

## Demographic Aspects and Dynamics of the Spread of COVID-19: Systematic Review Studies

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### Abstract

Demographics are one of the aspects most affected by the dynamics of COVID-19. The increase in the number of deaths to migration trends are aspects that are affected by COVID-19. However, it is not only influenced, demographic aspects can also be a determinant that affects the dynamics of the spread of COVID-19 globally. This study uses a systematic review method that collects relevant journals to be analyzed and studied regarding the causal relationship that arises between demographic trends and the dynamics of COVID-19. The results of the journal analysis show that there is a two-way relationship between demographic trends and the dynamics of COVID-19 which influence each other.

**Keywords:** COVID-19, Demography, Systematic Review



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### INTRODUCTION

The World Health Organization (WHO) declared the corona virus a pandemic in March 2020. One area of life that has been directly or indirectly affected by the COVID-19 outbreak is the population. The pandemic affects the population structure in the future by making some residents sick to death and making the elderly the majority who die (Ridho et al., 2021)).

One of the countries that has succeeded in dealing with the COVID-19 outbreak is Indonesia. Confirmed cases of COVID-19 total 6,653,469 in Indonesia as of 28 November 2022, while cases of death reached 159,735 (WHO, 2022). The Jabodetabek Metropolitan Area was the focus of the COVID-19 outbreak for the first time. COVID-19 has spread to 34 provinces in Indonesia. With 1,425,915 or 22% of COVID-19 cases in Indonesia, DKI Jakarta Province is ranked as the province with the largest percentage of positive cases.

Various efforts have been made by the government to stop the spread of COVID-19. The application of Regional Quarantine (lock down) which is sometimes called Large-Scale Social Restrictions (PSBB) is one of them. The Ministry of Health's estimate of the level of spread of COVID-19 in each region—province, district, and city—determines how this PSBB will be implemented. Government Regulation (PP) Number 21 of 2020 stipulates guidelines for implementing PSBB. Presidential Decree (Keppres) Number 11 of 2020 concerning the Establishment of a Public Health Emergency also contains rules regarding PSBB. On March 31, 2020, President Joko Widodo signed the PP and Presidential Decree.

With the enactment of the PSBB, many family or community events are held at home, so that there is more time and attachment with family. This is another element that influences how intensely a husband and wife engage in sexual activity. As a result of public anxiety about the spread of the Covid 19 virus, PSBB also has an impact on reducing the use of health services by

the community. People joining family planning programs have decreased since few of them visited health facilities, even during the Covid 19 outbreak. There is a greater risk of unwanted births due to decreased use of contraception. There were 1,946 pregnancies during the Covid 19 pandemic, increasing the pregnancy rate by 67 conceptions compared to the previous year (Yusita, 2020). The PSBB program, which seeks to stem the spread of Covid 19 to reduce the death rate, has actually contributed to increasing conception and birth rates.

COVID-19 has an impact on demographic factors including mortality. The death rate has been affected since rising in Indonesia during the COVID-19 outbreak. COVID-19 carer records show that up to 40% of deaths are in patients over 60 years of age. While the remaining 56% are aged between 50 and 59 years. Data on the COVID-19 surveillance website also revealed that the 40-49 year age group accounted for a mortality rate of 12.5% and those under the age of 40 accounted for 6.25%. The elderly are not the only group suffering the most from severe COVID-19 infections. Changes also occurred at the level of migration which was influenced by regulations such as the ban on going home on holidays and the PSBB. Policies to stop the spread of COVID-19 have changed the Demographic trend. Therefore, it is very important to understand how the effects of COVID-19 depend on changing demographic patterns.

## RESEARCH METHODS

Using a scientific and analytical approach, this study examines the interplay between the COVID-19 pandemic and demographic changes using a search tool with Google Scholar. Based on research from published articles from Scopus indexed journals in accordance with selected databases through systematic literature results, it is hoped that demographic aspects that play a role as determinants in the dynamics of COVID-19 and the impact of the pandemic on general demographic trends can be identified.

**Table 1. Demographic Research Articles and the COVID-19 Pandemic**

No	Article Title, Author, Year	Database
1	<i>Demography and The Coronavirus Pandemic</i> (Balbo et al., 2020)	Population Europe
2	<i>Crowding Effects Dominate Demographic Attributes in COVID-19 Cases</i> (Federguen & Naha, 2021)	Elsevier
3	<i>Spatial Analysis of The Impact of Urban Geometry and Socio-demographic characteristics on COVID-19, a study in Hong Kong</i> (Kwok et al.,2021)	Elsevier
6	<i>Examining the association between socio-demographic composition and COVID-19 fatalities in the European region using spatial regression approach</i> (Sannigrahi et al.,2020)	Elsevier
5	<i>Analysing the Impact of Demographic Variables on Spreading and Forecasting COVID-19</i> (Sharif et al.,2022)	Springer
6	<i>Demography and COVID-19 : Risks, Responses and Impacts</i> ( Jatrana et al.,2022)	Springer
7	<i>Population Dynamics and Demography of COVID-19. Introduction</i> (Eigdi & Piero, 2021)	Springer
8	<i>Socio-demographic Factors Associated with Self-protecting Behaviour During the COVID-19 Pandemic</i> (Papageorge et.,al 2021)	Springer
9	<i>Demographic Perspectives on The Mortality of COVID-19 and other Epidemics</i> (Goldstein & Lee, 2020)	PNAS

10	<i>Demographic Science Aids in Understanding the Spread and Fatality Rates of COVID-19</i> (Dowd et al., 2020)	PNAS
11	<i>Correlation Between COVID-19 Morbidity and Mortality Rates in Japan and Local Population Density, Temperature and Absolute Humidity</i>	MDPI

A systematic review of the literature may cover a variety of publications. A systematic literature review has five processes used to collect research papers of caliber SR: (1) Identifying keywords and concepts, (2) Finding articles, (3) Evaluating quality, (4) Extracting data, and (5) Synthesizing data. Finding keywords and search phrases obtained from a theoretical review is the first stage in a systematic literature study. The second stage is identifying articles according to the selected database. Each database searches for articles using the same keywords and terms, making adjustments as necessary to stay within the keyword term ranges. The third stage is evaluation of paper quality, which only applies to academic journal publications that have been vetted and indexed by Scopus. The fourth stage, data extraction, and the fifth step is data synthesis.

This study chose the Population Europe, Elsevier, Springer, PNAS and MDPI databases using the keywords demography and COVID-19 and COVID-19 Impact on demography. There are 10 articles used and published from 2020 to 2022 which are presented in Table 1. In this study, articles are grouped according to categories such as year of publication, journal title, country where the study is concentrated, article classification, methodology, findings, and theory.

## RESEARCH RESULTS AND DISCUSSION

### Demographic Aspect as a Determinant in the Dynamics of COVID-19

The existence of the COVID-19 pandemic has had a major impact on changes in all aspects of people's lives in the world, with various dynamics and challenges that were not predicted before (Sulistianingsih et al., 2021). This pandemic has resulted in the obstruction of several community activities, especially the economy and a decrease in social welfare to changes in the demographic aspects of society. The dynamics of the spread of COVID-19 itself is influenced by the social and demographic conditions of a region. Age structure is one of the demographic aspects that influences the dynamics of the COVID-19 pandemic. Countries with a high proportion of older people have been hit hardest by the presence of the COVID-19 virus. According to Balbo et al., 2020, the composition of the population, especially the age structure, has an important role to determine the impact intensity and dynamics of COVID-19.

The age structure as part of the population composition can be studied more deeply to understand the community groups that are at the highest risk of infection and explain the spread of COVID-19. Research by Dowd et al., 2020 illustrates how age structure influences the high number of COVID-19 cases and the increase in mortality due to the spread of the virus, especially in the elderly. Dowd used a constant prevalence of 10% and used age- and sex-specific mortality rates to show large differences in death rates from COVID-19 across age structures. Research by Balbo and Dowd concluded that a country's older population is more likely to suffering from diseases including COVID-19 when compared to a relatively younger population.

However, age structure is not the only demographic aspect that plays a role as a determinant in the dynamics of COVID-19. Several researches and studies have proven that the transmission of the COVID-19 virus can be caused by physical contact or physical contacts that occur through physical touch or droplets containing the virus and sticking to an object.

Therefore, a correlation appears between the intensity of population interaction and the transmission of the COVID-19 virus. According to research by Federgruen and Naha (2020), population density is widely believed to be the main determinant of the dynamics of COVID-19 on a global scale. However, not all countries with high population densities have high rates of COVID-19 cases. Other factors such as household size can also determine the number of COVID-19 infections. The condition of the household is measured based on the age structure, occupation and economic conditions. Households with relatively older members who are below the poverty line have a higher potential to be infected with the COVID-19 virus, especially if it is exacerbated by a high population density (Federgruen & Naha, 2020).

High population density has the potential to lead to a higher and more intensive intensity of population interaction. Interaction between residents can potentially be a factor that causes the transmission of the COVID-19 virus and can also be exacerbated by people's habits that are difficult to change, such as not keeping their distance and not wearing masks (Kwok et al., 2021).

### **Impact of COVID-19 Dynamics on Demographic Trends**

The dynamics of COVID-19 have a multidimensional impact including demographic trends in people's lives. Based on research results from journals that have been collected, the COVID-19 pandemic has affected several demographic aspects such as increased mortality rates, life expectancy rates, fertility and migration trends. An increased mortality rate is considered a direct risk of infection with the COVID-19 virus (Jatrana et al., 2022). Increased mortality has become the most influential demographic aspect after the COVID-19 pandemic and has occurred globally throughout the world (Sannigrahi et al., 2020). Not only has the mortality rate increased, but the life expectancy in the world since the COVID-19 pandemic hit. The decline in life expectancy for men is greater than for women in several countries. However, research by Sharif et al., 2020 shows that the impact of COVID-19 also affects fertility rates. According to him, the tendency of people to have fewer children in the period of uncertainty that occurred during the pandemic. This perception has contributed to the decrease in the number of births during the pandemic, especially in European countries.

### **CONCLUSION**

The demographic aspect and the COVID-19 pandemic have a two-way or causal relationship, which means that the two things influence each other. Demographic aspects such as age structure, population density, intensive community interaction to the economic level in the household. Meanwhile, the multidimensional impact of the COVID-19 pandemic directly affected several demographic trends, such as increasing mortality as the highest risk of the COVID-19 pandemic, reducing life expectancy and reducing birth rates. Meanwhile, in the long term, the dynamics of COVID-19 will also influence migration trends if it is associated with the economic crisis that has been predicted due to the ongoing pandemic.

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