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| RESEARCH ARTICLE

Analysis of the Healthcare and Overall Economic Competitiveness of Santiago, Isabela, Philippines

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| ABSTRACT
City of Santiago, Isabela, is otherwise known as the "Queen City of the North" and the only independent component city in region 2 that substantially contributes to the overall production and competitiveness of the region. This study aimed to determine the influence of the state of healthcare to the economic competitiveness, identify the determinants that contribute to the demand for healthcare, discover the factors that affect the choices of consumers to healthcare services, and measure the effect of healthcare inputs on the level of mortality rate in the City of Santiago, Isabela, Philippines. Primary and secondary data were utilized, and even employed descriptive and inferential statistics for the analysis. This study discovered that the competitive index has a significant positive impact on the total annual patients and healthcare facilities while the annual healthcare expenditure of the City of Santiago is insignificant. The demand for healthcare services arises because of demographic, medical-related, and socio-economic factors. Moreover, the prime factor influencing residents' acquiring healthcare services is the quality itself. Lastly, the mortality rate has a significant inverse impact on the number of general practitioners and medical specialists in the city, while the number of hospital beds showed a significant positive effect.

| KEYWORDS

Healthcare, Economic Competitiveness, Demand for Healthcare, Healthcare Services, Mortality Rate, Healthcare Inputs, City of Santiago, Isabela, Philippines

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1. Introduction

Health is to be in a state of having complete physical, mental, and social well-being, and not merely the absence of disease or infirmity (WHO, n.d.). Humans can fully function and meet their expectations by having good health. As much as health is an essential objective to achieve individual development, it is also significant to society. Now, to achieve good health, quality healthcare services should be available. This entails how vital healthcare services are towards the economic progress of a certain country. According to Casasnovas, Rivera, and Currias (n.d.), having good health contributes to the increase in human capital level that automatically leads to the individuals' economic productivity and the country's economic growth rate.

In the Philippines, there is a law implemented known as the Republic Act 7160 or the "Local Government Code of 1991", where the provision of healthcare services had been devolved to the local government units such as the provincial, city, municipal governments, and even barangays. In effect, they are now responsible for managing and delivering health services to communities. The purpose of Republic Act 7160 is to expand and raise efficiency to healthcare with its assumption that the local government units (LGUs) are savvier and more conversant, which can respond quickly to the health needs of their people. While the Department of Health (DOH) still oversees the development and formulation of all related health policies and plans, the local government units (LGUs) are expected to handle other responsibilities that include direction and operation. This delivery approach has resulted in inequities in the quality and quantity of health services provided. Some factors that affect health performance are financial

incapability, geographic isolation, and even the disadvantaged areas, which result in higher morbidity and mortality rates (Moalong et al., 2020).

The city of Santiago is otherwise known as the "Queen City of the North" and the only independent component city in Region 2. It is in the southern portion of Isabela Province and the gateway to Cagayan Valley. The city of Santiago is one of the cities that contributes a huge component to the overall production and competitiveness of the entire region, having several business enterprises, hospitals, and manufacturing companies, making it the Commercial and Trading Center of Region 2 and tagged as the "Investment Hub of the North". Indeed, it is essential to identify how healthcare influences the city's overall competitiveness. And for the past few years, the city has been facing some difficult situations that need to be addressed at the earliest opportunity. According to the 2019 Regional Social and Economic Trends (RSET) of region 2, the City of Santiago and like many other cities in the country is confronted with a lack of medical professionals despite the fact that the population is immensely rising over the years.

This study focuses on the effect of healthcare in the City of Santiago, Isabela. The researchers felt the need to formulate this study because healthcare is vital for each individual and an instrument to attain progress. The researchers believe that the study can address the previous shortcomings the city has encountered and provide results that will be essential for better decision-making. In addition, there is little health economics research that specifically focuses on the city-level of the Philippines, which is very relevant in these years (COVID-19 pandemic) in order to identify the detailed approach and solutions needed.

1.2. Statement of the Problem

This study aims to provide an analysis of the effect of healthcare on the overall competitiveness of the City of Santiago, Isabela. Specifically, it intended to answer the following research questions:

1. Does the state of healthcare affect the economic competitiveness of the City of Santiago, Isabela?
2. What are the determinants that contribute to the demand for healthcare based on sex?
3. What are the factors that affect the choices of consumers to healthcare services?
4. What is the effect of healthcare inputs on the mortality rate in the City of Santiago, Isabela?

1.3. Hypotheses

Objective 1: To determine the influence of the state of healthcare on the economic competitiveness of the City of Santiago, Isabela

Null Hypothesis (Ho): The state of healthcare does not significantly affect the economic competitiveness of the City of Santiago, Isabela.

Alternative Hypothesis (Ha): The state of healthcare significantly affects the economic competitiveness of the City of Santiago, Isabela.

Objective 4: To determine the effect of healthcare inputs on the level of mortality incidence in the City of Santiago, Isabela.

Null Hypothesis (Ho): The level of healthcare inputs does not significantly affect the level of mortality rate in Santiago City, Isabela.

Alternative Hypotheses (Ha): The healthcare inputs significantly affect the level of mortality rate in Santiago City, Isabela.

1.4. Scope and Limitations

This study is primarily focused on analyzing the effect of healthcare on the overall economic competitiveness of the City of Santiago, Isabela. It will mainly identify the state of healthcare to economic competitiveness, the determinants that contribute to the demand for healthcare, the factors that affect consumer choices towards healthcare providers, and the effect of healthcare inputs on the mortality rate in the City of Santiago Isabela. Therefore, the study is limited only to City of Santiago respondents.

The researchers opted to cover the years 2000 up to 2020 because 21 years is a significant number in order to measure and assess change and development in the said city. The researchers confined the study based on the data handed by the City of Santiago Office of the Mayor, City Health Office of Santiago and City of Santiago Planning and Development Office. The other data are gathered through survey questionnaires from the research respondents.

1.5. Significance of the Study

Knowing how healthcare weighs to the overall competitiveness would provide contributions that will help eradicate existing problems. It will impart a course of action on what specific projects and initiatives must be pursued. The entirety of the study could be highly significant and beneficial to the following:

Local Policymakers. This study can devise effective policies and protocols concerning the healthcare system that will initiate better healthcare services utilization.

Local Government officials. This study can serve as a reference relative to issues concerning healthcare provision that the government officials wish to address and reform. Additionally, the study can be considered as grounds for implementing appropriate incentives that encourage better utilization of healthcare services.

Health Insurance companies. This study can supply necessary data that can be used as a basis for improving their offered products to cater to their customers' needs and demands more effectively.

University. This study can add to improve knowledge and information that can contribute to the development of research and even to society.

Future and other researchers. This study can serve as a reference and provide direction for future research that is related to this matter.

2. Literature Review

2.1. Health and its influence on Economic Progress

Presently, health is being acknowledged by individuals across the world as a fundamental ingredient of the development and economic well-being of individuals and nations (Piabuo & Tieguhong, 2017). According to Boyce and Brown (2019), to determine a country's economic performance and stability, the health status of its people should be considered. They asserted that health contributes to economic and social progress. It generates positive consequences towards the economic performance of other sectors in the entire economy through the jobs it provides and from the purchase of goods and services. This has also been explored in prior studies by Sharma (2018), stating that improved health allows the working population to be more productive by formulating better and new ideas and innovations that lead to the escalation of productivity of the physical capital when employed by more skilful managers in the economy. Despite the compelling evidence that health impacts economic growth, the magnitude of the effect is less clear because of the multi-dimensionality of health outcomes, and that makes the relationship dynamic, complex, and under-appreciated (Dimble & Menon, 2017). Bloom, Kuhn, & Prettner (2018) have also discovered that the relationship between health and economic growth is acclaimed; however, there are still underlying mechanisms that are complex and difficult to discern. Their study concluded that there are three central concerns regarding the relationship between health and economic growth. First is, evaluating and disengaging the causality between health and economic growth is challenging. Second, as growth changes over economic development, the relationship between health and economic growth changes as well, considering that the factors to be considered in achieving economic growth vary and extend. And lastly, different dimensions of health may have different economic effects depending on how developed a country is.

Developing countries like the Philippines mostly depend on physical capital and prefer healthy individuals to achieve an optimum output, and this denotes that health is a basic unit of productivity (Hena et al., 2018). Hence, some part of growth is determined through health status that reflects society's human capital accumulation (Ndedi, Metha, & Nisabwe, 2017). The Commission on Macroeconomics and Health (CMH), an independent expert group launched by WHO, is assigned to work on collecting evidence of the economic benefits attributable to better health in developing countries. One of their studies states that for developing countries to be out of the circle of poverty, they must prioritize and improve their healthcare to achieve better health outcomes (Hanrieder, 2016).

2.2. Determinants of Demand for Healthcare

The demand in healthcare is a concept in economics that explains the consumer's willingness to pay for desirable services and goods. An increase in a good or service price will decrease the demand, ceteris paribus (Rice & Unruh, 2016). It is said that the demand for healthcare is increasing continuously, and most of the countries will dedicate more than twenty percent (20%) of their Gross Domestic Product (GDP) to their healthcare by the year 2050. The reason behind this increase is the rising frequency of preventable illness and the inefficient utilization of healthcare resources. In order to understand the concept of demand in health care, some important concepts or factors that influence demand in healthcare must be known. These are the price, income, government intervention, consumer, and supply (Babalola, 2017).

The demand for healthcare is also influenced by the classification of the providers and services, status, and expenditure in health and healthcare. With that being said, the determinants of healthcare demand are gender, age, occupation, marital status, education, ethnicity, household income, household size, family size, health status, health problem, medical coverage (insurance), medical and non-medical costs, health expenditure, the distance of the provider, and even waiting time (Z.A et al., 2018). This is also related to the study of Subramanian (2020), where it proved that poor access to healthcare interventions caused higher suffering and lower health benefits, specifically to the middle and third world countries. This is brought by the slew of the demand and supply barriers that must be investigated to devise effective strategies. With that, location, income, price, nature of household decision making, non-price cost, and even the cultural influences are examples of the factors on the demand side.

In the study of Vrhovec and Tajnikar (2016) in Slovenia, the results showed that the major determinant that will significantly impact demographic changes in healthcare. The demand for healthcare in the four major groups of healthcare services is expected to rise because, looking at their population, older people have higher numbers than younger people. Meaning implies there will be a great increase in demand for hospital services, such as hospitalizations and hospital day-care. Then, secondary care is also predicted to have a significant increase, while primary care is expected to see a moderate increase. The demand for healthcare services related to infant diseases, child diseases, and even childbirth will decline, while the demand for diseases that primarily affect the elderly will rise. In the four major groups of healthcare services, the greatest increase in demand will be for treatments caused by the circulatory system diseases, blood and forming of blood organs diseases, eye and adnexa diseases, and certain immune-related disorders and diseases. The number of hospitalizations for neoplasms will rise as well. The increased demand for healthcare will place significant strain on Slovenia's already overburdened healthcare system.

2.3. Determinants of Demand for Healthcare based on Sex

Cardiovascular diseases (CVDs) and stroke have continued to be the major causes of death in the Philippines for more than four decades. Hypertension (HTN) is a significant risk factor for cardiovascular disease (CVD) and stroke and has been linked to the mortality of tens of thousands of Filipinos each year (Castillo et al., 2020). Bang et al. (2017) study showed that women have more functional impairments than men. The largest stated chronic diseases are hypertension, cardiovascular-related diseases, gastrointestinal diseases, and even musculoskeletal disorders. The self-rated health status, BMIs, age, and the count of the non-communicable diseases are still significant forecasters of healthcare. This study is backed up by Oksuzyan et al. (2018) findings that women are more likely than males to have chronic conditions affecting functional capacity. With that, since women are more prone to illnesses, this led them to be more aware of their own health status than men are. With that, women acquired a greater understanding of healthy lifestyles (Oksuzyan et al., 2018).

To address the differences in healthcare-seeking behaviours of males and females, the study of Thompson et al. (2017) showed that women were more likely than men to visit a family physician for both physical and mental health concerns because males are said to be more prone than women to avoid going to the doctor or admitting their own fragility (Benyamini et al. 2017; Idler 2019). Women seek treatments more on private health infrastructures because they feel that private providers provide the benefits of ease, efficiency, and privacy, even though they do not always give high-quality care (Keesara et al., 2017).

Acquiring healthcare insurance is also a major factor that contributes to how people regard their overall health situation. According to the study of National Women's Law Center entitled, Insurance Discrimination Against Women Today and the Affordable Care Act, when it comes to acquiring health insurance, women are more frequent in availing such than men because they tend to visit the doctor more frequently, live longer, and have babies. Females who belong to the upper-class level of occupation are more likely to have health insurance. The Kaiser Family Foundation (2020) declared that women generally received their health coverage from employer-sponsored insurance. Women in families with at least one full-time worker are more likely to have job-based health insurance coverage having 71%, than women in families with only part-time workers, 30% or without any work 17%. Therefore, employment is a vital component up to what extent a person can suffice his or her health situation, considering that this specific socioeconomic indicator indicates an individual's economic capacity to acquire health-protective commodities (Oksuzyan et al., 2018).

2.4. Consumer choices towards Healthcare Services

The Lewis et al. (2018) study exemplified how geography, both physical and symbolic, influences healthcare decision-making and service utilization; These findings highlight the importance of how well a healthcare system is 'navigated' or the routes that patients take to move between services. It showed that widespread perceptions of the relative worth of practitioners and services, even when they contradict available evidence, are at the heart of healthcare decision making. The study of Chauhan & Campbell (2021) explored the interpretation of the patients to the risks and how it is allied in seeking the three levels of healthcare, specifically in the middle- and low-income countries. This showed that the choices of the patients are still limited to the access and the affordability of healthcare. This also found that the patients improve the strategic approach by negotiating risks with trust. With that, the informal healthcare providers bridge the gap between the low and middle-income countries because it provides accessible

and affordable care imbued with interpersonal trust. This assumes that patients carefully take into consideration the available options and make rational decision making. In addition, the middle and low-income countries are subjected to critical patient's choices because mostly, it will only provide complementary and alternative medicine and care. On the other side of the economy, the developed countries have great choices such as trained, qualified, and certified healthcare professionals that can provide immediate and great healthcare, specifically in the United Kingdom (NHS,2020).

According to Nyambura (2016), the healthcare services demand came from a multitude of factors. These include accessibility, affordability, and quality. These factors are also determined by the characteristics of health care workers patients and social and environmental influences. A variety of factors also influence client satisfaction, which influences the use of medical services requested and the choice of a particular healthcare provider. In empirical evidence, it resulted that for every year increased, the demand probability of hospital care increased by 0.0024%, ceteris paribus at the 5% significance level. To interpret, this means that as an individual becomes older, the economic status, quality of care, or even the factors that are related to the avoidance of going to hospitals become more critical. In addition, this study discovered that, at a 1% significance level, an increased level of education resulted in a statistically significant increase which relates to the probability of requesting private hospital care by 5.75%. Moreover, people who had access to the information of health through the media had a higher likelihood of rising demand for private hospital care by 2.58% at 10% significance level, ceteris paribus.

Indeed, the quality of services is essential in choosing the right and proper healthcare. The function of choice in improving healthcare quality is predicated on the hypothesis that healthcare providers will be encouraged to enhance their services, specifically when people ignore healthcare services because of their poor quality. As a result, the less educated and the elderly value the function of choice more because they have fewer options than those who are at a higher socioeconomic level (Aalto et al., 2017).

2.5. Healthcare Inputs and their effect on Mortalities

A recent study by Bulck et al. (2020) states that healthcare inputs are human resources and infrastructure that are engaged in actions whose primary intent is to enhance health. And these healthcare inputs have shown a significant relationship between mortalities and morbidities. For example, Oleribe et al. (2018) research has provided evidence regarding the devastating consequences of healthcare worker strikes. The study concluded that because of healthcare worker strikes, disruption in service delivery, increased morbidity and mortality of patients are observed. This shows that having a greater primary care physician supply is a component to achieve lower population mortality (Basu et al., 2019).

Furthermore, several authors have recognized the effect of having poor healthcare infrastructure on the number of morbidities and mortalities. According to the Center for Medicare and Medicaid Services (2019) study, in rural communities, there is an apparent insufficient supply and access to high-quality health services considering the shortage of hospitals. As a consequence of having the lack of access to quality healthcare, a continuous increase in the quantity of negative maternal health outcomes, including premature birth, low-birth weight, maternal mortality, and severe morbidity, is observed. An additional study also backed up these research findings stating that providing high-quality medical care in low- and middle-income countries is one of their problems (Chou, Walker, & Kanyangarara, 2019). One of the major drivers of increased mortality across conditions, from cardiovascular disease and injuries to neonatal and communicable disorders, is due to poor quality healthcare services. Having limited access to high-quality health care results in significant mortality and macroeconomic burden for low-income countries (Alkire et al., 2018). The Philippines is one of the countries in South Asia that is said to have a substantial amount of mortality due to the use of poor-quality health care at 1.9 million deaths this is equal to thirty-nine percent (39%) of global poor-quality service access mortality (Kruk et al., 2018). For this reason, it is crucial to provide quality health services to save lives and prevent morbidity and mortality in high-burden settings (Chou, Walker, & Kanyangarara, 2019).

2.6. Synthesis and Research Gap

Various researchers produce studies about the importance of healthcare in different aspects. However, few and almost no studies solely focus on the impact of healthcare on economic progress. The significant gap that this study aims to address are the following: first, the geographical gap where there is a lack of research in the Southeast Asian countries, specifically in the Philippines. In addition, most of the research in Isabela, Philippines, are not directly related to healthcare and economic progress; it's just a part or even a glimpse in some studies. Second, the population and sample gap where the researches focus on specific scopes such as healthcare and private hospitals, healthcare and specific socio-economic status, healthcare and specific kind of disease, and even healthcare and age group. Third, the deficiency in quantitative research because most of the studies are processed through qualitative research. It is done through interviews and not on numerical and measurable approaches that can also provide accurate results.

Still, health economics related research papers are still few compared to other areas of economics. The past research also showed different positive and negative results in relation to health, healthcare, and the economy due to the divergent data, scope, variables, and the like.

2.7. Theoretical Framework

2.7.1 Michael Grossman's Demand for Health

In the 1970s, Michael Grossman, an Economist, made a demand for a health model where the investment in health stands as a kind of human capital investment. Its framework was originally acquired by Gary Becker's investment in education in 1972, where the human capital models have been used to measure productivity and even the wage rate. With that, Grossman decided to broaden this concept to health. The major contribution of Grossman's demand for a health model is the distinctiveness between medical care as input and health as an output. Health is considered an output because it is the source of the people's utility, and on the other hand, medical care is the input to the production of health. In this model, health is both demanded and produced by every individual because it affects the total time available to produce wealth and income, which is another source of utility. When ill health prevails, the level of happiness and the ability to earn decreases. It is also presumed that a person inherits an initial stock of health that decreases with age, but through investment, it can increase. With that, an individual consumes both health and non-health goods because it provides utility. The utility can also be determined as a function of quantity to the medical care received. The variables such as race, age, social class, education, health status, even attitudes and behaviours like actions, cooperation and mood have positive and negative effects and impacts on the level of utilization (Dewar et al., 2017).

The Theory of Health Demand begins with the assumption that people draw on two products for simplicity:

U = U (H,O)

Where,
U = Utility
H = Health
O = Other fundamental Commodities

U stands for a utility which means the total satisfaction from a good or service consumption. Each economic theory is based on rational choice and usually assumes that consumers are working to maximize their usefulness. Second, the O stands for other fundamental commodities, which means these are others that are non-health-related but still contribute to the utility of an individual. Leisure time with family and friends playing online games are some examples of it. Third, H stands for health, where it equates to the healthy days of an individual.

Michael Grossman's Model is a huge breakthrough in the field of health economics. Grossman's "demand for health" model is not restricted to the traditional theory of demand. The model made by Grossman heavily relies on the theory of Human Capital, stating that an increase in human capital (education, training, intelligence, skills, health) increases the individual's productivity in the market sector of the economy (Pinto, 2014). Given that the study aims to measure the health of Santiago City's population for the reason of assessing how it affects its overall economic competitiveness, Grossman's model is best suitable as the groundwork.

The researchers applied Grossman's model in this study and derived into a city-level model:

Equation (1)

CI =CI (H1, H2, HO)

Where,
CI = Competitive Index
H1 = Healthcare Expenditures

H2 = Healthcare Facilities
HO = Annual Number of Patients

Equation 1 shows that the competitive index (CI) represents the utility (U) of the city and the health-related components are health expenditure (H1) and healthcare facilities (H2). Then, the other fundamental component is the annual number of patients (HO).

Equation (2)

Mort=Mort (H1, H2, H3)

Where,
Mort = Mortality Rate
H1 = Hospital Beds
H2 = Number of General Practitioners

H3 = Number of Medical Specialists

Equation 2 presents the mortality rate in the healthcare inputs of the city. The factors that affect the mortality rate are hospital beds (H1), number of general practitioners (H2), and number of medical specialists (H3).

2.8. Conceptual Framework

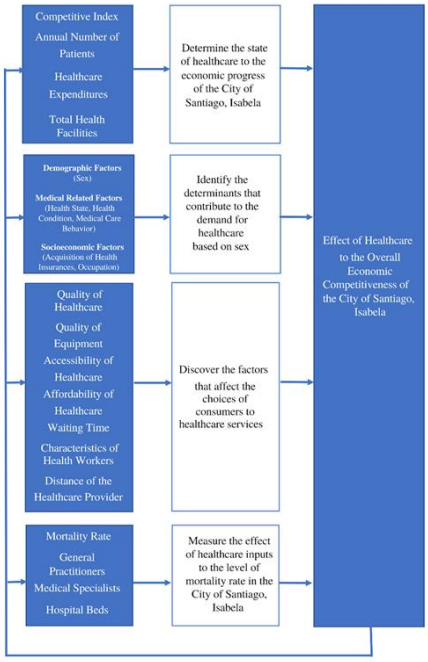


Figure 1.1. Conceptual Framework

Shown in figure 1.1 is the conceptual framework of the study. The researchers patterned this in Michael Grossman's Demand for Health. This means that as the variables in the first column (which also represents the utility of the city) are measured and analyzed, it will directly answer the objectives and goals of the study in the second column. Lastly, it will determine the effect of healthcare on the overall competitiveness of the City of Santiago, Isabela.

3. Methodology

3.1. Research Design

This study utilized a quantitative research method wherein it is all about the collection and the analysis of structured data that can be measured in numbers. The primary aim of this quantitative research method is to produce accurate and credible measurements that can be utilized for statistical analysis, specifically in relationships. With that being said, the result of this method usually covers the behaviours and trends, but it must take note that it does not provide perceptions on how and why individuals respond in various ways (Goertzen, 2017). This study also utilizes descriptive statistics to answer the major questions such as what, where, who, and even to what extent. Additionally, it provides measurements like percentages, proportions, and frequencies. Whether the objective is to identify and describe trends and variations and establish new phenomena, the descriptive research method is important (Loeb, 2017). This method is applied because it will directly answer the research questions, and it is usually useful and crucial in the field of economics. In line with this, this study used both primary sources and secondary sources.

3.2. Research Locale

The locale of this study is conducted at the City of Santiago, Isabela. It is selected by the researchers to further analyze the effect of healthcare on the city's competitiveness. The study is implemented on the residents of the City of Santiago. The City of Santiago is known for housing the biggest hospitals in region 2. Some of its private hospitals are Callang General Hospital, De Vera's Medical Center and Medical Center, Santiago Medical Center, and Santiago Adventist Hospital. The Southern Isabela Medical Center is one of the biggest public hospitals in the entire region. The city of Santiago's location also gave rise to the growth of smaller hospitals like Corado Hospital and Renmar Hospital. In 2016, the City of Santiago was declared as the fastest growing local economy in the entire Philippines and was able to grab the 51st rank in terms of economic size among all cities in the country. And for the year 2020, the City of Santiago landed on the 30th ranked in terms of economy size among all cities in the country.

3.3. Data

This study employed all primary and secondary data that are related to the contribution of healthcare to the overall competitiveness of Santiago City, Isabela. In primary data, the researchers produced online surveys and physical questionnaires that were gathered from the sample respondents. In addition, this study utilized the secondary data from the City of Santiago Office of the Mayor, City Health Office of Santiago, and City of Santiago Planning and Development Office. This study applied pooled series data because this includes data from 2000 to 2020 to measure the changes to healthcare and the overall competitiveness alongside other variables over the same period of time and cross-sectional data since the researchers also gathered data through survey questionnaires. The researchers were able to obtain a total of 21 observations.

Specific Objective No.1: To determine the influence of the healthcare state on the economic competitiveness of the City of Santiago, Isabela.	
Dependent Variable	**Definition**
Competitive Index	This refers to the annual measurement regarding the city's performance and represents the city's competitiveness considering its economic dynamism, government efficiency, and infrastructure. The lower the index is, the city is more competitive.

Independent Variables	**Definition**	**Assumption**
Annual Number of Patients	This refers to the increase and decrease of the number of patients annually.	Positive Relationship
Healthcare Expenditure	This refers to the amount spent by the city government on healthcare and others related to it.	Inverse Relationship
Healthcare Facilities	This refers to all health facilities that improve the quality of health and healthcare.	Inverse Relationship

Specific Objective No.4: To measure the effect of healthcare inputs on the level of mortalities in the City of Santiago, Isabela.	
Dependent Variable	**Definition**
Mortality Rate	This refers to the ratio of death to the population of the city per year caused by an event or an ailment.

Independent Variables	**Definition**	**Assumption**
Number of Healthcare Infrastructures	This refers to all health facilities that improve the quality of health and healthcare.	Inverse Relationship
Number of General Practitioners	This refers to the doctors that provide primary health care to patients.	Inverse Relationship
Number of Medical Specialists	This refers to the doctors that have advanced education in a specific field of medicine and health.	Inverse Relationship
Number of Hospital Beds	This refers to a bed designed for patients who are in need of healthcare.	Inverse Relationship

3.4. Sample and Sampling Techniques

Based on the Philippine Statistics Authority census last 2015, the City of Santiago, Isabela, has 134,830 population with 30,158 households. In measuring the number of sample sizes in this study, the researcher uses the Slovin formula. This formula is used to determine the number of samples from a given population. The sample of this study is 399 respondents, by using the Slovin formula:

$$n = \frac{N}{1 + Ne^2}$$

Where,
n = Number of samples

N = Total population
e = Margin of error

$$n = \frac{134{,}830}{1 + (134{,}830)(0.05)2}$$

$$n = \frac{134{,}830}{1 + 337.075}$$

$$n = \frac{134{,}830}{338.075}$$

$$\mathbf{n = 398.82}$$

This study also adopted the convenience sampling technique under non-probability sampling. According to Taherdoost (2016), this sampling technique is utilized if participants are being selected for the reason that they are often readily and easily available. Malthora & Birks (2006) claims that convenience sampling is known as the most economical and least time-consuming of all sampling techniques. The sampling units that are to be gathered are accessible and much easy to measure. Considering the current situation in the City of Santiago, Isabela being under Modified Enhance Community Quarantine (MECQ) since the year 2020; the researchers made sure that they will employ the most convenient way of gathering data from the residents of the City of Santiago that will be further assessed to procure the data that best fits the objectives of the study.

3.5. Research Procedure on Data Collection

Since this study applied convenience sampling, the researchers distributed the online survey form (google form) through posting on social media platforms while the physical questionnaires were handed to the individuals who were more comfortable in answering through paper and a pen. Rest assured that safety protocols are being followed by the respondents and the researchers during the time of data collection. Moreover, the study also requires secondary data from the City of Santiago Office of the Mayor, City Health Office of Santiago and City of Santiago Planning and Development Office. The secondary data was obtained through government publications and databases. The researchers made sure that they followed the proper method of data collection from the said associations through answering forms and furnishing permission letters to the authorities.

3.6. Research Instrumentation

The research instrument for the study's primary data is a research-made questionnaire to gather the needed data from the respondents. On the other hand, government publications and databases are the research instrument for secondary data. The draft of the research-made questionnaire is formulated based on the collated related literature, other scholarly articles, and informal interview with the respondents. The survey also undergoes pilot testing in order to know if the questionnaires can be understood easily that the researchers wish to provide through online google forms and physical questionnaires. The selected respondents for this study are any representative from each household ages 18 years old and above in the City of Santiago, Isabela. The research instrument for primary data consists of three (3) parts. Part one (1) consists of the demographic profile, such as sex, occupation, and others. Part two (2) of the research instrument is for health-related questions that contain 4 questions. Lastly, part three (3) comprises the consumer's preference in acquiring healthcare services that are formulated using the rank order scaling. The total number of questions is nine (9) questions that require five (5) minutes of answering.

3.7. Content Validation of the Research Instrument

The validator of this research instrument has a PhD in Urban and Regional Planning, Former Regional Director at National Economic and Development Authority (NEDA), Former Department of Disaster Risk and Management (DRRM) Specialist, and a Health Economics professor at the University of Santo Tomas. The validator assessed the applicability of the questionnaires and the secondary data to the study. Revisions are made. After adopting all the corrections and suggestions, the validator confirms the relevance of the chosen research instrument to the objectives and research questions.

3.8. Construct Validation of the Research Instrument

The validators in the test run of the research instrument are the 15 individuals residing in the City of Santiago, Isabela. The research questionnaires were disseminated during the month of June 2021 and were collected five (5) days after. The results are analyzed to strengthen the reliability of the survey questionnaires to the study.

3.9. Ethical Considerations

To complete the study complying with appropriate research guidelines, the researchers made sure that they had considered several ethical considerations. Connelly (2014) states that in every research study, the researchers are responsible for reporting on the ethical considerations of their research towards their respondents and must always exercise ethical schemes in acquiring resources or data from other studies. For acquiring primary data, online and physical questionnaires, the researchers provided a brief explanation about the background and purpose of the study and that the data that will be collected from the participants will remain confidential and will only be used for research purposes only. The researcher assigned to collecting the data will strictly observe social distancing and will abide by the protocols mandated by the authorities. After the participants of online questionnaires are done, there will be an automated email sent to them disclosing their answers for them to examine if everything was answered correctly, and if not, they can contact the researchers from the given email address and contact numbers that will be indicated. For the participants of physical questionnaires, the researchers will allow two (2) to (3) days for the participants to complete the survey and for them to further examine possible corrections. In addition, the acquiring of secondary data was performed by the researchers by providing a formal letter addressed to the head of the chosen departments, which for this study are the City of Santiago Office of the Mayor, City Health Office of Santiago and City of Santiago Planning and Development Office. For the studies that were quoted and used as a reference, the researchers made certain that everything was cited correctly and was listed on the reference list.

3.10. Statistical analysis

The data gathered from the online survey and physical questionnaires are examined using descriptive analysis and statistics to accumulate the results in weighted mean with ranking, cross tabulation, frequencies, and percentages. Furthermore, for the researchers to measure the relationship and the effect, pooled ordinary least square analysis was used for the study through the Eviews 11 software. The regression analysis is an effective statistical analysis method in indicating a relationship between response and the number of associated variables. The multiple regression has one dependent variable and two or more independent variables. There are five (5) steps to follow in getting the regression results: first, design experiments and collect data. Second, determine the regression model. Third, scrutinize the reliability of the model. Fourth, drop variables or outliers if present for validity. Fifth, analyze the results (Ye et al., 2017). This study applied multiple regression because it has various independent variables that determined the research questions and research objectives. Below is the formula for multiple regression:

$$Yi = \beta 0 + \beta 1\ (X1) + \beta 2\ (X2) + \beta 3\ (X3) + \ldots\ldots\ldots \mu$$

Where,

Yi = Dependent Variable

β0 = Population Y-Intercept

β1 = Population Slope Coefficient

X1, X2, X3 = Independent Variables

μ = Random Error Term

All data collected are analyzed, tabulated, and interpreted in order to answer the research objectives and questions.

3.11. Econometric Model

Specific Objective No.1: To determine the influence of the state of healthcare on the economic competitiveness of the City of Santiago, Isabela.

Competitive Index = β0 + β1 (Annual Number of Patients**) + β2 (**Health Expenditure**) + β3 (**Health Facilities) + **μ**

Where,
Competitive Index = Dependent Variable
β0 = Population Y-Intercept
β1 = Population Slope Coefficient

Annual Number of Patients **=** Independent Variable
Healthcare Expenditure **=** Independent Variable
Health Facilities **=** Independent Variable

μ = Random Error Term

Specific Objective No.4: To determine the effect of healthcare inputs on the level of mortality incidence in the City of Santiago, Isabela.

Mortalities = **β0 +β1** (Number of Hospital Beds) **+ β2** (Number of General Practitioners) **+ β3** (Number of Medical Specialists) **+ μ**

Where,
Mortalities = Dependent Variable
β0 = Population Y-Intercept
β1 = Population Slope Coefficient
Number of Hospital Beds = Independent Variable
Number of General Practitioners = Independent Variable
Number of Medical Specialists = Independent Variable
μ = Random Error Term

3.12. Coefficient of Determination

The coefficient of determination is abbreviated as R-Squared (R^2), wherein it measures the portion of the variation of the dependent variable to the independent variable/s in the model. To put it in a simpler way, this coefficient of determination is used to know the total variation of the dependent variable to the impact and effect of the independent variable (Zhang,2016). The researchers worked through economic software such as Eviews in order to obtain results.

3.13. Test for the Individual Significance

The P-values are used to assess the statistical significance of the observed results in natural and social sciences. These can be identified into two hypotheses, such as the null hypothesis, where it states that there is no significant difference and effect to the treatment of the variable. The other one is the alternative hypothesis, where it represents the assumption that the null hypothesis is not true. The significance level, also known as the alpha (α) = 0.05, is the method to measure its impact (Shrestha, 2019). The researchers also applied the 5% level of significance in the individual significance.

3.14. Test for the Overall Significance of the Model

The F-test of overall significance is applied to establish how well the obtained regression line fits the given data points. The F-test of overall significance involves numerous issues, and the mathematics involved is challenging, specifically if two or more variables are present (Sureiman & Mangera, 2020).

3.15. Test for Multicollinearity

The multicollinearity exists when two (2) independent variables or more are correlated through Variance Inflation Factors (VIF). This multicollinearity will lead to problems if it is not solved or even treated (Daoud, 2017). The researchers undergo the independent variables to Variance Inflation Factors through Eviews in order to establish a good model. If it has high results, the researchers treat it by adding more observations, dropping a variable, and or ignoring it.

3.16. Test for Serial Correlation

The serial correlation is a frequent matter in time series data and pooled series data. It is an uncomplicated way to examine and analyze if a fundamental problem occurs (Lee & Park, 2016). The researchers adopted the Durbin Watson test and the Breusch-Godfrey Serial Correlation LM Test in this study.

3.17. Test for Misspecification

The misspecification is a terrible problem in the regression analysis, and it is required to determine the optimal number of variables that have the greatest influence on the model's dependent variables (Mahaboon et al., 2019). To know if there's misspecification, the researchers utilized the Ramsey RESET test in this study.

3.18. Test for Heteroscedasticity

Heteroskedasticity is the variation in non-constant error variance. In other words, once the independent variables are included in the regression, the remaining residual variability changes as a function of something not included in the model (Astivia & Zumbo, 2019). The researchers use the residual square scatter plot method to compare the fitted values of the independent variable. The researchers used various tests for heteroskedasticity to obtain accurate estimates, such as Breusch-Pagan-Godfrey Test.

3.19. Test for Normality

The test for normality applies to check for the data normality assumption violation. The interpretation and results may not be reliable if this violation is present, and it is a must to check its normality (Rana et al., 2021). The researchers implied normality tests and considered variables as statistically significant and normally distributed when their significance is less than 0.05 (5% level of significance) using the Jarque-Bera.

4. Results and Discussion

4.1. Healthcare Status and Economic Competitiveness

To determine the influence of the healthcare state on the economic progress of the City of Santiago, Isabela, Philippines; the researchers used the following methods:

- Descriptive Statistics
- Inferential Statistics

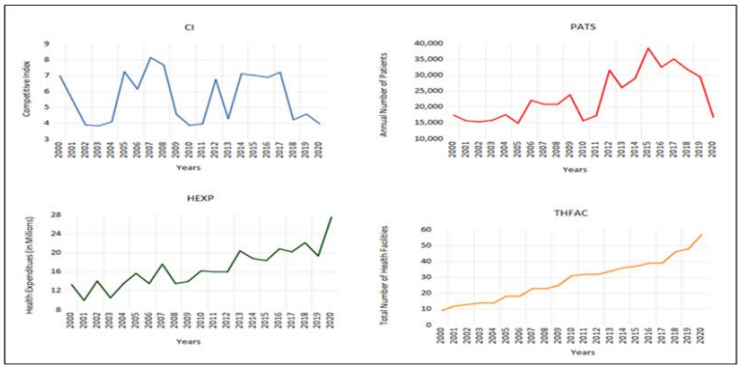
Table 4.1. Descriptive Statistics

	CI	PATS	HEXP	THFAC
Mean	5.626938	23268.10	16.75429	28.571243
Median	5.493200	20812.00	16.00000	31.00000
Maximum	8.136400	38540.00	27.50000	57.00000
Minimum	3.839700	14852.00	10.00000	9.000000
Std. Dev.	1.543254	7551.650	4.169067	13.25734
Skewness	0.131838	0.528518	0.605460	0.315977
Kurtosis	1.3365030	1.904966	3.318015	2.241695
Jarque-Bera	2.482154	2.026870	1.371529	0.852594
Probability	0.289073	0.362970	0.503705	0.652922
Sum	118.1657	488630.0	351.8400	600.0000
Sum Sq. Dev	47.63266	1.14E+09	347.6223	3515.143
Observations	21	21	21	21

Ho: Normally Distributed Data
Ha: Not Normally Distributed Data

The Jarque-bera probability values revealed that all the individual variables show that 0.289073 (CI), 0.362970 (PATS), 0.503705 (HEXP), and 0.652922 (TFHAC) are greater than the 5% significance level. Therefore, we do not reject the null hypothesis that the data are normally distributed.

Figure 4.1. The trend of Annual Competitive Index, Annual Number of Patients, Annual Health Expenditure, Total Annual Healthcare Facilities from 2000-2020



The graph for the Competitive Index displayed that there was a sharp increase and decrease from the year 2000 to the year 2020. The lowest Competitive Index was obtained in 2003, and the highest index was recorded in 2007. Similarly, the Annual Number of Patients and Annual Healthcare Expenditure graph exhibited an increase and decrease of particulars. The graph showed that the lowest recorded total number of patients was in 2003, and the highest was in 2015. The Annual Healthcare Expenditure exhibited an extensive increase in recent years and recorded the smallest allocation happened in 2001. On the other hand, the Annual Total Number of Health Facilities in the City of Santiago, Isabela, Philippines, between the periods of 2000 to 2020 consistently showcased an upward increase over the years

Table 4.2. Pooled Ordinary Least Square Multiple Regression

Dependent Variable: LOG(CI)
Method: Least Squares
Date: 11/17/21 Time: 00:31
Sample: 2000 2020
Included Observations: 21

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.670959	2.090248	-2.234644	0.0392
LOG(PATS)	0.633980	0.210924	3.005721	0.0080
HEXP	0.038791	0.030643	1.265911	0.2226
THFAC	-0.022115	0.010451	-2.116080	0.0494

R-Squared	0.369797	Mean dependent var	1.690899
Adjusted R-squared	0.258584	S.D. dependent var	0.278750
S.E. of regression	0.240019	Akaike info criterion	0.153444
Sum squared resid	0.979353	Schwarz criterion	0.352401
Log likelihood	2.388838	Hannan-Quinn criter.	0.196623
F-statistic	3.325141	Durbin-Watson stat	2.101903
Prob(F-statistic)	0.044674		

Individual Significance

Since the computed t-value probability of the regressors total annual patients (PATS) and annual total healthcare facilities (THFAC) are less than 5% level of significance, **therefore, we reject the null hypothesis, which states that there is no significant impact between X and mentioned Y variables.**

However, the regressor healthcare expenditure (HEXP) resulted in a t-value probability greater than 5% percent level of significance; therefore, for this specific variable, we accept the null hypothesis, which states that there is no significant impact between the X and the Y variable. The coefficients of total annual patients (PATS) and annual health expenditure (HEXP) are positive, which indicate a direct impact on the competitive index. On the other hand, the coefficient of a total number of healthcare facilities (TFAC) is negative, which posits an inverse impact on the competitive index.

Overall Significance and Coefficient of Determination

Since the computed F-value is 0.04476, which is below the 5% level of significance, **therefore, we reject the null hypothesis, which states that the explanatory variables have no significant effect on the explained variable when taken collectively.**

In this estimation, the R2 value is 0.3698, which suggests that 36.98 percent of the variation in the change of Competitive Index was explained by the variations in the Patients, Healthcare Expenditure, and a Total number of Healthcare Facilities.

Regression Equation

$$\log(CI) = -4.670959 + 0.633980 \log(PATS) - 0.02215\ THFAC + \mu$$

The regression equation explained that if all variables are equal to zero, the competitive index will be equal to -4.670959. **A percentage increase in PATS will cause CI to increase by 0.63 percent, ceteris paribus, and vice-versa. An additional health facility would decrease the competitive index by 0.02 percent, ceteris paribus, and vice-versa.**

The competitive index represents the city's competitiveness considering its economic dynamism, government efficiency, and infrastructure. Indexes are used as a statistical measure to calculate economic components where, as the index becomes closer to one (1), the better economic outturn and vice versa.

With that being said, based on the regression analysis, an additional increase in patients will cause the competitive index to increase, which implies that the economic competitiveness of the City of Santiago, Isabela, will also diminish. In addition, an increase in health facilities would decrease the competitive index, which means that the economic competitiveness of the City of Santiago, Isabela, will progress. The results obtained are related to the study of Boyce and Brown (2019) that health contributes to economic and social progress; it generates positive consequences towards the economic performance of other sectors in the entire economy. Furthermore, various diagnostic tests were conducted in order to examine and strengthen the model.

Table 4.3. Test for Multicollinearity

Variance Inflation Factors
Date: 11/17/21 Time: 0:33
Sample: 2000 2020
Included observations: 21

Variable	Coefficient Variance	Uncentered VIF	Centred VIF
C	4.369135	1592.665	NA
LOG(PATS)	0.044489	1625.343	1.548613
HEXP	0.000939	101.7418	5.664340
THFAC	0.000109	39.16511	6.664292

Ho: There is no perfect multicollinearity
Ha: There is perfect multicollinearity

The centered VIF showed that PATS was 1.548613, HEXP was 5.664340, and THFAC was 6.664292, which is less than 10 that represents the absence of perfect multicollinearity. **Therefore, we do not reject the null hypothesis, which indicates that there is no perfect multicollinearity between the independent variables.**

Table 4.4. Test for Serial Correlation: Durbin Watson Autocorrelation

Durbin-Watson stat
2.101903

Ho: There is No First Order Autocorrelation
Ha: There is First Order Autocorrelation

This displays the test for serial correlation through the Durbin-Watson Test, and its value is 2.101903, which is between the range of 1.5 to 2.5. **Therefore, we do not reject the null hypothesis, which states that there is no first-order autocorrelation.**

Table 4.5. Breusch-Godfrey Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:
Null Hypothesis: No serial correlation at up to 3 lags

F-statistic	0.344488	**Prob. F(3,14)**	0.7936
Obs*R-squared	1.443628	**Prob. Chi Square(3)**	0.6953

Ho: There is No Serial Correlation at up to 3 lags
Ha: There is a Serial Correlation at up to 3 lags

The degrees of freedom 3 and 14 with the probability of chi-squared 0.6953, which is greater than the 5% significance level and states that **we do not reject the null hypothesis that there is no serial correlation at up to 3 lags.**

Table 4.6. Ramsey RESET Test

Ramsey RESET Test Equation: UNTITLED Omitted Variables: Powers of fitted values from 2 to 4 Specification: LOG(CI) C LOG(PATS) HEXP THFAC			
	Value	**df**	**Probability**
F-statistic	0.204896	(3, 14)	0.8913
Likelihood ratio	0.902365	3	0.8249

Ho: There is the absence of misspecification error
Ha: There is a misspecification error

The t-statistic and F-statistic computed p-value is 0.8913, which is greater than the 5% significance level. **Therefore, we do not reject the null hypothesis, and there is the absence of misspecification error.**

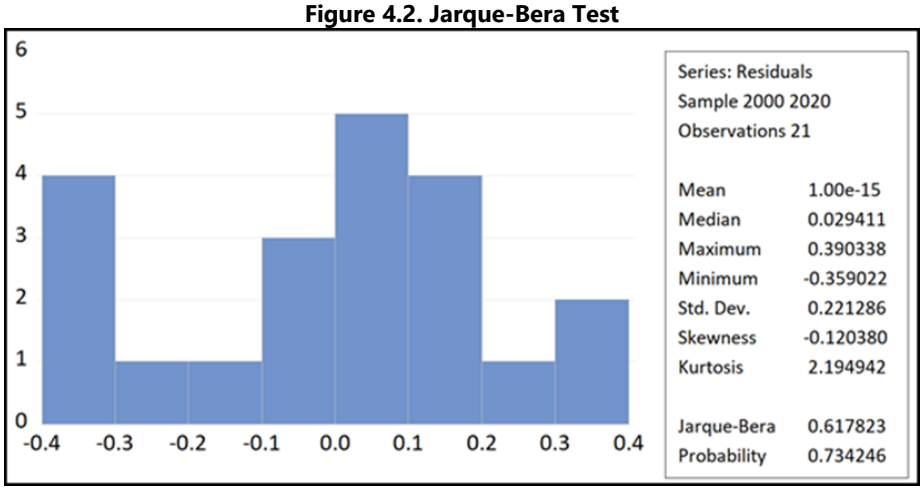
Table 4.7. Breusch-Pagan-Godfrey Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey Null Hypothesis: Homoskedasticity			
F-statistic	1.598550	Prob. F(3,17)	0.2267
Obs*R-squared	4.620585	Prob. Chi-Square(3)	0.2018
Scaled explained SS	1.809144	Prob. Chi-Square(3)	0.6129

Ho: The data is homoscedastic
Ha: The data is heteroscedastic

The P-value corresponds to the Chi-Square test statistic of 0.2267, and it is more than 5% level of significance. **Therefore, we do not reject the null hypothesis and conclude that homoscedasticity is present in the data.**

Figure 4.2. Jarque-Bera Test



Ho: Normally Distributed Data
Ha: Not Normally Distributed Data

The graphical presentation of the residuals was normally distributed because of the bell-shaped curve. As shown, the p-value of the Jarque-Bera statistics is 0.734246, which is greater than the 5% level of significance. With that being said, **we do not reject the null hypothesis, which states that the data is normally distributed.**

4.3 Determinants to the Demand for Healthcare based on sex

In order to identify the determinants that contribute to the demand for healthcare, the researchers used primary data, which are presented in the succeeding discussions.

Demographic Factors

Table 4.7. Sex of the Respondents

Sex	Frequency	Percentage
Male	203	50.75
Female	197	49.25
Total	400	100.00

There were 50.75% (203) male respondents that represented most of the sample size. The remaining 49.25% (197) were females. This implied that most of the population in Santiago, Isabela is male, and it is inclined in the released data of Santiago City Population Structure wherein the male sex group were 50.5%, and the female sex group were 49.5%.

Medical Related Factors

Table 4.8. Health State of the Respondents based on Sex

	Best Health		**Good Health**		**Moderate Health**		**Worst Health**		**Total**	
Sex	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Total Frequency	Total Percent
Female	44	11.00	134	33.50	18	4.50	1	0.25	197	**49.25**
Male	81	20.25	109	27.25	13	3.25	0	0.00	203	**50.75**
Total	125	31.25	243	60.75	31	7.75	1	0.25	**400**	100.00

Males who were experiencing best health were 20.25% (81); males were mainly perceived as having good health with 27.25% (109); the other 3.25% (13) males had moderate health out of 203 male respondents, which represents the 50.75% of the total respondents. On the other side of the sex classification, females who possessed the best health were only 11.00% (44); females who encountered good health were more than half of it with 33.50% (134); only a few females who faced moderate health with 4.50% (18); and only one suffered from worst health with 0.25% out of 197 female respondents which portray the remaining 49.25% of the total respondents. Overall, as shown, the majority of respondents encountered good health with 60.75% (243), followed by the best health, which embodies the 31.25% (125) of both sex; then, 7.75% (31) respondents of both sex described that they have moderate health; and only 0.25% (1) stated that she experienced worst health.

In this part, best health was defined as no problem with walking, self-care, usual activities, pain or discomfort, anxiety, or depression. Then, good health was detailed as no problem with walking, self-care, usual activities, but there was a moderate problem with pain or discomfort, anxiety, or depression. Then, the moderate problem was comprehensive as some problems with walking, self-care, usual activities and moderate problems with pain or discomfort, anxiety, or depression. Lastly, the worst health was denoted as an extreme problem with at least one of the following such as walking, self-care, usual activities, pain or discomfort, anxiety, or depression.

This indicated that males experience a better health state rather than females. In addition, this is connected to the study of Oksuzyan et al. (2018), numerous researches indicated that women are more prone to report poor health than men of all ages. There are three major explanations for this gender disparity that are frequently cited: gender disparities in morbidity profiles, gender disparities in health reporting, and gender disparities in socioeconomic determinants of health. In addition, Bang et al. (2017) also discussed that women have more functional impairments than men.

Table 4.9. Prevalent Health Conditions of Both Sex

Health Conditions based on Sex														
Sex	**High Blood Pressure**		**Asthma**		**Diabetes**		**Stomach Ulcers**		**Infection**		**Other Health Conditions**		**Total**	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Total Frequency	Total Percent
Female	43	15.64	35	12.73	29	10.55	15	5.45	9	3.27	25	9.09	156	56.73
Male	38	13.82	25	9.09	24	8.73	7	2.55	7	2.55	18	6.55	119	43.27
Total	81	29.45	60	21.82	53	19.27	22	8.00	16	5.82	43	15.64	**275**	**100.00**

The results found that the high blood pressure was more prevalent in females with 15.64% (43); followed by asthma with 12.73% (35); then, diabetes with 10.55% (29); then, stomach ulcers with 5.45% (15); then, infection with 3.27% (9); and other health conditions with 9.09% (25) such as kidney failure, lung and heart disease that can be found in appendices. On the other hand, males with high blood pressure consisted of 13.82% (38) of the total respondents; followed by asthma with 9.09% (25); then, diabetes with 8.73% (24); then, stomach ulcers with 2.55% (7); then, infection with 2.55% (7); and other health conditions with 6.55% (18). Overall, for both sex, high blood is the most prevalent health condition in the City of Santiago, Isabela, with 29.45% (81) of the 275 respondents having it. The second prevalent health condition is asthma, with 21.82% (60) respondents. The third prevalent health condition is diabetes, with 19.27% (53). The fourth prevalent health condition is stomach ulcer, with 8.00% (22). The fifth prevalent health condition is an infection, with 5.82% (16), while the other health condition that can be seen in the appendices comprises 15.64% (43) of the 275 respondents.

Even in city provinces like Santiago City, high blood pressure is placed first, and it was also written that cardiovascular diseases (CVDs) and stroke have continued to be the major causes of death in the Philippines for more than four decades. Hypertension (HTN) is a significant risk factor for cardiovascular disease (CVD) and stroke and has been linked to the mortality of tens of thousands of Filipinos each year (Castillo et al., 2020). This was also correlated with Bang et al. (2017), where the largest stated chronic diseases are hypertension, cardiovascular-related diseases, gastrointestinal diseases, and even musculoskeletal disorders. The self-rated health status, BMIs, age, and the count of the non-communicable diseases are still significant forecasters of healthcare.

Table 4.10. Medical Care Behavior and Chosen Health Facility based on Sex

Seeking Treatment							**Chosen Facility**					
	Yes		**No**				**Public Hospitals**		**Private Hospitals**		**Total**	
Sex	Frequency	Percent	Frequency	Percent	Total	Total Percent	Frequency	Percent	Frequency	Percent	Total Frequency	Total Percent
Female	172	43.00	25	6.25	197	**49.25**	43	10.75	154	38.50	197	**49.25**
Male	171	42.75	32	8.00	203	**50.75**	55	13.75	148	37.00	203	**50.75**
Total	343	85.75	57	14.25	**400**	**100.00**	98	24.50	302	75.50	**400**	**100.00**

Results showed that 43.00% (172) females chose to seek medical treatment in times of need and the other 6.25% (25) did not. Moreover, 38.50% (154) females preferred to be treated at the private hospitals and the other 10.75% (43) chose public hospitals instead. On the other hand, 42.75% (171) males sought medical treatment, and the other 8.00% (32) did not consider having medical treatment. In addition, males mostly selected private hospitals with 37.00% (148) while the remaining 13.75% (55) males opted to consult in public hospitals. Overall, 85.75% (343) of both sex groups chose to seek medical treatment. In addition, 75.50%

(302) decided to seek care in private hospitals, and the other 24.50% (98) sought care in public hospitals. The remaining 14.25% (57) respondents do not seek care in times of need.

There is a major difference in seeking medical treatment based on sex. A research study conducted by Thompson et al. (2017) specifically investigated the extent of women's and men's healthcare-seeking behaviours in response to mental and physical health concerns. The study showed that women were more likely than men to visit a family physician for both physical and mental health concerns. The reduction of the gender divide in education has had a significant impact on female survival rates and affects child mortality rates. As women acquired a greater understanding of healthy lifestyles, both mothers and their children's health improved during pregnancy and the first years of life together with their own life (Oksuzyan et al., 2018). In addition, results showed that females prefer private hospitals rather than males. As stated in the study of Keesara et al. (2017), in developing countries, over 40% of women seek health care services from the private sector because they feel that private providers provide the benefits of ease, efficiency, and privacy, even though they do not always give high-quality care.

Socioeconomic Factors

Table 4.11. Acquisition of Health Insurances based on Sex

	With Insurance		**Without Insurance**		**Total**	
Sex	Frequency	Percent	Frequency	Percent	Total Frequency	Total Percent
Female	123	30.75	74	18.50	197	**49.25**
Male	119	29.75	84	21.00	203	**50.75**
Total	242	60.50	158	39.50	**400**	100.00

Based on the procured data, more than half of the female group appeared to have already insured their health with 30.75% (123). The remaining 18.50% (74) shared that they decided not to have health insurance up to now. On the other side, most male groups, with 29.75% (119), declared that they are also health insured, while the other 21.00% (84) disclosed that they are not health insured. This represented that out of two sex groups; females acquire health insurance more than males.

Since women pay higher and acquire more medical insurance premiums than men, insurance companies frequently provide women-centric plans that include maternity insurance (Future Generali India Life Insurance Company, n.d.). According to the study of the National Women's Law Center entitled, Insurance Discrimination Against Women Today and the Affordable Care Act, when it comes to health insurance, women are considered at higher risk than men because they tend to visit the doctor more frequently, live longer, and have babies. To further support the obtained results, a study by Mulenga (2017) shows that men who reside in rural areas have a lower probability of having healthcare insurance.

Table 4.12. Female Occupations and Acquisition of Insurances

Female								
Occupation			**With Insurance**		**Without Insurance**		**Total**	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Total Frequency	Total Percent
Managers	16	8.12	15	7.61	1	0.51	16	**8.12**
Professionals	54	27.41	40	20.30	14	7.11	54	**27.41**
Technicians and associate professionals	7	3.55	6	3.05	1	0.51	7	**3.55**
Clerical support workers	37	18.78	21	10.66	16	8.12	37	**18.78**
Service and sales workers	27	13.71	11	5.58	16	8.12	27	**13.71**

Skilled agricultural, forestry and fishery workers	2	1.02	0	0.00	2	1.02	2	**1.02**
Craft and related trades workers	5	2.54	4	2.03	1	0.51	5	**2.54**
Plant and machine operators and assemblers	2	1.02	1	0.51	1	0.51	2	**1.02**
Elementary occupations	13	6.60	7	3.55	6	3.05	13	**6.60**
Armed forces occupations	2	1.02	2	1.02	0	0.00	2	**1.02**
Student	32	16.24	16	8.12	16	8.12	32	**16.24**
Total	**197**	**100.00**	123	62.44	74	37.56	**197**	100.00

For table 4.12 and 4.13, the researchers defined the following occupations based on the Philippine Standard Occupational Classification of Philippine Statistics Authority:

- **Managers.** These are the individuals who direct, plan, and assess the overall activities of businesses, governments, and other organizations, as well as the actions of organizational units within them, as well as establish and review their policies, laws, rules, and regulations.
- **Professionals.** These individuals contribute to the existing body of knowledge, implement scientific or creative concepts and theories, educate about the foregoing in a methodical manner, or engage in any combination of these activities.
- **Technicians and Associate Professionals.** These individuals generally handle technical labor relating to the scientific or creative study, operational procedures, and government or commercial laws.
- **Clerical Support Workers.** These are the people who document, arrange, store, calculate, and retrieve information connected to and conduct a variety of administrative responsibilities associated with money handling operations, travel plans, information requests, and appointments.
- **Service and Sales Workers.** These are the group of individuals that provide housekeeping, travel, personal care, catering, and protection against fire and unlawful activities, or display and sell items in wholesale or retail stores and similar establishments, including stalls and marketplaces.
- **Skilled agricultural, forestry and fishery workers.** These people work hard to provide the basic necessities (food, house, and the like) for themselves and their families through planting and harvesting crops (and the like) together with taking care of the other aquatic life creatures.
- **Craft and related trades workers.** These are the individuals who utilized their gained knowledge and skills in order to create and construct buildings, metals, machines, equipment, together with textiles and handcrafted goods.
- **Plant and machine operators and assemblers.** These are the people who are in charge of the operation of the machines and equipment, whether in the industrial field.
- **Elementary occupations.** These are the individuals who execute simple work with the help of tools and physical strength.
- **Armed forces occupations.** These are the people who are a member and works in the army, military, and even air force services.
- **Students**. These refer to the undergraduate students, master students, and doctorate students.

The researchers discovered that the first common occupation for females were professionals with 27.41% (54), and almost two-thirds have health insurance with 20.30% (40). The second common occupation for females were clerical support workers with 18.78% (37), and almost half the said workers acquired health insurance with 10.66% (21). The third common occupation for females were students with 16.24% (32), and again, half of them have health insurance with 8.12% (8). The fourth common occupation for females were service and sales workers, with 13.71% (27) and only 5.58% (11) invested in health insurance. The fifth common occupation for females were managers with 8.12% (16). Additionally, 7.61% (15) of the female managers invested in health insurance. The other occupations for females were elementary occupations with 6.60% (13) and 3.55% (7) of it were health insured; technicians and associate professionals with 3.55% (7) and 3.05% (6) are also decided to have health insurances; craft and related trades workers with 2.54% (5) and 2.03% (4) acquired health insurances; skilled agricultural, forestry and fishery workers with 1.02% (2) and none of them are insured in health; and armed forces occupation with 1.02% (2) and both of them are 1.02% (2) insured. With that being said, a total of 197 female respondents were explained.

Based on the results, females who belong to the upper-class level of occupation have health insurance. In addition, the Kaiser Family Foundation (2020) declared that women generally received their health coverage from employer-sponsored insurance. Women in families with at least one full-time worker are more likely to have job-based health insurance coverage having 71%, than women in families with only part-time workers, 30% or without any work 17%.

Table 4.13. Male Occupations and Acquisition of Insurances

Male								
Occupation			**With Insurance**		**Without Insurance**		**Total**	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Total Frequency	Total Percent
Managers	24	11.82	18	8.87	6	2.96	24	**11.82**
Professionals	38	18.72	31	15.27	7	3.45	38	**18.72**
Technicians and associate professionals	18	8.87	13	6.40	5	2.46	18	**8.87**
Clerical support workers	20	9.85	10	4.93	10	4.93	20	**9.85**
Service and sales workers	31	15.27	11	5.42	20	9.85	31	**15.27**
Skilled agricultural, forestry and fishery workers	7	3.45	6	2.96	1	0.49	7	**3.45**
Craft and related trades workers	6	2.96	4	1.97	2	0.99	6	**2.96**
Plant and machine operators and assemblers	8	3.94	6	2.96	2	0.99	8	**3.94**
Elementary occupations	15	7.39	5	2.46	10	4.93	15	**7.39**
Armed forces occupations	10	4.93	8	3.94	2	0.99	10	**4.93**
Student	26	12.81	7	3.45	19	9.36	26	**12.81**
Total	**203**	**100.00**	119	58.62	84	41.38	**203**	100.00

Based on the procured data, the researchers found out that the first frequent occupations for males were professionals, with 18.72% (38) and 15.27% (31) being health insured. The second most common occupation for males were services and sales workers, with 15.27% (31) and 5.42% (11) deciding to invest in health insurance. The third most frequent occupation for males were students, with 12.81% (26) and 3.45% (7) being health insured. The fourth most frequent occupation for males were managers, with 11.82% (24) and 8.87% (18) having health insurance. The fifth most frequent occupation for males were clerical support workers with 9.85% (20), and half of them were already insured; 4.93% (10).

The other occupations for males were technicians and associate professionals with 8.87% (18) and 6.40% (13) were health insured; elementary occupations with 7.39% (15) and 2.46% (5) were only decided to invest in health insurance; armed forces occupation with 4.93% (10) and 3.94% (8) were also insured; plant and machine operators and assemblers with 3.94% (8) and 2.96% (6) acquired health insurances; skilled agricultural, forestry and fishery workers with 3.75% (7) and 85.71% (6) were already insured in health; craft and related trades work with 2.96% (6) and 1.97% (4) also acquired health insurances. With that being said, a total of 203 male respondents were discussed.

The common occupation for both sex groups for males and females were almost the same, only the rankings of it differ. The occupation also represents their educational attainment and socioeconomic status. This explains that females and males who belong to the upper-class level of occupation have health insurance because of the association between education, employment, and health. According to Oksuzyan et al., 2018, there are two fundamental explanations why education, employment, and health are correlated to each other: first, more educated individuals are more likely to have access to information and knowledge essential

to living a healthy lifestyle. Second, education and employment are socioeconomic indicators that indicate an individual's economic capacity to acquire health-protective commodities.

Table 4.14. Major Insurances Acquired based on sex

Sex	Pru Life		Sun Life		Manu Life		Coco Life		Philam Life		Other Insurances		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percentage	Total Frequency	Total Percent
Female	28	11.57	27	11.16	26	10.74	24	9.92	13	5.37	12	4.96	**130**	53.72
Male	17	7.02	16	6.61	15	6.20	14	5.79	7	2.89	43	17.77	**112**	46.28
Total	45	**18.60**	43	**17.77**	41	**16.94**	38	**15.70**	20	**8.26**	55	**22.73**	**242**	**100.00**

Based on the result, females mostly decided to invest in Pru Life with 11.57% (28); followed by Sun Life with 11.16% (27); then, Manu Life with 11.16% (26); then, Cocolife with 9.92% (24); then, Philam Life with 5.37% (13) while the other insurances are 4.96% (12) such as AXA and other bank insurances that can be found in the appendices. On the other hand, the male also chose to invest in Pru Life with 7.02% (17); followed by Sun Life with 6.61% (16); then, Manu Life with 6.20% (15); then, Coco Life with 5.79% (14); then, Philam Life with 2.89% (7) while the other insurances are the remaining 17.77% (43).

Overall, the major insurance chosen is PruLife Insurance with 18.60% (45). Pru Life UK Santiago City is one of the pioneers of insuravest, or investment-linked life insurance products in the city. The second acquired insurance is the Sunlife with 17.77% (43); the third high demand insurance was the Manulife with 16.94% (41); Followed by the Cocolife with 15.70% (38); and the Philam Life with 8.26% (20).

This means that the well-known insurances around the nation are still acquired by the individuals even in city provinces like Santiago City because of its performances, rankings, and outcomes that led the respondents to trust and invest in them.

4.4 Factors that Affect the Choices of the Consumers to Healthcare Services

Table 4.15. Factors that Influence the Choices in the Healthcare Services of the Respondents

	7 (Most Important)	6	5	4	3	2	1 (Least Important)	Weighted Mean	Rank
Quality of Healthcare	317	40	30	10		3	0	6.6375	**1**
Quality of Health Equipment	257	85	38	13	2	3	2	6.4125	**2**
Accessibility of Healthcare	252	85	47	10	3	2	0	6.4050	**3**
Affordability of Healthcare	250	80	49	15	3	2	0	6.3700	**4**
Waiting Time	186	110	57	31	8	0	7	6.0050	**5**
Characteristics of Healthcare Workers	173	112	77	25	5	6	2	5.9925	**6**
Distance of the Healthcare Provider	174	107	72	33	6	5	3	5.9575	**7**

Out of 400 respondents, it presents that above all, the quality of healthcare (6.6375) is the topmost priority of the respondents and is followed by the quality of equipment (6.4125). The third factor is the accessibility of healthcare (6.4050) then the affordability of healthcare (6.3700). The fifth factor was the waiting time which stands at how long it takes for a sick person to receive proper health medication (6.0050), followed by the sixth factor, which was the characteristics of health workers (5.99250). The last factor was the distance of the healthcare provider (5.9575) which states that the respondents do not care how long the travel time is if the quality of healthcare is present.

This is backed up by the study of Nyambura (2016), wherein the healthcare services demand came from a multitude of factors. These include accessibility, affordability, and quality. These factors are also determined by the characteristics of health care workers patients, as well as social and environmental influences.

Indeed, the quality of services is an essential component in choosing the right and proper healthcare. The function of choice in improving healthcare quality is predicated on the hypothesis that the healthcare providers will be encouraged to enhance their services, specifically when the people are ignoring the healthcare services because of their poor quality (Aalto et al., 2017).

4.5. Healthcare Inputs and Mortality Rate

In order to measure the effect of healthcare inputs on the level of mortalities in Santiago City, Isabela; the researchers used the following methods:

- Descriptive Statistics
- Inferential Statistics

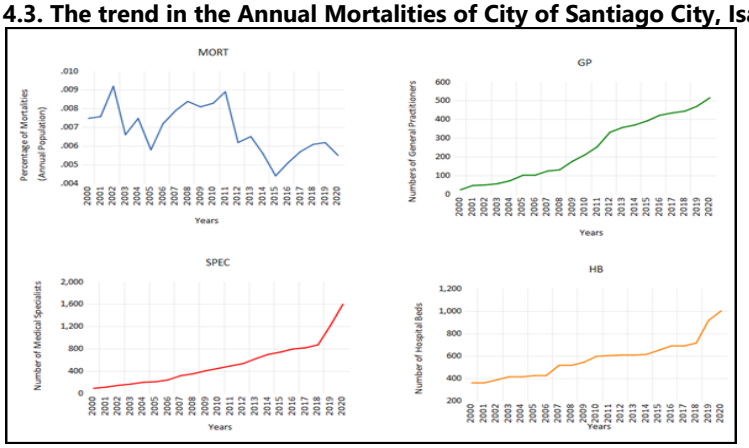
Table 4.16. Descriptive Statistics

	MORT	GP	SPEC	HB
Mean	0.006871	242.9524	529.9524	574.0000
Median	0.006600	213.0000	451.0000	598.0000
Maximum	0.009200	518.0000	1603.000	1005.000
Minimum	0.004400	24.00000	91.00000	358.0000
Std. Dev.	0.001321	166.8261	387.5081	171.7225
Skewness	0.045830	0.180105	1.129416	0.858900
Kurtosis	2.023571	1.485801	3.966208	3.414038
Jarque-Bera	0.841588	2.119731	5.281396	2.731982
Probability	0.656525	0.346502	0.071311	0.255128
Sum	0.144300	5102.00	11129.00	12054.00
Sum Sq. Dev	3.49E-05	556619.0	3003251	589772.0
Observations	21	21	21	21

Ho: Normally Distributed Data
Ha: Not Normally Distributed Data

The Jarque-bera probability values revealed that all of the individual variables are 0.656525 (MORT), 0.346502 (GP), 0.255128 (SPEC), and 0.071311 (HB) are greater than the 5% significance level. **Therefore, we do not reject the null hypothesis that the data are normally distributed.**

Table 4.3. The trend in the Annual Mortalities of City of Santiago City, Isabela



The graph for the Annual Mortality Rate displayed a sharp increase and decreased from the year 2000 to the year 2020. The lowest recorded Mortality Rate was obtained in 2015, and the highest number of mortalities was in 2003. On the other hand, all the independent variables, namely, Total Number of General Practitioners, Total Number of Healthcare Specialists, and Total Annual Number of Hospital Beds, consistently showcased an upward increase over the years. Therefore, as years passed by, the Total Number of General Practitioners, Total Number of Healthcare Specialists, and Total Annual Number of Hospital Beds rose.

Table 4.17. Pooled Ordinary Least Square Multiple Regression Results

Dependent Variable: LOG(MORT)
Method: Least Squares
Date: 11/11/21 Time: 04:43
Sample: 2000 2020
Included Observations: 21

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	**-5.809272**	0.343798	-16.89734	0.0000
GP	-0.001326	0.000472	-2.808732	0.0121
SPEC	-0.001054	0.000460	-2.293599	0.0348
HB	0.002947	0.000999	2.951292	0.0089

R-Squared	0.649284	Mean dependent var	-4.998544
Adjusted R-squared	0.587393	S.D. dependent var	0.197240
S.E. of regression	0.126696	Akaike info criterion	-1.124403
Sum squared resid	0.272884	Schwarz criterion	-0.925446
Log likelihood	15.80623	Hannan-Quinn criter.	-1.081224
F-statistic	10.49075	Durbin-Watson stat	2.227727
Prob(F-statistic)	0.000385		

Individual Significance

The researchers used Pooled Least Square model to estimate the relationship of regress and regressors. Since the computed t-value probability of the regressors such as general practitioners (GP), medical specialists (SP), and hospital beds (HB) of City of Santiago, Isabela, Philippines are less than five (5) percent level of significance, therefore reject the null hypothesis which state that there is no significant impact between X and Y variables. The coefficients of general practitioners (GP), medical specialists (SP), and hospital beds (HB) are positive, which indicate a direct impact on the mortality rate of the City of Santiago, Isabela, Philippines.

Overall Significance and Coefficient of Determination

Since the computed F-value is 0.0004, which is below the five (5) percent level of significance, therefore reject the null hypothesis, which states that the explanatory variables have no significant effect on the explained variable when taken collectively. Moreover, the coefficient of determination (R2) of 0.6493 suggests that 64.93 percent of the variation in mortality rate was explained by the variations in the general practitioners (GP), medical specialists (SP), and hospital beds (HB) while the remaining 35.07 percent explained by the variations of the error term.

Regression Equation

$$\log(Mort) = -5.8093 + 0.0029\ HB - 0.0013\ GP - 0.0011\ SPEC + \mu$$

The regression equation explained that if all variables are equal to zero, the mortality rate will be equal to -5.8093. A percentage increase in HB will cause mortalities to increase by 0.29 percent, ceteris paribus, and vice-versa. An additional general practitioner would decrease the mortality rate by 0.13 percent, ceteris paribus, and vice-versa. An additional medical specialist would decrease the mortality rate by 0.11 percent, ceteris paribus and vice versa.

With that being said, based on the regression analysis, as the number of general practitioners and medical specialists rise, the mortality rate falls, which aligns with the study of Basu et al. (2019), stating that having a greater primary care physician supply is a component to achieve lower population mortality. In addition, Oleribe et al. (2018) has provided evidence regarding the devastating consequences of healthcare worker strikes and concluded that because of healthcare worker strikes, disruption in

service delivery, increased morbidity and mortality of patients are observed. Moreover, a study by Madsen et al. (2017) discovered that higher bed occupancy rates in hospitals had been shown to be associated with increased mortality. The findings support the result of the regression analysis stating that an increase in hospital beds will generate a higher number of mortalities. Furthermore, various diagnostic tests were conducted in order to examine and strengthen the model.

Table 4.18. Test for Multicollinearity

Variance Inflation Factors Date: 11/13/21 Time: 05:20 Sample: 2000 2020 Included observations: 21			
Variable	**Coefficient Variance**	**Uncentered VIF**	**Centered VIF**
C	0.118197	154.6312	NA
GP	2.23E-07	24.93674	7.727734
SPEC	2.11E-07	117.1895	39.54003
HB	9.97E-07	466.4571	36.63762

Ho: There is no perfect multicollinearity
Ha: There is perfect multicollinearity

The Centered Variance Inflation Factors (VIF) of the variables, GP is 7.727732, which is less than 10 that represents the absence of perfect multicollinearity. On the other hand, SPEC is 39.540003, and HB is 36.63762, which is more than 10 that represents the presence of perfect multicollinearity. Therefore, we failed to accept the null hypothesis, which indicates that there is no perfect multicollinearity between the independent variables. However, with only 21 observations, the researchers opted to ignore it because, according to Blanchard, the presence of multicollinearity is a data deficiency problem itself.

Table 4.19. Test for Serial Correlation: Durbin Watson Autocorrelation

Durbin-Watson stat	2.227727

Ho: There is No First Order Autocorrelation
Ha: There is First Order Autocorrelation

The test for serial correlation through the Durbin-Watson Test and its value is 2.2277, which is between the range of 1.5 to 2.5. **Therefore, we do not reject the null hypothesis, which states that there is no first-order autocorrelation.**

Table 4.20. Test for Serial Correlation: Breusch-Godfrey Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test: Null Hypothesis: No serial correlation at up to 3 lags			
F-statistic	0.334610	**Prob. F(3,14)**	0.8005
Obs*R-squared	1.405005	**Prob. Chi Square(3)**	0.7044

Ho: There is No Serial Correlation at up to 3 lags
Ha: There is a Serial Correlation at up to 3 lags

The test of serial correlation through Breusch-Godfrey Serial Correlation LM Test, the degrees of freedom 3 and 14 with the probability of chi-squared 0.7044, which is greater than the 5% significance level and states that **we do not reject the null hypothesis that there is no serial correlation at up to 3 lags.**

Table 4.21. Ramsey RESET Test

Ramsey RESET Test Equation: UNTITLED Omitted Variables: Powers of fitted values from 2 to 4 Specification: LOG(MORT) C GP SPEC HB			
	Value	**df**	**Probability**
t-statistic	0.409053	16	0.6879
F-statistic	0.167325	(1, 16)	0.6879
Likelihood ratio	0.218473	1	0.6402

Ho: There is absence of misspecification error
Ha: There is a misspecification error

The result of the Ramsey RESET Test showed that the t-statistic and F-statistic computed p-value is 0.6879, which is greater than the 5% significance level. Therefore, we do not reject the null hypothesis, and there is the absence of misspecification error.

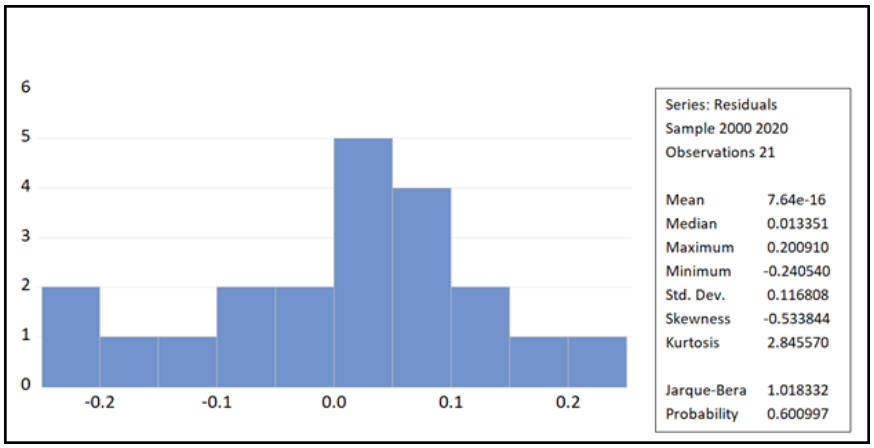
Table 4.22. Test of Heteroskedasticity: Breusch-Pagan-Godfrey

Heteroskedasticity Test: Breusch-Pagan-Godfrey Null Hypothesis: Homoskedasticity			
F-statistic	0.355599	Prob. F(3,17)	0.7857
Obs*R-squared	1.239996	Prob. Chi-Square(3)	0.7434
Scaled explained SS	0.749860	Prob. Chi-Square(3)	0.8614

Ho: The data is homoscedastic
Ha: The data is heteroscedastic

The P-value corresponds to the Chi-Square test statistic of 0.7857, and it is more than 5% level of significance. **Therefore, we do not reject the null hypothesis and conclude that homoscedasticity is present in the data.**

Figure 4.4. Test for Normality: Jarque-Bera



Ho: Normally Distributed Data
Ha: Not Normally Distributed Data

The graphical presentation of the residuals was normally distributed because of the bell-shaped curve. As shown, the p-value of the Jarque-Bera statistics is 0.600997, which is greater than the five (5) percent level of significance. With that being said, **we do not reject the null hypothesis, which states that the data is normally distributed.**

5. Conclusion

5.1. Summary of Findings and Conclusions

The primary objective of this study is to analyze the contribution of healthcare to the economic competitiveness of Santiago City, Isabela. It also aimed to identify the determinants that contribute to the demand for healthcare, the factors that affect the choices of consumers to healthcare services, and the effect of healthcare inputs specifically, Healthcare Facilities, General Practitioners, Medical Specialist, and Hospital Beds to the level of Mortality in Santiago city, Isabela. Based on the results of chapter IV, the conclusions are the following:

1. The study revealed that the Competitive Index of Santiago City has a significant positive impact on the Total Annual Patients and Healthcare Facilities in the city. However, the Annual Healthcare Expenditure of Santiago city is insignificant to its Competitive Index. The results showed that 36.98% of the variation in change of Competitive Index was explained by the variations in the Annual Total number of Patients, Healthcare Expenditure, and a Total number of Healthcare Facilities. Therefore, the health state of the city contributes to its economic competitiveness but is not the top driver.
2. The study showed the determinants to the demand for healthcare based on sex and was categorized into three components, namely, demographic, medical-related, and socio-economic.
    a. In demographic factors, there are more male residents in the City of Santiago, Isabela rather than females.
    b. In the medical-related factors, males experience better health than females. Since females are more prone to prevalent health conditions such as high blood pressure, asthma, diabetes, stomach ulcers, and infection, generally, they have wiser medical care behavior. Accordingly, females seek medical treatments more compared

to males considering that males have a greater health state because of the sex differentials in health that lead to different health outcomes.

c. In the socioeconomic factors, females acquired more health insurance than males. Both males and females who are in the higher level of occupations represent a higher literacy in health because of the correlation of education, employment, and health. These details tend to invest in health-related plans. The major insurances acquired for both sex groups are Pru Life UK, Sun Life, Manulife, Cocolife, and Philam Life.

3. The study revealed that the prime factor that influences the choices in healthcare services is the quality of healthcare services—followed by the quality of equipment, accessibility of healthcare, affordability of healthcare, the waiting time, characteristics of health workers and lastly, the distance of the healthcare provider.
4. The study demonstrated that the Mortality Rate of Santiago city has a significant inverse impact on the number of General Practitioners and Medical Specialists in the city. However, the number of Hospital Beds in Santiago city shows a significant positive impact on the Mortality Rate. The results showed that 64.93% of the variation in change of Mortality Rate was explained by the variations in the number of General Practitioners, the number of Medical Specialists, and the number of Hospital Beds.

5.2 Recommendations

Based on the findings and conclusions presented, the following recommendations are drawn:

1. The researchers recommend that future researchers they must obtain a higher number of observations. Make sure that the observations should not be less than thirty (30) in order to avoid complications in quantifying the data of your study, and this may also improve the results of the study.
2. The researchers recommend that if available annual data are insufficient, consider measuring your data quarterly or monthly instead.
3. The different offices of Santiago City should provide accessible databases to the public for transparency and for research studies since the variables that could closely represent the fitness are not available.
4. Insurance companies should improve their products and services that can cater for the needs and demands of prospective customers regardless of demographic and socioeconomic factors.
5. The Local Government of the City of Santiago should invest more in healthcare, considering the significant influence in achieving a more competitive economy.
6. Since quality service is the prime factor that affects the choices of the residents in the city in acquiring healthcare services, healthcare facilities should guarantee that this factor is one of their top priorities.
7. The residents of the city should invest more in their health because this will not only benefit them personally but also the economic competitiveness of the city.
8. The Local Government Unit and private hospitals should grant incentives to medical professionals in order to encourage them to remain and avoid the brain drain that is existing.

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