Case Study of Lobitos Medical Center in time of COVID-19

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27 September 2021

Introduction and Case Study of Lobitos

Lobitos, home to just over 1,659 people, is a small isolated fishing village in the Northern coastline of Peru's region, Piura (MINSA). Originally a hub for local Peruvian fishermen, Lobitos was developed in the late 19th century by the Scottish oil firm Balfour Williamson & Company, who helped complete the leading Lobitos developments, which the fishermen locals later preceded. After Peru's military coup in 1968, Lobitos's oil company was bought out by the International Petroleum Company, which was then expropriated by the military. The military was eventually stationed in Lobitos, and occupied the surrounding structures, as the region was vulnerable to foreign attack. Because of this, Lobitos was established as a military base, as Peru remained in constant conflict with Ecuador until 1995. In the 2000s, the local infrastructure that initially founded Lobitos began to be dismantled, as the military found significant utility in deconstructing the buildings for their wood. Lobitos has since been reclaimed by the surfing community of Peru who discovered the town's surf and beauty (Surfing Lobitos). Today, the town is known by tourists as a popular surf destination, but to locals, it is their home.

The dry, arid town is isolated from most Peruvian urbanization, with the closest city, Talara, a distant 8 miles away. Considering this, there is little economic opportunity for locals, who depend on the district's unreliable industries for their livelihoods. The economic activity that sustains the majority of the population of Lobitos is fishing. However, overfishing and climate change have contributed to resource depletion in this type of work. Though fishing remains a popular local industry, citizens of Lobitos have had to turn to positions in local transportation services, mechanics, local government employment, oil infrastructure security, and tourism (Surfing Lobitos). All of these local industries are extremely low-paying, leaving the entirety of the local population in dire poverty (INEI). Not only are salaries from these industries somewhat low, but they are also unreliable. In fact, Peru's Institute of National Statistics 2017 census recorded that over half of Lobitos's population was unemployed within the week of analysis (INEI). Poverty levels are so extreme within the district that approximately 95% of citizens lack access to constant water supply, access to basic infrastructures, and electricity in their homes (INEI). The growing popularity of surf tourism in the district gives citizens a glimmer of hope for more economic security in the future, although the COVID-19 pandemic has hampered its progress.

Not only has Lobitos's surf tourism industry been negatively affected by the prolonged COVID-19 pandemic, but so has the health and well-being of its local citizens. The cultural and economic situations of most patients impede both their ability to seek treatment and to follow quarantine regulations. As of August 10th, 2021 there has been a total of 84,924 COVID-19 cases and 11,787 COVID-19 deaths in Piura as reported by MINSA. Unfortunately, we were unable to find an accurate number of COVID-19 cases and deaths for the district of Lobitos. It is important to note the inaccurate health statistic reporting in Lobitos as it may contribute to why the district receives inadequate government support. Isolated from Peru's larger health and school systems,

citizens must rely on the district's sole medical center for COVID-19 treatment and education. Working from an under-funded medical center with limited resources, the medical post's staff struggles to contain the virus and provide its citizens with proper care.

Institutional Factors

The insufficiency of Lobitos's medical post is a product of the larger, complex Peruvian healthcare system. Peru's healthcare system is fragmented and composed of both the public and private sector. The largest entities exist in the public sector and include The Ministry of Health of Peru (MINSA) which provides the majority of health care for 60% of the population and the social security system of Peru (EsSalud) provides for 30% of the population. The Armed Forces (FFAA), National Police (PNP), and the private sector together provide healthcare for 10% of the country's population (WHO). MINSA generally oversees the Peruvian healthcare system and is in charge of issuing policies, technical standards, and procedures (PAHO). Even with MINSA governing, organization and coordination of providing coverage for healthcare resources is difficult to achieve, given the abundant ecological regions that are embedded in the diverse geography of Peru. These ecological regions range from the arid coast on the Western side of Peru, to the Andes mountains highland region in the center of Peru, to the tropical environment of the Amazon rainforest on the eastern portion of Peru (Britannica). Because of its varied geography, Peru is divided into 25 separate regions, 196 provinces, and 1,839 districts (World Atlas).

As an attempt at organizing the system and "maximizing the use of human and material resources", MINSA adopted a health center classification model that separates public health centers by their levels of care and complexity (MINSA). Medical centers are given their rankings based on the health needs of the population they serve. With each classification, MINSA developed separate criteria for staffing, equipment, and treatment abilities. The idea is that medical centers under the same classification, regardless of location, should be functionally identical and have the ability to face equivalent demands (ESAN). This is an interesting feat considering that each individual medical center deals with entirely different populations with entirely different needs. Once classified, medical centers must remain at that same level for 3 years before they can request a reclassification (ESAN). Each classification is assigned a set amount of government funding, regardless of any external factors. The classifications range from the lowest to the highest level of care: I, II, and III. Each larger category has a series of subcategories. Levels I-1 and I-2 are considered medical posts, levels I-3 and I-4 are considered medical centers, levels II-1, II-2, and III-1 are considered hospitals, and level III-3 is considered a specialized institute (MINSA).

Per MINSA, medical post centers (I-1 and I-2) should have the capability to treat the basic health needs of their jurisdiction. Level I-1 centers should have at least one nursing technician but may additionally have either another nurse or a professional midwife. Level I-2 centers should have at least one general practitioner, one nurse, one midwife, and either a technician or nursing assistant. Medical centers (I-3 and I-4) should have superior services to that of level I-1 and I-2 centers. Level I-3 are usually assigned specialties and have the appropriate staff for that

designation. Level I-4 health centers should be able to treat more complex and emergent medical conditions. Their staff should include a general practitioner as well as a series of specialty doctors. All hospital-level centers (II-1, II-2, and III-1) should have the capability to treat more complex medical conditions requiring advanced care and specialization. Hospital-level centers should be staffed with surgeons and doctors of numerous specialties as well as an array of non-clinical staff for administration, sanitation, and other general services. The staff increases in size and complexity at each level. While MINSA establishes that all level I centers should have the ability to attend to the health needs of their jurisdiction, MINSA also reported that these same health centers were unable to attend to COVID-19 (MINSA, 13) . As the coronavirus surge hit Peru, COVID-19 patients in poor conditions were directed to level II hospitals, despite whether or not patients had the means of transportation to get to these centers.

The distribution of quality health centers is inequitable, with higher-ranked medical centers concentrated in the most urban areas of the country, leaving rural areas of Peru with inequitable access to quality medical care (PAHO). It is not a requirement that each district, or even province for that matter, have at least one hospital-level health center. In fact, in the region of Piura, where Lobitos is located, the majority of provinces do not have hospital-level health centers. Using data from DIRESA Piura on health center classifications in Piura, we determined that there are only 5 hospital-level medical centers in Piura. These hospitals are located in Paita, Castilla, Veintiséis de Octubre, Sullana, and Chulucanas, which are considered some of the most metropolitan districts of the region. They have significantly high populations relative to Piura's other districts and make up 34.5% of Piura's total population. Since the region Piura has an area of 13,858 square miles and a population of 1,858,617, there exists one hospital per 2,771.6 square miles and 371,723.4 people (Knoema). This obvious scarcity of hospital-level medical centers drives many Piuran citizens to level I-4 medical centers for ailments needing hospital-level attention. We determined that there are only 28 level I-4 medical centers spread across 23 districts in Piura, leaving 394,978 people without close access to comprehensive, quality care. Those in areas without level I-4 medical centers are left to specialty I-3 medical centers and medical posts (I-1 and I-2) for their primary care. The majority of Piura's health centers, 321 out of 416, are listed as medical posts. 183 are classified as level I-1 centers and 138 are classified as level I-2 centers (DIRESA Piura).

To understand how the staff of these medical centers perceive the situation within them in terms of infrastructure and general preparedness for COVID-19 treatment, our research team conducted interviews with the staff of an I-2 level medical post in the district of Lobitos, Piura. This should give us an understanding of the differences between what is officially expected from these medical posts and the experienced reality. The following section compares the perspectives derived from these qualitative exercises and the official stance of the Peruvian Ministry of Health on the topic.

CASE STUDY OF LOBITOS MEDICAL CENTER:

METHODS:

The qualitative data collection process proved to be quite essential in supporting our findings. Lobitos, the smallest district in Piura, is chosen as our case study mainly due to its small population size, and its unique economic, geographic and political background as discussed in the previous section, which distances it from the government. In order to determine whether the Lobitos medical post was equipped and ready to properly treat COVID-19 patients, we conducted interviews with the medical staff. The interviews were conducted by Cameron Kamps, a medical EcoSwell intern who worked at the medical post for seven weeks as a medical assistant. The interviews were completed in Spanish and transcribed through the assistance of Alejandro Pizarro, an EcoSwell director and Bryce Nichols, a renewables energy EcoSwell intern. EcoSwell is a non-profit organization primarily devoted to providing environmentally sustainable development for the district of Lobitos. All of the medical staff agreed to participate in the interviews and gave approved consent for the use of their content in this paper. The Medical Post staff include Luisa Cosio Graneros, an obstetrician and chief of the post, Evelyn Laura, a dentist, Clara Reto Garcia, a medical assistant, and Maximina Aguilar Silva, a lab technician. Each staff member was asked a series of questions about their post regarding funding, general infrastructure, and their overall ability to treat both COVID-19 and non-COVID-19 patients (see appendix I). We compared the qualitative data collected from these interviews with the expectations for a level I-2 health center as written in MINSA's health establishment guide.

INFRASTRUCTURE:

To determine whether a health center is equipped to treat COVID-19 patients, it is important to examine its general conditions, infrastructure, and operations. We began the interview by asking questions about public aid and expenditure spent on the posts' general needs.

Throughout the interview, we have found problems within the Seguro Integral de Salud (SIS). The central government gives funds based on the registered population, using the number from The National Institute of Identification (RENIEC, for its spanish initials) instead of the National Institute of Statistics (INEI). It leaves out a certain percentage of the people who cannot register due to socioeconomic factors, which lead to unmatching numbers between funds provided for the medical post and people in need.

Both Maximina Aguilar Silva and Clara Reto Garcia explained that the funding for the medical post is both determined and supplied by the regional government in Sullana, Piura. Luisa Coiso Graneros explained that in a normal year, the post receives around PEN S/1200 (USD $ 303) for sanitation and upkeep. This year, funding has increased to PEN S/2200 (USD $ 555) 2 times a year to attend to COVID-19. While the medical staff expressed gratitude for the resources they do receive, they all agreed that they were in need of more support. This budget is used only to buy cleaning materials for the medical post. Besides lacking sufficient COVID-19-specific resources, the medical post is lacking fundamental infrastructure.

After interviewing the medical post staff, they acknowledged a variety of infrastructural issues that impede them from providing quality care to the population of Lobitos. Their first, initial concern was the lack of running water. Maximina Aguilar Silva described that without a sustainable water system, the medical post's only sources of water include an unsanitary well in

the center's hallway and water tanks that cannot be filled (Aguilar Silva, July 08, 2021). Because of this, Maximina Aguilar Silva says, her and coworkers are unable to wash their hands and instead must rely on alcohol wipes and hand sanitizer for personal sanitation. The medical staff is also expected to sanitize the entirety of the post themselves, as they do not have access to a cleaning staff. The staff uses ammonium quaternary, an all purpose cleaner and chemical disinfectant, as well as other sanitation supplies they have left over. Due to the high influx of patients they encounter frequently, they are unable to clean the facility in-between COVID-19 patients, making it increasingly difficult to contain the transmission of COVID-19. Not only does this potentially medically compromise the patients they treat; the staff themselves are also at increased risk of obtaining the virus. This protocol raises a number of risks. Due to the high influx of patients they encounter frequently, they are unable to clean the facility in-between COVID-19 patients, making it increasingly difficult to contain the transmission of COVID-19. Not only does this potentially medically compromise the patients they treat; the staff themselves are also at increased risk of obtaining the virus. As UNICEF reports, "sanitation services in health care facilities are essential to deliver high-quality care" and centers without them "can spread disease instead of preventing them" (UNICEF). Proper sanitation protocols are especially essential when attending to COVID-19 patients. Though rare, it is possible for people to become infected with COVID-19 by making contact with surfaces the virus has landed on and touching viral entry points like the nose, mouth, or eyes. Even with a cleaning staff, the medical post would still face issues of sanitation due to a number of structural hazards. Roofing issues, holes in the ceiling, and improper filtration systems cause water leaks that pour into areas of treatment (Cosio Graneros, July 08, 2021). Per the Centers of Disease Control and Prevention (CDC), "wet environments pose a particular hazard of infection, promoting microbial growth and serving as a source of antibiotic resistant pathogens, and healthcare-associated infections" (CDC). Improper water and sanitation services in the Lobitos medical center pose risks for higher rates of COVID-19 infection.

In addition to their water and sanitation crisis, the medical post lacks an electrical system, causing the medical staff to pay out of pocket for energy. The energy they pay for is unreliable and spotty, and often causes blackouts. Without continuous and reliable electricity, the medical post is unable to use vital equipment and machinery that is necessary in treating and preventing the spread of COVID-19[1]. These blackouts have especially impeded the progress of the medical post's COVID-19 vaccination process. When blackouts occur, vaccines begin to thaw and become unusable. This issue has led to a diminished supply of vaccines in Lobitos. The regional government would lower their shipment of vaccines to Lobitos upon realizing a large amount of the vaccines were not being administered. From this information, we conclude that the general infrastructure of the Lobitos medical post is unable to support proper treatment of COVID-19 patients.

When asked about what changes to infrastructure were needed to better attend to COVID-19 patients, we received similar responses. First, the medical staff expressed the need for a

[1] EcoSwell has been dedicated in supporting the locals with interventions with sustainable development such as solar panels and UPS to prevent power cuts.

laboratory. This was deemed essential to them, given the recent uptake in Dengue cases across the region of Piura. Being able to distinguish whether someone had Dengue in an efficient and timely manner was quite significant, as symptoms for patients that present to the medical post for COVID-19 and Dengue overlap frequently. Additionally, a COVID-19 unit, or separate area outside of the medical center was mentioned consistently throughout the interviews. The entirety of the medical staff expressed concern about the lack of a separate COVID-19 unit. As of now, their COVID-19 patients are treated next door to non-COVID-19 patients. The COVID-19 area is especially close to Evelyn's designated room to the point where she must stay out of it when COVID-19 patients are being treated next door. In contrast, Talara's Centro de Salud II, a level I-4 medical center, often referred to throughout the interview process, has a separate COVID-19 wing. According to the medical staff, the Talara center is much better equipped to treat COVID-19 patients. As a level I-4 medical center, Talara's health center is prepared to treat a much larger population compared to Lobitos. The health center receives substantially higher amounts of funding, equipment, and access to doctors in numerous specialties. Since the Lobitos medical post is set to treat a much smaller population, the regional government does not see the money value in expending similar funds and resources to Lobitos. Luisa said that the regional government is so stringent with their money that if the medical post wanted to receive more funding, they would have to treat more patients. This is also seen in the minimal amount of structural infrastructure allocated to the medical post by the Municipality of Lobitos, as half of the medical post was donated by the fisherman's association. Because of the limited space that the medical post currently occupies, the treatment they provide is quite finite, as they prioritize COVID-19 patients. Currently, the Lobitos medical post is only equipped with only 2 oxygen tanks and a limited amount of antigen tests. Oftentimes, the medical staff in Lobitos is unable to attend to COVID-19 patients with more severe symptoms, and must send COVID-19 patients to Talara for more extensive treatment. Transporting patients to the Talara health center is no easy task. As mentioned before, the Talara center is located 8 miles away from Lobitos through unpaved roads. An overwhelming 83.65% of Lobitos' citizens do not own a car. Additionally, 72.92% of citizens do not have access to a motorcycle. Though Lobitos does have access to an ambulance, it is rarely used, as the regional government does not supply Lobitos with an ambulance driver. In order for the ambulance to be used, patients must pay for this service out of pocket.

UNDERSTAFFING:

Understaffing at the medical post was consistently brought up throughout the interview process. Every interviewee described that the medical post was understaffed in some or many ways. Under the MINSA's health centre guide, a level I-2 medical post should act as a centre for general health care and must have a general practitioner who is not present under the cause of Lobitos. Such understaffing leads the majority of the medical post staff to describe feeling overworked and stressed. Though Luisa is a licensed physician, her specialty is obstetrics, not general medicine. The guide also says that a level I-2 medical post should have at least one registered nurse, which Lobitos does not have. As described before, these staffing issues have posed a number of barriers to patient care and pandemic management. Many of the staff members

described having to take on roles outside of their fields of expertise, especially during the pandemic. Evelyn, a dentist, for example, has been treating around 6 patients a day for non-dental related issues (Evelyn, July 07, 2021). Every member of the medical staff, besides Clarita, explained how the medical post is in need of another full-time, head doctor. While they have repeatedly requested another doctor, the regional government has yet to send one. Maxi described that the government will procrastinate aiding them in this request by sending them endless forms and paperwork (Maxi, July 08, 2021). Evelyn described how the post is also in need of a lab technician, especially to help Maximina Aguilar Silva with COVID-19 testing and research. The regional government has sent a lab technician for COVID-19 to Lobitos, but only for a limited amount of time (Evelyn, July 07, 2021). Though Lobitos is receiving some vaccines, the medical post does not have the proper staff to administer them. Legally, only registered nurses, for which Lobitos's medical post does not have, are allowed to administer vaccines. As of now, Maximina Aguilar Silva, a nursing assistant, has been administering the vaccines (Luisa, July 07, 2021). Luisa has had to ask nurses at the Talara health center to help administer vaccines instead of going to the government. Even if the health care workers in Lobitos present strong evidence for needing more staff, it is unlikely that the government will provide sufficient aid. The government has extremely tight resources and thus, remains stringent in the aid they provide. Health care workers, therefore, are forced to be stretched thin, taking on as many jobs as they can. The medical staff does not have the sole job of treating their patients. They are also tasked with taking on the administrative, maintenance, financial, and all other general needs at the medical post.

During the pandemic, many staff members have described having to take on non-physical caregiving roles for their patients. The pandemic has caused a lot of mental suffering for Lobitos's locals. As Lobitos is small and isolated, family, friends, and social interactions are extremely important to locals. Quarantine and social distancing measures have left people feeling especially lonely. The medical post staff has had to deal with this rise in mental health suffering. In her interview, Clarita said that she has seen a lot more patients come in who are emotionally distressed. She describes how she feels obligated to provide emotional support for her patients, essentially filling in the role of a mental health provider. Although the MINSA health establishment guide establishes that level I-2 medical centers should have the ability to treat depression, Clarita, nor any other staff member in Lobitos have been medically trained to address mental health issues (MINSA). However, those struggling in Lobitos have nowhere else to turn as Lobitos does not have any mental health programs or support networks. The pandemic has also been financially challenging for many Lobitos citizens. Due to the lack of funding for unemployment benefits from the government, workers are more inclined to report to work despite contracting COVID-19 as they cannot support themselves. Also, the government is not providing any form of passive income for those who contract COVID-19, thus putting many in an uncompromising situation, as they are forced to prioritize their health or their financial obligations. This is quite notable, considering that last week (8/12), 97.16% of the population reported that they were not looking for work (out of 564 correspondents). This staggering statistic further enforces the idea that economic opportunity in the district of Lobitos is severely compromised,

given the lack of its constituents to actively search for work. Oftentimes, Clarita describes she also feels obligated to help patients who have run into financial issues. She described a moment where an emotional patient left treatment begging Clarita for money to pay for food. Although the MINSA guide states level I-2 centers should have the ability to treat malnutrition, Lobitos's medical post does not have the ability to either provide patients with solid food or insert a feeding tube. If patients go to the medical post in need of food, the medical staff often feels obligated to use their own resources, as the government does not provide them. Since the government has not provided Lobitos's locals with financial aid, the medical staff has been put in a very difficult position. As Clarita put it, the medical staff has taken on a parental role for their patients, caring for them physically, mentally, and financially. As the sole representatives of the public sector in Lobitos, these are not only parental roles, but rather the essential roles of the government.

LIMITATIONS:

During the course of the study, there were limitations that obstructed the process of collecting data. This occurred in various forms, which prevented the researchers from obtaining verifiable information designed to better inform themselves of the topics they were investigating. These discrepancies were identified in underrepresentation of quantitative COVID-19 data, the translations through interviews that were obtained by the researchers, and the nature of qualitative research.

The first, and most significant limitation that impeded our research from the further development of our paper was the lack of COVID-19 quantitative data. Throughout the quantitative data collection process, we attempted to find information on the number of COVID-19 cases and deaths in the Lobitos district. This proved to be quite challenging, given the inconsistent information that we identified during our online investigation of sources. Though we did obtain information on the number of COVID-19 cases and deaths in the district of Lobitos, these numbers seemed to consistently undervalue the actual number of cases and deaths from COVID-19 in the Lobitos' population. This misrepresentation of COVID-19 information in Lobitos was corroborated by Cameron Kamps, who in his time attending at the Lobitos medical post, saw a significantly higher proportion of COVID-19 patients compared to information provided through online sources. Additionally, there was also insufficient information when attempting to distinguish the role of government expenditure on COVID-19 through separate healthcare classifications (levels I-1, I-2, I-3, etc.), where the data we now obtain of Lobitos medical post is a combination of the government fundings and donation from the private sector. Such lack of information prevents the researchers from drawing a clear conclusion between the government expenditure and the current situation of Lobitos medical post.

One other obstacle experienced in our interviews that hindered the qualitative data collection process were the various challenges experienced when transcribing the interviews. Because the lead interviewer, Cameron Kamps, was not a Spanish speaker, the interviews were immediately translated with the help of a translator once the interviewee gave an initial response. Although the translator was able to translate a majority of the conversation between interviewer

and respondent, the translator was not able to translate the entirety of the responses verbatim. Thus, the responses provided by the medical staff during their interviews were not entirely representative of translated information. Additionally, because of this, the writers were unable to use direct quotes from the interviews as they could not produce a transcript.

Some limitations lie within the nature of qualitative studies. Qualitative studies use direct data from respondents and participatory observations to explain social phenomena. The data collected is based on the respondent's personal experience, where the objectivity of the conclusions may be affected. In addition, the subject of the study is a specific group, it is difficult to generalize the conclusions obtained in a specific situation to a wider range of situations where we encountered difficulties when attempting to expand our research findings to other districts of Piura. When attempting to formulate conclusions based on the research we collected, we found significant challenges in generalizing the data to the region of Piura, as we were unable to collect qualitative data from separate districts regarding COVID-19 specifically. Because of the finite time and resources that were designated for this project, we were unable to undergo separate interview processes that would have contributed to our group having an array of information applicable to the current healthcare situation experienced in the Piura region. Thus, our scope of information was significantly impacted by this, and we were only able to focus our data collection process on the district of Lobitos.

CONCLUSION:

While the MINSA's guide expects level I-2 medical posts to attend to the health needs of their jurisdiction, we found that the Lobitos medical post does not have the proper support, equipment, infrastructure, staff, or organization to do this. Lobitos's small population leaves the district as a low priority to the regional government. Inaccurate reporting of COVID-19 and other health statistics may also contribute to the district's lack of government support. The medical staff of the sole medical post in Lobitos must compensate for the lack of sufficient resources. Though the staff is overwhelmed and overworked, their needs are not adequately addressed by the government. The medical post needs more support to address general infrastructure issues, understaffing, inadequate medical and cleaning supplies, and other basic health establishment needs. Without fixing these issues, the Lobitos medical post is not prepared to attend to COVID-19 patients in their district.

The case study of Lobitos medical centre is an important one to analyze. Even though Lobitos is a small district with a small population, it reflects the Peruvian health care system and its preparedness in terms of a sudden pandemic, especially in rural areas. The results were rather shocking when calculating the percentage of the Piura population living without I-4+ medical centres in their district. Using the data from SIA (PAHO - Sala de Información y Análisis en Salud), we have found that 394,978 Piura locals live in areas that cannot provide them with the promised COVID-19 treatment stated in the government document, which is 21.25% of the total population. By taking a deeper analysis of the data, they are primarily located in rural districts.

Due to the lack of city development, they do not have the ability and capacity of I-4+ medical centres. The rural population accounts for 24.75% of the total Piura people, and by applying the numbers of the population living without I-4+ medical centres in the context of Piura rural population, we get 85.86%. By comparing the 21.25% of the total population and the 85.86% of the rural population who live under an unprepared healthcare system, the findings highlight the health inequalities issue within Piura. The grand majority of the rural population of Piura are distant from proper COVID-19 care.

Therefore, we highly recommend further studies to look into the causes and consequences of Peruvian health inequalities as health inequalities do not happen accidentally. They are socially determined by circumstances that are largely beyond the control of individuals. These conditions put people at a disadvantage and limit their chances of living longer and healthier.

We would also suggest extending this research in order to determine if other level I medical centers in the region of Piura are facing similar issues. We recommend conducting similar research in medical centers of I-1, I-3, and I-4 classification in the province of Talara. We also recommend further analyzing the social factors that connect Lobitos to other rural districts in the province and region, at large. Understanding the similarities and differences between both level I classified health centers and contributing social factors in Piura, will lead to a holistic analysis of the centers' readiness to treat COVID-19 patients in the region.

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Appendix I

DISCUSSION GUIDE: ENGLISH

WARM UP:
How long have you been a doctor? Do you have a speciality?
Have you always worked in this medical post/hospital or have you worked in others too? Why did you choose to work in this hospital specifically? Do you have ties to this area or did you choose to work here for other reasons?
How many patients do you see on a normal day? Have you had an increase in the number of patients you see recently? Is it because of COVID-19?
How many of the patients that you see have COVID-19 related concerns?

COVID-19 IN PIURA
Objective: Evaluate the prevalence and effect of COVID-19 underlying conditions on the morbidity rate in Piura.

- **PATIENTS:** What demographic do most of your patients come from? (gender, socioeconomic background, age, occupation)
- **CONDITIONS:** Before the beginning of the pandemic, what were the most common medical conditions you would treat? Why do you think these conditions are common in the district? Do any environmental, social, or financial factors affect what types of conditions are most common in this region?
- **RELATION TO COVID-19:** Do any of the COVID-19 patients you treat have any of the conditions mentioned before? How do these conditions affect the course of the virus for patients? Do COVID patients with these conditions tend to have worse health outcomes than patients without these conditions? After COVID-19, how are they doing? Do they continue to have complications with COVID?

GENERAL PUBLIC EXPENDITURE AND AID

Objective: Evaluate the effect of public expenditure on general healthcare in the transmission of COVID-19.

- **GENERAL AID:** How has the COVID-19 pandemic affected the amount of time resources spent treating other common medical conditions?
- **POST FUNDING:** Can you describe how your medical post and the Talara hospital are funded? Do you know how much general funding the medical post receives? Do you feel that your medical post is sufficiently funded? Why or why not?

- **DISTRIBUTION:** How does funding compare to the medical posts and hospitals in other districts? Are some districts better funded than others? Why do you think that is?
- **INFRASTRUCTURE:** Can you tell me about the infrastructure of your medical post including equipment, staff, water, and electric systems? (Specifically) How do these conditions affect your work? Do you feel as though you have the proper infrastructure necessary to provide the best possible care you can? What would you like to add? If not, why?

Need specific layout of equipment/rooms here at the medical post
What do they think could be added to improve their care

- **INFRASTRUCTURE & COVID-19:** How do these conditions affect COVID-19 treatment specifically? Do you feel as though you have the proper infrastructure necessary to properly treat COVID-19 patients?
- **INFRASTRUCTURE & AID:** Do you think it is important to improve these structural issues? Why?

COVID RELATED PUBLIC EXPENDITURE AND AID

Objective: Evaluate the effect of public expenditure and aid in the transmission of COVID-19 over the course of the year.

- **AMOUNTS:** How much aid has your hospital/medical post gotten from the regional government directly for COVID-19 relief? And from other institutions?
- **PROCESS:** When did you get the aid? Has the process of getting aid been efficient and effective? Why or why not?
- **SUPPLIES:** What forms of aid have you received so far? Which specific supplies did you receive or purchase? Why?
- **PREPAREDNESS:** What aid do you still need in order to effectively prevent and treat the virus? Are the medical posts sufficiently staffed to treat the number of cases they are receiving? Why?
- **POLICIES:** Do you feel the way that the central government has managed COVID-19 related policies, been beneficial or detrimental to the spread of the virus? What other policies could have affected the spread of the virus? How so?
- **DISTRIBUTION:** Has the funding for district medical posts been evenly distributed? Or are some districts getting more aid than others? Does the distribution vary between regions? What is this dependent on?

CONCLUSION:

Is there anything you would like to add?