

The Influence of Social Economic Factors on the Health Quality of West Sumatera Population

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Abstract

This study aims to analyze the effect of income, education, number of dependents, age, type of work, employment sector, marital status, health insurance, home environment and area of residence on the health quality of the population of West Sumatra. The population in this study were all heads of households in West Sumatra. The data in the study came from the Central Bureau of Statistics in the form of the 2019 National Socio-Economic Survey (Susenas). The data analysis method was carried out by logistic regression. The results of this study concluded that jenis gender, age, marital status, home environment, income, health insurance, education level, type of work and sector of work determine the quality of health of the population of West Sumatra. Whereas the area of residence does not determine the quality of health of the population of West Sumatra. The suggestions that can be put forward in this research are expected to the government to educate the public about the importance of sanitation for health. provide decent work opportunities for the community. With the availability of jobs, it will be able to increase people's income so that they are able and understand the quality of their health.

Keywords: Economy, Health, Logistic Regression

Preliminary

Health is one of the human rights. Health is also a part of human capital. Without quality health, it will not be possible for humans to realize a better life. Without quality health, development goals will not be achieved. Health is an investment in human life in the future. Therefore, quality health is very important if a country wants to realize its development goals and create a better life for its people [1-2].

Several experts have proven through a series of studies that health has a positive impact on the economic performance of a region.

Good population health will increase worker productivity so as to contribute to improving the economy of the area. In addition, health as a part of human capital investment makes a positive contribution to regional economic growth. Thus, to spur regional economic performance, it is necessary to improve the quality of health of the population in that area [3-4].

West Sumatra as a province in Indonesia is also very concerned about the quality of the health of its population. According to data from the West Sumatra Central Statistics Agency (BPS) from 2011-2018 in

general it can be said that there has been an increase in the quality of health of the population of West Sumatra. This can be seen from the decrease in the percentage of the population who have had health complaints (fever, cough, mental disorders, etc.) during the past month. In 2011 the number of people

who experienced health complaints was 29.29% and increased in 2012 to 28.81% (although it had decreased from 2012-2015). However, in 2018 this figure increased to 29.37%. Of course, this condition shows something that is less encouraging.

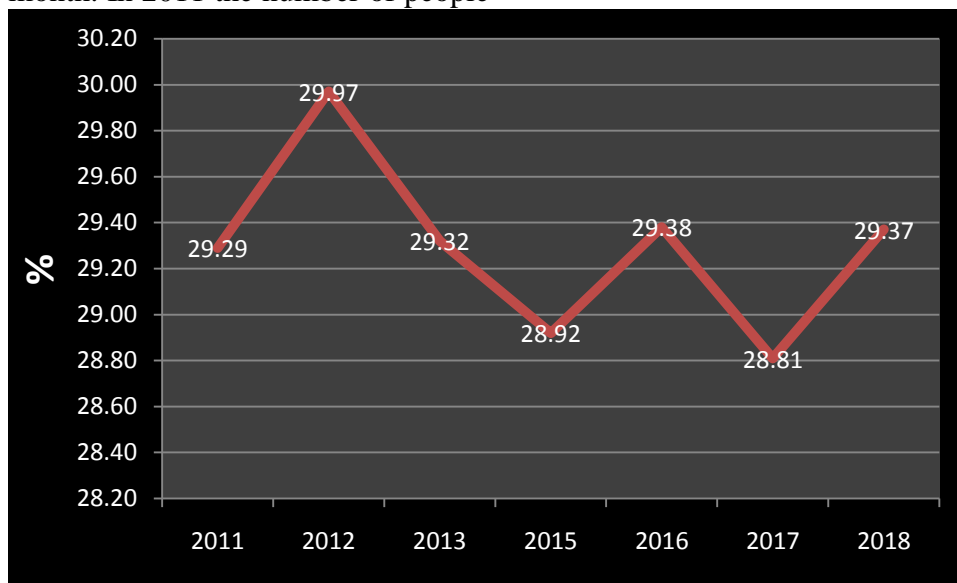


Figure 1: Percentage of West Sumatra Population with Health Complaints during the Last Month, 2011-2018

From the results of previous studies it was found that there are social and economic factors that influence the quality of health of the population in a country or region [5-10]. However, these studies only see partially the influence of social and economic factors on health quality. Even the quality of health that is used as an indicator is not comprehensive, such as measuring the quality of health only from mental and physical. Therefore, the contribution in this study develops previous studies by looking at the influence of social and economic factors together on the health quality of the population in West Sumatra. This study also includes health

quality indicators that are more comprehensive than previous studies.

Theoretical framework

Human capital theory is basically about the process of formulating investment forms that can be invested in humans. Humans are recognized as one of the resources needed in the production of goods and services in the economy. One form of investment in human capital theory is health [11].

Investing in human resources is a sacrifice of something that can be measured in value for money in the hope of being able to earn better income in the future. The income earned in the future is a higher level of income to be able to achieve a higher level of consumption as well.

This investment relates to human capital as previously described. With this investment, it is hoped that the quality of human life will improve.

Health economics theory refers to the investment model approach and assumes that each individual assesses the benefits of spending on health in comparison with expenditures on other commodities in order to determine his optimal health status [12]. In this case, consumers are assumed to have knowledge of their own health status, the level of depreciation of their health status and the production function that links health improvements with spending on health services.

In the theory of consumer behavior, good quality health is a need that is desired by each individual. Therefore, each individual will maximize his satisfaction with good health quality but they are faced by budget constraints [13-16].

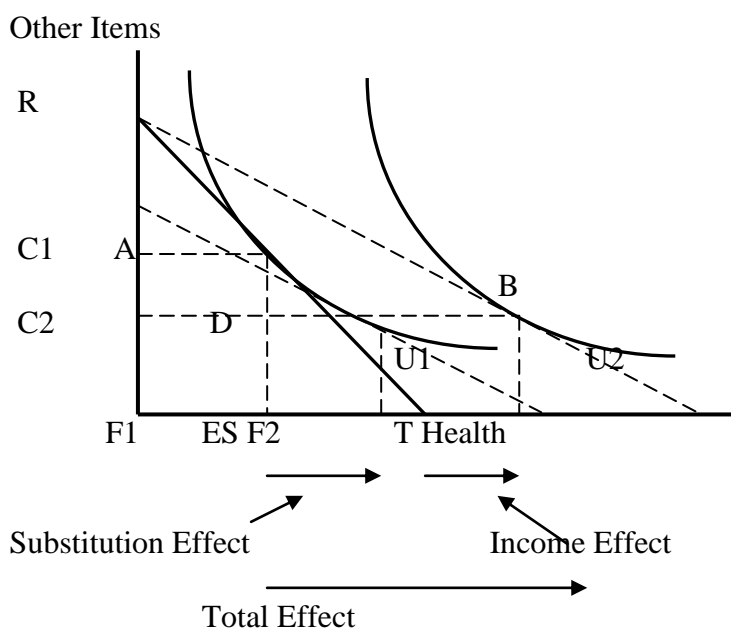


Figure 2: Substitution and Income Effects

To maximize satisfaction with good health each individual must pay or get a price for good health. Figure 2 shows the substitution effect, it can be seen that the budget line was originally a hospital where there were two demands for goods, namely

investment in health and other goods. Consumers will maximize utility by choosing market basket on A because both goods can be consumed at a certain level of expenditure. Thus the utility rate is obtained from the indifference curve U1 [17-19].

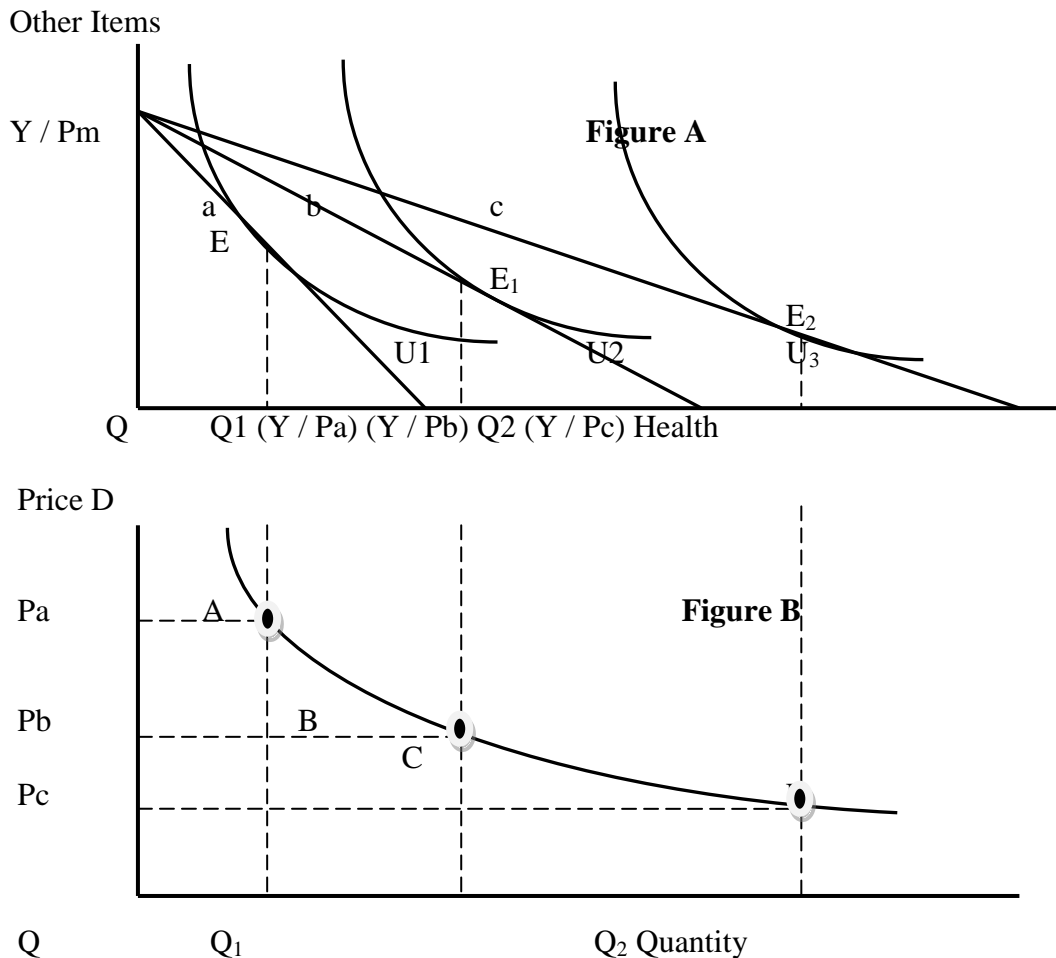


Figure 3: Derivation of the Health Demand Curve

If the price of health investment falls causing the budget line to circle outside the RT line then the consumer will choose market basket B on the indifference curve U2. This is because market basket B has been selected even though market basket A can actually be selected. From this condition, it can be seen that B is preferred over A. A decrease in health investment has both income and substitution effects. The customer is first A on the RS budget line. When the price of health investment falls, consumption increases by F1F2 as the consumer moves to B the substitution effect, F1E (associated with the movement from A to D) changes the relative

prices of other goods and health investment but keeps real income (satisfaction) constant. The income effect EF2 (associated with the movement from D to B) keeps prices relatively constant but increases purchasing power. Health investment here is a normal good because the income effect of EF2 is positive.

Based on the indifference curve and budget line with the behavior of the substitution effect and income effect above, a demand curve can be formed. Suppose that the consumer's income is Y and the price of using other goods is Pm and the price of health investment is Pa. Thus at the beginning line a depicts the consumer spending budget line.

Line A alludes to the satisfaction curve at U1 at point E. The investment in health consumed is therefore Q units. So on, suppose that the income and prices of other goods do not change, but the price of health investment has decreased and now has become Pb. With this change, the current expenditure budget line is shown as line b. He alluded to the satisfaction curve at U2 at point E1. This balance illustrates that the other goods consumed have increased to Q1 units. Suppose that the price of health investment continues to decline, namely to become a Pc. This price reduction moves the expenditure budget line again, namely to line c. The curve U3 is the three points above is a demand curve for health investment.

From the above explanation it can be concluded that if the price of an item has decreased, then the demand for goods that have decreased in price will increase. The decline initially causes a substitution effect and then the income effect occurs. A decrease in the price of this good has an impact on shifting the budget line and the same satisfaction curve to the price that has decreased. This behavior shows the movement of the demand curve.

Several previous research results found that people with high income, high education and social status have good health quality compared to people with high income, high education and low social status. Likewise with other studies which conclude that the level of education, income, employment status, gender, home environment have an influence on people's healthy behavior. This condition indicates that there are several factors that

crossed by line c at E2 which shows that health investment has now progressively increased to Q2.

Figure 2 (B) shows the relationship between the price of health and the amount of health investment demanded. Point A describes the consumer when the price change has not been applied, that is, the health investment price is Pa and the required health investment is Q units. Point B describes a situation when the price of health investment falls to Pb, the amount of health investment demanded becomes Q1. Finally, when the health investment price becomes Pc (indicated by point C), the demand for health investment is Q2. The DD curve created through determine the quality of health of the population in a region or country [20-26].

Method

The population in this study were all household heads (KRT) in West Sumatra who had good and bad health quality during the last month as many as 10,742 people. The data in the study came from the Central Bureau of Statistics in the form of the 2019 National Socio-Economic Survey (Susenas).

The data analysis technique was performed using a logistic regression model. The form of the logistic regression equation in this model is:

$$Ln \frac{p}{(1-p)} = \beta_0 + \beta_1 X_1 \dots \beta_{10} X_{10} + e_i \quad (18)$$

Where

P = Health quality opportunities
 (1-p) = Other participation opportunities

β_0 = Constant
 $\beta_{1..10}$ = Regression coefficient ($\beta_1, \dots \beta_{10}$)
 $X_1 \dots X_{11}$ = Independent variable

Research result

first step is to test the feasibility of the model. The feasibility test of this model is carried out using the Hosmer and Lemeshow Test method.

From the results of the Hosmer and Lemeshow Test in Table 1, it can be seen that the Chi-square value is 13,472 with a significance value of 0.097 (significance greater than 0.05). Because the significance

1) Model Feasibility Test (Goodness of Fit Test)

The model referred to in this study is a logistic regression model to see the trend of social economic factors on the health quality of the population of West Sumatra. The value of the Hosmer and Lemeshow Test is greater than 0.05, H0 is accepted, which means that there is no significant difference between the model and its observation data. Thus, the model used in this study deserves to be analyzed further because this model has matched the observed data.

Table 1

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	13,472	8	.097

Source: Results of Data Processing with SPSS

2) Assessing the Overall Model (Overall Model Fit Test)

The next step is to assess the whole model by paying attention to the value at -2Log Likelihood (LL) block number = 0 with -2Log Likelihood (LL) block number = 1. In Table 19 it can be seen that the -2Log Likelihood (LL) block number

= 0 is 13990.723. while -2Log Likelihood (LL) block number = 1 is 13472,381. This condition shows that there is a decrease in the value of block number = 0 with block number = 1 of 13990,723 - 13472,381 = 522,342. The results of the analysis show that the data distribution meets the model's feasibility.

Table 3

Overall Model Fit Test

-2 Log likelihood Block Number = 0	-2 Log likelihood Block Number = 1
13990,723	13472,381

Source: Results of Data Processing with SPSS

3) Model Fit Test

Model fit test is used to see the variability of the independent variable in explaining the variability of the dependent variable. The methods used are Cox and Snell R

Square and Nagelkerke R Square. The Cox and Snell R Square coefficients can be interpreted the same as the coefficient of determination (R²) in ordinary multiple linear regression, but because the maximum value of the Cox and Snell R Square coefficients is less than 1 so it is difficult to

interpret and this measuring tool is rarely used (Ghozali, 2011: 341). Modification of Cox and Snell square namely Nagelkerke R Square

to ensure the value varies from 0 (zero) to 1 (one).

Table 4
Cox & Snell R Square and Nagelkerke R Square Model 1

Step	Cox & Snell R Square	Nagelkerke R Square
1	.048	.065

Source: Results of Data Processing with SPSS

Table 4 shows the Nagelkerke R Square results on this model of 0.065. The value of 0.065 means that the independent variable is able to explain the variability of the dependent variable by 6.5%, while the rest is explained by other variables not included in the model.

596 people. While respondents whose health quality is not good will be predicted to have good health quality as many as 3,230 people. In addition, respondents who have good health quality will be predicted to have bad health quality as many as 463 people, while respondents who have good health quality will be predicted to have good health quality as many as 6,453 people. Overall, the classification accuracy of the binary logistic regression model for the health quality of the population of West Sumatra is 65.6%.

4) Model Prediction Accuracy Test

From Table 5, it can be seen that respondents whose health quality is not good will be predicted to have bad health quality as many as

Table 5
Classification Table

		Predicted		
		y		Percentage Correct
Observed	0	1		
Step 1 y	0	596	3230	15.6
	1	463	6453	93.3
Overall Percentage				65.6

Source: Results of Data Processing with SPSS

Table 6, the logistic regression equation can be made in this study as follows:

5) Estimation Results

After several methods are carried out to ensure that the binary logistic regression model is feasible and good for analysis, the next step is to interpret the results of the binary logistic regression estimation itself. The results of the logistic regression estimation can be seen in Table 6.

$$\ln = 0.244 - 0.293 X1 + 0.726 X2 + 0.208 X3 + 0.027 X4 + 0.001 X5 \left(\frac{P}{1-P} \right) + 0.333 X6 + 0.107 X7 + 0.120 X8 + 0.093 X9 + 0.145 X10$$

(4.1)

From the results of the logistic regression estimation in

Gender (X1) has a negative and significant effect on the health

quality of the population of West Sumatra. This can be seen from the significance value of this variable of $0.020 < 0.05$. The odds ratio (EXP (B)) for this variable is 0.746. This condition means that the female gender has a better health quality than the male gender by 0.746 times.

The significance value of age (X2) on the health quality of the population of West Sumatra is $0.000 < 0.05$. In other words, age has a significant effect on the health quality of the population of West Sumatra. The odds ratio value for this variable is 2.067. This means that the age of the older population has a chance of having a good health quality of 2.067 times compared to the age of the younger population.

Marital status (X3) also has a significant effect on the health quality of the population of West

Sumatra. This can be seen from the probability value of marital status on health quality of $0.019 < 0.05$. The odds ratio value of this variable is 1,231, which means that the currently married population has a better chance of having a better health quality than the non-married population of 1,231 times.

The home environment (X4) significantly affects the health quality of the population of West Sumatra. The probability value of this variable is less than 0.05, which is equal to 0.000. The odds ratio value for this variable is 1.028. This figure implies that a house that has sanitation has a chance for a good quality of health by 1,028 times compared to a house without sanitation.

Table 6
Estimation Results of Health Quality Logistic Regression
West Sumatra residents

	B	SE	Wald	df	Sig.	Exp (B)
Step 1a x1	-.293	.093	9,844	1	.002	.746
x2	.726	.049	218,209	1	.000	2,067
x3	.208	.088	5,523	1	.019	1,231
x4	.827	.045	.375	1	.000	1,028
x5	.001	.049	4,023	1	.990	1,001
x6	.333	.100	11,169	1	.001	1,717
x7	.107	.049	4,776	1	.029	1,898
x8	.120	.058	2,358	1	.025	1,127
x9	.133	.054	2,927	1	.007	1,097
x10	.145	.048	9,296	1	.002	1,156
Constant	.244	.143	2,908	1	.088	1,277

a. Variable (s) entered on step 1: x1, x2, x3, x4, x5, x6, x7, x8, x9, x10.

The area of residence (X5) does not significantly influence the health quality of the population of West Sumatra. This condition can be seen from the probability value of this variable ($0.999 > 0.05$). The odds

ratio value of this variable is 1,001, which means that residents who live in rural areas (regencies) have a better health quality chance of 1,001 times compared to residents who live in cities.

Income (X6) has a significant effect on the health quality of the population of West Sumatra. This significant effect can be seen from the probability value of the income variable of $0.01 < 0.05$. The value of the odds ratio for this income variable is 1.717. This means that people with high incomes will have a chance for health to be better by 1,717 times greater than those with low income.

Health insurance (X7) also has a significant effect on the quality of health of the population of West Sumatra. This can be seen from the probability value of this variable of $0.029 < 0.05$. The odds ratio value for this variable is 1,898. This figure means that people who have health insurance will have a chance for a better quality of health by 1,898 times compared to people who do not have health insurance.

The level of education (X8) has a significant effect on the health quality of the population of West Sumatra. The significant effect of this level of education can be seen from the probability value of $0.025 < 0.05$. The odds ratio for this variable is 1.127. This means that the higher education level of the population (senior high school and above) will have a better chance of health quality by 1,127 times compared to the population with a lower education level.

Type of work (X9) has a significant effect on the quality of health of the population of West Sumatra. This significant effect can be seen from the probability value of this variable of $0.07 < 0.05$. The odds ratio for this type of work variable is 1.097. This means that residents with non-primary types of work have a chance for their health quality to be

better by 1,097 times compared to those with primary occupations.

The employment sector (X10) also has a significant effect on the health quality of the population of West Sumatra. This is indicated by the probability of this variable of $0.02 < 0.05$. The odds ratio for this variable is 1.156. This figure shows that people who work in the formal sector have a chance for a better quality of health by 1,156 times compared to people who work in the informal sector.

Discussion

a. Effect of Gender (X1) on the Health Quality of the Population of West Sumatra

Based on the estimation results in Table 16, it can be seen that gender has a significant negative effect on the health quality of the population of West Sumatra. This means that the male gender has better health quality. This is because in West Sumatra men have better physical strength than women so that men are not susceptible to disease. Besides that, men as the head of the family think that if they are sick, the family's financial condition will be disturbed. For that they have to maintain their health so that they can work longer hours so that they can get more income. On the other hand, this condition is also indicated by the odds ratio of the female sex that is smaller than 1, which is 0.746.

The results of this study are in line with the findings of Van Kippersluis H (2010), Kachmar (2019), Veisani (2015), and Williams (2016) who found that men have better health quality than women. Because men have better physical conditions than women.

b. The Effect of Age (X2) on the Health Quality of the Population of West Sumatra

From the estimation results in Table 16, it can also be seen that age has a significant positive effect on the health quality of the population of West Sumatra. This means that increasing the age of the population will increase the chances of the population's health quality being better. This condition is also shown by the age odds ratio value greater than 1, which is 2.067. This is due to the increasing age of the population, the higher their knowledge, awareness, concern and sensitivity to health. Especially if the age of the population is the age with the number of family members being borne increasing. Thus the awareness to maintain health is getting higher because if not then there is a health risk that will not threaten.

The results of this study are consistent with those found by Adams (2003), Haas (2006) and Hoffman (2018) who concluded that increasing age will increase a person's chances of getting better health.

c. The Effect of Marital Status (X3) on the Health Quality of the Population of West Sumatra

The same is shown by the marital status of the population on the quality of health. Marital status has a positive and significant effect on the health quality of the population of West Sumatra. This means that people who are married will have a higher chance of being healthier. The odds ratio value of this variable is also greater than 1. This condition is because people with married or married status will have

better emotional stability, a more established psychological condition, and calm in thinking to be more mature so that these conditions make the quality of the population's health married for the better. If the resident is not married, this condition will show the opposite sign, the emotions will not be awake, psychologically more unstable and maturity to think is not so good. Therefore, these signs will cause the health quality of the unmarried population to be less good.

This finding is in line with Veisani (2015), Williams (2016), Haas (2006) and Hoffman (2018) who found that people who get married will have better health quality. Because people who are married will have a mature psychological condition compared to those who are not married.

d. The Effect of the Home Environment (X4) on the Health Quality of the Population of West Sumatra

The home environment has a significant positive effect on the health quality of the population of West Sumatra. These results can be seen from Table 16. These findings indicate that a home environment that has sanitation will have a higher chance of health quality than a home environment without sanitation. Because a house with sanitation means that the house has a place to dispose of feces, a smoother drain, and a garbage disposal area so that it will have an impact on the good environment of the house. Unlike the case with houses that do not have sanitation with these indicators, of course, the danger of disease will always threaten the health of the population.

This finding is consistent with the findings of Adams (2003), Haas (2006), Van Kippersluis H (2010), Kachmar (2019) and Veisani (2015) who concluded that a house with good sanitation will have an impact on the good quality of health of the population. Because sanitation can prevent people from the dangers of disease.

e. The Effect of Residence Area (X5) on the Health Quality of the Population of West Sumatra

Unlike the previous variables, the area of residence does not have a significant effect on the health quality of the population of West Sumatra. This situation implies that neither the population living in villages nor in cities determines whether the health quality of the population is good or bad. Even though people living in villages do not guarantee their health is better than those who live in cities if the villagers do not pay attention to health supporting factors. Such as a house without sanitation, smoking, bad habits without regard for cleanliness and so on. Conversely, if these residents live in cities as long as they pay attention to health supporting factors, the quality of their health will be maintained.

The results of this study are not in accordance with the research findings of Van Kippersluis H (2010), Kachmar (2019), Adams (2003), Haas (2006), and Veisani (2015) which concluded that villagers have a higher chance of having a higher quality of health than the population. city. Because the village is a more natural area, there is no pollution, no social problems, slums and so on. Therefore, the

health quality of rural residents is better than urban residents.

f. The Effect of Income (X6) on the Health Quality of the Population of West Sumatra

Income affects the health quality of the population of West Sumatra in a significant and positive way. Increased income will have an impact on increasing the chances of improving the health of the population of West Sumatra. This situation is because the higher the income of the population, the higher the ability and purchasing power of the population to improve and obtain better health quality. For example, the ability to buy medicine, obtain health insurance, have home sanitation, improve education and so on. Conversely, people with low incomes will not have the ability to improve their health, such as buying medicine, having health insurance, having home sanitation, and so on.

The results of this study are in accordance with research Varian (2010), Mohr (2012), Parkin (2012), Huurre (2005), and Kröger (2015) who also found that income affects an increase in population demand. The demand here is mainly for the quality of health such as medicine, home sanitation, health insurance and others.

g. The Effect of Health Insurance (X7) on the Health Quality of the Population of West Sumatra

Health insurance has a significant positive effect on the quality of health of the population of West Sumatra. The existence of health insurance will improve the quality of health of the population. With the existence of health insurance, it will increase the trust of

the population to seek treatment or consultations, thus making certainty of the population's health services higher. Therefore, residents will no longer feel worried about the certainty of their health services. It is different if the population does not have health insurance. Of course this will make residents feel uncomfortable with the assurance of their health.

These findings are in line with the research of Huurre (2005), Veisani (2015), Kachmar (2019), and Lee (2017) which states that health insurance will make residents have certainty about their health services, thereby increasing confidence in the quality of their health.

h. The Effect of Education Level (X8) on the Health Quality of the Population of West Sumatra

The level of education also determines the health quality of the population of West Sumatra in a positive and significant way. Residents who have higher education will have high knowledge, awareness and concern for their health. Highly educated people will know how much they lose if their health is not good quality. How many opportunities are lost if they get sick so they can't take advantage of opportunities that should increase their profits. Higher education also opens their horizons how health is a major factor in increasing their productivity. However, it is not the same as the population with low education. They generally don't really care about the quality of their health.

The results of this study are in accordance with the findings of Chandra (2006), Fleisher(2010), Hoffman (2018) which states that

education will determine the quality of population health. With a higher level of education will be able to encourage the improvement of the quality of their life health. These two things will be a driving force for economic progress.

i. Effect of Type of Work (X9) on the Health Quality of the Population of West Sumatra

The type of work has a positive and significant impact on the health quality of the population of West Sumatra. People who work in the formal sector are usually people who have higher education, decent income, have health insurance, house sanitation, so these indicators encourage them to better understand the importance of maintaining health quality. Because for them time is so precious that when they are sick they will feel very loss because of the many missed opportunities. A different thing is shown by residents who work in the informal sector. They have unmeasured working hours, low education, unorganized work locations, low income, no health insurance, especially good sanitation at home, which impacts on the quality of their health.

The results of this study are in accordance with the findings of Hoffmann (2008), Hasmi (2011), Huurre (2005) which states that people who work in the formal sector have good job characteristics so that most of them really care about health. Meanwhile, residents who work in the informal sector do not really pay attention to this because they only think that being able to survive is enough.

j. Effect of the Work Sector (X10) on the Health Quality of the Population of West Sumatra

Finally, according to the estimation results in Table 16, the employment sector also has a significant positive effect on the health quality of the population of West Sumatra. People who work in the non-primary sector have better health quality than those who work in the primary sector. Residents who work in the non-primary sector are residents who partly work in the industrial and service sectors. The characteristics of the population who work in this sector are higher education, more than enough income, on average have high-class health insurance, and very good home sanitation so that they understand and are well aware of the importance of maintaining health. Health is a fundamental thing that must be maintained besides education because health is the driving factor for their productivity. If the quality of their health is poor, of course, it will reduce their productivity so that it will eliminate many opportunities that can benefit them. Meanwhile, most of the population who work in the primary sector have the characteristics of low education, inadequate income, there is no definite health insurance so that most of them do not care about health. For them, living in moderation is enough and they are unable to meet the proper health standards. there is no definite health insurance so most of them do not care about health. For them, living in moderation is enough and they are unable to meet the proper health standards. there is no definite health insurance so most of them do not care about health. For them, living in

moderation is enough and they are unable to meet the proper health standards.

The results of this study are in accordance with the findings of Hoffmann (2008), Hasmi (2011), Huurre (2005) which states that people who work in the non-primary sector are more sensitive to health because health is the main asset for them to increase productivity. They will lose many opportunities if their health is compromised. This is different from the population who work in the primary sector who do not really care about the quality of their health.

Conclusion

The results of this study concluded that jenis gender, age, marital status, home environment, income, health insurance, education level, type of work and sector of work determine the quality of health of the population of West Sumatra. Whereas the area of residence does not determine the quality of health of the population of West Sumatra.

Based on the above conclusions, the suggestions that can be put forward in this study are expected to the government to be able to provide education to the public about the importance of sanitation for health. In addition, the government is also expected to help provide forms of sanitation for community housing, especially for the poor. Such as repairing community sewers, landfills, latrines and so on. So that people who are less fortunate can enjoy good environmental hygiene. Then it is also hoped that the government can provide decent jobs for the community. With the availability of jobs, it will be able to increase

people's income so that they are able and understand the quality of their health.

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