TRENDS IN COVID-19 VACCINE ACCEPTANCE IN THE PHILIPPINES AND THEIR IMPLICATIONS ON HEALTH COMMUNICATION

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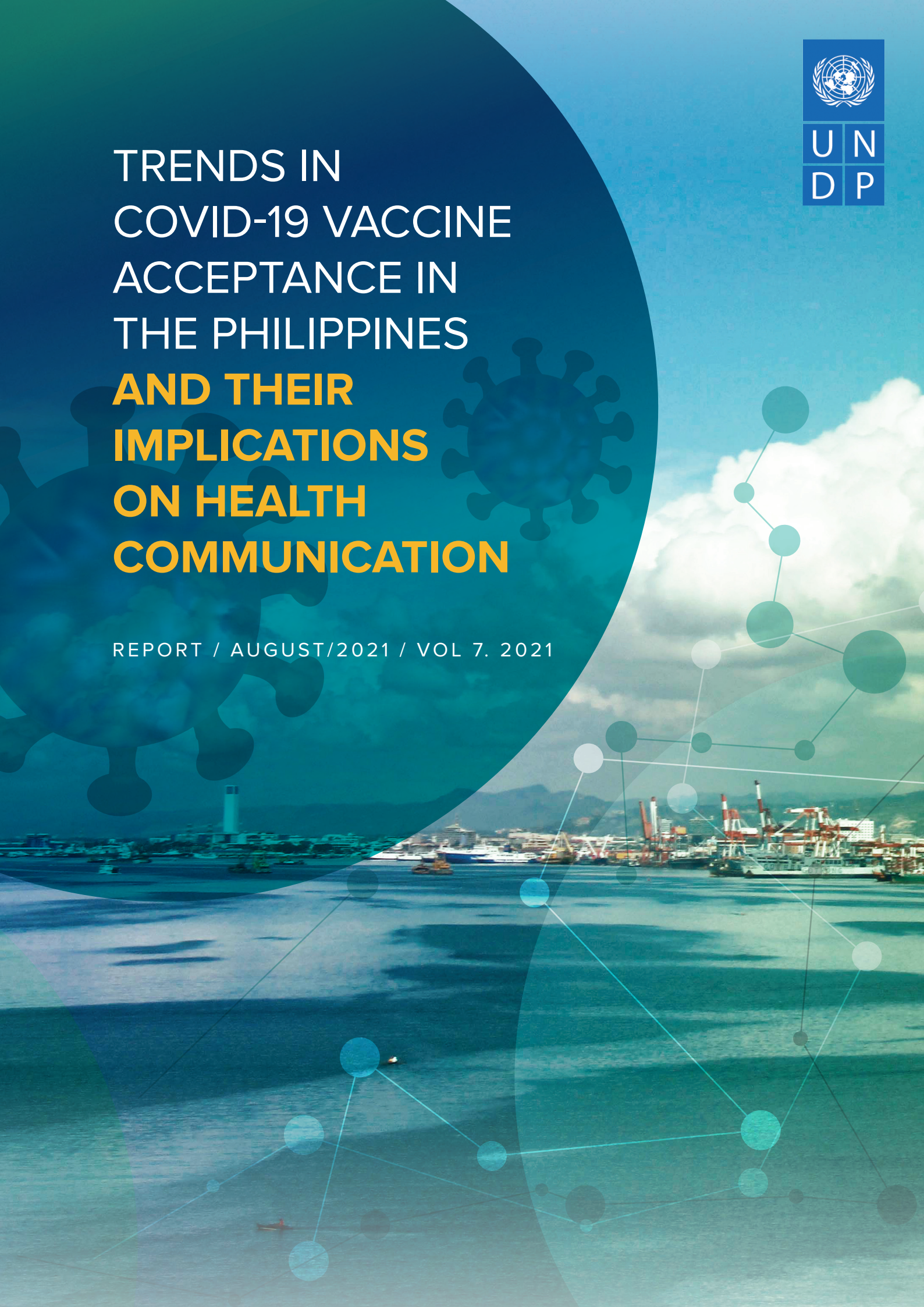

DESIGN & LAYOUT
Angela Galia

Foreword

It has been over 18 months since people in the Philippines began the battle against this COVID-19 pandemic. During this period, major advances have been made in the understanding of COVID's modes of transmission, epidemiological trends, vaccines, clinical management, development of point of care diagnostics, and treatments.

Alongside public health measures, vaccination is key to controlling the continuous spread of this pandemic and I am encouraged to see the progress on rollout of the nationwide vaccination programme in Philippines.

The Philippines is accelerating the implementation of its vaccination programme amidst the recent COVID-19 surges, the fears about the spread of variants of concern, and the mobility restrictions. COVID-19 vaccination in the Philippines started in March 2021, with a target of 70 million vaccinations (or 70 percent of the population) by end of 2021 to achieve herd immunity.

As of August 15, 2021, the government has reported that around 27.8 million doses have been administered, translating to around 40.4 to 44.1 percent of the adult population having received at least one COVID-19 vaccine shot. Around 15.2 million individuals have gotten the first dose while around 12.6 million are fully vaccinated, with highest shares observed for the A3 category (the persons with comorbidities) and A2 category (the senior citizens), respectively. The Philippines is proactively attempting to reaching the targets for the A2 (the elderly persons aged 60 years old and above) and A3 groups by boosting availability of vaccine and increasing vaccine acceptance.

In July 2021, it has been reported that the Delta variant of the coronavirus has been detected in the country. A far more contagious variant that threatens to put the country into lockdown again. Furthermore, on August 15, the first case of the Lambda variant was detected. According to the DOH, this variant has the potential to affect the transmissibility of SARS-CoV-2 and is currently being monitored for its possible clinical significance. We are now at a crucial time.

Thus, UNDP Philippines, in close collaboration with the National Economic and Development Authority (NEDA), has commissioned this research titled, **"Trends in COVID-19 Vaccine Acceptance in the Philippines and Their Implications on Health Communication"**, to deepen our understanding of the factors behind vaccine acceptance in Philippines. In this research, we applied innovative methodologies to generate insights for community mobilization and social behavior change communication (or SBCC) interventions, which could be an effective strategy in addressing vaccine acceptance. The report generated significant insights related to the level of vaccine acceptance, factors that determine the change in behavior and identified strategic communication messaging cues.

As we know, vaccine acceptance can be affected by many factors. During a time when opinions are quickly changing, people need to be well informed with accurate and timely information. Mainstream media, social media, experts, leaders, key influencers, and even our families and friends may drive these opinions. How we trust one another may also determine our attitudes or behavior. We think about the vaccine's safety and effectiveness, perceptions that they might not be free or needed, or that we think some brands are better than others. All of these are intertwined. Understanding human behaviors and adjusting our communication strategy to promote wide-spread acceptance is key.

I therefore want to acknowledge the authors of this report comprised of members of UNDP's Pintig Lab (an advanced data analytics lab) - Dominic Ligot (Lead Author and Data Scientist), Claire Tayco (Data Scientist), Angelo Jose Lumba (Data Scientist), Reinabelle Reyes (Chief Technical Advisor), Riza Halili (Project Manager), Jonathan Hodder (Governance Specialist), and Sheena Kristine Cases (Data Analyst). The report has been prepared with guidance and leadership of Ms. Yemesrach Workie (Senior Policy Advisor, UNDP Philippines). Moreover, I am grateful that the research benefitted from the guidance and support from the National Economic and Development Authority (NEDA), the Department of Health (DOH), the World Health Organization (WHO) Philippines, and UNICEF Philippines. Lastly, UNDP is grateful for The Rockefeller Foundation's financial support of this project.

I hope that this valuable work helps in shedding light on our pressing questions about vaccine acceptance.

Dr. Selva Ramachandran
Resident Representative
UNDP Philippines

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Executive Summary

Background.

Wide-spread COVID-19 vaccination has begun in the Philippines, and its success depends on efficient allocation of supply as well as willingness of the population to get vaccinated. Targeted communication interventions can be used to mobilize communities toward vaccination. Existing pro-vaccination messaging is focused on education and informative messaging while in contrast, anti-vaccination groups use various narratives to influence their audiences. Vaccine literacy is also an important factor that drives behavior.

Objective.

This research was undertaken to examine vaccination trends in the Philippines and to understand drivers of vaccine acceptance. The research aimed to identify demographic and geographical segments as well as facilitating factors and barriers to vaccine acceptance. The research also proposes messaging strategies for possible vaccine communications intervention.

Methods.

Longitudinal data from Facebook's World Symptoms survey was used to establish the trend of vaccinations, acceptance and hesitancy, and generate regional groupings for targeting. Metadata from Pulse Asia and MinDA surveys were gathered to establish the level of vaccine hesitancy nationwide and the region-specific rate. Response data from the Department of Health's (DOH) Vaccine Survey was used to create demographic segments and surface facilitating factors and barriers to behavior. The regional and demographic segments were overlaid on a diffusion of innovation framework for prioritization. Facilitating factors and barriers to behavior were harmonized with Behavioral and Social Drivers (BeSD) of Vaccination framework to generate messaging cues for communications interventions.

Results.

Increasingly more Filipinos are willing to get vaccinated against COVID-19 since February 2021. However, there is still a considerable segment of the population who are either undecided or unwilling to take the vaccine, especially at the regional level. Since acceptance has a positive relationship with vaccinations, further increase in acceptance of vaccine can be expected as more people get vaccinated. Regional analysis suggests that vaccine supply issues exist within the Low Hesitancy and Low Vaccination group while High Hesitancy and High Vaccination groups are driven by the need to get vaccinated for travel and employment purposes (e.g. Overseas Filipino Workers). Facilitating factors for vaccination include: concern for family and loved ones, COVID-19 risk perception, FDA/DOH approval and endorsement, and work-related reasons. Barriers to vaccination include: concerns about side-effects, medical reasons, news about vaccines, and vaccine effectiveness and efficacy. Seven demographic segments were identified for targeted messaging.

Recommendation.

Accelerating the vaccination program and addressing vaccine supply are critical in promoting vaccine acceptance. Policies that provide more travel flexibility and increase employment options provide a strong incentive for vaccination, even among the hesitant. Harmonizing identified facilitating factors and barriers to behavior into messaging cues could increase effectiveness of vaccine communications campaigns. United Nations (UN) and World Health Organization (WHO) vaccine communication best practices were provided to augment current communications, in particular: **vaccine literacy**. Monitoring the performance of vaccination campaigns through proactive social listening is highlighted as a key enabler to communications campaigns that could lead to increased vaccination.

Vaccine Acceptance

Although this report aims to promote **vaccine acceptance**, the reference data and literature used for the research refer to hesitancy as a metric. Hesitancy definition used is aligned with that recommended by WHO (i.e. delay In acceptance or refusal of vaccines despite availability of vaccine services (SAGE Working Group, 2014)), and was captured in the surveys through the question *"If there is a COVID-19 vaccine available, will you get vaccinated or not?"* To avoid confusion and excessive interchanging of terminologies, the report will reference hesitancy in the data analysis, but will orient the discussion towards acceptance in its conclusions.

Introduction

Vaccination is proceeding in the Philippines amidst the recent COVID-19 surges, fears about the spread of variants of concern, and emergency wide-scale mobility restrictions. Hopes of returning to normal are now becoming more realistic as the country engages itself in the pursuit of obtaining herd immunity. Whether or not this will be realized soon rests on the speed and efficient allocation of vaccines by government and, more recently, private institutions as well as the willingness of Filipinos to be vaccinated, making the matter both a macro and micro concern.

COVID-19 vaccination in the Philippines started in March 2021 (Department of Health Philippines, 2021), with an original target of 70,000,000 vaccinations (or 70 percent of the population) by end of 2021 (Department of Health Philippines, 2021). In May 2021, the government revised its target from 70 percent to a range of 50-60 percent of the population due to tight supply of doses, which are concentrated on National Capital Region (NCR) plus 8 other critical areas: Metro Cebu, Metro Davao, Bulacan, Pampanga, Rizal, Cavite, Laguna, and Batangas (Aning, 2021). As of August 15, 2021, the government has reported that around 27.8 million doses have been administered, translating to around 40.4 to 44.1 percent[1] of the adult population having received at least one COVID-19 vaccine shot. Around 15.2 million individuals have gotten the first dose while around 12.6 million are fully vaccinated, with highest shares observed for the A3 category (the persons with comorbidities) and A2 category (the senior citizens), respectively (Department of Health, 2021).

Community mobilization and targeted communication interventions can be effective strategies in addressing vaccine hesitancy (Waisbord & Larson, 2005). However, inadequate or poor vaccine-related communications can contribute to vaccine hesitancy (SAGE Working Group, 2014). Studies have shown that pro-vaccination messaging tends to be monothematic and focused on educating and advocating vaccination with facts, statistics, and evidence-based articles (Johnson, Velásquez, Restrepo, & et al., 2020). Not only is this approach ineffective in addressing vaccine hesitancy and anti-vaccination mindset, but it can also lead to even more hesitancy (Dubé, Gagnon, & Vivion, 2020). On the other hand, anti-vaccination groups offer a wide variety of narratives on topics such as vaccine safety, conspiracy theories, alternative health and medicine, and the purported origin of and cure for the COVID-19 virus. Anti-vaccination contents also tend to be more highly emotional than those from pro-vaccination groups on average (Johnson, Velásquez, Restrepo, & et al., 2020) (Germani & Biller-Adorno, 2021). Moreover, anti-vaccination groups, while smaller in size compared to pro-vaccination ones, are heavily

1 As a denominator, 2020 projection of population aged 15 years old and above from Philippine Statistics Authority (68,823,510) and 2019 adult population from Statista (63,000,000) were used to estimate shares.

entangled with clusters of undecided individuals in online social networks, making them central in the diffusion of (mis)information about vaccines (Johnson, Velásquez, Restrepo, & et al., 2020).

Other factors influencing vaccine hesitancy include inconsistent public health messages, low confidence in government and science, and easing of restrictions that temper the perceived threat of COVID-19 (Paul, Steptoe, & Fancourt, 2021). Health and vaccine literacy-the degree to which people have the capacity to obtain, process, and understand basic health information and services to make proper health decisions-has also been identified as an important factor in vaccine acceptance (Biasio, 2019). Bautista (2020) highlighted a number of studies which found poor health literacy among Filipinos. Particularly for the Philippines as well, vaccine confidence was severely impacted when the controversy relating adverse reactions in children to the Dengvaxia vaccine erupted (Reyes, Dee, & Ho, 2020).

Objectives

In this report, survey datasets were used to generate insights on the vaccine acceptance in the Philippines. Due to the halting of face-to-face data collection during community quarantine, surveys conducted online were used in understanding the problem. This research aims to answer the following key questions:

- What are the trends of vaccination rates and acceptance levels in the country, nationally and regionally?
- What are the barriers and facilitating factors to getting vaccinated against COVID-19 among Filipinos?
- What are the key segments of the target population for COVID-19 vaccine and their profiles, corresponding to different levels of acceptance?
- What are effective strategies for targeted communications interventions for vaccine acceptance and uptake in the Philippine context?

Various surveys were available at the time this research was conducted (e.g. Johns Hopkins Center for Communication Programs' knowledge, attitudes and practices (KAP) COVID survey). However, the ones finally selected are the ones with most up-to-date data available. Two (2) main and two (2) supporting surveys were used in the analyses.

- **DOH COVID-19 Vaccine Survey** is one of the regular online sectoral attitudinal surveys, which uses convenience sampling, that the department conducts as part of their social listening and learning system for demand generation of COVID-19 vaccines. The survey, which was conducted from 16 to 31 May 2021, were distributed through organization partners: Katuwang na Impormasyon para sa Responsableng Aksyon (KIRA) chatbot, and Regional Health Promotion Officers. This survey was primarily used to have an indication of national hesitancy level as of the period considered, identify drivers of vaccination decision-making, and derive audience segments.

- **COVID-19 World Symptoms Survey** is a collaboration between the academe and Facebook. Data is collected daily from January 16 to June 5, 2021 via convenience sampling by inviting Facebook users across 113 countries, to provide information on a range of matters including vaccine acceptance (University of Maryland, n.d.). This survey was used to analyze global, national, and regional trends in vaccination rates and hesitancy levels and to identify barriers and facilitating factors to getting vaccinated. Respondents from the Philippines were distributed across all regions except for the Bangsamoro Autonomous Region in Muslim Mindanao (BARMM).

- **Pulse Asia Ulat ng Bayan National Survey** is a nationwide survey conducted last June 7 to 16, 2021, using face-to-face interviews to estimate the level of COVID-19 vaccine acceptance among Filipino adults (18 years old and above) and to understand drivers of vaccine hesitancy (ABS-CBN News, 2021). Being the only data source that used probabilistic sampling and covers offline audience nationwide, this survey was used to provide a more accurate measure of vaccine hesitancy in the Philippines as of the period covered in the survey.

- **Socioeconomic Impact Assessment of COVID-19 in Mindanao (MinDA) Survey** is an online survey coupled with phone and field interviews, which were conducted from 22 May to 20 June 2021 via convenience quota sampling, to understand the socioeconomic impact of the current pandemic on Mindanao. It included questions on vaccination acceptance in the region and its drivers. This survey was used to provide a more accurate view of the hesitancy levels in Mindanao. This survey was conducted by United Nations Development Programme (UNDP) and the Mindanao Development Authority (MinDA).

Limitations of the Datasets

Aside from considerations based on the targeting parameters and sampling design of the main surveys used in the subsequent analyses, it should be noted that all references to vaccination rates are estimates based on the results of the surveys, due to unavailability of regional data from national government agencies (NGAs) and local government units (LGUs).

Additionally, the World Symptoms Survey does not include any question regarding the priority group category of the respondents.

Trends of Vaccination Rates and Hesitancy Levels in the Philippines

Establishing Vaccination Penetration and Hesitancy Levels in the Philippines

Table 1 summarizes the estimated vaccination rates and percentages of hesitant individuals from the different surveys analyzed. It is important to note not to directly compare the results of the surveys, since they have different date coverage, methodologies, and, potentially, different contextual backgrounds. Additionally, it should be noted that vaccine hesitancy evolves through time as it is complex and context specific (SAGE Working Group, 2014).

Table 1. Estimated Vaccination and Hesitancy Rates in the Philippines (by Data Source)

Surveys	Period Covered	No. of Respondents	% Vaccinated	% Hesitant*
Pulse Asia June-21 Ulat ng Bayan Nationwide Survey[1]	June 7 - 16, 2021	2,400	5.00%	52.00%
COVID-19 World Symptoms Survey[2]	As at June 5, 2021	180,684	22.46%	24.89%
DOH COVID-19 Vaccine Survey[3]	May 16 - 31, 2021	57,695	21.23%	14.27%
MinDA Survey[4]	May 22 - June 20, 2021	1,546	12.35%	58.57%

Notes:
* - % Hesitant = % unwilling to get vaccinated + % undecided to get vaccinated
1 – Question to capture acceptance / hesitancy was "Now that there are vaccines against COVID-19, will you get vaccinated or not?"
2 – Question to capture acceptance / hesitancy was "If COVID-19 vaccine is offered to you today, would you choose to get vaccinated?"
3 - Question to capture acceptance / hesitancy was "Should the vaccine be deemed safe, with efficacy and effectiveness comparable, and approved by the Food and Drug Administration (FDA) for use, how likely are you to get a COVID-19 vaccine?"
4 - Question to capture acceptance / hesitancy was "If you have not yet registered to get vaccinated against COVID-19, why not?"

According to results of Pulse Asia COVID-19 survey in June, 5 percent of Filipino adults (18 years old and above) have already been vaccinated with at least one dose. Thirty-six percent (36 percent) responded "***No***" when asked if they will get vaccinated now that there are vaccines against COVID-19, while 16 percent were undecided. This disinclination to get vaccinated declined from February 2021 (-32 percent), largely for National Capital Region (-49 percent) and Mindanao (-34 percent).

Considerable hesitancy level was also observed in Mindanao. Estimated vaccination penetration from MinDA survey was at 12.35 percent. Among unvaccinated respondents, who have also not registered for immunization, 58.57 percent expressed that they were either unwilling or undecided to get vaccinated.

The DOH COVID-19 vaccine survey, which mainly focused on an online audience, revealed that 21.23 percent of respondents were already vaccinated with at least 1 dose. Among the unvaccinated respondents, 85.73 percent were willing to get safe, efficacious, effective, and FDA-approved vaccines, 11.09 percent were undecided, and 3.18 percent were unwilling to get vaccinated. From the vaccinated group, only 38.83 percent have completed their required doses, and 61.17 percent have just had one dose. 97.07 percent of respondents who received one dose expressed their likely return for a second dose (Table 2).

Table 2. Estimated Vaccination Rates and Vaccine Hesitancy Levels (DOH Survey, May 16-31)

COVID-19 Vaccinated	No. of Respondents	Percentage to Total
Yes	10,102	17.51%
No	47,593	82.49%

Likelihood to get Vaccinated among Unvaccinated	No. of Respondents	Percentage to Total
No, not likely	1,507	3.18%
Not sure	5,260	11.09%
Yes, highly likely	40,655	85.73%

Number of Doses Received by Vaccinated Respondents	No. of Respondents	Percentage to Total
One	6,179	61.17%
Two	3,923	38.83%

Likelihood of Getting Second Dose of COVID-19 Vaccine	No. of Respondents	Percentage to Total
No, not likely	35	0.57%
Not sure	146	2.36%
Yes, highly likely	5,995	97.07%

Additionally, based on both the World Symptoms and DOH surveys, **women have lower vaccine acceptance** compared to men (Appendix A). Estimated hesitancy rate among women was statistically significantly higher from that among men (24.52 percent vs. 21.38 percent), based on the World Symptoms survey as of first week of June 2021. Higher hesitancy among women was further confirmed by the DOH survey (15.46 percent vs. 12.51 percent).

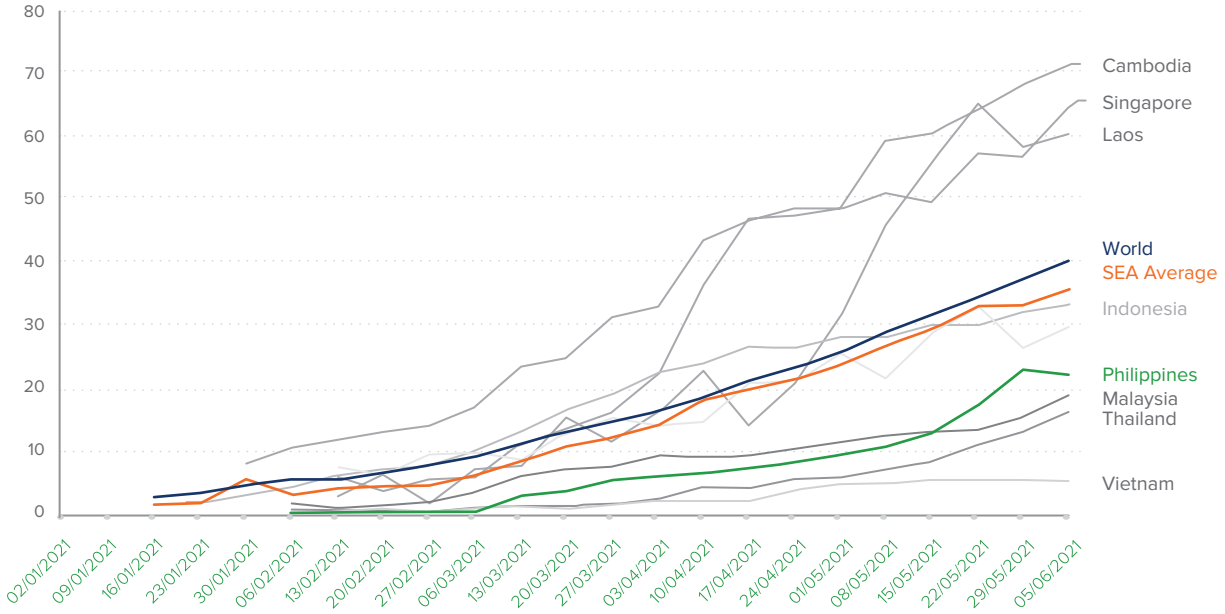
Global, National, and Regional View

Philippines vs. The Rest of the World

COVID-19 World Symptoms Survey showed that vaccination rate in the Philippines is still lower than world and Southeast Asia (SEA) average (Figure 1), with the vaccine rollout just starting to ramp up. As of the first week of June 2021, around 40.45 percent of respondents were vaccinated on average across participating nations.

Cambodia, Singapore, and Laos exceeded this at 71.74 percent, 64.94 percent, and 60.71 percent, respectively. The Philippines, on the other hand, had the fourth lowest percentage of vaccinated in SEA, at 23.21 percent. Notwithstanding, an uptrend is observed ever since vaccination efforts began—a movement shared across the globe.

Figure 1. Percentage of Vaccinated Respondents, Philippines Vis-a-Vis Its Neighbors (COVID-19 World Symptoms Survey, January-June 2021)



In relation to vaccine hesitancy, the Philippines started off with a higher percentage of vaccine hesitant respondents (38.17 percent) relative to the world average (33.35 percent) and SEA (24.71 percent) at the start of 2021. Compared to its neighboring countries, the Philippines also initially ranked first in terms of vaccine hesitancy from the second week of January to mid-March 2021. Hesitancy levels have improved since then, with the **Philippines ranking third among Southeast Asian countries** in first week of June, ahead of Myanmar and Indonesia (Table 3).

Table 3. Percentage of Vaccine Hesitant Respondents, Philippines Vis-a-Vis Its Neighbors (COVID-19 World Symptoms Survey, January vs. June 2021)

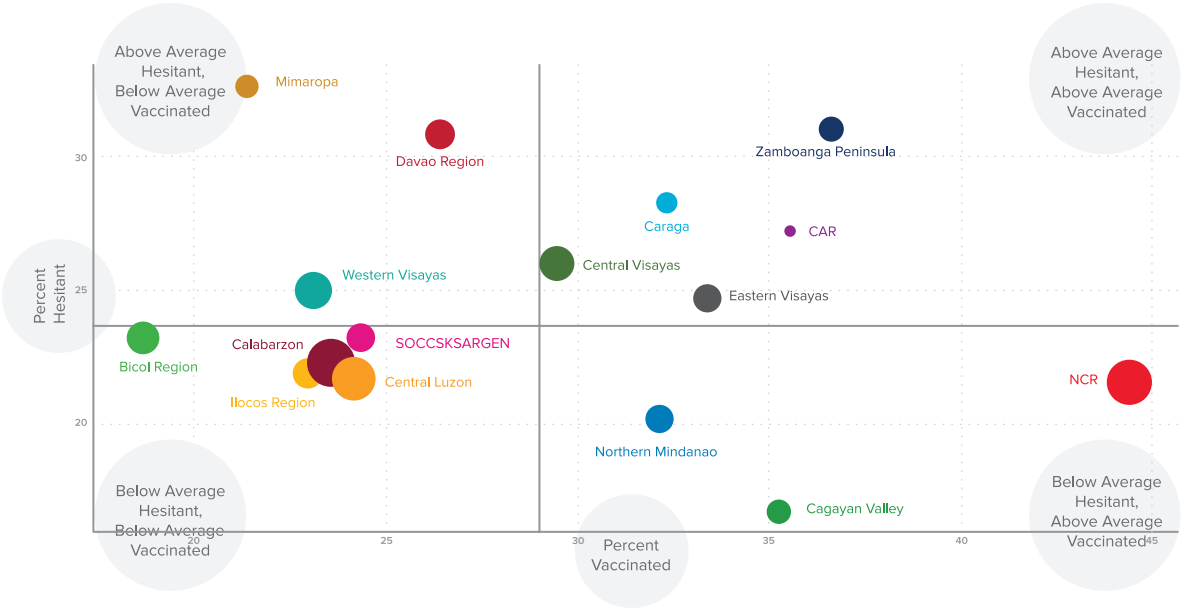
Countries	Jan-2021		Jun-2021	
	% Hesitant	Rank	% Hesitant	Rank
Cambodia*	25.99	5	18.37	6
Indonesia	28.64	2	28.05	2
Laos*	26.12	4	24.23	4
Malaysia	27.91	3	13.49	8
Myanmar	14.78	9	41.83	1
Philippines	38.17	1	24.89	3
Singapore	25.12	6	15.25	7
Thailand	17.71	8	21.41	5
Vietnam	17.95	7	8.41	9

Regional Performance

Analyzing the performance of Philippine regions based on hesitancy per vaccination and infection rate levels as of June 2021 gives indication of differences in possible drivers of issues encountered at a local level. Figure 2 groups the regions by hesitancy and vaccination rates. Figure 3 categorizes the regions according to hesitancy level and average daily attack rate[2] (as a measure of infection rate). In both charts, the size of the bubble represents population size.

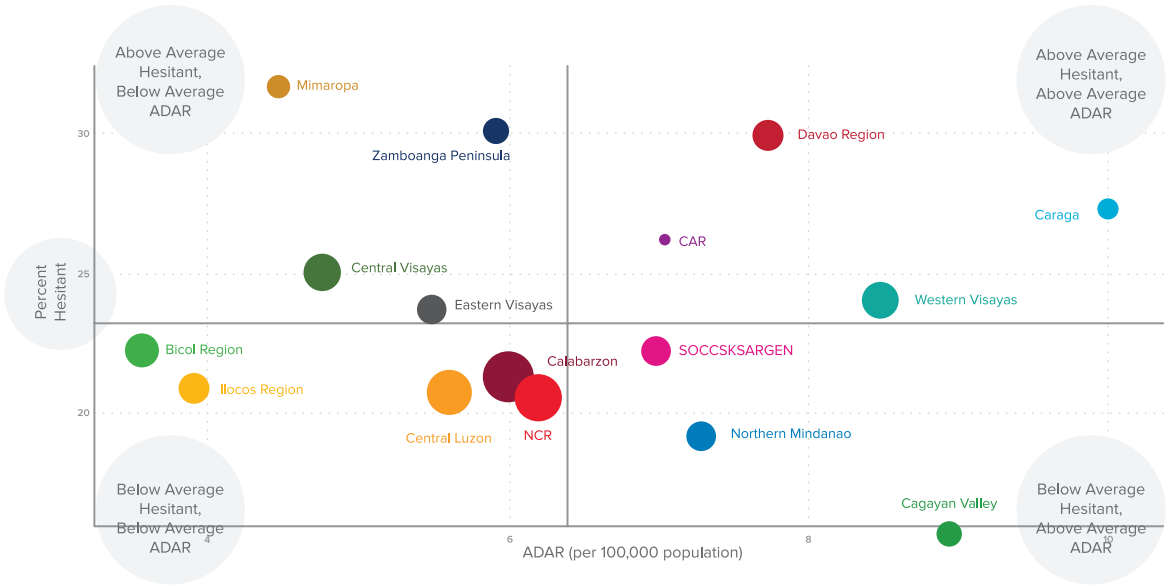
2 Average Daily Attack Rate (ADAR) measures the proportion of the at-risk population that contracts the disease during a specified time interval.

Figure 2. Vaccine Hesitancy and Extent of Vaccination Across Regions, Latest Available Information (COVID-19 World Symptoms Survey, June 2021)



Note: The vertical line at x = 29.01 represents the average percentage of vaccinated respondents across all regions as of June 2021, while the horizontal line at y = 23.62 represents the average percentage of vaccine hesitant respondents across regions in the same period.

Figure 3. Vaccine Hesitancy and Infection Rates Across Regions, Latest Available Information (COVID-19 World Symptoms Survey, June 2021)



Note: The vertical line at x = 6.40 represents the average of average daily attack rate across all regions as of June 2021, while the horizontal line at y = 23.62 represents the average percentage of vaccine hesitant respondents across regions in the same period.

Below Average Hesitant, Above Average Vaccinated

In regions with below average hesitancy and above average vaccination rates, vaccines were successfully deployed to areas with a more willing population. Vaccination outcomes in these locations will also likely further improve. As more people get inoculated, the more information about the safety and effectiveness of vaccines will get disseminated by official sources or through interpersonal dyadic communication. Reservations anchored on vaccine affordability are also expected to attenuate, as assurances by the government to shoulder costs are made and, eventually, met.

Expectedly, NCR falls under this group, outperforming other regions (Figure 2, lower right quadrant). Since the Greater Manila Area recorded the highest case counts and infection rates since the start of the pandemic, the region was prioritized in the inoculation efforts.

In the same category are Cagayan Valley and Northern Mindanao. Given that infection risk is above average for these regions as of June 2021 (Figure 3, lower right quadrant), it is possible for the population to have high COVID-19 risk perception, which could potentially drive vaccine acceptance. Nonetheless, deeper analysis of additional data need to be performed to confirm this assumption.

Below Average Hesitant, Below Average Vaccinated

Regions with below average hesitancy and below average vaccination penetration are locations that are possibly impacted by vaccine supply, deployment, and prioritization issues. While the population from these regions are willing to get vaccinated, not enough among them are getting immunized.

This group includes Ilocos, Central Luzon, CALABARZON, Bicol, and SOCCSKSARGEN (Figure 2, lower left quadrant). Incidentally, except for SOCCSKSARGEN, regions under this category also have lower than average infection risk (Figure 3, lower left quadrant). This could indicate that relatively lower vaccination rates in these locations are due to the concentration of vaccine distribution in other higher risk areas.

Within this category, SOCCSKSARGEN marked higher than average infection risk (Figure 3, lower right quadrant). While awaiting possible supply, deployment, or prioritization issues to be resolved, adherence with COVID-19 preventive and control measures must be strengthened to minimize further spread of the virus.

Above Average Hesitant, Above Average Vaccinated

This group experienced high vaccination rates despite a high percentage of vaccine hesitant, suggesting that people likely feel obligated to get immunized for specific reasons. Central Visayas, Eastern Visayas, Caraga, Cordillera Administrative Region (CAR), and Zamboanga Peninsula fall under this category (Figure 2, upper right quadrant).

People from Central Visayas, Eastern Visayas, and Zamboanga Peninsula possibly do not consider COVID-19 as enough of a threat, since infection rates are also low in these regions (Figure 3, upper left quadrant). On the other hand, infection risks are above average in Caraga and CAR, which potentially indicates that considerable percentage of the populations from these regions are skeptical of the benefits of COVID-19 vaccines. Motivations for getting vaccinated for these two subgroups might differ and will be good to understand further.

Above Average Hesitant, Below Average Vaccinated

Regions with high hesitancy levels and low vaccination rates are possibly areas dominated by vaccine skeptics. This group includes Davao, Western Visayas, and MIMAROPA (Figure 2, upper left quadrant).

Davao and Western Visayas seem to be the problem areas among all regions, since vaccine hesitancy is high despite the clear threat of COVID-19 in these locations (Figure 3, upper right quadrant). On the other hand, MIMAROPA recorded lower than average daily attack rate (ADAR) (Figure 3, upper left quadrant), which indicates that hesitancy in the region is likely due to low COVID-19 risk perception.

Barriers and Facilitating Factors Affecting COVID-19 Vaccine Decision-Making

COVID-19 World Symptoms Survey

Barriers are reasons that prevent or make it difficult for an individual to adopt a positive behavior. On the other hand, facilitating factors are aspects or influences that make it easier for an individual to adopt a positive behavior.

The COVID-19 World Symptoms Survey delved more deeply into the behavioral aspect of vaccination through inquiries on drivers of and hindrances to acceptance. Barriers included in the survey were: (1) fear of side effects, (2) waiting for signals that vaccines are safe, (3) view that vaccines are ineffective, (5) notion that other people should be given a higher priority first, (5) cost of getting vaccinated, (6) belief in not needing a vaccine, (7) dislike of vaccines, (8) religious beliefs, (9) distrust in government, and (10) other reasons. Facilitating factors included were recommendations by (1) the World Health Organization, (2) government health officials, (3) local healthcare workers, (4) doctors and other health professionals, (5) friends and family, and (6) politicians. Tables 4 and 5 show the ranking of these barriers and facilitating factors, respectively.

Table 4. Barriers to Vaccine Acceptance in the Philippines (COVID-19 World Symptoms Survey, January-June 2021)

Barriers to getting vaccinated	Average % of the Hesitant Respondents
Concern about side effects	65.95
Concern about safety	52.67
Concern about vaccine ineffectiveness	35.30
Perception that other people need it more than they do	30.35
Concerns about cost	16.02
Distrust in government	14.93
Perception on necessity of vaccines	14.63
Others	12.59
Dislike of vaccines	11.88
Religious reasons	3.31

Table 5. Facilitating Factors of Vaccine Acceptance in the Philippines (COVID-19 World Symptoms Survey, January-June 2021)

Recommending Party	Average % of Hesitant Respondents who will likely get vaccinated upon recommendation
Doctors and Other Health Professionals	30.06
WHO	25.21
Family and Friends	19.00
Local Healthcare Workers	14.92
Government Health Officials	14.12
Politicians	7.79

Fear of side effects and concerns about safety were found to hinder vaccine acceptance the most. Secondarily, negative perceptions on vaccine effectiveness and considerations for segments of the population that need to be given priority with regard to vaccination were also highlighted as drivers of vaccine hesitancy.

On the other hand, recommendations of doctors and other health professionals, as well as pronouncements from the World Health Organization (WHO), appear to carry some weight among hesitant Filipinos in deciding to get vaccinated. The influence of friends and family also increases the likelihood of vaccination for the hesitant segment.

DOH COVID-19 Vaccine Survey

The results of the DOH survey confirmed the finding that concern about side effects was the leading barrier to getting vaccinated against COVID-19 (Table 6). Other considerable barriers to willingness to get inoculated identified were negative news about the vaccine, concerns about vaccine efficacy / effectiveness, and medical reasons (i.e., being advised by primary care provider / doctor not to get vaccinated due to comorbidities).

Table 6. Drivers of Vaccination Decision-Making among Unvaccinated Respondents (DOH Survey, May 16-31)

Reasons	Likelihood to get vaccinated		
	Yes, highly likely	Not sure	No, not likely
Protect self and family from infection	78.7%	0.0%	0.0%
COVID-19 risk perception	34.7%	10.6%	14.9%
FDA approval or DOH / government endorsement of vaccine	33.1%	5.4%	8.8%
Work-related reasons	32.9%	1.9%	0.0%
Vaccine unavailable	23.2%	15.5%	8.8%
Statement/endorsement of government officials/leaders	21.8%	6.5%	8.2%
Studies/results of clinical trials	19.6%	17.5%	23.7%
Concerns about side effects	13.4%	65.8%	51.6%
Vaccine manufacturer / brand	12.4%	16.1%	21.0%
Medical reason (e.g. comorbidities)	12.0%	30.2%	33.6%
Healthcare provider advice	10.9%	2.0%	3.0%
Previous vaccination experience	4.9%	14.8%	12.7%
Religious reasons	2.5%	4.4%	11.3%
News about the vaccine	0.0%	62.2%	47.9%
Vaccine effectiveness / efficacy	0.0%	34.2%	36.0%
Taking of other medications (e.g. Ivermectin)	0.0%	6.6%	11.5%
Actual vs expected time to get vaccinated	0.0%	4.4%	4.4%
Distance of vaccination site from residence	0.0%	2.0%	1.5%

On the other hand, protection of oneself and loved ones against infection was **the primary driver of acceptance** of COVID-19 vaccine. To a lesser extent, high COVID-19 risk perception, FDA approval or DOH endorsement of the vaccines, and work-related requirements were also found to be facilitating factors to getting inoculated.

Target Audience Segments

In addition to facilitating factors and barriers, audience segmentation was performed on the DOH respondents based on the combination of demographic, geographic, psychographic, and behavioral characteristics. Vaccine confidence (i.e. the trust in the effectiveness and safety of vaccines, the system that delivers them, including the reliability and competence of the health services and health professionals, and the motivations of the policy-makers who decide on the needed vaccines (SAGE Working Group, 2014)) was also captured in the segmentation by considering responses to survey questions regarding (1) trust in COVID-19 vaccines, (2) belief in the importance of vaccine to health, (3) perception that vaccine will protect one's self, family, and community, (4) perception of vaccine safety, (5) trust in experts and regulatory agencies recommending the vaccines, and (6) likelihood to recommend vaccine to family and friends. Audience segmentation enables communication programs to identify which groups of people are critical to target or reach for specific types of messages. It enables design of demand creation and advocacy activities tailored to the unique attitudes, beliefs, needs, and preferences of each segment, including **gender** as an attribute.

Only unvaccinated respondents of the DOH survey was considered in the audience segmentation (sample size = 47,422). Segmentation was performed using K-means clustering. Since there were 31 factors (i.e. questions) to use as basis for the segmentation, principal component analysis (PCA) was done to reduce dimensionality of the data and generate segments with better distinguished characteristics (Afrin, Al-Amin, & Tabassum, 2015).

Seven audience segments were identified: (1) easy-sells (27 percent), (2) concerned (22 percent), (3) supporters (16 percent), (4) pragmatists (5 percent), (5) obligated (28 percent), (6) complacents (14 percent), and (7) skeptics (9 percent).

Demographic/Geographic Profile

Easy Sells are the quadragenarian, married, highly-educated individuals, who likely have high incomes and are mostly situated in the Greater Manila Area (NCR + CALABARZON + Central Luzon). The **Concerned** segment comprised mostly of married people with middle range income from Visayas and Mindanao (VisMin). **Supporters** are the married males in their mid-30's, have middle range income and mostly living in VisMin. **Pragmatists** are the low income females who are likely non-degree holders from NCR+. **Obligated** ones are the highly educated, married females from the provinces. **Complacents** are mostly married males with middle range income from VisMin. Lastly, **Skeptics** are mostly married female with middle range income from VisMin.

Table 7. Demographic / Geographic Profile of the 7 Audience Segments

Easy Sells	Concerned	Supporters	Pragmatists
84% were 25-54 y.o. **Oldest among the 7 segments** (Ave. Age = 40) **Mostly married** (62%) with **relatively higher income** of P22k - P77k (63%). **One of the segments with the highest percentage of post-graduates** Mostly from NCR (18%), CALABARZON (14%), Central Luzon (13%), Davao (12%), Central Visayas (10%).	88% were 25-54 y.o. **Mostly married** (65%) with income 11k - 44k (78%). Majority are college graduates Mostly from Zamboanga (16%), Central Luzon (15%), SOCCSKSARGEN (11%), Central Visayas (11%), and Davao (10%).	78% were 25-44 y.o.. **Youngest among the 7 segments** (Ave. Age = 35) **Mostly married** (55%) male (59%) with income 11k - 44k (81%) Majority are college graduates Mostly from Zamboanga (19%), Central Visayas (17%), Davao (13%), and Central Luzon (10%)	69% were 18-44 y.o. **Mostly female** (65%) with income 22k and below (75%) **Finished up to vocational only** (100%) Mostly from NCR (23%), CALABARZON (23%), and Central Luzon (19%).

Complacents	Obligated	Skeptics
72% were 25-44 y.o. **Mostly married** (59%) male (59%) with income 11k - 44k (76%) Majority are college graduates Mostly from Central Visayas (18%), Zamboanga (13%), Davao (10%), and SOCCSKSARGEN (10%)	73% were 25-44 y.o. **Mostly married** (65%) female (62%) with income 11k - 44k **One of the segments with the highest percentage of post-graduates** Mostly from SOCCSKSARGEN (20%), Central Luzon (15%), Zamboanga (10%), and Cagayan Valley (10%)	74% 25-44 y.o. **Mostly married** (63%) female (51%) with income 11k - 44k (80%) Majority are college graduates Mostly from SOCCSKSARGEN (23%), CAR (15%), Central Visayas (14%), and Zamboanga (13%).

Acceptance of Vaccines / Barriers / Facilitators

Easy sells are the ones most accepting of COVID-19 vaccines. They agree with or do not even question vaccines. The concerned segment is called as such because while members of this group have very high likelihood of getting vaccinated, they also are quite concerned about side effects from or adverse reactions to vaccines. Likewise, **supporters** and **pragmatists** have high vaccination acceptance but is relatively lower compared to that of the easy sells and concerned segments. The **obligated** group, while still likely to get inoculated, has a considerable level of hesitancy, even with FDA approval or DOH endorsement of the vaccine. Work-related requirement is also a key reason for them getting immunized. The complacents, while highly likely to get vaccinated, do not consider COVID-19 as a threat and are not too concerned about adverse reactions to the vaccines. Finally, the **skeptics** are either undecided or unwilling to get inoculated. They are also very much concerned about side effects, vaccine efficacy, and effectiveness, and are the ones most susceptible to misinformation and disinformation.

Table 8. Vaccine Acceptance / Barriers and Facilitating Factors of the 7 Audience Segments

Easy Sells	Concerned	Supporters	Pragmatists
99% were highly likely to get vaccinated **Facilitating Factors:** High COVID-19 risk perception, protection of one's self and family from COVID-19 infection, mostly agree with or do not question vaccines, high trust in experts and regulatory agencies recommending the vaccines **Barriers:** Unavailability of vaccine or lack of vaccine supply, inconvenience of vaccination process	95% willingness to get vaccinated, which increased to **98% if vaccines have FDA approval or DOH endorsement** **Facilitating factors:** High COVID-19 risk perception, protection of one's self and family from COVID-19 infection, recommendation of primary care provider / doctor to get vaccinated due to comorbidities, very high trust in experts and regulatory agencies recommending the vaccines **Barriers:** Concerns about adverse reactions to vaccine, recommendation of primary care provider / doctor not to get vaccinated due to comorbidities, inconvenience of vaccination process.	88% willingness to get vaccinated, which increased to **94% if vaccines have FDA approval or DOH endorsement** **Facilitating Factors:** High COVID-19 risk perception, protection of one's self and family from COVID-19 infection, convenience of vaccination process **Barriers:** Concern on adverse reactions to the vaccine, limited or difficult access to vaccination services due to physical distance	85% willingness to get vaccinated, which increased to **91% if vaccines have FDA approval or DOH endorsement** **Facilitating Factors:** High COVID-19 risk perception, protection of one's self and family from COVID-19 infection, lower concern on adverse reactions to vaccine **Barriers:** Unavailability or lack of supply of vaccines, perception that vaccines are moderately safe, inconvenience of vaccination process

Complacents	Obligated	Skeptics
72% willingness to get vaccinated, which increased to **83% if vaccines have FDA approval or DOH endorsement** **Facilitating Factors:** Protection of one's self and family from COVID-19 infection, relatively low concern about adverse reactions to vaccine **Barriers**: Low COVID-19 risk perception, inconvenience of vaccination process	56% **willingness** to get vaccinated, which increased to 76% if vaccines have FDA approval or DOH endorsement. 39% **undecided to get vaccinated**, which decreased to **22% if vaccines have FDA approval or DOH endorsement** **Facilitating Factors:** High COVID-19 risk perception, protection of one's self and family from COVID-19 infection, willingness to get vaccinated to comply with work-related requirements **Barriers:** Concerns about vaccine safety and adverse reactions to vaccines, lower trust in experts and regulatory agencies recommending vaccines, inconvenience of vaccination process	44% **unwillingness to get vaccinated** which decreased to **33% with FDA approval or DOH endorsement of the vaccine** 47% **undecided** with marginally increased to **49% with FDA approval or DOH endorsement of the vaccines** **Barriers:** Concern about possible side effects, negative news about vaccines, concern about vaccine effectiveness / efficacy, low COVID-19 risk perception, low trust in experts and regulatory agencies recommending the vaccines

Values, Attitudes, Perceptions, and Expectations related to Vaccination

Easy sells and **concerned** segment have the highest vaccine confidence among the seven groups. Both have the highest trust in experts and regulatory agencies recommending the vaccines. They are also the ones most highly likely to register at the facility when called for schedule or appointment and to recommend vaccination to family and friends. Concerned segment is the one most concerned about side effects and adverse reactions to the vaccine, while easy sells are the least concerned. Majority of individuals from both segments reside 30 minutes away from the vaccination sites. However, between these two segments, concerned ones are only willing to spend a maximum of one hour on the vaccination process.

Supporters and **pragmatists** still have high vaccine confidence but is slightly lower than that of easy sells and concerned segments. Compared to the latter two groups, they only have moderate trust in experts and regulatory agencies recommending the vaccines. Nonetheless, they still have high likelihood of registering for vaccination and likelihood of recommending inoculation to loved ones. Individuals from the supporter segment are mostly residing at least an hour away from the vaccination sites and expect that the vaccination would take a long time, but are still willing to spend four hours or more in the process. On the other hand, pragmatists live about an hour away from vaccination sites and are willing to spend only a maximum of two hours on the vaccination process.

Obligated and **complacent** segments have lower vaccine confidence relative to the first four groups. In terms of perceived social norms, these two are less likely to get influenced by family, friends, and religious and community leaders to get vaccinated. The obligated segment considers vaccines important to health, but also thinks that vaccines could be little to moderately safe. Complacents are the ones least concerned about them or their loved one getting infected by COVID-19 among all segments. Both groups are only willing to spend a maximum of an hour on the entire immunization process.

Skeptics have the least confidence in vaccines, the highest distrust in experts and regulatory agencies, and are unlikely to register for inoculation and to recommend vaccination to loved ones.

Table 9. Vaccine-related Values, Attitudes, Perceptions, and Expectations of the 7 Audience Segments

	Easy Sells	Concerned	Supporters	Pragmatists
Values, Attitudes, and Perceptions	**One of the 2 segments with the highest vaccine confidence** The **least concerned about adverse reactions** The most sure that loved ones and community / religious leaders would want them vaccinated among the 7 segments. Segment with the **highest likelihood to get registered** at the facility when called or scheduled. Segment **most highly likely to recommend** vaccination to loved ones.	The most highly concerned that they and their loved ones will get infected **Segment with the highest vaccine confidence**, but also is the **most concerned about adverse reactions to the vaccine among the 7 segments.** Mostly sure that loved ones and community / religious leaders would want them vaccinated Have the **highest trust in experts and regulatory agencies** recommending the vaccine among the 7 segments Have **high likelihood to get registered** at the facility when called or scheduled Have very High likelihood to recommending vaccines to loved ones	Relatively higher vaccine confidence with **moderate concern on adverse reactions** Mostly sure that loved ones and community / religious leaders would want them vaccinated Have **moderate trust in experts and regulatory agencies** recommending the vaccines Relatively higher likelihood of register at the facility when called or scheduled Have high likelihood of recommending vaccination to loved ones	Relatively higher vaccine confidence **Think that vaccine is moderately safe** Have relatively lower concern on adverse reactions Mostly sure that loved ones and community / religious leaders would want them vaccinated Have **moderate trust in experts and regulatory agencies** recommending the vaccines Have relatively higher likelihood of registering at the facility when called or scheduled Have high likelihood of recommending vaccination to loved ones

Table 9. Vaccine-related Values, Attitudes, Perceptions, and Expectations of the 7 Audience Segments (Continued)

	Easy Sells	Concerned	Supporters	Pragmatists
Vaccination Process Expectations	Most are less than 30 minutes away from vaccination site (64%). 94% expects up 3 hours of vaccination process. 62% are willing to spend up to 2 hours.	**Most** (60%) **live less than 30 minutes away from vaccination site.** Expect vaccination process to last less than an hour (57%), so they are **only willing to spend a maximum of an hour** on vaccination (65%).	**Majority** (65%) **live at least an hour away from vaccination site** Expect vaccination process to last 3 hours or longer (62%), but are **willing to wait 4 hours or more** (52%).	86% live an **1 hour away from vaccination site** 84% expect up to 3 hour vaccination process but are willing to spend a maximum of 2 hours (63%)
	Complacents	**Obligated**	**Skeptics**	
Values, Attitudes, and Perceptions	Segment that is the **least concerned about them and their loved ones getting infected** Moderate vaccine confidence Relatively lower concern about adverse reaction Mostly sure that **loved ones and community / religious leaders would want them vaccinated**, but a **considerable percentage are still unsure** Moderate trust in experts and regulatory agencies recommending the vaccines Moderate likelihood of registering at the facility when called or registered Have high likelihood to recommend vaccination to loved ones, but a considerable percentage are still unsure	Have moderate trust in new vaccines **Consider vaccine as very important to health** **Considers vaccine to be little to moderately safe** Have moderate concerns about adverse reactions **Most are unsure if loved ones want them vaccinated, but mostly sure that community leaders want to.** Relatively lower trust in experts and regulatory agencies recommending vaccines Moderate likelihood of registering at the facility when called or scheduled Have high likelihood to recommend vaccination to loved ones, but a considerable percentage were also unsure.	Relatively lower concern about getting infected Have the **lowest vaccine confidence among the 7 segments** Have moderate concern about adverse reactions to vaccines **Mostly unsure that loved ones and community / religious leaders would want them vaccinated**, with considerable percentage who are sure that loved ones do not want them vaccinated. Have **the lowest trust in experts and regulatory agencies** among the 7 segments Least likely to register at the facility when called or scheduled Mostly **unsure if they will recommend** vaccination to loved ones	
Vaccination Process Expectations	83% live about 1 hour away from vaccination site 87% expect process to last up to 3 hours **but are only willing to spend a maximum of 1 hour**	88% live about 1 hour away from vaccination site 53% expect vaccination process to last about 1-3 hours, but are **only willing to spend a maximum of 1 hour** (56%)	Most (77%) live at most 1 hour away from vaccination site Expects vaccination process to take up to 3 hours (94%) and only willing to spend 2 hours (62%).	

Information Sources

All seven segments get COVID-19 and vaccine-related information from three main sources: (1) social media, (2) DOH and government releases, and (3) television (TV). The **concerned**, **obligated**, and **skeptics** seem to prefer TV over social media as an information source. **Easy sells** prefer social media over TV.

Table 10. Information Sources of the 7 Audience Segments

Easy Sells	Concerned	Supporters	Pragmatists
Main information sources: Social media, DOH / government releases, and television. **Prefers social media over TV.**	Main information sources: Social media, DOH / government releases, and television. **Prefers TV over social media.**	Main information sources: Social media, DOH / government releases, and television. **Prefers DOH media and social media.**	Main information sources: Social media, DOH / government releases, and television. **Prefers DOH media.**

Complacents	Obligated	Skeptics
Main information sources: Social media, DOH / government releases, and television. **Prefers DOH media.**	Main information sources: Social media, DOH / government releases, and television. **Prefers TV over social media.**	Main information sources: Social media, DOH / government releases, and television. **Prefers TV over social media.**

Appendix B shows a condensed profiling of the seven segments.

Discussion: Understanding Vaccine Adoption and Diffusion of Innovation

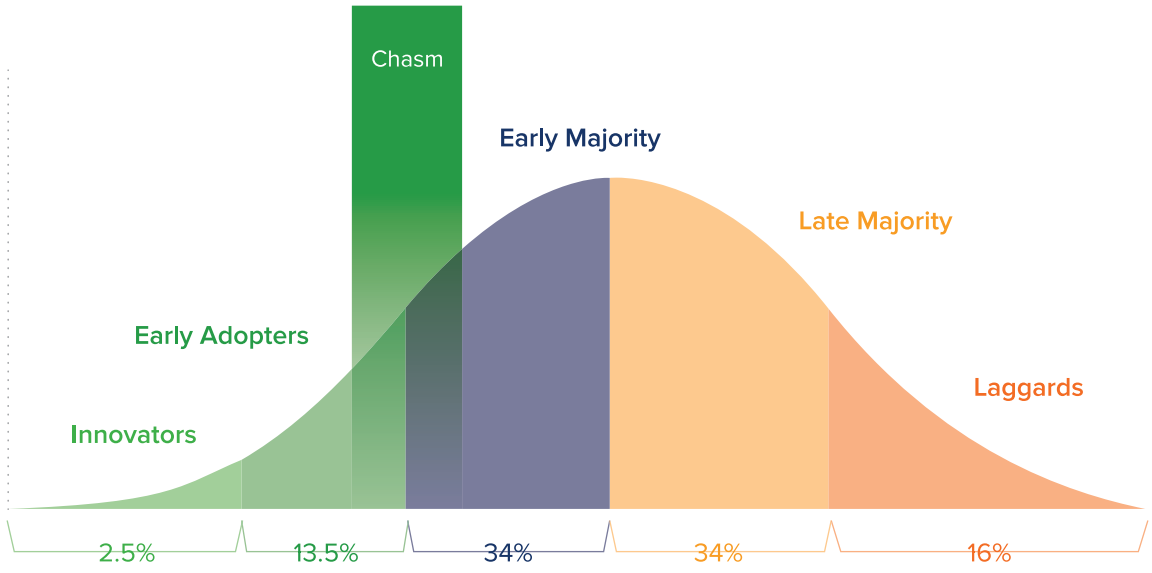
Diffusion of Innovations

The diffusion of innovations framework seeks to explain how, why, and at what rate new ideas and technology spread (Rogers, 2003). Under this framework there are five adopter categories in any social system:

- Innovators (first 2.5 percent) - those willing to take risks, have the highest social status and means to initiate a change.
- Early Adopters (next 13.5 percent) - those who have high opinion leadership, and carefully follow innovators onto a new trend.
- Early Majority (next 34 percent) - those adopting an innovation after a varying degree of time after the early adopters.
- Late Majority (latter 34 percent) - those adopting an innovation after the average participant. Usually skeptical of new things.
- Laggards (last 16 percent) - last to adopt an innovation, and have little to no opinion leadership.

There is a further chasm of adoption between Early Adopters (who are the visionaries) and Early Majority (who are the pragmatists) (Moore, 2014). The two groups have different expectations and "crossing the chasm" requires a deliberate strategy for mass adoption.

Figure 4. Diffusion of Innovations Framework



In Figures 5 and 6, the demographic and geographical segments identified are overlaid on the diffusion curves for comparison and prioritization purposes. The “Easy Sell” segment as well as NCR, Cagayan and Northern Mindanao are identified as early adopters. Applying the “chasm” concept suggests that the mechanism driving these segments will be different from the next segments comprising the Early Majority, and require targeted and nuanced messaging to motivate towards vaccination.

Figure 5. Mapping of Audience Segments to the Innovation Diffusion Curve

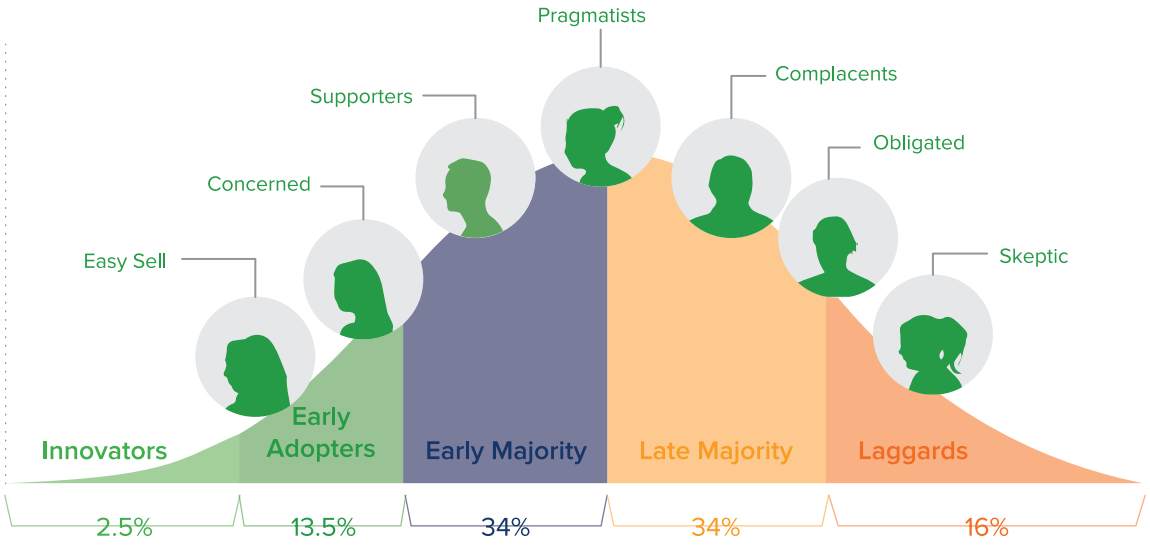
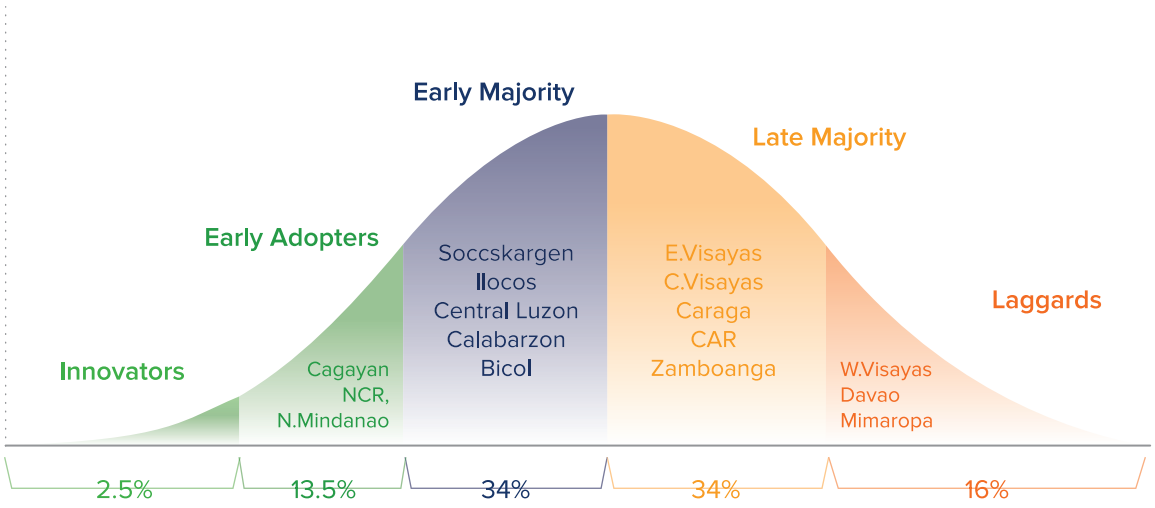


Figure 6. Mapping of Regions to the Innovation Diffusion Curve



Distribution of Segments across Regions

Table 11 summarizes the audience profile of the seven regions combined with the hesitancy-vaccination penetration quadrant (Figure 2). This can aid in identifying regions to prioritize for vaccine communication interventions, as well as in designing localized segment-specific communication strategies. Differences between the results of the quadrant and the audience segment distribution regions are likely due to hesitancy of individuals who dislike COVID-19 vaccines to respond to the DOH survey to begin with. In regions where this is the case, strategy based on the quadrant should mainly be followed.

Table 11. Audience Profile of Philippine Regions

Below Average Hesitant, Above Average Vaccinated	Sample Size	Easy Sells	Concerned	Supporters	Pragmatics	Complacents	Obligated	Skeptics
NCR	4,565	40%	16%	10%	10%	10%	12%	2%
Cagayan Valley	2,942	13%	25%	6%	2%	10%	36%	9%
Northern Mindanao	529	29%	18%	11%	5%	10%	21%	6%

Below Average Hesitant, Below Average Vaccinated	Sample Size	Easy Sells	Concerned	Supporters	Pragmatics	Complacents	Obligated	Skeptics
Ilocos Region	639	23%	24%	8%	8%	12%	20%	4%
Central Luzon	5,950	21%	26%	10%	6%	8%	26%	4%
CALABARZON	4,177	33%	17%	9%	11%	9%	17%	4%
Bicol Region	531	24%	18%	14%	5%	12%	21%	4%
SOCCSKSARGEN	5,733	10%	20%	9%	4%	9%	36%	13%

Above Average Hesitant, Above Average Vaccinated	Sample Size	Easy Sells	Concerned	Supporters	Pragmatics	Complacents	Obligated	Skeptics
Central Visayas	5,524	18%	20%	19%	1%	17%	17%	8%
Eastern Visayas	688	20%	25%	16%	2%	16%	16%	5%
CAR	3,518	13%	22%	10%	2%	14%	25%	14%
Caraga	123	31%	22%	12%	3%	15%	15%	2%
Zamboanga Peninsula	5,814	14%	28%	20%	0%	12%	19%	7%

Above Average Hesitant, Below Average Vaccinated	Sample Size	Easy Sells	Concerned	Supporters	Pragmatics	Complacents	Obligated	Skeptics
MIMAROPA	1,447	23%	24%	18%	1%	10%	20%	4%
Western Visayas	722	18%	20%	7%	4%	12%	31%	8%
Davao Region	4,462	26%	23%	18%	3%	12%	13%	4%

	Sample Size	Easy Sells	Concerned	Supporters	Pragmatics	Complacents	Obligated	Skeptics
BARMM	58	21%	22%	10%	9%	12%	22%	3%

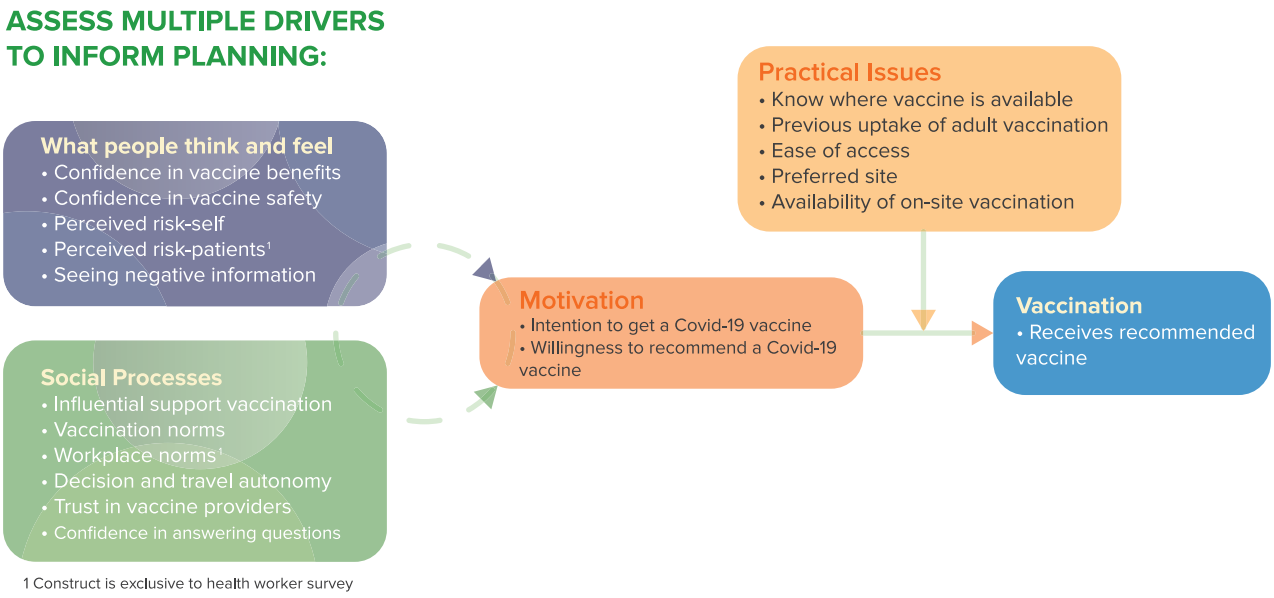
Notes:
- *Regional classification using hesitancy and vaccination levels was based on COVID-19 World Symptoms survey (Figure 2).*
- *Audience segmentation was based on DOH COVID-19 Vaccine Survey.*
- *There were no respondents to the symptoms survey from BARMM; hence, only the audience segment distribution was shown.*

Designing Campaigns for Vaccine Acceptance and Uptake

Behavioral and Social Drivers (BeSD) of Vaccination framework (World Health Organization, 2020) has been adopted by DOH in its COVID-19 vaccine demand generation and communications strategy. Under this framework, motivation to seek vaccination is driven by: (1) what people think and feel about vaccines and (2) the social processes that drive or inhibit vaccination. Additionally, vaccination decision-making can also be influenced by practical factors, such as vaccine availability, convenience, costs, service quality and satisfaction, requirements, incentives and intervention fatigue (Figure 7).

Since the audience segmentation done was based on demographics, facilitating factors and barriers to getting vaccinated, values, attitudes and perceptions towards vaccines, as well as expectations related to the vaccination process, it can be used to complement existing segmentation done by DOH and to further refine communication interventions to improve motivation to get immunized and to manage process expectations. Moreover, resolution of process-related issues that matter the most to the different segments across locations can also be prioritized.

Figure 7. BeSD Framework



1 Construct is exclusive to health worker survey

Implications to Health Communications Policy

Using Segments Beyond Targeting (Diffusion of Innovations)

The seven identified audience segments serve a dual purpose. First, segmentation helps to find ideal and problem segments that can be targeted for communications. Communications strategy must decide on a "glass half-full or half-empty" priority - i.e. reinforce ideal segments to continue their behavior or attempt to turn the problem segments around.

Secondly, the more ideal segments can also serve as illustrative examples for the other segments. Stories can be culled from the populations of vaccine supportive groups to be used to influence the vaccine skeptics.

Combining Facilitating Factors and Messaging Cues

From results from the preliminary analysis in Table 6, primary and supporting facilitating factors and barriers to vaccine seeking behavior can be summarized as follows:

Table 12. Distilled Facilitating Factors and barriers to Behavior

Facilitating Factors	Barriers to Behavior
Primary: Protect self and family from infection Marginal: Risk of COVID-19 FDA approval or DOH endorsement of vaccine Work-related reasons	Primary: Concerns about side-effects News about vaccine Marginal: Vaccine efficacy/effectiveness Medical reasons (comorbidities)

From these factors, a playbook is suggested for messaging cues that specifically address vaccine hesitancy:

Table 13. Messaging Cues for Vaccine Hesitancy Campaigns

Emphasis	Facilitating Factors	Barriers to Behavior
Cognition, Rational Decision-Making	Emphasize why vaccination is important to protect one's family Explain the implications of vaccination to job seeking and livelihood	Focus attention on percentage occurrence of side-effects vs. No side-effects Inform definitions of efficacy and effectiveness
Fear Management	Establish the threat of COVID-19 entering the household Establish how vaccination helps empower families to safety	Establish the threat of death or unemployment vs. Fear of side-effects Show how majority of vaccinations result in no side effects
Social Learning	Illustrate happy families post-vaccination Illustrate how families can help each other by prioritizing vaccination among its members	Show side-effect free individuals post-vaccination Illustrate people with co-morbidities taking initiative to protect themselves and their loved ones

Further Guidance: UN Guide to Vaccine Communications

The UN Guide to COVID-19 Vaccine Communications lists nine factors to consider in creating vaccine communications messaging. These factors are added considerations in preparing the communication strategy to encourage vaccine acceptance. (Center for Public Interest Communications. University of Florida College of Journalism and UN Verified Initiative, 2020)

1. Lack of Trust – hesitancy arises from a low trust level. Communications should address the typical factors driving lack of trust, namely: inconsistency, false balance, wrong messages, and abstractions.

2. Moral Values – messages should play to established moral values and attitudes of the community.

3. Timing – identify content areas where you can have a first move advantage. Consider current events and reactions to latest development related to vaccines.

4. Messengers – cultivate credible and reliable influencers applicable to the target community or segment.

5. Narrative - overcome scientific jargon and abstractions and create narratives that speak to people. Flip the themes of choice, regret, and control and frame them in a positive way.

6. Communities – use the segmentation to determine the right audience for specific messaging.

7. Social Norms – shift perceived norms by highlighting people within a community or social network who are getting vaccines (refer to observational learning). Work with influencers to shift these perceptions.

8. Emotions – focus on emotions that drive action such as pride, parental love, hope. Avoid using shame, fear, or sadness in calls to action.

9. Motivations of Messenger – be transparent about the motivations of the messenger. Use influencers who are unimpeachable in their motivations.

10. Vaccine Literacy [WHO, 2021] - address specific literacy issues through informative messaging, but tailor fit to education levels for better appreciation (e.g. efficacy, effectiveness, herd immunity, limited side-effects) without resorting to heavy scientific jargon.

Program Capacity

Both demographic and geographic segments suggest that vaccine supply is an ongoing concern. Strategies to address supply challenges, focusing on areas that already have Low Hesitancy and Low Vaccination, can be combined with messaging on vaccine availability, targeting the Supporter and Pragmatist segments.

Review of Existing Messaging Strategies

A systematic review of existing messaging being done by public health authorities and their media partners should be performed. At the same time, review of anti-vaccination, fear-mongering and conspiracy theory messages online should be compared for possible counter-narrative strategies.

Social Listening as an Enabler to Communication Strategy

Proactive social listening is an enabler of the success of a communications campaign for vaccine acceptance. Appendix C details the existing social listening and learning system used by DOH Health Promotions Bureau (HPB). Data feeds from the various online and manual sources can be integrated and subsequently analyzed using natural language processing (NLP) and machine learning techniques, providing near-real time insight on the take up and engagement of various segments to the vaccine communications and making the process scalable.

Table 14. Social Listening Strategies

	Survey / FGD Analysis	Keyword Trend Analysis	Opinion Mining	Engagement Monitoring	Social Network Analysis
Data Source	Survey, Focus group discussion (FGD) transcripts	Keyword Search Trends, Social Media Mentions	Social Media, Discussion Sites, Blogs, Web Posts	Social Media Posts, Facebook Audience and Page Insights, Twitter Analytics, Facebook Ads	Social Media Posts
Analysis	Audience segmentation Barriers to Behavior and Facilitating Factors Automated Topic Discovery and Sentiment Analysis	Trending Topics Related Topics / Queries Effects of Events or Interventions on Topics Keyword Visualization (Scatterplot, Keyword Network, Keyword Trends)	Topic Modeling Sentiment Analysis (Polarity and Emotion) Topic Visualization (Word Clouds, Topic Network, Topic Trends)	Experimental Design and Analysis (e.g. A/B testing) Organic vs. Paid Ads Audience Profiling (Engagement) Effects of events or interventions on engagement	Network visualization and graph analysis of online user connections
Role in Communication	Baselining / Refining of target users to engage Identifying / Refining communication cues	Tracking of Information-seeking Behavior Identifying timing of issues to address	Measuring impact of messaging Identifying narratives and counter-narratives	Measuring actual user engagement Measure campaign performance Testing timing of interventions to address issues	Identifying influencers Detecting spread of misinformation and identifying super-spreaders

Conclusion and Recommendations

Various surveys were analyzed to understand vaccine acceptance in the Philippines and its drivers. Estimated vaccination coverage was at around 20 percent level and the nationwide vaccine hesitancy rate was estimated to range from 52 percent to 59 percent. The trend of hesitancy has a negative relationship to vaccinations, which suggests further drops in hesitancy can be expected as more people get vaccinated. Based on the recent Pulse Asia survey, hesitancy decreased from 84 percent in February to 52 percent in June 2021, as immunization by priority group ramped up. While the country's vaccination and hesitation trends have been improving from February 2021 levels, regional analysis highlighted issues that need to be addressed at a local level. Vaccine supply, deployment, or prioritization issues likely exist within the Low Hesitancy and Low Vaccination group (i.e. Ilocos, Central Luzon, CALABARZON, Bicol, and SOCCSKSARGEN) while High Hesitancy and High Vaccination (i.e. Central Visayas, Eastern Visayas, Caraga, CAR, and Zamboanga Peninsula) groups are driven by obligation to get vaccinated to comply with travel and employment requirements (e.g. Overseas Filipino Workers). On the other hand, High Hesitancy and Low Vaccination regions (i.e. MIMAROPA, Davao, and Western Visayas) are possibly areas with vaccine skeptic populations.

On the basis of the forgoing the following key recommendations are put forward:

- A review of vaccination program capacity is recommended to specifically address vaccine supply issues. Accelerating the vaccination program in the Philippines is a critical measure to increase acceptance especially in regions where hesitancy and the rate of vaccination is driven by supply (Ilocos, Central Luzon, CALABARZON, Bicol, and SOCCSKSARGEN).

- Travel and employment requirements provide a strong incentive for individuals to get vaccinated, even among those who are hesitant. This is observed in the High Hesitancy and High Vaccination group in Central Visayas, Eastern Visayas, Caraga, CAR, and Zamboanga Peninsula. This shows the potential of policies that provide more travel flexibility and increased employment options to vaccinated individuals as an effective incentive for vaccination. Targeted communications strategies should be adopted to influence vaccine acceptance especially among those with High Hesitancy and Low Vaccination which are observed in MIMAROPA, Davao, and Western Visayas. This report identifies seven (7) audience segments (i.e. Easy Sells, Concerned, Supporters, Pragmatists, Obligated, Complacents, and Skeptics), combined with the regional segments based on vaccination and hesitation levels, and this can aid in targeting prioritization and design of more tailored and localized communication campaigns. The facilitating factors (i.e. concern for family and loved ones, COVID-19 risk perception, FDA/DOH approval and endorsement, and work-related reasons) and barriers to behavior (i.e. concerns about side-effects, medical reasons, news about vaccines, and vaccine effectiveness and efficacy), produced 12 messaging cues, which can be used and tested for campaigns. UN and WHO vaccine communication best practices were provided to augment current communications, in particular: **vaccine literacy**.

- Accelerate action on tailored messaging towards refined audience segments. Findings and suggested communications cues could also be used to inform national and local vaccination communications by all levels of government, civil society actors (including faith-based organizations and religious leaders), and the private sector, which includes influential companies and social media influencers.

- Perform a systematic review of existing messaging being done by public health authorities and their media partners, and compare them against anti-vaccination, fear-mongering and conspiracy theory messages online, to improve current communications strategies and to identify possible counter-narrative strategies.

- Enhance existing social listening and learning system of DOH-HPB by integrating their various data feeds and leveraging NLP and machine learning methods to make process of design, optimization, and monitoring of vaccination-related communication campaigns more proactive, timely, and scalable.

Appendix

Appendix A. Hypothesis Testing of Difference between Vaccine Hesitancy of Males and Females

(a) Based on DOH COVID-19 Vaccine Survey (May 16-31, 2021)

Sex	# of Respondents	Hesitancy Rate	
Female	24,723	15.46%	
Male	22,231	12.51%	
Grand Total	**46,954**	**14.07%**	**(p < 0.001)**

Notes:
Respondents who preferred not to declare their sex was excluded.
Hesitant = Undecided + No
P < 0.001 suggests that there is significant difference in the vaccine hesitancy rates between males and females

(b) Based on COVID-19 World Symptoms Survey

Sex	Estimate	P-value	
Intercept	34.463791	1.24E-235	(p < 0.001)
Sex (Male=1)	-9.332267	7.49E-32	(p < 0.001)

Note:
Regression with hesitancy rate as dependent variable and sex as independent variable was performed to test significance of difference in hesitancy rates between males and females.
p < 0.001 suggests that there is significant difference in the vaccine hesitancy rates between males and females

(c) Based on MinDA Survey

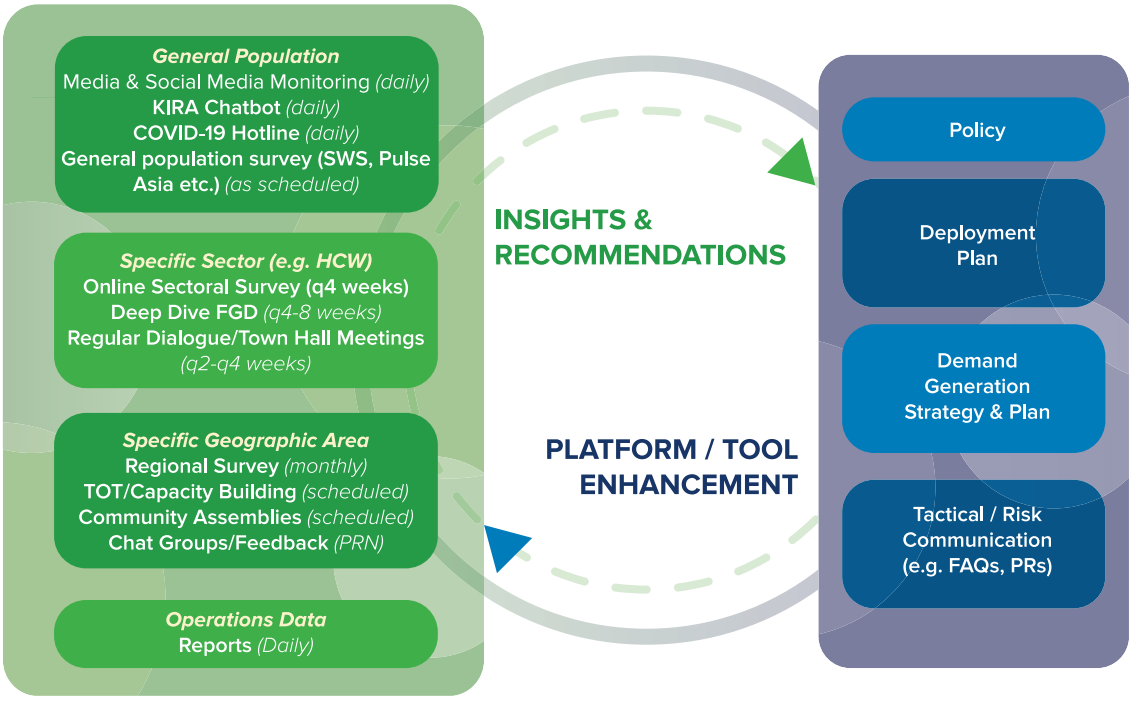
Sex	# of Respondents	Hesitancy Rate	
Female	416	48.08%	
Male	595	44.03%	
Grand Total	**1,011**	**45.70%**	**(p > 0.05)**

Notes:
Respondents who preferred not to declare their sex was excluded.
1,011 only Includes only those who have not yet been vaccinated and have not yet registered for vaccination.
Hesitant = Undecided + No
P > 0.05 suggests that there is no significant difference in the vaccine hesitancy rates between males and females

Appendix B. Audience Segment Profiling (Condensed)

	Easy Sell	Concerned	Supporter	Pragmatist	Compla-cent	Obligated	Skeptic
Hesitancy	1%	2%	6%	9%	17%	25%	82%
Demographics	25-54yo, Married, Higher income, Highly Educat-ed	25-54yo, Married, Mid income	25-44yo, Married, Male, Mid income	18-44yo, Female, Low income, Vocational	25-44yo, Married, Male, Mid income	25-44yo, Married, Highly educated	25-44yo, Married, Female, Mid income
Geographic	NCR+	VisMin	Provincial	NCR+	VisMin	LuzMin	VisMin
Reasons for getting vacci-nated	Risk of COVID Protect one's self and family	Risk of COVID Protect one's self and family Trusts ex-perts	Risk of COVID Protect one's self and family Vaccination process	Risk of COVID Protect one's self and family Less concerned about side effects	Protect one's self and family Less concerned about side effects	Risk of COVID Protect one's self and family **Work-related**	
Reasons for avoiding vaccination	Lack of supply Vacci-nation process	Side effects Comorbid-ities Vaccination process	Side effects Vaccine access	Lack of supply Vaccination process	**Does not believe COVID is a risk** Vaccination process	Side effects **Lack of trust in experts** Vaccination process	Side effects **Negative news** **Does not believe COVID is a risk** **Lack of trust in experts**
Information and Media habits	Social Media	TV Social Media	DOH media Social Media	DOH media	DOH media	TV	TV

Appendix C. DOH Social Listening and Learning System



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United Nations Development Programme

Philippines Country Office
15th Floor North Tower, Rockwell Business Center Sheridan
Sheridan Street corner United Street
Highway Hills, 1554 Mandaluyong City, Philippines
Email: registry.ph@undp.org Website: https://www.ph.undp.org/