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Post Pandemic strategy to the Egyptian Insurance market - A Statistical Approach –

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Abstract

This research studies the effect of Covid-19 on the operations and performance of the insurance companies generally and the medical insurance specifically around the world, focusing on the behavior of pandemic and its impact on the Egyptian insurance market. The data sets were collected from the daily published reports issued by the Egyptian Ministry of Health. Different statistical distributions are examined to explain the characteristics of Covid-19 to provide better understanding of the effect of the pandemic on the operations of the insurance companies. The experiences that are witnessed in different regions helped in formulating the outline of post pandemic strategy to the Egyptian insurance companies. Hence, in this paper a set of post pandemic policies are introduced to the Egyptian insurance companies. Adopting this post pandemic strategy and studying the implementation of these guidelines on the operations and revenues of the insurance companies would be recommended for a quick recovery in the future.

Keywords:

Covid-19, statistical distributions, post pandemic policies, insurance markets



1. Introduction

The virus known as COVID-19 is a mutated virus that was found to have similarities to SARS-CoV-2. In late 2019 and early 2020, it hit the world to change dramatically the aspects of life in many regions in the world. The WHO declared it as a pandemic upon the deadly spread of the contagious virus in many countries on the 11th of March 2020. The virus which started in the city of Yuahn-China caused stopping of many activities over year 2020, and most of the year 2021. It had a great negative impact on the economies and societies around the world. This included the serious damages resulting from the closure of borders and imposing strict quarantines policies to shut down most of the activities.

With the announcement of WHO that the world was facing a serious pandemic of COVID-19, the governments started to set emergency plans to control the spread of the pandemic with the increasing number of infected people daily, and the high death rates observed. In the beginning, Coronavirus spread badly in Europe: Italy, France, Spain, Germany, and UK were among the top countries affected by the deadly virus. Then it was spread in the USA and Russia, and to other countries around the world. A complete lock down in these countries for months had been an urge to control the situation. And a blockade of borders with a set of precautions procedures were announced by the governments to face the pandemic in the affected countries.

Egypt is one of the countries that was also hit by the pandemic in early March 2020. At that time, the severe effect of Covid-19 monitored in Europe was terrifying and shocking. Witnessing this on the other side of the Mediterranean, the Egyptian Government responded rapidly through issuing a set of strict precautions procedures, preparing hospitals and staff, raising the awareness in the different sectors to control the spread of the disease in the country. Although the effort that was made by the government was remarkable compared to other countries, the pandemic has slowed down the activities of the economic development including insurance and financial entities, education, and health.

The outbreak of the pandemic of Covid -19 and its deadly effect had been considered the main health concern around the world for two years. Since then, the researchers from different fields: medical, economic, political among others have been studying thoroughly the behaviour of the disease, along with the effect and the consequences of spread of the disease on humanity and the economies in the future. Furthermore, many statistical models were developed to understand the trend of Corona virus in different regions as illustrated by Bantan, *et al*, (2020), Patel, *et al*; (2020) and Mansour, *et al*; (2021). Applying statistical approach by using the probability distributions and analyzing the parameters of the best fitting distributions of the data collected from China, Italy and Spain focusing on infection speed, death and fatality rates was also studied by Sahin, *et al*; (2020), along with the impact of the precautions adopted by the governments to control the deadly effect of the virus. Also, they examined the pandemic's evolution in relation to the government measures and the method adopted in the research provides valid insights into the individual and national actions implemented and adhered to in order to slow the effect of the pandemic during the first wave of COVID-19. They also elucidate the two strategies for handling the pandemic, which are: the mitigation which is focused on reducing the pressure on the healthcare system during the peak of the outbreak by isolating the suspected cases and quarantining the households of suspected cases, and the second is the suppression that is focused on applying the precaution procedures in entire population including the social distancing and measures of lockdown. It is expected that the decision of lockdown and its duration is a knife edge of trading off between the economic survival of the country and the saving of lives.

On the other hand, the impact of the pandemic on the economies of the world was clarified by The International Monetary Fund (IMF) statistics in 2020 and 2021 - from growth prospects-. These statistics indicate that the world has entered a recession, and it has led to a contraction of emerging and developing economies by 10%, with an economic impact of the epidemic that is considered significant on the social life of individuals and societies. In addition, the statistics show



that the emerging market economies achieved negative growth of 2.4 percent in 2020, then it turns to a growth rate of 6.3 percent in 2021, while the advanced market economies achieved negative growth of 4.9 percent in 2020, then it turns to a growth rate of 4.3% in 2021(IMF report, 2021).

As a result of this recession, which is considered the deepest since the thirties, the insurance market was one of the industries that was badly affected in 2020 and 2021. However, the negative impact was expected to be recovered with application of the strict precaution procedures and the release of the vaccine during 2021. The impact of Covid-19 in the insurance markets has been of great interest to policymakers and actuaries. Studies have been carried out to understand not only the effect of the pandemic on the performance and the operations of the insurance companies worldwide, but also, to recommend and set policies to control its consequences in the industry. The Egyptian insurance market as one of the largest in the MENA region is affected by the pandemic as the rest of the world. Therefore, it is important to study the behavior of Coronavirus and its impact on the Egyptian insurance market thoroughly and set a strategy for the post-pandemic that should be adopted for recovery. The number of newly infected people and the deaths are two vital variables that are chosen to explain the behavior of the disease over the period from March 2020 to May 2021. This period is considered the most important to represent the real experience of the pandemic in Egypt. Applying a statistical approach using different probability distributions with statistical analyses is considered essential to illustrate how is the virus evolved in Egypt and the effect of its peaks and falls on the Egyptian insurance market.

The paper will present the data set collected of Covid-19 in Egypt and the statistical models used to study the behavior of Covid-19 and the statistical analysis in section 2. The impact of Covid -19 in the insurance markets around the world and its effect in the Egyptian insurance market are illustrated in section 3. In section 4, we introduce a set of post pandemic policies to the Egyptian insurance companies for

recovery in the future. The final remarks and conclusions will be stated in section 5.

2. The statistical approach

2.1 Data set

In this research, the data was collected from the daily published reports issued by the Egyptian Ministry of Health. The data is officially collected from the hospitals and the medical units around the country and reported to the Ministry of Health in a daily base. The Ministry in turn issued reports including five categories of data, they are: 1- number of newly reported affected cases, 2- number of deaths, 3- number of recovered cases, 4- total number of affected cases, 5- total number of deaths. Here, the two main categories of data: the daily newly affected cases and the daily deaths are selected to explain the evolving of the pandemic over fourteen months. The collected data covers the duration since the outbreak of Coronavirus in March 2020 to May 2021. This observation period is considered the most critical in Egypt where dangerous waves of the pandemic are clearly detected, and hence, the pandemic's trend with the peaks and falls of its waves can be illustrated. Furthermore, studying the effect of the waves of Covid-19 on the performance of the Egyptian insurance market is explored in section 3. Hence, the data related to the operations of the Egyptian insurance market was collected in a monthly base during the same observation period. This dataset includes the earned premiums and incurred claims of the main types of the insurance market: life and non-life to examine the effect of the pandemic in the performance of the insurance companies. Moreover, the performance of the medical insurance will be mentioned as it is expected to be the most affected among other insurance branches in the market.

2.2 Models

Many statistical models were developed to illustrate the behaviour of Covid- 19 in different regions around the world as stated earlier. In this section, it is important to present the main findings that were



reached to understand the characteristics of the pandemic using different statistical distributions.

An exponential Mfamily of continuous distributions was developed by Bantan, *et al*, (2020) and was applied on the Covid-19 cases in Pakistan. A derivation of a new three-parameter lifetime distribution was conducted with the choices of the inverse exponential and exponential distributions as baselines. It was called the EM inverse exponential exponential (EMIEE) distribution. The application of the EMIEE model on the new COVID-19 cases in Pakistan during the period from 21 March to 29 May 2020 (inclusive) was carried out. The analysis of the results with fair comparisons with 15 other solid models were presented, and the fitting results were favorable to the EMIEE model. It was recommended that the EMIEE can be used in other countries to allow comparisons and more understanding of the COVID-19 pandemic.

Also, Zhao *et al*; (2020) compared the COVID-19 pandemic dynamics of two neighboring Asian countries, Iran and Pakistan, and developed a new statistical model describing data on COVID-19 daily deaths in Iran and Pakistan.

Furthermore, Patel, *et al*; (2020), develop a mathematical model called Multilevel Integrated Model with a Novel Systems Approach (MIMANSA) to help understanding more the challenges in patient management. MIMANSA is a multi-parametric model that is designed to simulate the incubation period of coronavirus. The incubation period decides when virus-infected patients would show symptoms. The research also explores a variety of probability distributions functions (PDF) and their impact on parameter estimation in the MIMANSA model. It is applied in India, and the results show that the Weibull distribution gives a better training model and predictions.

Moreover, a previously developed Bayesian model of disease transmission is adopted for COVID-19 transmission by Recio, J.F. (2020) to study the evolution of the disease and the effect of intervention measures in some European countries and territories. A

clear impact of the major intervention measures on the reproduction number (R_t) has been found in the studied countries and territories with the drop in the number of deaths over time. The model provides realistic estimates of the total number of infections, active cases, and future outcomes. Moreover, it is found to be helpful in the implementation of control measures, but the reliability of the long-term predictions may depend on the moment of the epidemic outbreak.

In addition, Mansour, *et al*; (2021) develop a new generalized family of distributions to provide the best description of COVID-19 daily data collected from Egypt and Saudi Arabia. The mathematical properties of the proposed new generalized Geometric Poisson (NGGP) family are studied to arrange for appropriate quarantine activities. A comparison between the Egyptian and Saudi experience of the epidemic dynamics is conducted. It is observed that the proposed model fitted the COVID-19 daily cases data and the COVID-19 daily deaths data very closely in the two neighboring countries. Moreover, Alshammari, *et al*; (2021) derives a parametric compound G family of continuous probability distributions called the Poisson generalized exponential G (PGE) family. Relevant mathematical properties are derived. Two real-life data applications (aircraft windshield failure and service times) are examined to illustrate the importance of the new family.

In this research, several statistical distributions were fitted to the two main rates in this research: the daily number of reported affected cases of Covid -19 and the daily number of deaths. The two data sets were tested using 64 different statistical distributions. It is found that seven distributions are the most common fitting distributions, they are: Logistic distribution, Log-Logistic distribution, Lognormal distribution, Generalized Pareto distribution, Gamma Distribution, Exponential distribution and Weibull distribution. Moreover, we estimated the parameters of each distribution and performed goodness of fit tests to explain which distribution would be the best fit to the data used in each set. The results of the analysis will be illustrated in section 2.3.

The PDFs of the seven distributions are stated below:



1. Logistic distribution

$$f(x; \mu, s) = \frac{e^{-\frac{x-\mu}{s}}}{s \left(1 + e^{-\frac{x-\mu}{s}}\right)^2}, \quad -\infty < x < \infty, \quad s > 0$$

where μ is the location parameter and σ is the scale parameter.

2. Log-logistic distribution

$$f(x; \alpha, \beta) = \frac{\frac{\beta}{\alpha} \left(\frac{x}{\alpha}\right)^{\beta-1}}{\left(1 + \left(\frac{x}{\alpha}\right)^\beta\right)^2}, \quad x > 0, \quad \alpha, \beta > 0$$

where α is the location parameter and β is the scale parameter.

Or $\mu = \ln \alpha$, $s = \frac{1}{\beta}$

3. Lognormal distribution

$$f(x; \mu, \sigma) = \frac{1}{x\sigma\sqrt{2\pi}} e^{-\frac{(\ln x - \mu)^2}{2\sigma^2}}, \quad x > 0$$

where μ is the location parameter and σ is the scale parameter

4. Generalized Pareto distribution

$$f(x; \mu, \sigma, \zeta) = \frac{1}{\sigma} \left(1 + \frac{\zeta(x - \mu)}{\sigma}\right)^{-\frac{1}{\zeta} - 1}$$

where μ is the location parameter, σ is the scale parameter and ζ is the shape parameter.

5. Gamma distribution

$$f(x; \alpha, \lambda) = \frac{\lambda^\alpha}{\Gamma_\alpha} x^{\alpha-1} e^{-\lambda x}, \quad x > 0, \quad \alpha, \lambda > 0$$

where α is the location parameter and λ is the scale parameter

6. Exponential distribution

$$f(x; \lambda) = \lambda e^{-\lambda x} \quad , \quad x > 0 \quad , \quad \lambda > 0$$

where λ is the scale parameter

7. Weibull distribution

$$f(x, \alpha, \beta) = \frac{\alpha}{\beta} \left(\frac{x}{\beta}\right)^{\alpha-1} \cdot e^{-\left(\frac{x}{\beta}\right)^\alpha} \quad x > 0 \quad , \quad \alpha, \beta > 0$$

where α is the scale parameter and β is the shape parameter

2.3 The statistical analysis

Studying the trend of the pandemic and the characteristics of the two datasets (daily deaths and daily infected cases) during the observation period in Egypt is important to perceive its effect on the financial sector in Egypt, especially the Egyptian insurance market which is the main interest in this research. In this subsection, we conducted a descriptive statistical analysis to explain the different characteristics of both variables: the daily number of deaths and daily new COVID-19 cases during the observation period. Then, the fitting distributions of both data sets are presented.

Table (1) shows the descriptive statistics of the number of deaths and the number of newly affected cases from March 2020 to May 2021 in Egypt. It summarizes the four moments (Mean, Standard Deviation, Skewness and Kurtosis) of both sets of data during the observation period. The mean of the daily deaths recorded cases is approximately 34 cases whereas the mean of the daily newly infected reported cases is approximately 588 cases. It is notable that the average number of cases reported in the two datasets are considered low compared to the average number of death or infected cases reported in many countries at that time. This could be referred to the quick response of the Egyptian government by applying the strict precaution procedures and the social distancing rules along with preparing and equipping the hospitals to be quarantine places to deal with severe cases. The minimum infected cases reported were 7 whereas the maximum number of daily cases reached 1774. The results also show that there



were days where no death cases were reported whereas the maximum number of reported daily deaths were 97 cases. Furthermore, it is noted that both variables are positively skewed and platykurtic.

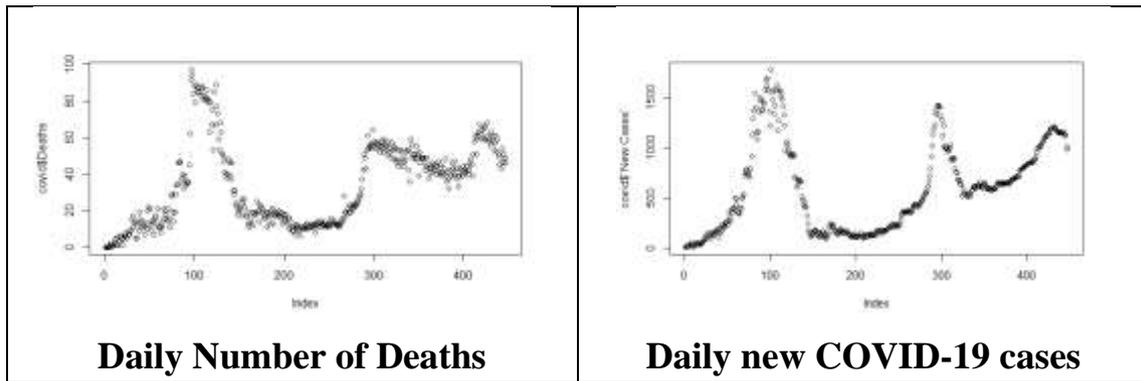
Moreover, Figure (1) also shows that both the distribution of daily number of deaths and daily new infected COVID-19 cases have the same trend over the observation period. There were three waves of the pandemic detected from March 2020 to May 2021: three peaks are clearly shown: the first one was at June 18th 2020 with 1774 cases, the second peak was January 6th 2021 with 1219 cases and the last peak was May 14th 2021 with 1201 cases.

Table (1)
Descriptive statistics of daily number of deaths and daily new COVID-19 cases

Measure	Daily number of deaths	Daily number of new infected cases
Mean	33.79	587.45
Standard Deviation	22.34	437.16
Median	32	547
Min	0	7
Max	97	1774
Range	97	1767
Skewness	0.54	0.6
Kurtosis	-0.53	-0.67
Standard Error	1.06	20.68

Source: Statistical analysis of daily no of deaths and new cases calculated by using R Package

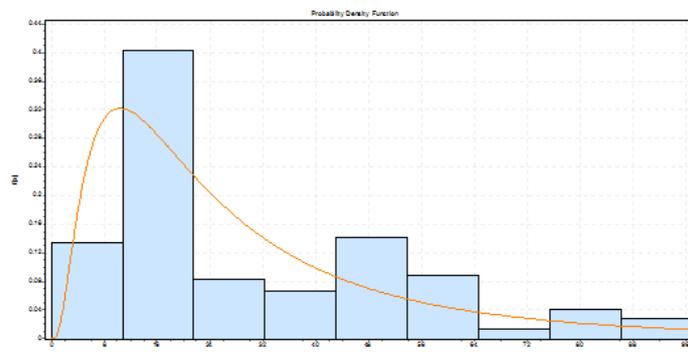
Figure (1)
The trend of daily number of deaths and daily new COVID-19 cases from March 2020 to May 2021



Source: The trend of daily no of deaths and new cases plotted by using R Package

The fitting statistical distributions for daily number of deaths and daily new Covid-19 cases are shown below in Figure (2) and (3) respectively. The fitting of the statistical distribution for daily number of deaths and daily new COVID-19 cases are both conducted by using the EasyFit software. Both figures confirm that the distributions of both sets of data used are positively skewed. This illustrates that the high frequencies and the central of data are considerably low in the recorded cases, where the mean is 34 and the median is 32 in the daily deaths, and the mean is 588 and the median is 547 in the daily infected cases. The range and standard deviations reveal that there is a tendency of variation in both data sets.

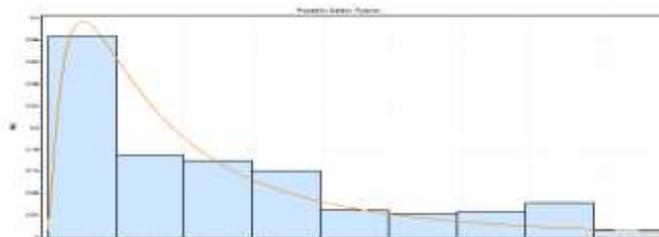
Figure (2)
Histogram of fitting distribution for daily number of deaths
(March 2020 – May 2021)



Source: Distribution of daily no of deaths plotted by using R Package.



Figure (3)
Histogram of fitting distribution for daily number of new COVID-19 cases(March 2020 – May 2021)



Source: Distribution of daily no of new cases plotted by using R Package.

Furthermore, Table (2) illustrates the estimated parameters of the seven different statistical distributions used that fit the daily number of deaths due to COVID-19. Also, Table (3) shows the estimated parameters of these statistical distributions that fit the daily new infected cases. The seven statistical distributions give the best fit from a total of 64 statistical distributions, based on testing the goodness of fit using Chi-square test, Kolmogorov Smirnov and [Anderson Darling](#) tests using EasyFit software. Each statistical distribution has its own characteristics indicated by parameters of the distribution. These parameters are estimated using the maximum likelihood estimation that fits the actual data. Moreover, parameters represent the location, scale and shape of the distribution.

Table (2)
Estimated parameters for the daily number of deaths due to COVID-19

Distribution	Parameters
Logistic	$\sigma=12.774 \mu=30.343$
Log-Logistic	$\alpha=2.0183 \beta=22.993$
Lognormal	$\sigma =0.87396 \mu =3.1071$
Gen. Pareto	$\zeta =-0.19982 \sigma =33.191 \mu =2.68$
Gamma	$\alpha =1.7152 \lambda =17.691$
Exponential	$\lambda =0.03296$
Weibull	$\alpha =1.0684 \beta =34.131$

Source: Estimated parameters for the daily no of deaths calculated by using EasyFit software.

Table (3)
Estimated parameters for the daily number of new COVID-19 cases

Distribution	Parameters
Logistic	$\sigma = 245.97$ $\mu = 514.85$
Log-Logistic	$\alpha = 1.6271$ $\beta = 326.43$
Lognormal	$\sigma = 1.0576$ $\mu = 5.7929$
Gen. Pareto	$\zeta = -0.11238$ $\sigma = 564.85$ $\mu = 7.0672$
Gamma	$\alpha = 1.3318$ $\lambda = 386.59$
Exponential	$\lambda = 0.00194$
Weibull	$\alpha = 1.1674$ $\beta = 532.33$

Source: Estimated parameters for the daily no of new cases calculated by using EasyFit software.

3. Impact of Covid-19 on insurance markets

As the insurance industry represents a major sector in the financial markets, a large body of studies discussing the impact of the emerging Corona virus pandemic (Covid-19) on the operations and the performance of insurance companies now exists in the literature. These studies cover the effect of the pandemic on the operations of the insurance companies from different aspects in various regions. They also discuss how would the insurance company -which is specialized in risk management - deal with the pandemic risk, and also, decrease the expected losses due to the government safety measures and precautions applied. In addition, the impact of the pandemic on the economies generally and insurance industry specifically was also covered. In subsection 3.1, these studies will be reviewed to understand the impact of Covid-19 on the operations of insurance companies, insurance markets and the economies in different countries. Having studied the different experiences from other states, this is considered essential to observe the impact on the Egyptian insurance market which will be covered in subsection 3.2.



3.1 Covid -19 and insurance markets worldwide

Facing the repercussions of risks resulting from the pandemic and the importance of insuring against pandemics along with development of new policies to allow systems to cope with financial technology and digital insurance were studied by Kharaj, M. (2020), Richter and Wilson (2020). Furthermore, Sufyan (2020) recommends that the Insurance companies should adapt to the Corona pandemic by resetting the mechanisms of hedging, and risk management and reserving policies. Pooling or creating insurance funds could also be considered to deal with such risks in cooperation with the state or other insurance companies in the market.

The performance of the insurance companies and the impact on the operations during the pandemic were extensively studied in different markets. Al-Amayrah (2020) investigates the acts of general managers and CEOs of Jordanian insurance companies towards the pandemic. The study was applied on 24 general managers and CEOs of insurance companies in the Hashemite-Kingdom of Jordan, and focused on four dimensions: the financial, technical, technological, and human dimensions. The results of the study show that the (Covid-19) pandemic affected the performance of insurance companies in the financial dimension at a medium level. However, a high-level impact of the (Covid-19) pandemic on the performance of insurance companies was detected in the technical dimension through decreasing the underwriting operations with the manifestation of lack of credit to individuals and the procedures taken that the companies work remotely during the pandemic. On the other hand, the technological dimension and the human dimension have a positive impact by protecting the financial rights, implementing health procedures, and creating a safe work environment and work plans.

Eldaia, *et al*; (2021) study the impact of the Corona pandemic on the Malaysian Takaful insurance market. The pandemic which led to a decrease in Malaysia's gross domestic product (GDP) to 3.5% instead of 5.5%, also resulted in an increase in the unemployment rate to 5%. This negatively affected the Malaysian Takaful insurance market

which would have to deal with the increased volatility and credit risks that would expect to continue for the coming years. They suggest that the negative effect of the pandemic could be reduced by using new technology tools, maintaining customers, and bearing social responsibility.

Babuna, *et al*; (2020) study the impact of Covid -19 pandemic on the insurance industry in Ghana and compare the effect of (Covid-19) crisis with previous epidemics such as (swine flu) and (SARS). The results conclude that the impact of (Covid-19) was significantly negative compared to what was the situation under previous epidemics, in terms of economic stagnation, low profits and the increase in compensation and indemnities. Remoting work, adopting social distancing and health precautions along with facilitating the payments of premiums and indemnities.

Stojkoski *et al*; (2020) studies the North Macedonia insurance market with application of seasonal autoregressive model for the total written premiums and indemnities in 11 insurance branches. One of the main findings is that: there is a decrease in both the total indemnities paid and the total written premiums by 10% during the first half of 2020.

Furthermore, four Chinese insurance companies (listed in the stock exchange market during the period from the first quarter of 2019 to the third quarter of 2020) are examined focusing on measuring the credit risk of these companies. Using KMV application, the results show that the credit risk in these companies is increased due to Covid-19 pandemic and that leads to a decrease in the value of the shares of those companies on the Chinese Stock Exchange (Zeng, *et al*; (2021)).

The relationship between Covid-19 and the revenues of the insurance industry during the period from January 22nd to September 14th, 2020, was studied by Fareed and Iqbal (2020). The research is applied in emerging markets and developing markets using Wavelet methods. The results show a strong negative impact of insurance revenues but not continuously during that period. In addition, the emerging markets



achieve larger losses compared to the developed markets. The research provides important findings to the decision makers in the insurance companies to formulate future policies to deal with the pandemics.

Adopting various approaches to reduce the negative impact of the pandemic and set policies to deal with the post pandemic effect in different markets is important to be mentioned in this subsection. This was explained by Baumann (2020) in a study that was carried out by Deloitte expecting that the insurance companies would face large financial losses due to Covid -19 crisis in the long term around the world. Thus, major changes in the operations of these companies are needed, such as: reformulating of the insurance policy, the reinsurance coverage, setting proper plans to face the pandemics, and design new products to satisfy the clients. This negative impact of Covid-19 in different insurance markets is also explained by Klonowska and Strupczewski (2020) who study the challenges that had faced the global insurance industry due to Corona pandemic and conclude that there is a positive impact as well represented in: managing risks, increasing awareness of the importance of insurance in all branches, and increasing social responsibility to face the negative effect of the pandemic. Moreover, Kirti & Shin (2020) confirm the negative impact of the (Covid-19) crisis on the performance of insurance companies and its effect in different insurance markets as they witness widespread financial turmoil across asset classes. In addition, they conclude that life insurance companies will face many challenges considering the increase in the number of deaths. They also recommend tightening control over insurance companies and monitoring assessments of financial stability and capital of insurance companies, in addition, setting strategies to deal with post pandemic status.

Focusing on the health insurance which is considered one of the major branches that is affected by the pandemic. Kip (2020) illustrates that the cost of deaths in the United States was estimated at 1.4 trillion dollars in the first half of 2020 out of the total global death cost of 3.5 trillion dollars in more than 100 countries till July 2, 2020. It is also

noted that the risk of death and health care losses are increased to 40% instead of 10% before the pandemic. Verifying the impact of the Corona pandemic on the Health insurance law in USA, Liddick (2021) recommends the expansion in providing online health services and raising the awareness of confidentiality of patients and health care information.

A detailed study in examining how could the Coronavirus pandemic affect the cost of health or medical care was carried out by Milton, *et al*; (2020) in the commercial health insurance market (U.S) in 2021, taking into consideration the following:

1- Treatment and vaccination of Covid-19 virus, 2- Access to and demand for health care, 3- Long term effect on the health of the population, 4- Economic impacts on health care, 5- Disrupting healthcare provider systems, 6- Operational Effects, 7- Future considerations regarding how will the pandemic affect the prices of health services after 2020, and what is the potential impact of reporting the medical loss ratio, also how can the health plans deal with the cost impact of the Corona pandemic on future health care coverage?

The various studies mentioned above show the significance of the effect of the pandemic on the insurance industry around the world over the past two years. In the following subsection, we will present the characteristics of the Egyptian insurance market and how would it be affected by Covid-19 during the observation period from March 2020 to May 2021, so that, we can formulate a set of post pandemic policies to control the post pandemic effect in the Egyptian insurance market.

3.2 Effect of Covid-19 in the Egyptian insurance market

The Egyptian insurance market is considered one of the largest in the MENA region. The insurance companies in the market are classified into: life and nonlife companies. The Life insurers and offices represent 39% of the total market by 16 insurers, while nonlife companies represent 61% of the total market by 25 companies. In addition, life insurers are categorized into commercial and takaful



insurance companies with percentage of 67% and 33% respectively, whereas the percentage of commercial and takaful nonlife insurance companies are 76% and 24% respectively. This means that most of the life and nonlife insurance companies are commercial and the takaful life and nonlife insurance companies are approximately one third and one quarter of the total market share respectively.

As for the insurance operations, insurance companies achieved total premiums of nearly 47.5 billion Egyptian pounds at the end of June 2021 compared to EGP 40.1 billion during the previous year. This reflects an increase of approximately 18.5% in premiums. The total investments of insurance companies amounted to more than 131.5 billion Egyptian pounds at the end of June 2021, compared to nearly 107.7 billion Egyptian pounds in the previous year, with a growth rate of 22.1%.

Table (4) and Figure (4) show monthly records of earned premiums for non-life and life insurance companies – in millions Egyptian Pounds - collected from FRA during the observation period from March 2020 to May 2021.

Table (4)
Earned premiums for non-life and life from March 2020 to May 2021

-in millions Egyptian Pounds-

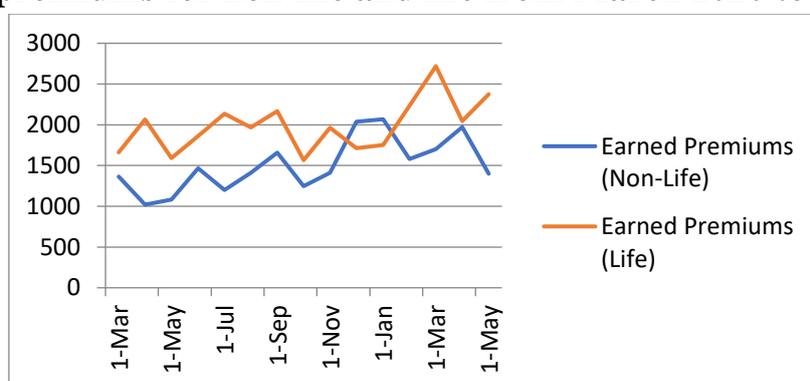
Month	Earned premiums (Non-Life)	Earned premiums (Life)
Mar-20	1365.2	1661.8
Apr-20	1019.6	2066.3
May-20	1083.2	1589.6
Jun-20	1464.1	1860.6
Jul-20	1201.3	2134.3
Aug-20	1410.8	1965.8
Sep-20	1658.1	2167.6
Oct-20	1247.3	1566.1
Nov-20	1410.8	1965.1

Dec-20	2036.6	1713.2
Jan-21	2067.7	1752.1
Feb-21	1581.3	2232.4
Mar-21	1701.9	2719
Apr-21	1971.4	2046.2
May-21	1397.7	2372.8

Source: Financial Regulatory Authority (FRA) Reports, 2021.

Figure (4)

Earned premiums for non-life and life from March 2020 to May 2021



Source: Earned premiums for non-life and life insurance companies plotted by using EXCEL

Table (4) and Figure (4) show the earned premiums for non-life and life insurance companies during the period from March 2020 to May 2021. It is notable that the trend of the earned premiums fluctuates in both types. There is an increasing trend in the earned premiums of the nonlife companies over the observation period which is lower than the earned life premiums. This could be due to the increasing demand on the medical insurance and health care and general decrease in the underwriting operations because of slowing down all the activities during the pandemic. On the other hand, the trend of earned premiums of life insurance companies are generally higher than the non-life premiums with a remarkable increase in the beginning of year 2021 till March 2021. This could be referred to the increase in the need



of having a life coverage due to the high unexpected number of deaths caused by the pandemic during the observation period. Moreover, there are peaks in the earned premiums in both types around June 2020 and March 2021 reflecting the two waves of Coronavirus detected in Figure (1). Here, it is worth mentioning that the average market share of the earned premiums in the medical insurance recorded during this period is quite high and it is equal to 22% (it is almost one fifth of the earned premiums of all other types) (Financial Regulatory Authority Reports, 2021).

The incurred claims of non-life and life insurance companies are shown in Table (5) and Figure (5) below.

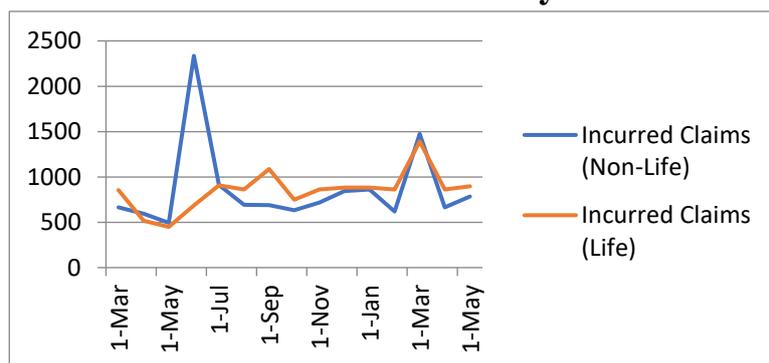
Table (5)
Incurred claims for non-life, life from March 2020 to May 2021
-in millions Egyptian Pounds-

Month	Incurred claims (Non-Life)	Incurred claims (Life)
Mar-20	663.5	855.5
Apr-20	593.2	518.4
May-20	494	448.8
Jun-20	2335.8	684.1
Jul-20	910.8	908.5
Aug-20	691	861
Sep-20	689.3	1086.1
Oct-20	631.3	748.6
Nov-20	716.2	861
Dec-20	844.9	883.8
Jan-21	863	883.8
Feb-21	619.8	860.6
Mar-21	1475.7	1391.1

Apr-21	665.4	861.9
May-21	785.2	896.3

Source: Financial Regulatory Authority (FRA) Reports, 2021.

Figure (5)
Incurred claims for non-life, life, commercial, Takaful
from March 2020 to May 2021



Source: Incurred claims for non-life and life insurance companies plotted by using EXCEL.

Table (5) and Figure (5) presents the incurred claims for non-life and life during the period from March 2020 to May 2021. There are at least two observable peaks of incurred claims in both types. These two peaks are closely related in time to the peaks recorded for the daily death cases and daily infected cases of Covid 19 shown in Figure (1), which are occurred in May-June 2020 and March-April 2021. Although the medical insurance in non-life does not cover the pandemics, the increase could be partially resulted from the high cost and number of medical examinations, x-rays and medication cost recorded by the large number of infected cases at that time. On the other side, the peaks of incurred life claims could be due to the severity of the pandemic and the high frequency of death cases in the two waves of the pandemic within this period.

According to the Financial Regulatory Authority Reports (2021), the market share of the incurred claims in medical insurance is considerably high reaching a maximum of 55% which represents more



than half of the incurred claims during the observation period, and the average incurred claims is equal to 38%.

A full statistical analysis of the earned premiums and incurred claims of non-life, life and medical insurance is carried out by using R Package and is illustrated in Table (7). This is to give more insights and better understanding to the effect of the pandemic on the operations of the Egyptian insurance companies.

Table (7)

Descriptive statistics for earned premiums and incurred claims for non-life, life, and medical insurance in Egyptian insurance market from March 2020 to May 2021.

Measures	Earned Premiums (Non-Life) In millions	Earned Premiums (Life) In millions	Incurred Claims (Non-Life) In millions	Incurred Claims (Life) In millions	Medical Insurance Premiums (% of market share)	Medical Insurance Claims (% of Market share)
Mean	1507.80	1987.53	865.27	849.97	0.22	0.38
Standard Deviation	328.12	315.88	465.61	218.05	0.03	0.08
Median	1410.80	1965.80	691.00	861.00	0.21	0.38
Skewness	0.44	0.69	2.68	0.52	1.40	0.49
Kortusis	-0.66	0.54	7.58	2.44	3.44	0.21
Minimum	1019.60	1566.10	494.00	448.80	0.17	0.25
Maximum	2067.70	2719.00	2335.80	1391.10	0.29	0.55
Range	1048.10	1152.90	1841.80	942.30	0.13	0.30

Source: Statistical analysis of earned premiums and incurred claims in non-life, life and medical insurance calculated by R Package.

Table (7) shows the descriptive statistics for monthly records of earned premiums and incurred claims for non-life, life, and medical insurance in the Egyptian insurance market from March 2020 to May 2021. The safety precautions and the closure rules that were applied during this period have affected the whole economy including the insurance

businesses. Although insurance premiums and claims vary according to the type of insurance, there is an obvious increasing trend of insurance claims due to Covid-19 specially in life and medical insurance. The other types of insurance have faced some difficulties due to the macro-economic crisis occurred by Covid-19. The distributions of earned premiums for non-life and life insurance tend to be approximately normal as the difference between mean and median is slightly small. In addition, the distribution of incurred claims for non-life looks positively skewed and platykurtic whereas the distribution of incurred life claims tends to be normal.

The market share of earned premiums and incurred claims for medical insurance during the period from March 2020 to May 2021 reflects the importance of the medical insurance that arose during the pandemic and the high cost of medication. The average premiums earned from medical insurance represents 22% of the total market share and the average claims reached 38% of the total market share during the observation period.

4. Post pandemic strategy for Egyptian Insurance market

The need to face the consequences of Covid-19 pandemic is an urge to the global insurance market. Hence, it is vital that the insurance companies in Egypt should set plans to deal with the expected challenges resulting from the pandemic as in other countries. In this section, a number of policies are set to formulate a strategy that can be adopted in insurance companies to accelerate the process in passing the post pandemic status, and at the same time, ascertain lesser losses seeking for more progressive performance in the coming years. These policies could include the following:

- 1- Moving to digital transformation which includes the expansion in developing platforms to provide electronic insurance services and policies. This can be used as an alternative to reduce the density of the number of people inside the company, whether they are company's



senior management, employees, or customers. This can include the following:

1/1 Encouraging holding online meetings across different sectors in the company.

1/2 Using artificial intelligence and insurance mobile phone applications that could help in speeding up the technical procedures: conducting inspections, collecting premiums, disbursing indemnities, etc...

1/3 Providing training to the insurance brokers to encourage them using the electronic platforms; the insurance broker is considered a key person in supporting and strengthening the insurance industry. Given that the world is now moving towards working through electronic means; one of the most important challenges facing brokers is the extent to which their tools have evolved considering the industry's trend towards digital transformation and changing consumer expectations. That is why the insurance broker must develop his/her marketing skills by using electronic platforms and dealing with online services.

2- Promoting for income protection policies considering the Coronavirus pandemic.

3- Focusing on sustainable underwriting with the current economic transformations that would affect the insurance sector. In addition to the monetary policy of applying lower interest rates for a longer period, and a potential risk of higher inflation, the insurance companies should try to:

3/1 Increase the awareness of the financial risks associated with epidemics.

3/2 Innovate new coverages to counter new risks.

3/3 Apply digital transformation in the methods used for premiums and indemnities.

3/4 set policies to create new products.

4- Reviewing the main strategy of the company and reevaluating the current and future objectives, taking into consideration:

4/1 Returns on capital.

4/2 Rating of the companies by international organizations.

4/3 Financial solvency.

4/4 Reinsurance of finance risks.

5- Evaluating the underwriting and reserve policies through:

5/1 Amending the conditions of the policies.

5/2 Considering the impact of Corona crisis on the companies' portfolios either directly or indirectly.

5/3 Supporting the role of the supervisory authorities.

5/4 Reevaluating of the scope of coverage of risk reinsurance contracts.

6- Reducing new risks and adapting to risk taking by:

6/1 Assessment of underwriting risks.

6/2 Determining the relative importance of risks among the different branches of insurance.

6/3 Dependence on the capacity of reinsurance policies.

7- Assessing of Capital adequacy through:

7/1 Valuation of assets and liabilities.

7/2 Evaluation of investment policies.

7/3 Assessment of the reserves.

7/4 Reconsidering the minimum standards of international rating agencies.

7/5 Applying mandatory capital requirements.

8- Increasing the efficiency of the health insurance coverage and the complementary medical care services to the one provided by Law No. 2 of 2018 (Law of the Comprehensive Health Insurance System). The levels of health care provided according to this Law include three levels, they are:

8/1 First level: is the first line of defense against disease, and is concerned with the preventive aspect, referral, health promotion, and combating the spread of the



disease in the pre-infection stage.

8/2 Second level: is the stage of disease diagnosis and treatment.

8/3 Third level: deals with the rehabilitation stage for special cases of illness.

Here, it is worth to mention that the new health comprehensive insurance system provides health insurance services for all diseases to the insured people in Egypt. These include: diagnostic, treatment, or rehabilitation services, medical or laboratory examinations, etc.

Taking into account maintaining the financial and actuarial balance for the new system, this would make the role of the insurance companies in offering extra health services more challenging and competitive.

9- Establishing an insurance pool for insurance companies to cover the risks of epidemics and pandemics.

This set of policies provide the insurance companies with a strategical framework that can be studied thoroughly by the decision makers in each company. An analysis of the cost and benefits of each policy is required to be determined for implementation. We believe that moving towards the application of these policies will lead the insurance market to progress faster in overcoming the negative effect that was caused by the pandemic. In addition, carrying out these policies is expected to help the Egyptian insurance market to develop its services, not only to keep its position in the MENA market but also to compete with the international insurance markets.

5. Conclusions

This research studies the effect of Covid-19 on the Egyptian insurance market, focusing on setting a post pandemic strategy to reduce the negative impact of Coronavirus on the developing economy of the country. The data about the daily new COVID-19 cases and daily number of deaths are collected from the published reports by the Ministry of Health over 14 months. The statistical analysis show that

seven distributions are the most common fitting distributions, they are: Logistic distribution, Log-Logistic distribution, Lognormal distribution, Generalized Pareto distribution, Gamma Distribution, Exponential distribution and Weibull distribution. Also, the earned premiums and incurred claims recorded in the Egyptian insurance market were studied and compared with the waves of COVID-19 detected during the observation period. The analysis of the insurance operations shows that there is an impact of Covid-19 on the Egyptian insurance industry reflected on both the earned premiums and incurred claims. Moreover, the analysis reveals that life and medical insurance (non-life) are affected by the pandemic. This is shown in the incurred claims which have an obvious increasing trend due to Covid-19 in life and medical insurance. The statistical analysis of the earned premiums and incurred claims was conducted to provide better understanding of the effect of the pandemic on the operations of the insurance companies, along with the experiences that were witnessed in different regions, this helped in formulating the outline of the post pandemic strategy to the Egyptian insurance companies. Adopting the set of the recommended post pandemic policies by the Egyptian insurance market and studying the implementation of these guidelines on the operations and revenues of the insurance companies could be covered in future work.



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