

# Influence of Patient Age towards Recovery Days of COVID-19 Disease in the Philippines: A Correlational Analysis

Mark Van M. Buladaco\*

\* Faculty, Institute of Information Technology, Davao del Norte State College, Philippines, [markvan.buladaco@dncs.edu.ph](mailto:markvan.buladaco@dncs.edu.ph)

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## Abstract:

The world is now in a pandemic crisis due to the new Coronavirus, which can cause a disease called COVID-19. In the Philippines now has 8,928 positive cases of COVID-19 as of May 2, 2020, even though the government is imposing quarantine guidelines throughout the country. The characteristic of the patients contracted the virus has a possible effect on his or her recovery. Data on new positive cases in the Philippines are available from the Department of Health case tracker website. The data was cleaned and prepared for the analysis. The sample size of 664 cases was considered. In this paper, the age of the Patient with COVID-19 and the recovery days from the date confirmation are tested for correlation using Pearson r analysis using IBM SPSS. Results show that the patient's age does not significantly influence the number of recovery days. It also produced a weak negative correlation between the two variables.

**Keywords —Recovery rate, COVID-19, SARS-COV2,public health, Philippines**

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## I. INTRODUCTION

The world is now in a pandemic crisis because of the COVID-19 disease from the SARS-CoV2 virus. This type of Coronavirus first appeared and in Wuhan City, Hubei Province, a metropolitan city in the People's Republic of China last December 31, 2019, as reported by the World Health Organization (WHO) [7]. Assumptions from different media that this kind of Coronavirus has spread and mutated because of people consuming animals [1] such as aliped or tittle bat and snakes that were the main reason and factor in attribution for the cause of existing this disease. Furthermore,preparation of the exotic food consumed by the people in Wuhan was poor. According to the theory reported by Chinese, this new kind of Coronavirus spreads from bats and snakes [2].

As SARS-CoV2 spreads in different parts of the world, disruptions to businesses and trade have been prevalent in different countries. Sports,

recreational, entertainment activities were suspended. Even some government agencies had to stop their operations to the public. This is due to the different countries' efforts to restrain the spread of the virus and limit the new cases of COVID-19 disease. This pandemic is truly has a tremendous effect on the world economy and might end up in an economic crisis in most countries [18]. The WHO has ordered the different national governments of the countries to impose quarantine measures, wearing masks, social distancing, and frequent handwashing and use of alcohol and sanitizers [19].

The SARS-CoV2 virus can spread through humans to human transmission through small droplets caused by sneezing and coughing by a person. This virus can live up to 72 hours on surfaces [20]. It can cause COVID-19 disease, which primarily affects the lungs and upper respiratory organs [3]. This new Coronavirus [4] can lead to death to a person who has

immunodeficiency problems or in a person with a disease like cancer, diabetes, and that every age tends to affect by this virus. The virus is considered highly contagious, and it is spreading rapidly around the world. Italy is one of the hard-hit countries due to COVID-19, and there are hundreds of new cases every day. According to a prediction in a study, Italy positively increases the fatality rate cases up to 7.2% as of March 17, 2020 [5]. Moreover, the rise of new cases of COVID-19 causes several effects on education and employment. Students are forced to learn through alternative means and online learning. There is also a rise of unemployment in different countries, and this affects several workers wherein they were temporarily suspended from their job, and this will cause on not receiving any salary [21]. Lastly, there is an absolute scarcity and shortage of food supply due to the limited and restricted activities, and people in low-middle income areas are only relying on the support of government response. There is a clear negative impact on the economic progression of the country dealing with this disease.

In the Philippines, there are 8,928 positive cases of COVID-19 as of May 2, 2020, based on the Department of Health data [22]. There 1,124 recoveries and 603 deaths. The Philippine government has imposed enhanced community quarantine on hotspot areas in the country, most notably in the National Capital Region and metropolitan cities such as Cebu City and Davao City. It is the result of the recommendation from the Inter-agency Task Force for The Management Of Emerging Infectious Diseases Resolutions and was approved by the President [23]. During the enhanced community quarantine, areas affected will have strict guidelines and can only go out to buy foods and medicines. There are also areas that were put under general community quarantine. Areas under it will have a relaxed guideline, and some businesses will resume its operations.

The patient information such as age, province city, the onset of symptoms, hospital confined, date of confinement, date of recovery, and sex are shown by the DOH reports. There are numerous reports that those people infected with the age of 60 and above tend to have a higher mortality rate [24].

In figure 1, it shows the comparison of cases base on age group in the case of the Philippines. It shows a higher number of deaths in the 60+ age group. In a global report, that most patients suffer a stroke and could result in fatality. It might also relate to the age of the patients as it tends to have heart problems and illnesses [15]. There are reports that younger patients tend to recover quickly from the disease for some reason that their body is rapidly developing and illness free [16] it is also reported that the COVID-19 triggered and attack the lungs and the respiratory system of the patient's body [17].

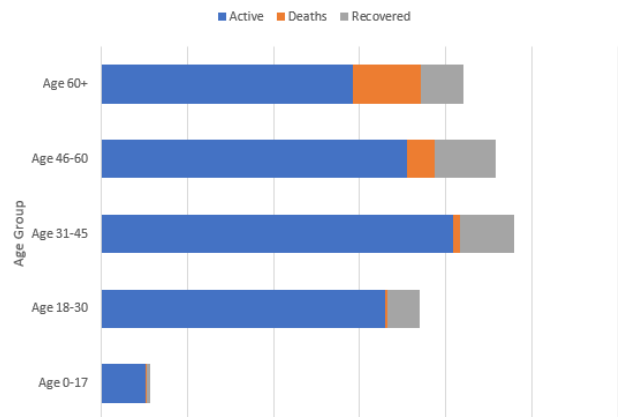


Fig. 1. Age group comparison of cases in the Philippines as of May 2, 2020

The recovery rate of the Philippines shows a 12.59% in the last May 2, 2020 data [22]. It is not yet clear from the research community and health sector the average recovery time for a person to recover as it entails several factors such as underlying illnesses and the age of the patient.

This paper focuses on determining the influence of a person's age towards the recovery time or days of a patient. The linear relationship will be determined first between the two variables. Once confirmed, linear regression will be utilized to identify if there is a positive influence.

**Conceptual Framework**

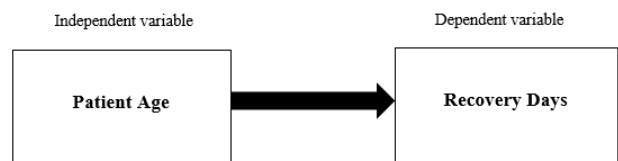


Fig. 2. Conceptual Framework

Figure 2 shows the conceptual framework of this paper. The independent variable is COVID-19 patient's age from the DOH drop data, and the dependent variable is the recovery time in the form of days.

### **Research Question**

The purpose of this paper is to identify if there is a linear relationship between patient age and recovery days. Further, if there is a confirmed linear relationship, an investigation will be made if there is a positive influence of the independent variable towards the dependent variable.

## **II. METHODOLOGY**

The research design of this paper is correlational research as it will investigate a linear relationship between age and recovery days of the patient. This kind of research design is used to assess relationships among variables in a single group of subjects [14]. In this case, the two variables are age and recovery of COVID-19 patients in the Philippines. For instance, correlational research design doesn't provide or prove causation, but it can actively support causal hypothesis [6]. Pearson's Correlation Coefficient was used in this paper, and it is a technique for investigating the relationship between two quantitative, continuous variables and will measure the strength and magnitude of the two variables [25].

To identify that the critical area of distribution is a two-sided, two-tailed test was used. A two-tailed test is designed to examine both sides of a specified date range as designated by the probability distribution involved. It is also used in null-hypothesis testing and testing for statistical significance [26]. If the Sig (2-Tailed) value is greater than 0.05 as the level of significance, that means, increases or decreases in one variable do not significantly relate to increases or decreases in your second variable. It will be stated that there is a statistically significant correlation between your two research variables [8].

### **Data Collection and Preparation**

The data used in this paper are collected from the DOH COVID-19 tracker website for the Philippines. A data drop was made available by the government agency, and it is updated every day. The data consist of all positive cases in the Philippines from Day 0 to May 2, 2020. A COVID-19 virus tends to affect older adults. There are a total of 8,928 cases in the Philippines, and this will serve as the population of the data. There are a total of 1,124 recoveries as of May 2, 2020. It also reported that those patients with underlying illnesses and other medical conditions such as diabetes, hypertension, chronic liver disease, chronic obstructive pulmonary disease, and cardiac disease have a higher tendency of mortality [9].

The 8,928 vases will be considered as the total population for this research. It has undergone data cleaning and preparation. Since the cases that will be included in this paper are those who already recovered. Thus, those cases without a recovery date will be removed. Second, there are unknown recoveries, which means in their date of recovery, it is still empty; these cases will also be removed. With this inclusion criteria, there are a total of n=664 cases to be included in this paper for correlation inquiry. It is shown in figure 3 how the sample size where trimmed down.

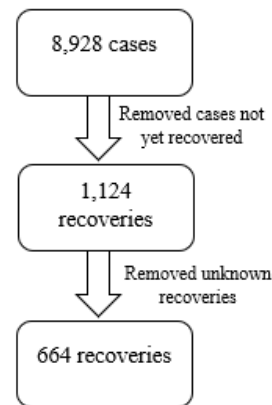


Fig. 3. Determining the sample size of the cases

### III. FINDINGS

There are 664 observations based on the inclusion criteria imposed in this paper for correlation analysis. This paper focuses on determining the influence of patient age on their recovery days. IBM SPSS was utilized in analyzing the data and visualizing the findings. To visualize the data, a scatterplot was made and shown in figure 4.

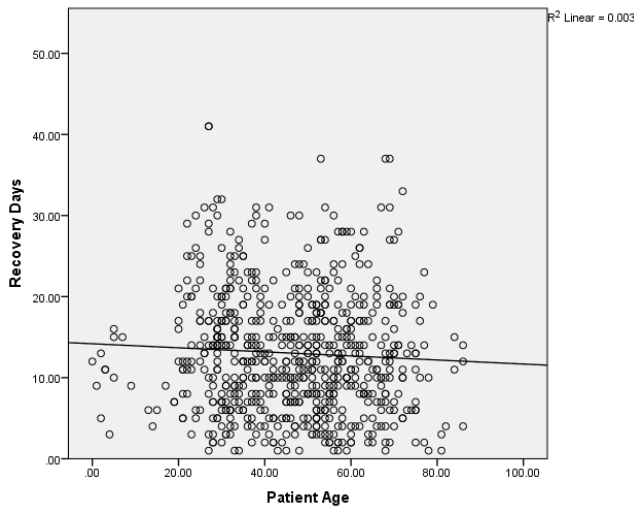


Fig. 4. Scatterplot of age and recovery days of COVID-19 patients

A correlation using Pearson  $r$  was utilized to determine the relationship between patient age and recovery days. This is evident with the research of Alipio, wherein he analyses characteristics of the epidemic in the Philippines using Pearson  $r$  [10]. He provided a study on the situation of healthcare professionals in the Philippines, which is not desirable as compared to other countries [11] also provides findings of the patient's characteristics analysis. In table 1 shows the descriptive statistics of the two variables. The mean age of patients of the sample is 46.57, and the mean recovery days of the sample is 13.02.

TABLE I  
DESCRIPTIVE STATISTICS

	Mean	Std. Deviation	N
Patient Age	46.5678	16.37591	664
Recovery Days	13.0196	7.52520	664

A bivariate correlation using Pearson  $r$  was conducted, and the result is shown in table 2.

TABLE 2  
Correlation Results

Correlation	Patient's Age	Days of recovery
(Patient's Age) Pearson Correlation	1	- 0.054
Sig. 2-tailed		.161
N	664	664
(Days of recovery) Pearson Correlation	- 0.054	1
Sig. 2-tailed	.161	
N	664	664

With a coefficient  $r$  of -0.054 and a  $p$ -value of 0.161, it signifies that there is a very poor negative relationship among patient age and recovery days. A negative relationship indicates an inverse correlation, which means that the higher the age of the patient, the lower the number of days to recover, but that being said, the relationship is very poor, and it might have no association at all. Thus, this theory will be rejected. This is somehow opposite a report that indicates that patients' age plays a vital role in the recovery towards underlying severe conditions, mainly the adults and seniors [17]. The  $p$ -value 0.161 is higher than the level of significance of 0.05. It also accepts a null hypothesis that there is no significant relationship between these two variables. However, the strength of the association is weak; it reveals enough that there is a relationship between the two variables showing 16.1% of having a recovery day by chance base on our  $p$ -value result. This implies that the age of the patient, who is already recovered from the COVID-19 disease, does not entirely and significantly influence the days and time of his or her recovery. Since there is no significant relationship between the two variables, it can be implied that the patient's age does not influence the patient's recovery days.

#### IV. CONCLUSIONS

The purpose of this paper is to determine the relationship between two variables: Age and Recovery Days of COVID-19 patients and if the patient's age does influence on the recovery days. Based on the findings, the age of the admitted patients and positive cases in the disease does not influence the number of days he or she will be recovered from the illness. This is a foundation of the research theory as there is no significant association of age of the patient their number of days in their recovery from the date of confirmation.

Most of the cases considered in this paper are adults and are more exposed to the new Coronavirus, but they have a higher chance of being able to recover rather than those children and older people [13]. Adults are the potential carrier and host of the SARS-CoV2 and will contract the disease.

Due to the community quarantine implemented by different local government units in the Philippines, there are limited activities in the streets, and that includes children playing, going to school, and going to malls and entertainment areas. This is the reason why there is a small number of cases of minor or 18 years old below. This minimizes their exposure to the new Coronavirus and contacts the COVID-19 disease.

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