Strengthening the Health System to Address the COVID-19 Surge: An Empirical Study in South Kalimantan Province, Indonesia

Gurendro Putro[1,*], Ristrini Ristrini[1], Masdalina Pane[1], Noor Edi Widya Sukoco[1], Nita Rahayu[1], Rustika Rustika[1], Muhammad Nirwan[1], Dea Anita Ariani Kurniasih[1], Lusy Noviani[2] and Musthamin Balumbi[3]

[1]*Research Center for Public Health and Nutrition, Health Research Organization, National Research and Innovation Agency, Indonesia*

[2]*Department of Pharmacy, School of Medicine and Health Sciences Atma Jaya Catholic University of Indonesia, Jakarta, Indonesia*

[3]*Department of Biology Education, Faculty of Teacher Training and Education, Halu Oleo University, Indonesia*

Abstract: The COVID-19 case entered South Kalimantan Province on May 12, 2020, and spread throughout all districts/cities. This research aims to examine the ability of the South Kalimantan Provincial Health System to address the COVID-19 pandemic. This study analyses secondary data from the South Kalimantan Provincial Health Office and in-depth interviews with policymakers. This study assesses the capacity of the South Kalimantan health system in managing the COVID-19 pandemic. Findings reveal significant challenges, including hospital bed shortages, high infection rates among health workers (10.02%), and limited ventilator availability. Despite allocating 23.27% of the health budget to the pandemic response, key subsystems such as human resources, drug supply, and coordination mechanisms remained under strain. Strengthening these subsystems is essential for better preparedness in future health emergencies. In conclusion, strengthening the health system is very important in overcoming the COVID-19 pandemic, and it is hoped that the lessons of the COVID-19 pandemic will make the health system more prepared to address the disease pandemic.

Keywords: Health system, health services, community empowerment, health budget, health worker, drugs and health supplies, and health management.

INTRODUCTION

The health system is essential for providing comprehensive health services to the community, starting with promotive, preventive, curative, and rehabilitative services. The subsystem of health efforts is carried out in health facilities with additional treatment rooms. According to the World Health Organization (WHO), during the COVID-19 pandemic, health systems in many countries are overwhelmed in providing quality health services [1]. During the COVID-19 pandemic, a robust health system could provide good health services and protect against the pandemic threat [2]. During the COVID-19 pandemic, the health system provides mental health services to groups at risk of contracting the disease [3]. Artificial intelligence can address health problems with health system updates [4]. The experience of the COVID-19 pandemic has improved the robustness of the mental health system [5].

Health service facilities provide optimal services during the COVID-19 pandemic. A sound health system will provide optimal services to the community [6]. During the COVID-19 pandemic, the health system provided optimal health services [7]. Improvement and community supervision during the COVID-19 pandemic encouraged improvements in health services [8]. When the COVID-19 pandemic spreads, the health system must be able to control its transmission and spread [9]. During the COVID-19 pandemic, the utilization of health services decreased by one-third, with various variations. Improving the health system will improve health services [10]. The COVID-19 pandemic provides experience in preparing the health system to face similar challenges in the future [11].

The number of COVID-19 cases has increased substantially, and the health system is not ready to provide optimal services. During the COVID-19 pandemic, the health system has been unable to prevent and control COVID-19 infection [9]. The COVID-19 pandemic has burdened the health system, so many children are not vaccinated [12]. Increasing numbers of COVID-19 cases are associated with many illnesses and deaths. There were 3,460,932 patients (16% HIV positive); 22,308 were diagnosed with COVID-19, of which 625 died from COVID-19 [13]. To overcome deaths due to COVID-19, it is necessary to

*Address correspondence to this author at the National Research and Innovation Agency, M.H. Thamrin No.8, Jakarta, Indonesia;
Tel: +62 81330548945; E-mail: gure001@brin.go.id

prevent it by developing a vaccine [14]. COVID-19 patients who have cardiovascular disease are at risk of severe disease and death [15]. The prediction of death due to COVID-19 is physiological damage and death for approximately 20 days [16]. The rapid increase in cases caused by the COVID-19 pandemic has created an unprecedented healthcare crisis [17]. In total, 76.9% of COVID-19 patients were hospitalized, and most of those who died were black (70.6%) [18]. Administering the influenza vaccine can reduce the risk of contracting COVID-19 [19] People infected with COVID-19 are at high risk of death and use high health resources in their treatment [20].

The Community Empowerment Subsystem is very important for preventing transmission and social restrictions in daily life. The involvement of the Sri Lankan community is significant in disease outbreak control activities to support the success of activities [21]. Community empowerment by involving all activity programs significantly strengthens health services [22]. Community involvement is crucial in helping the government during the COVID-19 pandemic [23]. Community participation in Oman is increasing to address the COVID-19 pandemic by empowering the community, mobilizing resources, conducting effective advocacy, providing good information, and networking between regions to strengthen each other [24]. Community empowerment during the COVID-19 pandemic can help identify the causes of death in the community [25]. During the COVID-19 pandemic, it is necessary to empower the community by providing information and knowledge to prevent the spread of COVID-19 [26]. The World Health Organization recommended building good information and community empowerment during the COVID-19 pandemic [27].

The financing subsystem allocates and increases the budget to overcome the COVID-19 pandemic, which is very important. Even the development budget has been widely reallocated to help overcome COVID-19. The budget for COVID-19 response in Spain accounts for 12.3% of all health expenditures [28]. The cost of COVID-19 must be prioritized because the disease has become a widespread pandemic spread worldwide, and considerable costs are needed to overcome it [8]. The COVID-19 pandemic in low- and middle-income countries requires an additional budget, but it is limited because there is a burden of acute and chronic diseases [29]. The health budget must be increased to address the COVID-19 surge and reduce transmission effectively [30]. The COVID-19 incident instructed local governments to reallocate budgets to address COVID-19 [31].

To protect human health resources from COVID-19 transmission, screening and treatment must be carried out. In the context of the COVID-19 pandemic, health workers have made rules to provide services with barriers so that health workers and the patients they serve do not contract COVID-19 [32]. Health workers must provide services for COVID-19 patients with protection so that transmission does not occur [33]. To reduce the number of COVID-19 cases, it is necessary to carry out COVID-19 vaccination to provide immunity and reduce the number of cases and the risk of transmission to health workers to overcome the COVID-19 surge. To increase the capacity to handle COVID-19, collaboration between countries is needed to assist personnel and facilities in making control measures more effective [34]. Health workers are overwhelmed in dealing with the COVID-19 pandemic, and many health workers are infected with COVID-19, resulting in a shortage of human resources in health services [26]. In Gana countries, when there are COVID-19 cases, it is necessary to improve health facilities and add staff to improve health services [35].

In the subsystem of drugs and health supplies used to overcome the COVID-19 surge, it is ensured that there are drugs and health supplies in health facilities that are able to handle COVID-19 cases quickly according to standard operating procedures and reduce the number of illnesses and deaths. Preparation in the fulfillment of drugs in times of crisis is essential for sufficient stocks and supplies of drugs if the infrastructure is in good condition [36]. If there is a shortage of drugs during the COVID-19 pandemic, patient care is not optimal, and disease transmission spreads [37]. During the COVID-19 crisis in Rwanda, sufficient pharmacy availability for optimal servers was necessary [38]. During the COVID-19 pandemic, there was vulnerability in the drug supply, so there was a shortage of drugs. This requires the intervention of the government, philanthropy, and industry to fill drug stocks [39]. The impact of the COVID-19 pandemic in Sudan is a shortage of medicines, so efforts are needed to obtain drugs from pharmaceuticals or policies on imports, production, and reasonable prices [40]. There is a need for pharmacies in communities to be accessible to the public during the COVID-19 pandemic [41]. During the COVID-19 pandemic, it is necessary to maintain the supply of drugs and distribute them in hospitals to pharmaceutical services in the community and remote clinical pharmacy services [42].

Pharmacists have responded to the need for drugs during the COVID-19 pandemic, with an adequate supply of drugs to meet drug needs [43]. The COVID-19 pandemic provides lessons for pharmacists to better plan their drug needs, with an even distribution [44]. Drug services during the COVID-19 pandemic require community pharmacies that provide drugs and equipment that protect patients [45]. The health system and the addition of health facilities are essential in addressing COVID-19 [15]. With many COVID-19 cases, health facilities (hospitals and health centers), medicines, ventilators, oxygen, and other supporting facilities are experiencing shortages in handling COVID-19 cases. The use of health services during the COVID-19 pandemic has decreased due to mobility restrictions, maintaining distance, and worrying about contracting in health facilities [46]. To prevent the transmission of COVID-19, it is necessary to carry out initial control in health facilities, examinations, or screening in the context of early detection [9]. With the increase in COVID-19 cases, medical waste is also increasing, so waste management must be carried out carefully and follow the requirements for medical waste disposal, and the spread of the virus can be limited [47].

The health management subsystem for handling the COVID-19 pandemic in South Kalimantan Province was formed by the COVID-19 Task Force Team in South Kalimantan Province and Districts/Cities. The lessons policymakers from COVID-19 need to make transformative planning and action to create more just, strong, and sustainable conditions [48]. Community implementation and compliance with very strict social distancing for interactions can reduce the spread of COVID-19 [49]. The COVID-19 crisis presents considerable challenges, but we can adapt and learn from this event [50]. Risk management is necessary in dealing with COVID-19 so that all risk management is taken into account, the problems can be appropriately overcome, and the negative impact can be minimized [51]. In handling COVID-19, good planning and strategies are needed to narrow its spread, thereby reducing the risk of transmission that causes illness and death [7].

This research is fundamental because it is necessary to strengthen the health system to address the COVID-19 surge and reduce the number of illnesses and deaths. Efforts are made to improve the components of the health system, which consists of subsystems of health efforts, community empowerment, health financing, health human resources, drugs and health supplies, and health management. All of these components focus on overcoming the COVID-19 surge. The output of strengthening the health system will be better prepared to address a surge in COVID-19 or other similar diseases, which can have a broad health impact.

METHODS

Study Design and Procedure

This study uses a quantitative and qualitative mixed-methods design. The population in this study included all COVID-19 patients and policy stakeholders in the Province of South Kalimantan, Indonesia. Data collection in this study uses interviews with policymakers and secondary data collection. The data were analyzed via descriptive methods and triangulation.

Ethical Aspects

This study was conducted with the highest ethical standards. This study received ethical clearance from the NIHRD (Number LB.02.01/2/KE.415/2020). Informed consent was obtained verbally prior to interviews, and all data were anonymized to ensure confidentiality. Interviewees were assured their participation was voluntary and data would only be used for research purposes.

RESULTS

South Kalimantan is an Indonesian province comprising 13 districts and cities. According to data from the South Kalimantan Health Office, 8192 patients are infected with COVID-19. A review of the data from the South Kalimantan Health Office revealed that 8,192 patients were infected with COVID-19. All districts and cities in the province have been affected by the virus, with the highest incidence of cases occurring in Banjarmasin, where 2,835 individuals have been infected. The lowest number of cases of COVID-19 in the Kotabaru Regency was 185. The complete data are presented in Figure **1**. The recovery rate for individuals who contracted the disease was the highest in the Tabalong Regency at 88.92% and the lowest in the Kotabaru Regency at 55.1%. The overall recovery rate for South Kalimantan Province is 75.6%.

Figure **3** shows substantial variation in COVID-19 case fatality rates across districts and cities in South Kalimantan Province. The highest rate was recorded in Banjar City (5.94%), which may reflect its high

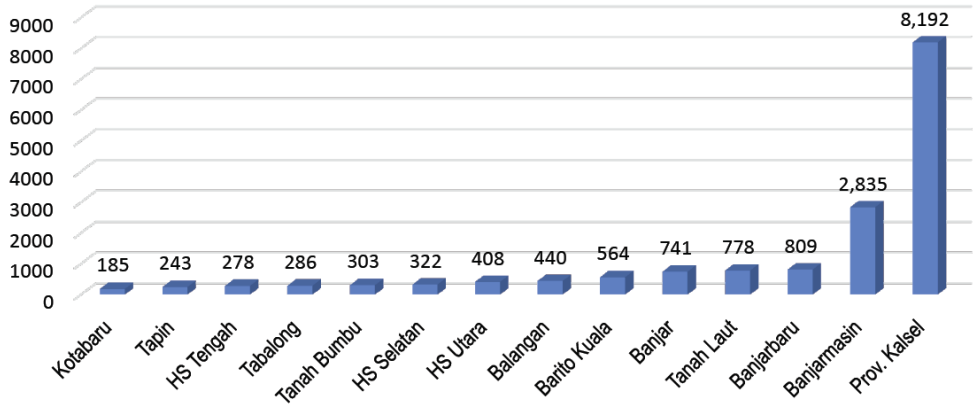

Figure 1: Positive COVID-19 cases by district/cities in South Kalimantan.

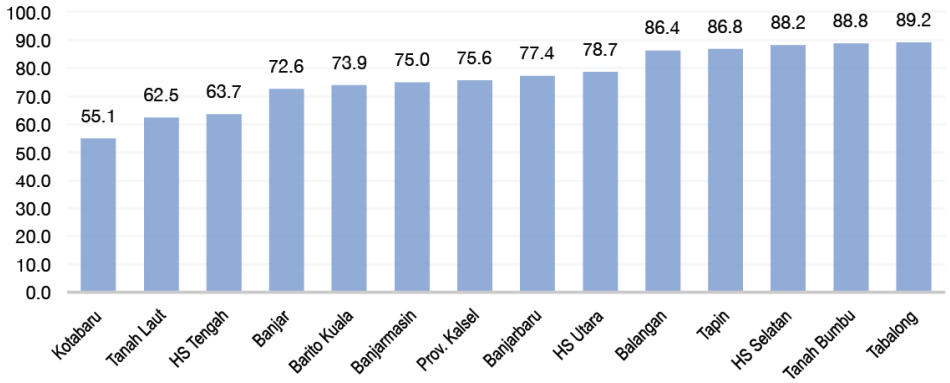

Figure 2: Percentage of COVID-19 recovery rates by district/city in South Kalimantan (September 1, 2020).

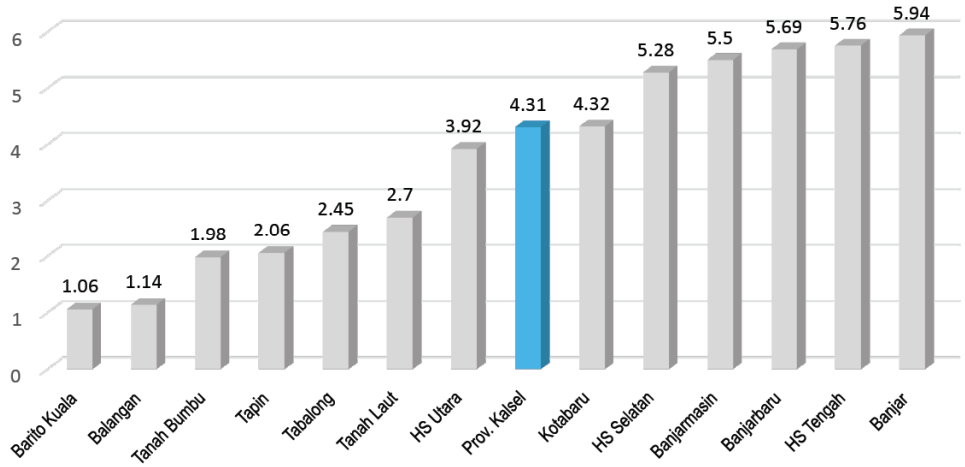

Figure 3: Case fatality rates of COVID-19 cases by district/city in South Kalimantan Province (September 1, 2020).

population density and case volume, potentially overwhelming the healthcare system. In contrast, Barito Kuala Regency reported the lowest mortality rate (1.06%), possibly due to better case management or fewer total infections. These disparities suggest uneven pandemic impact and raise questions about healthcare access, ICU capacity, and treatment readiness across districts.

The highest mortality rate associated with SARS-CoV-2 infection was observed in Banjar city, at 5.94%. Conversely, the lowest mortality rate was documented in Barito Kuala Regency, at 1.06%. The overall mortality rate in South Kalimantan Province was 4.31%, as illustrated in Figure **3**. In South Kalimantan Province, seven hospitals have designated referral centers for patients with confirmed or suspected cases

Table 1: COVID-19 Referral Hospitals in South Kalimantan Province

Hospitals	Number Beds	Covid19 Treatment Capacity	Number of I.C.U.	Number Ventilator	Covid19 testing laboratory t(Exist/Not)	Number of Covid patients treated	Number of Covid patients who have recovered	Number of Covid Patients Who Died
Ulin Regional General Hospital Banjarmasin	101	108	7	7	Exist	963	447	218
Dr. H. Moch. Ansari Saleh Hospital Banjarmasin	120	128	8	10	Exist	533	434	369
Idaman Regional General Hospital Banjarbaru	37	37	8	9	Not	448	116	68
H. Hasan Basry Hospital, Kandangan	85	85	2	8	Not	366	294	40
Boejasin Hospital Pelaihari	30	30	0	18	Exist	270	33	31
Suriansyah Hospital Banjarmasin	104	104	0	1	Exist	223	93	50
Bhayangkara Hospital Banjarmasin	46	46	1	1	Exist	275	191	16
Total	523	538	26	54		3,078	1,608	792

of coronavirus disease 2019 (COVID-19). As of September 2, 2020, data indicate that of the seven referral hospitals (Table **1**), 523 beds have the capacity for 538 patients receiving treatment for complications associated with the novel coronavirus, 26 of which are in the intensive care unit. A total of 54 ventilators and five hospitals with laboratories for the examination of patients with symptoms of the novel coronavirus were available. Among the patients treated, 1,608 (52.2%) recovered, and 792 (25.7%) died.

In response to the global pandemic caused by the novel coronavirus 2019-nCoV, a series of restrictive measures have been implemented to limit the mobility of individuals across districts and provinces. These included stringent protocols for boarding aircraft, which required passengers to present negative results from a diagnostic test for 2019-nCoV. In general, the public is provided with information regarding the use of masks in various settings, particularly when traveling, avoiding crowds or maintaining social distance, and avoiding touching and washing hands with soap and running water or using hand sanitizers. The establishment of Tangguh villages restricted the mobility of residents between villages. In the event that an individual is infected with the novel coronavirus, whether asymptomatic or exhibiting mild symptoms, they are instructed to self-treat at home. The facility is utilized by neighbors, housekeepers, or residents for activities such as dining and beverage consumption. The provincial government provides temporary shelter for individuals with mild symptoms. The provincial

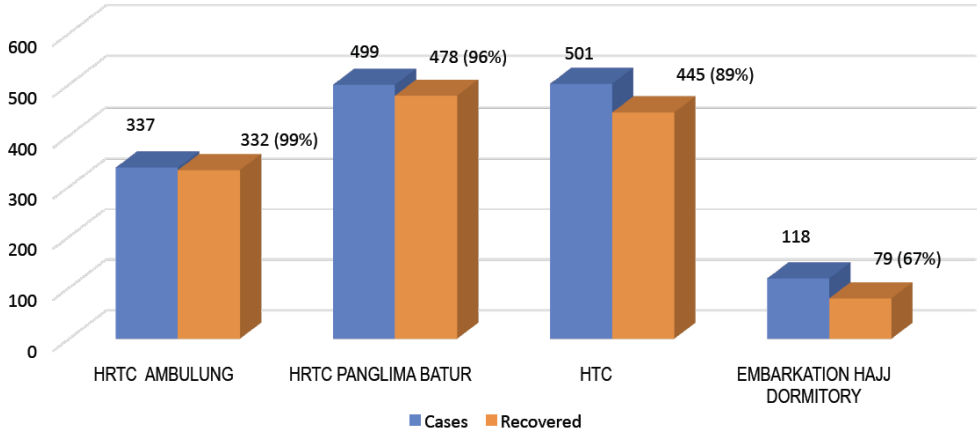

Figure 4: COVID-19 patients quarantined in South Kalimantan Province (as of August 2020).

government assumes responsibility for all living expenses and provides accommodations for approximately 14 days to one month, contingent on the individual presenting a negative SARS-CoV-2 test result and being cleared to return home.

The South Kalimantan Provincial Government also provides facilities for isolation or quarantine for asymptomatic COVID-19 patients. There are four places used to accommodate asymptomatic COVID-19 patients in Ambulung and Panglima Batur, the Health Training Center in Banjarbaru, and the Banjarmasin Embarkation Hajj Dormitory. A total of 337 COVID-19 patients were quarantined at H.R.T.C. Ambulung: 332 people (99%) have recovered, 499 people have recovered at H.R.T.C. Panglima Batur, 478 people have recovered (96%), 501 people have recovered from the Health Training Center (H.T.C.), 445 people have recovered (89%), and 118 people have recovered from the Hajj Dormitory, with 79 people (67%).

In quarantine or isolation activities coordinated by the South Kalimantan Provincial Task Force, there are joint gymnastics activities, religious lectures, and health checks. Facilities included bedding, bathing, washing, and ironing three times daily with different menus. Each quarantine place has specialist doctors, pharmacist doctors, nurses, midwives, and nutritionists who take care of them to accompany COVID-19 patients. The duration of treatment in this quarantine location ranged from 14 days to one month. If the swab result is negative after isolation, then the patient is said to have recovered, but if not, through the swab examination, there is a certificate that has undergone an isolation period in quarantine for 14 days.

In overcoming the COVID-19 pandemic in South Kalimantan Province, funding from the 2020 Regional Expenditure Budget of the Health Office and the Special Allocation Fund, which was originally IDR 117,946,636,983, was used for COVID-19 purposes as much as IDR27,451,520,644 (23.27%). When viewed per program, the refocusing of funds with the highest percentage is the Capacity Building and Apparatus Quality Program at 58.35%. The amount of the budget most used to contribute to COVID-19 activities is from the Health Service Improvement program IDR 10,486,177,400,-. The second largest reallocation by the Public Health Improvement program amounted to IDR 7,275,467,932,-. Meanwhile, the least budget reallocation is the Program for the Development of Planning, Reporting, Performance, and Financial Achievements System of IDR 33,000,000,-. This picture shows that the need for the COVID-19 budget is enormous and more important because the COVID-19 pandemic requires all resources to be used extensively for COVID-19 control.

Health workers have been significantly impacted by COVID-19, with a high percentage of infections among their ranks. The data show that 18.07% of health workers with infections are among their colleagues, whereas only 0.73% of those with infections are among the general public. Among the infected health workers,

Table 2: Refocusing the Health Budget of the South Kalimantan Health Office to Overcome the COVID-19 Surge

Program	Initial Budget (IDR)	Refocusing for Covid19 (IDR)	Budget After Refocusing (IDR)	Percentage Refocusing (%)
Office Administration Services	4,477,828,500	494,364,500	3,983,464,000	11.04
Improvement of Apparatus Facilities and Infrastructure	3,324,399,500	694,000,000	2,630,399,500	20.88
Development of Planning, Reporting, Performance, and Financial Achievement Systems	285,226,000	33,000,000	252,226,000	11.57
Capacity Building and Quality of Apparatus	1,504,250,000	877,700,000	626,550,000	58.35
Improving Health Services	24,026,746,700	10,486,177,400	13,540,569,300	43.64
Public Health Improvement	22,853,646,082	7,275,467,932	15,578,178,150	31.84
Improvement of Health Human Resources	33,894,757,087	3,954,403,387	29,940,353,700	11.67
Health Service Policy and Management	4,110,403,600	493,470,725	3,616,932,875	12.01
Improvement of Pharmaceutical Services and Medical Devices	14,850,196,289	616,631,250	14,233,565,039	4.15
Disease Prevention and Control	8,619,183,225	2,526,305,450	6,092,877,775	29.31
TOTAL	117,946,636,983	27,451,520,644	90,495,116,339	23.27

Note: IDR, Indonesian Rupiah.

Table 3: Health Workers Infected with COVID-19 (September 1, 2020)

Types of Health Workers	Sum	Infected	%
Public Health	274	2	0.73
Dentists	123	5	4.07
Sanitarians	216	7	3.24
Electrical Technicians Medic	310	7	2.26
Pharmacy	330	20	6.06
Specialist doctors	233	25	10.73
Nutrition	352	28	7.95
Medical Doctors	384	37	9.64
Midwife	1,643	105	6.39
Nurses	1,451	208	14.33
Other Health Workers	1,101	199	18.07
Total	6,417	643	10.02

nurses constituted 14.33%, followed by specialist doctors at 10.73%. Overall, health workers accounted for 10.02% of all COVID-19 cases. The detailed data can be found in Table **3**. With respect to treatment, the stock of medications for patients is sufficient. This includes treatments for those with mild symptoms as well as those with underlying conditions such as hypertension, diabetes mellitus, and kidney diseases. Personal protective equipment (PPE), including masks, gloves, hand sanitizers, face shields, and protective clothing, is primarily managed by the Regional Disaster Management Agency (BPBD) of South Kalimantan Province. PPE procurement is supported by the South Kalimantan Provincial Government and supplemented by supplies from the central government. Additionally, local governments in regencies and cities also procure PPE. In terms of medical supplies, hospitals report having an adequate supply of medications. However, there is a noted limitation in the number of available ventilators, with only 54 units currently in use. Waste disposal during the COVID-19 pandemic adhered strictly to established medical waste disposal procedures to ensure safety and compliance.

In response to COVID-19, a dedicated COVID-19 handling task force was established by the governor of South Kalimantan Province. This task force comprises members from various sectors of the local government. Its responsibilities include formulating technical policies, coordinating and overseeing efforts at the provincial and district/city levels, supervising activities, implementing strategic measures to address challenges, accelerating COVID-19 response efforts, and recording and reporting data both provincially and at the district/city levels. Every district and city in South Kalimantan Province has issued a decree, signed by their respective Regents or Mayors, to address COVID-19 within their jurisdictions. The Regents or Mayors lead the COVID-19 Handling Task Force Teams in their respective districts/cities. These teams involve cross-sector collaboration, with members assigned specific roles to mitigate the impact of COVID-19 in their areas. This variation in mortality across districts could be influenced by differences in ICU availability, response speed, or population demographics, which warrants further investigation.

DISCUSSION

To address the surge in COVID-19 cases in South Kalimantan, strengthening the health system is crucial. This effort includes optimizing health services by enhancing the capacity and quality of hospitals, health centers, and laboratories to provide comprehensive care. Community empowerment is also vital, engaging residents through initiatives such as Kampung Tangguh, where they independently monitor their temperature, wear masks, wash their hands with soap and water, maintain social distancing, and support asymptomatic or mildly symptomatic COVID-19 patients by providing groceries and daily necessities. Additionally, refocusing the budget of the South Kalimantan Provincial Health Office, which allocated 23.27% specifically for COVID-19 control, ensures that funding is prioritized for preventing transmission and reducing illness and death. The recruitment of additional health workers, including volunteers from the local government and health professionals from the

central government, helps address the increased demand for healthcare. Ensuring a sufficient supply of medicines and health essentials is necessary to meet the needs of COVID-19 patients and reduce morbidity and mortality. Finally, establishing a COVID-19 mitigation task force at both the provincial level, led by the governor, and the regency/city level, led by the regency/mayor of South Kalimantan Province, ensures coordinated and effective health management. By focusing on these areas, South Kalimantan can effectively manage and mitigate the impact of COVID-19.

To improve this health effort, all hospitals must be filled with human resources and facilities, even though there was a shortage in the early days of the COVID-19 pandemic. However, after hospital personnel and facilities have been established as treatment rooms for COVID-19 patients, they can finally take maximum care of the available hospital beds. The addition of laboratory facilities for COVID-19 examinations has also increased, and everyday checks suspects, both symptomatic and tressing results by health workers, have increased. In line with the research results, health systems in many countries are overwhelmed in providing quality health services [1]. During the COVID-19 pandemic, a robust health system could provide good health services and protect against the pandemic threat [2]. In line with sound health system research results, it provides optimal services to the community [6]. During the COVID-19 pandemic, the health system has optimized health services [7].

As shown in Figure **3**, case fatality rates varied significantly across districts, suggesting disparities in critical care access, response capacity, and health system readiness. These findings highlight the importance of strengthening district-level resources to ensure equitable pandemic response across the province.

Community empowerment involves all communities, community leaders, religious leaders, and nongovernmental organizations to help spread COVID-19. People who are positive for COVID-19 but do not have symptoms or mild symptoms are treated at home or in isolation places provided by the government and residents. The existence of this Tangguh village is very helpful in preventing and transmitting COVID-19. During the incubation period between 7 and 14 days, infected people must stay indoors and not leave the house. If there are still mild symptoms such as cough, runny nose, fever, pain in swallowing, and inability to smell, then isolation can be added indoors for 21–30 days until the symptoms of COVID-19 disease disappear in healthy patients. The mobility of the population is restricted; even religious worship in places of worship (mosques, churches, temples, temples, and temples) is not allowed, and it is better to worship in each other's homes. Everything has been regulated by the government and their respective religious leaders. Our interviews concerning self-isolation management organized by the government were as follows:

> *"COVID-19 patients who are asymptomatic and have mild symptoms are treated at the local government building and financed during treatment until they recover, are given a proper isolation room, nutritious food, and drinks, and are tested for COVID-19 until the results are negative and there are no symptoms. The duration of treatment for this patient is up to 14 days, even if symptoms persist and a positive COVID-19 test results, plus isolation for 30 days. Covid patients are monitored and checked every day by doctors and nurses, and they do gymnastics together in the morning and bask in the sun."*

Community empowerment in Sri Lanka is essential in disease outbreak control activities to support the success of these activities [21]. Community empowerment by involving all activity programs significantly strengthens health services [22]. Community involvement is crucial in helping the government during the COVID-19 pandemic [23]. This increased community participation in Oman in dealing with the COVID-19 pandemic by empowering the community, mobilizing resources, conducting effective advocacy, providing good information, and networking between regions to strengthen each other [24]. Community empowerment during the COVID-19 pandemic can help identify the causes of death in the community [25]. During the COVID-19 pandemic, it is necessary to empower the community by providing information and knowledge to prevent the transmission of COVID-19 [26]. The World Health Organization, during the COVID-19 pandemic, recommended building good information and empowering the community [27].

The health budget has also undergone a refocus on financing for COVID-19. This component is

unnecessary, and this cost needs to be supported and increased so that the need to handle COVID-19 can be adequately overcome. The results of the interviews with the secretary of the South Kalimantan Provincial Health Office are as follows:

> *"The budget of the South Kalimantan Provincial Health Office is refocused to overcome the COVID-19 problem by 23.27%; we prioritize this fund for COVID-19 control in order to reduce transmission and reduce the rate of illness and death."*

The budget for countermeasures in Spain accounts for 12.3% of all health expenditures [28]. The results of this study are similar in that the cost of COVID-19 must be prioritized because the disease has become a pandemic and has considerable costs [8]. The COVID-19 pandemic in low- and middle-income countries requires additional budgets, but it is limited because there is a burden of acute and chronic diseases [29]. The health budget must be increased to address the COVID-19 surge and effectively reduce transmission [30]. The COVID-19 incident instructed local governments to reallocate budgets to address COVID-19 [31].

To maintain the condition of health workers in hospitals, a working system is implemented that alternates for a rest period of 2 weeks. Health workers who work in hospitals and treat COVID-19 patients for 3--4 weeks are then given time to rest for two weeks and then admitted to the hospital. This is done repeatedly for health workers who work in hospitals. To overcome the shortage of health workers, the South Kalimantan government is recruiting health volunteers and additional health workers from the Ministry of Health to handle the surge in COVID-19 cases. The increase in health workers will add strength, considering that many health workers are also infected with COVID-19 and have died. This addition of personnel can improve health services. The results of the interviews with Mr. R from the South Kalimantan Provincial Health Office are as follows:

> *"Yes, health workers are indeed overwhelmed with the surge in COVID-19 cases, so the Governor of South Kalimantan is recruiting health workers, and in addition to that, there is a drop in personnel from the Ministry of Health."*

In the context of the COVID-19 pandemic, health workers have made rules to provide services with barriers so that health workers do not contract COVID-19 with the patients they serve [32]. Health workers must provide services for COVID-19 patients with protection so that transmission does not occur [33]. To reduce the number of COVID-19 cases, it is necessary to carry out COVID-19 vaccination to provide immunity and reduce the number of cases and the risk of transmission [52] Fulfilling medicines and health supplies is essential for meeting health service standards and protecting health workers through the use of hazmat inpatient services so that transmission between health workers and patients does not occur. The government and health regulations that involve this drug must also be fulfilled to protect health workers from COVID-19 transmission. Our interviews with Regional Disaster Management Agency officers were as follows:

> *"As officers of the Regional Disaster Management Agency of South Kalimantan Province, we meet the needs of all health workers in hospitals and health laboratories in examining COVID-19 suspects, treating patients so that health services run well and optimally."*

Our interviews with the staff of one of the hospitals revealed the following:

> *"For enough medicines and health supplies in hospitals, we have added treatment rooms for COVID-19 patients, the disposal of hospital medical waste is following safety regulations, and officers use hazmat clothes in the service of COVID-19 patients to reduce transmission".*

Preparation in the fulfillment of drugs in times of crisis is essential for sufficient stocks and supplies of drugs if the infrastructure is in good condition [36]. If there is a shortage of drugs during the COVID-19 pandemic, patient care is not optimal, and disease transmission spreads [37]. In the context of the COVID-19 crisis in Rwanda, there is a shortage of medicines, so it is necessary to strengthen the pharmaceutical sector and the need to use drugs to ensure the adequacy of medicines [38]. During the COVID-19 pandemic, there was vulnerability in the drug supply, so there was a shortage of drugs; this needed the intervention of the government, philanthropy, and industry to fill drug stocks [39]. The impact of the COVID-19 pandemic in Sudan is a shortage of medicines, so efforts are needed to obtain drugs from pharmaceuticals or policies on imports, production, and

reasonable prices [40]. There is a need for pharmacies in communities to be accessible to the public during the COVID-19 pandemic [41]. During the COVID-19 pandemic, it is necessary to maintain the supply of drugs, starting with planning, distribution in hospitals, pharmaceutical services in the community, and remote clinical pharmacy services [42]. Pharmacists have responded to the need for drugs during the COVID-19 pandemic, with an adequate supply of drugs to meet drug needs [43]. The COVID-19 pandemic provides lessons for pharmacists to better plan their drug needs, with an even distribution [44]. Drug services during the COVID-19 pandemic require community pharmacies that provide drugs and equipment that protect patients [45].

In the health management subsystem, according to the Decree of the Governor of South Kalimantan, technically, the Provincial Health Office handles health problems by coordinating with all government and private hospitals both in the province and in Regencies/Cities in suppressing COVID-19 cases and reducing the number of illnesses and deaths. The examination patterns of suspected COVID-19 patients and their treatment independently, including isolation from asymptomatic and mild symptoms; patient treatment in hospitals; and referral patterns from first-level health services or healthy practicing doctors or clinics, and the monitoring data of patients and health workers who serve both at health centers, practicing doctors, clinics and government and private hospitals are presented.

Policymakers need transformative planning and action to create more just, strong, and sustainable conditions in the context of COVID-19 [48]. Community implementation and compliance with very strict social distancing for interactions can reduce the spread of COVID-19 [49]. The COVID-19 crisis presents considerable challenges, but we can adapt and learn from this event [50]. Risk management is necessary in dealing with COVID-19 so that all risk management is taken into account, the problems can be adequately overcome, and the negative impact can be minimized [51]. In handling COVID-19, good planning and strategies are needed to narrow its spread, thereby reducing the risk of transmission that causes illness and death [7].

Efforts made comprehensively for all subcomponents of the health system are carried out optimally to overcome the COVID-19 problem by reducing illnesses and deaths. All elements of health efforts in health services involve health facilities from the first level, namely, health centers, doctor practices, clinics, and referrals to government and private hospitals, which are well regulated so that services run well. Likewise, community empowerment, health financing, human resources, drugs, health supplies, and health management have all been maximally sought to overcome the COVID-19 surge. With the condition of a sound health system, it is hoped that a solid and adequate health system can overcome the problem of the COVID-19 surge. This health system can suppress the spread of disease and reduce the number of illnesses and deaths.

CONCLUSION

The surge in COVID-19 cases in South Kalimantan Province is significant for the preparation of a solid health system consisting of 6 health subsystems: health efforts, community empowerment, health financing, health human resources, drugs and health supplies, and health management. Each of these subsystems must be optimal and ready, as well as innovations in their implementation strategies. They are improving the health system, especially health services in hospitals and health centers, refocusing the health budget, adding health workers, fulfilling drugs and supporting facilities, and adding laboratory examination facilities to detect COVID-19 cases in South Kalimantan Province. Policy recommendations include increasing ICU capacity, ensuring continuous PPE supply, expanding community-based isolation centers, and training reserve health workers. Strengthening health information systems and promoting regional coordination will also improve future pandemic resilience

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CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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