International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

Determinants Of Life Expectancy: A Case Study By Gender In Indonesia In 2014-2023

Yoga Nur Rahman[1], Neli Aida[2], Vitriyani Tri Purwaningsih[3]

[1,2,3]Faculty of Economics and Business, University of Lampung, Indonesia

Coresponding author : yoganurrahman4@gmail.com

Abstract

Study aims to analyze the determinants of life expectancy (LE) by gender across 34 provinces in Indonesia during the 2014–2023 period. The variables examined include health complaints, health facilities, Gross Regional Domestic Product (GRDP) per capita, education level, and poverty rate on male and female LE. The study employs panel data regression with a Fixed Effect Model approach. The results show that education and GRDP per capita have a positive and significant effect on both male and female LE. Health facilities have a significant effect only on male LE, while the poverty rate has a negative and significant effect on male LE but is not significant for females. Health complaints do not significantly affect LE for either gender. Simultaneously, all independent variables significantly influence both male and female LE. These findings highlight the importance of economic development, education, and access to health facilities in improving life expectancy in Indonesia.

Keywords: Life expectancy, GRDP per kapita, Education, Health facilities, Poverty

INTRODUCTION

Population is one of the important assets for a country in supporting the development process. The Human Development Index (HDI) is used as the main indicator to assess the success of population development in an area. HDI consists of three main sectors, namely education, health, and economy. The Human Development Index (HDI) is an important factor in determining the minimum wage level and the HDI also reflects the level of quality of the workforce in terms of skills and abilities (Alpina Aprilia & Aida, 2024). This is in accordance with the UNDP which developed the HDI as an indicator to

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

measure the progress of development and the welfare of a country. In the health sector, one of the indicators of community welfare is measured through life expectancy. Therefore, life expectancy is one of the benchmarks in assessing the health and welfare status of a country (Halicioglu, 2011). The welfare of the community is one of the points in Sustainable Development Goals or the third point of the SDGs, which is about a healthy and prosperous life. As for this life expectancy, a phenomenon emerges, namely the gap between the life expectancy of men and the life expectancy of women. Where women's life expectancy is longer when compared to men's life expectancy. For example, in 2020, research conducted in Bulgaria showed that the life expectancy of men was 69.9 years, while the life expectancy of women was 77.5 years (Pinho-Gomes et al., 2022). In the last 10 years, AHH in Indonesia has shown an upward trend every year. Both men and women enjoy a fairly stable increase in life expectancy. However, despite the general improvement, there is still a striking gap between the life expectancy of men and women in Indonesia.

Life expectancy (AHH) is an estimate of the possible life expectancy of a person in a community group assuming there is no change in the pattern of mortality by age. Life expectancy is a measure of how long a person is expected to live and is more broadly used to measure human development.

Health complaints are one of the signs that someone has a health problem in themselves, this health complaint can be a good sign if when they feel it someone immediately quickly handles it in one of the ways, namely consulting the health authorities so that the health complaints suffered will be known and can be handled immediately. health complaints that occur in men and women in Indonesia fluctuate which means that these health complaints can come at any time, and can happen to anyone, especially individuals with unhealthy lifestyles. Where health complaints experienced by women are higher or more often felt compared to men. Novitasari et al., (2021) explained that this health complaint had a negative and significant effect on the human development index (HDI) in East Java Province in 2015-2018.

Health facilities play a crucial role as one of the essential infrastructure pillars in a region's health system, where hospitals are among the most vital categories of advanced medical services. The availability of geographical and economic accessibility to hospitals for the entire population in an area has significant implications for the community's ability to obtain comprehensive and maximum health care. number of hospitals in Indonesia continues to grow every year, this shows that the infrastructure for health facilities in Indonesia continues to experience better improvement. Where the highest number for the

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

highest number of hospitals in 2023 is 2630 spread throughout Indonesia. Wardhana & Kharisma, (2023) that health infrastructure, one of which is the existence of a hospital, can have a positive and significant effect on a person's life expectancy. Good health infrastructure allows people to access medical services more easily.

Gross Regional Domestic Product (GRDP) per capita is one of the main indicators to assess the level of population welfare and economic growth of a region. The income of the community allows them to meet the needs of life, especially basic needs. GRDP per capita in Indonesia continues to show an upward trend, except in 2020 where GRDP per capita fell to Rp.39,778 where previously in 2019 GDP per capita was Rp.41,021, until in 2023 it increased to Rp.44,139. Setyadi et al., (2023) explains that GDP per capita shows a positive, yet statistically insignificant, effect influence on women's AHH, while for AHH men have a positive and significant influence.

Education is one of the important keys to improving the quality of human resources in society. Veugelers, (2001) highly educated people often have an understanding of better health, which in turn can have a positive impact on their life expectancy. level of education that can be felt by people in Indonesia continues to increase every year for both men and women, the highest male and female education is in 2023 where the average school for boys is 9.07 years and for women is 8.48 years. Wahyuni et al., (2023) explained that education level has a direct positive effect on AHH, where when the level of education in the community increases by 1 year, this will increase AHH by about 0.547 years. Meanwhile, indirectly the average length of school will have an impact on their work, where the higher a person's education, the greater the chance to get a job with a high salary, this will indirectly affect the per capita expenditure of the community in consumption expenditure.

Poverty is a situation when a population or community living in a state of deprivation such as lack of nutrition and poor health, has a low level of education, lives in an area with an inadequate environment, and has a below-average income (Todaro, 2011). poverty that occurs in Indonesia is still quite high, this can be seen based on the percentage of poverty in the population, in the 2014-2023 period. The percentage of the Indonesian population that still experiences poverty every year fluctuates with the highest occurring in 2015 around 11.13% of the Indonesian population experiencing poverty. Tafran et al., (2020) Where when the decrease in poverty rates can be associated with better health outcomes in the community, where poverty has a significant negative effect on a person's life expectancy, which means that the reduction in the poverty rate that occurs in the community can increase their life expectancy for the community.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

This study continues from previous research to see the causes of the gap between the life expectancy of men and women from factors that can affect it from previous research, by using the panel data regression method to see the factors that can affect the life expectancy between men and women, the data used in this study is in 34 provinces in Indonesia with a time vulnerability from 2014-2023, and obtain comprehensive research results both in the long and short term from the variables of GDP per capita, education level, poverty level, health complaints, and health facilities on life expectancy variables.

METHOD

Types and Data Sources

This study is a type of quantitative research that aims to objectively analyze and measure the relationships between variables in the research object that affect each other, as well as to prove or test the hypothesis proposed (Neuman, 2003). The results of this study will illustrate how the influence of health complaints, health facilities, GDP per capita, education level, and poverty on life expectancy for both men and women. This study uses secondary panel data in the form of serial data from 2014 to 2023, with *cross-sections* covering 34 provinces in Indonesia. The data source used comes from the Central Statistics Agency (BPS).

Research Limitations

Tabel 1. Research Limitations

Variable	Symbol	Unit	Data Source
Men's Life Expectancy Figures and Women	HHP & HHW	Year	BPS
Male and Female Health Complaints	KKP & KKW	Percent (%)	BPS
Health Facilities	FK	Unit	BPS
GRDP Per Capita	PPK	Rupiah (Rp)	BPS
Male and Female Education	PP & PW	Year	BPS
Poverty Rate	TK	Percent (%)	BPS

Analysis Methods

In this study, a multiple regression model of panel data was used to analyze the effect of independent variables on dependent variables. Using the Stata-64 application as an analysis software, this study aims to find out whether there is an effect of male and

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

female health complaints (X1), health facilities (X2), GRDP Per Capita (X3), male and female education (X4), and Poverty Rate (X5) on the Life Expectancy Rate of men and women (Y) in 34 provinces in Indonesia in 2014-2023. This study uses a double natural logarithmic model, which is a logarithmic model applied to independent and dependent variables, because logarithms have various benefits, such as reducing the scale of the measured variables and making adjustments to overcome normality and heteroscedasticity. Therefore, this model is referred to as the logarithmic model (Gujarati, 2006). The following is a model for double logarithmic research:

$$LnAHHPit = \beta_0 + \beta 1KKP_{it} + \beta 2LnFK_{it} + \beta 3LnPPK_{it} + \beta 4LnPPit + \beta 5TKit + eit \quad \text{(Pers.. 1)}$$

And

$$LnAHHWit = \beta_0 + \beta 1KKWit + \beta 2LnFK_{it} + \beta 3LnPPK_{it} + \beta 4LnPWit + \beta 5TKit + eit \quad \text{(Pers... 2)}$$

From equation (1) the model explains that AHHP is the life expectancy of men as a bound variable and KKP is male health complaints, PDRBPK is GDP per capita, PP is male education and TK is poverty level as an independent variable. Meanwhile, from Equation (2) the model explains that AHHW is the life expectancy rate of women as a bound variable and KKW is women's health complaints, PDRBPK is GDP per capita, PW is women's education and TK is the poverty level as an independent variable. With Ln is a natural logarithm.

RESULTS AND DISCUSSION

Model Selection Test

Table 2. Model Selection Test

Model Selection Test	Prob.>F	Selected Models
Chow Test (Men)	0.0000	Fixed Effect
Chow Test (Women)	0.0000	Fixed Effect
Hausman Test (Men)	0.0000	Fixed Effect
Uji Hausman (Women)	0.0000	Fixed Effect

As presented in Table 2, the CHOW test results indicate a P-value of 0.0000 for both male and female life expectancy, which is smaller than α (0.05). Thus, The appropriate decision is to reject H0 and accept Ha, indicating that the Fixed Effect Model (FEM) is more suitable than the Common Effect Model (CEM) for estimating this study. Since the Fixed Effect Model (FEM) is selected based on this test, the subsequent step

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

required is to perform the Hausman test. While the results of the thirst test test explained that a P-value of 0.0000 was obtained for both male and female life expectancy, this value was smaller than α (0.05), it was determined that the decision taken was to reject H0 and accept Ha. The Fixed Effect Model (FEM) outperforms the Random Effect Model (REM), based on the results of the preceding tests, the Fixed Effect Model (FEM) is identified as the most appropriate model for analyzing male and female life expectancy.

Model Selection results

Table 3. Selected Model Regression Test Results

lnHHP	Coef.	Std. Err Robust	P >[t]	lnHHW	Coef.	Std.Err Robust	P>[t]
Cons	3,772528	0,028808	0,000	Cons.	3,931442	0,0197556	0,000
KKP	-0,0000806	0,000076	0,246	KKW	0,0000441	0,0000662	0,440
lnFK	0,0034525	0,0015512	0,014	lnFK	0,0002297	0,0011025	0,858
lnPPK	0,01431	0,003067	0,000	lnPPK	0,0082868	0,0025226	0,001
lnPP	0,1352099	0,0165497	0,000	lnPW	0,1196275	0,0073232	0,000
TK	-0,0009511	0,0003358	0,002	TK	-0,000287	0,0002592	0,299

Based on the results of these estimates in table 3, the following equation model was formed:

lnHHPit = 3.772528 – 0.0000806KKPit + 0.0034525lnFKit + 0.01431lnPPKit + 0.1352099lnPPit – 0.0009511TKit + εit

And

lnHHWit = 3.931442 + 0.0000441KKWit + 0.0002297lnFKit + 0.0082868lnPPKit + 0.1196275lnTPit – 0.000287TKit + εit

From the equation above, it can be seen that the dependent variable, namely the life expectancy of men and women, is in the form of a natural logarithm or ln and the independent variable is in the form of ln consisting of the variables of per capita GDP, health facilities, and education of men and women, while the variables with original values are the variables of health complaints of men and women and the level of poverty. So from the explanation, the following conclusions can be drawn:

1. Dependent variable, namely male life expectancy, has a natural logarithm or ln and has a constant value of 3.772528, so it must be antilogized first, so that the male life expectancy is obtained a constant value of 5.922 with a unit of years, which means that when the variables of male health complaints, health facilities, GDRB per capita, male

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

education, and poverty have a constant value or zero, then the life expectancy of men will increase by 5,922 years.

2. The variable of male health complaints (KKP) has a coefficient value of -0.0000806, based on the form of a unit in the variable of male health complaints which is a percentage and is the original value, it means that a 1% increase in male health complaints is expected to reduce the life expectancy of men by 0.0000806 years.

3. The variable of health facilities (FK) has a coefficient value of 0.0034525, based on the unit of measurement, the health facility variable has been transformed into its natural logarithmic (ln) form. This implies that the coefficient reflects the percentage change in the dependent variable resulting from a 1% change in the independent variable, assuming other variables remain constant. In this context, a 1% increase in health facilities is associated with an increase in male life expectancy of approximately 0.0034525 years.

4. The variable GDP per capita (PPK) has a coefficient value of 0.01431, the GDP per capita variable, originally measured in rupiah, has been transformed into its natural logarithmic (ln) form. This transformation allows the coefficient to be interpreted as the percentage change in the dependent variable resulting from a 1% change in GDP per capita, assuming all other variables are held constant. Accordingly, a 1% increase in GDP per capita is estimated to raise male life expectancy by approximately 0.01431 years.

5. The Male Education Variable (PP) has a coefficient value of 0.1352099, based on the unit form of the male education variable in the form of years and is a value that has been transformed to the form of ln where this shows the percentage change in the dependent variable due to a change of one percent in the independent variable, assuming that the other variable is constant, which means that a 1% increase in male education will increase men's life expectancy by around 0.1352099 year.

6. The variable poverty level (TK) has a coefficient value of -0.0009511, based on the unit form of the poverty level variable which is in the form of percent and is the original value, which means that a 1% increase in poverty in society is estimated to reduce the life expectancy of men by 0.0009511 years.

7. As for women's life expectancy, it also has a natural logarithm or ln and has a constant value of 3.931442, so it must be antilogized first, so that women's life expectancy is obtained a constant value of 8.539 with a unit of years, which means that when the variables of women's health complaints, health facilities, GDRB per capita, women's education, and poverty have a constant value or zero, then a woman's life expectancy will increase by 8,539 years

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

8. The variable of women's health complaints (KKW) has a coefficient value of 0.0000441, based on the unit form of the variable of male health complaints which is in the form of a percentage and is the original value, it means that a 1% increase in women's health complaints is expected to increase women's life expectancy by 0.0000441 years.

9. The variable of health facilities (FK) has a coefficient value of 0.0002297, the health facility variable, initially measured in units, has been transformed into its natural logarithmic (ln) form. This transformation allows the coefficient to be interpreted as the percentage change in the dependent variable resulting from a 1% change in the independent variable, assuming other variables are held constant. Thus, a 1% increase in health facilities is associated with an increase in female life expectancy of approximately 0.0002297 years.

10. The variable GDP per capita (PPK) has a coefficient value of 0.0082868, based on the unit form of the GDP per capita variable in the form of rupiah and is a value that has been transformed to the form of ln where this shows the percentage change in the dependent variable due to a change of one percent in the independent variable, assuming that other variables are constant, which means that a 1% increase in GDP per capita will increase women's life expectancy by around 0.0082868 year.

11. The variable of women's education (PW) has a coefficient value of 0.1196275, based on the unit form of the male education variable in the form of years and is a value that has been transformed to the form of ln where this shows the percentage change in the dependent variable due to a change of one percent in the independent variable, assuming that the other variable is constant, which means that a 1% increase in women's education will increase women's life expectancy by around 0, 1196275 years.

12. The variable poverty level (TK) has a coefficient value of -0.000287, based on the unit form of the poverty level variable which is in the form of percent and is the original value, it means that a 1% increase in poverty in society is estimated to reduce women's life expectancy by 0.000287 years.

Classical Assumption Test

Normality Test

Tabel 4. Result Normality Test

Variable	Obs.	Adj-Chi-Sq(2)	Prob > Chi-Sq
Residual	340	5,02	0,0813
Residual	340	5,24	0,0728

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

Table 4 shows that the residual variable for male life expectancy has a probability value of 0.0813 which is above 0.05 which means that it accepts H0, that the residue is distributed normally. Meanwhile, the residual variable for women's life expectancy has a probability value of 0.0728 which is above 0.05 which means that receiving H0 means that the residue has been distributed normally.

Multicollinearity Test

Tabel 5. Result Multicollinearity Test

Variable (male)	VIVID	Multicollinearity	Variable (female)	VIVID	Multicollinearity
KKP	1,25	Low	KKW	1,20	Low
lnFK	1,07	Low	lnFK	1,07	Low
lnPPK	1,62	Low	lnPPK	1,43	Low
lnPP	1,65	Low	lnPW	1,46	Low
TK	1,31	Low	TK	1,47	Low

Multicollinearity occurs in a linear regression model when all independent variables have a perfect linear relationship with each other. The VIF (Variance Inflation Factor) approach is used in multiple regression models as a multicollinearity detection strategy (Widarjono, 2018).

Table 5 indicates that, in relation to male life expectancy, the variable of male health complaints, it has a VIF value of 1.25, then health facilities are 1.07, GDP per capita is 1.62, men's education is 1.65, and poverty is 1.31 where each variable has a VIF value in the range of 1<5 which means the variables of male health complaints, health facilities, GDP per capita, men's education, and poverty have low multicollinearity values. As for the life expectancy of women with the variable of women's health complaints, it has a VIF value of 1.20, then health facilities are 1.07, GDP per capita is 1.43, women's education is 1.46, and poverty is 1.47 where each variable has a VIF value in the range of 1<5 which means that the variables of women's health complaints, health facilities, GDRB per capita, women's education, and poverty have low multicollinearity values.

Heteroscedasticity and Autocorrelation Test

The presence of heteroscedasticity and autocorrelation in the regression model does not eliminate the unbiased and consistent nature of the parameter estimates.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

However, this condition makes the estimate no longer efficient because the variance is not optimal. This is in line with the opinion of Wooldridge (2016)who stated that the application of the Ordinary Least Square (OLS) method still produces unbiased and consistent parameters, although the presence of heteroscedasticity and autocorrelation can cause the standard error to be biased. This bias has an impact on inaccurate variance estimates, which can be too large or too small, potentially resulting in incorrect conclusions and not reflecting the true relationship between variables.

As a solution to the problems of heteroscedasticity and autocorrelation, robust standard error is used as an alternative to conventional standard error. Ananta (2023) stated that robust standard error is effective in dealing with both of these problems in the regression model, so this method is considered capable of providing more accurate estimates. By using robust standard error, the standard error value obtained becomes more stable and appropriate, which ultimately increases the validity and quality of research analysis. In panel data regression analysis, the application of this method is quite easy, simply by adding the word "robust" to the command in STATA to accommodate the potential for heteroscedasticity and autocorrelation.

Statistical Test

T test

Tabel 6. Result T test

Variable	Coeff.	t-count	T-Table	Prob > t	Conclusion
KKP	-0,0000806	-1,06	- 1,967071	0,290	Receiving H0
lnFK	0,0034525	2,23	1,967071	0,027	Reject H0
lnPPK	0,01431	4,67	1,967071	0,000	Reject H0
lnPP	0,1352099	8,17	1,967071	0,000	Reject H0
TK	-0,0009511	-2,83	-1,967071	0,005	Reject H0
KKW	0,0000441	0,67	- 1,967071	0,506	Receiving H0
lnFK	0,0002297	0,21	1,967071	0,835	Receiving H0

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

lnPPK	0,0082868	3,29	1,967071	0,001	Reject H0
lnPW	0,1196275	16,34	1,967071	0,000	Reject H0
TK	-0,000287	-1,11	-1,967071	0,269	Receiving H0

1. The results of the t-test showed that the coefficient value for the variable of Male Health Complaints (KKP) was -0.0000806 with a probability level of 0.290 > 0.05 and a tcal value of -1.06 < ttable -1.967, this means that H0 was accepted and Ha was rejected, so that the variable of male health complaints (KKP) had a negative but insignificant effect on the life expectancy of men in Indonesia in 2014-2023.
2. The t-test results indicate that the health facility variable (FK) has a coefficient of 0.0034525, with a probability value of 0.027, which is less than the 0.05 significance level. Additionally, the calculated t-value of 2.23 exceeds the critical t-value of 1.967. This leads to the rejection of H0 and acceptance of Ha, confirming that the health facility variable (FK) has a significant positive impact on male life expectancy in Indonesia during the period 2014–2023.
3. The t-test results reveal that the coefficient for the GDP per capita variable (PPK) is 0.01431, with a probability value of less than 0.001, which is below the 0.05 significance level. The calculated t-value of 4.67 exceeds the critical value of 1.967, leading to the rejection of H0 and acceptance of Ha. This indicates that GDP per capita (PPK) has a significant positive effect on male life expectancy in Indonesia from 2014-2023.
4. The results of the t-test show that the coefficient value for the male education variable (PP) is 0.1352 with a probability level of 0.000 < 0.05 and a tcal value of 8.17 > a table of 1.967 means that H0 is rejected and Ha is accepted, so that the education level variable (TP) has a significant positive effect on the life expectancy of men in Indonesia in 2014-2023.
5. The t-test results indicate that the poverty level variable (TK) has a coefficient of -0.0009511, with a probability value of 0.005, which is less than the 0.05 significance level. The calculated t-value of -2.83 is less than the critical t-value of -1.967, leading to the rejection of H0 and acceptance of Ha. This signifies that the

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

poverty level variable (TK) has a significant negative effect on male life expectancy in Indonesia during 2014–2023.

6. The t-test results show that the coefficient for the Women's Health Complaints variable (KKW) is 0.0000441, with a probability value of 0.506, which exceeds the 0.05 significance level. The calculated t-value of 0.67 is less than the critical t-value of 1.967, leading to the acceptance of H0 and rejection of Ha. This indicates that the Women's Health Complaints variable (KKW) has a positive but statistically insignificant relationship with women's life expectancy in Indonesia during 2014–2023.
7. The t-test results indicate that the health facility variable (FK) has a coefficient of 0.0002297, with a probability value of 0.835, which is greater than the 0.05 significance level. The calculated t-value of 0.21 is less than the critical t-value of 1.967, leading to the acceptance of H0 and rejection of Ha. This suggests that the health facility variable (FK) has a positive but statistically insignificant relationship with women's life expectancy in Indonesia from 2014 to 2023.
8. The t-test results reveal that the GRDP per capita variable (PPK) has a coefficient of 0.0082868, with a probability value of 0.001, which is below the 0.05 significance level. The calculated t-value of 3.29 exceeds the critical value of 1.967, leading to the rejection of H0 and acceptance of Ha. This indicates that GDP per capita (PPK) has a significant positive effect on women's life expectancy in Indonesia during 2014–2023.
9. The t-test results indicate that the coefficient for the women's education variable (PW) is 0.1196275, with a probability value of less than 0.001, which is below the 0.05 significance threshold. The calculated t-value of 16.34 exceeds the critical value of 1.967, leading to the rejection of H0 and acceptance of Ha. This demonstrates that women's education (PW) has a significant positive effect on women's life expectancy in Indonesia from 2014 to 2023.
10. The t-test results show that the coefficient for the poverty level variable (TK) is -0.000287, with a probability value of 0.269, which is greater than the 0.05 significance level. The calculated t-value of -1.11 is less than the critical t-value of -1.967, leading to the acceptance of H0 and rejection of Ha. This indicates that the poverty level variable (TK) has a negative but statistically insignificant effect on women's life expectancy in Indonesia during 2014–2023.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

F test

Tabel 7. Result F test

F-Statistics	F-Table	Prob > F	Conclusion
1078,13	2,241015	0,000	Reject H0
1203,45	2,241015	0,000	Reject H0

The Ftable value is obtained from the formula df1 = k – 1 and df2 = n – k where df1 = 6-1 = 5 and df2 = 340-5 = 335, so that the Ftable value is obtained as 2.24, then it is known that the statistical value is 1078.13 > Ftable 2.241, with a probability of 0.0000 < 0.05 means rejecting H0 and accepting Ha which this shows that the variable of male health complaints, Health facilities, GDP per capita, men's education, and poverty rates together have a significant effect on the added value of men's life expectancy in Indonesia in 2014-2023. As for women's life expectancy, the Ftable value was obtained at 2.241, then it was known that the statistical value was 1203.45 > Ftable 2.241, with a probability of 0.0000 < 0.05 meaning rejecting H0 and accepting Ha, which shows that the variables of women's health complaints, health facilities, GDP per capita, women's education, and poverty level together have a significant effect on the added value of women's life expectancy in Indonesia in 2014-2023.

Determinant Coefficients

Tabel 8. Result Determinant Coefficients

Selected Models	R-square
Fixed Effect (Men)	0,9927
Fixed Effect (Women)	0,9935

Based on the regression results in appendix 4.10, the R-Squared value for male life expectancy is 0.9927, indicating that 99.27% variation in male life expectancy variables reflected in life expectancy added can be explained by the variables of male health complaints, health facilities, GDP per capita, male education, poverty level. While the remaining 0.73% variation is other variations outside the panel data regression model. While the regression results in appendix 4.10 obtained an R-Squared value for women's

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

life expectancy of 0.9935, this figure indicates that 99.35% variation in the variable of male life expectancy reflected in the added value of life expectancy can be explained by the variables of women's health complaints, health facilities, GDP per capita, women's education, poverty level. While the remaining 0.65% is another variation outside the panel data regression model.

Individual effect

the results of this study show that Central Java province is an area with the largest individual effect value of 3.8505596% with a coefficient value of 0.0780316, this means that if the variables of male health complaints, health facilities, GRDP per capita, education, and poverty are constant, then the added value of male life expectancy in Central Java is 3.85% this is because Central Java is one of the provinces that has a strong social and cultural network, reflected in the tradition of mutual cooperation and high community cohesion. This strong social support, as revealed by various studies, has a positive correlation with individual mental and physical health, which in turn can extend life expectancy.

Next, DI Yogyakarta is the province with the second highest individual effect value after Central Java with an individual effect value of 3.8373666% with a coefficient value of 0.0648386, this means that if the variables of male health complaints, health facilities, GRDP per capita, education, and poverty are constant, then the added value of male life expectancy in DI Yogyakarta is 3.83%. This is because DI Yogyakarta is one of the provinces on the island of Java that can be said to be a center for students, where there are many campuses in this province, so the possibility for its people to get higher education is greater, besides that access to health facilities can be said to be easier, because there is a lot of development by the government that is centered on the island of Java.

RESULTS OF THE ANALYSIS

The Effect of Health Complaints in Men on Male Life Expectancy in 34 Provinces in Indonesia in 2014-2023.

The results of the study show that in the period 2014 to 2023 men's health complaints had a negative but not significant effect on men's life expectancy with a coefficient value of 0.0000806, this finding has a relationship that is in accordance with hypothesis 1 or H1. Then with a probability value of 0.290, it means that the increase in health complaints in men does not significantly reduce the life expectancy of men. This is

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

in accordance with research conducted by stating that health complaints in a person do not have a significant influence on a person's life expectancy. A one percent increase in health complaints in a person does not significantly lower the value of life expectancy (Maryani & Kristiana 2017).

The Effect of Health Facilities on Male Life Expectancy in 34 Provinces in Indonesia in 2014-2023.

The results of this study show that the availability of health facilities has a positive relationship with the life expectancy of men in Indonesia in 2014-2023, with a coefficient value of 0.0034525 and a probability value of 0.014 below 0.05 this finding is in accordance with the second hypothesis or H2 which according to the facility hypothesis is positively related to the life expectancy of men, where the results show that health facilities are measured by the availability of hospitals, Whether it is government-owned or private, it has a significant and positive influence on life expectancy. This means that the more hospitals available in an area, the more likely it is that the life expectancy of men in that area is likely to increase. The study emphasizes the importance of adequate health infrastructure for medical care and improved quality of life, which ultimately impacts an increase in men's life expectancy.

The Effect of Per Capita GDP on Male Life Expectancy in 34 Provinces in Indonesia in 2014-2023.

The results of this study show that GDP per capita in Indonesia in 2014-2023 has a positive relationship with men's life expectancy, where when GDP rises, men's life expectancy will also increase, in this case GDP per capita has a coefficient value of 0.01431 and a probability value of 0.000 is less than 0.05, this finding is in accordance with the third hypothesis or H3 that GDP per capita is positively related to men's life expectancy, The result is that GDP per capita has a significant and positive influence on the life expectancy of men in Indonesia in 2014-2023. The high GDP per capita reflects the well-being of the people because the increased income allows them to meet basic needs such as nutritious food, decent housing, and access to healthcare.

The Effect of Men's Education on Men's Life Expectancy in 34 Provinces in Indonesia in 2014-2023.

The results of this study show that the results of men's education assessed from the average length of schooling for men in Indonesia in 2014-2023 have a positive

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

correlation with men's life expectancy with a coefficient value of 0.1352099, where when men's education increases, men's life expectancy will also increase. And for the probability value obtained for men's education, which is 0.000, which is smaller than 0.05, this finding is in accordance with the fourth hypothesis or H4 that education has a positive relationship with men's life expectancy, meaning that men's education has a significant influence on men's life expectancy in Indonesia from 2014 to 2023. This means that the higher the male education level, the higher the life expectancy rate for men tends to increase.

The Effect of Poverty on Male Life Expectancy in 34 Provinces in Indonesia in 2014-2023.

The results of this study show that poverty measured by the percentage level of the poor population in Indonesia from 2014 to 2023 has a negative relationship with men's life expectancy with a coefficient value of -.0009511, where when poverty that occurs in society decreases this will increase men's life expectancy, while for the probability value of poverty this has a value of 0.002 this finding is in accordance with the fifth hypothesis that poverty has negative relationship with men's life expectancy, the result of which is that poverty has a significant influence on men's life expectancy in Indonesia from 2014 to 2023. This resulting poverty can create nutritional deficiencies, poor health, low levels of education, inadequate environment, and below-average incomes, all of which contribute negatively to life expectancy.

The Effect of Men's Health Complaints, Health Facilities, Per Capita GDP, Men's Education, and Poverty Rate Together on Men's Life Expectancy in 34 Provinces in Indonesia in 2014-2023

The results of this study show that if analyzed jointly or simultaneously, the variables of male health complaints, health facilities, GDP per capita, male education, and poverty have a significant influence on the life expectancy of men in Indonesia in 2014-2023 with a probability value of 0.000, this finding is in accordance with the sixth hypothesis or H6 that the variable of male health complaints, health facilities, GDP per capita, men's education, and poverty have a significant influence on men's life expectancy. This indicates that a man's life expectancy can be influenced by a variety of factors, whether related to health, economics, or social.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

The Effect of Health Complaints in Women on Women's Life Expectancy in 34 Provinces in Indonesia in 2014-2023.

The results of this study show that women's health complaints have a positive and insignificant effect on women's life expectancy, with a coefficient value of 0.0000441 and a probability of 0.440, meaning that this finding is not in accordance with the first hypothesis or H1 which should have a negative effect on women's life expectancy. This may be due to several factors, such as hormonal differences between men and women, women's lifestyles that tend to be safer and healthier, and women's tendency to be stronger in resisting mild illness than men. These results are in line with research conducted by stating that health complaints in a person do not have a significant influence on a person's life expectancy (Maryani & Kristiana 2017).

The Effect of Health Facilities on Women's Life Expectancy in 34 Provinces in Indonesia in 2014-2023.

The results of this study show that health facilities measured by the number of hospitals, either government or private, have a positive relationship with life expectancy where the coefficient is 0.0002297 this is in accordance with the second hypothesis or H2 that health facilities are positively related to women's life expectancy, where when the health facilities increase, women's life expectancy will increase. but in terms of probability value, this health facility has a probability value of 0.858 > 0.05 which means that the existence or availability of the hospital does not have a significant influence on women's life expectancy. This means that an increase in the number of hospitals in an area does not significantly increase the life expectancy of women in Indonesia. This is in accordance with research from which explains that hospital health facilities have a positive correlation with life expectancy in South Sulawesi but have low influence, it means that health facilities in South Sulawesi do not have a large or strong contribution to life expectancy in South Sulawesi (Alwi et al., 2023).

The Effect of Per Capita GDP on Women's Life Expectancy in 34 Provinces in Indonesia in 2014-2023.

The results of this study show that in the period 2014 to 2023 GDP has a positive correlation, with a coefficient value of 0.0082868 where this finding is in accordance with the third hypothesis or H3 that GDP per capita is positively related to women's life expectancy, so that when GDP per capita increases, this will increase women's life expectancy, and also with a probability level of 0.001 which is less than 0.05, where this

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

means that GDP per capita has a strong or significant influence on the life expectancy of women in Indonesia from 2014 to 2023. This result is in line with research from the one who explained that GDP has a positive relationship with life expectancy in Jember Regency and has a significant influence with a probability value of 0.0124, this shows that the increasing the number of GDP, the life expectancy will also increase (Vonita Astri Ardianti et al., 2015).

The Effect of Women's Education on Women's Life Expectancy in 34 Provinces in Indonesia in 2014-2023.

The results of this study show that education has a positive correlation with women's life expectancy in Indonesia in the period 2014 to 2023, with a coefficient value of 0.0082868 this finding is in accordance with the fourth hypothesis or H4 that education has a positive relationship with women's life expectancy, then a significant level of influence with a probability value of 0.000 less than 0.05, So that when women's education as measured by the average length of women's schooling in Indonesia continues to increase, this will increase the life expectancy of women as well.

The Effect of Poverty on Women's Life Expectancy in 34 Provinces in Indonesia in 2014-2023.

The results of this study show that poverty measured from the percentage of the population experiencing poverty in Indonesia from 2014 to 2023 has a negative relationship with women's life expectancy in Indonesia with a coefficient value of 0.000287 this finding is in accordance with the fifth hypothesis or H5 that poverty has a negative correlation with women's life expectancy, but for its effect, This percentage of poverty does not have a significant effect on the life expectancy of women in Indonesia with a probability value of 0.299 which is greater than 0.05. This result is in accordance with the research of , which in its research shows that life expectancy does not have a significant influence on poverty in West Java Province, this means that poverty also does not have a significant influence on life expectancy itself (Santoso, 2023).

The Effect of Women's Health Complaints, Health Facilities, GDP Per Capita, Women's Education, and Poverty Levels Together on Women's Life Expectancy in 34 Provinces in Indonesia in 2014-2023

The results of this study show that if the variables of women's health complaints, health facilities, GDP per capita, women's education, and poverty are analyzed together

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

or simultaneously have a significant influence on women's life expectancy in Indonesia with a probability value of 0.000 less than 0.05, this finding is in accordance with the seventh hypothesis or H7 that the variable of women's health complaints, health facilities, GDP per capita, women's education, and poverty have simultaneously had an influence on women's life expectancy. This is the same as a man's life expectancy, which has a significant influence on his previously predicted independent variables. This means that the independent variables used to see the effect on the life expectancy of men and women in this study have a significant influence on the dependent variable, namely the life expectancy of men and women in Indonesia in the period 2014-2023. This shows that women's life expectancy is influenced by the interaction of various interrelated factors

CONCLUSION

1. Health complaints, which are measured through the percentage of people who experience health complaints, have a negative but not significant effect on men's life expectancy. As for women's life expectancy, the variable of health complaints had a positive relationship and also did not have a significant influence on women's life expectancy.

2. Health facilities, which are measured by the number of hospitals in each province in Indonesia, have a positive and significant influence on the life expectancy of men. As for women's life expectancy, the health facility variable had a positive relationship but did not have a significant influence on women's life expectancy.

3. GDP per capita, measured through GDP per capita on a constant price basis, has a positive and significant influence on life expectancy, both men and women in Indonesia in 2014-2023.

4. Education level is measured through the average length of schooling based on gender, where male education has a positive and significant influence on men's life expectancy, and women's education has a positive and significant influence on women's life expectancy in Indonesia in 2014-2023.

5. The poverty rate, which is measured through the percentage of the poor population, has a negative and significant influence on the life expectancy of men. As for women's life expectancy, the percentage of poverty has a negative correlation but does not have a significant effect on women's life expectancy.

6. Meanwhile, if the results of the analysis of independent variables together eat the variables of men's health complaints, health facilities, GDP per capita, men's education, and poverty have a significant influence on men's life expectancy. And the results of the

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

analysis for women's life expectancy, independent variables that were analyzed were also jointly analyzed, namely the variables of women's health complaints, health facilities, GDP per capita, women's education, and poverty also had a significant influence on women's life expectancy.

REFERENCES

Alpina Aprilia, & Aida, N. (2024). Indeks Pembangunan Manusia dan Pertumbuhan Ekonomi Terhadap Upah Minimum Provinsi Lampung. Jurnal Ekobistek, 13(1), 7–12. https://doi.org/10.35134/ekobistek.v13i1.766

Alwi, W., Sauddin, A., & Islamiah, M. N. (2023). Faktor-Faktor Yang Mempengaruhi Angka Harapan Hidup di Sulawesi Selatan Menggunakan Analisis Regresi. Jurnal Matematika Dan Statistika Serta Aplikasinya.

Ananta, P. , K. M. E. B. M. , & M. N. (2023). Public Spending, Corruption, and Human Development: Empirical Evidence In Middle-Income Countries. European Proceedings of Social and Behavioural Sciences.

Ardianti, vonita astri, Wibisono, S., & Jumiati, A. (2015). Faktor-Faktor yang Mempengaruhi Angka Harapan Hidup di Kabupaten Jember. Artikel Ilmiah Mahasiswa.

Badan Pusat Statistik. (2024a). Jumlah Rumah Sakit Umum, Rumah Sakit Khusus, Puskesmas, Klinik Pratama, dan Posyandu Menurut Provinsi. Https://Www.Bps.Go.Id/Id/Statistics-Table/3/YmlzemNGUkNVblZLVVhOblREWnZXbkEzWld0eVVUMDkjMyMwMDAw/Jumlah-Rumah-Sakit-Umum--Rumah-Sakit-Khusus--Puskesmas--Klinik-Pratama--Dan-Posyandu-Menurut-Provinsi.Html?Year=2020.

Badan Pusat Statistik. (2024b). Persentase Penduduk yang Mempunyai Keluhan Kesehatan menurut Provinsi, Tipe daerah dan Jenis Kelamin. Https://Www.Bps.Go.Id/Id/Statistics-Table/1/MTYxNyMx/Persentase-Penduduk-Yang-Mempunyai-Keluhan-Kesehatan-Menurut-Provinsi--Tipe-Daerah-Dan-Jenis-Kelamin--2009-2024.Html.

Badan Pusat Statistik. (2025a). Angka Harapan Hidup (AHH) Menurut Provinsi dan Jenis Kelamin, Tahun 2019-2023. Https://Www.Bps.Go.Id/Id/Statistics-Table/2/NTAxIzI=/Angka-Harapan-Hidup--Ahh--Menurut-Provinsi-Dan-Jenis-Kelamin--Tahun-.Html.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Badan Pusat Statistik. (2025b). Persentase Penduduk Miskin (P0) Menurut Provinsi dan Daerah (Persen). Https://Www.Bps.Go.Id/Id/Statistics-Table/2/MTkyIzI=/Persentase-Penduduk-Miskin--September-2024.Html.

Badan Pusat Statistik. (2025c). Produk Domestik Regional Bruto Per Kapita (Ribu Rupiah). Https://Www.Bps.Go.Id/Id/Statistics-Table/2/Mjg4IzI=/-Seri-2010--Produk-Domestik-Regional-Bruto-per-Kapita--Ribu-Rupiah-.Html.

Badan Pusat Statistik. (2025d). Rata-rata Lama Sekolah (RLS) menurut Jenis Kelamin (Tahun). Https://Www.Bps.Go.Id/Id/Statistics-Table/2/NDU5IzI=/Rata-Rata-Lama-Sekolah-Rls-Menurut-Jenis-Kelamin.Html.

Gujarati, D. N. , & P. D. C. (2006). Dasar-dasar Ekonometrika. Edisi ke-3. Penerbit Erlangga.

Halicioglu, F. (2011). Modeling life expectancy in Turkey. Economic Modelling, 28(5), 2075–2082. https://doi.org/10.1016/j.econmod.2011.05.002

Maryani, H., & Kristiana, L. (2017). PEMODELAN ANGKA HARAPAN HIDUP (AHH) LAKI-LAKI DAN PEREMPUAN DI INDONESIA TAHUN 2016 Modeling Life Expectancy for Men and Women in Indonesia 2016. https://doi.org/10.22435/hsr.v21i2.245.71-81

Neuman, S. B. , & D. D. K. (2003). Handbook of early literacy research.

Novitasari, N. I., Suharno, S., & Arintoko, A. (2021). Pengaruh Keluhan Kesehatan terhadap Indeks Pembangunan Manusia Di Provinsi Jawa Timur. Jurnal Ilmiah Universitas Batanghari Jambi, 21(1), 239. https://doi.org/10.33087/jiubj.v21i1.1310

Pinho-Gomes, A. C., Vassallo, A., Carcel, C., Peters, S., & Woodward, M. (2022). Gender equality and the gender gap in life expectancy in the European Union. BMJ Global Health, 7(2). https://doi.org/10.1136/bmjgh-2021-008278

Santoso, B. S. E. (2023). Analisis Tingkat Kemiskinan di Provinsi Jawa Barat Tahun 2017-2021. PRIMANOMICS : JURNAL EKONOMI DAN BISNIS , 21(2).

Setyadi, S., Didu, S., Indriyani, L., Kurnia Fitri, A., & Widiastuti, A. (2023). Modeling Life Expectancy in Indonesia Using System GMM Model. In Review of Applied Socio-Economic Research (Vol. 25).

Tafran, K., Tumin, M., & Farid Osman, A. (2020). Poverty, Income, and Unemployment as Determinants of Life Expectancy: Empirical Evidence from Panel Data of Thirteen Malaysian States. In Iran J Public Health (Vol. 49, Issue 2). http://ijph.tums.ac.ir

Todaro, M. P. , & S. S. C. (2011). Pembangunan Ekonomi. Erlangga.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Veugelers, P. J. , Y. A. M. , & K. G. (2001). Proximate and contextual socioeconomic determinants of mortality: multilevel approaches in a setting with universal health care coverage. American Journal of Epidemiology, 154(8), 725–732.

Wahyuni, C., Sumargo, B., & Meidianingsih, Q. (2023). Penerapan Analisis Jalur (Path Analysis) dalam Menentukan Faktor-faktor yang Memengaruhi Angka Harapan Hidup di Wilayah Indonesia Bagian Tengah. Jurnal Statistika Dan Aplikasinya, 7(1).

Wardhana, A., & Kharisma, B. (2023). INFRASTRUCTURE AND HEALTH EXPENDITURE ON QUALITY OF LIFE IN INDONESIA. Jurnal Ekonomi, Pendidikan, Dan Akuntansi. https://doi.org/10.25157/je.v11i2.12125

Widarjono, A. (2018). Ekonometrika. PP STIM YKPN.

Wooldridge, J. M. (2016). Introductory Econometrics: A Modern Approach 6rd ed. In Cengage learning.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.