Promoting Vaccination Take-up at the Last Mile: Evidence from a Randomized Controlled Trial in Rural Indonesia*

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Abstract

In settings where resistance and rampant misinformation against vaccines exist, the prospect of ending infectious diseases remains a challenge. Can delivery of information regarding the benefits of vaccination through personal home visits by local ambassadors increase vaccine uptake? We conduct a door-to-door randomized information campaign targeted towards COVID-19 unvaccinated individuals in rural Indonesia. We recruited ambassadors—health cadres, influential individuals, and laypersons—from local villages tasked to deliver evidence-based information about COVID-19 vaccines and promote vaccination through one-on-one meetings, using an interpersonal behavioral change communication approach. To investigate which type of ambassador is the most effective, we carry out a cluster randomized experiment that varies the type of ambassador that delivers the information at the village level. Our sample consists of 3,422 unvaccinated individuals across 287 villages in three districts in West Java. We completed the intervention in July 2022 and expect to conduct the endline survey in the second week of August 2022.

JEL: *I1, I12, I18, I20, I3*

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1 Introduction

Vaccination is one of the most widely accepted preventive health behaviors globally (Brewer, 2021). However, confidence toward vaccines has been low in recent years (De Figueiredo et al., 2020), even during the COVID-19 pandemic when vaccines were touted as a key tool toward controlling it (Solís Arce et al., 2021).[1] A recent estimate shows that globally vaccines prevented 20 million excess deaths attributed to the COVID-19 pandemic (Watson et al., 2022). However, despite the apparent powerful impacts of vaccines, only 61 countries (as of June 2022) have achieved the WHO goal of 70% full-vaccination rate.[2] In addition to supply and accessibility issues, this stagnation can be partly attributed to a recent trend of misinformation in the social media and online messaging platforms (Allcott and Gentzkow, 2017), which has become more rampant during the pandemic (WHO, 2020; Bursztyn et al., 2022; Islam et al., 2021).

Information campaigns informed by insights from behavioral sciences are crucial in overcoming misinformation and driving behavioral changes during a global health crisis (Bavel et al., 2020; Breza et al., 2021; Siddique et al., 2022). Recent studies have documented the relative success of online and virtual media-based information campaigns, such as using SMS/phone calls and video/audio recordings in raising awareness about COVID-19 vaccines (e.g., Alsan and Eichmeyer, 2021; Dai et al., 2021), but most studies were conducted in the early phase of the vaccination roll out. Little is known whether using a similar approach (online or virtual intervention) can be equally effective if implemented in a later phase when vaccination rates are already high—the target population in the early and later phases are likely different in terms of their resistance against vaccination. There remains an urgent need to achieve a higher global vaccination coverage because the COVID-19 pandemic has not been eliminated—cases and death counts have resurged along with the emergence of a new variant—and vaccination

[1] Although vaccine hesitancy is generally low among low-and middle income countries, there is a substantial degree of heterogeneity across regions within a country and different socioeconomic groups (Solís Arce et al., 2021). While many of vaccine-hesitant individuals are not very opposed to vaccination, many of them are also not eager to get vaccinated for various reasons, such as having concerns about side effects and inconvenience related to traveling to and from vaccination centres. (Reza et al., 2022).

[2] https://www.nytimes.com/interactive/2021/world/covid-vaccinations-tracker.html

rates have plateaued in some regions.

In this paper, we study how dissemination of evidence-based information through a door-to-door campaign can counter misinformation and promote vaccination in a setting where vaccines have become widely available but vaccination has not reached universal coverage. We use a more personal communication approach—interpersonal communication implemented through in-person meetings—in this setting as it is more suitable than the online or virtual approach for two reasons. First, personal visits can reach a vulnerable group that is relatively harder to reach by online or virtual media, such as senior persons (aged 60 and older). This is relevant for our study because about 4 in 10 of the study participants are 55 years old and older, while 1 in 4 are seniors.

Second, an in-person interaction is arguably better than the one-way virtual information dissemination in terms of generating empathy and connection (Waytz and Gray, 2018) and clarifying some information about vaccines, which are useful in promoting vaccination take-up—a sensitive issue that interferes with personal liberty of vaccine-hesitant individuals (Rossen et al., 2019). For example, recent evidence shows that text messages and call reminders fail to increase child immunization because the receivers (caregivers) possibly could not understand the message and no one was there to explain it (Banerjee et al., 2021).

We implemented a randomized controlled trial in rural West Java, Indonesia. COVID-19 vaccination rate (first dose) in Indonesia has reached 70% of the total population (as of June 2022), but misinformation about vaccines has arguably in part stalled the progress.[3] Nationwide surveys find that about 4 in 10 people, mainly from rural areas, are reluctant to get vaccinated for reasons stemming from misinformation and misconceptions about COVID-19 vaccines (MoH, 2020; LSI, 2021; SMRC, 2021). People—mainly in rural areas—are reluctant to get vaccinated because (i) they worry about some potentially harmful side effects of vaccines, (ii) they think that vaccines are ineffective against COVID-19, and (iii) they think that they are in a good

[3]By the end of 2021—the time when we secured funding and devised plans for this study—the first-dose vaccination rates in Indonesia and our study areas were still below 50%.

health, and thus do not need vaccines.[4] This problem is not surprising given the evidence that 6 in 10 people in Indonesia are unable to distinguish hoaxes from facts.[5]

A recent survey suggests that misinformation and reluctance to vaccine uptake are also prevalent in West Java (KIC, 2021), the setting of our study. About 4 in 10 individuals who have not taken up vaccine strongly oppose vaccination and 8 in 10 people do not trust vaccines or believe that a strong immune system is sufficient to protect them against COVID-19. These issues are partially reflected in recent statistics: as of February 2022, more than 360,000 people in West Java were 'dropouts'—individuals who had received the first dose but have not taken the second dose within the suggested window period, i.e., six months between the first and second dose—meanwhile more than five million people (the highest in Indonesia) were on the verge of becoming 'dropouts'.[6]

With this context in mind, we designed a cluster randomized controlled trial to investigate whether delivering information regarding the benefits of vaccination through personal home visits by local ambassadors can boost vaccine uptake. To investigate which type of messenger is the most effective, we implemented a cluster randomized experiment that varied the type of ambassador that delivers the information at the village level. We consider three types of ambassadors (treatment groups): local health cadres (community health workers), local leaders or eminent individuals (selected through nomination by respondents), and laypersons.[7] All ambassadors are locals to the villages they are assigned to and can be found in any typical

[4]Local governments and communities have made creative efforts to encourage people to get vaccinated. For example, local village governments in the Java provinces created lottery-based incentives with goats, chickens, and plant seeds as the prizes, while other local governments (e.g., Jakarta) only allow vaccinated people to enter public areas such as shopping centers and malls.

[5]This survey was conducted in 2020 by the Ministry of Communication and Information Technology and the *Katadata* Insight Center (KIC) https://katadata.co.id/desysetyowati/digital/5fb7b04fa5eb9/survei-kic-masyarakat-lebih-percaya-medsos-ketimbang-situs-pemerintah.

[6]https://www.tribunnews.com/corona/2022/02/17/belum-disuntik-vaksin-dosis-kedua-360804-warga-jawa-barat-masuk-kategori-drop-out. In total, there were 20 million people on the verge of becoming dropouts in Indonesia. https://katadata.co.id/maesaroh/berita/620e75b87b2f7/telat-vaksin-dosis-kedua-20-juta-orang-terancam-harus-vaksinasi-ulang.

[7]We do not have a 'pure' control group (i.e., a group that does not receive any intervention) for two reasons: 1) for humanitarian reason, i.e., because we want to help combat misinformation in all villages and 2) for analysis purposes, i.e., having three types of ambassadors allows us to compare which ambassador type is most effective in promoting vaccination. For analysis purposes, we consider *laypersons* as the control group.

Indonesian village.

We consider local health cadres—instead of professional health workers—for several reasons. First, it has potentially great economic and policy relevance for the possibility of scaling up (Peretz et al., 2020; Ballard et al., 2020). Local health cadres are typically available across rural Indonesia, providing services, such as child immunization, to communities at the lowest administrative level (village) that may be hard to reach by conventional health care providers (e.g., hospitals). They are volunteers—not necessarily professional health workers—that have various occupations, such as government officials and housewives (homemakers). Second, because local health cadres are community members, they have some understanding of the local context and cultural values. This could be an important factor in promoting the adoption of health behaviors that may not be widely understood or accepted.

All ambassadors delivered the same messages prepared by the research team to each respondent through personal home visits. They implemented an interpersonal behavioral communication change (IBCC) approach in conducting the task. In addition to the standard message, we provided respondents' personal information—e.g., age, gender, and reasons for not having taken up vaccine—to the assigned ambassadors so that they can tailor a more personalized approach to each respondent. We estimate causal treatment effects by comparing vaccination take-up—verified by a physical or digital proof—and intention across treatment (ambassador) groups.

Our sample consists of 3,422 unvaccinated adult individuals spread across 287 villages in three districts (Bogor, Cirebon and Kuningan) in West Java. The intervention started in the second week of June 2022 and was completed in the first week of July 2022. The endline survey is expected to start in mid-August and end by late September 2022. In addition to vaccination intention in the baseline survey, we also collected rich information on individuals' beliefs and knowledge related to COVID-19 and the COVID-19 vaccine, role model on vaccination, mental health, and morbidity status, among other things.

The overall research design aims to achieve three objectives. First, to investigate whether

health cadres are more effective than local leaders in promoting vaccination take-up. A recent survey in Indonesia finds that respondents place more trust on physicians than on local or religious leaders when it comes to vaccines (SMRC, 2021). Some studies in the context of raising awareness of COVID-19, flu vaccination, and child immunization have documented the effectiveness of either health workers (Alsan et al., 2020; Breza et al., 2021; Armand et al., 2022) or local leaders and celebrities (Banerjee et al., 2019; Alatas et al., 2021), but this is the first study to evaluate the relative effectiveness of the two types of ambassadors. Moreover, the effectiveness of an information campaign to encourage vaccination in a period of falling disease incidence and partial immunization coverage of the population has not been examined before. Although this is an important topic to address—especially in resource-poor countries where misinformation is abound—to our knowledge, the evidence on this particular topic is scarce. These are our main contributions to the literature.

Second, recruiting local ambassadors is useful to increase the chance of success in vaccine promotion. Participants are more likely to be open-minded in accepting information and encouragement conveyed by individuals that share local traits and characteristics (social proximity) (Armand et al., 2022; Bicchieri et al., 2022).[8] Third, this study—if successful and results are economically meaningful—can provide some important insight on how to design information campaigns to encourage vaccination take-up or adoption of other welfare-enhancing behaviors in health or other domains.

This study connects to the growing literature on the impacts of information interventions on preventive health behaviors and vaccination in the COVID-19 context. A large proportion of studies use a combination of virtual media to disseminate information, such as text messages (SMS) and/or phone calls (e.g., Bahety et al., 2021; Dai et al., 2021; Siddique et al., 2022), video and/or audio recordings (e.g., Alsan et al., 2020; Banerjee et al., 2020; Armand et al., 2022; Breza et al., 2021; Torres et al., 2021). In contrast to these studies, as mentioned above, our ambassadors apply an IBCC approach in delivering the information through personal home

[8] We do *not* claim that we vary social proximity of ambassadors and participants in the intervention.

visits during the two-week intervention period.[9] Given that vaccination is a sensitive issue without universal public support, our communication and information delivery strategy offers a good alternative to the existing approach.

2 Institutional Background

2.1 COVID-19 in Indonesia: Pandemic and Vaccination

Pandemic waves. Indonesia officially recorded its first COVID-19 cases on March 2020 in greater Jakarta-West Java region, the main economic hub and largest metropolitan area in the country with a population of about 20 million residents. It marked the beginning of what would become an unprecedented and devastating pandemic that tested the capacity of Indonesia's health facilities and suppressed economic progress. As of April 2022, the Government of Indonesia has reported 6,044,150 confirmed cases of COVID-19 with 156,100 deaths from 510 districts across all 34 provinces (Covid-19, 2022). These numbers are likely to be underestimates as there were issues with the COVID-19 testing capacity and disputes in the official number of cases. The pandemic also imposed major costs to the economy. The poverty rate in (September) 2021—9.71 %—returned to the (September) 2018 rate—9.66 %—erasing three years of economic progress.

Like many countries that did not completely shut access to global travel, Indonesia has not been immune to COVID-19 waves. It has had multiple waves of COVID-19 cases with the Delta variant wave hitting the country especially hard. In mid-2021, Indonesia recorded its largest average number of daily cases, hitting 45,000 new cases per day, resulting in the incidence of COVID-19 cases to stand at 1,140 per 1,000,000 population. As a reference, this number is roughly four times larger than the number recorded in February 2021 (315 per 1,000,000

[9]Prior to the intervention, all ambassadors attended online and offline training sessions (lasted for two days) provided by a behavioural communication specialist from the University of Indonesia and an infectious disease specialist to equip the ambassadors with communication techniques and the latest scientific evidence on COVID-19 and COVID-19 vaccines.

population). The record cases were concentrated in seven provinces: DKI Jakarta (6,886), DI Yogyakarta (3,629), East Kalimantan (2,489), North Kalimantan (2,133), Riau Islands (2,081), West Papua (1,981) and Bangka Belitung Islands (1,780). The Delta wave drove the number of confirmed COVID-19 deaths at the national level to 28.3 per 1,000,000 population. There was a steep increase in deaths throughout June 2021, which has continued into July 2021 and peaked in September 2021. The severity of Delta had the number of deaths more than double in the span of 8 weeks, from 50,000 to 135,000. The increasing trend, however, did not occur during the Omicron-driven third wave as the number of deaths plateaued consistent with its milder form of symptoms.

Vaccination progress. Indonesia started its COVID-19 vaccination program in January 2021 following the approval of CoronaVac vaccine -manufactured by Sinovac Biotech, China- after passing clinical trials in Indonesia by the Indonesian Food and Drug Control Agency (BPOM). To encourage early vaccine take-up, the Indonesian Islamic Clerical Council (MUI) granted the halal status for the CoronaVac vaccine.

To promote and encourage vaccination, the government provided free vaccine shots to the public regardless of economic level.[10] The government attempted to make vaccines available to most individuals even those in remote areas. Eligible individuals may register and schedule their appointment at the nearest health facilities—a public health facility (*Puskesmas*) is usually available in every sub-district, an administrative level higher than villages—to receive their vaccination. However, distribution and storage of vaccines are often challenging for rural and remote areas. The government outlined four phases of vaccination program, with the first phase covering the frontline medical workers. The next phase targeted 17 million public sector workers and 22 million senior citizens (aged 60+ years old). The government focused the second vaccination phase on the main islands of Java and Bali, which have 60% of the total Indonesian population.

[10]The government initially intended to have a paid access to vaccine for economically well-off individuals, but the plan was scrapped after public protests https://www.thejakartapost.com/news/2021/07/17/govt-drops-self-paid-covid-19-vaccinations-after-public-outcry.html

To control the COVID-19 transmission and accelerate recovery, the Indonesian government aimed to fully vaccinate 75% of the target population or about more than 200 million individuals by the mid-2022. The government has met some obstacles in reaching this target. As of April 2022, about 71% and 60% of the target population had received the first and second dose, respectively. Given the logistical challenges, this achievement is pretty impressive, but it is still far short from the double-dose target. Hesitancy against vaccination partially impedes the progress, especially among those in rural areas (MoH, 2020; LSI, 2021; SMRC, 2021). Recent statistics indicate hesitancy and complacency against taking the second dose. As of April 2022, the difference in the number of people that received the first and second dose is staggering: more than thirty million individuals and about twenty million of them are on the verge of becoming 'dropouts'—individuals who had received the first dose but have not taken the second dose within the six-month window.

2.2 West Java

West Java is one of the 6 provinces of Indonesia's main island, Java. More than 100 million people or about 60% of Indonesia's population live in Java, and more than half of Javanese people live in West Java, with a total population close to 50 million people. Java has been one of the largest contributors to Indonesia's GDP in the last decades. The province is known as an industry-intensive province, contributing almost 60% to the national manufacturing industry-specific GDP and 14,3% to the overall national GDP. West Java consists of 27 regencies/cities and it covers almost 36,000 km^2 of land.

West Java has been in the center of the pandemic in Indonesia. The first identified COVID-19 patient was found in West Java in March 2020. Since then, West Java has recorded 707,111 cases (per 18 November 2021), or about 16% of total national cases. Additionally, roughly 10% of Indonesia's COVID-confirmed deaths are contributed by West Java, totaling 14,723 fatality cases, which is the third highest COVID deaths in the country along with Jakarta, Central Java, and East Java. In one occasion, (August 10^{th}, 2021), West Java recorded 491 deaths, accounting for

24% of all deaths in the country at the time. During the delta wave, around 90 % of hospital beds for COVID-19 patients were occupied in West Java, straining the province's capacity to admit patients in need of treatment.

Following national guidelines to prevent further hospitalizations, deaths, and collapse of the health care system, the local government ramped up its vaccination program. As of November 2021, official numbers recorded that 20 million people in West Java (41% of its population) were fully vaccinated (Barat, 2021). This achievement is quite impressive given the pre-existing high vaccine hesitancy in West Java. For example, in 2017 West Java had a diphtheria outbreak—a highly contagious disease that infects nose and throat that is easily preventable with routine vaccination—even though it had been eradicated decades ago.[11] The diphtheria vaccination rate in West Java was 75,6%, far from the recommended 90% rate which indicates high vaccine hesitancy in the region.

Studies suggest that religious tradition in the region, among others, contributed to the hesitancy towards COVID-19 vaccination, especially for districts that are farther away from the urban areas (Fernandez et al., 2011; Harapan et al., 2021). This has led to a centrally organised government initiative to do vaccination drives across the country, including West Java. Despite the concerted efforts, the vaccination rate in West Java remains lower than the national average.

In addition to hesitancy, West Java also faces equally serious issues that might impede vaccination progress: unequal access to public health facilities and lack of demand for health care. For example, Sukabumi and Cianjur districts have comparable population density (600 people/km^2) but the average distance to the nearest health facility differs by 7 km. The gap in health facility has harmful consequences, as reflected in health indicators, such as higher maternal mortality rate for districts that are located farther away from any health facilities (Ronsmans et al., 2009). The supply side is not the only pertinent issue. Some studies find indications of lack of demand for modern health care utilization, such as child birth services, because local people are deeply embedded in the traditional medical practices (Titaley et al.,

[11]During the outbreak, West Java reported 95 cases and 10 deaths, the second highest number of cases in Indonesia (Harapan et al., 2019).

2010).

2.3 Local Health Cadres (Community Health Workers)

Health cadres are community volunteers with the primary role to run village health posts (*Posyandu*), an extension to the primary health care centers (*Puskesmas*). Cadres may be recruited from two channels : (i) Informally through means of social networks of the existing cadres and (ii) Appointed by the village committee (Gadsden et al., 2022). They are mostly tasked to implement promotive and preventive programs such as child health screening and monitoring, immunization delivery, and various counselling sessions on maternal health on a monthly basis. Cadres may follow up the monthly sessions with individualized home visits to the families if necessary (MoH, 2012). Its voluntary nature of work specifies no formal financial compensation—usually monthly financial 'gift' from the village officials, where in a part of Java, they receive up to IDR50,000 (≈ US$4) (Gadsden et al., 2022).

3 Research Design

3.1 Sample Selection

The study sample consists of unvaccinated individuals aged 18+ in rural areas.[12] We focus on rural areas as a large proportion of the Indonesian rural population is misinformed and opposes COVID-19 vaccination (LSI, 2021; SMRC, 2021). We chose West Java province for three reasons: (i) its relatively low vaccination rate despite having adequate supply of COVID-19 vaccines, (ii) its relatively high vaccine hesitancy rate and misinformation problem (KIC, 2021), and (iii) its high 'dropout' rate (i.e., high first-dose but low second-dose). In West Java, we selected the bottom three districts in terms of vaccination rate: Bogor, Kuningan, and Cirebon (see Figure

[12]One main reason to restrict our sample to 18+ years old individuals is to ensure that they have sufficient knowledge about COVID-19 and COVID-19 vaccines and can make informed decisions regarding vaccination without adult supervision.

1).[13] The final sample comprises of 3,422 individuals from 287 villages or about 12 individuals per village.[14]

The randomization procedure was conducted in two steps. First, we randomly selected villages in Bogor, Kuningan, and Cirebon using information from the 2020 village census data (the 2020 PODES). We imposed several restrictions. For transportation and convenience purposes, we only included villages that are not located too far (in km) from district capitals (above 90% percentile). To prevent spillover of treatment effects, we excluded villages that are located within 2 km apart from each other. We then randomly selected 360 villages—60 as backup villages—to reach the target of 300 villages.

The process of selecting eligible individuals was challenging because official information on unvaccinated individuals at the village level did not exist.[15] To collect this information, our enumerators had to approach village officials and local health cadres and ask them to create a list of at least twenty eligible individuals. Enumerators then randomly selected twelve of them to be participants. In cases where enumerators had fewer than twelve eligible individuals to choose from, they followed a snowball approach until they reached twelve participants, i.e., enumerators asked participants for suggestions on the next eligible individuals.

3.2 Intervention

The main goal of this study is to investigate which type of ambassadors is more effective in disseminating information about COVID-19 vaccines and promoting vaccination among unvaccinated individuals. For this purpose, we conducted a randomized controlled trial that varies the type of vaccine ambassadors—local health cadres, local leaders, and laypersons—assigned to randomly selected villages (see Figure 2). Each ambassador implemented an IBCC

[13] As of Mid-November 2021, 46% of the target population (aged 12+) in West Java have received at least one dose and 25% have received two doses, while the numbers for Bogor, Kuningan, and Cirebon are lower than the provincial average for both criteria.

[14] We targeted to recruit 3,600 individuals from 300 villages in three districts. We missed the target mainly because some village heads/village officials and communities declined to participate in this study.

[15] Officials in some villages had information on the names of individuals that had not taken up vaccines.

approach to disseminate the same prepared content of information to each respondent through personal home visits. In addition, we provided respondents' personal information—e.g., age, gender, and reasons for not having taken up vaccine—to the assigned ambassadors so that they can tailor a more personalized approach for each respondent.

The ambassadors' communication skills and style are important for our intervention to be successful. Consistent, compassionate, empathetic, and honest information delivery is key to convince people to get vaccinated (Bavel et al., 2020), especially because vaccine-hesitant individuals are more concerned about their rights to vaccinate than public safety (Rossen et al., 2019).

However, the level of communication skills and style of ambassadors are likely to differ, and large variation can jeopardize the success of the intervention. Thus, to minimize the risk of communication failure, we hired a behavioral communication specialist—a professor in communication studies at the University of Indonesia—to train ambassadors to become an effective communicator. Our team worked closely together with the behavioral specialist to develop a training module, pamphlet, key messages, and a communication strategy for the ambassadors.[16] We used two approaches to develop our communication strategy: MINDSPACE and Social and Behavior Change Communication (SBCC). We use the MINDSPACE approach Dolan et al. (2010)—using principles from nudge theory (Thaler and Sunstein, 2008)—to develop the structure of key messages to be delivered by the ambassadors. Specifically, we used the following MINDSPACE nudging principles that have been documented to work relatively well in tackling vaccine hesitancy in recent studies (Reñosa et al., 2021): (i) make information salient, (ii) change the messenger (in this study, use the ambassadors), (iii) change the way outcomes are framed, (iv) invoke social norms, and (v) encourage emotional effects.

We used the SBCC approach to identify target and priority groups in our sample and to design strategies on how to influence respondents.[17] To create a supportive environment for

[16]We also provided a pocket book for ambassadors to help them conduct their tasks.

[17]Priority groups are individuals who become targets for behavior change. Direct influence is an individual or group (ambassadors) that directly influences the priority group. Indirect influence is an individual or group that does not directly influence priority groups, for example by forming social norms, influencing policies, providing

respondents and for our intervention to work, we designed a strategy which engages one household member from each respondent—regardless of their vaccination status—during the information session with the ambassador. To ensure that our materials connect to the local context, we conducted an FGD in a village in West Java in January 2022 to test our intervention procedure, key messages, and strategies.[18]

To ensure that all ambassadors had the desired level of communication skills and understanding about COVID-19 vaccines, they were required to learn all materials and attend sessions given by our team through online and in-person training sessions. Despite all these, we are aware that developing effective communication skills is unlikely sufficient to encourage vaccination—an ambassador must be credible, as well. We impose two conditions to improve an ambassador's credibility. First, we only recruited ambassadors that have received at least one dose of vaccine. Second, ambassadors were required to attend an information session on COVID-19 and COVID-19 vaccine with our infectious disease specialist in which they learned about the latest scientific evidence about the risks and information related to COVID-19 vaccines.

Information contents. During the two-week intervention period, the ambassadors disseminated information and promoted vaccination in two personal home visits—a week apart.[19] Each visit has different goals and will last about thirty minutes. The goals of the first visit are (i) to improve respondents' understanding on COVID-19 and vaccination and (ii) to promote vaccination through information dissemination. To be more effective, the ambassadors asked a household member to accompany respondents during the information session so that he/she can help persuade respondents and remind the respondent about vaccination. During the first visit an ambassador delivers the following information.

- **Efficacy of first and second dose of vaccine and key population.** The ambassadors

financial assistance, etc. In this study, we use household members as indirect influence.

[18]We summarize the training materials and FGD report in the Appendix A and B, respectively.

[19]Two-week intervention means that the intervention by each ambassador lasted for two weeks, but this does not mean that the intervention period only lasted for two weeks—it can last up to one month depending on the ambassadors' and participants' availability as well as the intervention start time.

conveyed key information of (i) how the vaccine works, including the efficacy rate of full vaccine dose in protecting people from COVID-19 and (ii) a variety of risks the virus poses to certain subgroups of the population. The main objective of this talking point is to educate respondents about the mechanics of vaccine and the key role of vaccine in protecting certain members of the community that have relatively high risk of having severe form of COVID infection.

- **Personal benefits of vaccines.** Next, the ambassadors discussed about the personal benefits of COVID vaccines, which includes benefits from a medical point of view, such as how vaccine protects the recipients from the severe risk of COVID through an immunity enhancing mechanism with minimal side effects as well as the non-medical aspect pertinent to individuals, such as the relative freedom of mobility after getting vaccinated. This information is critical and relevant as government still imposes regulations that require vaccination for access to public spaces, including domestic travel.

- **Social and economic benefits of vaccines.** This talking point discussed the social benefits and positive externalities of vaccination to the local community. In particular, the ambassadors emphasized that vaccinated individuals will protect their family members, relatives, and colleagues by lowering their chance to get infected by COVID. Participants were also informed in the topics of wider benefits of COVID vaccines, especially the alignment of national vaccination strategy and the impacts on the economic recovery at the local level.

- **Social norms of vaccination.** To encourage vaccination, the ambassadors raised issues about social norms related to COVID vaccination. Some of the talking points included (i) the altruism perspective, in which getting vaccinated can translate to the greater good and (ii) convincing respondents that getting vaccinated means conform to the new custom, which has been adopted by the majority.

- **Practical topics of vaccination.** Ambassadors will also engage the participants in some practical topics. These include, for example, vaccine types, number of doses, schedules, and

available local vaccination sites for the participants to access.

To enhance information retention and amplify the effects of information session, the ambassadors also distribute a pamphlet summarizing most important information delivered during the information session, such as minimal risk of severe side effects from vaccine despite morbidity risk (after consulting a physician) and importance of risk for economic recovery and personal freedom.[20] We show the pamphlet in the Appendix C.

During the second visit, the ambassadors asked respondents' intention and commitment to get vaccinated, especially if they appear hesitant during the first visit. The ambassadors offered respondents some help with vaccination registration and home-visit vaccination by local health workers (when available).

Treatment groups. Each type of ambassadors delivers the same content of information and each treatment group only differs in types of ambassadors. Following Sadish et al. (2021) and Siddique et al. (2022) we decided not to have a pure control group—one that does not receive COVID-19 ambassador intervention—in this project for two reasons. First, we want to combat misinformation about COVID-19 vaccine and COVID-19 in general because misinformation can have non-negligible consequences on health outcomes (Bursztyn et al., 2022). Thus, we consider excluding villages from receiving information about COVID-19 vaccine as unethical. Second, more importantly, having no pure control group allows us to test and compare the effectiveness of three actors as ambassadors to combat misinformation, which is our main interest.

- **Treatment 1 (Health cadres).** We recruited health cadres that operate at the village level. Selection was random using a list of available health cadres proposed by the head of health cadres or village officials. In terms of qualification and education credentials, these health cadres differ from health workers (doctors and nurses)—cadres generally do not have medical or nursing degrees. They are generally volunteers that assist community

[20] To minimize the risk of COVID-19 infection transmission during a session, we will require ambassadors and respondents to follow health protocols, such as mask-wearing and 1.5 meters of physical distancing.

health-related agendas, such as implementation of child immunization. Unlike doctors and nurses, most villages have health cadres. (see 2.3 for more details).

- **Treatment 2 (Nominated).** We leveraged village social networks to recruit a local eminent person as an ambassador. Following Banerjee et al. (2019), we asked respondents in each village to nominate and identify up to three individuals who they perceive as the most respected, trusted, and credible at disseminating health or important information in their village. We then approached and recruited the individual that had received the most nominations as an ambassador. In case the first candidate declined, we approached the second candidate and so on until we got an ambassador.

- **Treatment 3 (Layperson).** We coordinated with village officials to have an open recruitment for layperson ambassadors. We then randomly selected the ambassadors from interested candidates. To distinguish between treatment groups, we aimed not to recruit health cadres and village officials to serve as layperson ambassadors.[21]

In total, there are three treatment groups and no 'pure' control group. For the purposes of analysis, we will treat the layperson treatment group as the baseline group.

3.3 Timeline

We completed the baseline survey in April 2022. The ambassador recruitment started in mid-April and lasted for two weeks. Hybrid training and small focus group discussions started in the second week of May, a week after *Eid al-Fitr*—a major religious holiday in Islam that marks the end of the month-long fasting *Ramadan*. The planned two-week intervention—started in mid-June 2022—was completed in the first week of July 2022. The extended delay between baseline and intervention was mainly due to a series of planned activities (online and offline) to train the ambassadors. The endline survey is expected to start in the second week of August

[21]In practice, however, we could not prevent a small number of government officials to work as layperson ambassadors. Our data indicates that majority of nominated ambassadors are government/village officials, almost 50 %, which is significantly larger than health cadres and laypersons (see Table 4).

and end in September or October 2022 at the latest. See Table 1 for a summary of the projects' timeline.

4 Data collection

Our data primarily comes from a baseline survey, endline survey, and administrative data to verify vaccination status of respondents.

Baseline survey. We recruited respondents from our sampling frame to obtain informed consent and administer a baseline survey prior to randomization. We collected variables that may predict our outcome variables, such as basic socio-economic characteristics and some questions designed to elicit their willingness to get vaccinated, and their beliefs as well as attitudes toward COVID-19 vaccination. In addition, we also collected data on all types of ambassadors: health cadres, nomination on central or influential persons, and laypersons (neither health cadres nor local influential people). Below we highlight a set of information we collected during the baseline survey.

- Socio-economic characteristics:
  - Gender, age, educational attainment, employment status, marital status, and weekly expenditure
- Attitude and opinion toward COVID-19 vaccine
  - Degree of willingness to get vaccinated measured using Likert scale where 1 refers to strong opposition and 5 refers to strong support for vaccination, the main reasons for not having got vaccinated, and knowledge about access to vaccine and benefits of getting vaccinated
- Morbidity status

  - This variable records an individual's responses to questions on whether one has diabetes, high blood pressure, respiratory problem, heart problem cancer, and kidney problem.

- Health belief model

  - This variable records an individual's responses to questions on knowledge about COVID-19 and its prevention, severity of COVID-19 infection, benefits of COVID-19 vaccines, and ability to distinguish fake news versus facts about COVID-19. Responses are measured using Likert scale where 1 refers to strongly disagree and 5 refers to strongly agree.

- Vaccination status of other family members within the household and in the neighbourhood.

- Compliance to health protocols

  - Wash hands with soap and water for at least 20 seconds, wear a mask properly when leaving the house, maintaining physical distance of 1,5 meters from other people outside the house, avoid close contacts physical contact, or shaking hands with other people who do not live in the same household, stay away from other healthy people if one has a fever, cough, or difficulty breathing, cover mouth and nose with a tissue, handkerchief, or elbow when sneezing or coughing, and avoid leaving the house when there is no important or relevant work/business.

- Mental health

  - We have two sets of questions to measure the state of an individual's mental health. The first set of questions focus on the general mental health, i.e., depression or stresses that are not necessarily attributed to the pandemic. We draw these questions from the Indonesia Family Life Survey (IFLS), which adapted them from the General Health Questionnaire (GHQ) whose main goals are to measure symptoms of depression and anxiety (Goldberg, 1972). The second set of questions focusing on the state of mental health attributed to the pandemic—Fear of COVID-19 Scale—are taken from Ahorsu et al. (2020).

Endline survey. In addition to sets of information similar to those in the baseline, the endline survey will also collect information about respondents' vaccination status (first and/or double dose), vaccination intention, information spillover measures, and knowledge and beliefs about COVID-19 and vaccines, which we highlight below.

- Vaccination status
  - Vaccination status for first and second dose for respondent and his/her family members (verified by physical or digital vaccination proof).
  - Vaccination intention
- Information spillover measures
  - Changes in vaccination rates among household members, close friends, and relatives.
- Perceived quality of the ambassadors and intervention
  - Perception of participants on the quality of ambassadors in delivering the information session.
- Participation during information session
  - Respondents' knowledge about the information delivered during the ambassador's visit, such as the benefits and risks of taking up vaccines.

4.1 Hypotheses

Existing studies in the literature show that information interventions—delivered using virtual media—can have significant influence on COVID-19 vaccination (e.g., Alsan and Eichmeyer, 2021; Dai et al., 2021). We expect that our more personalized approach can also have positive impacts on vaccination uptake. We anticipate that the effects are more pronounced among individuals in villages assigned with health cadres and nominated ambassadors than those

assigned with layperson ambassadors because we assume that laypersons are less respected and knowledgeable than the other types.

However, it is unclear whether nominated ambassadors are more effective than health cadres. Recent studies show that influential individuals are effective in promoting vaccination or immunization in India (Banerjee et al., 2019) and Indonesia (Alatas et al., 2021), however some studies also find similar effects of health workers on vaccination (Alsan and Eichmeyer, 2021) and compliance to COVID-19 health protocols in the US (Breza et al., 2021). A recent nationwide survey in Indonesia also indicates that physicians are more influential than politicians, religious, and local leaders in encouraging vaccination (SMRC, 2021). Although we recruited health cadres—not necessarily professional health workers—we cannot entirely rule out the influence of health cadres on an individual's vaccination decision. Thus, the puzzle remains.

In addition to testing the effects of the intervention on the vaccination decision, we are also interested in examining the effects on some other outcomes, such as knowledge and beliefs about COVID-19 vaccine, health behaviors, mental health, and spillover effects on families and friends. Finally, we are also interested in testing whether different types of ambassadors have different impacts on the quality of information sessions and the intervention as a whole.

Table 2 summarizes the main hypotheses and outcomes. We provide detailed definition and construction of variables in the next subsection 4.2.

4.2 Outcome variables

4.2.1 Primary Outcomes

The main objective of this study is to examine the effect of the intervention on participants' vaccination decision, which is measured by vaccination uptake and vaccination intention.

Vaccination uptake. This outcome is an indicator variable that equals to one if respondents report that they receive either the first or second COVID-19 vaccine dose in the endline survey,

as verified by the official physical or digital vaccine card issued by the government or other recognized providers.

Vaccination intention. In addition to vaccination uptake as verified by a proof of vaccination, we will examine treatment effects on intention to get vaccinated, which will be measured by two variables. First, the degree of willingness to get vaccinated. This variable refers to the respondent's self-reported likelihood to get COVID-19 vaccine constructed from the following question: *"Currently, how willing are you to be vaccinated against COVID-19?"* Responses to this question are measured using Likert scale where 1 refers to strong opposition and 5 refers to strong support. We normalize these responses to have support 0 to 1. As an alternative measure, we will follow Alsan and Eichmeyer (2021) to categorize these responses into three groups: "most hesitant" if one answers 1 or 2 to the question, "moderate hesitant" if one answers 3, and "least hesitant" if one answers 4 or 5. If we do not have sufficient power to detect the differences between the three groups, to increase statistical power, we will create an indicator variable which equals 1 if an individual responds "least hesitant" or "moderate hesitant" and 0 if "most hesitant". Second, an indicator variable that equals to one if respondents report that they already registered, went to a vaccine center, but were declined by health workers for various reasons, such as high blood pressure or other health reasons.

The intention to vaccine uptake is commonly used as a measure of vaccination in many studies analyzing COVID-19 vaccination (e.g., Alsan and Eichmeyer, 2021; Campos-Mercade et al., 2021; Chang et al., 2021; Klüver et al., 2021). While actual vaccination uptake is arguably the ideal vaccination measure, using this outcome as the only vaccination measure can underestimate the effects of the intervention for two reasons—this is especially relevant for developing country context. First, despite having got vaccinated, some villagers may not be able to get the physical or digital proof of it due to the poor quality of health facilities and health workers. For example, during the baseline survey we found out that vaccination drives in some villages sometimes did not issue a physical card or sent the data to the government data center. Second, vaccination is almost entirely controlled by the government and, to some extent, NGOs or political parties.

This can lead to lower number of recorded vaccinations among our respondents. For example, even though our respondents intend to uptake vaccine, they must wait for their scheduled appointment or vaccination drives that might not overlap with our endline survey period.

Vaccination status of others (household members and close friends/relatives). In addition to individuals' vaccination status, we are also interested in examining the potential spillover effects of the intervention on the reported vaccination status of household members and friends/relatives. Household self-reported vaccination rate is calculated from information on vaccination status of each household member—first or second dose—including the respondent. We will assign 1 if a household member has been vaccinated, obtain the sum of vaccinated members, and divide it by total household members. Vaccination status of close friends/relatives is constructed from responses to "*How many people in your personal network (close family and/or friends) have been vaccinated against COVID-19?*" (conditional on responding "yes" to "*Have any of your relatives / neighbors / acquaintances been vaccinated since our last visit?*") measured using Likert scale, where 1 refers to "few" and 4 refers to "all". We normalize the response to have support between 0 and 1.

4.2.2 Secondary Outcomes

In addition to vaccination, we are also examining the impacts of the intervention on measures of health behaviors—compliance to COVID-19 health protocols and post-intervention COVID infection—and mental well-being. We expect that the intervention can affect health behaviors because the intervention disseminates scientifically-based information about COVID-19 and vaccines and encourages respondents to comply to health protocols and get vaccinated. We also expect that the intervention can influence mental well-being through psychological impacts of having obtained scientific-based knowledge about COVID-19 and vaccination.

Compliance to COVID-19 health protocols. This outcome is an index variable constructed from responses to survey questions regarding compliance to COVID-19 health protocols, such as hand-washing, mask-wearing, and maintaining physical distance. Compliance is measured by two types of responses: binary (yes/no) and 1-4 Likert scale. We create two indices from these responses. For binary response, we assign 1 if one responds 'yes' to each activity and take the average value of all responses to construct the index. For each Likert-scale response, we first normalize the responses to have support 0 to 1 and take the average value of all responses to create the index.

Post-intervention COVID infection. This outcome is an indicator variable that equals to one if respondents report getting infected with COVID after the intervention.

Mental health. The main mental health measure comprises of two index variables: general mental health and mental health attributed to COVID-19 as well as a variable that measures general mental well-being. Responses to general mental health question are measured using Likert scale where 1 refers to rarely or not at all ($\leq$ 1 day) and 4 refers to often (5-7 days). Responses to mental health attributed to COVID-19 are measured using Likert scale where 1 refers to strongly disagree and 5 refers to strongly agree. We normalize the responses to have support 0 to 1 and take the average value of all responses to create the index. In addition, we will also measure general mental health well being, measured using Likert scale where 1 refers to not healthy and 4 refers to very healthy. We normalize the response to this question to have support 0 to 1.

4.3 Intermediate Outcomes

To investigate possible channels through which the intervention affects the vaccination decision, we examine the impacts of the intervention on some intermediate outcomes, such as perception and trust towards ambassadors, knowledge, beliefs, and opinions about COVID-19 and vaccines.

Perceived quality of the ambassadors and intervention. This outcome is an index constructed from four closely related variables: 1) a variable that refers to the respondents' assessment on how convincing ambassadors were in delivering the information session, 2) a variable that refers to the respondents' assessment on how convincing information about the vaccine benefits delivered during the information session, and 3) a variable that refers to the respondents' or accompanying family/household member's assessment on the quality of the information session (first visit), and 4) a variable that refers to the respondents' or accompanying family/household member's assessment on the quality of the information session program as a whole (first and second visits). Responses to these questions are measured using a Likert scale, where 1 refers to least convincing and 5 refers to most convincing (for questions 1 and 2) and 1 refers to very bad and 5 refers to very good. We normalize responses to have support 0 to 1. Because this outcome comprises of four closely related variables, we will create an index that corrects for multiple hypothesis testing problem following Anderson (2008).

Participation during the information session. This outcome consists of two index variables: 1) an index that comprises of responses to questions regarding respondents' and ambassadors' participation during the information session, such as whether ambassadors visited respondents, information session period, and whether respondents had difficulty understanding information conveyed by the ambassadors and 2) an index that measures respondents' knowledge about the benefits and risks of taking COVID-19 vaccine delivered during the information session. To construct the first index variable, we do the following. First, we re-code all outcomes of the same domain so that higher values correspond to the same direction. For example, we assume that longer intensity of information session is better. Second, we generate z-score for each variable. Third, we generate means of these z-scores. Finally, we create the index by generating the z-score for the means of these z-scores. To construct the second index, we assign 1 if respondents' answers are correct, then we take the average of all responses.

Knowledge about COVID-19 and vaccines. This outcome comprises of several variables—knowledge about COVID-19 and its prevention, severity of COVID-19, benefits of COVID-19 vaccines, and fake news versus facts about COVID-19—that are adapted from a health belief model. Each variable, which comprises of several questions, is measured using Likert scale where 1 refers to strongly disagree and 5 refers to strongly agree. We re-code all outcomes of the same domain (e.g., questions on severity of COVID-19) so that higher values correspond to the same direction, then we normalize these responses to have support 0 to 1 and take the average of all responses to construct the index of each variable. Because the knowledge index comprises of several other variables, we will correct for multiple hypothesis testing following Anderson (2008).

Beliefs about COVID-19 and vaccines. This outcome comprises of several variables—vulnerability to catching COVID-19, barriers to COVID-19 vaccines, action, and future projections and benefits during a pandemic—that are adapted from a health belief model. Each variable, which comprises of several questions, is measured using Likert scale where 1 refers to strongly disagree and 5 refers to strongly agree. We re-code all outcomes of the same domain (e.g., vulnerability to catching COVID-19) so that higher values correspond to the same direction, then we normalize these responses to have support 0 to 1 and take the average of all responses to construct the index of each variable. Because the knowledge index comprises of several other variables, we will correct for multiple hypothesis testing following Anderson (2008).

Survey questions. Questions used to construct primary, secondary, intermediate outcomes, and variables for heterogeneity analysis are shown in the Appendix D.

4.4 Balance Tests and Summary Statistics

Participant characteristics. Table 3 presents the summary statistics of baseline characteristics and balance tests between treatment groups. Column 1 shows total number of observation at

the baseline for each variable. Columns 2 to 5 report the average value of baseline characteristics of all respondents and each treatment group. The average respondent is about 48 years old and 58 % are female. Our sample comes from low to lower-middle income groups as indicated by some socio-economic characteristics: less than half of the respondents are employed (45%), about 70% only completed primary school or lower, and nearly 80% received social assistance benefits. About 13% have a type of morbidity, e.g., heart problem, high blood pressure, and respiratory problem.[22] Out of the 5-scale degree of support towards vaccination (with 5 refers to the strongest support towards vaccination), an average respondent is hesitant about vaccine (2.5). The average respondent lives within 0.59 km of a health facility and 3.28 km to the sub-district capital, respectively.

Columns 6 to 8 present results from regressions of each baseline variable on treatment group indicators. None of the 42 coefficients across all balance tests are statistically significant at the 5% level. We also conduct joint orthogonality tests to evaluate an overall balance between groups across all baseline variables. Overall, these tests suggest that our randomization is successful in creating balance across treatment groups.

Ambassadors' characteristics. Table 4 summarizes the characteristics of our ambassadors. We managed to recruit 280 out of the targeted 287 villages (about 97% success rate).[23] In general, the ambassadors are relatively young, 40 years old, which is somewhat surprising as we expect nominated ambassadors to be older than the others. The share of female ambassadors is disproportionately large among health cadres (90 %), which confirms anecdotal evidence. All ambassadors seem credible to encourage participants to get vaccinated as almost all ambassadors have taken the second or even the third dose (booster) and trust vaccines as a key to reduce

[22]The morbidity index is based on eight questions on morbidity history, such as diabetes, high blood pressure, cancer, kidney problem, heart problem, liver problem, respiratory problem, and others. Each question equals 1 if a respondent has a morbidity and 0 otherwise. The index is created by taking average of a respondent's morbidity history.

[23]In the baseline we recruited respondents from 287 villages, but in the endline we will drop respondents in villages without ambassadors. The dropped villages are a mix of treatment groups.

probability of death from COVID-19.[24] Socioeconomic status (education and expenditure) does not differ much across type of ambassadors. We, however, observe some differences among them based on their occupation. Health cadres ambassadors are more active in community participation than layperson ambassadors. There are also some variations in terms of occupation across type of ambassadors. Almost half (47%) of nominated ambassadors are government or village officials, whereas only 7% of the laypersons ambassadors have such jobs. Majority (57%) of the health cadres ambassadors are females and they happen to be more likely to be housewives.

Nominated ambassadors. In total, out of the 90 (*nominated ambassadors*) villages, we received 2,545 nominations (for 859 candidate ambassadors or ≈ 9 candidates per village) from 1,150 participants or ≈ 2 nominations per participant. On average, a successful candidate—candidate that was selected to work as an ambassador—received ≈ 52 % of nominations. In terms of the number, an average successful candidate received more nominations than an average failed (not selected) candidate, 6 vs 2. Table 5 reports that the length of a relationship between a participant and a candidate does not have a clear prediction (non-monotonic) for whether that candidate gets selected as the ambassador in their village. For example, only the medium-length relationship (5-9 years) predicts selection of a candidate, which probably can be explained by the relatively young candidates—the average age of all candidates is 39. In terms of its relationship with candidates, we find that being a village heads/apparatus matters for selection but being a family member or relative does not matter. How comfortable a participant feels towards a candidate—roughly measured by topics of conversation—does not seem to matter.

[24] *Trust on vaccine* is a Likert variable where 1 refers to full distrust on vaccines and 4 refers to full trust on vaccines. We normalize it to to have support between 0 and 1.

5 Empirical Analysis

5.1 Main Results

To investigate the effects of our treatments on outcomes of interest, we will estimate the following regression specification:

$$Y_i = \alpha + \beta Cadres_i + \gamma Leaders_i + \theta Y_{0i} + \tau \mathbf{X}_{vi} + \epsilon_i \quad (1)$$

where Y_i indicates a range of outcomes of individual i in the endline survey, such as indicators for vaccination take-up and intention to get vaccinated. $Cadres_i$ is an indicator for respondents that are assigned to health cadres ambassadors and $Leaders_i$ is an indicator for respondents that are assigned to nominated local leader ambassadors.[25] $\mathbf{X}_{vi}$ denotes a vector of baseline individual covariates—gender, age, indicator variables (marital status, employment status, having primary or lower education, had childhood immunization, received social assistance benefits, health insurance status, total monthly household expenditure per month (in IDR '000), years of schooling, morbidity index, degree of willingness to get vaccinated—and village v covariates, such as the nearest distance to a health facility (in km) and distance to sub-district capital (in km). Whenever possible we also include baseline value of outcomes Y_{0i} to improve precision of our estimates. We cluster standard errors ε_i at the randomization level—village level. As a robustness, we will use double LASSO (Belloni et al., 2014) to objectively select baseline covariates.

Our parameters of interest, β and γ, can be interpreted as treatment effects of health cadres and nominated ambassadors compared to layperson ambassadors, respectively. In addition, we are also interested in investigating which type of non-layperson ambassadors is more effective. To do so, we will compare the effects of health cadres with the effects of local leaders ambassadors, β vs γ. As stated in a previous section, this comparison analysis is of particular interest in the literature and *ex-ante* the outcome is not very clear. Finally, we are also

[25] *Layperson* group serves as the reference group.

interested in examining whether non-layperson ambassadors (health cadres and nominated) are more effective than layperson ambassadors. We will estimate the modified version of Equation 1:

$$Y_i = \alpha + \zeta NonLayperson_i + \theta Y_{0i} + \tau \mathbf{X}_{vi} + \epsilon_i \tag{2}$$

where $NonLayperson_i$ is an indicator for respondents that are assigned to either health cadres or nominated ambassadors. ζ can be interpreted as treatment effect of receiving non-layperson ambassadors treatment compared to receiving layperson ambassadors treatment.

Given the current vaccine progress in Indonesia, we expect that some of our unvaccinated respondents might receive first-dose of vaccine before the intervention. Anticipating this, we designed the information contents, training modules, and instructed the ambassadors to encourage vaccination for unvaccinated individuals and those who have also received first-dose of vaccine. We will not exclude respondents that receive vaccine after the baseline survey because, as stated in a previous section, there are many vaccine 'dropouts' in West Java—the largest number of dropouts in Indonesia are in West Java—which is an important issue because failing to receive the second dose within the suggested time window can lead to less effective protection. Double-dose vaccination is critical since most vaccines require two doses to provide an effective protection against COVID-19 (Bernal et al., 2021; Goldberg et al., 2021).[26]

Hence, it is important to include these individuals in our analysis and encourage them to receive the second dose of vaccine. The treatment effects for individuals that received the first-dose of vaccine might be different from respondents that remain unvaccinated before the intervention. Thus, conditional on adequate number of vaccinated individuals, we will have different analyses based on an individual's vaccination status: those that remain unvaccinated, those who received the first-dose, and pooled (unvaccinated and vaccinated).[27]

[26] Goldberg et al. (2021) show that protection against the Delta variant in Israel decreased in all age groups a few months after receiving two doses of vaccine.

[27] If there are only a handful of individuals that received vaccine before the intervention, we might not be able to detect the treatment effects, and thus, it would not be useful to conduct a separate regression analysis.

Power calculation. To determine minimal detectable effects (MDE) size of this study, we performed power calculation using a normalized mean of vaccine intention—which is 0.384—that is calculated from a 5-scale self-reported degree of willingness to get vaccinated. Using the baseline survey data, we calculated and obtained intracluster correlation of 0.20. As stated in a previous section, our sample consists of 3,422 respondents spread across 287 villages (about 96 villages per treatment arms and 12 respondents per village) in three districts. Using this information, we performed power calculation and found that we are powered to detect a minimum effect of 0.1034.[28] In the presence of 20 % attrition rate across treatment groups and villages—which means our sample size is reduced to 9.5 or ≈ 10 observations per village or 2,737 in total—we are powered to detect a slightly higher effect, 0.1060.

Missing data and attrition. We anticipate attrition for a portion of respondents during the intervention period and endline survey. Attrition may result in missing values of some outcomes and could bias our estimates if the item non-response is systematically correlated with treatment status. To help address this problem we will construct Lee bounds (Lee, 2009) in our estimates for outcomes that are missing for at least 10 % of the sample. To check whether attrition is systematically correlated with treatment status (both within and across treatment and 'control' groups), we will compare baseline characteristics of respondents that droppout out to that of respondents that remain in the study. In addition, we will also check if the rate of attrition between treatment and control groups differs.

Multiple hypotheses testing correction. Because we consider multiple primary outcomes, such as vaccine uptake and intention, we will adjust for multiple hypothesis testing to minimize the false non-discovery rate (FNR) following Anderson (2008).

Randomization inference test. Following Athey and Imbens (2017), we will conduct randomization inference test to correct for p-values of our estimation results. To do so, our assignment

[28] We used the standard `power` command in Stata with two proportion and default (Chi-square) options.

will be reassigned randomly 1,000 times, which will re-estimate our parameters of interest.

5.2 Heterogeneity Analysis

To explore which subgroups are more affected by the intervention and shed light on plausible mechanisms, we estimate the effects of interactions between treatment group indicators—all groups and pool indicators for *health cadres* and *nominated* as treatment and *layperson* ambassadors as control groups— and baseline variables. We highlight some key heterogeneity analyses.

Degree of willingness to get vaccinated. The effect of the intervention on vaccination uptake (verified by physical or digital proof) might vary by an individual's baseline beliefs about vaccine and support towards vaccination. The effect is likely positive and stronger for individuals that show stronger support towards vaccine.

Socioeconomic status. The effect of the intervention might vary by an individual eocioeconomic status, but the direction might not be unambiguously clear. A meta-analysis study on vaccine hesitancy does not find a clear correlation between vaccine hesitancy and socioeconomic status (Larson et al., 2014). We measure socioeconomic status with several variables, such as indicators for higher income (1 if household expenditure per capita is above the median), employment status (1 if employed), higher educational attainment (1 if education is higher than primary school or lower), and beneficiary of any social assistance. Because there are four variables that capture economic status, we will construct an index to correct for multiple hypothesis testing problem following Anderson (2008).

Health belief model on COVID-19 and COVID-19 vaccine. The effect of the intervention might vary by an individual's health belief model about COVID-19 and COVID-19 vaccine, but the direction of the effect might not be unambiguously clear. A meta-analysis study on the effects of health belief model on health behaviors documents mixed results (Carpenter, 2010).

Demographic characteristics. The effect of the intervention might vary by an individual's

gender status and age. A meta-analysis study—that analyzes data from 46 studies (n = 141,550)—on gender differences on COVID-19 vaccine hesitancy finds that more men express intention to get vaccinated than women (Zintel et al., 2022). It is, however, unclear whether older people (aged 60+) have lower or higher vaccine hesitancy towards vaccination than younger people (aged 18-59) and whether the effects of the intervention differ by age groups.

Health status. The effect of the intervention might vary by an individual's morbidity status, but the direction of the effect might not be unambiguously clear depending on an individual's perception on the benefits and risks of vaccines. For example, the effects of the intervention might be *weaker* for sicker respondents—as suggested by their (index of) morbidity history—if they think that the risk of side effects after getting vaccinated is *higher* than the protection benefits of it. However, the effects might be *stronger* if they think that the risk of side effects after getting vaccinated is *lower* than the protection benefits of it. This mixed result is also documented by (Larson et al., 2014).

Role model on vaccination. The effect of the intervention might vary by an individual's source of motivation or role models for getting vaccinated. We expect that the effects of the intervention are stronger for respondents whose role models match with their assigned ambassador type. For example, respondents in health cadres group who consider health workers (e.g., nurse, midwife, health cadres) as trustworthy role models on vaccines are more likely to get or express intention to get vaccinated than individuals whose treatment groups do not align with their preferences.

We construct role model variables from the following: "*Please confirm whether you trust the following figures to motivate you to take the COVID-19 vaccine*". There are 11 choices of role models, including nurse, health cadre, religious leaders, traditional/local leaders, celebrities, self, and family members. We will create three index variables for each type of role models: local leaders (or influential people), health workers, and others. Local leaders categories include traditional leaders (e.g., village heads, religious leaders, political figures, celebrities). Health

workers categories include nurses, midwives, and health cadres.[29] Others categories include own self, advertising, and others. We will assign 1 if an individual reports each choice as her role model, and 0 otherwise. We will calculate the average for each role model category. We will conduct heterogeneity analysis using these three variables.

Robustness. Because our proposed heterogeneity analysis involves many sample splits that may lead to over-rejection of null hypotheses and *p*-hacking, we will apply honest causal forest techniques (Wager and Athey, 2018).

5.3 Mechanisms

The main goal of this study is to investigate whether treatment effects differ by type of ambassadors. For instance, we expect that nominated ambassadors might be more effective in promoting vaccination than layperson ambassadors.[30] One reason for this could be because nominated ambassadors are better in delivering the information. To test this hypothesis, we analyze the effects of the intervention on intermediate outcomes, such as perceived quality of the ambassadors and intervention, respondents' knowledge about COVID-19 and vaccines, and respondents' participation during the information session (see subsection 4.3 for more detailed explanation on each outcome).

We explore another potential explanation as to why nominated ambassadors are more effective than layperson ambassadors. We ask whether nominated ambassadors are simply more respected than layperson ambassadors regardless of the intervention quality. We use the ambassadors characteristics—measured by an index comprising of age, education, monthly expenditure, vaccination status (first, double or booster), attitude toward effectiveness of vaccines, and community participation—to serve as a proxy for respect from respondents.[31] We

[29] We include medical doctors in health cadres.

[30] In addition to comparing nominated with layperson ambassadors, we will also conduct a similar analysis for health cadres vs layperson, health cadres vs nominated, and non-layperson (pooling health cadres and nominated each) vs layperson ambassadors. Comparison between nominated and layperson is only for illustrating an example.

[31] To construct the index, we do the following. First, we re-code all outcomes of the same domain so that higher values correspond to the same direction. Second, we generate z-score for each variable. Third, we generate means of these z-scores. Finally, we create the index by generating the z-score for the means of these z-scores.

assume that ambassadors with higher characteristics index earns more respect from respondents. We will regress vaccination outcomes on characteristics of the ambassadors and test the differences between ambassadors' type to examine whether innate quality of the ambassadors matters in explaining respondents' vaccination decision.

Mediation analysis. Next, we will conduct mediation analyses on all intermediate outcomes (mediators) as an attempt to establish causal mechanisms and understand the indirect effects (contribution) of mediators on vaccination decision. We will follow an approach developed in Heckman et al. (2013), in which we impose three key assumptions explained in Huber et al. (2016): conditional independence of treatment, conditional independence of the mediator, and common support. Because conditional independence of the mediator (e.g., perceived quality on ambassadors and intervention is exogenous) does not necessarily hold, we will construct inverse probability weights from probability of treatment as a function of all potential mediators and any covariates following Huber (2014).

Finally, we will conduct some further analysis to evaluate how our communication approach and strategy for the intervention matters. For this purpose, we will evaluate whether the participants' perception on the quality of the intervention and ambassadors is driven by the ambassadors' competence or participants' respect towards the ambassadors.[32]

To test whether the perception is driven by competence, we will regress intermediate outcomes on treatment indicators interacted with the index of ambassadors' competency test scores, where the interaction term captures differential treatment effects of ambassadors' competence. The ambassadors' competence is measured by correct responses to 15 questions on knowledge about vaccines and communication skills.[33] We assume that higher score reflects higher competency.

To test whether the perception is driven by respect, we will regress intermediate outcomes

[32]We will only conduct this analysis if we find that the perceived quality outcome is indeed an important mechanism, as indicated by statistical significance and magnitude of its indirect effects to vaccination decision in the mediation analysis.

[33]The competency assessment form is shown in the Appendix E. We assign 1 to correct response to each question and 0 otherwise. We take the average value of all responses to construct the index.

on treatment indicators interacted with the index of ambassadors' characterjjjistics, where the interaction term captures differential treatment effects of ambassadors' characteristics.

6 Conclusion

We conduct a cluster randomized controlled trial that varies the type of ambassadors in rural West Java. We compare the effectiveness of three different types of ambassadors: local health cadres, local leaders nominated by the people within the village, and local laypersons to deliver information sessions in an attempt to promote COVID-19 vaccine take-up. In total, this study comprises of 280 ambassadors and 3,422 participants. During the intervention period, each ambassador made two home visits for each participant.

Our estimates of the intervention expenses suggest that each ambassador, on average, costs US$ 45 (IDR671,000) for the whole intervention or US$ 3.75 (IDR56,000) per participant.[34] Our intervention has a relatively high fixed cost to cover the training program for the ambassadors but moderate marginal costs (remuneration fee) per treated participant, suggesting its value for money potential. Moreover, because each type of ambassadors is generally available in a typical village in Indonesia, we hope that the success of this project can help inform policy makers about the potential of scaling up such intervention, particularly in settings where vaccination is persistently low and people need to be convinced to get vaccinated. In the next version—upon completion of the endline survey—we will provide a back-of-the-envelope estimate of the cost of increased take-up rate per individual.

[34]Total intervention expenses comprise of training and monitoring of the ambassadors (US$ 8,450 ≈ IDR 126,000,000) and remuneration fee (US$ 4,150 ≈ IDR 62,000,000).

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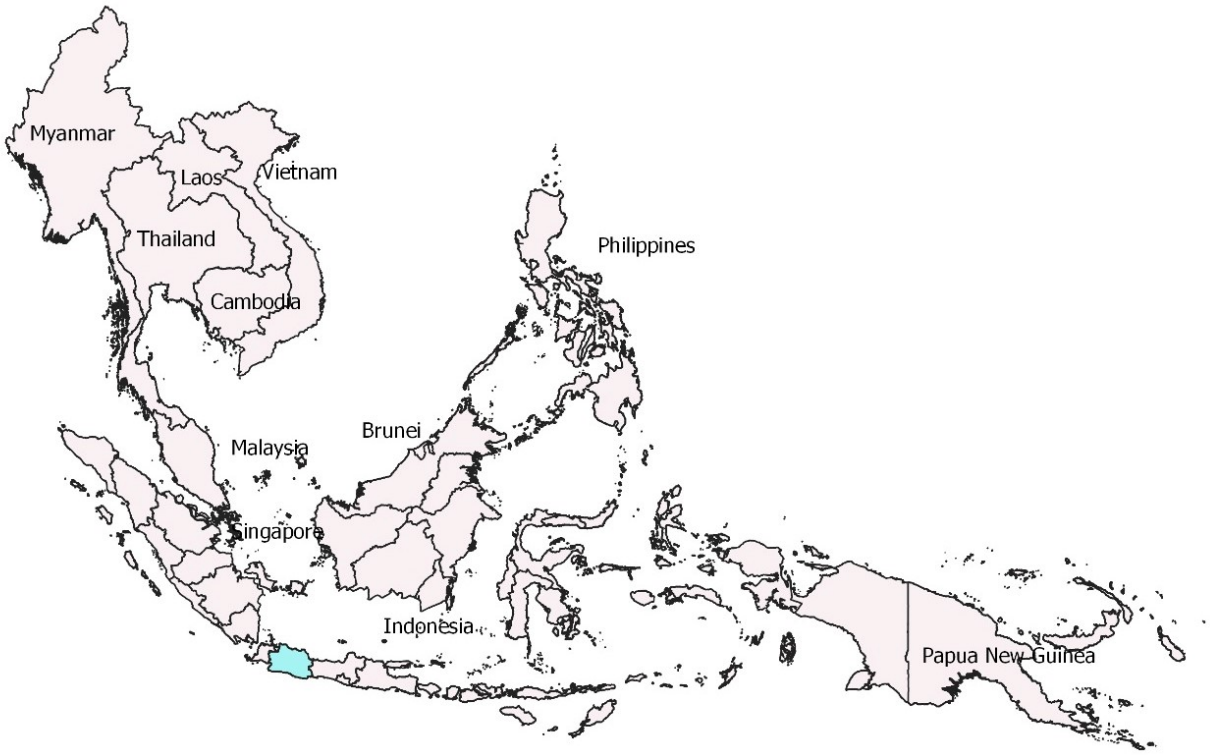
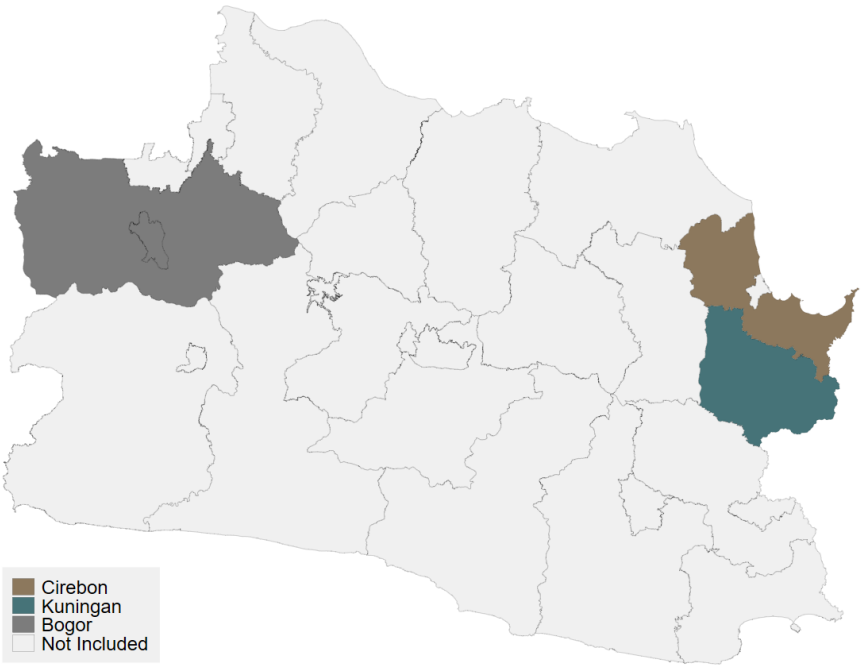
Figures

Figure 1: Map of Study Areas

(a) Map of Indonesia

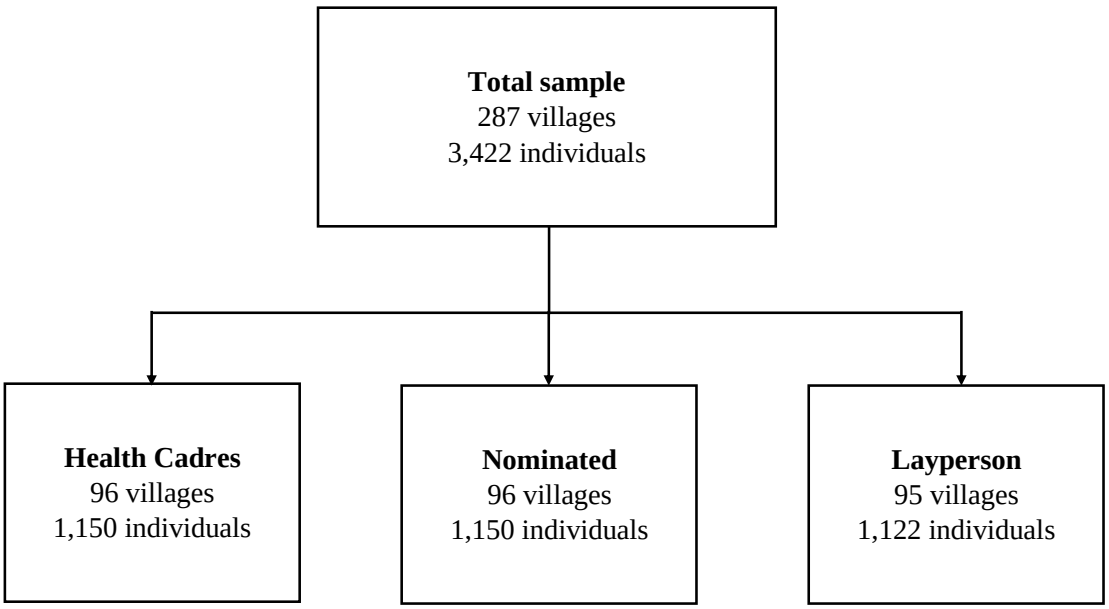


(b) Map of West Java Province



Note: This map shows Indonesia (upper panel—West Java highlighted) and West Java Province (lower panel—Bogor, Cirebon, and Kuningan districts highlighted).

Figure 2: Study Design



Tables

Table 1: Timeline

Date	Activity
Mid February-early April	Baseline
Mid-April	Ambassador recruitment
May	Hybrid ambassador training and FGD
June-July	Intervention: two weeks of personal home visits
August-October	Endline

Table 2: Summary of Hypotheses and Outcomes

Hypothesis	Outcomes
1. Do treated individuals increase vaccination take-up and intention?	
H_0: Compared to layperson ambassadors (control), information provision through health cadres and local leaders ambassadors (treatment) does not increase vaccination take-up and intention	Vaccinated (first or second dose) (=1), degree of willingness to get vaccinated (normalized—between 0 to 1), and registered but declined by health workers (=1). Will correct for multiple hypothesis testing problem following Anderson (2008).
2. Does our treatment generate spillover effects?	
H_0: Treatment has no impacts on vaccination take up of individuals not included in the sampling framework	Household vaccination rate (between 0 and 1), close friends/relatives get vaccinated (=1), and number of close friends/relatives having been vaccinated (normalized—between 0 to 1). Will correct for multiple hypothesis testing problem following Anderson (2008).
3. Do treated individuals improve their knowledge and change their beliefs about COVID-19 vaccine?	
H_0: Treatment does not have any impacts on knowledge and beliefs about COVID-19 vaccine	Index of knowledge about COVID-19 vaccine (e.g., side effects, benefits, and risks of getting COVID-19 vaccines) and index of beliefs about COVID-19 vaccine (e.g., beliefs about vulnerability to catching COVID-19 and barriers to getting COVID-19 vaccines).
4. Do treated individuals change their health behaviors and experience better mental health?	
H_0: Treatment does not change health behaviors and improve mental health well-being	Index of compliance to health protocols (e.g., mask-wearing, hand-washing), indicator for post-intervention COVID infection, index of general mental health well-being, and index of mental health well-being attributed to COVID-19.
5. Do treated individuals receive better information sessions?	
H_0: Treatment does not have any impacts on the quality of information sessions	Subjective assessment on how convincing ambassadors were in delivering the information session, subjective assessment on how convincing information on vaccine benefits was during the information session, subjective assessment on the overall quality of the information session, and subjective assessment on the overall quality of the intervention (first and second visit). All assessment variables are originally measured using likert scale 1-5 but are normalized to have support between 0 and 1). Will correct for multiple hypothesis testing problem following Anderson (2008).
6. Does type of ambassadors have significant impacts on vaccination (take-up and intention) and other outcomes?	
H_0: Type of ambassadors does not have any impacts on vaccination and other outcomes of treated individuals	Comparison of outcomes (mentioned in hypotheses 1-5) across treatment groups (nominated vs laypersons; health cadres vs laypersons; nominated vs health cadres).

Table 3: Baseline Summary Statistics and Balance Tests

		Mean				Difference between Groups (p-value)		
	N	Pooled	Health Cadres	Nominated	Layperson	Health Cadres vs Nominated	Health Cadres vs Layperson	Nominated vs Layperson
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Male	3,422	0.418	0.414	0.406	0.433	0.834	0.419	0.299
		(0.493)	(0.493)	(0.491)	(0.496)			
Age	3,422	48.661	48.703	48.825	48.450	0.840	0.759	0.613
		(14.040)	(14.055)	(13.890)	(14.186)			
Married	3,422	0.744	0.737	0.749	0.745	0.501	0.727	0.709
		(0.437)	(0.440)	(0.434)	(0.436)			
Employed	3,418	0.450	0.439	0.460	0.450	0.621	0.661	0.971
		(0.498)	(0.496)	(0.499)	(0.498)			
Primary or lower education	3,422	0.696	0.683	0.699	0.705	0.798	0.435	0.600
		(0.460)	(0.465)	(0.459)	(0.456)			
Had childhood immunization	2,988	0.720	0.731	0.714	0.716	0.725	0.713	0.958
		(0.449)	(0.444)	(0.452)	(0.451)			
Nearest distance to a health facility (KM)	3,422	0.587	0.607	0.573	0.581	0.974	0.988	0.961
		(1.075)	(1.186)	(0.918)	(1.103)			
Distance to subdistrict (KM)	3,422	3.276	3.113	3.457	3.259	0.619	0.866	0.752
		(2.496)	(2.215)	(2.687)	(2.552)			
Received any social assistance benefits	3,422	0.788	0.778	0.790	0.798	0.939	0.638	0.682
		(0.408)	(0.416)	(0.408)	(0.402)			
Years of schooling	3,419	6.233	6.326	6.196	6.175	0.785	0.567	0.758
		(3.459)	(3.462)	(3.570)	(3.341)			
Total HH expenditure per month (IDR '000)	3,398	2441.0	2488.6	2402.2	2431.8	0.392	0.535	0.837
		(1,301.8)	(1,371.5)	(1,219.3)	(1,310.0)			
Has health insurance	3,422	0.646	0.662	0.644	0.632	0.462	0.320	0.755
		(0.478)	(0.473)	(0.479)	(0.483)			
Morbidity index	3,418	0.131	0.130	0.131	0.134	0.851	0.737	0.861
		(0.115)	(0.115)	(0.111)	(0.118)			
Degree of willingness to get vaccinated	3,422	2.536	2.511	2.548	2.549	0.644	0.620	0.956
		(0.899)	(0.917)	(0.901)	(0.880)			
Joint-Test Prob > F						0.975	0.970	0.972

Note: Column 1 reports total number of observations. Column 2 shows the average value and standard deviation of each variable for all sample (pooled), while columns 3 to 5 for each treatment group. Columns 6 to 8 report p-values of the coefficient from regressing each baseline variable on treatment group indicators. Robust standard errors are clustered at village level. Joint Orthogonality Test Prob > F refers to the p-value of F-test of a regression of treatment indicators being compared on all baseline variables reported in this table. This test provides an overall evaluation of the balance between groups across all baseline variables. *, **, and *** denote statistical significance at 10 %, 5 %, and 1 % levels, respectively.

Table 4: Ambassadors' Characteristics

	Mean			Difference between Groups (p-value)		
	Health Cadres (1)	Nominated (2)	Laypersons (3)	Health Cadres vs Nominated (4)	Health Cadres vs Laypersons (5)	Nominated vs Laypersons (6)
Age	40.628	39.906	37.587	0.566	0.023	0.080
	(8.689)	(8.107)	(9.380)			
Male	0.104	0.656	0.383	0.000	0.000	0.000
	(0.307)	(0.478)	(0.489)			
Monthly HH expenditure (in '000 IDR)	2446.988	2480.769	2173.494	0.879	0.222	0.146
	(1504.979)	(1298.556)	(1369.180)			
Secondary or higher education	0.774	0.760	0.753	0.638	0.928	0.580
	(0.421)	(0.430)	(0.434)			
Vaccination status						
2nd dose	0.510	0.422	0.479	0.230	0.664	0.444
	(0.503)	(0.497)	(0.502)			
3rd dose	0.458	0.556	0.489	0.187	0.670	0.372
	(0.501)	(0.500)	(0.503)			
1st dose	0.031	0.022	0.032	0.704	0.979	0.687
	(0.175)	(0.148)	(0.177)			
Trust that vaccine can prevent death from COVID-19	0.889	0.893	0.911	0.903	0.393	0.495
	(0.203)	(0.211)	(0.156)			
Community participation	0.472	0.433	0.387	0.259	0.032	0.265
	(0.220)	(0.247)	(0.318)			
Occupation						
Government/village officials	0.133	0.475	0.081	0.000	0.267	0.000
	(0.342)	(0.503)	(0.275)			
Community workers/volunteers	0.133	0.025	0.023	0.008	0.006	0.942
	(0.342)	(0.157)	(0.152)			
Employee	0.144	0.275	0.465	0.038	0.000	0.011
	(0.354)	(0.449)	(0.502)			
Housewife	0.567	0.212	0.372	0.000	0.010	0.023
	(0.498)	(0.412)	(0.486)			
Unemployed/student	0.022	0.013	0.058	0.628	0.230	0.109
	(0.148)	(0.112)	(0.235)			
N	96	90	94			

Note: Columns 1 to 3 show the average value and standard deviation of each characteristic. Columns 4 to 6 report p-values of the coefficient from regressing each characteristic on ambassador type indicators. Variables *Trust on Vaccine* and *Community participation* are normalized to have support between 0 and 1. *Community workers/volunteers* include some cadres in health and other sectors. *Employee* category includes several occupations: employee, workers in agricultural sectors/farmers, and freelance workers.

Table 5: Nominated Ambassadors' Relationship and Interaction with Nominators (Participants)

	Nominated ambassadors		Difference (p-value)
	Selected	Not selected	
	(1)	(2)	(3)
Length of relationship			
<5 years	0.066	0.063	0.803
	(0.248)	(0.243)	
5-9 years	0.349	0.294	0.014
	(0.477)	(0.456)	
10-19 years	0.237	0.267	0.150
	(0.426)	(0.442)	
>20 years	0.348	0.377	0.206
	(0.477)	(0.485)	
Relationship			
Father/Mother	0.004	0.001	0.329
	(0.060)	(0.032)	
Brother/Sister	0.000	0.005	0.003
	(0.000)	(0.067)	
Other relatives	0.016	0.020	0.557
	(0.126)	(0.139)	
Neighbor	0.009	0.033	0.000
	(0.094)	(0.179)	
Friend	0.005	0.010	0.263
	(0.073)	(0.097)	
Members in the same organization	0.077	0.113	0.006
	(0.266)	(0.317)	
Work colleague	0.004	0.001	0.233
	(0.060)	(0.022)	
Public figure	0.037	0.047	0.311
	(0.190)	(0.211)	
Teacher	0.000	0.003	0.014
	(0.000)	(0.055)	
Religious leader	0.002	0.042	0.000
	(0.042)	(0.201)	
Health worker/cadre	0.025	0.104	0.000
	(0.156)	(0.306)	
Head/village apparatus	0.458	0.202	0.000
	(0.499)	(0.402)	
Hamlet head	0.291	0.300	0.651
	(0.454)	(0.459)	
Others	0.073	0.119	0.000
	(0.261)	(0.324)	
Topics of discussion aside from health issues			
Personal affairs	0.405	0.399	0.800
	(0.491)	(0.490)	
Financial issues	0.012	0.008	0.333
	(0.111)	(0.087)	
Work issues	0.103	0.126	0.137
	(0.305)	(0.331)	
Nothing specific	0.412	0.409	0.916
	(0.493)	(0.492)	
Total nominations	561	1984	
Number of ambassadors	90	769	

Note: Columns 1 and 2 show the average value and standard deviation of each variable for 'selected' and 'not-selected', respectively. Selected candidates are the available ambassadors who received the most nominations from participants. Column 3 reports the p-values of the coefficient from regressing each variable on the indicator for selection of candidate ambassadors.

Appendix

A Training Curriculum and Guideline for Ambassadors

We developed our training curriculum systematically which comprises of several stages of programs. In general, the programs can be grouped into (1) Training for Trainers, (2) Vaccine Ambassador training. Field officers (FOs) will recruit Vaccine Ambassadors based on the information collected by the enumerators. The next phase is the training of FOs. After being trained, the Field Officers will manage and provide training for Vaccine Ambassadors.

The training is carried out in two sessions, namely online and offline. The online session will discuss all information related to Covid and Covid vaccination. Whereas The offline session will equip the ambassadors with suitable communication skills, particularly in interpersonal communication and how to be persuasive. The session will take form in role play, where ambassadors will be divided into small groups. After the training, the FOs will facilitates and supervises the Vaccine Ambassadors during the intervention phase.

1. **Module Development Objectives**

   The training module was prepared as a training reference for Vaccine Ambassadors who will deliver information sessions to the participants in order to increase the take up of the COVID-19 vaccine. The Vaccine Ambassador Program is a research activity carried out by Monash University and LPEM FEB-UI, J-PAL, and CISDI to determine the effectiveness of education by Vaccine Ambassadors on decisions to use the COVID-19 vaccine.

2. **Expected Learning Outcomes**

   After attending the training sessions, participants are expected to be able to:

   - Provide education regarding the benefits of vaccines
   - Building relationships with participants/targeted communities
   - Building openness with participants/targeted community

- Invite participants/targeted community to vaccinate
- Encourage participant commitment target community

3. **Evaluation of Learning Outcomes**

   Participants' learning outcomes will be assessed based on three assessments:

   - Participants'pretest and post-test scores
   - The results of observations on the implementation of role-playing (role-playing)
   - Log book recording the visit of the Vaccine Ambassador to the participant's house

Ambassadors' guideline Prior to the visit, the vaccine ambassador will attend training to increase the knowledge and skills of the vaccine ambassador regarding the outreach that will be carried out. The training was conducted twice, namely online and offline training. Online training will be conducted via Zoom. While offline training will be conducted in the area of each vaccine ambassador managed by the Field Officer. All information related to training can be communicated to the Field Officer.

At the end of the training, the vaccine ambassador will receive several items from the field officer to support outreach activities, namely:

- Medical mask
- Hand sanitizer
- Log book
- Pamphlet
- List of target participants

Vaccine ambassadors work in one village area. Each ambassador will reach about 12 households in her village area, where in that household there is at least one person who has not received the first or second dose of COVID-19 vaccination. Outreach is carried out through

Table 6: Timeline of the ambassadors' activity

No	Activity	June			
		I	II	III	IV
1	Ambassador : Online training	✓			
2	Ambassador : Offline training	✓	✓		
3	Home visit 1			✓	
4	Home visit 2				✓

home visits to provide education to people who have not been vaccinated (participants) and one family member who lives in the same household as the participant.

The visits were carried out twice, with a distance between visits of at least 1 week. The first visit was conducted to provide education regarding the benefits of vaccines so that participants are motivated to benefit from the vaccination program. The second visit was carried out as a repeat visit with the aim of strengthening the participants' commitment. Home visits were used to build Duta's understanding of the participants and to establish two-way conversations.

For this, Ambassadors need to practice an interpersonal communication (KAP) approach by being a good listener and end the home visit by asking for commitments from participants according to their abilities and agreements made during the conversation ("locking commitments"), especially on the first visit. Home visits must observe strict health protocols and avoid physical overcrowding to minimize the risk of spreading COVID-19.

Home visits are at least 30 minutes long, depending on the interaction and discussion process that occurs. Duta will visit a maximum of three (3) households per day. The visit was carried out at the time agreed upon between the ambassador and the participants. The time of the visit will vary from one household to another, but in principle the visit is done when the participant is not working or busy with other matters.

Lastly, we also developed a guide book for the ambassadors which contains all the relevant information on Covid and Covid vaccination, practical tips, FAQs and how to answer participants' question, etc. Ambassadors are encourage to consult with this guide book when preparing for the home visit.

B Focus Group Discussion Report

Social and Behavior Change Communication Strategy Development for Vaccine RCT Project

Four focus group discussion (FGD) sessions were held with 36 residents of Cibanteng Village, Ciampea Subdistrict, Bogor District on Thursday, 6 January 2022. Of the total participants, 20 were men and 16 women. The purpose of the discussion is to gather the participants' opinions regarding the COVID-19 vaccination program, as part of the randomized clinical trial (RCT) study conducted by CISDI in collaboration with Monash University, LPEM FEB UI and J-PAL SEA.

Key findings. The discussions indicate that the participants perceive COVID-19 vaccination program as an obligation rather than a necessary measure to protect themselves from the threats of COVID-19. The benefits of the vaccination as a protection for themselves and others are not the top-of-mind opinions among the participants, both men and women of all ages.

The male participants within the age range of 18- to 50-year-old share similar views and do not focus on the importance of vaccination for themselves or others. The main reason they get vaccination is due to the flexibility to travel. The participants who are also students claim that their reasons are related to the requirements from their schools/universities for in-class or face-to-face sessions. The blue-collar workers say that their main reasons for vaccination are the obligation from their workplace and access to public transportation. A male participant says he is "forced" to vaccinate because he needs to take the commuter train, and his decision is made even before he checks the 'halal' status of the vaccine. This indicates that the participant puts his practical needs first before his religious values.

None of the participants, female or male, mentioned any words or statements associating the COVID-19 vaccination with disease transmission or prevention, or protection from the threat of a pandemic. In fact, some participants came to the discussion sites without wearing face masks. This demonstrates the participants' ignorance of the health protocol.

The discussion revealed differences between female and male participants regarding the

reasons to have been or have not been vaccinated for COVID-19. The female participants generally focus on the emotional aspects, such as fear of injection or needles, and worry about the adverse events following immunization. When asked to share their views on the COVID-19 vaccination program and the benefits, female participants tend to response with information that is not based on evidence. Such information is usually received in the form of individual testimonials. Although the participants do not believe some of the information as true, and even identify some as hoax, such information somehow sticks in their minds. Female participants who were over 50-year-old tend to use ambiguous, unscientific, and unclear information as their justifications for the decisions to not participate in the vaccination program.

All participants, both female and male, admit that they do not validate the information about COVID-19 vaccine they receive. This also applies to the participants with direct access to health workers, such as midwives. From the discussion, it was clear that verifying the information received, and/or finding trusted sources when seeking for information are not deemed necessary for the participants.

When making decisions about vaccination, the male participants tend to be influenced by community leaders, such as religious leaders or village officials, as well as heads of RT/RW (neighborhood units). According to the male participants, religious leaders play a major role in encouraging the community to be vaccinated. The supportive statements about vaccination program from the religious leaders, followed by the examples those leaders set to the community, are perceived to be effective in securing the acceptance from the community toward the program. This means that the COVID-19 vaccine is considered 'halal', is in accordance with the religious teachings, and is beneficial for them as well as others. On the 'halal' issue, all participants say they rely on the statement from the Indonesian Ulama Council (MUI) that supports the COVID-19 vaccination program.

All participants share the same view about the importance of access to vaccine when making decision about vaccination. Having the information about the location and the time of vaccination is said to be effective in encouraging participants to get the COVID-19 vaccination.

Easy access to vaccination increases the willingness of the community to be vaccinated. The COVID-19 vaccination program in Cibanteng has been carried out at the village level, down to the RW unit.

The participants observe that the community's motivation to get vaccination is due to the full support of the health cadres and community leaders who provide information on the location and schedules, starting from the day before and during the vaccination. The access to vaccination, coupled with the proofs from the other community members who do not have serious adverse events following immunization, has motivated the participants without existing medical conditions to be vaccinated. The other motivation, according to the participants, is the provision of nine basic staples for those who are vaccinated. Participants said that the nearby university once had a vaccination program that gave away the nine basic staples as rewards for those who were vaccinated. The event managed to attract a lot of people, even from farther areas.

The participants who are not vaccinated say that the main reason for their decision to not getting the vaccine is their existing medical conditions, such as hypertension, stomach acid disorders, diabetes, and arthritis. They were worried that the vaccine would worsen their conditions. As one female participant stated:

"*. . . actually I want to be vaccinated like other people. (However) my body and my conditions do not allow me, so I am afraid. I have many conditions (such as) gout, stomach acid, (and) my body is sick, (also) my legs. I fear the vaccine will make my conditions worse*."

The information relating COVID-19 vaccination and existing medical conditions is normally obtained from the news on television, as well as the chats on *WhatsApp* or posts in social media. These kinds of information are considered valid by all participants who are not vaccinated, although not all of them try to seek confirmation from their medical doctors about this information.

During the discussion, participants were unable to provide convincing information about the impact of vaccines on those with existing medical conditions. The information they use

as reference is not from credible sources. Participants with comorbidities did not seek further information from health workers or other reliable sources of information. They are quite satisfied with the information obtained or not obtained from the people around them. Some participants say that they receive information from the midwives. But it turns out that the midwives are also their relatives. Another reason given by the participants who have not vaccinated is related to their age (above 70-year-old) and limited activities outside of home, so vaccination is deemed unnecessary for them.

When discussing sources of information that are seen as credible and reliable for information related to COVID-19 vaccination, female participants tend to rely on people whom they know personally like health cadres and village midwives. The male participants, on the other hand, although influenced by religious or community leaders, they say that they prefer people who are competent in the health sector to assist the community or religious leaders when providing information. This way, those leaders will be more convincing. Those who consider competent include midwives, doctors, or other health workers.

The older male participants (beyond 50-year-old) emphasize the importance of providing the community or religious leaders with simple, brief written guidelines to help them responding to the frequently asked questions about COVID-19 vaccination. They also suggest that the guidelines include information about the different ways to convey the information to people from different background, as well as the tips on the right timing to share such information to the audience.

When asked about the delivery of the information, the participants prefer print materials and verbal explanations from those who are considered competent and trusted. The discussion also reveals that information containing abstract concepts is rather difficult to understand for the participants, especially female over 50 years of age. The participants prefer direct method, either one-way communication (such as using loudspeakers in places of worship) or two-way (such as counseling at the Posyandu). For participants with access to mobile phones and the Internet, the information they expect to receive on their phones is limited to technical information regarding

the implementation of the vaccinations or reminders to get vaccinated (for those who have not).

The discussion also reveals that the information regarding the benefits of COVID-19 vaccination for those who are vaccinated and for others has been provided by the Posyandu cadres. However, based on the observation during FGD, the female participants do not immediately remember the information. This could be due to the way the information was conveyed. It was conveyed verbally without any supporting or leave-behind materials for the participants, and was not repeated frequently.

In addition, female participants, especially those with young children, use the terms "vaccine" and "vaccination" only when referring to COVID-19. When talking about vaccination programs for other diseases, including those for infants and young children, the participants use the term "immunization". It seems that those terms are interpreted differently by the participants.

Opinions on key messages. The participants were requested to express their opinions on the key messages crafted by the research team. In general, the key messages were not self-explanatory. Further explanations of each message was required to ensure those messages were understood by the participants.

"Vaccination protects you from COVID-19"

Most female participants do not find this message easy to understand. After given further explanation, the participants say that they understand the meaning of this sentence. However, they do not suggest that this message will motivate others to get vaccination. The male participants also need time to digest the sentence, although they need shorter time compared to the female participants. The male participants do not need further explanation to grasp the meaning of the sentence. During the discussion with the male participants aged 18-50 years, they suggest the word 'protect' to be replaced with 'prevent' or 'maintain the immune system' that are considered easier to understand and able to motivate the audience. Meanwhile, the older male participants suggest the message be modified to "*Vaccination protects you, your family, and other people around you from COVID-19*".

"Vaccination helps protect other people from COVID-19"

The participants understand this message better following the discussion of the first key message (a). The female participants aged 18-50 years find this key message suitable because vaccines can also protect others from getting the disease. Participants who have been vaccinated can prevent the infection from spreading to others. This is how the participants interpret the second key message (b). The unvaccinated participants are also aware that they are protected by the others who have been vaccinated. The participants from older age group (more than 50 years) do not understand how the vaccinated people can help protect others who are not vaccinated.

Similar to the arguments for the first key message (a), the older male participants express that they better understand the second key message (b). The younger male participants share the same views. They say that protecting oneself will have an impact to others as well. One of the participants uses the analogy of safety vs. reckless driving that can also affect the safety of other people.

"Vaccination helps resume social and economic activities"

The female participants from both groups find this message difficult to understand without additional explanation. After further explanation, the younger participants find this message effective in motivating people to be vaccinated because they need to resume their social and economic activities (especially those who are also the breadwinnders). On the other hand, the older female participants do not immediately grasp the idea that vaccination relates to the socio-economic activities. To them, no significant changes are observed in their daily socio-economic activities before and after the vaccination program. Similar to their response to the second key message (b), they tend to view that the vaccination mainly benefits those who are vaccinated, not other people.

The male participants in both groups find this key message easy to understand and able to motivate people to get vaccination. The pressing needs for the participants to resume their social and economic activities, and the government's requirements for vaccination to use public transportation help the participants see the relationship between vaccination and socio-economic

recovery. The younger male participants believe that this key message is the most motivating message for people to get vaccination.

"Vaccination is in line with my personal values" The concept and the word 'value' in this message are difficult to understand by all participants, even after receiving additional explanation. No meaningful opinions are gathered from discussing this key message.

"Vaccination is in line with my religious values" Although this message is easier to understand than the previous key message (d), this still requires further explanation for all participants. The word '*halal*' helps the participants understand this message better. The MUI's fatwa (ruling) and the local religious leaders who have supported the halal issues are the main references for the participants. The willingness of the local religious leaders to be vaccinated is believed to be boosting the community's confidence that vaccination do not conflict with their religious values. In fact, vaccination is recommended as an effort to prevent from the pandemic.

C Pamphlet

The pamphlet—delivered during the second visit of the intervention—captures all the main points of the intervention and reinforce ambassadors' message to the participants.

1. Personal Benefits of Vaccines
    - Vaccines protect us from the dangers of COVID-19. The COVID-19 vaccine builds immunity to protect someone from contracting COVID-19.
    - Patients with comorbidity can still be vaccinated against COVID-19.
    - Severe vaccine side effects are very rare
    - Vaccination gives us greater freedom of mobility
2. Social Benefits of Vaccines
    - Vaccination protects families/relatives/colleagues who are vulnerable to contracting COVID-19
3. Benefits of Vaccines for Recovery in Social and Economic Activities
    - Vaccination provides protection when carrying out social activities
    - Vaccination helps the village's economic recovery
    - Vaccination in accordance with the spirit of mutual cooperation
4. Recommendations for Vaccines according to Social Values
    - To leverage the effect of social norms and make it more salient to respondents, we show that many of family members, relatives and friends have been vaccinated (as of early February 2022, 90% of Indonesians have been vaccinated).[35].

[35]Note that the denominator of this statistics is the eligible/target population. Using total population as the denominator—which is commonly used to measure global vaccination rate—the vaccination rate is unsurprisingly lower, 7 in 10 people

- Vaccination is recommended by government officials, traditional/community including religious leaders

CISDI CENTER FOR INDONESIA'S STRATEGIC DEVELOPMENT INITIATIVES

LPEM FEB UI UNIVERSITAS INDONESIA

MONASH University

J-PAL ABDUL LATIF JAMEEL POVERTY ACTION LAB

9 dari 10 orang Indonesia sudah mendapatkan vaksin COVID-19 agar terhindar dari risiko keparahan penyakit, risiko dirawat di RS dan risiko kematian.

"Saya punya penyakit penyerta"

Jika Anda punya penyakit penyerta, seperti darah tinggi, pernafasan, diabetes, atau jantung, Anda tetap dapat divaksin setelah konsultasi dengan tenaga kesehatan. Justru kalau tidak divaksin, tubuh akan lebih lemah dan rentan dari penyakit akibat COVID-19.

"Saya takut efek samping vaksin"

Tidak semua orang yang sudah divaksin akan mengalami efek samping vaksin. Umumnya efek samping ini ringan, dan akan hilang sendiri. Efek samping menunjukkan bahwa vaksin sedang membangun daya tahan tubuh supaya bisa mengusir virus yang masuk, jadi kita tidak sakit, atau sakit parah bahkan meninggal.

Yuk Segera Vaksin Dengan Lengkap!

Dengan mendapatkan vaksin lengkap, kita lindungi diri sendiri, orang-orang yang kita sayangi, dan orang lain di sekitar kita.

Vaksin tidak menyebabkan kematian, justru mencegah kita dari kesakitan lebih parah dan kematian.
Segera vaksin dengan lengkap. Pandemi belum berakhir!

“Saya lansia, di rumah saja, kenapa perlu di vaksin”

Daya tahan tubuh lansia tidak sebaik orang berusia muda, sehingga perlu divaksin. Lansia tetap bisa tertular dari orang sekelilingnya

Mau gotong royong keluar dari pandemi? Vaksin yuk...

Mereka yang sudah divaksin dapat kembali beraktivitas seperti sebelum masa pandemi.
Yuk vaksin sebagai ikhtiar
untuk keluar dari pandemi COVID-19.

“Satu kali vaksin tidak cukup. Lengkapi dengan dosis kedua sebelum 6 bulan setelah dosis pertama agar vaksin efektif.”

Nama Duta: .....

No HP Duta: .....

Nama Warga: .....

Komitmen Warga: .....

.....

CISDI
CENTER FOR INDONESIA'S STRATEGIC DEVELOPMENT INITIATIVES

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RT.1/RW.2, Gondangdia,
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Kota Jakarta Pusat,
DKI Jakarta 10350

D Questions to Construct Variables

D.1 Primary Outcomes

Vaccination uptake

1. Have you received the COVID-19 vaccination?
2. How many doses of the COVID-19 vaccine did you receive?
3. Did you get proof of a card or vaccination certificate?
4. Can we see the card or certificate?
5. When did you receive your latest vaccination?

Vaccination intention

1. Currently, how willing are you to be vaccinated against COVID-19?
2. Have you ever been to a vaccination site, but were declined?

Vaccination status of others

1. Have any of your relatives/neighbors/acquaintances been vaccinated since our last visit?
2. Apart from you, how many people in your personal network (close family and/or colleagues) have you been vaccinated against COVID-19?
3. Has the following household member taken the COVID-19 vaccination?

D.2 Secondary Outcomes

Compliance to COVID-19 health protocols (index)

1. When you travel outside the house, do you wash your hands with soap and water for at least 20 seconds?
2. ..., do you wear a mask properly when leaving the house?
3. ..., do you maintain a minimum distance of 1.5 meters from other people who do not live in the same house?
4. ..., do you avoid close contact, physical contact, or shaking hands with other people who do not live in the same household?
5. ..., do you keep yourself away from other healthy people if you have a fever, cough, or difficulty breathing?
6. ..., do you cover your mouth and nose with a tissue, handkerchief, or elbow when sneezing or coughing?
7. ..., do you avoid leaving the house when there is no important or relevant work/business?

Post-intervention COVID infection

1. Have you ever had a positive result of a COVID-19 test with Rapid Antigen Test or PCR between the last meeting with ambassador and up to 2 weeks ago?

General mental health (index)

1. I'm bothered by things that don't usually bother me
2. I find it hard to concentrate on work/whatever I do
3. I feel depressed
4. Everything I do requires a lot of effort.
5. I feel hopeful about the future

6. I feel scared
7. I feel restless while sleeping
8. I feel happy
9. I feel lonely

General mental health

1. In general, how is your mental health?

Mental health attributed to COVID-19

1. I feel very afraid of the COVID-19 virus
2. Thinking about COVID-19 makes me feel uncomfortable
3. I feel very worried thinking about COVID-19
4. COVID-19 tends to be incurable and causes death
5. COVID-19 is an unpredictable disease
6. My hands sweat when I think of COVID-19
7. I am afraid of losing my life because of COVID-19
8. I get nervous or anxious when I watch the news or read stories about COVID-19
9. I couldn't sleep because I was worried that I might catch the COVID-19 virus
10. My heart skips a beat or thumps when I think about contracting the COVID-19 virus

D.3 Intermediate Outcomes

Perceived quality of the ambassadors and intervention

1. On a scale of 1 to 5 where 1 is very bad and 5 is very good, how would you or your family member rate this health message and COVID-19 information session program as a whole (first and second visits)?
2. On a scale of 1 to 5 where 1 is very bad and 5 is very good, how would you rate the information session (first visit)?
3. On a scale of 1 to 5 where 1 is not at all convincing and 5 is very convincing, how convincing is the vaccine ambassador in providing information to you?
4. On a scale of 1 to 5 where 1 is not at all convincing and 5 is very convincing, how would you rate the information provided regarding the benefits of the COVID-19 vaccine?

Participation during the information session. Should be divided into ambassador and respondent participation

1. Are there any COVID-19 vaccine information officers who came to your place of residence and provided information related to the COVID-19 vaccine in June 2022?
2. How many times did the COVID-19 Vaccine information officer visit your house?
3. How long was the first information session?
4. Was the information session held at the right time, was it hard for you or a family member to listen to the session?
5. Do you or your family members remember the information provided by the officer during the information session?
6. Do you or your family members feel that the information was clear and easy to understand?

7. Can you name the main information topics given to you during the information session?
8. What information on vaccine benefits was discussed during the information session (all visits)?

Pamphlet

1. Do you or your family members receive flyers from attending the information session?
2. Have you read the information contained in the flyer?
3. Do you remember the information shown in the flyer?
4. What are your difficulties in reading and remembering the information in the pamphlet?
5. Can you mention what information is in the pamphlet (min. 2 pieces of information)?

Information spillover

1. Do you recommend your family, relatives or friends to get vaccinated against COVID-19?

Health belief model on COVID-19 and vaccines

1. Knowledge about COVID-19 and its prevention
   (a) COVID-19 is an infectious disease.
   (b) There is no cure for this disease (COVID-19).
   (c) The use of masks can reduce the spread of the COVID-19 virus.
2. Severity of COVID-19
   (a) COVID-19 can cause physical and mental stress.
   (b) People affected by the COVID-19 virus feel great pain.

(c) COVID-19 can cause death.

3. Benefits of the COVID-19 vaccines

   (a) The COVID-19 vaccine will help prevent the spread of COVID-19.

   (b) Vaccination makes me feel less worried about contracting the COVID-19 virus.

   (c) Vaccination will reduce the impact of deaths from COVID-19.

4. Fake news vs facts about COVID-19

   (a) The COVID-19 vaccine has passed thorough safety tests.

   (b) People who are young, healthy, and active can still catch the COVID-19 virus.

   (c) Wearing a mask will remain mandatory until most of us have been vaccinated.

   (d) Receiving one dose of vaccine will give me optimal protection from COVID-19.

   (e) COVID-19 vaccination causes death.

   (f) COVID-19 vaccination causes infertility.

5. Vulnerability to catching COVID-19

   (a) I'm worried about contracting COVID-19.

   (b) Anyone can catch COVID-19.

   (c) I am vulnerable to COVID-19 in the next few months.

6. Barriers to COVID-19 vaccines

   (a) I have my doubts about the efficacy of COVID-19 vaccines.

   (b) I have doubts about the safety of the COVID-19 vaccination.

   (c) I don't want to spend money to get the COVID-19 vaccines because the vaccine site is far away.

   (d) I am worried that the side effects of COVID-19 vaccines will hinder my daily activities.

(e) I can still catch COVID-19 even though I have been vaccinated.

(f) Vaccine availability is limited or non-existent.

7. Future projections and beliefs during COVID-19 pandemic

(a) I would avoid people who have not been vaccinated.

(b) I won't catch it, so I don't need to be vaccinated.

D.4 Heterogeneity

Degree of willingness to get vaccinated

1. Currently, how willing are you to be vaccinated against COVID-19?

Socioeconomic status

1. How much did you (household) spend in the last week? For food and drink? For non-food and drink? (1=above median)
2. Employment status (1=employed)
3. High educational attainment (1=higher than primary school or lower)
4. Have you received social assistance from the government in the last year?

Health belief model on COVID-19 and COVID-19 vaccine

1. See D.3

Demographic characteristics

1. Gender (1=male)
2. Older people (1=60+ years old)

(Index of) Health status (morbidity history)

Do you have a history of the following diseases (Yes/No)?

1. Diabetes
2. High blood pressure
3. Cancer
4. Kidney problems
5. Heart problems
6. Liver problems
7. Breathing problems
8. Others (specify)

Role model on vaccination

Please confirm whether you trust the following to motivate you to take the COVID-19 vaccines

1. Yourself
2. Nurses
3. Midwives
4. Health cadres
5. Family members
6. Traditional leaders (hamlet head, village head, elders)
7. Religious leaders

8. Celebrities and influencers
9. Political figures
10. Advertising in the media
11. Others (specify)

E Competency test for ambassadors

1. The true statement regarding the social benefits of vaccines is...

   a. Vaccines lower the risk of severity if infected with COVID-19.
   b. Severe vaccine side effects are very rare.
   c. Vaccines lower the risk of hospitalization if infected with COVID-19.
   d. Vaccination lowers the chances of transmitting COVID-19 to others.

2. People who have allergic diseases should not be vaccinated at all (True / False)

3. People with congenital diseases such as high blood pressure, gout, diabetes, and heart disease can be vaccinated against COVID-19 (True / False)

4. Sort the order of vaccine ambassador's first visit correctly.

Activities	**Order #**
Ambassadors leave contact number for participants to ask any questions	
Ambassadors introduce themselves and have a dialogue to get to know participants better	
The ambassador hand out a pamphlet and asked participants to read the pamphlet	
Ambassadors investigate participants' reasons for having hesitancy against vaccines	
Ambassadors socialize appropriately	

5. The visit of the two vaccine ambassadors to the participants' homes aims to...
   a. Find out why participants are not or have not been vaccinated.
   b. Explain and hand out pamphlets
   c. Strengthen participants' commitment to be vaccinated
   d. Explain the purpose of socialization

6. One thing that must be done if an ambassador has difficulty answering questions from participants
   a. Answer questions as much as possible.
   b. Answer politely that the ambassador does not know the answer to the question.
   c. Take note of the question and convey that the answer will be delivered later.
   d. Ask participants to look for the information in the pamphlet.

7. The RIGHT things to do if participants decline a visit by the Vaccine Ambassador are ... (*You can choose more than one answer*)
   - Try to get acquainted first and invite again to be met at a later time.
   - Directly record unsuccessful visits in the *log book* without inviting to meet at a later time.
   - Contact the Field Officer if the participant still refuses after being invited to meet at a later time.
   - Submit a pamphlet only without making a visit or explanation of the main messages .
   - Continuously contact participants until they are willing to receive a visit.

8. The CORRECT statement regarding the filling of *the log book* is. (*You can choose more than one answer*)
   - *Log books are* filled in every weekend.
   - *The log book is* filled in at the end of each visit.
   - Log *book photos are* collected to the Field Officer at the end of each week.
   - Log *book photos* may not show the identity (name) of the participant.
   - Participants who are not successfully encountered do not need to be recorded in *the log book*.

9. The correct statement regarding data confidentiality is. (*You can choose more than one answer*)
   - Upload photos of documents to social media.
   - Destroy documents by burning when the activity has ended.
   - Leave the document to someone else who is not in pieces.
   - Put the document in the open that can be accessed by the other party.
   - Treat participant lists and *log books* as confidential documents that cannot be read by unauthorized parties.

10. The following are the things that are NOT RECOMMENDED in conveying the main talking points or messages to participants are... (*You can choose more than one answer*)
    - Conveying basic messages that are in accordance with the conditions and / or reasons for participants to be vaccinated.
    - Convey information in official technical terms .
    - Use someone else's name as an example to reinforce the main messages.
    - Conveying speech points as a recommendation for participants.
    - Convey that all information comes from governments and other trusted experts and organizations .
    - Use local terms or dialects to impress like a regular conversation.

11. Things can be done to form familiarity, unless...
    a. Ask about family or family news
    b. Ask the cause of the problem at hand
    c. Looking for nodes or equations, such as regions of origin or favorites
    d. Provide small help

12. The mention of a name in a conversation can increase the attention and acceptance of the interlocutor (True / False)

13. Take a look at the example of the conversation below:

Vaccine Ambassador:	*Mrs. Siti has been vaccinated yet?*
Mother Siti:	*Not yet mom, I'm afraid I want a vaccine*
Vaccine Ambassador:	*How scared? Vaccines are important, mrs. Siti to protect us from COVID-19*

The conversation above shows the Vaccine Ambassador is already a good listener. (True / False)

14. Suppose the participant on behalf of Mrs. Yeyen stated, "*I am afraid of being vaccinated, the proof is that my neighbor has a fever after being vaccinated, up to a week cannot work*". From the following options, which is the most appropriate step to respond to Mrs. Yeyen's statement...
    a. Immediately say that Mrs. Yeyen's opinion was not right.
    b. Provide support for Mrs. Yeyen's opinion by providing personal examples or examples of others.
    c. Confirm the truth of Mrs. Yeyen's statement, for example by asking what her name is and how many peoplehave a fever after being vaccinated, etc.
    d. Give appreciation to Mrs. Yeyen's statement, for example by stating that she was very concerned about the condition of the surrounding neighbors, then conveyed the content of the main message in accordance with Mrs. Yeyen's statement.

15. In the example of Mrs. Yeyen's case above, the most appropriate main message for responding to or clarifying Mrs. Yeyen's statement is...
    a. Vaccination protects families/relatives/colleagues who are vulnerable to contracting COVID-19.
    b. The severe side effects of vaccines are very rare, and not everyone will experience any side effects.
    c. People with congenital diseases, such as hypertension, diabetes, autoimmune, heart can still be vaccinated on the advice of health workers.
    d. Vaccination reduces the risk of spreading viral infections, so it can protect people who are susceptible to contracting the disease.