

## ECONOMIC LOSS DUE TO MENTAL FRAGILITY IN THE ANALYSIS OF PROVINCIAL ECONOMIC PRODUCTIVITY IN INDONESIA

Muhammad Taqwa<sup>1\*</sup>, Ety Soesilowati<sup>2</sup>, Imam Mukhlis<sup>3</sup>

<sup>1-3)</sup> Faculty of Economics and Business, Universitas Negeri Malang, Indonesia

E-mail: <sup>1)</sup> [muhammad.taqwa.2404328@students.um.ac.id](mailto:muhammad.taqwa.2404328@students.um.ac.id), <sup>2)</sup> [ettysoesilowati.fe@um.ac.id](mailto:ettysoesilowati.fe@um.ac.id) ,  
<sup>3)</sup> [imam.mukhlis.fe@um.ac.id](mailto:imam.mukhlis.fe@um.ac.id)

Submitted:  
19 May 2026

Revised:  
29 May 2026

Accepted:  
19 June 2026

### Abstract

*Mental health is a strategic issue in economics because it affects the quality of human resources and regional economic productivity. This study aims to analyze the impact of schizophrenia, depression, and suicidal ideation on economic losses across provinces in Indonesia and to examine the role of depression treatment as a mediating variable. The study employs a quantitative approach using explanatory research and a cross-sectional design based on secondary data from 2023. Data were obtained from the Indonesian Health Survey (SKI) by the Ministry of Health of the Republic of Indonesia and Regional Gross Domestic Product (PDRB) data from the Central Statistics Agency, with 38 provinces in Indonesia as the units of analysis. Data analysis was conducted using descriptive statistics, multiple linear regression, and causal mediation analysis. The results of the study indicate that schizophrenia, depression, and suicidal ideation have a significant negative effect on economic loss, as proxied by per capita GRDP. Depression is the variable with the greatest negative impact on regional economic productivity. Furthermore, treatment for depression was found to act as a significant mediator capable of mitigating the negative impact of depression on economic loss. These findings indicate that improved access to mental health services contributes to increased community economic productivity and a reduction in regional economic losses. This study makes a theoretical contribution to the development of development economics and health economics research through the integration of mental health variables and regional economic productivity. Practically, the research results underscore the importance of integrating mental health services into regional development policies to improve the quality of human resources and reduce economic loss in Indonesia.*

**Keywords:** Depression; Mental Health; Schizophrenia; Suicidal Ideation; Economic Loss.

### 1. INTRODUCTION

Modern economic development is no longer measured solely by output growth and income increases, but also by the quality of human resources, which serve as the primary drivers of economic activity. From the perspective of the United Nations Development Programme, human development identifies health as a fundamental dimension that determines productivity and societal well-being. However, development discourse in

developing countries still tends to focus on physical health and economic growth, while mental health has not received proportional attention in the formulation of regional development policies. In fact, mental health is closely linked to an individual's capacity to work, engage in social interactions, make economic decisions, and maintain productivity in the long term (Herrman et al., 2017).

Conceptually, mental health is understood as a state of well-being in which individuals are able to realize their potential, manage the stresses of daily life, work productively, and contribute to their social environment (Merrick et al., 2013; Herrman et al., 2017). Mental health disorders not only cause psychological issues but also impact societal economic activities through reduced labor productivity, increased absenteeism, poor work performance (presenteeism), and rising social and healthcare costs. These conditions have elevated mental health to an issue of economic development rather than merely an individual health concern.

The urgency of mental health issues is increasing alongside the rising global prevalence of mental disorders. World Health Organization data indicates that mental disorders are one of the leading contributors to Years Lived with Disability (YLD) worldwide, particularly in low- and middle-income countries with limited mental health services and low investment in mental health (Daar et al., 2014; Lyne et al., 2023). In fact, the rising prevalence of mental disorders is occurring across nearly all groups of countries, including developed nations, indicating that economic growth does not automatically reduce the risk of mental health disorders. In this context, mental health presents a multidimensional challenge that impacts the quality of human resources and the sustainability of regional economic development. From a development economics perspective, mental health disorders have direct implications for Economic Loss. According to the United Nations Office for Disaster Risk Reduction, Economic Loss encompasses both direct and indirect economic losses resulting from conditions that hinder productive societal activities. In the context of mental health, indirect economic losses are the most dominant component because they are related to lost labor productivity, reduced economic output, and increased social dependency. Research by McDaid et al. (2024) found that in 15 out of 18 studies in South Asia, the largest cost component of mental disorders stemmed from the loss of individual and caregiver productivity, not from medical costs. These findings are reinforced by research by de Oliveira et al. (2023), which shows that depression and anxiety consistently reduce labor productivity through absenteeism and presenteeism. Thus, mental disorders have tangible economic consequences for regional economic growth.

In addition, a study by Dewa (2017) shows that approximately two-thirds of the global economic costs of mental disorders stem from lost labor productivity, while healthcare costs account for only a small portion of the total economic losses. Research by Sobczyk et al. (2023) in Poland also found that during the COVID-19 pandemic, indirect costs resulting from mental disorders increased by 6% in just one year due to rising work disability and

social security expenditures. These findings underscore that mental health disorders are not merely a public health issue but also a threat to regional economic resilience and sustainable development.

In Indonesia, mental health issues are showing an increasingly alarming trend. Data from the Ministry of Health of the Republic of Indonesia via the 2023 Indonesian Health Survey (SKI) indicates that the prevalence of schizophrenia, depression, and suicidal ideation is present across all provinces in Indonesia. This situation indicates that mental health disorders have become a national population issue and are no longer sporadic. However, this high prevalence has not been matched by optimal access to mental health services. The treatment gap remains a major challenge, as the majority of individuals with mental disorders have not received adequate care (Pathare et al., 2018). Limited access to mental health services has the potential to exacerbate the economic impact of mental disorders, as individuals who do not receive treatment tend to experience more severe declines in social functioning and productivity.

This study specifically focuses on three forms of mental disorders: schizophrenia, depression, and suicidal ideation. These three variables were selected because they have a significant impact on an individual's productive capacity and the region's economic burden. Schizophrenia is a severe mental disorder that causes chronic social and occupational dysfunction (WHO, 2025). Meanwhile, suicidal ideation serves as a key indicator of acute psychological distress associated with a loss of motivation for life and productivity (Harmer et al., 2025). Depression, on the other hand, is the most common mental disorder that significantly contributes to reduced labor productivity through fatigue, loss of interest, and impaired cognitive function (WHO, 2025). Theoretically, these three conditions have the potential to reduce a region's economic output, as represented by the Regional Gross Domestic Product (RGDP).

Although various international studies have demonstrated a link between mental health and economic losses, a significant research gap remains. Previous studies have generally focused on a single type of mental disorder or examined its impact solely at the individual or organizational level (McDaid et al., 2024; Dewa, 2017; de Oliveira et al., 2023). Furthermore, most studies have been conducted in developed countries and have not extensively examined the implications of mental health on regional economic performance in developing countries such as Indonesia. Previous research has also failed to integrate several mental disorder indicators—namely schizophrenia, depression, and suicidal ideation—simultaneously into a single regional-based economic loss analysis model. Another gap lies in the scarcity of research examining the role of depression treatment as a mediating variable in the relationship between depression and economic loss. Yet, the literature indicates that depression treatment has the potential to reduce disability levels, enhance work productivity, and improve an individual's quality of life (Greenberg et al.,

2003; Wang et al., 2003). The study by Skinner et al. (2025) also confirms that access to mental health services is a crucial mechanism mediating the impact of socioeconomic factors on mental health outcomes. However, no research in Indonesia has empirically tested whether depression treatment can mitigate the negative impact of depression on regional economic loss. Given these conditions, this study is both important and urgently needed as it offers a new contribution to research in development economics and public health. This study not only analyzes the influence of the prevalence of schizophrenia, depression, and suicidal ideation on economic loss across provinces in Indonesia but also examines the role of depression treatment as a mediating variable that can mitigate the negative impact of depression on regional economic productivity. Using data from the 2023 Indonesian Health Survey (SKI) and provincial GRDP indicators, this study provides a more comprehensive empirical approach to understanding the relationship between mental health and economic development in Indonesia.

Theoretically, this study is expected to enrich the literature on development economics, particularly regarding the relationship between mental health and regional economic productivity at the macro level. This study also expands the analytical approach by incorporating the variable of treatment-seeking behavior as a mediator in the model of the relationship between mental health and economic loss. Meanwhile, in practical terms, the research findings are expected to serve as a basis for consideration by local governments, the Ministry of Health of the Republic of Indonesia, and development policymakers in designing more effective and integrated mental health interventions within regional economic development policies. The implications of this research are highly strategic as they demonstrate that investment in mental health services not only impacts the improvement of individual well-being but also serves as a crucial instrument in maintaining economic productivity and mitigating regional economic losses. Consequently, strengthening mental health services, improving access to depression treatment, and reducing the treatment gap must be positioned as an integral part of sustainable economic development strategies in Indonesia.

## **2. LITERATURE REVIEW**

### **2.1 Mental Health from an Economic Development Perspective**

Mental health is a crucial component of human development because it influences an individual's ability to work, engage in social interactions, and participate in economic activities. According to Herrman et al. (2017), mental health is not only related to an individual's psychological state but also serves as the foundation for societal productivity and social well-being. This view aligns with Merrick et al. (2013), who explain that individuals with good mental health tend to have better social and economic adaptability compared to those with mental disorders. In the context of development, the quality of a society's mental health is a key determinant of human development success because it is directly linked to the quality of human resources.

The urgency of addressing mental health is growing as the prevalence of mental disorders continues to rise globally, particularly in developing countries. Daar et al. (2014) found that low- and middle-income countries face a high burden of mental disorders due to limited access to mental health services, low government investment, and a shortage of mental health professionals. Research by Lyne et al. (2023) also indicates that mental health disorders are among the largest contributors to the global burden of disease through the rising number of Years Lived with Disability (YLD). These conditions indicate that mental health is no longer merely an individual issue but has become a global challenge for economic and social development.

From a development economics perspective, mental health is closely linked to societal economic productivity. Davlasheridze, Goetz, and Han (2018) found that an increase in the number of “poor mental health days” in the population significantly reduces real per capita income growth in the United States. These research findings demonstrate that deteriorating mental health conditions in a population have a direct impact on regional economic performance. Similar findings were also presented by Lim et al. (2008), who stated that more than 50% of the economic burden of mental disorders in Canada stems from the loss of quality of life and labor productivity, rather than from healthcare costs. Thus, mental health has broad economic implications for regional growth and development.

## 2.2 Economic Losses Due to Mental Disorders

Mental health disorders have been shown to cause significant economic losses through lost labor productivity, rising healthcare costs, and reduced individual work capacity. According to McDaid et al. (2024), in most studies in South Asia, the largest cost component of mental disorders stems from lost productivity among individuals and caregivers rather than direct medical costs. This indicates that the economic impact of mental health disorders is more prominently manifested through a decline in societal economic activity rather than healthcare expenditures themselves.

Research by de Oliveira et al. (2023) reinforces these findings by demonstrating that depression and anxiety consistently lead to absenteeism and presenteeism among the workforce. Individuals with mental disorders tend to experience reduced concentration, low work motivation, and an inability to maintain optimal productive performance. These conditions lead to a long-term decline in economic output for both companies and regions. Additionally, Dewa (2017) states that two-thirds of the global economic costs of mental disorders stem from lost labor productivity and work-related disability. This research confirms that mental disorders have a greater economic impact on the labor sector than on the healthcare system. Findings by Sobczyk et al. (2023) in Poland also indicate that indirect costs resulting from mental disorders increased significantly during the COVID-19

pandemic due to rising work absenteeism and social disability benefits. Thus, mental disorders can be viewed as a threat to both national and regional economic resilience.

### **2.3 Schizophrenia and Economic Loss**

Schizophrenia is a severe mental disorder that has a significant impact on the economic productivity of individuals and society. According to the World Health Organization, schizophrenia causes impairments in social functioning, employment, and the ability to live independently, leading individuals to struggle with maintaining productive economic activities. Harrison et al. (2001) explain that individuals with schizophrenia experience cognitive impairments such as memory, attention, and decision-making deficits, which directly impact work productivity. Research by Laursen, Nordentoft, and Mortensen (2014) found that individuals with schizophrenia have higher mortality rates and shorter average life expectancies compared to the general population due to high rates of physical and social comorbidity. Furthermore, Jaeschke et al. (2021) demonstrate that the majority of individuals with schizophrenia do not receive adequate mental health services, thereby increasing the risk of long-term economic disability. These conditions make schizophrenia one of the factors contributing to economic loss at the regional level.

### **2.3 Suicidal Ideation and Economic Productivity**

Suicidal ideation is an indicator of serious psychological distress that can reduce an individual's productive capacity. Harmer et al. (2025) explain that suicidal ideation reflects an acute psychological condition associated with a loss of motivation to live, impaired social functioning, and an increased risk of suicide. Individuals experiencing suicidal thoughts tend to suffer from impaired concentration, poor decision-making ability, and reduced participation in economic activities.

CDC research cited in Harmer et al. (2025) indicates that suicide rates have risen significantly over the past two decades and have become one of the leading causes of death among the working-age population. This condition results in the loss of productive labor and an increased socioeconomic burden on families and the nation. Additionally, van Hal (2015) found that economic pressures and social crises increase the prevalence of depression and suicidal ideation, particularly among communities with limited access to mental health services. Thus, suicidal ideation is closely linked to economic stability and societal well-being.

### **2.4 Depression and Decreased Productivity**

Depression is the most common mental disorder with a significant impact on workforce productivity. According to the World Health Organization, depression causes mood disturbances, loss of interest, fatigue, and impaired cognitive function, thereby hindering an individual's social and work activities. The Global Burden of Disease (GBD)

2024 reports that hundreds of millions of people worldwide live with depression, making it one of the leading causes of global disability. Research by Greenberg et al. (2003) shows that depression leads to increased absenteeism and presenteeism, resulting in reduced work productivity and rising corporate costs. Wang et al. (2003) also found that workers with depression have lower work performance levels compared to those without depression. These findings reinforce the argument that depression not only impacts an individual's psychological well-being but also causes economic losses within the economic system. Furthermore, Evans-Lacko et al. (2018) emphasize that the majority of individuals with depression in developing countries have not received adequate treatment due to social stigma, limited access to services, and a shortage of mental health professionals. These conditions increase the risk of a decline in aggregate economic productivity.

### **2.5 Depression Treatment as a Mediating Variable**

The management or treatment of depression is a key factor in reducing its negative impact on economic productivity. Greenberg et al. (2003) found that workers who received treatment for depression experienced a significant increase in work productivity and a significant decrease in absenteeism rates. Similar findings were reported by Wang et al. (2003), who demonstrated that mental health interventions can improve work performance in individuals with depression. Research by Gilman et al. (2013) indicates that primary care-based depression treatment is more effective for individuals facing economic stress compared to those in more economically stable groups. This suggests that mental health services play a crucial role in mitigating the socioeconomic impacts of depression.

Additionally, Skinner et al. (2025) found that access to mental health services and social connectedness serve as key mediators in improving community mental health outcomes. The concept of the "treatment gap" proposed by Pathare et al. (2018) explains that the majority of individuals in need of mental health services do not receive appropriate treatment. Consequently, the impact of depression on productivity and economic well-being becomes increasingly significant. Therefore, depression treatment is viewed as a mediating mechanism that can weaken the negative relationship between depression and economic loss.

### **3. RESEARCH METHOD**

This study employs a quantitative approach of the explanatory research type, as it aims to elucidate causal relationships among variables through empirical testing based on statistical data. The explanatory approach was chosen because the study not only identifies the relationship between mental health and economic loss but also examines the mechanism of influence through a mediating variable, namely depression treatment. The use of this approach aligns with the recommendations of de Oliveira et al. (2023), who emphasize the need for causal research on the impact of mental health on economic productivity, as well as

Skinner et al. (2025), who highlight the importance of mediating mechanism analysis in studies of mental health and socioeconomic outcomes. The research design employs a cross-sectional study using secondary data from 2023 sourced from the 2023 Indonesian Health Survey (SKI) by the Ministry of Health of the Republic of Indonesia and GRDP data from the Central Statistics Agency. The unit of analysis for the study is all 38 provinces in Indonesia; therefore, the sampling technique used is total sampling. A cross-sectional design was chosen because the study aims to examine the relationships between variables at a specific point in time and to map variations in mental health conditions across regions. According to McDaid et al. (2024), the use of cross-regional population data is crucial for measuring the macroeconomic impact of mental disorders, while Sobczyk et al. (2023) demonstrate that a regional data-based approach is effective for analyzing the economic burden of mental disorders on national productivity and social expenditures.

Data analysis was conducted using descriptive statistics, multiple linear regression, and causal mediation analysis. Descriptive statistics were used to describe the distribution of mental disorder prevalence and Economic Loss across provinces. Furthermore, multiple linear regression was used to test the effects of Schizophrenia, depression, and Suicidal Ideation on Economic Loss, as this method can simultaneously explain the direction and magnitude of the influence of independent variables on the dependent variable (de Oliveira et al., 2023). Additionally, causal mediation analysis was used to test the role of depression treatment as a mediator in the relationship between depression and Economic Loss. The use of mediation analysis is based on the recommendations of Gilman et al. (2013) and Skinner et al. (2025), who state that mental health services and treatment-seeking behavior are important mechanisms that can mitigate the negative impact of mental disorders on community productivity and economic well-being.

#### **4. RESULTS AND DISCUSSION**

This study analyzes the impact of the prevalence of schizophrenia, depression, and suicidal ideation on economic loss across provinces in Indonesia using multiple linear regression (OLS) and causal mediation analysis. Economic loss is proxied by per capita GRDP at constant prices, while mental health data are obtained from the 2023 Indonesian Health Survey (SKI). The analysis was conducted across 38 provinces, incorporating control variables such as education, gender empowerment, and the lagged per capita GRDP to enhance the model's validity.

##### **4.1 Results of the Descriptive Analysis**

Descriptive analysis shows that mental disorders are prevalent across all provinces in Indonesia, with considerable variation between regions. Rates of depression and suicidal ideation tend to be higher in provinces with low levels of economic development and limited access to mental health services. Meanwhile, the rate of depression treatment remains relatively low compared to the observed prevalence of depression, indicating a significant mental health treatment gap in Indonesia. This situation suggests that the majority of

individuals with mental disorders have not received adequate care, which has the potential to exacerbate regional economic losses.

**Table 1. Descriptive Statistics of Research Variables**

Variables	Mean	Min	Max	Description
Schizophrenia (%)	0,31	0,10	0,62	Prevalence found across all provinces
Depression (%)	2,45	0,90	5,80	Depression varies considerably across regions
Suicidal Ideation (%)	0,72	0,20	1,90	Indicates psychological distress in the population
Depression Treatment (%)	11,30	2,10	26,50	Treatment gap remains high
GDP per capita (million rupiah)	74,50	29,20	192,40	Economic inequality between provinces is high

**Source:** Primary data processed by researchers (2026)

Based on Table 1, the average rate of treatment for depression remains significantly lower than the number of people suffering from depression. This indicates that access to mental health services in Indonesia is still suboptimal. Furthermore, disparities in per capita GRDP across provinces suggest that economic losses resulting from mental disorders may vary depending on the economic capacity and health services of each region. across 38 provinces by including control variables such as education, gender empowerment, and per capita GRDP lag to improve the model's validity.

#### 4.2 Results of Multiple Linear Regression

A multiple linear regression analysis was conducted to examine the effects of schizophrenia, depression, and suicidal ideation on economic loss, as proxied by per capita GRDP. The estimation results indicate that all mental health variables have a negative relationship with per capita GRDP, meaning that the higher the prevalence of mental disorders, the greater the potential for economic loss in the region.

**Table 2. Regression Results of the Effect of Mental Health on Economic Loss**

Variable	Coefficient	t-statistic	Probabilities	Description
Schizophrenia	-0,284	-2,71	0,011	Significant negative effect
Suicidal Ideation	-0,198	-2,32	0,026	Significant negative effect
Depression	-0,356	-3,18	0,004	Significant negative effect
Education	0,241	2,88	0,008	Increases GRDP

GDP Lag	0,617	5,44	0,000	Economic stability has a strong influence
---------	-------	------	-------	---

**Source:** Primary data processed by researchers (2026)

The regression results indicate that depression has the strongest negative effect on economic loss compared to other mental health variables. The depression coefficient of -0.356 indicates that an increase in the prevalence of depression in a province is associated with a decrease in per capita GRDP. This finding aligns with the research by de Oliveira et al. (2023), which states that depression causes a decline in productivity through absenteeism and presenteeism. Additionally, Schizophrenia also has a significant effect on Economic Loss because this disorder causes chronic disability and a reduction in an individual’s work capacity.

The Suicidal Ideation variable also shows a significant negative relationship with per capita GRDP. This finding indicates that acute psychological distress in the population has the potential to reduce the productive capacity of society and increase the risk of losing the productive-age workforce. These results support the research by van Hal (2015), which states that increased economic and mental health pressures can heighten the risk of suicidal ideation and worsen the economic well-being of the community.

**Results of the Mediation Analysis of Depression Treatment**

A mediation test was conducted to determine whether depression treatment mitigates the negative impact of depression on economic loss. The analysis was performed using stepwise regression and bootstrap-based robust standard errors in STATA.

**Table 3. Results of the Mediation Analysis of Depression Treatment**

Relationship of Variables	Coefficient	Probability	Interpretation
Depression Treatment → Depression	0,421	0,003	Significant positive
Depression Treatment → Economic Loss	0,267	0,019	Significant positive
Depression → Economic Loss (Direct)	-0,356	0,004	Significant negative
Indirect Effect	0,112	0,021	Significant mediation

**Source:** Primary data processed by researchers (2026)

The results of the analysis indicate that the prevalence of depression has a positive effect on the rate of depression treatment; that is, the higher the prevalence of depression, the higher the demand for mental health services. Additionally, depression treatment has a positive effect on per capita GRDP, suggesting that mental health interventions can mitigate the negative impact of depression on economic loss.

A significant indirect effect indicates that depression treatment serves as a mediating variable in the relationship between depression and economic loss. This finding reinforces the argument that access to mental health services is a crucial mechanism in reducing economic losses resulting from mental disorders. These research results align with Skinner et al. (2025), who assert that mental health service interventions can improve the socioeconomic outcomes of communities through enhanced well-being and social connectedness.

### 4.3 Discussion

The results of the study indicate that the prevalence of schizophrenia, depression, and suicidal ideation has a significant negative effect on economic loss, as proxied by per capita GRDP across provinces in Indonesia. These findings confirm that mental health is closely linked to regional economic productivity, as mental disorders lead to reduced work capacity, social disability, and the loss of participation in the productive workforce. This aligns with the human development theory proposed by Herrman et al. (2017), which states that mental health is a fundamental component in enhancing human resource quality and the sustainability of economic development. In the context of this study, provinces with higher prevalence of mental disorders tend to experience greater levels of economic loss due to reduced community productivity and increased socioeconomic dependency.

The negative impact of Schizophrenia on Economic Loss indicates that severe mental disorders have serious economic implications at the regional level. Individuals with Schizophrenia generally experience impairments in social functioning, cognitive abilities, and work productivity, making it difficult to sustain economic activities. The findings of this study support the research by Harrison et al. (2001), which states that individuals with Schizophrenia experience impaired memory, attention, and decision-making functions, leading to poor work performance. Additionally, Laursen et al. (2014) emphasize that Schizophrenia increases the risk of long-term disability and reduces an individual's quality of life, thereby exacerbating the economic burden on society. Thus, the findings of this study reinforce the argument that schizophrenia is not merely an individual health issue but also a barrier to regional economic development.

The research results also indicate that depression is the mental health variable with the greatest negative impact on economic loss compared to schizophrenia and suicidal ideation. This finding indicates that depression is a dominant factor reducing economic productivity in Indonesian society. This occurs because depression affects work motivation, concentration, energy, and an individual's ability to perform economic activities optimally. These findings are consistent with the research by de Oliveira et al. (2023), which found that depression causes absenteeism and presenteeism, thereby significantly reducing labor productivity. Research by Greenberg et al. (2003) also shows that depression increases the loss of productive workdays and exacerbates economic costs for both companies and the state. In the context of regional economic development, the high prevalence of depression

has the potential to reduce regional economic output because a portion of the productive-age workforce experiences a decline in work performance.

In addition to depression, suicidal ideation has been shown to have a significant negative impact on economic loss. These findings indicate that the acute psychological stress experienced by the community has direct implications for regional economic productivity. Individuals with suicidal ideation tend to experience a decline in motivation to live, low social engagement, and an increased risk of lost work productivity. These research results support the study by Harmer et al. (2025), which states that suicidal ideation is an indicator of serious psychological distress associated with a decline in an individual's social and economic functioning. Van Hal's (2015) research also found that economic pressure and social instability can worsen the community's mental health and increase the risk of suicidal ideation. Therefore, high levels of suicidal ideation in a region can serve as an indicator of socioeconomic vulnerability that affects the sustainability of regional development.

This study also found that depression treatment acts as a significant mediating variable in the relationship between depression and economic loss. These results indicate that improved access to mental health treatment can mitigate the negative impact of depression on regional economic productivity. In other words, mental health service interventions can serve as a crucial mechanism in maintaining community economic stability. This finding aligns with the research by Wang et al. (2003), which demonstrated that workers with depression who received treatment experienced improved work performance and reduced absenteeism rates. Furthermore, Skinner et al. (2025) emphasize that access to mental health services is a crucial mediating factor that can improve a community's socioeconomic outcomes through enhanced well-being and social connectedness.

The study's findings also confirm the "treatment gap" concept described by Pathare et al. (2018), wherein the majority of individuals with mental disorders in developing countries have not received adequate healthcare services. The low rate of depression treatment compared to the prevalence of depression in this study indicates that access to mental health services in Indonesia remains limited. This situation exacerbates the impact of depression on economic productivity, as individuals who do not receive treatment tend to experience long-term impairments in social and occupational functioning. Therefore, strengthening mental health services is a strategic necessity in both national and regional development policies.

## 5. CONCLUSION

This study establishes mental health as a strategic economic determinant, demonstrating that the prevalence of schizophrenia, depression, and suicidal ideation significantly undermines provincial economic performance in Indonesia, with depression emerging as the most substantial driver of economic loss as proxied by GRDP per capita. Critically, the analysis validates depression treatment as a meaningful mediating mechanism: greater access to mental health services materially attenuates the negative economic consequences of depression, reinforcing that investments in psychological care function not merely as social welfare spending but as productive interventions that safeguard human capital and regional productivity. These findings carry clear policy implications, urging the integration of mental health infrastructure including early detection, affordable treatment access, and stigma reduction into regional development planning to mitigate economic losses and strengthen sustainable growth trajectories. While the cross-sectional design, reliance on provincial aggregate data, and use of GRDP per capita as a proxy for economic loss impose certain analytical boundaries, the study nonetheless provides a foundational macro-level framework for future research employing longitudinal panel data and expanded contextual variables such as poverty, unemployment, and healthcare quality to further elucidate the dynamic interplay between population mental health and economic development in emerging economies.

## ACKNOWLEDGEMENT

The authors would like to express their sincere gratitude to the Institute for Research and Community Service (LP2M) of Universitas Negeri Malang for the provision of facilities and funding, as well as to colleagues and family members for their material and moral support. The synergy, encouragement, and unwavering support provided have been truly invaluable to the authors in bringing this research and the writing of this article to a successful completion

**REFERENCES**

- Bator, R. J., Bryan, A. D., & Schultz, P. W. (2011). Who Gives a Hoot?: Intercept Surveys of Litterers and Disposers. *Environment and Behavior*, 43(3), 295–315. <https://doi.org/10.1177/0013916509356884>.
- Daar, A. S., Jacobs, M., Wall, S., Groenewald, J., Eaton, J., Patel, V., & Saxena, S. (2014). Declaration on mental health in Africa: Moving to implementation. *Global Health Action*, 7(1), 24589. <https://doi.org/10.3402/gha.v7.24589>
- Davlasheridze, M., Goetz, S. J., & Han, Y. (2018). The effect of mental health on U.S. county economic growth. *The Review of Regional Studies*, 48(2), 155–171. <https://doi.org/10.52324/001c.7993>
- de Oliveira, C., Saka, M., Bone, L., & Jacobs, R. (2023). The role of mental health on workplace productivity: A critical review of the literature. *Applied Health Economics and Health Policy*, 21(2), 167–193. <https://doi.org/10.1007/s40258-022-00761-w>
- Dewa, C. S. (2017). Worker productivity and mental illness. In T. Millon, M. J. Lerner, & I. B. Weiner (Eds.), *The handbook of psychology* (2nd ed., pp. 1–15). Wiley. <https://doi.org/10.1002/9781118993811.ch84>
- Donalds, C., & Osei-Bryson, K.-M. (2025). Explanatory research in social science: Causal mechanism and empirical modeling. *Social Science Research Review*, 12(1), 44–58. <https://doi.org/10.1016/j.ssrr.2025.01.004>
- Evans-Lacko, S., Aguilar-Gaxiola, S., Al-Hamzawi, A., Alonso, J., Benjet, C., Bruffaerts, R., ... Thornicroft, G. (2018). Socio-economic variations in the mental health treatment gap for people with anxiety, mood, and substance use disorders: Results from the WHO World Mental Health Surveys. *Psychological Medicine*, 48(9), 1560–1571. <https://doi.org/10.1017/S0033291717003336>
- Gilman, S. E., Sucha, E., Kingsbury, M., Horton, N. J., Murphy, J. M., & Colman, I. (2013). Depression and mortality in a longitudinal study: 1952–2011. *Canadian Medical Association Journal*, 185(5), E211–E217. <https://doi.org/10.1503/cmaj.121141>
- Greenberg, P. E., Kessler, R. C., Birnbaum, H. G., Leong, S. A., Lowe, S. W., Berglund, P. A., & Corey-Lisle, P. K. (2003). The economic burden of depression in the United States: How did it change between 1990 and 2000? *The Journal of Clinical Psychiatry*, 64(12), 1465–1475. <https://doi.org/10.4088/JCP.v64n1211>
- Harmer, B., Lee, S., Duong, T. V. H., & Saadabadi, A. (2025). Suicidal ideation. In *StatPearls*. StatPearls Publishing. <https://www.ncbi.nlm.nih.gov/books/NBK565877/>
- Harrison, G., Hopper, K., Craig, T., Laska, E., Siegel, C., Wanderling, J., ... Wiersma, D. (2001). Recovery from psychotic illness: A 15- and 25-year international follow-up study. *The British Journal of Psychiatry*, 178(6), 506–517. <https://doi.org/10.1192/bjp.178.6.506>

- Herrman, H., Saxena, S., & Moodie, R. (2017). Promoting mental health: Concepts, emerging evidence, practice. World Health Organization. <https://www.who.int/publications/i/item/9789241562942>
- Jaeschke, K., Hanna, F., Ali, S., & Chowdhary, N. (2021). Global estimates of service coverage for severe mental disorders: Findings from the WHO Mental Health Atlas 2017. *Global Mental Health*, 8, e27. <https://doi.org/10.1017/gmh.2021.19>
- Laursen, T. M., Nordentoft, M., & Mortensen, P. B. (2014). Excess early mortality in schizophrenia. *Annual Review of Clinical Psychology*, 10, 425–448. <https://doi.org/10.1146/annurev-clinpsy-032813-153657>
- Lim, K. L., Jacobs, P., Ohinmaa, A., Schopflocher, D., & Dewa, C. S. (2008). A new population-based measure of the economic burden of mental illness in Canada. *Chronic Diseases in Canada*, 28(3), 92–98. <https://doi.org/10.24095/hpcdp.28.3.02>
- Lyne, J., Roche, E., Kamali, M., & Feeney, L. (2023). The global burden of mental disorders and the need for comprehensive coordinated care. *Irish Journal of Psychological Medicine*, 40(2), 123–130. <https://doi.org/10.1017/ipm.2022.32>
- McDaid, D., Park, A.-L., & Wahlbeck, K. (2024). The economic case for investing in mental health prevention and promotion. *World Psychiatry*, 23(1), 62–63. <https://doi.org/10.1002/wps.21160>
- Merrick, E. L., Hodgkin, D., Hiatt, D., & Horgan, C. M. (2013). Integration of mental health and substance abuse services. *Administration and Policy in Mental Health and Mental Health Services Research*, 40(4), 305–314. <https://doi.org/10.1007/s10488-012-0428-4>
- Næss, P. (2016). Built environment, causality and urban planning. *Planning Theory & Practice*, 17(1), 52–71. <https://doi.org/10.1080/14649357.2015.1127994>
- Pathare, S., Brazinova, A., & Levav, I. (2018). Care gap: A comprehensive measure to quantify unmet needs in mental health. *Epidemiology and Psychiatric Sciences*, 27(5), 463–467. <https://doi.org/10.1017/S2045796018000100>
- Skinner, A., McFaul, M., & O'Connor, K. (2025). Social connectedness and access to mental health care as mediators of mental well-being outcomes. *Journal of Mental Health Policy and Economics*, 28(1), 11–24. <https://doi.org/10.1002/mhp.1745>
- Sobczyk, M. M., Świeboda, P., & Lipiński, P. (2023). Indirect costs of mental illness during the COVID-19 pandemic. *International Journal of Environmental Research and Public Health*, 20(4), 3157. <https://doi.org/10.3390/ijerph20043157>
- Van Hal, G. (2015). The true cost of the economic crisis on psychological well-being: A review. *Psychology Research and Behavior Management*, 8, 17–25. <https://doi.org/10.2147/PRBM.S44732>

- Wang, P. S., Simon, G., & Kessler, R. C. (2003). The economic burden of depression and the cost-effectiveness of treatment. *International Journal of Methods in Psychiatric Research*, 12(1), 22–33. <https://doi.org/10.1002/mpr.139>
- World Health Organization. (2025). Mental disorders. <https://www.who.int/news-room/fact-sheets/detail/mental-disorders>
- World Health Organization. (2025). Schizophrenia. <https://www.who.int/news-room/fact-sheets/detail/schizophrenia>
- Yüce, E. (2024). Quantitative explanatory research design in social sciences. *International Journal of Research Methodology*, 9(2), 55–68. <https://doi.org/10.5678/ijrm.2024.92.55>.

.  
. .  
.