

# Evaluation of the Implementation of Urban and Rural Local Government Unit (LGU) Responses to the COVID-19 Pandemic in Selected Communities in Luzon

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## ABSTRACT

**Objectives.** The study aims to identify the gaps and document the best practices in the response during the COVID-19 pandemic. The study also compared how urban and rural sites of local government units (LGUs) implement measures. Hence, the study was conducted to probe into the non-uniform implementation of COVID-19 protocols in two (2) rural and two (2) urban local government units (LGUs), and the best practices that can be done to remedy this gap in disaster risk management.

**Methods.** A case study design was employed and analyzed using a triangulation approach to determine the gaps and best practices of the selected urban and rural LGUs in implementing COVID-19 protocols. The study adopted the WHO COVID-19 Strategic Preparedness and Response Plan (SPRP) Monitoring and Evaluation Framework (COVID-19) M&E Framework) in monitoring and tracking situations, containment efforts, and the response during the pandemic around the world. The study was tailored for both urban and rural LGUs in the Philippines to identify their approach in implementing their COVID-19 protocols.

**Results.** Findings showed that best practices include strict border controls and granular lockdowns, conversion of existing buildings into isolation facilities, and extensive information dissemination. The gaps in implementation identified were the lack of human resources and necessary facilities to treat patients, no purpose-built isolation facilities, “inapplicability” of national protocols and ordinances in local settings, misinformation regarding the COVID-19 pandemic, and uncooperative behavior of the people.



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**Conclusion.** Urban and rural communities are recommended to build risk communication and scenarios, establishing “Botika” and mobile vaccination, and extensive information dissemination as remedy to the misinformation regarding the virus, vaccine, and other pandemic-related information. Additionally, penalizing people who spread false information regarding the pandemic also be implemented. Finally, preventive health assistance should be provided to the first responders such as barangay hall personnel.

**Keywords:** LGU response, non-uniform implementations, protocols, disaster risk management, COVID-19 pandemic

## INTRODUCTION

The World Health Organization (WHO) reported that the first local case was a 38-year-old female traveler from China who arrived in the Philippines on January 30, 2020.<sup>1</sup> Protocols created by the WHO were adapted into the Department of Health (DOH) Memorandum No. 2020-0034, which included identifying and handling suspected cases, treatment plans, and implementing guidelines. Under Annex 8 of the Department Memorandum, the DOH (2020) advised that suspects and confirmed patients must stay indoors, avoid using public facilities, and maintain strict hygiene.<sup>2</sup> The protocols were not closed for implementation among individuals but also included the compliance of Local Government Units (LGUs). However, due to the disparity of local context, the protocols among rural and urban communities differ.

Hence, the study addresses the non-uniform implementation of COVID-19 protocols across various LGUs in the Philippines, highlighting significant disparities between urban and rural settings. These differences are rooted in variations in resources, community engagement, and infrastructure, which have led to inconsistent application of pandemic measures. The authors were motivated to explore these disparities, particularly focusing on the gaps in disaster risk management and the need for empirical evidence to enhance local preparedness and response strategies. The impetus for the study stems from the COVID-19 pandemic's exposure of critical weaknesses in local response mechanisms, especially concerning public health emergencies. By understanding how urban and rural communities approached the pandemic differently, the study aims to inform policy and program interventions, ultimately contributing to better disaster management and preparedness for future public health crises.

Through this, a grounded framework on the implementation of the country's response to the COVID-19 pandemic and other similar disasters was developed. This can serve as a basis for improvement in future strategic and operational planning to address future disasters, most especially on emerging and re-emerging diseases. Government agency heads can adopt this to have a large-scale response during a public health crisis to strengthen the delivery of safe and effective healthcare services by improving facilities and strategic structures.<sup>3</sup>

### International Practices Implemented Against COVID-19

The increased rapid scaling among several countries was rooted differently. South Korea<sup>4,5</sup> focused on the speed and accuracy of its testing facilities and kits. Singapore augmented its real-time reverse transcription polymerase chain reaction (rRT-PCR) testing. Hongkong increased its quarantine site capacity by converting housing estates and systematizing sputum collection with minimal contact with frontliners.<sup>6</sup>

A parallel study of seasonal flu implicated a delay in the spread of infectious diseases through travel restrictions and social distancing. Singapore tightened security on disease control within new international arrivals and subsequently denied entry (residents are exempted but are imposed to undergo a 14-day isolation period from the day of arrival).<sup>7</sup>

Taiwan triggered its Central Epidemic Command Centre which was able to identify 124 key measures from medical supplies and equipment to economic stimulus packages.<sup>8</sup> Vietnam provided credit and financial assistance<sup>9</sup> to businesses affected by tax rescheduling and exemptions for some medical items.<sup>10</sup>

### Local Condition

The local government unit devolved in 1991, giving LGUs the autonomy to implement and adapt based on the context of their jurisdiction. Despite having the autonomy to prioritize programs necessary for disaster management and response, it is not an urgent priority.<sup>11</sup> There is also a lack of compartmentalization in human resources and a disparity in monetary limitations between urban and rural LGUs, which amplify the ad-hoc situation of disaster risk management.

Under the Universal Health Care Law or RA 11223<sup>12</sup>: (1) Filipinos must be guaranteed fair access to quality and affordable healthcare goods and services; and (2) Realization of universal healthcare through a systematic approach and clear delineation of roles and responsibilities of key stakeholders and agencies towards better performance in the health system.

Rural LGUs show complacency due to the relative disparity in the impact of the virus amongst urban settings.<sup>13</sup> Given that the LGUs play a vital role in the implementation of any national goal, measures must come with a simulation exercise to equip them for the actual response against the disasters. In essence, for any goal to be achieved, policies must be proven effective through empirical evaluation and monitoring. Hence, this study aims to assess the COVID-19 response of specific LGUs through a specific data collection process.

## MATERIALS AND METHODS

The study adopted the WHO COVID-19 Strategic Preparedness and Response Plan (SPRP) Monitoring and Evaluation Framework (COVID-19 M&E Framework) that monitors and tracks situations, containment efforts, and the response during the pandemic around the world. (Figure 1) This monitoring and evaluating framework were tailored for various communities. In the case of this study, it was tailored for both urban and rural LGUs in the Philippines to identify their approach in implementing their COVID-19 protocols.

In this framework, the input indicators are divided into the following dimensions: (a) the public health dimension, which covers the first 3 input indicators and observes the Prevent-Detect-Isolate-Treat-Reintegrate (PDITR) strategy of the DOH; (b) the socioeconomic dimension, which covers

programs to support families and the subsidies and loans to local/small businesses and; (c) mental health wellbeing dimension which accounts for the mental wellbeing of the residents and their satisfaction to the response of their respective LGUs.

Subsequently, the researchers incorporated the Life Satisfaction Measurement scale and an Affect Measurement Scale to capture mental health perspectives, due to the possible effects of the pandemic on the mental health of the people specifically during the lockdown. Furthermore, a cross-cutting output and outcome indicator for communications has been added at the bottom part of the conceptual framework. It covers the three levels of communications (upward, downward, and sideward) in terms of the pandemic response done by LGUs.

This paper applied a case study research design to determine the gaps as well as the best practices of the selected urban and rural LGUs in implementing COVID-19 protocols. In selecting two (2) urban and two (2) rural LGUs, travel restrictions and the availability of resources were also considered. Moreover, descriptive statistics were used to describe the situation of each locality while a structured, community-based interview shall constitute the qualitative aspect. This interview was executed in two phases with an FGD on the public and private spheres of the locality; and KII. An online survey questionnaire was also given to the respondents.

The study gathered data from respondents across two urban and two rural LGUs, focusing on key stakeholders and residents. LGU A, an urban area with a total population

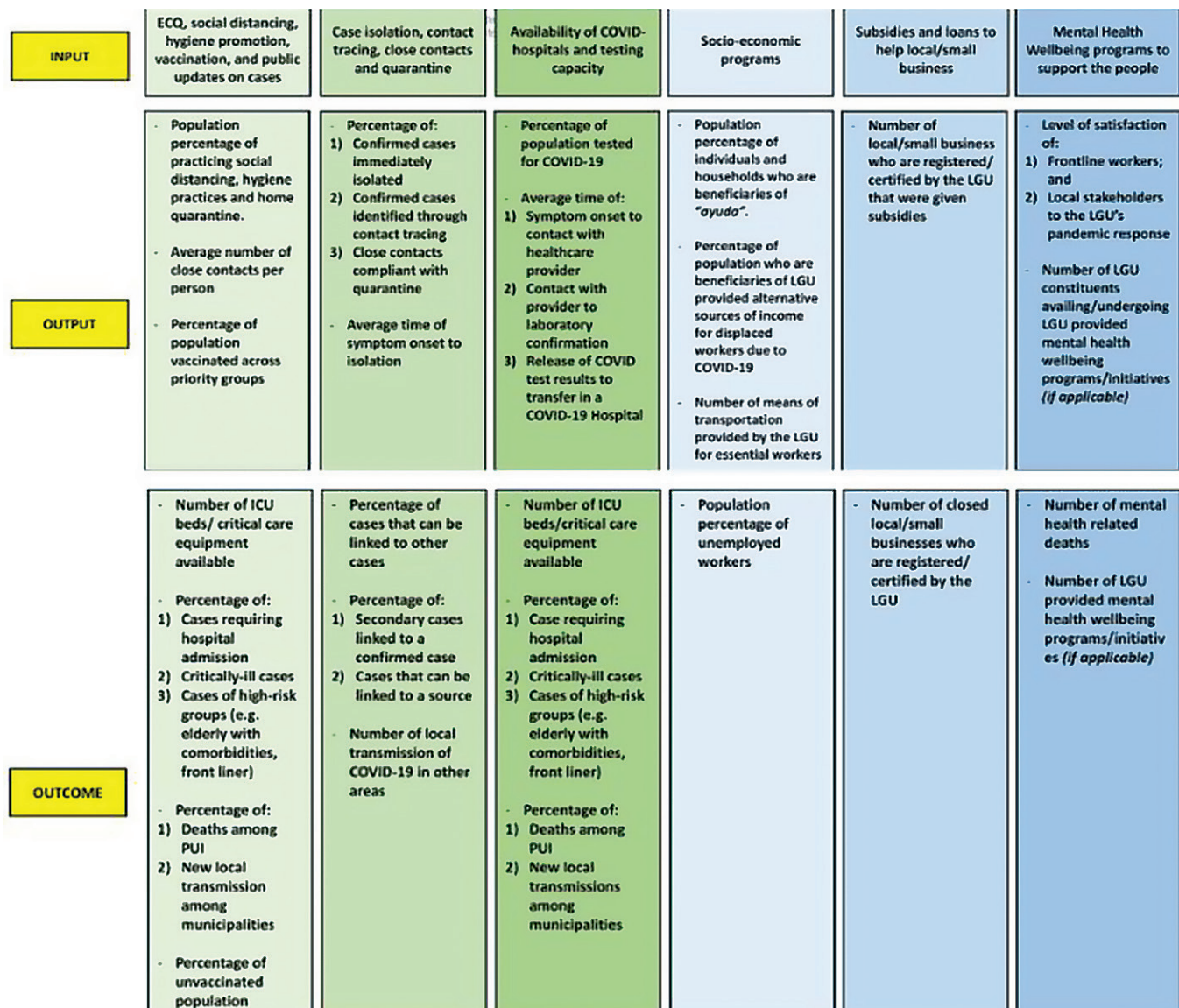


Figure 1. Modified Conceptual Framework adapted from Is ECQ Working? A COVID-19 Monitoring and Evaluation Guide for Government Response.<sup>14</sup>

**Table 1.** Tabular representation of the parts of the All-Stakeholders Workshop/FGD

Part of the Workshop	Data Collection Approach	Data Collection Tool	Type of Data Collected
<b>1. Pre-workshop</b> <i>(a few days before the workshop)</i>	1. Secondary data was requested from LGUs on their COVID-19 response to have an initial background regarding their response. An orientation through Zoom was arranged before the FGD to explain the study to participants and acquire their consent. 2. Preliminary survey forms were distributed upon registration to prepare for the FGD. 3. Secondary data were collected from LGU officials, health care providers, and local stakeholders.	1. Semi-structured interview guide 2. Google survey forms	1. Qualitative data 2. Quantitative data 3. Secondary data
<b>2. During the online workshop</b>	1. Presentation of LGU's pandemic response/ answers to the guide questions sent pre-workshop. 2. FGDs with multiple sector local stakeholders were initiated during the workshop.	1. Semi-structured interview guide	1. Qualitative data 2. Quantitative data
<b>3. After the workshop</b>	1. Synthesis of the data collected pre-workshop and during the workshop. 2. Secondary data review		1. Qualitative data 2. Quantitative data

of 374,550, involved a range of respondents including LGU officials, healthcare workers, and local stakeholders in the study. In contrast, LGU B, a rural community with a population of 44,958, gathered input from LGU officials, barangay health workers, and community members. LGU C, a larger urban LGU with a population of 1,661,584, included residents, healthcare providers, and local leaders as respondents. Lastly, LGU D, the smallest rural LGU with a population of 18,943, collected insights from healthcare workers, barangay officials, and community members.

The study utilized a selection matrix to focus on analyzing data from two (2) rural and two (2) urban LGUs; excluding the regions within Visayas and Mindanao due to limited resources and restrictions. Furthermore, data provided by key informant interviews (KII) and focus group discussions (FGD) might be inhibited due to the limited period allocated per interview. The researchers also must not disclose any sensitive information about the study and the participants to those outside of the research group. Hence, the LGU names are kept confidential. Figure 2 shows the process of collecting the data and interpreting the results thereof. Further information regarding the workshop and FGD process can be seen in Table 1.

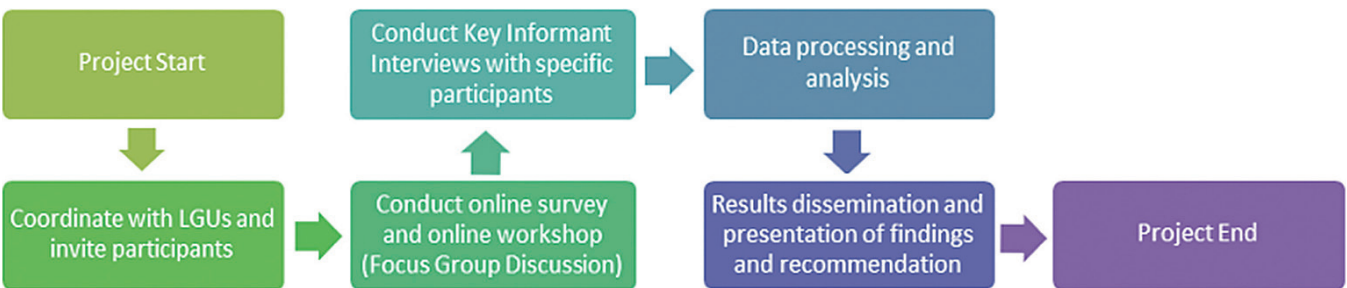
**Quantitative Approach**

An online survey was administered to the participants and consent forms were distributed. The survey consisted of statements that participants will answer on a scale of strongly disagree to strongly agree for questions on public health measures. On the other hand, strongly dissatisfied to strongly satisfied for socioeconomic questions. The questions were developed following the local setting and aligned with the conceptual framework. The researchers also incorporated a section for mental health well-being<sup>15</sup> questions which utilizes a semantic differential scale. These questions prioritized Life satisfaction measures (Cantril's Ladder) and Affect measures.

The data collected gave insights into the LGU COVID-19 pandemic response and its implementation in the community and supplemented the FGDs. This took about ten (10) minutes at most. The data gathered also examined whether the results varied by gender and age. Cronbach's alpha was computed to test the reliability and internal consistency of the scores. A test-retest was also done to ensure that the answers for the two rounds of testing were consistent.

**Qualitative Approach**

The FGD questionnaire developed by the researchers included indicators that were consistent with the conceptual framework and the PDITR-V Strategy implemented in the country. It also included the measurement of the enforcement



**Figure 2.** Diagrammatic Research Workflow.

of the public health policies by the LGUs with the socio-economic and mental health programs as an addition. This was conducted to gather the implementations, recommendations, and experiences regarding the LGU COVID-19 pandemic response of the local stakeholders in the community. The event was divided into three parts (Table 1):

KIIs were conducted to supplement specific data and the following inclusion criteria were taken and consent was sought:

- a. Local Government Unit (LGU) officials
- b. Representatives from local government institutions/agencies
- c. Healthcare workers affiliated with local government institutions/agencies
- d. Healthcare workers non-affiliated with local government institutions/agencies
- e. Regional DOH health expert
- f. Locals of the community
- g. Other stakeholders (religious institutions, non-governmental organizations, international organizations).

A selection matrix was created to determine which LGU could participate. This includes and is limited to the total population, the total number of COVID-19 cases and active cases, the number of recoveries and deaths, the availability of medical facilities, and the recovery and fatality rate. Urban and rural LGUs with the highest weighted score were invited to participate. When the LGU is unresponsive to invitations, the ones ranked under them would be used to replace them. Budget and safety limitations forced the researchers to select the most accessible LGUs.

### Data Processing and Analysis

The collected quantitative data from online interviews were analyzed descriptively by showing the numbers to describe the COVID-19 situation in the specific locality. The distribution of the LGU score and the items that constitute the score were evaluated descriptively as well. Gathered data were examined to ensure that results varied by gender and age. Cronbach's alpha was computed to test the reliability and internal consistency of the scores.

The qualitative data that was collected through the FGDs and KIIs were grouped into major themes and coded into more specific sub-themes through thematic analysis. The data collected from the FGD employed a systematic approach to monitoring and analyzing public health and social measures (PHSM) where PHSM indicators are scored based on an ordinal scale corresponding with the response policy's degree of intensity and scope. This was rescaled according to the maximum indicator value and placed on a scale between 0 and 100. The average of these indicators forms the composite PHSM Severity Index score for each LGU.

All ethical standards were followed including data privacy and informed consent. Notably, a special portion addressed

the biosafety clearance to ensure the utmost safety of the researchers and participants. Research utilization implies that the data may be used to recommend better local government responses that would dictate future programs, policies, and protocols that would address similar public health crises such as the COVID-19 pandemic in the future.

## RESULTS

LGU A, an urban area with a population of 374,550, had well-established healthcare facilities and a diverse economic base, while LGU C was a larger urban LGU with 1,661,584 residents, featuring advanced healthcare infrastructure and digital tools. On the rural side, LGU B had a population of 44,958 and relied heavily on barangay health units, with its economy centered on agriculture. LGU D, the smallest LGU with 18,943 residents, had prior experience in handling health emergencies, which helped shape its pandemic response.

Following the introduction, the urban LGUs' pandemic responses are detailed. LGU A implemented a local Inter-Agency Task Force (IATF), strict quarantine measures, and digital contact tracing while offering socioeconomic support to affected families. LGU C enforced public health protocols, reallocated budgets to bolster sanitation, and used GIS mapping for case tracking, along with providing financial assistance to businesses. The rural LGUs' responses highlight their community-driven strategies. LGU B adapted national guidelines, conducted health seminars, and employed advanced contact tracing. LGU D utilized its prior health emergency experience, scenario-based planning, and innovative solutions like mobile vaccination drives.

The figures below compare urban and rural LGUs, emphasizing their best practices and challenges. Urban LGUs benefit from technological tools and accessible resources but face difficulties due to high population density and enforcement challenges. Rural LGUs demonstrate strong community leadership and innovative local solutions, though they struggle with limited healthcare infrastructure and the inapplicability of certain national policies. Figures 3 and 4 illustrate these gaps and best practices visually.

### LGU A

As seen in Table 2, LGU A has a total population of 374,550, 129 barangays, and 6 major hospitals and medical centers that cater to COVID-19 cases.<sup>16</sup> The total dedicated beds and equipment for COVID-19 are as follows: 44 ICU beds, 335 non-ICU beds, and 48 mechanical ventilators.<sup>16</sup> As of October 22, 2021, the LGU has 28,714 total COVID-19 cases, 917 active cases, and 619 deaths. The Average Daily Attack Rate as of October 22, 2021, was 18.62 or for every 100,000 residents 19 are infected.<sup>16</sup>

The patients' mean age is 36.0 years, the median is 33, and the modal age is 23, with a standard deviation of 18 years. A 95% confidence interval for the mean age of the patients is 36 years old. Half of the patients are above 33 years old, and

the other half are below 32. Most of the patients are 23 years old. The skewness coefficient is 0.45 which means that the age distribution of the patients is skewed to the right implying that there are more younger patients ( $p < 0.01$ ).

Based on the primary data, LGU A has been proactive and not reactive justified by their claimed struggle to access scarce resources and public distrust, albeit having prepared a set of measures including (A.1) formation of a local IATF; (A.2) prompting a public health information dissemination drive; (A.3) community quarantine and strict border control; (A.4) activation of Emergency Operation Center as border control; (A.5) formulation of local advisories; (A.6) assigning a proactive and knowledgeable City Epidemiology Surveillance Unit (CESU); (A.7) digital innovation; (A.8) established isolation facilities. On the other hand, the gaps

and challenges include (A.1) Lack of manpower; (A.2) Limited resources; (A.3) lack of consistent implementation and monitoring; (A.4) Gaps in the tagging system; and (A.5) inconsistent mental health intervention. They also assisted small-time business owners and encouraged rental holidays.

**LGU B**

LGU B, according to Table 2, consists of 40 barangays and a total population of 44,958 according to the 2020 census.<sup>16</sup> It is a landlocked municipality in the coastal province. It has four major hospitals and clinics that cater to COVID-19 cases.<sup>16</sup> The total beds and equipment dedicated exclusively for COVID-19 are the following: 3 ICU beds, 42 non-ICU beds, and 1 mechanical ventilator (data from DOH COVID-19 Tracker). As of January 31, 2022, there

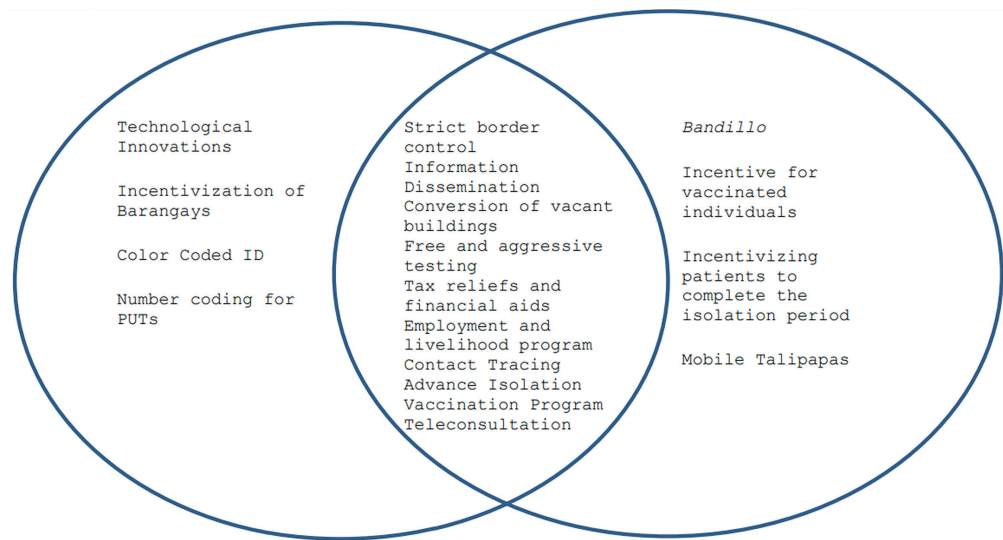


Figure 3. Best Practices of Urban and Rural LGUs in Pandemic Response.

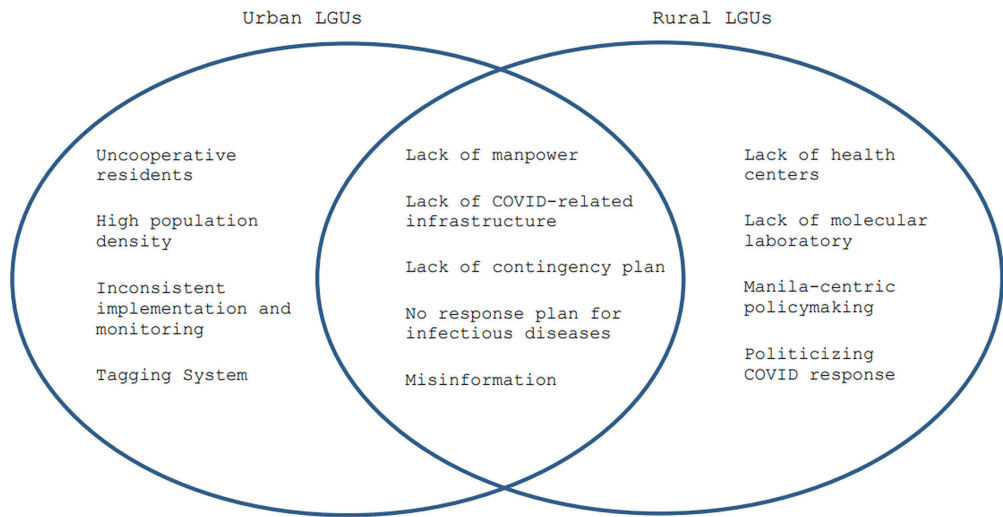


Figure 4. Gaps and Challenges between Urban and Rural LGUs in Pandemic Response.

**Table 2.** Statistical Data of the Four Different LGUs

Description	LGU A	LGU B	LGU C	LGU D
<i>Total Population</i>	374,550	44,958	1,661,584	18,943
<i>Number of Barangays</i>	129	40	188	15
<i>Hospitals that cater COVID-19 Cases</i>	6	4	13	1 (COVID Facility)
<i>ICU Beds</i>	44	3	35	-
<i>Non-ICU Beds</i>	335	42	275	-
<i>Mechanical Ventilators</i>	48	1	68	-
<b>COVID-19 Data</b>				
<i>Total Cases</i>	28,714 (As of October 22, 2021)	883 (As of January 31, 2022)	65,540 (As of January 14, 2022)	432 (As of December 31, 2021)
<i>Active Cases</i>	917	31	2,266	-
<i>Deaths</i>	619	47	1,651	9
<i>Average Daily Attack Rate (For every 100,000 residents)</i>	19 residents	-	-	-
<b>Patients' Information</b>				
<i>Mean Age</i>	36 years old	-	-	-
<i>Median Age</i>	33 years old	-	-	-
<i>Modal Age</i>	23 years old	-	-	-
<i>Standard Deviation</i>	18 years old	-	-	-
<i>Confidence Interval</i>	95%	-	-	-
<i>Skewness Coefficient</i>	0.45	-	-	-

are a total of 883 COVID-19 cases with 31 active cases and 47 total deaths.<sup>16</sup>

Based on the interviews, LGU B's contingency planning only focuses on two hazards: landslide and flooding. LGU B relied heavily on the guidelines, ordinances, protocols, and directives of the National Government and adapted them to the local level. After some adjustments, LGU B has started to implement these directives in its locality. Their measures include: (B.1) seminars and information dissemination; (B.2) community quarantine and strict border control; (B.3) established isolation facilities; (B.4) advanced contact tracing by starting to detect close contacts based on antigen results and while waiting for RT-PCR results; (B.5) established barangay isolation facilities and option for home isolation; (B.6) close monitoring of those under quarantine and isolation. On the other hand, the gaps and challenges include (B.1) lack of manpower; (B.2) lack of resources; (B.3) misinformation and vaccine hesitancy; (B.4) limited access to health facilities; and (B.5) uncooperativeness of people within the community; (B.6) others are found to be escaping and not finishing their quarantine duration; (B.7) lack of oxygen tanks and relying on outside hospital facilities.

### LGU C

LGU C is a landlocked highly urbanized city.<sup>17</sup> Its total population according to the 2020 Census was 1,661,584. It has 188 barangays and 13 major hospitals and medical centers that cater to COVID-19 cases.<sup>16</sup> The total beds and equipment dedicated exclusively to COVID-19 are 35 ICU

beds, 275 non-ICU beds, and 68 mechanical ventilators.<sup>16</sup> As of January 14, 2022, there are a total of 65,540 COVID-19 cases with 2,266 active cases and 1,651 deaths.<sup>16</sup>

LGU C heavily relied on the National Government's guidelines, ordinances, procedures, and directives. LGU C has begun implementing these directives in its community after minor revisions that will fit its community. Respondents also reported that there's no existing response plan for infectious diseases such as COVID-19. LGU C has started to implement these directives in its locality. Their measures include: (C.1) strict implementation of minimum public health measures; (C.2) implementation of Q bands, strict community quarantine, and border control; (C.3) communication, coordination, and collaboration between DILG, Mayor's office, and the mayor to barangay captains; (C.4) realignment of budget for sanitation and training of BHERTs; (C.5) disposal of dead bodies with special consideration to religious beliefs and cultural practices; (C.6) teleconsultation; and (C.7) constant coordination with the COVID-19 Command Center. On the other hand, the gaps and challenges include (C.1) geographical issues as the city has both north and south areas; (C.2) uncoordinated Social Amelioration Program (SAP) distribution; (C.3) problems and difficulties in interpreting and implementing ordinances; (C.4) protocols frequently change that health workers had difficulty keeping up because the information was not given in advance; and (C.5) uncooperativeness of people within the community in following the protocols and ordinances; (C.6) barangay officials not taking the seminars and trainings

seriously; and (C.7) lack of manpower in the health sector specifically for surveillance officers and contact tracers.

## LGU D

According to the 2020 Census, LGU D has a total population of 18,94316. It is a fourth-class municipality with 3 downtown barangays and 12 upland barangays.<sup>16</sup> As of December 31, 2021, LGU D had a total of 432 COVID-19 cases, 423 recovered, and 9 deaths.<sup>16</sup> LGU D does not have its own hospital, but it has a COVID-19 facility.<sup>16</sup>

Before the start of the pandemic, LGU D had already created response plans for infectious diseases — this was made possible as their mayor and vice mayor are both doctors. What the LGU D prepared was for the Avian Flu. The mayor was the former Regional Coordinator for the Health Emergency of the DOH. LGU D also initiated the inclusion of Health in their Disaster Risk Reduction Management (DRRM) Plan. In the whole province, they are the first to include health in their DRRM Program. Lastly, even before the pandemic hits their municipality, LGU D already had what they call HERMES (Health Emergency Response Management Evacuation Service) training where the barangay officials were trained and created a response team to respond to different kinds of disasters. Other measures implemented by LGU D include (D.1) the initiative to form a Core Group specifically designed for health policy operating and creating a preparedness plan whenever a guideline comes from IATF; (D.2) the creation of a “War Room” designed for scenario building to come up with possible solutions in different situations they might encounter in implementing their response plan; (D.3) due to weak internet signals, the mayor, municipal health officer, and municipal IATF meet with barangay captains to inform them about latest policies and ordinances; (D.4) farmers and exporters from other municipalities were allowed to sell their products to avoid food spoilage; (D.5) established mobile *talipapas* which allows “barter” system; (D.6) utilized police and office vehicles to serve government employees; (D.7) detecting close contacts up to the third generation; and (D.8)

perimeter fencing around the neighborhood to contain the infection. Gaps and challenges encountered by the LGU include (D.1) being a small municipality, some were scared to be tagged as a COVID-19 patient in fear of discrimination; (D.2) some guidelines from national IATF are inapplicable to the municipality; (D.3) people were skeptical about the virus, so some health protocols were difficult to implement (specifically in upland barangays); (D.4) insufficient resources.

## DISCUSSION

Table 3 illustrates a comparative summary of discussions regarding the implementation of various COVID-19 response measures across four LGUs classified as urban (LGU A and LGU C) and rural (LGU B and LGU D). The table evaluates the presence and application of public health and socio-economic indicators within these LGUs. The table underscores the disparity between urban and rural LGUs in implementing pandemic response measures, with urban areas often better equipped for advanced and technology-driven initiatives. Rural LGUs, however, have shown resourcefulness through community-driven solutions like barter systems. These findings reflect the diverse approaches required to address public health crises effectively across different contexts.

## Quantitative Analysis

A total of 393 responses were included in the study after the survey responses were validated. From these responses, 115 respondents are from LGU A, and 122 from LGU C, making a total of 237 respondents from the urban population. There were 76 respondents from LGU B and 80 respondents from LGU D, making a total of 156 respondents from the rural population.

Figure 5 shows the distribution of the respondent's gender in terms of the type of their community. For urban communities, which are composed of LGU A and LGU C, there were 97 males, 126 females and 14 preferred not to say with a total of 237 respondents from the Urban community.

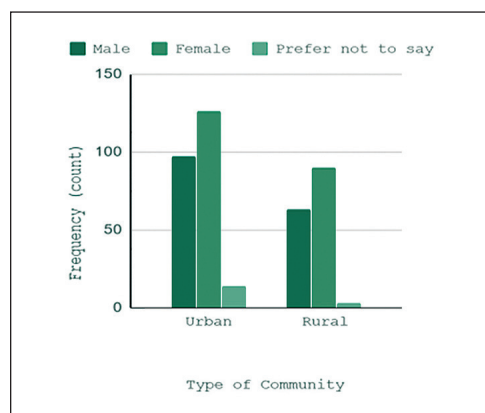


Figure 5. Gender Distribution of Respondents.

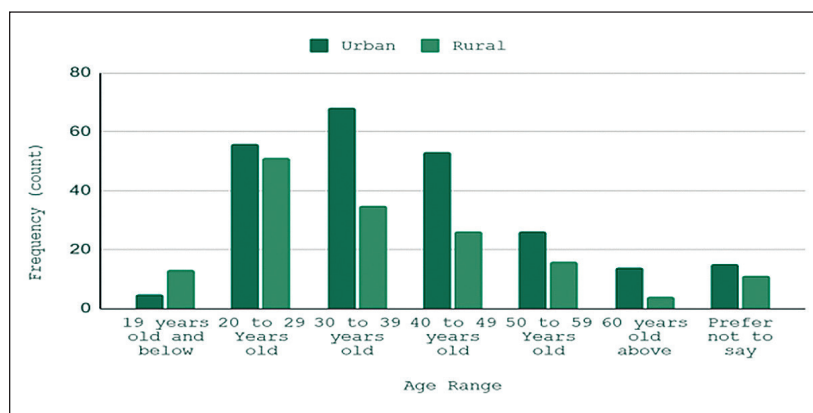


Figure 6. Age Distribution of Respondents.

**Table 3.** Summary Table of Discussion

Parameters	Indicator	Urban		Rural	
		LGU A	LGU C	LGU B	LGU D
<b>Public Health</b>	Formation of Local IATF	✓			
	Strict community quarantine and border controls	✓			
	Enforcement of public health measures (e.g., mask-wearing, physical distancing)		✓		
	Implementation of GIS mapping and centralized databases		✓		
	Adoption of national guidelines			✓	
	Advanced contact tracing measures			✓	
	Pre-existing health preparedness plans				✓
	Mobile vaccination units				✓
<b>Socio-economic</b>	Budget allocation for support programs	✓			
	Digital innovations for contact tracing	✓			
	Realignment of resources for sanitation		✓		
	Subsidies and financial assistance for small businesses		✓		
	Community seminars for awareness			✓	
	Home isolation under specific conditions (e.g., separate room and restroom, not being in common rooms in the house, etc.)			✓	
	Barter systems for essential goods				✓
	Community-driven support systems				✓
<b>Mental Health</b>	Information drives on mental health	✓			
	Online support groups for mental well-being	✓			
	Counseling services through health centers		✓		
	Regular mental health assessments		✓		
	Community support initiatives			✓	
	Engagement with mental health professionals			✓	
	House-to-house mental health checks				✓
	Focus on family support systems				✓
<b>Communication</b>	Digital tools for upward and downward communication	✓			
	Regular coordination meetings with local leaders		✓		
	Use of traditional media (radio, community bulletins)			✓	
	Scenario-based planning communicated to the public				✓

While for Rural, which is composed of LGU B and LGU D, there were 63 males, 90 females and 3 preferred not to say with a total of 156 respondents from the Rural community.

Figure 6 shows the age distribution of the respondents according to the type of community. For both urban and rural communities, most of the respondents' ages were between 20 to 29 years and 30 to 39 years. The age group with the least representation are those who are 19 years old and below, and those who are 60 years old and above, with 18 respondents each. A total of 26 individuals preferred not to mention their age in the survey.

Looking into each community, the most represented urban communities are those from the 30 to 39 age group with 68, while the least represented are those from the 19 years old and below age group with 5. The most represented in rural communities are from the 20 to 29 age group with 58, and the least represented were those who are 60 and above with 4.

To examine the internal validity of the surveys, Cronbach's alpha was computed for each strategy. The treatment and reintegration strategy contains only one question; thus, a Cronbach's alpha test was not needed. For the other strategies,

Cronbach's alpha ranges from 0.803 to 0.94 which indicates that the tool used was both reliable and unidimensional.

For the analysis of the different strategies, excluding the mental health items, the researchers assigned quantitative marks for the survey responses with values from 1 to 5. Strongly positive responses were assigned a value of 5 and more negative responses were assigned a value of 1. The mean value for each strategy was obtained by getting the mean of the respondent's perception of the questions on the strategy, then getting the mean of all the obtained values.

For the analysis of the questions regarding mental health, the same methods were used to obtain the mental health mean, but the last three questions were recorded in reverse order. Since these questions were of negative nature, which means a higher mark means a more negative emotion, the scale was inverted to remain consistent with the rest of the questions, where a higher value denoted a more positive response or emotion.

The means computed were analyzed by one-way ANOVA to determine differences in mean groups, specifically between gender, age, and type of community. This is to determine if these variables affect the perceptions of the respondents.

Comparing the gender groups, only the prevention strategy yielded a significant statistical difference ( $p$ -value = 0.032). This means that for the other strategies, people perceive them the same way regardless of gender. Looking deeper into the prevention strategies, we see that the strategies that show significant differences are strict compliance with wearing face masks and face shields, promotion of proper hand hygiene, and strict implementation of physical distancing ( $p$ -value of 0.005, 0.25, and 0.20, respectively).

For the age groups, only the socioeconomic strategy yielded a statistical difference ( $p$ -value = 0.031). Furthermore, it was the statements regarding SAP assistance, food packs, livelihood programs, and hazard pay ( $p$ -value of 0.31, 0.002, 0.014, and 0.044, respectively).

Comparing urban and rural communities, the prevention, treatment, and reintegration strategies yielded significant statistical differences ( $p$ =0.001 and 0.29, respectively). Furthermore, all items in the prevention showed a significant difference between urban and rural communities except the statement on the truthfulness and reliability of the COVID reports released by their respective LGUs. Looking at the means and standard deviation of each of these statements, the perceptions in rural communities are more positive than those of their urban counterparts. The standard deviations are also lower in rural areas than in urban areas. This denotes a more varied response from urban communities compared to rural communities regarding prevention strategies. These observations also extend to the treatment and reintegration strategies. The mean of the perception of the treatment and reintegration strategies is also more positive in rural areas, and more varied in urban areas.

For the mental health survey, a comparison of the means between gender, age group, and type of community was also done using one-way ANOVA. Gender and the type of community did not show any statistical difference between the groups. For the age groups, the analysis showed significant differences in the questions that pertain to excitement, stress, loneliness, and tiredness.

### Qualitative Analysis

The paper also adopted the series done by the Joint EpiMetrics Inc. with UP College of Public Health and Ateneo de Manila School of Medicine and Public Health in reviewing the best practices in the LGUs.<sup>16</sup> This literature reviewed and summarized best practices among Asian countries in the fields of testing, border control, centralized government response, and local conditions.

There are also differences and similarities between urban and rural LGUs' responses during the pandemic, following DOH's PDITR-V strategies. As for the Prevention Strategy, all LGUs implemented the "basic" protocols and guidelines given by the IATF. These guidelines include but are not limited to strict border control by establishing checkpoints around the LGUs' entry points, imposing lockdowns and community quarantines, curfew imposition, closure of

establishments, schools, and other offices, liquor ban, limited transportation system, as well as disseminating information about the COVID19 virus as timely as possible.

LGU C and D on the other hand have prepared their barangay officials for the impending lockdown<sup>18</sup> that was officially implemented by the national government in March 2020. LGU C conducted orientation and lectures to its barangay health workers and other officials on the COVID-19 virus. However, since the officials were unaware of the seriousness of the matter, the lectures were not taken seriously and became lackluster. Meanwhile, LGU D, having an existing response plan against infectious diseases (Avian Flu and H1N1), already had some grasp on how they can respond to the pandemic. The Mayor and other LGU officials had already communicated the risks of the imminent danger from the virus to every barangay captain. At the same time, scenario building was carried out to prepare the barangay officials for every possible situation they might encounter during the pandemic.

Disaster preparedness and response in the Philippines are not prioritized in the LGUs. All of the LGUs investigated in this study only relied on the national directive given by the Inter-Agency Task Force (IATF) in responding to the COVID-19 Pandemic.<sup>20</sup> This resulted in several gaps including (1) Lack of resources (manpower, financial, and other materials) throughout the pandemic and reliance on support from other sources; (2) LGUs had struggles in implementing the ordinances that were given by the national government as policies were differently interpreted by the stakeholders which resulted to inconsistent implementation of the ordinances – which is more observable in LGU C. (3) Some of the policies were not applicable in the context of the LGU. In the cases of both LGU D and LGU B, guidelines and ordinances they received from the national government were structured in a Manila-centric setting.

During the early phase of the pandemic, all the LGUs began organizing and deploying their Barangay Health and Emergency Response Teams (BHERTs) to be utilized to respond to COVID-19 cases as well as control the virus' spread. The LGUs also began drafting their specific ordinances that strengthened their preventive measures. LGU A established a centralized triage system to control and monitor the flow of incoming and outgoing people in their city. LGU B used their "*Bandillo*" strategy (healthcare workers distribute pamphlets regarding COVID-19 updates in every barangay) to keep their residents updated on the COVID-19 status in their municipality. LGU C used color-coded IDs to control and regulate people when going out to do errands, and LGU D with their mobile *talipapa* strategy to keep the residents in their respective barangays.

All four LGUs examined in the study faced similar challenges in their response to COVID-19, one common example would be the residents' uncooperativeness in following the minimum health protocols imposed. Most people do not follow the public health measure on physical

distance, go to social gatherings despite being prohibited, and do not wear their face masks and face shields properly. Subsequently, fines and penalties should have been imposed on the violators but only one or two were penalized because the people normally could not afford these fines since most of them lost their jobs or other sources of income when the pandemic started. Alternatively, the LGUs had no choice but to resort to just warning and educating the people resulting in the less strict implementation of ordinances.

Additionally, discrimination against healthcare workers, Persons Under Monitoring (PUM), and close contacts of positive cases were also faced by LGUs C and D. In turn, the LGUs drafted anti-discrimination ordinances to protect the health workers as well as the patients. However, similar to the problem presented earlier, reprimanding violators became difficult for them. On the other hand, the discrimination issues of LGU A are more directed toward mental health while LGU B did not report any problems when it comes to discrimination.

The detection strategies of the four LGUs can be analyzed as one of the most crucial dimensions in their COVID-19 response. It is also where most of their resources, both material, and manpower, were allocated. As the number of cases grows day by day, the need to identify the close contacts of the patients within the last two weeks became more important. Hence, with the help of the Department of Interior and Local Government, all four LGUs hired additional contact tracers to fulfill the growing need for contact tracing. All the contact tracers hired by the DILG served as augmentation to the existing contact tracers appointed to the BHERTs. Furthermore, all LGUs approached COVID-19 detection aggressively by providing free testing for their employees, healthcare workers, frontliners, and even up to second-generation contact of a COVID-19-positive patient.

One clear distinction that arose between the urban LGUs and the rural LGUs in their detection strategy was the utilization of technology in monitoring their COVID-19 patients. LGU A used systems such as Geographic Information System Mapping and a centralized database to monitor infected individuals efficiently. LGU A also created apps and a website where people planning to enter the area must register first and show the accepted QR code before they will be permitted entry, this helps to track individuals entering the city. The same case can be also said of LGU C where they also utilized a centralized database to record and monitor their COVID-19 cases. In contrast to the rural LGUs, LGUs B and D suffer from the limited infrastructure and resources to utilize technology in their contact tracing and data management efforts. LGUs B and D utilized less sophisticated digital innovations like online group chats and messaging applications for communication. With the lack of these technologies and access to stable connections or signals, the rural LGUs compensated by doing advanced and aggressive testing. LGU B procured additional rapid test kits and RT-PCR that enabled them to do spot testing in different

barangays. LGU D on the other hand, trained the midwives, BHWs, and other health workers to do specimen collection.

Infrastructure-wise, LGUs in the urban setting are again at an advantage when it comes to processing collected specimens. LGUs A and C were able to establish their molecular laboratory resulting in a faster yielding of test results. Meanwhile, LGUs B and D, given their lack of healthcare facilities and necessary infrastructures, relied on molecular laboratories from other municipalities resulting in backlogs and late confirmation of positive cases.

In terms of the Isolation Strategy, all four LGUs acted promptly and converted existing, old, and vacant buildings into isolation facilities. In addition to this, each barangay for every LGU had also established its own isolation facilities that catered to one to three patients. The urban LGUs took advantage of hotels and motels that are temporarily closed because of restrictions imposed by the national government. A Memorandum of Understanding (MOU) was drafted between the City Councils and the private owners to use the hotel buildings as temporary quarantine and isolation facilities. These facilities usually catered to returning OFWs as well as Locally Stranded Individuals (LSIs) undergoing quarantine. On the other hand, LGU B in the latter part of the pandemic was able to avail loan from a private bank to build its own isolation facility. Meanwhile, LGU D had to convert its own municipal building into its isolation facility and also relied on isolation facilities in neighboring municipalities.

Mild and asymptomatic patients were eventually allowed to be home quarantined provided that their respective houses passed the assessment conducted by the BHWs. The most common requirement needed for home isolation is if the patient's house has a separate room, restroom, and kitchen that the patient can exclusively use. The number of individuals living in the household was also considered. If they couldn't meet these requirements, they are forced to quarantine in isolation facilities. LGU D had an advantage in this scenario. Since most of the houses in the upland barangays are far from each other, spreading the virus is very unlikely. The opposite scenario can be observed for LGU C. Houses in urban poor communities<sup>19</sup> in LGU C are often clumped up thus proper distancing is rarely observed. Second generations in LGU C with more than one family are living in a single household making it difficult to maintain proper distance or seclusion for isolation. Later, LGU C and D figured out that it would be more effective to do a clustered lockdown than to implement a barangay-wide lockdown for different reasons. LGU C had to implement a cluster lockdown to avoid disruption of the operations of other barangays. Meanwhile, LGU D implemented cluster lockdown during the Delta and Omicron variants surge because the variants are faster to spread and testing each close contact would be inefficient for them hence locking down the whole block is the more appropriate action for them.

Home isolation in all four LGUs was being monitored by their BHERTs, BHWs, and sometimes accompanied by the

barangay and national police to make sure that the patients complete their quarantine period. LGU C implemented a strategy to monitor and track their isolated patients' movements by putting a "Q-band" on the patient's wrist.

All LGUs except LGU A had implemented advanced isolation where patients were subjected to isolation while waiting for their results. LGU C has a unique issue when it comes to this strategy. If the tested individual turns out to be positive, day 1 of his/her quarantine period will be the day he/she receives the test result. This resulted in long quarantine and required LGU C to allocate more resources.

Overall, all four LGUs assisted the isolated patients whether they are in the quarantine facilities or home isolation. Patients in quarantine facilities were given free meals throughout their stay while home-quarantined patients were given groceries. The rural LGUs give certificates of completion as proof that the patients completed their quarantine period. Aside from the certificate, LGU B also gives additional goods such as rice and canned goods to the patients at the end of their quarantine.

In treating patients with the COVID-19 virus, all the LGUs analyzed in this study usually employed the same strategy. Whether in urban or rural communities, all patients had to go under the LGU's referral before being admitted to the hospital. The only difference in this is that urban LGUs have their own hospitals, both private and public, that can cater to their patients while the rural LGUs suffer from a lack of healthcare facilities to treat COVID-19-positive patients and must rely on either the provincial hospital or other hospitals from neighboring municipalities. All LGUs also established teleconsultation to cater to the health needs of their constituents. Despite this, all LGUs suffered from limited resources in implementing their respective treatment strategies. LGU A specifically lacked healthcare professionals and bed capacity while the rest of the LGUs lacked necessary medical supplies and facilities.

Furthermore, LGUs have their own preferred medicine when it comes to treating patients. LGU A mainly used Remdesivir and Tocilizumab. LGU B only distributed vitamins and medicines for coughs and common colds. LGU C, through their "Mobile Botika, Libreng Gamot Program" provided free medicines like Lagundi and Paracetamol. And lastly, LGU D gives ibuprofen, paracetamol, and other cough medicines for patients with mild symptoms while dexamethasone and hydrocortisone were used for critically ill patients.

Reintegrating patients who suffered from the COVID-19 virus was also included in the socio-economic assistance initiative of the LGUs. LGU A distributed goods and financial aid (*ayuda*). They also provided temporary employment and livelihood programs to help their constituents. LGU B was also consistent in providing groceries, food, and vitamins to its patients and its constituents in general. They also utilized the employment and livelihood programs of the national government. LGU C, aside from the standard provision of

*ayuda* and the national government's employment program, also assisted its constituents in finding jobs through its Public Employment Service Office. Lastly, LGU D was able to help its patients by providing relief goods, cash assistance, and employment programs. Rural LGUs also received assistance from the Department of Agriculture to specifically help the agricultural sector. Aside from the loans and cash assistance, fertilizers were also subsidized by the government to alleviate the burden on the farmers.

When vaccines became available, vaccinating a large portion of the population became the priority of all LGUs in this study. All four LGUs used information dissemination and educational drive strategies to inform the public on why vaccines are important in fighting the spread of the virus. Of course, some of the residents resisted and were not fully confident in this due to various reasons (i.e., religion, disinformation, and cultural beliefs). In turn, the LGUs enforced this by using vaccine certificates/cards as a requirement in crossing borders, entering establishments, prerequisites in renewing and applying for a business permit, and operating businesses. Aside from this, each LGU implemented its unique strategies. In the case of LGU A, they made an early procurement plan wherein they signed deals for vaccine supplies as early as January 2021 and also procured freezers in advance. P100 million was allocated for this effort. Additionally, LGU A incentivized the barangay with the highest vaccination rate for their senior citizens. LGU B, on the other hand, provided free transportation for individuals who are interested in getting the vaccine. This is a big deal to them since some of the barangays in LGU B are in remote areas. Furthermore, each vaccinated individual is rewarded with three kilograms of rice and three canned goods. Hence, the more vaccinated individuals in a household, the more incentives they will receive. LGU C did not have a distinct strategy to increase its vaccination rate aside from accepting walk-in individuals regardless of where they live. And lastly, given the geographical characteristics of LGU D, they opted to bring the vaccines and conduct vaccination drives in the upland barangays. Furthermore, a house-to-house vaccination drive was also implemented to increase their vaccination rate.

### Socio-economic and Mental Health Aspects

It was mentioned earlier that the LGUs provided socio-economic assistance as well as mental health services to alleviate the economic and psycho-social impacts of the pandemic. In terms of assistance, all LGUs implemented tax reliefs, extended the deadline for payment, and waived tax dues and fees for applying for business permits. Additionally, the LGUs also partnered with national government agencies like Department of Labor and Employment (DOLE), Department of Tourism (DOT), Department of Social Welfare and Development (DSWD), and Department of Agriculture (DA) to provide temporary employment for disadvantaged/displaced workers as well as financial aid for their constituents. Mental health services on the other hand

are lacking for both rural and urban LGUs. One problem they encountered is the lack of mental health professionals that can provide free and accessible services.

However, the forms of these services and assistance also vary in each LGU, especially between rural and urban LGUs. For example, LGU A has suicide prevention campaigns as well as an ordinance that emphasizes culturally sensitive mental health programs. Under this ordinance, discrimination against mentally-ill people is penalized. Furthermore, psychosocial debriefing is also regularly conducted for the health workers and other frontliners. LGU B, unfortunately, does not have any existing program or campaign for mental health. LGU C, with the help of the religious institution, has its "Kaagapay" Program to provide psychological first aid. And lastly, LGU D offers free counseling and free medication, and trains BHWs to provide psychological first aid through its "Women in Sitios" Program.

Assistance-wise, all LGUs provided relief goods in the form of rice, canned goods, and other groceries to its residents. LGU A, aside from tax reliefs, offered interest-free loans to business owners. "Rental Holiday" is also given to the tenants of government-owned properties to alleviate their hardships during the pandemic. LGU B gave financial assistance to tricycle drivers as well as goods with the help of private and religious institutions. The same case was with LGU C where a religious institution provided financial aid and some form of medical assistance. Furthermore, LGU C launched a livelihood program where they provided seeds that the residents can grow in their backyards. Lastly, LGU D, with the help of the Department of Agriculture offered zero-interest loans for farmers as well as subsidizing fertilizers under the Rice Tariffication Law. They also provided financial assistance to tricycle drivers and a small group of tour guides.

## CONCLUSION

The study concluded that the best practices identified include: (1) strict border controls and granular lockdowns; (2) conversion of existing buildings into isolation facilities; and (3) extensive information dissemination (Figure 3). The challenges that serve as the basis for the following recommendations are (1) lack of human resources and necessary facilities to treat patients; (2) no purpose-built isolation facilities; (3) "inapplicability" of national protocols and ordinances in local settings; (4) misinformation regarding the COVID-19 pandemic; and, (5) uncooperative behavior of the people (Figure 4).

There were two recommendations each for urban and rural localities. First, enhanced unified detection and contact tracing should be established in dense areas to ensure continuous day-to-day operations. Notably, there was also a

recommendation of lifting the "no work, no pay" policy to prevent incentivizing employees from faking their health. Second, incentives must replace the militaristic approach of the government in keeping the uncooperative residents in place.

On the other hand, rural communities were used to devise the *Balik Probinsya* program, which only sped up the spread of the virus nationwide. The paper recommended that the decongestion was a good start but the implementation lacked proper protocol implementation. Finally, the scarcity of infrastructures to serve as quarantine and isolation facilities should be addressed with a Memorandum of Agreement (MOA) where existing lodging establishments are imposed to allow the utility of their facilities.

Urban communities may utilize tracking devices such as Q-bands to prevent uncooperative patients from escaping isolation facilities. Designated color-coded IDs were given to residents to organize the flow of accessing consumption. It was also noted that foot pads are effective in reminding people of social distancing.

Rural communities may implement clustered lockdowns instead of total lockdowns to allow the freedom of carrying out mundane tasks and government assistance should be concentrated within affected areas. Augmenting human resources with the guidance of the DOH, and establishing health centers and providing enough healthcare staff especially in far-flung remote barangays would also be proven beneficial to immediately access the services, helping alleviate the viral spread. Finally, strict ordinance on travel modes must also be in place due to the disparity of their situation compared to the Manila-centric basis of policy making.

For both urban and rural LGUs are recommended to build risk communication and scenarios, establishing "*botika*" and mobile vaccination, and extensive information dissemination is one solution to remedy the disinformation regarding the virus, vaccine, and anything related to the pandemic. This may be in forms of "*bandillo*", regular forums, and press releases. Additionally, penalizing people who spread false information regarding the pandemic can be also implemented. Finally, preventive health assistance should be provided to the first responders such as barangay hall personnel.

## Statement of Authorship

All authors certified fulfillment of ICMJE authorship criteria.

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