

# The Impact Of Mortality Risk to Life Insurance's Financial Performance in Indonesia During Covid-19

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**Abstract.** This paper aims to analyze the impact of mortality and morbidity risk on the Financial Performance of Life Insurance in Indonesia during the COVID-19 period. Data in the study were obtained from the Task Force (Government of Indonesia) for COVID-19 infected cases and deaths from 2020 to 2021. The financial performance of the life insurance industry such as premium acquisition and insurance claims during the pandemic will be analyzed using statistical methods i.e regression and t-test. This paper will not focus on the activities of the Indonesian government and the policies of life insurance companies that may affect their business. Pandemic has had an impact on increasing the risk of mortality which has a negative impact on the financial performance of the Life Insurance industry in several countries, but Life Insurance in Indonesia, which has a small penetration ratio, is going through the pandemic in a different way.

**Keywords:** Mortality risk, financial performance, life insurance, Covid-19, Indonesia

## 1 Introduction

In 2020, the world was hit by a new pandemic, namely Coronavirus disease -19 (COVID-19), which resulted in all people being affected both from the economic sector, health, and social life. Based on data released by Worldometers on December 19, 2021, there are 273.4 million cases of Covid-19 worldwide, with a total of 13.7 million active cases. In Indonesia, there are 4.3 million cases of Covid-19, so the Indonesian government has implemented several policies that limit the mobility of all Indonesian people and minimize business activities, including life insurance. The number of Covid-19 cases continues to grow with no effective drug yet found, and also, due to the Covid-19 virus being able to mutate, the level of immunity produced by the vaccine needs to be increased. The death rate due to Covid-19 varies in each country, which can be influenced by the government's better data collection and the level of vaccination carried out. In Indonesia, excess mortality due to the Covid-19 pandemic is 2.1% or half of the world's excess mortality. World Health Organization (WHO) states that Covid-19 is pandemic since March 2020.

Life insurance companies manage the risk of mortality/morbidity by assessing prospective customers' information through underwriting process. The underwriting standard is an assessment of the health of prospective customers, such as age, gender, and habit, and also assessment of financial. Life insurance companies in Indonesia are under the supervision of the Financial Services Authority (OJK) for the non-bank financial industry. As a financial industry under the OJK, life insurance companies are required to follow the standards set to maintain the company's health, as stated in the company's financial statements, as well as the existence of good corporate governance. Bauer (2019) states that every time a health issue occurs in a person, it will affect that person's life expectancy, the more often health issues occur, the greater the impact on that person's life expectancy. The high level of health issues and age factors can make insurance premiums increase.

There are more than 50 life insurance companies in Indonesia, both conventional and sharia-based. Life insurance penetration in Indonesia itself is still minimal, below 4%. This figure is still below that of neighboring countries such as Singapore, which has a penetration rate of 6% to 7% for the insurance industry. The life insurance industry in Indonesia is currently dominated by joint-venture companies whose shares are partially owned by foreigners, namely 22 companies, and dominate the life insurance market. In contrast, local life insurance companies are controlled by state-owned banks or local conglomerates. The lack of competition in the life insurance industry is due to the vital need for capital for insurance companies. The insurance company requires at least Rp. 100 billion as capital must be paid in; besides that, the public still needs socialization regarding the importance of life insurance. In Indonesia, life insurance companies offer products to the public such as death, accident, health, and critical illness.

This paper aims to analyze and to compare the impact of mortality risk due to the Covid-19 pandemic on the financial health of life insurance companies for the period 2020 to 2021. The scope of life insurance financial health level covers premium income levels, insurance loss ratio, and profitability.

## **2 Literature review**

According to OJK, Insurance risk is the risk of failure of insurance companies to fulfil its obligations to insured as a result of inadequate risk selection process, determination of premiums, use of reinsurance, and/or handling claim. During Covid-19 that creates excess mortality, life insurance companies need to manage its risk especially insurance risk because it may create negative product profit margin to company through premium. According to Wanjiku (2019), mortality risk is one of the main risk factors managed by life insurance companies and significantly impacts their financial health, including its strategy. The mortality risk is the risk if the death rate exceeds the mortality rate used by the insurance company to assess or determine the premium that the customer must pay. In Indonesia, mortality rates can be obtained from various sources through studies conducted; some examples of institutions that issue mortality rates are Indonesia life insurance association (AAJI), local and international reinsurance companies, and life insurance companies. Each insurance company's mortality rate may vary according to their experience and underwriting policies, so the premiums offered to customers may vary between each insurance company. Pricing strategy can also affect the amount of premium offered to customers. While Morbidity risk is the risk if the level of health care exceeds

the level of morbidity used by the company. Unlike mortality rates, morbidity rates do not have tables issued by associations. The morbidity rate has a high degree of flexibility due to the many types of diseases, types of treatment, and hospitals and facilities that can be combined according to customer needs. One approach to look is loss ratio to determine the risk of mortality/morbidity to the financial condition of a life insurance company. Loss ratio is a calculation of the total claims paid by the insurance company with the total premiums received, where a ratio above 1 or 100% indicates that the company is in an unhealthy condition.

The financial health of life insurance companies is influenced by accurate projections and premium prices for mortality risk (Harris. 2020). This was clarified by Kirti (2020) that Covid-19 affected life insurance companies through health shock (mortality and morbidity) and financial shock (stock market, money market, and interest yield). In a country like America, life insurance companies cannot bear the entire burden of the Covid-19 pandemic, so the role of the government is needed (Richter. 2020). similar to Indonesia, Covid-19 patient is a subject to government expense, however with the development of product some companies provide Covid-19 treatment for certain market.

The impact on insurance companies due to Covid-19 varies depending on the level of liquidity, portfolio at risk, reinsurance, and capital (Babuna. 2020). The increasing mortality rate caused by Covid-19 will increase the company's liabilities so that it can harm the company's finances (Zhang. 2021). Another impact of Covid-19 on mortality can change the price or value of a product issued by an insurance company. However, it needs to be re-examined that this Covid-19 will become endemic in the future and whether the impact will be permanent (Schnurch. 2021).

The financial health of life insurance companies is influenced by accurate projections and premium prices for the risk of death (Harris, 2020). that COVID-19 had an impact on life insurance companies through health shocks and financial shocks such as stock market, money market, and interest yields (Kirti, 2020). In a country like the United States, life insurance companies cannot bear the entire burden of the COVID-19 pandemic, so the government's role is needed (Richter, 2020).

To see the raise of mortality/ morbidity risk impact, we will look at the premium and claim of the life insurance industry. By collecting the information that gathered from monthly statistic held by OJK and see at the growth of those on month to month basis and link it to the growth of Covid-19 in Indonesia. We expect that this will provide how life insurance industry perform against Covid-19. Also by doing this, we will overlook on how accurate the Covid-19 data in Indonesia as well as the fact that the low penetration ratio of life insurance. In 2020 to 2021, no life insurance company filing bankruptcy or close their operation will provide best scenario on the relationship of Financial performance and Covid-19. Government policy like lockdown may effect the loss ratio due to the OJK policy that requires life insurance sales to have face to face meeting with prospective client until it's being relaxed with the digital solution, which depends on each company's internal development.

Life insurance company will also need capital injection if Risk based capital (RBC) requirement is less than 120% causes by increase of liability that create reduction in company solvability. Solvability level in Indonesia is based on the difference between allowable asset (each asset category like stock and bond has own limitation for inclusion in the calculation) and liabilities of company funds.

### 3 Data & methodology

The data used in this research is secondary data. This data is obtained from the annual/quarterly financial reports of life insurance companies, OJK statistical data reports for the insurance industry, and data on Covid-19 in Indonesia. To provide better insight on the situation, 4 actuaries working in life insurance company were contacted.

**Table 1.** Operational variable.

Variables	Measurement	Data source
Explained Variable	Gross Premium	OJK statistical data
	Claim paid	
Explanatory Variable	Confirmed cases	Indonesian's Covid taskforce
	Confirmed death	
Control Variable	Inflation	Indonesian Stock Exchange
	Stock Index	Central Bureau of Statistic
	Consumer Index	Bank Of Indonesia
	Interest Rate	

Mortality/Morbidity Risk will use hypotheses such as:

- Does the Covid-19 pandemic affect the company's Mortality/ Morbidity Risk
- How does Covid-19 affect the company's financial statements, both Claim and premium growth

The methodology used is regression analysis to see the relationship between Covid-19 and the financial condition of life insurance companies, for example, the relation between earned premium and claim payment with Covid-19 growth in 2020 to 2021.

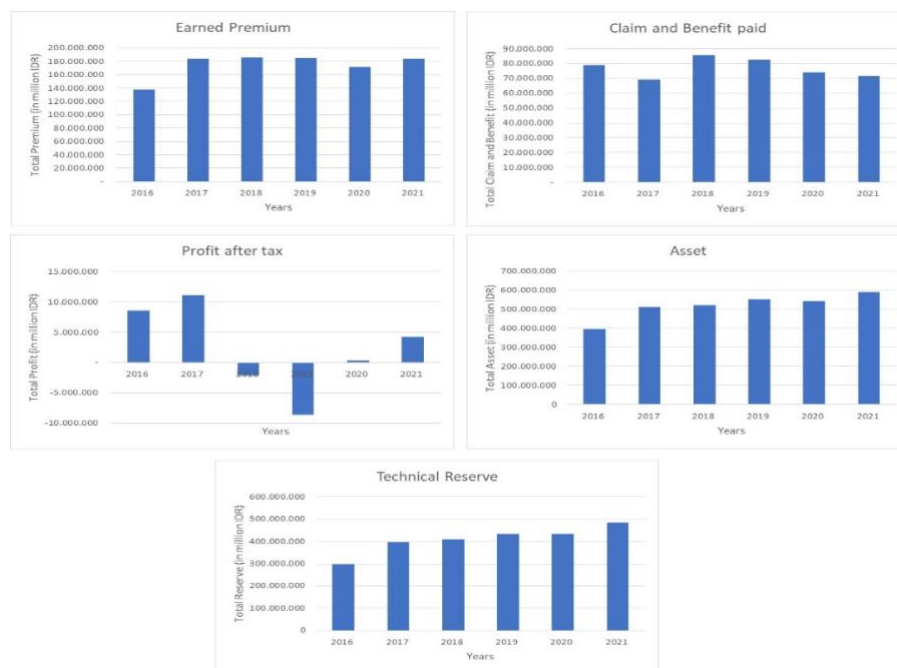
Another methodology to compare the impact of Covid-19 to life insurance industry is by using paired t-test. The paired t-test will be conducted by observing the similar period between January 2018-December 2019 and January 2020-December 2021 and to look at difference between those two variables. The following is the formula for t-test (Sugiyono. 2017):

$T = \text{mean difference} / \text{standard error of mean difference}$

In the t-test, variable 1 will represent pre-covid 19 and variable 2 will represent during covid-19

## 4 Result

### 4.1. General outlook of Indonesian life insurance industry



**Fig. 1.** Life insurance trend in Indonesia (Based on OJK statistic data).

According to Babuna (2020), there is an economic recession due to reduce of economy activity that lead to decreased premium and increased claim in Ghana. While also arguing that the profit of the company have been reduced because more claim and budget spending on social responsibility. The other effect is coming from investment income with reduced interest rates because of volatility in financial markets.

There is a different phenomenon in Indonesia unlike the one that happened in Ghana. In Indonesia, claim is decreasing in 2020 and 2021 compared to previous years. This information can happen on certain factor like different products and benefit and also the government intervention. In Indonesia covid patient is being taken care off by Indonesian government and all the expenses are guaranteed. Lockdown scenario also plays part in reduce claim, there is an adjustment for online process for claim and people activity outside their house is being monitored that may reduce the hospital visit.

## 4.2. Paired t-test on financial performance before covid-19 and during covid-19

### 4.2.1 Earned Premium

**Table 2.** Comparison of Earned premium received by Life insurance industry in Indonesia between period before Covid (Variable 1) and period during Covid (Variable 2)

	Variable 1	Variable 2
Mean	100458264	94838826
Variance	2,9557E+15	2,6457E+15
Observations	24	24
Pearson Correlation	0,98620032	
Hypothesized Mean Difference	0	
df	23	
t Stat	2,97262152	
P(T<=t) one-tail	0,00340698	
t Critical one-tail	1,71387153	
P(T<=t) two-tail	0,00681397	
t Critical two-tail	2,06865761	

Based on the result, t-stat > t Critical two tail (t-table) meaning that there are difference performance of premium income before Covid-19 and during Covid-19. the result is similar to Prahasti (2021) that there are downward movement in the premium income compared with pre Covid-19 but with lesser gap of t-stat and t-table that proves there is improvement from the last observation that only carried for year 2020.

### 4.2.2 Claim and Benefit paid

**Table 3.** Comparison of Claim and benefit paid by Life insurance industry in Indonesia between period before Covid (Variable 1) and period during Covid (Variable 2)

	Variable 1	Variable 2
Mean	43987471,2	37709066,94
Variance	6,5145E+14	4,77466E+14
Observations	24	24
Pearson Correlation	0,99307944	
Hypothesized Mean Difference	0	
df	23	
t Stat	6,67905412	
P(T<=t) one-tail	4,0908E-07	
t Critical one-tail	1,71387153	
P(T<=t) two-tail	8,1816E-07	
t Critical two-tail	2,06865761	

Based on the result, t-stat > t-table meaning that there are difference performance of Claim before Covid-19 and during Covid-19. The result is different to Prahasti (2021) that there is no difference in the claim paid by Insurer. Longer year observation shows that claim between those two period is similar and this also shown from the general outlook performance.

Similar to Premium, there is Indonesian companies that facing some legal issue that affects its operational activity. The other factor is new life insurance company may have different growth compared to the old ones.

### 4.2.3 Profit after tax

**Table 4.** Comparison of Profit before tax for Life insurance industry in Indonesia between period before Covid (Variable 1) and period during Covid (Variable 2).

	Variable 1	Variable 2
Mean	-2462888,2	723708,793
Variance	1,2927E+13	8,1016E+12
Observations	24	24
Pearson Correlation	-0,2201921	
Hypothesized Mean Difference	0	
df	23	
t Stat	-3,0893223	
P(T<=t) one-tail	0,00258843	
t Critical one-tail	1,71387153	
P(T<=t) two-tail	0,00517686	
t Critical two-tail	2,06865761	

Based on the result, t-stat > t-table meaning that there are difference performance of Profit before Covid-19 and during Covid-19. The result is different to Prahasti (2021) that there is no difference in the profit of Life insurance company. Profit pre-Covid 19 is lower than during Covid-19 while the performance shows similar trend shows that investment income and interest yield play a bigger part for life insurance company than claim in determining the profit. Another factor is the reduced of operating expense of companies especially building rent, management expenses, and company marketing activity.

### 4.3 Regression analysis on the relationship between Covid and life insurance premium and claim

**Table 5.** The relationship between Claim paid by Life insurance company and Covid case, the relationship between Claim paid by Life insurance company and death by Covid case, The relationship between Premium earned by Life insurance company and Covid case, and the relationship between Premium earned by Life insurance company and death by Covid case.

Claim and Covid Case		Claim and Covid Death	
<i>Regression Statistics</i>		<i>Regression Statistics</i>	
Multiple R	0,03978365	Multiple R	0,02428284
R Square	0,00158274	R Square	0,00058966
Adjusted R Square	-0,0437999	Adjusted R Square	-0,0448381
Standard Error	22324406,7	Standard Error	22335506,5
Observations	24	Observations	24
Premium and Covid Case		Premium and Covid Death	
<i>Regression Statistics</i>		<i>Regression Statistics</i>	
Multiple R	0,0515393	Multiple R	0,11205126
R Square	0,0026563	R Square	0,01255549
Adjusted R Square	-0,0426775	Adjusted R Square	-0,0323284
Standard Error	52522333,6	Standard Error	52261027
Observations	24	Observations	24

The result shows small correlation between Covid-19 and claim paid & premium earned by insurance company. This result shows difference to Kirti (2020) that during pandemic, life insurance claims will rise immediately. The study may differ due to the government regulation as well as the insurance policy between Indonesia and USA and also due to the insurance penetration in Indonesia that is relatively small. In this event, it looks like that the excess mortality due to Covid-19 is being overshadowed by the life insurance penetration in Indonesia.

## **5 Conclusion**

### **5.2 Conclusion**

Covid-19 has created economic turmoil for countries and this has spread to life insurance companies that provide protection for health and life (mortality and morbidity). When there are excess mortality due to Covid-19, the assumption that it will create negative impact to life insurance through mortality risk is being a subject to discuss, however analysis above shown that there is small relation and impact from the mortality to life insurance premium and claim. Various factor may play part on why there is small impact like insurance penetration, government policy, life insurance policy, etc, but there is also indication that life insurance company in Indonesia can overcome the pandemic situation.

### **5.1 Recommendation**

Further study can be conducted to see the impact of excess mortality of Covid-19 in Indonesia on Life Insurance, such as:

- Analysis on investment yield and Indonesia's GDP to see the greater impact to life insurance company in Indonesia, than mortality. Also analysis on Company's level
- Solvency requirement impact from excess mortality.
- Study that captures 3 periods of life insurance business (pre covid, covid-19, and post covid-19) in order to see what area has greater impact due to Covid-19.
- Indonesia's mortality table to get the new life expectancy.



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