JURNAL BIOMETRIKA DAN KEPENDUDUKAN

(Journal of Biometrics and Population)

ANALYSIS OF THE DEVELOPMENT OF REGIONAL SOCIO-ECONOMIC CONDITIONS ON THE AGING POPULATION IN ACEH PROVINCE

[*]Rohil Al Azizah[1], Wiwik Puji Mulyani[1], Sukamdi[1]

[1]Faculty of Geography, Gadjah Mada University, 55281 Sleman, The Special Region of Yogyakarta, Indonesia
***Corresponding Author:** Rohil Al Azizah**; Email:** rohilalazizah@mail.ugm.ac.id

Published by *Fakultas Kesehatan Masyarakat Universitas Airlangga*

Keywords:
Population Aging,
Regional Socioeconomics,
Klassen Typology

ABSTRACT

Socio-economic developments in Aceh Province have had a real impact which is reflected in the reduction in death and birth rates as well as an increase in life expectancy, causing changes in the composition of the population aged 60 years and over to increase. However, the developments that have occurred are not evenly distributed throughout the region, it is crucial to be aware of the concept of "being not ready to get old" that will arise in Aceh Province. This study analyzes the socio-economic development of regions with population aging in Aceh Province. The study was conducted with a quantitative approach. Data collection using documentation. Data analysis using descriptive analysis and modification of the Klassen typology. The results of the study showed that Aceh Province in 2020 was in the early aging stage (Mid-Aged) because the percentage of elderly people was more than 7%. It is estimated that in the next 25 years in 2035 Nagan Raya, South Aceh, and West Aceh will be in the high aging category (Super-Aged) or more than 14% and the results of the Klassen typology analysis using socio-economic indicators on population aging show that the development of the 23 districts/cities in Aceh Province is not only in areas that are high growth and high income (quadrant I), several districts/cities are in the category of low growth and low income (quadrant III) where socio-economic development is low but have entered the early aging stage.

Kata Kunci:
Penuaan Penduduk,
Sosial-Ekonomi wilayah,
Tipologi Klassen

ABSTRAK

Perkembangan sosial ekonomi di Provinsi Aceh telah memberikan dampak yang nyata yang tercermin dari menurunnya angka kematian dan kelahiran serta meningkatnya usia harapan hidup, sehingga menyebabkan perubahan komposisi penduduk usia 60 tahun lebih menjadi semakin meningkat. Akan tetapi, perkembangan yang terjadi belum merata di seluruh wilayah, perlu diwaspadai konsep "being not ready to get old" yang akan terjadi di Provinsi Aceh. Penelitian ini bertujuan untuk menganalisis perkembangan sosial ekonomi wilayah terhadap penduduk menua di Provinsi Aceh. Penelitian dilakukan dengan pendekatan kuantitatif. Pengumpulan data memakai dokumentasi. Analisis data menggunakan analisis deskriptif dan modifikasi tipologi Klassen. Hasil penelitian menunjukkan bahwa Provinsi Aceh pada tahun 2020 berada pada tahap penuaan dini (Mid-Aged) karena presentase penduduk lanjut usia lebih dari 7% dan diperkirakan 25 tahun kedepan pada tahun 2035 Nagan Raya, Aceh Selatan, dan Aceh Barat masuk dalam kategori penuaan tinggi (Super-Aged) atau lebih dari 14% dan hasil penerapan analisis tipologi Klassen dengan menggunakan indikator sosial ekonomi terhadap penuaan penduduk bahwa perkembangan wilayah 23 kabupaten/kota di Provinsi Aceh tidak berada pada wilayah cepat maju dan tumbuh saja (kuadran I) saja, beberapa kabupaten/kota berada pada katagori wilayah realtif tertinggal (kuadran III) yang mana perkembangan sosial ekonominya rendah tetapi sudah masuk kedalam katagori penuaan dini.

Received in 23 February 2024 **; Reviewed** in 23 October 2024 **; Accepted** in 02 November 2024 **; p-ISSN** 2302–707X - **e-ISSN** 2540–8828 ; **DOI:** https://doi.org/10.20473/jbk.v13i2.2024.144-152 **; Cite this as :** Azizah R Al, Mulyani WP, Sukamdi S. Analysis of The Development of Regional Socio-Economic Conditions on The Aging Population in Aceh Province. J Biometrika dan Kependud [Internet]. 2024;13(2):144–52. Available from: https://doi.org/10.20473/jbk.v13i2.2024.144-152

INTRODUCTION

The success of development implemented by the Indonesian government has brought a clear impact, seen from the increasing life expectancy of the community and changes in the age structure of the population. The cause is a decrease in birth and death rates, which ultimately changes the demographic composition in Indonesia. This is in line with the theory of demographic transition which explains the change in population structure in a region that was initially dominated by young people shifting to the elderly population influenced by a decrease in death and birth rates (1). Population aging is mainly caused by changes in fertility, death, and migration levels in a region (2).

Population aging refers to the increase in the number of individuals over the age of 60 in an area. Success in several aspects, namely education, health, and the availability of job vacancies, are the causes of population aging (3). Based on Law No. 13 of 1998 concerning the welfare of the elderly, the limit for the category of elderly population is determined as individuals aged 60 years or older (4). A region is considered to have entered premature population aging if the percentage of elderly residents in the region is more than 7% (5). Measuring whether a region is entering a population aging phase can also be done using the Aging Degree Index (6).

Studies on the elderly require a comprehensive understanding because the aging process needs to be studied so that in the end a new scientific discipline is given birth which is called gerontology, but the study of this field of science is multidisciplinary, characterized by gerontology experts including researchers and practitioners with different scientific backgrounds such as biology., sociology, economics, demography, geography, psychology, political science, and others. The connection between gerontology and geography is that both fields of science have the same material object, namely society (7).

*The demographic dividend (*demographic bonus) which has started to occur since 2020-2030 in several regions in Indonesia has become a warning that the productive age population (15-64 years) whose number is greater than the non-productive age population in the next few years, the productive age population will age (8). This condition is a challenge in the development of the Indonesian population. Therefore, a comprehensive mapping is needed regarding the aging of the population that will occur in the future. Because the condition of the elderly population currently tends to be dominated by those with low socioeconomic levels and poor health conditions (9).

Implicitly, the concept of demographic transition also explains the changes in population structure with regional development. Regions with high levels of development will achieve the demographic transition process faster (10). The development of a region can be analyzed through socio-economic indicators. Various parameters are used to assess socio-economic conditions, including Gross Domestic Product (GDP) per capita, road network density, and inflow and outflow population rate (6). Life expectancy, net migration rate, average length of study, and open unemployment rate (1)

The development of the Aceh Province region, especially in the socio-economic sector, shows an increasing trend from previous years, but the regional development that occurs is not evenly distributed. The economic growth of Aceh Province still tends to lag other provinces on the island of Sumatra, so researchers are wary of the term "aging before getting rich" or "being not ready to get old" because this condition will be a serious threat to development in the future.

Although research on population aging is quite extensive, such as research on the quality of the elderly in Indonesia (11), factors that influence the decision of the elderly to work (12), and mapping the distribution of population aging in China (6) (13). However, research on the relationship between regional socio-economic development and the rate of aging that occurs in smaller regional units, namely districts/cities, is still very limited. So based on the problems above and the renewal of research on the elderly, this study aims to analyze regional socio-economic development with population aging in districts/cities in Aceh Province.

METHODS

This study uses a quantitative approach and is carried out in Aceh Province. The determination of the boundary of an area that

has experienced population aging is >7% which means it is starting to experience premature aging (5). The unit of analysis used is the elderly population aged 60 years or over in 23 districts/cities in Aceh Province from 2010 to 2020. The determination of the unit of analysis for the age limit of the elderly population is adjusted to the definition of the elderly population contained in Law No. 13 of 1998 concerning the welfare of the elderly, namely those aged 60 years or over (4).

This study uses research data from the publication of the Central Statistics Agency, namely data on the percentage of the elderly population, human development index, gross domestic product per capita, open unemployment rate data, and life expectancy of regencies/cities in Aceh Province in 2010-2020, which represent socio-economic conditions. The data collection technique applied in this study is the documentation technique. The documentation instrument is used to obtain secondary data from the publication of the Central Statistics Agency or *Badan Pusat Statistik* (BPS).

The analysis techniques used in this study are 1) descriptive analysis to describe the differences in the speed of population aging distribution between districts/cities in Aceh Province, using the Aging Degree Index which is also implemented spatially using the ArcMap 10.4.1 application, and 2) Application of Klassen typology analysis in this study to see regional development using the average socio-economic conditions and population aging database which will later form a regional classification. Calculations are carried out using SPSS Statistics version 25.

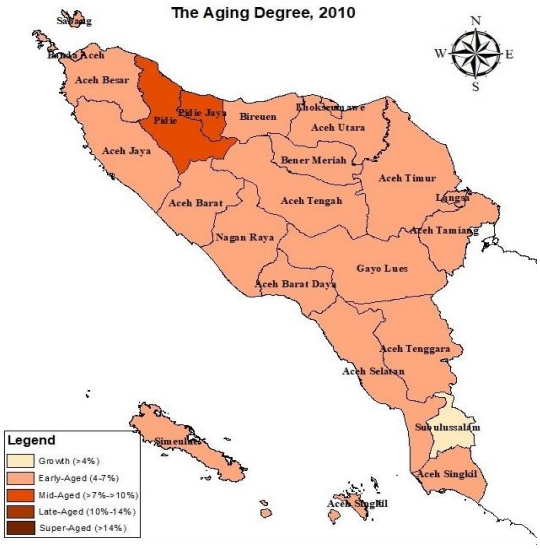
The actual application of Klassen typology analysis compares 2 main indicators, namely economic growth rate and Gross Regional Domestic Product (GRDP) Per Capita. The results will be divided into four regional typologies: The first quadrant describes fast-developing and fast-growing areas (high growth and high income), the second quadrant shows fast-developing areas (high growth and low income), the third quadrant reflects relatively underdeveloped areas (low growth and low income), and the fourth quadrant describes advanced but depressed areas (low growth and high income).

The calculation of socioeconomic indicators in this study is determined based on the total score of each socioeconomic variable, namely the human development index, gross domestic product per capita, and life expectancy. A score of 2 is given if the value in the district/city is above the provincial average, and a score of 1 if it is below the average. Meanwhile, the open unemployment rate, gets a score of 1 if it is above the provincial average, while those below the average are given a score of 2.

RESULT

Aging Degree Index Calculation Results

Based on the results of the 2010 Population Census contained in the publication. The population projection for the districts/cities of Aceh Province from 2010 to 2020 shows that the percentage of the elderly population is 5.5% or258,220 souls so Pidie Jaya Regency becomes the Regency with the highest percentage of the elderly population at 8.2% and Subulussalam City becomes the city with the lowest percentage of elderly population at 3.1%. Figure 1 shows that in 2010 there was 1 city still in the Growth category (<4%), namely Subulusalam, 20 other regencies/cities were included in the Early-Aged (>4-<7%) and there were only two regencies/cities in Aceh Province included in the Mid-Aged (>7%->10%) namely Pidie Jaya and Pidie.



Source: Data Processing Results, 2024.

Figure 1. The Aging Degree Index 2010

Ten years later, in 2020, the elderly population increased by 7.8% or 425,100 people. Where Pidie Regency is the Regency with the highest percentage of the elderly

population at 10.2% and Subulussalam City is the city with the lowest percentage of the elderly population at 4.6%. Figure 2 shows that in 2020 there were no more regencies/cities included in the Growth category (<4%), 5 regencies/cities were still in the Early-Aged (>4-<7%), 15 regencies/cities in Aceh Province in 2020 were already in the Mid-Aged (>7%->10%) and 1 regency in had entered *Late Aged* (10%- 14%) namely Pidie.

Source: Data Processing Results, 2024

Figure 2. The Aging Degree Index 2020

Source: Data Processing Results, 2024

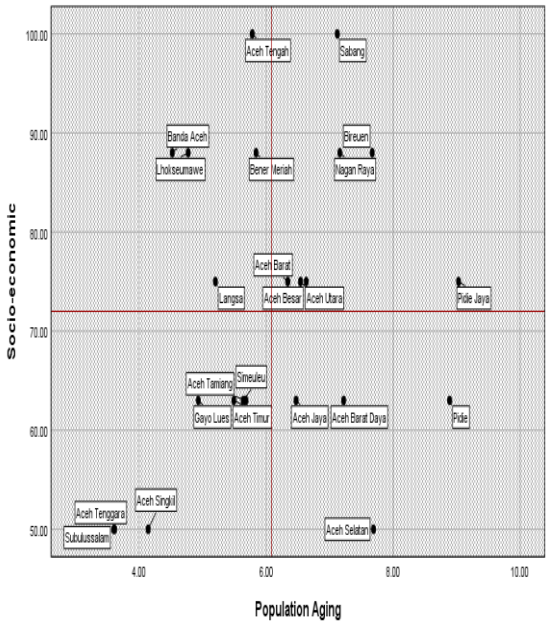
Figure 3. The Aging Degree Index 2035

No districts/cities have entered the Super-aged category (>14%) in Aceh Province at the 2010-2020 period. If the percentage of the elderly population is projected in 2035 as seen in Figure 3, there will be a trend of increasing elderly population as many as 3 districts/cities are in the Mid-Aged category (>7%->10%), 17 districts/cities are in the Late-Aged category (10%-14%) while 3 other districts, namely Nagan Raya, South Aceh, and West Aceh will be in the Super-Aged category (>14%).

Results of Analysis of the Development of Regional Socio-Economic Conditions Using the Application of Klassen Typology to Population Aging in Districts/Cities in Aceh Province

Application of Klassen typology analysis using socio-economic indicators on population aging in regencies/cities in Aceh Province. The results of plotting socio-economic data with population aging are shown in Figure 4.

The detailed classification of regions is explained in Figure 4. There are 7 districts/cities included in the category of rapidly developing and rapidly growing regions (Quadrant I), 5 districts/cities included in the category of rapidly developing regions (Quadrant II), 7 districts/cities included in the category of relatively underdeveloped regions (Quadrant III) and 4 districts/cities included in the category of developed but depressed regions (Quadrant IV).



Source: Data Processing Results, 2024

Figure 4. Plotting Data on Socioeconomic Conditions and Population Aging, 2010-2020

Table 1. Classification of Calculation of Typology of Socio-Economic Conditions of Population Aging in Districts/Cities in Aceh Province from 2010 to 2020.

Socio-Economic Conditions (r)	Population Aging (Y)	
	(Above average population aging) Yi>Y	(Population Aging is below average) Yi<Y
(above average socio-economic conditions) ri > r	**Fast-developing and fast-growing areas:** Pidie Jaya, Bireuen, Nagan Raya, Sabang, North Aceh, Great Aceh, West Aceh,	**Fast-developing areas:** Langsa, Bener Meriah, Banda Aceh, Central Aceh, Lhoksumawe
(below average socio-economic conditions) ri < r	**Relatively underdeveloped areas:** Southeast Aceh, Aceh Singkil, Gayo Lues, East Aceh, Simelue, Aceh Tamiang, Subulussalam	**Developed but depressed areas:** Pidie, South Aceh, Southwest Aceh, Aceh Jaya

Source: Processing Results, 2024

DISCUSSION

The population of Aceh Province based on the results of the 2010 Population Census was 4,523,144 people (14). Meanwhile, the results of the 2020 Population Census showed that the population of Aceh Province was 5,259,726 people (15). The increase in population in Aceh Province between 2010-2020 was also accompanied by an increase in the number of elderly people dominated by elderly women centered in the 60–64-year age group. Other studies also suggest that the elderly in Indonesia are dominated by elderly women (16). There were two districts/cities where the population aged 60 years and over had exceeded 7% in 2010, namely Pidie Jaya and Pidie. There were 18 districts/cities where the population aged 60 years and over had exceeded 7% in just ten years later. This incident did not only occur in Aceh Province, other Asian countries such as Thailand, which is still classified as a developing country, currently have a large percentage of elderly people. In 2010, the percentage of elderly people was 13.2 percent, and it is estimated that in 2021 the percentage of elderly people will increase to 20 percent (17).

The population aging process in Aceh Province is not evenly distributed across 23 districts/cities. This is influenced by various factors, one of which is the difference in socio-economic development between districts/cities. Population aging in Aceh Province when associated with regional development, especially in the socio-economic field of the region based on the application of Klassen typology analysis, it is known that there are 7 districts/cities in the rapidly developing and rapidly growing region (quadrant I) which means that the socioeconomic conditions of the district/city are above the provincial average and population aging is also above the provincial average. This is in line with developed countries, especially in Asia, which have high socio-economic conditions followed by rapid population aging as is currently happening in Japan, Hong Kong, Singapore, and Korea, which are projected to have an elderly population in 2050 above 27%. This situation can be caused by progress in various fields, especially socioeconomics, which is significant both globally and regional (18).

If we observe based on the socioeconomic indicators, namely the health sector represented by education, which can be seen in the human development index indicator, where the 7 districts/cities are ranked in the top 15 districts/cities that have the highest average Human Development Index (HDI) throughout Aceh in the 2010-2020 period. The Human Development Index (HDI) is a significant indicator for assessing other aspects of development success in a region. (19). If you look at the health sector represented by the life expectancy of the 7 districts/cities is included in the ranks of the 11 districts/cities with the highest average life expectancy in all of Aceh in the 2010-2020 period. Therefore, the level of public health in the 7 districts/cities is getting better (20). The cause of population aging is due to two demographic changes, one of which is increasing life expectancy. Meanwhile, the average percentage of elderly people in the 7 districts/cities is ranked 11th highest in all of Aceh in the 2010-2020 period.

Meanwhile, the other 4 districts/cities, namely Pidie, South Aceh, Aceh Jaya, and Southwest Aceh are included in the developed but depressed areas (quadrant IV) which have district/city socio-economic conditions below

the provincial average and the aging of the district/city population above the provincial average, meaning that these districts are experiencing population aging in low socio-economic conditions or in English terms it is called the condition of "Aging Before Getting Rich" or other terms. *Being "Not Ready To Get Old"* means a region is in a condition of becoming old but not rich. This condition is the same as the condition of China in 2000 where at that time the number of elderly people had reached or exceeded 7% but the condition of China's per capita GRDP, industrialization, and urbanization levels were not only lower than developed and developing countries that were aging but also below the world average.

If we observe based on the socio-economic indicators, namely the health sector represented by the life expectancy of the 4 regencies/cities, the average value is ranked 10th lowest in all of Aceh in the 2010-2020 period and the education sector represented by the human development index of the 4 regencies/cities, the average value is ranked 14th lowest in all of Aceh in the 2010-2020 period. Meanwhile, the average value of the percentage of elderly people is ranked 10th highest in all of Aceh in the 2010-2020 period.

The areas included in the rapidly developing areas (quadrant II) where the socio-economic conditions of the district/city are above the provincial average and the aging of the population of the district/city is below the provincial average are Langsa, Bener Meriah, Lhoksumawe, Banda Aceh, Central Aceh. Furthermore, the last is the area included in the relatively underdeveloped area (quadrant III) where the socioeconomic conditions of the district/city are below the provincial average and the aging of the population is also below the provincial average, namely 7 districts/cities, namely Southeast Aceh, East Aceh, Gayo Lues, Simelue, Aceh Tamiang, Subullusalam and Aceh Singkil.

The relatively rapid population aging in several districts/cities in Aceh Province will pose a series of socio-economic and health service challenges in the future, especially with the increasing burden of elderly care. According to the latest report published by the BPS of Aceh Province, the percentage of elderly people experiencing health complaints in the last month of 2020 was still in rural areas at 50.06. This figure is the second highest figure in Sumatra after the Bangka Belitung Islands at 54.20. This figure is higher than the national figure of 48.14. The morbidity rate of the elderly population of Aceh Province is the highest in Sumatra at 30.86.

Recognizing the challenges that will arise due to the aging population has been discussed previously. Aceh Province must create and strategize well-organized policies such as long-term health services, especially for the elderly, equalizing old-age social security or pensions, especially for informal workers, and preparing elderly-friendly cities early on, especially in districts/cities in Aceh Province whose areas have experienced faster population aging but whose socioeconomic development is still low.

The welfare of the elderly population in Aceh Province is regulated in the Aceh Governor Regulation number 30 of 2018, which regulates the position, organizational structure, duties, functions and work procedures of the regional technical implementing unit of the Geunaseh Sayang Welfare House at the Aceh Social Service (21). Currently, awareness of development that must pay attention to the elderly population is still very lacking and not as popular as the young population (children) and groups of people with disabilities. Many developments in a region mention child-friendly cities and cities that are friendly to groups with disabilities, but not many regions in Indonesia have adopted the theme of an elderly-friendly city. Not only focusing on the physical aspect, but the Aceh government can also prepare various programs so that the elderly population is no longer seen as a burden on resources, but the elderly can later play an active role in various social, economic, cultural, and community activities in the long term. This concept is known as active and healthy aging.

CONCLUSION AND SUGGESTIONS

Conclusion

Aceh Province in 2020 is in the early aging stage (Mid-Aged) because the percentage of elderly people is more than 7% and it is estimated that in the next 25 years in 2035 Nagan Raya, South Aceh, and West Aceh will be in the high aging category (Super-Aged) or more than 14%. When associated with the results of the application of the Klassen typology analysis using regional

socio-economic indicators, the development of the 23 districts/cities in Aceh Province has not occurred evenly.

An interesting point in this study is that some districts/cities have district/city socio-economic conditions below the provincial average and population aging above the provincial average, namely Pidie, South Aceh, Aceh Jaya, and Southwest Aceh so these 4 districts/cities need to receive more attention from the government regarding the socio-economic development of their regions which are still relatively low so that the elderly population in these districts/cities have the same welfare as the elderly population in districts/cities that have better socioeconomic conditions.

Suggestion

More comprehensive attention and appropriate policies are needed, especially for districts/cities in Aceh Province that are starting to enter the aging period but whose socio-economic conditions are not in good condition. Carrying out equitable development throughout districts/cities in Aceh Province, especially in the fields of economy, health, education, and employment. Furthermore, the Aceh Provincial Government must carry out infrastructure development that is friendly to the elderly so that in the future the elderly will get better facilities to spend their old age.

ACKNOWLEDGEMENT

The authors in this research would like to thank the supervisors from Universitas Gadjah Mada who have accommodated the author's ideas regarding the study of the elderly in Aceh Province.

REFERENCES

1. Heryanah, Kadir. Causes of Differences in Aging Between Provinces in Indonesia: Analysis Using Panel Data and Logistic Regressions. Jurnal Biometrika dan Kependudukan [Internet]. 2023 Jul 6 [cited 2024 Oct 21];12(1):100–11. Available from: https://e-journal.unair.ac.id/JBK/article/view/39035
2. Peng X. Coping with Population Ageing in Mainland China. Asian Popul Stud [Internet]. 2021 Jan 2 [cited 2024 Oct 22];17(1):1–6. Available from: https://www.tandfonline.com/doi/abs/10.1080/17441730.2020.1834197
3. Heryanah H. Ageing Population dan Bonus Demografi kedua di Indonesia. Populasi [Internet]. 2015 Nov 1 [cited 2024 Oct 21];23(2):1. Available from: https://jurnal.ugm.ac.id/populasi/article/view/15692
4. President of the Republic of Indonesia. Undang-undang (UU) Nomor 13 Tahun 1998 tentang Kesejahteraan Lanjut Usia [Internet]. Jakarta; 1998 p. 1–24. Available from: https://peraturan.bpk.go.id/Details/45509/uu-no-13-tahun-1998
5. Zhao D, Han Z, Wang L. The Spatial Pattern of Aging Population dDistribution and its Generating Mechanism in China. Dili Xuebao/Acta Geographica Sinica. 2017 Oct 1;72(10):1762–75.
6. Xu X, Zhao Y, Zhang X, Xia S. Identifying the Impacts of Social, Economic, and Environmental Factors on Population Aging in the Yangtze River Delta Using the Geographical Detector Technique. Sustainability (Switzerland). 2018 May 11;10(5).
7. Tri S Mildawani. Gerontologi: Sebuah Pengantar [Internet]. 1st ed. Mario Manalu, editor. Jakarta Timur: Lestari Kiranatama; 2015 [cited 2024 Oct 21]. 1–120 p. Available from: https://dosen.perbanas.id/docs/wp-content/uploads/2020/09/GERONTOLOGI-Sebuah-Pengantar-.pdf
8. Achmad W, Nurwati N, Fedryansyah M, Sumadinata RWS, Sidiq RdSSS. Taking Advantage of Indonesia's Demographic Bonus in 2024: Challenges and Opportunities. Management Studies and Entrepreneurship Journal [Internet]. 2024;5(2):4425–34. Available from: http://journal.yrpipku.com/index.php/msej

9. Cicih LHM, Nugroho DNA. Kondisi Lanjut Usia Di Indonesia Era Bonus Demografi Condition of the Elderly in Indonesia in the Era of Demographic Bonus. Sosio Informa [Internet]. 2021 [cited 2024 Oct 31];7(02):158–71. Available from: https://ejournal.poltekesos.ac.id/index.php/Sosioinforma/article/view/2681
10. Muta'ali L. Teknik Analisis Regional untuk Perencanaan Wilayah Tata Ruang dan Lingkungan. 1st ed. Yogyakarta: Badan Penerbit Fakultas Geografi UGM; 2015. 1–345 p.
11. Primastuti R, Sukamdi, Listyaningsih Umi. Pengelompokan Provinsi di Indonesia Berdasarkan Karakteristik Lansia dan Hubungannya dengan Kondisi Sosial Ekonomi Wilayah [Internet] [Thesis]. [Yogyakarta]: Universitas Gadjah Mada; 2023 [cited 2024 Oct 21]. Available from: https://etd.repository.ugm.ac.id/penelitian/detail/221541
12. Panjawa JL, Triyanto J. Determinan Keterlibatan Lansia dalam Pasar Kerja di Kabupaten Sragen. Jurnal Litbang Sukowati [Internet]. 2020;3(2):82–91. Available from: http://journal.sragenkab.go.id
13. Guan D, Lei L, Han Z, Xia J. Spatial-Temporal Variation of Population Aging: A Case Study of China's Liaoning Province. Complexity [Internet]. 2020 [cited 2024 Oct 21]; 2020:1–13. Available from: https://doi.org/10.1155/2020/5436061
14. Central Statistics Agency of Aceh Province. Proyeksi Penduduk Kabupaten/Kota Provinsi Aceh 2010-2020 [Internet]. 2015 [cited 2024 Nov 8]. 1–105 p. Available from: https://www.bps.go.id/id/publication/2015/06/30/d134b947dc034d67a6dcaf12/proyeksi-penduduk-kabupaten-kota-tahunan-2010-2020-provinsi-aceh.html
15. Central Statistics Agency of Aceh Province. Proyeksi Penduduk Kabupaten/Kota Provinsi Aceh 2020-2035 Hasil Sensus Penduduk 2020 [Internet]. 2023 [cited 2024 Nov 8]. 1–259 p. Available from: https://aceh.bps.go.id/id/publication/2023/07/20/c5b064a1664cac76d5aa7ed7/proyeksi-penduduk-kabupaten-kota-provinsi-aceh-2020-2035-hasil-sensus-penduduk-2020.html
16. Ainistikmalia N. Determinants of the Elderly Female Population with Low Economics Status in Indonesia. Jurnal Ilmu Ekonomi Terapan [Internet]. 2019 [cited 2024 Oct 21];4(2):85–100. Available from: https://e-journal.unair.ac.id/JIET/article/view/14033/8742
17. Kantachote K, Wiroonsri N. Do Elderly Want to Work? Modeling Elderly's Decision to Fight Aging Thailand. Qual Quant. 2023 Feb 29;57(1):509–39.
18. Kudo S, Mutisya E, Nagao M. Population Aging: an Emerging Research Agenda for Sustainable Development. Soc Sci [Internet]. 2015 [cited 2024 Oct 21];4(4):940–66. Available from: https://www.mdpi.com/2076-0760/4/4/940
19. Nadia SP, Riyanto WH. Analisis Tipologi Klassen pada Indeks Pembangunan Manusia di Provinsi Bali. Jurnal Ilmu Ekonomi (JIE) [Internet]. 2023 [cited 2024 Oct 21];7(1):30–40. Available from: https://ejournal.umm.ac.id/index.php/jie/article/view/24831/12063
20. Central Statistics Agency of Aceh Province. Indeks Pembangunan Manusia Provinsi Aceh 2022 [Internet]. Banda Aceh: Badan Pusat Statistik Provinsi Aceh; 2022 [cited 2024 Oct 21]. 1–84 p. Available from: https://aceh.bps.go.id/id/publication/2023/06/28/108a20bfd6b020c723bc64ab/indeks-pembangunan-manusia-provinsi-aceh-2022.html

21. Gubernur Aceh. Peraturan Gubernur Aceh Nomor 30 Tahun 2018 [Internet]. 2018 p. 1–10. Available from: https://jdih.acehprov.go.id/dih/view/184895c7-b9ed-4acf-89f4-1a6769942aca