Determinants of Population Growth Rate in Kedungkandang Sub-District, Malang City

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Abstract. The high rate of population growth in Kedungkandang District can result in a rapid increase in population which can lead to food shortages and poverty. This study aims to determine and examine whether there is a significant relationship between the number of births, the number of deaths, the number of migrations and population growth with the population growth rate in Kedungkandang District, Malang City. This is a correlational study. The sample was all (12) villages in Kedungkandang District, Malang City in 2019. Data collection using documentation techniques. The results show that: (1) The peason correlation coefficient of number of natalities was 0.846, p= 0.001 (2) peason correlation coefficient of number of mortalities was 0.916, p= 0.000. (3) The peason correlation coefficient of of number of in-migrations was 0.952, p= 0.000. (4) The peason correlation coefficient of number of out-migrations was 0.931, p= 0.000. (5) The peason correlation coefficient of the population growth variable was 0.975, p= 0.000. The results of multiple linear regression tests showed that population growth has a correlation to population growth to rate.

Keywords: Birth, Death, Migration, Population Growth Rate

1   Introduction

Population growth rate is a number that shows the speed of population growth in the form of numbers every time in a certain period. High and low population growth can be seen from the rate of population growth in a region. High population growth is one of the main population problems that must be addressed immediately, this can lead to a population explosion that has a negative impact on human life. As the population increases, the facilities and infrastructure of education, health and other socio-economic services also increase. Conversely, low population growth can adversely affect the development of the region such as the need for human resources that play a role in development is very limited [1].

The population growth rate in Indonesia has decreased over the last 3 years in 2015-2018. This also happens in East Java Province, which decreases every year [2].

Malang City at the 3rd lowest out of 9 cities in East Java Province [3]. The population growth rate in Malang City does not exceed the national population growth rate, which means that population growth in Malang City was not too large even though for the last 3 years it has decreased. There are 5 sub-districts in Malang City with different population growth rates. Kedungkandang District was the highest population growth rate compared to other sub-districts in Malang City [4]

Factors affecting the rate of population growth are births, deaths, migration, population growth, population, social mobility, marriage, economic growth, lifestyle, population quality and environmental factors [5]. High rates of population growth can increase population rapidly and lead to food shortages and poverty. The impact of high population growth on population aspects such as denser settlements, higher congestion, competition in the world of work, social insecurity, and exploitation of nature and the environment [6].

The impact of population migration can occur in an area that causes population density to increase in destination areas, unemployment increases, business development in the informal sector, slums and violence also increase [7]. The population growth rate reflects the population growth rate of an area each year, the higher the population growth cause the population growth rate to accelerate. Conversely, if population growth is getting lower, the population growth rate is slower [5].

The number of populations that is constantly increasing and not controlled can lead to a population explosion. Population growth also increases food needs, if population growth is not balanced with the amount of land to produce food there will be food shortages that can cause starvation of the population. This is the source of human destitution and poverty [8].

This study aims to determine relationship between the number of births, the number of deaths, the number of migrations and population growth with the population growth rate in Kedungkandang District, Malang City.

2   Methods

This study was a correlational study that focus on population as the unit of analysis. The population in this study was all urban villages in Kedungkandang District, Malang City in 2019. The number of samples were 12 urban villages. We conducted documentation technique at district offices to collect the data. Pearson and linear regression test were used to analyse the data.

3   Results

Table 1. shows that the number of natalities in Kedungkandang District, Malang City were 2,391 people. The highest number of natalities out of 12 sub-districts was Lesanpuro village (298 people). While the lowest number of natalities was Tlogowaru Village (61 people). The number of mortalities during 2019 were 966 people. The village with the highest number of mortalities was Madyopuro (147 people). While the village with the lowest number of mortalities was Arjowinangun (24 people). The

number of in-migration in 12 urban villages in Malang City in 2019 were 2,973 people. Madyopuro Village was one of the villages that has the highest number of in-migration compared to 11 other villages (469 people). While the lowest number of in-migration was Tlogowaru Village (74 people). The number of out-migration in Kedungkandang District in 2019 were 2,359 people. Madyopuro was one of the villages with the highest number of out-migration compared to 11 other villages (396 people). The lowest number of out-migration was Wonokoyo (35 people). Population growth in Kedungkandang District during 2019 was 1,453%. The village with the highest population growth was Wonokoyo Village at 0.329%. While the lowest population growth was Mergosono (0.008%).

Table 1. Numbers of natality, mortality, in-migration, out-migration, polulation growth, and population growth rate

Urban Village	Mortality	Natality	In-migration	Out-migration	Population growth	Population growth rate
Kotalama	254	94	102	221	0.012	0.003
Mergosono	256	121	252	370	0.008	-0.002
Bumiayu	173	90	155	122	0.056	0.011
Wonokoyo	269	53	75	35	0.329	0.033
Buring	269	76	450	192	0.316	0.043
Kedungkandang	156	56	307	204	0.161	0.013
Lesanpuro	298	119	387	323	0.090	0.012
Sawojajar	189	116	284	296	0.016	0.002
Madyopuro	222	147	469	396	0.070	0.008
Cemorokandang	175	42	227	83	0.195	0.020
Arjowinangun	69	24	191	61	0.136	0.017
Tlogowaru	61	28	74	56	0.065	0.014
Total	2,391	966	2,973	2,359	1.453	0.174

Table 2 shows the results of Pearson and linear regression test. Correlation coefficient (r) of the number of natality and the population growth rate was 0.846 (p1= 0.001), the number of was 0.916 (p1= 0.000), the number of in-migration was 0.952 (p1= 0.000), the number of out-migration was 0.931 (p1= 0.000), and population growth was 0.975 (p1,2= 0.000).

Table 2. Pearson test

Variable	r	p1 (Pearson test)	p2 (Linear regression test)
Mortality	0.846	0.001	-
Natality	0.916	0.000	-
In-migration	0.952	0.000	-
Out-migration	0.931	0.000	-
Population growth	0.975	0.000	0.000

4   Discussion

4.1   The Relationship Between Number of Natality to Population Growth Rate

The Pearson correlation coefficient of the number of natalities toward the rate of population growth was 0.846, it means that the number of natality with the rate of population growth had a very strong relationship and a positive relationship direction. This is in accordance with the demographic transition theory which explains that changes in population growth are influenced by natural factors; natality and mortality [5].

A study in Bengkulu Province by Sunaryanto's (2012), showed that the population in Bengkulu Province has increased meaning that the number of natality has increased, and the government was unable to reduce the population growth rate properly, so that the population growth rate of Bengkulu Province was higher than the national population growth rate [9]. A study by Chola & Michelo's (2016), showed that marriage and childbirth account for the greatest inhibitory effect on natural birth from its biological maximum for managing birth in Zambia, policies and programmes should consider the effect of marriage [10].

This research is in line with research conducted by Soleha (2016), it stated that the increase in population growth was influenced by increasing births. Efforts can be made to reduce births by implementing Family Planning programs [11]. Silva & Tenreyro's (2017) study, showed that integrated population control policies implemented in developing countries tend to play a central role in the decline in global births that are not well accounted for by other socioeconomic factors [12].

A study by Owusu, et al. (2018), showed that natality rates in West Africa have been reducing very slowly, suggesting that population control programs in some countries was not enough to achieve the sustainable development goals and policymakers should consider additional measures to increase birth reduction rates [13]. According to Severus (2019), higher education participation, population density, and GDP had a significant influence on fertility rates. Changes in fertility rates are referred to as demographic transitions that can affect the rate of population growth [14].

4.2   The Relationship Number of Mortality to Population Growth Rate

The Pearson correlation coefficient of the number of mortalities to the population growth rate was 0.916 (p= 0.000), it means that the number of mortality had a very strong relationship and a positive relationship direction significantly. This was in accordance with the demographic transition theory which states that the factor that influences changes in population growth is mortality.

A study of Almaulida et al (2018), showed that mortality affected the population growth rate in Bawen District, Semarang Regency in 2000-2015 [15]. Ding et al. (2019) study showed that the implementation of the action plan reduced the concentration of infectious diseases in China significantly, where population density was high, the

decreasing infectious diseases and mortality rates during the period 2013-2017 which is 2:5 [16].

Desra & Idris (2019) study showed that the age of mothers and medical personnel had a significant positive influence on mortality rates in West Sumatra [17]. The results of Mallick & Roy (2020) research showed that women who marry before 18 years without education are likely to experience high natality and infant mortality due to population diversity being a major role in socio-demographic, cultural and lifestyle factors contributing to demographic scenarios among the population [18]. According Mavelil & Srivastava (2020) study, infant mortality rates correlate with maternal, prenatal, perinatal and neonatal determinants among tribes in rural Meghalaya, sociocultural factors correlate with infant mortality, so infant mortality rate was relatively high among rural tribes in India [19].

4.3 The Relationship Between the Number of In-Migration to the Population Growth Rate

The Pearson correlation coefficient of the number of in-migration to the population growth rate was 0.952 (p=0.000), it means that the of the number of in-migration to the rate of population growth had a very strong relationship and a positive relationship direction significantly. This is in accordance with the demographic transition theory which explains that external factors that can affect changes in the state of population growth are in-migration.

The Maulida's research (2013), showed that population movement occurs due to pull factors for residents of other regions. This causes the population in the region to increase [20]. According to Chowdhury's research (2013), in-migration had a positive effect on population growth, with the movement of people coming to an area can cause an increase in population [21]. Viji's (2013) showed that recognition factors, employment problems, career advancement, family factors, family involvement, coercion factors and available facilities had a positive effect on going to cities that cause migration [22].

Mustapita and Khalikussabir (2019) stated that population growth has a significant influence on internal migration because the driving factor for someone to migrate to urban areas is because the opportunities in the area are very large, especially in the industrial sector [23].

4.4 The Relationship of the Number of Out-Migration to the Rate of Population Growth

The Pearson correlation coefficient of out-migration with a population growth rate of 0.931 (p=0.000), meaning that the variable of the number of out-migration with the rate of population growth had a very strong relationship and a positive relationship direction significantly. This is in accordance with the demographic transition theory which explains that there are several factors that influence changes in population growth such as population movement or out-migration.

The Kalita's (2015) study explained that the prevalence of interstate migration from Indian states, in particular, Bihar, USA, West Bengal and international migration from

outside India, in particular, neighbouring countries such as Bangladesh, Nepal and Bhutan, is a population growth problem that worries particularly Assam boarding districts [24].

The results of Peterson's (2017) study suggested that international migration can help adjust this imbalance but is opposed by many. Drawing on the economic analysis of inequality, it appears that lower population growth and limited migration can contribute to increased national and global economic inequality [25]. Previous research conducted by Julianto & Alfian (2017), population movement (migration) causes an increase or decrease in population. If the number of out-migrations is greater than the number of in-migrations, there will be a decrease in the number of people in an area. So migration has a negative effect on population growth [26].

The results of Zainuddin's research (2019), showed that per capita income has a positive and significant influence on out-migration in Jeneponto Regency, this migration occurs because outside the area his opinion is higher than the area where he lives [27]. The prevalence of international migration from neighboring countries led to unusual population growth in boarding districts in Assam, contributing to the total population growth in the region [28].

4.5   The Relationship of Population Growth to Population Growth Rate

The Pearson correlation coefficient of out-migration with the population growth rate was 0.975 (p=0.000), meaning that the variable of the number of population growth with the rate of population growth had a very strong relationship strength and the direction of a positive relationship. This is in accordance with Pearl's theory which explains that changes in population growth can reflect the rate of population growth in a region [29].

Riyanto et al (2014) showed that population growth factors are very influential on the development of settlements in Gajah Mungkur District. As a result, the population increased and caused the settlement to become dense [29]. Hardati's research (2013), shows that the population in Central Java has increased, although population growth has decreased. This happens because the region was experiencing fluctuations and still high unemployment. Thus causing the number of labor force in the village to increase [30].

The results of Rahaman's research (2018), explained that changes in the urban population growth rate of cities during the three decades 1981-91, 1991-2001 and 2001-2011, explosive urban population growth has attracted the attention of urban geographers and urban planners such as India, due to the driving factor, rural-urban migration that led to the urbanization process [31]. According to research by Coccia (2018), it shows that high population growth seems to be the basis for the source and evolution of terrorism growing in certain cultural zones with high population growth rates combined with factors of collective identity and low socioeconomic development [32]. Low population growth in high-income countries tends to create social and economic problems, while high population growth in low-income countries can slow their development [25].

5   Conclusion

This study found that population growth rate was determined by number of natalities, number of mortalities, number of in-migrations, number of out-migrations, and the population growth. The population growth rate reflects the population growth rate of an area each year, the higher the population growth cause the population growth rate to accelerate.

Author's Contribution

LM: Concept this research, collect data, and analysis. SN: Concept this research, guide implementation, direct research, and review the questioner. LRA: Concept this research, guide analysis and interpretation, and also review article.

Acknowledgment

The authors express gratitude to Universitas Negeri Malang and the Government at Kedungkandang Subdistrict.

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