taimur Shah, Sarene Eyla Shaked, Jacob N. Shapiro, Jakob Svensson, Ahsan Tariq, Achille Mignondo Tchibozo, Hamid Ali Tiwana, Bhartendu Trivedi, Corey Vernot, Pedro C. Vicente, Laurin B. Weissinger, Basit Zafar, Baobao Zhang, Dean Karlan, Michael Callen, Matthieu Teachout, Macartan Humphreys, Ahmed Mushfiq Mobarak ✉ & Saad B. Omer ✉ -Show fewer authors

*Nature Medicine* (2021) | Cite this article

- COVID-**19 vaccine acceptance** across 10 low- and middle-income countries (LMICs) in Asia, Africa and South America, Russia and the United States
- Considerably **higher willingness to take a COVID-19 vaccine in LMIC countries**
    - Mean 80.3% vs 64.6% in the US and 30.4% in Russia.

# Vaccine acceptance and hesitancy in LMICs

**Childhood** vaccine **acceptance** is **very high** in most LMICs

>95% believe they are important for children to have

Covid-19 vaccine acceptance is **higher** in most **LMICs** (average 80%) than in HICs

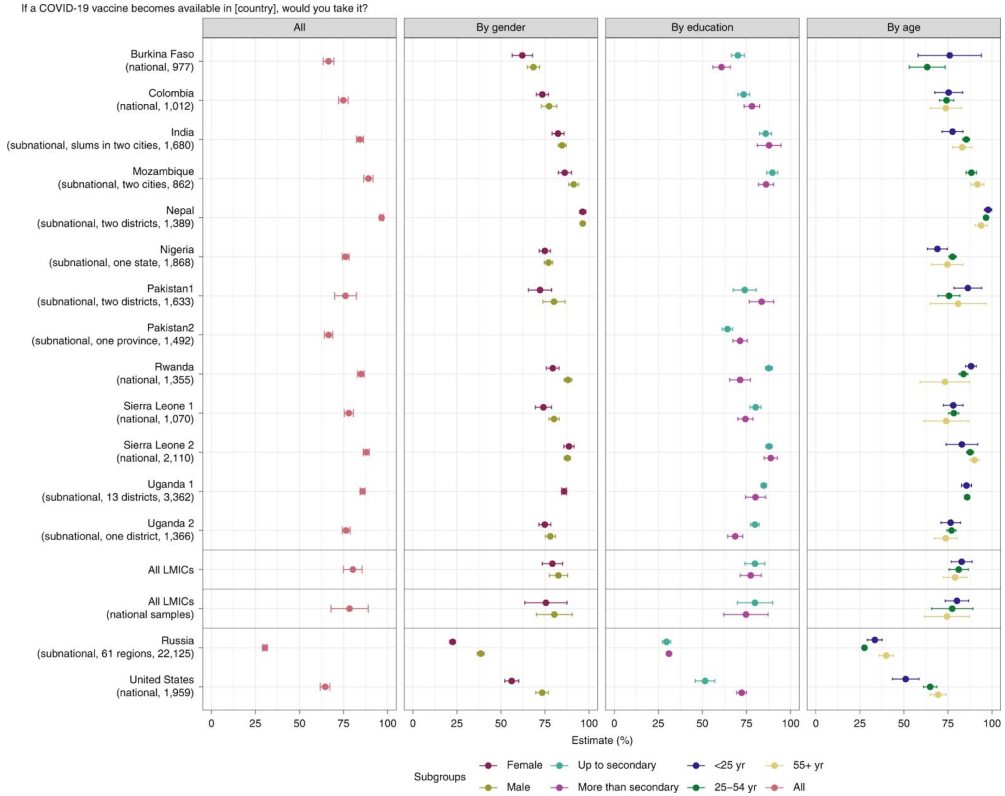
personal protection is the most cited reason for acceptance

Vaccine hesitant individuals are most concerned about side effects (**safety**)

followed by doubts about outbreak severity-- concerns that could be addressed;

**Healthcare workers** are the most **trusted** source of guidance on vaccine uptake in most LMICs.

# Vaccine Acceptance in Low and Middle Income Countries



# Ensuring widespread vaccination

| Eager | Indifferent | Procrastinators | Reluctant |
|---|---|---|---|
| Will travel to a local centre and take the vaccine (trustful of the vaccine) | Will take the vaccine if access is easy low-cost and low-effort | Don't think there's urgency and prefer to avoid side-effects | Distrustful/ fearful of the vaccine/ government |

## Approach 1: Improve ease of uptake

- Set-up vaccination centres near those who are *indifferent*
- Registration support, reminders, information on nearest centre and timing
- Cover transport cost or ease logistics or transportation to vaccine center

## Approach 2: Overcome Hesitancy

- Role-models: community leaders
- Social proof: families and friends
- Trusted information
- Conversation

- Payment e.g. Rs.200

*or*

- Lottery

**Join** our large coalition of partners and help us **NORMalize mask wearing**

https://www.poverty-action.org/masks

**Contact:**

Layla Kwong, lakwong@berkeley.edu

More information: https://osf.io/vzdh6/
To join us or view the pre-print (coming Wednesday): https://www.poverty-action.org/masks

Berkeley Public Health
ipa INNOVATIONS FOR POVERTY ACTION
Stanford MEDICINE
Yale
2041 a2i innovate for all
GREEN VOICE
Give Well
brac