

Socioeconomic Determinants of Health Status; Evidence from Nusa Tenggara Barat – Indonesia

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Abstract

Health is a vital component of human capital, influencing long-term economic productivity and social well-being. In developing regions such as Nusa Tenggara Barat (NTB), Indonesia - where poverty, limited education, and underdeveloped health infrastructure persist - understanding the socioeconomic drivers of health is crucial for inclusive development. This study examines the impact of socioeconomic and demographic factors on individual health status using data from the 2019 National Socioeconomic Survey (SUSENAS) and a logistic regression approach. The results show that individuals with higher education, stable employment, greater household expenditure, and health insurance coverage are significantly more likely to have good health. Conversely, older individuals and women are less likely to do so. The study finds that income, residential location, education, age, marital status, and gender significantly affect health outcomes in NTB, while employment status does not. Higher income and urban residence improve health, but unexpectedly, higher education is linked to poorer short-term health, likely due to reporting bias, stress, or lifestyle factors. These results support human capital theory while revealing context-specific dynamics, underscoring the need for targeted poverty reduction, rural healthcare expansion, gender-sensitive interventions, and comprehensive health promotion across all education levels.

Abstract

Kesehatan merupakan komponen penting dari modal manusia, yang memengaruhi produktivitas ekonomi jangka panjang dan kesejahteraan sosial. Di wilayah berkembang seperti Nusa Tenggara Barat (NTB), Indonesia - di mana kemiskinan, pendidikan yang terbatas, dan infrastruktur kesehatan yang belum berkembang masih menjadi masalah - memahami faktor-faktor sosioekonomi yang memengaruhi kesehatan sangat penting untuk pembangunan inklusif. Studi ini menganalisis dampak faktor-faktor sosioekonomi dan demografis terhadap kesehatan yang dilaporkan sendiri menggunakan data dari Survei Sosioekonomi Nasional (SUSENAS) 2019 dan pendekatan regresi logistik. Hasil menunjukkan bahwa individu dengan pendidikan lebih tinggi, pekerjaan stabil, pengeluaran rumah tangga lebih besar, dan memiliki jaminan Kesehatan cenderung lebih sehat. Sebaliknya, individu yang lebih tua dan perempuan cenderung kurang sehat. Studi ini menemukan bahwa pendapatan, lokasi tempat tinggal, pendidikan, usia, status perkawinan, dan jenis kelamin secara signifikan mempengaruhi kesehatan di NTB, sementara status pekerjaan tidak. Pendapatan yang lebih tinggi dan tempat tinggal di perkotaan meningkatkan kesehatan, tetapi secara tak terduga, pendidikan yang lebih tinggi terkait dengan kesehatan yang lebih buruk, kemungkinan disebabkan oleh bias pelaporan, stres, atau faktor gaya hidup. Hasil ini mendukung teori modal manusia sambil mengungkap dinamika spesifik konteks, menyoroti kebutuhan akan pengurangan kemiskinan yang ditargetkan, perluasan layanan kesehatan di pedesaan, intervensi yang sensitif terhadap gender, dan promosi kesehatan komprehensif di semua tingkat pendidikan.

Keywords: *health status, logistic regression, Nusa Tenggara Barat, socioeconomic determinant, SUSENAS*

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Introduction

Health and economic development are mutually reinforcing. Good health enhances productivity, learning capacity, and workforce participation, whereas poor health can perpetuate cycles of poverty (Becker, 1994; Grossman, 1972). Socioeconomic factors such as income, education, and employment are critical determinants of health outcomes, with wealthier and more educated individuals generally

enjoying longer and healthier lives (Pampel et al., 2010; Wang & Geng, 2019). For example, in South Africa, parental education especially maternal significantly improved child health outcomes.

In Indonesia, substantial national progress in healthcare has not eliminated regional disparities. West Nusa Tenggara (NTB) remains among the poorest provinces and recorded the highest morbidity rate in the country in 2020 (21.1%), exceeding the national average (BPS, 2023). This elevated illness rate reflects persistent challenges such as limited income, inadequate healthcare infrastructure, and restricted access to health services in rural areas (Rakasiwi & Kautsar, 2021).

While education is typically associated with healthier lifestyles, NTB data suggest that this link may not hold uniformly, potentially due to stress-related illnesses, reporting bias, or systemic healthcare access issues. Demographic variables - such as age, gender, and marital status - also play a role. Married individuals often experience better health due to social support (Pustaka Pelajar, 2000), and women generally live longer but may report higher morbidity due to caregiving burdens (WHO, 2019).

Aligned with Sustainable Development Goal (SDG) 3, which emphasizes ensuring healthy lives and promoting well-being at all ages, this research examines the interplay between socioeconomic and demographic factors and individual health status in NTB.

Literature Review and Hypothesis Development

Human capital refers to investments in individuals - such as education, skills, and health - that enhance productivity and economic performance (Mankiw, 2018). Health is a core element of human capital; individuals in good health are more productive and better able to contribute to economic activities (Rastogi, 2002; Romer, 1990). As Nurkholis notes, people function as capital similar to machinery or technology, actively participating in production, consumption, and market transactions (Nurkholis, 2018).

Health is both a means and an outcome of human capital investment. Poor health reduces productivity, limits economic participation, and constrains the pursuit of well-being. Health status can be measured through indicators such as life expectancy (Mantra, 2000), morbidity, and mortality. Morbidity - the occurrence of illness - directly affects labor capacity and economic stability.

Income plays a crucial role in health outcomes. In macroeconomic theory, income influences consumption (Mankiw, 2018). Low income limits the ability to afford nutritious food, quality healthcare, and safe living conditions, perpetuating a cycle of poverty and poor health (Grigoriev & Grigorieva, 2011).

Blum's 1974 health model identifies four key determinants of individual health: genetic inheritance, healthcare services, lifestyle, and environment (Blum, 1974). While genetics are fixed, individuals can improve their health through healthy behaviors, access to medical care, and living in clean, safe environments. Similarly, the health production function proposed by Santerre and Neun views health

as the result of inputs such as medical care, socioeconomic conditions, environmental factors, and personal characteristics (Santerre & Stephen P, 2010). The model also highlights diminishing returns to medical care without complementary improvements in lifestyle and environment.

Case reinforce the importance of socioeconomic inputs, showing that parental education - particularly maternal - strongly correlates with better child health outcomes (Case et al., 2002). This underscores the multifactorial nature of health, shaped by structural and behavioral influences.

Several interrelated factors influence individual health outcomes. The first is economic factors, particularly income and employment. Higher income provides the means to secure nutritious food, adequate housing, and quality healthcare, thereby lowering the likelihood of illness (Amru & Sihaloho, 2020). Employment can enhance health by ensuring financial stability and, in some cases, offering employer-sponsored benefits. However, the quality of employment is equally important, as unfavourable working conditions can harm well-being. Those who are employed are generally more inclined to adopt healthy lifestyles, whereas unemployment can restrict healthcare access and increase stress levels (von der Lippe & Rattay, 2016).

The second determinant is education level. Education fosters health literacy and promotes preventive behaviors, with more educated individuals tending to practice better nutrition, hygiene, and disease prevention, which contribute to improved health outcomes (Jiang et al., 2019). Furthermore, education often leads to higher income and better employment opportunities, indirectly supporting health.

The third factor is location of residence. Urban residents usually have better health outcomes due to greater access to healthcare services, public infrastructure, and health-related information. In contrast, those living in rural areas may encounter limited medical facilities, geographic isolation, and lower income levels (Rakasiwi & Kautsar, 2021).

Finally, demographic factors such as age, gender, and marital status also play a role. Age can influence health behaviors, with older adults often more conscious of maintaining their well-being (Rakasiwi & Kautsar, 2021). Gender differences persist - men may report better health due to higher levels of physical activity, while women often experience greater morbidity linked to caregiving responsibilities and social inequalities. Marital status may provide a protective effect, as married individuals often benefit from emotional and practical support that fosters healthier lifestyles.

Based on the theory and prior empirical studies, this research proposes the following hypotheses there is a positive and significant relationship between households' expenditure, employment status, educational attainment, residential location, age, marital status and gender with individuals' health status.

Research Methods

The primary aim of this study is to examine the influence of socioeconomic status and demographic characteristics on individual health in Nusa Tenggara Barat (NTB). The research was conducted in NTB because it has the highest morbidity rate among all Indonesian provinces, recorded at 21.09% - significantly higher than the national average of 13.09%. These conditions make NTB a relevant and important case for investigating the relationship between socioeconomic and demographic factors and health outcomes.

This study utilizes raw data from the 2019 National Socioeconomic Survey (*Survei Sosial Ekonomi Nasional* or SUSENAS) conducted by the Central Bureau of Statistics (BPS). The dataset comprises a total of 14,469 observations. Data reduction process involves selecting, simplifying, abstracting, and transforming raw data into a more organized form for analysis. Specifically, the data reduction process included three steps: (1) selecting relevant data, (2) summarizing the collected information, and (3) grouping the data into broader patterns to facilitate interpretation.

This study employs a logit regression model, adapted from the approaches used by Rakasiwi and Kautsar (2021) and Jiang (2019). The analytical framework in this research combines variables from both models while incorporating several modified variables to better align with the specific context of West Nusa Tenggara. The resulting model is presented below.

$$Y = \beta_0 + \beta_1 HE_i + \beta_2 ES_i + \beta_3 EL_i + \beta_5 A_i + \beta_6 MS_i + \beta_7 G_i + \mu_i \dots\dots\dots (1)$$

Where:

- Y = Individual Health Status
- $\beta_1 - \beta_7$ = The coefficients of regression
- HE = Household Expenditure
- ES = Employment Status
- EL = Education Level
- LR = Location of Residence
- A = Age
- MS = Marital Status
- G = Gender

Table 1. Operational Definition of the Variables and Measurement

Variable	Notation	SUSENAS Code	Description	Measurement
<i>Dependent Variable</i>				
Individual Health Status	Y	R1102	The health condition of respondent	1 = Healthy 0 = Others
<i>Independent Variable</i>				
Household Expenditure	HE	Exp_cap	The poverty rate of the household	1 > poverty rate 0 ≤ poverty rate
Employment Status	ES	R701	Working status	1 = Working 0 = Others
Educational Level	EL	R613	Last completed education	1 ≥ Junior High School 0 < Junior High School
Location of Residence	X4	R105	Rural or urban residential	1 = Urban 0 = Rural
Age	X5	R407	The productive age	14-64 years old
Marital Status	X6	R404	Marital status of respondent	1 = Married 0 = Others
Gender	X7	R405	Sex of respondent	1 = Male 0 = Female

Source: Susenas 2019 processed, 2023

To assess whether the logistic regression model accurately represents the observed data, this study employs a Goodness of Fit test. Specifically, the Hosmer–Lemeshow (H–L) test is applied, which divides the sample into groups (commonly deciles) based on predicted probabilities and then compares the observed and expected frequencies within each group (David W et al., 2013). The null hypothesis (H_0) assumes no significant difference between the observed and predicted values. The decision criterion is as follows: if the p-value ≤ 0.05 , H_0 is rejected, indicating that the model does not adequately fit the data; if the p-value ≥ 0.05 , H_0 is accepted, suggesting that the model provides a good fit to the observed data.

Table 2. Goodness of Fit Test

Number of observations	14.469
Number of groups	10
Hosmer–Lemeshow chi2(7)	13.50
Prob > chi2	0.0958

Source: Susenas 2019 processed by author, 2023

In this study, as shown in Table 1, the p-value exceeds 0.05, indicating that the model adequately fits the data, and the logistic regression analysis can proceed.

Results and Analysis

Results

Omnibus Test Result

In logistic regression, the Omnibus Test of Model Coefficients evaluates whether the independent variables, taken together, significantly improve the model compared to a baseline model with no predictors (intercept-only). This test uses the likelihood ratio chi-square statistic to compare the -2 log-likelihood values of the two models. The null hypothesis (H_0) states that all predictor coefficients are equal to zero, meaning they collectively have no effect on the dependent variable, while the alternative hypothesis (H_1) posits that at least one predictor's coefficient is non-zero. If the chi-square statistic is significant ($p\text{-value} < 0.05$), H_0 is rejected, indicating that the predictors as a group contribute meaningfully to explaining variation in the dependent variable. If the $p\text{-value} \geq 0.05$, H_0 is accepted, suggesting that the model with predictors does not perform better than the intercept-only model. This test serves as an initial overall indicator of whether the logistic regression model is statistically meaningful before interpreting individual variable effects.

Table 3. Omnibus Test

Number of observations	14,469
LR chi2 (7)	657.20
Prob > chi2	0.0000
Pseudo r2	0.0332

Source: Susenas 2019 processed by author, 2023

Based on the results, the probability value obtained is $\text{Prob} > \chi^2 = 0.0000$. Referring to the previously described decision criteria, this $p\text{-value}$ is less than 0.05, leading to the rejection of the null hypothesis (H_0) and acceptance of the alternative hypothesis (H_1). This indicates that, simultaneously, the independent variables in the model have a statistically significant influence on the dependent variable.

Wald Test Results

In logistic regression, the Wald test is used to evaluate the significance of each independent variable individually, determining whether its coefficient is statistically different from zero. The test statistic is calculated as the estimated coefficient divided by its standard error, producing a $z\text{-value}$. The null hypothesis (H_0) states that the coefficient for a given variable equals zero, implying no effect on the dependent variable, while the alternative hypothesis (H_1) states that the coefficient is non-zero. At a 5% significance level ($\alpha = 0.05$), if the absolute value of the $z\text{-statistic}$ is large enough to yield a $p\text{-value}$ less than 0.05, H_0 is rejected, indicating that the variable significantly affects the dependent variable. Conversely, if the $p\text{-value}$ exceeds 0.05, H_0 is accepted, suggesting that the variable has no statistically

significant effect. The results of the Wald test for each predictor in this study are summarized in Table 3.

Table 4. Wald Test Result

Variable	Code	P> Z	Description
Household Expenditure	HE	0.000	The Household Expenditure Variable has a significant effect on Individual Health Status based on the p-value <0.05, which is 0.000.
Employment Status	ES	0.396	The Employment Status Variable has no significant effect on Individual Health Status based on the p-value >0.05, which is 0.396.
Education Level	EL	0.000	The Education Level Variable has a significant effect on Individual Health Status based on the p-value <0.05, which is 0.000.
Location of Residence	LR	0.000	The Location of Residence Variable has a significant effect on Individual Health Status based on the p-value <0.05, which is 0.000.
Age	A	0.000	The Age Variable has a significant effect on Individual Health Status based on the p-value <0.05, which is 0.000.
Marital Status	MS	0.000	The Marital Status Variable has a significant effect on Individual Health Status based on the p-value <0.05, which is 0.000.
Gender	G	0.000	The Gender Variable has a significant effect on Individual Health Status based on the p-value <0.05, which is 0.000.

Source: Susenas 2019 processed, 2023

The Odds Ratio Result

In this study, the interpretation of results is based on the odds ratio (OR), which is used to assess the strength and direction of the relationship between each independent variable and the dependent variable. An odds ratio greater than 1 indicates a positive association, meaning that as the independent variable increases, the likelihood of the outcome occurring also increases. Conversely, an odds ratio less than 1 signifies a negative association, indicating that higher values of the independent variable are associated with a reduced likelihood of the outcome.

Table 5. Odds Ratio Estimation

Variable	Odds Ratio
Household Expenditure	1.389179
Employment Status	0.9663309
Education Level	0.8315752
Location of Residence	1.623001
Age	1.022075
Marital Status	1.177725
Gender	0.878265

Source: Susenas 2019 processed, 2023

The findings of this study reveal that several variables exhibit positive relationships with individual health status, while others demonstrate negative associations, reflecting the complex interplay of socioeconomic and demographic factors in shaping health outcomes.

Logistic Regression Estimation Results

In this study, logistic regression is employed to estimate the coefficient values for each independent variable. Once obtained, these coefficients are incorporated into the formulated logistic regression model to represent the relationship between the predictors and the outcome variable. This method not only allows for the construction of the final model but also provides a means to assess the direction and magnitude of the influence exerted by each independent variable on the dependent variable. Through this estimation, the analysis identifies which factors significantly affect individual health status and the extent of their impact.

Table 6. Logistic Regression Estimation Results

Variable	Coefficient	Std. Error	Z	p> Z	95% Conf	Interval
MS	.163585	.0435293	3.76	0.000	.0782691	.2489009
LR	.4842772	.0437498	11.07	0.000	.3985291	.5700253
HE	.3287131	.0456918	7.19	0.000	.2391588	.4182675
G	-.1298069	.0360663	-3.60	0.000	-.2004956	-.0591183
ES	-.0342489	.0403223	-0.85	0.396	-.1132792	.0447813
EL	-.1844336	.0364432	-5.06	0.000	-.2558609	-.1130062
A	.0218348	.0015578	14.02	0.000	.0187816	.024888
Cons	-1.352021	.0660999	-20.45	0.000	-1.481574	-1.222468

Source: Susenas 2019 processed, 2023

Based on the logit regression model estimation on table 4.15, it can be input into this research model:

$$Y = -1.352021 + 0.3287131HE - 0.0342489ES - 0.1844336EL + 0.4842772A + 0.163585MS - 0.1298069G$$

Household Expenditure and Health

The analysis shows that household expenditure has a positive and significant effect on individual health status. Individuals whose household expenditure is above the poverty line are 1.389 times more likely to be healthy compared to those whose expenditure falls below the poverty line. This finding aligns with Mankiw's view that expenditure reflects consumption capacity; higher spending enables better nutrition and healthier lifestyle choices (Mankiw, 2018). It is also consistent with previous studies by Jiang (2019) also Rakasiwi and Kautsar (2021). Both of which found that individuals with expenditures above the poverty threshold tend to have better health outcomes.

Employment Status and Individual Health Status

The analysis indicates that employment status has a negative but statistically insignificant relationship with individual health. Those engaged in work activities are 0.966 times less likely to be healthy compared to individuals without work activities. The difference in health status between the employed and unemployed is minimal. According to the Ministry of Health of the Republic of Indonesia (2023), poor working conditions - such as overtime and unsafe environments - can increase stress levels and impair physical health. While employment may boost income, the absence of adequate workplace safety measures can undermine these benefits. This finding is consistent with research by Jimmy (2016) and Irawan (2018), which reported no significant relationship between employment status and health outcomes, as both employed and unemployed individuals tend to use health services at similar rates, and health behaviors are often influenced by personal motivation and mindset rather than job status alone.

Education Level and Individual Health Status

Unexpectedly, education level in this study shows a negative and statistically significant effect on health. Individuals with lower education are 0.832 times less healthy than those with higher education; however, it's reveals that a larger proportion of individuals with lower education report being healthy (46.08%) compared to those with higher education (39.78%). This result contrasts with human capital theory (Mankiw, 2018), which suggests that greater investment in education should lead to better quality of life and health outcomes. The finding is, however, in line with Afifah et al. (2022), who observed that in some contexts, individuals with lower education may still maintain good health. Meik et al. (2018) similarly found no significant link between education and health, noting that low-educated individuals often adopt healthy lifestyles. According to Halodoc (2023), basic healthy living principles—such as regular exercise, nutritious eating, stress management, and adequate rest—are widely understood and practiced across education levels, which may explain the results observed in this study.

Location of Residence and Individual Health Status

The results indicate a positive and significant relationship between location of residence and health status. Individuals living in urban areas are 1.623 times more likely to be healthy compared to those in rural areas. This finding aligns with Rakasiwi and Kautsar (2021), who reported that urban residents tend to enjoy better health outcomes due to easier access to quality healthcare services and supporting infrastructure. Urban centers typically offer more comprehensive health facilities, enabling residents to receive timely and effective medical care. Data from the Central Bureau of Statistics for West Nusa Tenggara Province (2023) confirm this disparity: cities such as Bima and Mataram each have around 13 hospitals, while most rural districts have only two or three. Moreover, urban residents often have greater financial capacity to utilize healthcare services (Dye, 2008). These combined factors contribute to the observed urban health advantage, highlighting the role of spatial inequality in shaping health outcomes.

Age and Individual Health Status

The findings indicate a positive and significant relationship between age and health status. Each increase in age is associated with a 1.022 times greater likelihood of being healthy. This suggests that as individuals grow older, they tend to adopt healthier lifestyles and consume more nutritious food, contributing to improved well-being. These results are consistent with Rakasiwi and Kautsar (2021), who found that advancing age increases the tendency to maintain good health, particularly among the productive workforce, where health plays a role in sustaining labor market participation. Similar conclusions were drawn by Ki et al. (2017), who reported that adults are generally healthier than teenagers, largely due to greater health awareness and more consistent engagement in preventive health behaviors.

Marital Status and Individual Health Status

The results show a positive and significant association between marital status and health, with married individuals being 1.178 times more likely to be healthy compared to those who are unmarried. This finding is consistent with Rakasiwi and Kautsar (2021), who reported that marriage is linked to better health outcomes. According to Thompson and Ski (2013), marriage can reduce stress levels, support heart health, and foster healthier behaviors through mutual care and attention between partners. Evidence from the Ministry of Health of the Republic of Indonesia (2023), as reported on the Alodokter platform, further supports these results, noting that marriage can enhance emotional well-being, lower certain health risks, and provide tangible benefits such as emotional support, healthier lifestyle choices, improved financial stability, and greater social acceptance. These combined factors suggest that the social and emotional support embedded in marital relationships contributes significantly to better health outcomes.

Gender and Individual Health Status

The results indicate a negative and significant relationship between gender and health status, with women tending to be healthier than men. Men are 0.878 times less likely to be healthy compared to women. As shown in Table 4.13, 44.70% of women report being healthy compared to 41.34% of men, highlighting a slight but meaningful health advantage for women. These findings are consistent with Eko and Sinaga (2018), who observed that women generally adopt healthier lifestyles than men. Gender is a key determinant of health-related behavior (Notoadmojo, 2010), with healthy individuals more likely to engage in preventive practices, maintain balanced lifestyles, and make health-conscious choices. According to the Ministry of Health of the Republic of Indonesia (2023), women in developed countries have a life expectancy 3–5 years longer than men, partly due to greater health awareness. Women are also less likely to engage in risky behaviors such as smoking or excessive alcohol consumption and tend to be more proactive in seeking medical check-ups, which contributes to their better overall health outcomes.

Analysis

Our analysis offers insights into the social determinants of health in a low-income, high-morbidity setting, with several findings reinforcing established theories and one notably deviating from expectations. We discuss each major result in turn, interpreting the findings through the lens of economic theory (particularly human capital theory) and prior empirical research, and we outline the implications for public health policy in NTB and similar contexts.

Economic Factors and Health: Income and Employment

Higher household expenditure significantly improves individual health, aligning with Grossman's health demand model, which emphasizes income as a means to invest in health-enhancing goods and services (Grossman, 1972). In NTB, this finding reflects the reality that material well-being is crucial to accessing basic health needs. It supports human capital theory, where health is seen as an outcome of financial investment in essentials like food, shelter, and care (Becker, 1994; Mankiw, 2018). Policies such as poverty alleviation, cash transfers, and health subsidies are therefore critical to reducing health disparities. Similar patterns have been observed internationally, including in China and Canada, where income inequality is closely tied to morbidity and health outcomes (Jiang et al., 2019).

Conversely, employment status did not significantly predict better health, suggesting that the nature of work matters more than employment itself. In NTB, many jobs—especially informal or agricultural—may expose individuals to physical strain and poor conditions, diminishing health benefits (Kemenkes, 2023). This is supported by studies showing no significant health difference between employed and unemployed individuals in Indonesia. Therefore, employment-based health strategies must prioritize safe, decent work and labor protections.

Education and Health: A Counterintuitive Outcome

One of the most unexpected findings in this study is the negative association between higher education and reported health in NTB, which contrasts with the widely accepted view that education improves health outcomes (Cutler, 2020). Several explanations may account for this. First, health awareness and reporting bias may play a role: more educated individuals may be more likely to recognize and report mild symptoms as illness, while less-educated individuals might underreport (Pampel et al., 2010). Second, cohort effects may influence outcomes—older adults with lower education may appear healthier due to survivorship bias, while younger, better-educated groups face stressors like childrearing or job competition. Third, occupational and lifestyle shifts tied to urbanization—such as sedentary jobs, processed food consumption, and less physical activity—may increase health risks for the educated, unlike their rural counterparts who maintain physically active routines and traditional diets. Additionally, stress and mental health pressures in white-collar environments may manifest physically (Cohen, 2004). Lastly, selection bias or health-related life choices could also distort the observed relationship. These findings highlight that education alone may not guarantee better short-term health and point to the need for targeted public health interventions for all socioeconomic groups.

Urban-Rural Health Divide

This study confirms a significant health advantage for urban residents over rural populations in NTB, highlighting persistent disparities in access to healthcare, infrastructure, and living conditions. This finding aligns with Rakasiwi and Kautsar (2021), who attribute better urban health outcomes in Indonesia to greater availability of health services and infrastructure. In NTB, urban centers like Mataram have many hospitals, while rural districts often have only one to three, with fewer doctors and longer travel times to care. Clean water access and education—both health-related determinants—are also more prevalent in cities.

From a development economics perspective, this reflects spatial inequality in human capital, where poor rural health can suppress productivity and educational outcomes, reinforcing poverty. According to Blum's (1974) health model, structural factors like environment and healthcare access are fundamental to health production—conditions that clearly disadvantage rural communities.

To reduce this gap, policies should prioritize rural health investments, improve transportation and referral systems, promote preventive care, and integrate technology such as telemedicine. Broader rural development - improving income, roads, and education - would also enhance health outcomes. The urban-rural divide in NTB underscores the need for inclusive growth strategies that reach underserved areas.

Demographic Influences: Age, Marital Status, and Gender

The positive relationship between age and health observed in this study may reflect lower illness rates among older individuals in NTB, suggesting that childhood diseases remain a dominant health burden in the region. Common infections like diarrhea and respiratory illnesses tend to disproportionately affect children, whereas older individuals benefit from stronger immunity and preventive care. This supports the need for early-life health investments, such as maternal nutrition, vaccinations, and sanitation improvements, which can significantly reduce child morbidity (Pampel et al., 2010). Although chronic diseases are rising nationally, NTB may still be in a transitional phase where acute illnesses outweigh long-term conditions among the elderly. Nevertheless, as life expectancy improves, chronic disease care for older adults will become increasingly important (Blum, 1974).

The study also confirms a positive health effect of marital status, consistent with social support theory. Married individuals tend to experience better health due to companionship and extended family care (Johnson et al., 2000). In NTB's cultural context, where marriage is common, health interventions could leverage family structures, such as couple-based health education. Attention should also be paid to unmarried or widowed individuals, who may lack caregiving support and be more vulnerable to health risks (Liu & Umberson, 2008).

Lastly, the finding that women report better short-term health aligns with global trends. Women are more likely to engage in preventive behaviors and maintain strong social support networks, whereas men often face greater occupational risks and engage in riskier behaviors like smoking (Pampel et al., 2010). In NTB, where smoking is prevalent among men, male-focused health interventions—including tobacco control, workplace safety, and mental health support—are critical. Meanwhile, women's health programs must continue to address maternal and long-term care needs as their life expectancy increases.

Theoretical Implications

The findings of this study broadly support Human Capital Theory, which posits that health is a form of human capital enhanced by socioeconomic inputs such as income, urban infrastructure, and social capital through marriage. Better health improves productivity and learning potential, reinforcing the value of investments in poverty alleviation, infrastructure, and social welfare as means of enhancing human capacity (Becker, 1993; Mankiw, 2018). However, the unexpected negative link between education and short-term health in NTB suggests that context matters. As Cleland (2010) notes, the marginal health returns to education may diminish once basic public health knowledge is widely available—through outreach efforts like immunization campaigns and hygiene promotion—even among low-educated populations.

This aligns with the health production function model (Santerre & Stephen P, 2010), which views health as an outcome of multiple inputs: SES, lifestyle, environment, and care access. Our results confirm

that urban location, behavior, and environment significantly shape health alongside income. Moreover, the observed gender differences support sociobehavioral theory—specifically, that male health is undermined by cultural norms that discourage help-seeking and promote risk-taking (Courtenay, 2000). Thus, effective health policy must address both structural inequality and behavioral norms.

Policy Implications

This study highlights several targeted policy recommendations for improving health outcomes in NTB and similar regions:

1. **Strengthen Anti-Poverty Programs:** Since household economic status significantly influences health, expanding cash transfers like PKH and supporting nutrition programs—especially school meals—can break the poverty-health cycle (Thomas, 1990).
2. **Invest in Rural Health Access:** Urban-rural health disparities call for more rural clinics, incentives for health workers, mobile clinics, and enhanced village health posts to bring services closer to underserved communities (Rakasiwi & Kautsar, 2021).
3. **Revamp Health Education:** The unexpected education-health link suggests a gap in translating knowledge into behavior. Health campaigns and workplace wellness programs must target all groups, including educated youth (Cleland, 2010).
4. **Promote Gender-Sensitive Health Interventions:** Tailor outreach to men (e.g., smoking cessation at mosques), while empowering women - shown to improve household health outcomes - through education and economic opportunities (Courtenay, 2000; Thomas, 1990).
5. **Leverage Family and Social Support:** Expand joint health programs for couples and create support systems for widowed or elderly individuals to replicate family-based care.
6. **Prioritize Child Health:** Boost immunization, sanitation, and school-based nutrition programs. Investing in child health builds future human capital (Pampel et al., 2010).
7. **Monitor and Evaluate:** Conduct follow-up studies on anomalies like the education-health gap and use national surveys (e.g., SUSENAS) to track intervention impact.
8. **Adopt Cross-Sectoral Approaches:** Health improvements depend on coordination across agriculture, education, sanitation, and social protection—aligned with the Sustainable Development Goals (SDGs 1, 3, 4, 6, 10).

In essence, NTB requires evidence-based, locally adaptive policies that address both well-known health drivers and emerging anomalies.

Conclusion

This study examined the influence of socioeconomic and demographic factors on individual health status in West Nusa Tenggara (NTB) using 2019 SUSENAS data and a binary logistic regression model. The findings indicate that higher household income and urban residence are significantly associated with better self-reported health, highlighting the importance of poverty reduction programs and improved healthcare accessibility in rural areas. Employment status did not show a significant effect, suggesting that job quality and security, rather than employment alone, are key to improving health outcomes. Interestingly, higher education was linked to poorer short-term health, which may reflect lifestyle-related risks, occupational stress, or a greater tendency to report illness. Demographically, older age, marriage, and female gender were positively related to health, pointing to the protective role of social support networks and the need for targeted male health engagement.

From a policy perspective, these results underscore the need for integrated strategies that combine poverty alleviation, rural health infrastructure development, workplace health standards, and inclusive public health education. Expanding cash transfer programs, increasing employment quality, and promoting universal health insurance coverage could significantly reduce health inequalities. However, this study is limited by its cross-sectional design and reliance on self-reported health, which may introduce reporting bias. Future research should use longitudinal data to explore causal relationships, investigate underlying mechanisms behind the education–health paradox in NTB, and incorporate qualitative approaches to capture local perceptions of health. By addressing both structural and behavioral determinants, NTB can move toward reducing morbidity, improving population well-being, and advancing progress toward the Sustainable Development.

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