Do public health indicators affect life expectancy?

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Abstract: Indonesia has implemented a decentralization policy since the end of the Soeharto era. Decentralization gives central government tasks to local governments. Local governments are obliged to manage, develop regions, and improve the welfare of their people. Each region has its own policies in improving the health of its people. To monitor the achievement of the success of the health system in each region, a clear and broad picture is needed. One of them is the index. East Java is one of the provinces with the highest population in Indonesia. This study aims to see whether the indicators of Public Health Development in East Java have an influence on life expectancy. The results of the study showed that complete immunization and the proportion of doctors to residents in 1 sub-district have an influence on life expectancy. To improve immunization achievement, the government has launched various programs. The government is also carrying out equal placement of doctors through various health programs. The indicators measured are used as monitoring and evaluation materials for programs that have been carried out. Further research is needed regarding the relationship between regions and life expectancy.

Keywords: basic health research, public health, immunization, doctors, life expectancy.

1. Introduction

Indonesia consists of 38 provinces, 416 districts/cities and each region has its own policies, in accordance with the decentralization policy. The decentralization era began since the end of the Soeharto era in the late 1990s (Maharani et al., 2015; Heywood & Choi, 2010; Sparrow et al., 2017). Research conducted by Sparrow and colleagues (2017), which compared data from 262 districts/cities throughout Indonesia from 2004 and 2010, also noted large variability between districts/cities in terms of financing schemes and health services (Sparrow et al., 2017). To monitor the health system between regions, a clear but also broad picture is needed. The index is one of the values that can be used. The index is a composite measurement by systematically combining relevant indicators and summarizing the number of topics to produce a measurement number (Heywood & Choi, 2010; World Bank Group, 2017).

The Human Development Index consists of 3 dimensions, namely Long and Health Life (Life Expectancy); Knowledge (Long Schooling Expectancy and Average Length of Schooling), and A Decent Standard of Living (real expenditure per capita per year). The public health development index (IPKM) is a measuring tool used by the government to determine the health conditions of the community in an area. IPKM contains 30 indicators grouped into 7 sub-indices. The sub-indices contained in IPKM are toddler health, reproductive health, health services, health behavior, non-communicable diseases, infectious diseases, and

environmental health. The data listed in each indicator is obtained from three surveys, namely basic health research (Riskesdas), national socio-economic survey (Susenas), and village potential (Podes) (Kementerian Kesehatan, 2019).

The Health Community Develoment Index consists of 7 sub-indices, namely toddler health (6 indicators), reproductive health (4 indicators), health services (4 indicators), health behavior (5 indicators), non-communicable diseases (6 indicators), infectious diseases (3 indicators), and environmental health (2 indicators). Indirectly, the Health Development program also increases Life Expectancy (AHH) (Galvani-Townsend et al., 2022). This study aims to determine whether there is an influence between the 7 sub-indices of the IPKM on Life Expectancy.

2. Materials and Methods

This study is a non-reactional study with a cross-sectional study. The researcher used secondary data of AHH and IPKM. The dependent variable in this study is Life Expectancy. Life Expectancy is obtained from the HDI calculation report issued by the Central Statistics Agency of East Java Province.

The IPKM figure is obtained from the IPKM report issued by the Ministry of Health. The independent variables in this study are 7 sub-indices that form the IPKM. The unit of analysis is 38 districts and cities in East Java province. This study uses multiple linear regression methods.

3. Results and Discussion

Life Expectancy is one of the dimensions that form the HDI. Life Expectancy reflects the overall health of the community and is also improving. The figure below explains the distribution of AHH in East Java Province.
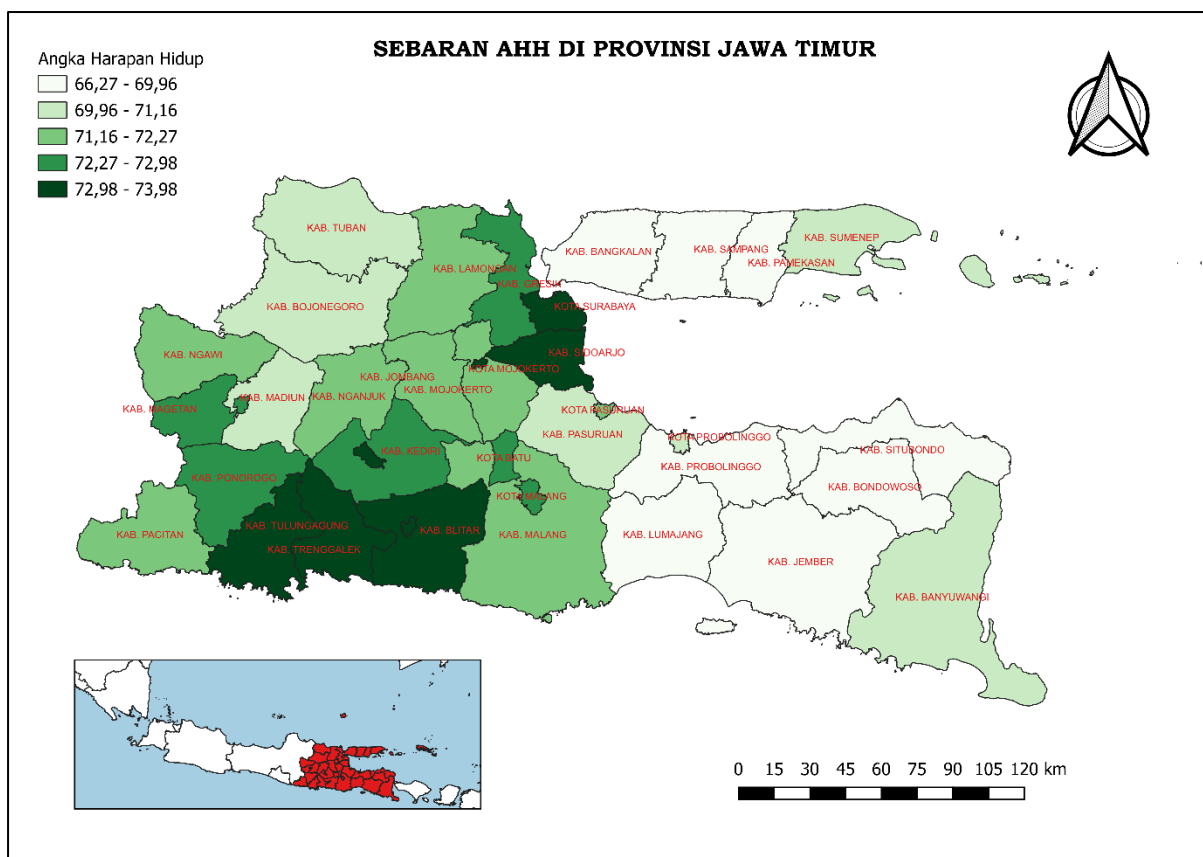
Fig.1. Distribution of AHH districts/cities in East Java Province

The highest life expectancy is achieved by the city of Surabaya, which is 73.98 years. This means that every baby born in the city of Surabaya is estimated to live to 73.98 years during their lifetime in the city of Surabaya. There are several lowest life expectancies owned by Bondowoso district with an AHH of 66.27 years. The average AHH in East Java is 65.36 years.

The factors that influence the health of individuals and communities are closely related to the theory of H.L.Blum in 1970. The four main factors are environmental factors, behavioral factors, health service factors, and genetic factors. These four factors can also be seen from the 7 sub-indices measured from the results of the 2018 Basic Health Research. The results of the linear regression can be seen in table 1 below.

Table 1. Sub-Indices that influence AHH values

No	Variable	Sig	Exp (b)
1	Sub-Indices Health services	0,000	0,437
2	Sub-Indices Toddler health	0,044	0,285

The results of the calculation using linear regression show that there are 2 sub-indices that affect the AHH value. The two sub-indices consist of health services (4 indicators) and toddler health (6 indicators). The four indicators in the health service sub-index are: Delivery by health workers in health facilities, Proportion of sub-districts with sufficient number of doctors per population, Proportion of villages with sufficient number of integrated health posts

per village, Proportion of villages with sufficient number of midwives per population, and Ownership of health service insurance. The toddler health sub-index consists of 6 indicators, namely: Malnourished and undernourished toddlers, Very short and short toddlers (stunting), Obese toddlers, Toddler weighing, Neonatal Visit (KN) 1, and Complete immunization. The ten indicators were then analyzed using multiple linear regression.

Table 2. Sub-Indices that influence AHH values

No	Variable	Sig	Exp (b)
1	Complete toddler immunization	0,000	0,583
2	Proportion of sub-districts with sufficient number of doctors per population	0,005	0,367

Immunization is the most "cheap" effort to reduce morbidity and mortality due to diseases that can be prevented by immunization (PD3I). This effort is expected to have an impact on reducing infant and toddler mortality rates. The implementation of immunization can prevent and reduce the incidence of cases and deaths of toddlers each year by 25 million toddlers. Based on immunization coverage worldwide, Indonesia still ranks fourth in the world and Indonesia is one of the countries that has received world attention and is a priority in efforts to increase UCI coverage by providing complete immunization (Unicef. 2013. The State of World's children. New York United Nations).

Geographical constraints and transportation barriers can be resolved by improving the referral system from home to health centers and to hospitals or bringing health services closer to the community (Galvani-Townsend et al., 2022). The way to bring it closer is by increasing the number of doctors and midwives and then placing them evenly according to the population and geographical conditions (Kristiansen & Santoso, 2006).

4. Conclusion

This study shows that there is a relationship between the IPKM indicator and life expectancy. Indonesia has made various efforts to increase immunization coverage, one of which is the School Children's Immunization Month (BIAS) program in August and February. The placement of doctors in several areas with shortages requires in-depth study. This is because the cost of living and the needs of each region are different. Further research is needed related to regional factors with life expectancy. This can be seen from Figure 1 which shows that several areas that have high life expectancy, areas adjacent to the area also have high life expectancy.

Conflict of Interest
All Authors declare no conflict of interest and agree with the content of the manuscript.

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