Analysis Comparative Of The Cost Medical Services For The Treatment Confirmed Patients COVID-19 An Isolation Ward Of The Prima Husada Hospital, Cipta Medan And The Claims Of The Ministry Of Health For Covid-19 Isolation Patients

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Abstract: In late January, a worldwide crisis known as COVID-19 was declared a Public Health Emergency of International Concern by the WHO. Within only a few weeks, the outbreak took on pandemic proportions, affecting over 100 countries. It was a significant issue to prevent and control COVID-19 on both national and global scales due to the dramatic increase in confirmed cases worldwide. Government guidelines provide a fundamental resource for communities, as they guide citizens on how to protect themselves against COVID-19, however, they also provide critical guidance for policy makers and healthcare professionals on how to take action to decrease the spread of COVID-19. Nort Sumatera government-provided community and healthcare system guidelines, and to explore the relationship between guideline issue dates and the prevalence/incidence of COVID-19 cases.

Keywords: Hospital Prima Husada, Covid 19 and Medical Service.

1. INTRODUCTION.

Coronaviruses are a large family of viruses that cause disease in humans and animals. In humans, it usually causes respiratory tract infections, ranging from the common cold to serious illnesses such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). A new type of coronavirus found in humans since an extraordinary event appeared in Wuhan, China, in December 2019, was later named Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-COV2), and caused Coronavirus Disease-2019 (COVID-19) (Perez-Downes et al., 2017).

On March 2, 2020, Indonesia for the first time confirmed a case of COVID-19 (Tim detikcom, 2020). As of May 28, 2020, there were 31,024 cases of COVID-19 that had spread in 34 provinces in Indonesia (Task Force for the Acceleration of Handling COVID-19, 2020). The current state of the COVID-19 pandemic has had a fairly serious impact on the health, economy, and social structure in Indonesia (Lundell et al., 2018).

In Law Number 4 of 1984 concerning Outbreaks of Infectious Diseases, it is stated that an epidemic is an outbreak of an infectious disease in a community whose number of sufferers has increased significantly more than the usual situation at a certain time and area and can cause havoc. The Minister of Health determines certain types of diseases that can cause outbreaks. Furthermore, in Law Number 6 of 2018 concerning Health Quarantine, in the event of an extraordinary public health health incident marked by the spread of an infectious disease that poses a health hazard and has the potential to spread across regions or across countries, the central government shall establish a Public Health Emergency(The Effect of Paternalist Leadership on Work Engagement ;, n.d.).

The Indonesian government, based on Presidential Decree No. 11 of 2020 concerning the Determination of the Corona Virus Disease 2019 (COVID-19) Public Health Emergency, has declared COVID-19 as a public health emergency that must be taken care of. In addition, the Government has also stipulated Presidential Decree Number 12 of 2020 concerning the Determination of Non-Natural Disasters for the Spread of Corona Virus Disease 2019 (COVID-19) as a National Disaster. In the context of continuity of service at hospitals that provide services for Corona Virus Disease 2019 (COVID-19), in accordance with Minister of Health Regulation Number 59 of 2016 concerning Exemption of Patient Fees for Certain Emerging Infectious Diseases, For the financing of patients being treated with certain Emerging Infectious Diseases including COVID-19 infection, it can be claimed to the Ministry of Health through the Director General of Health Services (Hasan et al., 2020).

This financing claim applies to patients who are treated in hospitals that provide services for Certain Emerging Infectious Diseases. Currently, PIE referral hospitals and other hospitals providing services for certain infectious...
diseases have been established based on the Decree of the Minister of Health. Given the tendency for a high COVID-19 case escalation and requiring treatment in a hospital, causing the designated referral hospital capacity to be unable to accommodate COVID-19 cases, it is necessary to encourage the involvement of all health care facilities that are able to provide COVID-19 services so that health services for COVID-19 patients can be optimal. In addition, several cases of COVID-19 were exacerbated by the presence of comorbidities/comorbidities that were unable to be managed by the designated referral hospital (Lo et al., 2002).

The Indonesian government has declared the coronavirus (Covid-19) pandemic a national disaster. The government will pay for all Covid-19 patients undergoing inpatient or outpatient treatment. The cost of treating Covid-19 patients is quite expensive. The Ministry of Health (Kemkea) has made technical instructions for reimbursement for the cost of such care. The cost unit is contained in the attachment to the Letter of the Minister of Health NoHK.01.07/MENKES/238/2020 Regarding Technical Instructions for Claiming Reimbursement for Treatment of CertainEmerging Infectious Disease Patients for Hospitals Providing Services for Coronavirus Disease 2019 (Covid-19)This letter serves as a guide for the hospital to submit a claim to the Ministry of Health to reimburse the cost of treating Covid-19 patients.

Prima Husada Cipta Medan General Hospital (PHCM Hospital) is the only hospital belonging to a State-Owned Enterprise in the city of Medan. Starting in August 2020, the PHCM Hospital opened isolation inpatient services for patients experiencing COVID-19. The increasing number of Covid-19 patients has made the PHCM RSU continue to improve services by increasing the number of inpatient rooms. RSU PHCM has its own pattern of calculating service rates for Covid-19 patients. This tariff is of course different from the tariff issued in the technical instructions for payment of Covid-19 claims by the Ministry of Health.

2. LITERATURE REVIEW.

2.1 Coronavirus Disease (Covid-19)

In December 2019, the first mysterious case of pneumonia was reported in Wuhan, Hubei Province. The source of the transmission is still unknown, but the first case was linked to a fish market in Wuhan.1 From December 18 to December 29 2019, there were five patients who were treated with Acute Respiratory Distress Syndrome (ARDS).2 From December 31, 2019 to January 3, 2020, this case increased rapidly, marked by the reported 44 cases. In less than a month, the disease has spread to other provinces in China, Thailand, Japan and South Korea (Ho et al., 2007).

The sample under study shows the etiology of the new coronavirus.2 Initially, this disease was temporarily named as 2019 novel coronavirus (2019-nCoV), then WHO announced a new name on February 11, 2020, namely Coronavirus Disease (COVID-19) caused by the Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) virus.3

The virus can be transmitted from person to person and has spread widely in China and more than 190 other countries and territories.5 On March 12, 2020, WHO declared COVID-19 a pandemic.6 As of March 29, 2020, there were 634,835 cases and 33,106 deaths worldwide.5 Meanwhile in Indonesia, 1,528 cases have been confirmed positive for COVID-19 and 136 deaths.

2.2. Epidemiology

Since the first case in Wuhan, there has been an increase in COVID-19 cases in China every day and peaked between late January to early February 2020. Initially, most reports came from Hubei and surrounding provinces, then increased to other provinces and throughout China.

As of January 30, 2020, there have been 7,736 confirmed cases of COVID-19 in China, and 86 other cases were reported from various countries such as Taiwan, Thailand, Vietnam, Malaysia, Nepal, Sri Lanka, Cambodia, Japan, Singapore, Saudi Arabia, South Korea, Philippines, India, Australia, Canada, Finland, France and Germany. The first COVID-19 was reported in Indonesia on March 2, 2020, with two cases.9 Data on March 31, 2020 showed that there were 1,528 confirmed cases and 136 deaths.10 The COVID-19 mortality rate in Indonesia is 8.9%, this figure is the highest in Southeast Asia.

As of March 30, 2020, there were 693,224 cases and 33,106 deaths worldwide. Europe and North America have become the epicenter of the COVID-19 pandemic, with cases and deaths already surpassing China. The United States ranks first with the most COVID-19 cases with the addition of 19,332 new cases on March 30, 2020, followed by Spain with 6,549 new cases. Italy has the highest mortality rate in the world, at 11.3%.5

2.3. Transmission

Currently, the spread of SARS-CoV-2 from human to human is the main source of transmission so that the spread becomes more aggressive. Transmission of SARS-CoV-2 from symptomatic patients occurs through droplets
released when coughing or sneezing. In addition, it has been observed that SARS-CoV-2 is viable in aerosols (generated via a nebulizer) for at least 3 hours. WHO estimates the reproductive number (R0) COVID-19 by 1.4 to 2.5. However, other studies estimate R0 of 3.28.

Figure 1. Several case reports suggest that transmission from asymptomatic carriers is suspected, but the exact mechanism is unknown.

Cases related to transmission from asymptomatic carriers generally have a history of close contact with COVID-19 patients. Several investigators have reported SARS-CoV-2 infection in neonates. However, vertical transmission from pregnant women to the fetus has not been proven to occur. If it can happen, the data shows that the chance of vertical transmission is relatively small.

SARS-CoV-2 has been shown to infect the gastrointestinal tract based on the results of biopsies of gastric, duodenal, and rectal epithelial cells. The virus can be detected in the feces, in fact there are 23% of patients who reported that the virus was still detected in the feces even though it was not detected in respiratory samples. These two facts confirm the possibility of fecal-oral transmission.

The stability of SARS-CoV-2 in inanimate objects is not much different from that of SARS-CoV. Experiments conducted by van Doremalen, et al. showed that SARS-CoV-2 was more stable on plastic and stainless steel (>72 hours) than copper (4 hours) and cardboard (24 hours). Another study in Singapore found extensive environmental pollution in the rooms and toilets of COVID-19 patients with mild symptoms. Viruses can be detected in doorknobs, toilet seats, light switches, windows, cabinets, and ventilation fans, but not in air samples.

2.4. Pathogenesis

The pathogenesis of SARS-CoV-2 is still not widely known, but it is suspected that it is not much different from that of SARS-CoV which is more widely known. In humans, SARS-CoV-2 primarily infects cells in the airways lining the alveoli. SARS-CoV-2 will bind to receptors and make its way into cells. The glycoprotein contained in the viral spike envelope will bind to a cellular receptor in the form of ACE2 in SARSCoV-2. Inside cells, SARS-CoV-2 duplicates genetic material and synthesizes the necessary proteins, then forms new virions that appear on the cell surface.

Similar to SARS-CoV, in SARS-CoV-2 it is suspected that after the virus enters the cell, the viral RNA genome will be released into the cell cytoplasm and translated into two polyproteins and structural proteins. Next, the viral genome will begin to replicate. The glycoproteins in the newly formed viral envelope pass into the endoplasmic reticulum or Golgi membrane of the cell. A nucleocapsid is formed which is composed of the RNA genome and nucleocapsid proteins. Virus particles will grow into the endoplasmic reticulum and Golgi cells. In the final stage, vesicles containing viral particles will fuse with the plasma membrane to release new viral components.

In SARS-CoV, Protein S was reported as a significant determinant in viral entry into host cells. It is known that the entry of SARS-CoV into cells begins with the fusion of the viral membrane with the plasma membrane of the cell. In this process, the S2' protein plays an important role in the proteolytic cleavage process that mediates the membrane fusion process. In addition to membrane fusion, there is also clathrin-dependent and clathrin-independent endocytosis that mediates the entry of SARS-CoV into host cells.

Viral and host factors play a role in SARS-CoV infection. The cytopathic effect of the virus and its ability to overpower the immune response determines the severity of the infection. Dysregulation of the immune system then plays a role in tissue damage in SARS-CoV-2 infection. Inadequate immune response leads to viral replication and tissue damage. On the other hand, an exaggerated immune response can lead to tissue damage.
Figure 2. Schematics of viral replication and pathogenesis, adapted from various sources.

The immune response caused by SARS-CoV-2 is also not fully understood, but can be studied from the mechanisms found in SARS-CoV and MERS-CoV. When the virus enters the cell, the viral antigen will be presented to the antigen presentation cells (APC). Viral antigen presentation depends mainly on major histocompatibility complex (MHC) class I molecules. However, MHC class II also contributes.30 Antigen presentation further stimulates the body’s humoral and cellular immune responses mediated by virus-specific T and B cells.30 In the humoral immune response, IgM and IgG are formed against SARS-CoV. IgM against SARS-CoV is lost by the end of the 12th week and IgG can persist long term.30 The results of the study of patients who had recovered from SARS showed that after 4 years, CD4+ and CD8+ memory T cells were specific for SARS-CoV, but their numbers decreased gradually in the absence of antigen.

Viruses have mechanisms to evade the host immune response. SARS-CoV can induce the production of double membrane vesicles that do not have pattern recognition receptors (PRRs) and replicate within these vesicles so that they cannot be recognized by the host. The IFN-I pathway is also inhibited by SARS-CoV and MERS-CoV. Antigen presentation is also inhibited in MERS-CoV infection.

Figure 3. Schematic of the COVID-19 disease journey, adapted from various sources.3, 49, 58, 60, 64-66

2.5. Immune Response of the Host in Clinically Mild COVID-19

The immune response that occurs in patients with mild manifestations of COVID-19 is illustrated from a case report in Australia. This patient had an increase in CD38+HLA-DR+ T cells (activated T cells), especially CD8 T cells on days 7-9. In addition, there was an increase in antibody secreting cells (ASCs) and follicular helper T cells in the blood on day 7, three days before symptom resolution. A progressive increase in SARS-CoV-2 IgM/IgG was also found from day 7 to day 20. These immunologic changes persisted up to 7 days after symptoms resolved. There was also a decrease in CD16+CD14+ monocytes compared to healthy controls. Activated natural killer (NK) cells HLA-DR+CD3-CD56+ and monocyte chemoattractant protein-1 (MCP-1; CCL2) were also found to be decreased, but levels were the same as in healthy controls.
2.6. Immune Response of the Host in Severe Clinically COVID-19

The difference in immunological profiles between mild and severe cases of COVID-19 can be seen from a study in China. The study found lower lymphocyte counts, higher leukocyte and neutrophil-lymphocyte ratios, and lower percentages of monocytes, eosinophils, and basophils in severe cases of COVID-19. Proinflammatory cytokines such as TNF-α, IL-1 and IL-6 as well as IL-8 and infection markers such as procalcitonin, ferritin and C-reactive protein were also found to be higher in cases with severe clinical trials. Helper T cells, suppressor T cells, and regulatory T cells were found to be decreased in COVID-19 patients with lower levels of T helper and T regulators in severe cases.6

Another case report in a COVID-19 patient with ARDS also showed a decrease in CD4 and CD8 T lymphocytes. The CD4 and CD8 lymphocytes were in a hyperactivated state which was characterized by a high proportion of the HLA-DR+CD38+ fraction. CD8 T lymphocytes were found to contain high concentrations of cytotoxic granules (31.6% positive for perforin, 64.2% positive for granulicin, and 30.5% positive for granulicin and perforin). In addition, an increase in the concentration of proinflammatory Th17 CCR6+ was also found.

ARDS is the leading cause of death in COVID-19 patients. The cause of ARDS in SARS-CoV-2 infection is cytokine storm, which is an uncontrolled systemic inflammatory response due to the release of large amounts of proinflammatory cytokines (IFN-α, IFN-γ, IL-1β, IL-2, IL-6, IL-7, IL-10 IL-12, IL-18, IL-33, TNF-α, and TGFβ) and large amounts of chemokines (CCL2, CCL3, CCL5, CXCL8, CXCL9, and CXCL10) as shown in Figure 3.3.

Table 1. Disease course in severe COVID-19

<table>
<thead>
<tr>
<th>Duration</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4–13 hari</td>
<td>Sepek mulai batu 3-8</td>
</tr>
<tr>
<td>12-23 hari</td>
<td>Sepek mulai batu 3-8</td>
</tr>
<tr>
<td>19 hari</td>
<td>Pasien dapat pulang dari rumah</td>
</tr>
<tr>
<td>10 hari</td>
<td>Discharge</td>
</tr>
</tbody>
</table>

2.7 Risk Factors

Based on existing data, comorbid hypertension and diabetes mellitus, male gender, and active smoking are risk factors for SARS-CoV-2 infection. A greater sex distribution in males is thought to be associated with a higher prevalence of active smokers. In smokers, hypertension, and diabetes mellitus, it is suspected that there is an increase in ACE2 receptor expression.

Diaz JH43suspect that users of ACE inhibitors (ACE-I) or angiotensin receptor blockers (ARBs) are at risk for more severe COVID-19. Regarding this allegation, the European Society of Cardiology (ESC) confirms that there is no convincing evidence to conclude a positive or negative benefit of ACE-i drugs or ARBs, so users of both types of drugs should continue their treatment.

Cancer patients and chronic liver disease are more susceptible to SARS-CoV-2 infection. Cancer is associated with immunosuppressive reactions, cytokine overload, suppression of the induction of proinflammatory agents, and impaired dendritic cell maturation.

Patients with cirrhosis or chronic liver disease also have a decreased immune response, making them more susceptible to contracting COVID-19, and may experience a worse outcome.48 The study of Guan, et al.49 found that of the 261 comorbid COVID-19 patients, 10 of them were with cancer and 23 were with hepatitis B.

Acute respiratory infections that attack HIV patients generally have a greater risk of mortality than non-HIV patients. However, to date there have been no studies linking HIV with SARS-CoV-2 infection.50 The association of SARS-CoV-2 infection with hypersensitivity and autoimmune disease has also not been reported.51 There are no studies linking a history of asthma with the likelihood of being infected with SARS-CoV-2. However, the meta-analysis study conducted by Yang et al.52 showed that COVID-19 patients with a history of respiratory system disease would tend to have more severe clinical manifestations.

Several other risk factors determined by the Centers for Disease Control and Prevention (CDC) are close contact, including living in the same house with a COVID-19 patient and a history of travel to infected areas. Being in the same
environment but not in close contact (within a radius of 2 meters) is considered low risk. Medical personnel are one of the populations at high risk of infection. In Italy, about 9% of COVID-19 cases are medical personnel. In China, more than 3,300 medical personnel were also infected, with a mortality of 0.6%.

3. METHOD.
This type of research is descriptive quantitative research. Quantitative research with a cross sectional design is used to calculate the difference. The location of the research was carried out at the Prima Husada Cipta General Hospital, Medan. The time of the research will be carried out in September-December 2021. The population in this study is data and medical record files about Covid-19 services and the population who act as informants in this study are INA-CBG's verifier officers, isolation inpatient health workers at Prima Husada Cipta Medan Hospital.

The sample is part or representative of the population under study. Sampling in this study used incidental sampling, which is a sampling technique based on chance, that is, anyone who coincidentally or incidentally meets the researcher can be used as a sample.

The data obtained is secondary data is data obtained from medical records include:
1. Patient medical resume
2. Patient service billing file

4. RESULT.
4.1 Overview of Research Subjects
Data collection was carried out for two months by collecting service data for Covid-19 patients in 2021. Data were taken from all medical records of patients treated at Prima Husada Cipta Hospital Medan. From the medical record data, the total number of inpatients is 544 people, but by calculating the sample size, the number of samples taken is 150 samples. The characteristics of the research subjects are presented in the table below.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>N (Mean +SD)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Man</td>
<td>81</td>
<td>54.0%</td>
</tr>
<tr>
<td>Woman</td>
<td>69</td>
<td>46.0%</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-17 years old</td>
<td>4</td>
<td>2.7%</td>
</tr>
<tr>
<td>18-59 years old</td>
<td>119</td>
<td>79.3%</td>
</tr>
<tr>
<td>&gt; 60 years</td>
<td>27</td>
<td>18.0%</td>
</tr>
<tr>
<td>Covid-19 Financing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nursing Day</td>
<td>7.66</td>
<td>± 3.04</td>
</tr>
<tr>
<td>Doctor's Consul Fee</td>
<td>3,199,960.00</td>
<td>± 2,658,892.41</td>
</tr>
<tr>
<td>Treatment Fund</td>
<td>3,943,793.33</td>
<td>± 1,968,165.21</td>
</tr>
<tr>
<td>Laboratory Fee</td>
<td>2,940,433.68</td>
<td>± 1,472,799.73</td>
</tr>
<tr>
<td>PPE Cost</td>
<td>8,140,304.67</td>
<td>± 5,269,660.21</td>
</tr>
<tr>
<td>Equipment Rental Fee</td>
<td>4,012,786.67</td>
<td>± 10,029,317.94</td>
</tr>
<tr>
<td>Total Hospital Rates</td>
<td>30,833,732.97</td>
<td>± 20,301,680.24</td>
</tr>
<tr>
<td>Total Claim</td>
<td>57,156,086.67</td>
<td>± 25,274,861.36</td>
</tr>
</tbody>
</table>
4.2 Analysis of Covid-19 Treatment Substitute Claims and Associated Factors

The results of this study obtained a p value <0.001 (P>0.05), so it was concluded that there was a relationship between the variable days of treatment and the total claims for Covid-19 treatment replacement at the Prima Husada Cipta Medan Hospital. In addition, it can be seen in Figure 2.1 from the results of the correlation test, an R Square value of 0.855 is obtained, means the ability of the variable day of care in influencing the total claims of 85.5%. The results of this variable analysis are the strongest correlations compared to other variables.

Figures 3. Correlation Test Between Days of Hospitalization and Claims Replacement Covid-19 Treatment

The results of this study obtained a p value of <0.001 (P>0.05), so it was concluded that there was a relationship between the variable cost of a doctor's consultation with the total claims for Covid-19 treatment replacement at the Prima Husada Cipta Medan Hospital. In addition, it can be seen in Figure 2.2 from the results of the correlation test, the R Square value is 0.541, means that the variable ability of the doctor's consultant fee in influencing the total claims is 54.1%. This shows a fairly strong correlation.


The results of this study obtained a p value <0.001 (P>0.05), so it was concluded that there was a relationship between the treatment fund variable and the total claims for Covid-19 treatment replacement at the Prima Husada Cipta Medan Hospital. In addition, it can be seen in Figure 2.3 from the results of the correlation test, the R Square value is 0.538. It means that the ability of the maintenance fund variable in influencing the total claims is 53.8%. This shows a fairly strong correlation.

Figures 5. Correlation Test Between Treatment Funds and Covid-19 Treatment Substitute Claims
The results of this study obtained a p value <0.001 (P>0.05), so it was concluded that there was a relationship between the laboratory cost variable and the total claims for Covid-19 treatment replacement at the Prima Husada Cipta Medan Hospital. In addition, it can be seen in Figure 2.4 from the results of the correlation test, the R Square value is 0.476. means that the ability of laboratory costs to influence the total claims is 46.7%. This shows a weak correlation and there is still 53.3% of the variance of the dependent variable which is explained by other factors.

Figures 6. Correlation Test Between Laboratory Costs and Covid-19 Treatment Substitute Claims

In the results of this study, a p value of <0.001 (P>0.05) was found, it was concluded that there was a relationship between the variable cost of PPE replacement and the total claims for Covid-19 treatment replacement at RS Prima Husada Cipta Medan. In addition, it can be seen in Figure 2. 5 from the results of the correlation test, the R Square value is 0.394. means the ability of the variable cost of PPE in influencing the total claims of 39.4%. This shows a weak correlation and there is still 60.6% of the variance of the dependent variable which is explained by other factors.

Figures 7. Correlation Test Between PPE Costs and Covid-19 Treatment Substitute Claims

The results of this study obtained a p value <0.001 (P>0.05), so it was concluded that there was a relationship between the variable cost of equipment rental and the total claims for Covid-19 treatment replacement at RS Prima Husada Cipta Medan. In addition, it can be seen in Figure 2. 6 from the results of the correlation test, the R Square value is 0.381. means the ability of the variable rental costs to affect the total claims of 38.1%.

5. CONCLUSION:
Based on the research results from the discussion the author has stated previously, the following conclusions can be drawn:
1. Calculation claim replacement for covid-19 treatment greater than the applicable tariff at the Prima Husada Cipta Medan General Hospital.
2. There is a difference claim replacement for covid-19 treatment and hospital rates based on days of stay, doctor's consultant fees, treatment funds, laboratory fees, PPE costs, equipment rental fees, total hospital fees, total claims.
3. The strongest correlation is between days of hospitalization and replacement claims covid-19 treatment (R² = 0.855, p < 0.001).
4. The strongest correlation is between equipment rental costs and replacement claims covid-19 treatment (R² = 0.381, p < 0.001).

REFERENCES: