Accessibility and suitability analysis of health facilities in Penjaringan Subdistrict, North Jakarta in 2021

A H Safura¹, S T V Andi², N L Rohmah¹, R Laudiansyah¹, N Ismayuni¹, M I Fathurrizqi¹ and S Ahadia¹

¹Environmental Geography, Faculty of Geography, Universitas Gadjah Mada, Indonesia
²Cartography and Remote Sensing, Faculty of Geography, Universitas Gadjah Mada, Indonesia

E-mail: rizkylaudi@gmail.com

Abstract. DKI Jakarta has the highest number of Covid-19 increasing cases in Indonesia, especially the Penjaringan Subdistrict, North Jakarta has a high potential for Covid-19 because of its strategic location and close to Soekarno-Hatta Airport. The distribution of health facilities in the Penjaringan Subdistrict is an essential thing to suppress the growth of Covid-19 cases. This study aims to analyze the resilience of health facilities based on the accessibility and suitability of the number of people served in each facility. This research used secondary data and was guided by Indonesian National Standard (abbreviated SNI) Number 03-1733-2004 about Tata Cara Perencanaan Lingkungan Perumahan di Perkotaan also known as Procedures for Planning a Residential Environment in Urban Area. This study uses the buffering method with ArcMap and assessing the facilities' availability. The results showed that all villages in Penjaringan Subdistrict are served by available health facilities based on the distance. Meanwhile, six types of health facilities are incompatible with the standard and one type of health facility is compatible with the standard.

1. Introduction

The Covid-19 pandemic has harmed the population's health and the world economy (Andersen et al., 2020). In September 2021, the World Health Organization (WHO) reported that more than 4.7 million people had died because of this pandemic. Indonesia is one of the affected countries with the highest cases in ASEAN reaching 141,258 people in September 2021 (Nurhaliza, 2021). Economic, social, cultural, technological, and political factors will tend to make the city develop rapidly from time to time. Those factors lead to spatial changes, especially housing development in the middle of the city due to easy accessibility to the center of the economy and government (Szpilko, 2020) especially DKI Jakarta which has the same characteristics as Szpilko’s finding.

DKI Jakarta is the capital city of Indonesia and the provinces in Indonesia which according to data from the COVID-19 Task Force from the BNBP (2021). It is triggered by the number of population density in DKI Jakarta as the highest in Indonesia; 16,882 people/km. As the center of government and economy supported by high mobility, Jakarta turned to the epicenter of COVID-19 transmission (Liu et al., 2020). Therefore, the government must be responsive in tracking areas or zones with high
One of the sub-districts in Jakarta that needs special attention is the Penjaringan Subdistrict, North Jakarta is an area in DKI Jakarta that has a high potential for Covid-19’s exposure because of its strategic location and near to Soekarno-Hatta International Airport. This is what makes the many developers build new housing so that population growth also increased in a strategic location (Mohamad et al., 2020). This strategic location affects good accessibility. The development of highways and railroad lines leads to suburb-urban, causing traveling to be more accessible (Rahmati et al., 2020). Accessibility is a measure of the ability of a location to be reached or to reach different locations. Each location does not have the same capacity. Accessibility can be seen through the availability of good roads and transportation to visit the place (Bakar et al., 2021).

Based on Jakarta Covid-19 data monitoring, until September 2021, positive cases of Covid-19 in the Penjaringan Subdistrict reached 18,474 people. It is important paying attention to the distribution of health facilities in suppressing Covid-19 cases in this region. The accessibility of health facilities is the opportunity to identify healthcare needs, to seek healthcare services, to reach, to obtain, to use healthcare services, and had services fulfilled (Levesque et al., 2013). Health facilities are a component that must be met to serve and meet the needs of the community regarding health.

Access to health facilities is an important component of the health system that has a direct impact on the burden of disease that affects countries in the developing world and is a significant factor that contributes to a healthy population (Kibon and Ahmed, 2013). It is important when the health systems are overwhelmed and many people do not have easy access due to the unequal distribution of health facilities, the public trust in the health system and policies will decrease. To meet essential needs safely through the availability of adequate and equitable health facilities is one of the keys to ensuring behavior in obtaining appropriate treatment and maintaining public trust (WHO, 2020).

The inequality of health facilities issues can be measured and solved by a spatial approach (geographical accessibility). Geographical accessibility is a measure of the distance between locations and it is considered by distance to facilities (Delamaeter et al, 2012). Some studies described geographical accessibility as the representation of the capacity of health facilities relative to the size of the target population (service availability) and physically accessible for people (service accessibility) (Huerta and Kallestal, 2012). Studies that deal with accessibility utilize buffer analysis as it is considered to measure distances (Ergen, 2020; Koliotsis and Papadopoulou, 2017). However, some specific studies use buffer zones for delineating the accessibility of health facilities (Ashaigbor et al, 2020; Masoodi and Rahimzadeh, 2015; Popoola et al, 2016). This buffer analysis can be adopted to solve the Penjaringan issue in health services distribution.

The facilities have to be easily accessible as a guarantee for the community to obtain quality health services. This study aims to analyze the accessibility and suitability of health facilities in Penjaringan Subdistrict, North Jakarta based policy for planning the construction of health facilities; National Standard (abbreviated SNI) Number 03-1733-2004 about Tata Cara Perencanaan Lingkungan Perumahan di Perkotaan also known as Procedures for Planning a Residential Environment in Urban Area.

2. Data and Method
2.1. Study Area
Penjaringan Subdistrict, North Jakarta is a very strategic area and easy to access because of its location close to Soekarno-Hatta International Airport in the southwest and Tanjung Priok Harbour in the north. This sub-district has a 35.47 km² area consisting of 5 urban villages as shown in figure 1. According to the Central Bureau of Statistics as known as BPS (2020), the village that has the highest population density is Penjaringan 32.552 person/km²), followed by Pejagalan (23.939 person/km²), Pluit (7,117 person/km²), Kapuk Muara (6,950 person/km²), and Kamal Muara (1,940 person/km²).
2.2. Data
This study utilized population data, the number of health facilities data, spatial data, and attribute data from details of the service area of health facilities which led to an understanding of the accessibility and suitability of health facilities in Penjaringan. The population data for 2021 is obtained from the geometric calculation of the projected population using population data for 2006 - 2015 sourced from BPS 2020. The number of health facilities is obtained through the identification of health facilities distribution (refers to figure 2).
The spatial data were acquired from Google Earth imageries, Google Maps, Dinas Cipta Karya, Tata Ruang dan Pertanahan, and Jakarta Government. The attribute data was collected from Indonesian National Standard (abbreviated SNI) Number 03-1733-2004 (as mentioned in Table 1) about the procedures for planning residential neighborhoods in urban areas. The standard explained the health facilities have the maximum service area and the number of supporting populations such as drugstores, clinics, doctor’s offices, integrated health posts (Posyandu), public health service (Puskesmas), and hospitals.

**Table 1 Service area of health facilities within specific regulation in SNI 03-1733-2004.**

| Health Facilities                  | Service Area (m²) | Service Standard (person) |
|-----------------------------------|-------------------|---------------------------|
| Drugstore                         | 1.500             | 30.000                    |
| Integrated health post (Posyandu) | 500               | 1.250                     |
| Doctor’s office                   | 1.500             | 5.000                     |
| Village public health center      | 1.500             | 30.000                    |
| Clinic                            | 1.500             | 2.500                     |
| Sub-district public health center | 3.000             | 120.000                   |
| Hospital                          | 3.000             | 240.000                   |

*Source: SNI 03-1733-2004*

2.3. **Health Facilities Structure in Indonesia**

Some health facilities in Indonesia include primary, secondary, and tertiary health institutions (Harjanti and Aulianingtyas, 2020). Primary health facilities include Village Public Health, Integrated Health Post, Doctor’s Office, and Clinic are the closest facilities from the society and handle the light case. Secondary health facilities include Subdistrict Public Health Service and District Hospital are comprehensive health facilities and usually within the control of sub-district and district governments. Tertiary health facilities include Province Hospital, which is the specialist health services and handles complex health cases as referrals from general hospitals or on direct admission to its own.

2.4. **Assessment of The Facilities’ Availability**

Data on the number of health facilities and the population of Penjaringan Subdistrict in 2021 were used as quantitative analysis. Both of the data are used as input in analyzing the suitability of health facilities based on SNI Number 03-1733-2004 (Table 1). The results of the analysis carried out will show the number of residents served at each health facility.

2.5. **Spatial Accessibility Analysis with Buffer**

Administrative area and health care distribution 2021 in Penjaringan are used for qualitative analysis. The spatial accessibility begins with the buffer of every single health facility. Buffer analysis is one of the spatial analysis methods in Geographic Information Systems (GIS) to create a zonal area of a certain range of buffer regions through point, line, and polygon entities (Xu et al, 2020). The buffer zone of every health facility determines the scope of accessibility according to the standard of the service area of health facilities (Table 1).


3. Result and Discussion

3.1. Suitability Analysis of Health Facilities

Facilities are tools for service functions (Annishia, F.B, and Prastiyo, E. 2019). The exact fulfillment of needs can be seen from the availability of facilities in your area. Facilities problems are often encountered are facilities in certain areas (generally the central area) and facilities in other areas (peripheral areas). Facilities are indicators of community progress and welfare. One of the facilities that can be analyzed is the availability of health facilities.

Accessibility has a role in utilizing the potential of health care services that can be used to estimate the extent to which all individuals in the population can reach the required services present within the specified driving distance or time (Parvin, F. et al. 2020). On the other hand, not only distance parameter to determine the suitability of health facilities in an area but also the number of capacity. Availability, affordability is another important component of the utilization of health services. Optimal exercise of health facility assessment is not an easy task and can be done by estimating accessibility based on the number of the population who can access the health facility. The spatial distribution and the number of capacity for public health services describe the health care profile of each space.

The availability of health facilities has been regulated in Ministerial Regulation Number 32 of 2006 about Technical Guidelines for Ready-to-Build Areas and Stand-alone Ready-to-Build Environments (Peraturan Menteri Perumahan Rakyat Republik Indonesia No. 32 Tahun 2006 tentang Petunjuk Teknis Kawasan Siap Bangun dan Lingkungan Siap Bangun Yang Berdiri Sendiri) and has regulated provisions relating to residential facilities. Based on the analysis used using the calculation method of Availability and Value of Health Service facilities in Penjaringan Subdistrict in 2021, the following results are listed in table 3.1.

Table 3.1 Calculation of availability and value of health service facilities in Penjaringan Subdistrict in 2021.

| Health Facilities                  | Service Standard (Person) | Number of Patients (Person) | Number of Facilities (buildings) | Number of Served (person) | Description |
|------------------------------------|---------------------------|-----------------------------|----------------------------------|---------------------------|-------------|
| Drugstore                          | 30.000                    | 14                          | 25.773                           | Adequate                  |
| Integrated health post (Posyandu) | 1.250                     | 22                          | 16.401                           | Inadequate                |
| Doctor’s office                    | 5.000                     | 11                          | 32.802                           | Inadequate                |
| Village public health center       | 30.000                    | 360.822                     | 5                                | Inadequate                |
| Clinic                             | 2.500                     | 34                          | 10.612                           | Inadequate                |
| Sub-district public health center  | 120.000                   | 1                           | 360.822                          | Inadequate                |
| Hospital                           | 240.000                   | 7                           | 51.546                           | Adequate                  |

Source: Author’s fieldwork, 2021 (adopted from SNI 03-1733-2004)
Six facilities are used as variables for the analysis of health service facilities (Table 3.1). Based on this assessment, there are only two facilities that can be said to be appropriate; drugstores and hospitals. Meanwhile, other facilities are still considered inappropriate. The discrepancy in Penjaringan Subdistrict occurred due to a mismatch or disproportion between the number of facilities and the number served. Procurement of the number of existing health facilities, because the number is still not under existing standards. The more facilities that are not suitable, the more things that need to be improved, such as the availability and value of health facilities in the Penjaringan Subdistrict.

Meanwhile, compared with previous relevant research in the City of Tomobagu, the results show that the Penjaringan sub-district has very poor availability and undervalued health service facilities (Rumengan et al., 2019). According to the results of the study, the population of the Penjaringan sub-district was three times higher than the population of Kotamobagu City. Penjaringan with 360,822 residents and Kotamobagu with 124,933, while the number of health facilities owned by Kotamobagu City was more than the number of health facilities owned by Penjaringan sub-district (Rumengan et al., 2019). So, it can be said that based on the results of the study in table 3.1 which shows the results correctly. Furthermore, the lack of health facilities in the Penjaringan sub-district is one of the reasons for the limited land available to build more health facilities. Analysis of the availability and value of health facilities services is not only carried out at the subdistrict level but also at the village level. The following data is the number of health facilities in the Penjaringan Subdistrict per urban village in 2021.

Table 3.2 Data on the number of health facilities in Penjaringan Subdistrict per urban village in 2021.

| Health Facilities                  | Kamal Muara | Pejagalan | Pluit | Kapuk Muara | Penjaringan | Total |
|-----------------------------------|-------------|-----------|-------|-------------|-------------|-------|
| Drugstore                         | 4           | 3         | 5     | 1           | 1           | 14    |
| Integrated health post (Posyandu)| 5           | 5         | 1     | 5           | 6           | 22    |
| Doctor’s office                   | 0           | 1         | 8     | 2           | 0           | 11    |
| Village public health center      | 1           | 1         | 1     | 1           | 1           | 5     |
| Clinic                            | 1           | 5         | 10    | 2           | 16          | 34    |
| Sub-district public health center | 0           | 1         | 0     | 0           | 0           | 1     |
| Hospital                          | 1           | 2         | 1     | 1           | 2           | 7     |
| Total                             | 12          | 18        | 26    | 12          | 26          | 94    |

Source: Author’s fieldwork, 2021

The availability of the health facilities sources and the access to those sources is greatly decisive the standards of an individual’s life. Healthcare institutions are accountable for providing multiple facilities like health education and precautions, managing the disease, nursing, and medical measures for diagnosis and treatment (Yeboah et al., 2020). Thus, the aim of health care institutions should be fair availability to all the residents of the country by fair means to follow the policy right service for the right person and in the right space and time (Murad, 2018). Penjaringan Subdistrict have five villages; Penjaringan, Pejagalan, Pluit, Kapuk Muara, and Kamal Muara Village. Based on the number of
facilities from all villages in Penjaringan Subdistrict, Penjaringan village has the most health facilities, meanwhile, Kamal Muara Village has the fewest health facilities.

The availability of these facilities is highly dependent on the number served or the number of residents in the area. The results of the analysis carried out on the value of the availability and value of health facilities in the Penjaringan Subdistrict in every village showed that from all the villages in the Penjaringan Subdistrict there was a discrepancy between the available standards and the value of health facilities. This is due to the high population in the Penjaringan Subdistrict. It can be seen in Figure 3.2 that more clearly when compared to the availability and spatial value of facilities which indicate conformity. Based on previous research in the European Union, the discrepancy between the standard number of health facilities and the population in the European Union has an impact on not addressing the need for emergency care or urgent medical aid (Webb et al., 2021). So it is necessary to do further evaluation of the number of health facilities based on the number served or the number of residents in Penjaringan Subdistrict.

3.2. Accessibility Analysis of Health Facilities

The Indonesian government through specific regulation in SNI 03-1733-2004 suggested an ideal service area of health facilities as adequate accessibility of health facilities. The representation of service area is created by buffer zone analysis refers to the Indonesian regulation to analyze the accessibility. Similar to the findings in Ghana, where the accessibility of health facilities is analyzed by buffer analysis (Ashiagbor et al, 2020). However, there is a difference between the findings in the Penjaringan and Ghana (2020) where the buffer distance in Penjaringan uses the Indonesian standard (varies depending on the type of health facility) while in Ghana uses the World Health Organization standard (5 km). The smallest service area of health facilities is integrated health post, 500 m². The widest service area of health facilities is Hospital and Sub-district public health center, 3000 m². In short, the buffer zone determines the maximum distance Penjaringan people have to travel to access the health facilities. The adequate accessibility means the health facility can cover up all over the inhabited area, such as clinics in three villages (Pluit, Penjaringan, and Pejagalan) and hospitals in two villages (Kapuk Muara and Pejagalan). The distribution of health facilities and their service area is represented in Figure 3.a – Figure 3.h.

**Figure 3.a Buffer analysis service area of health facilities in Penjaringan Subdistrict, North Jakarta, DKI Jakarta Province in 2021**

Source: Author’s fieldwork, 2021
There were ninety-four health facilities in Penjaringan: seventy-two primary health facilities include integrated health post, doctor’s office, village public health center, and clinic; eight secondary health facilities include sub-district public health facilities and district hospital; fourteen drugstores. Since the drugstore is classified as a place to buy medicine and not handle the medical cases based on SNI. According to Indonesia Regulation; Peraturan Menteri Kesehatan Republik Indonesia No 9 Tahun 2017, pharmacy is a place where pharmaceutical work is carried out, distribution of pharmaceutical preparations and other health supplies to the public. Pharmaceutical preparations are drugs, medicinal ingredients, native Indonesian drugs, medical devices, and cosmetics.

**Figure 3.b** Buffer analysis service area of the integrated health post in Penjaringan Subdistrict, North Jakarta, DKI Jakarta Province in 2021  
Source: Author’s fieldwork, 2021

**Figure 3.c** Buffer analysis service area of clinics in Penjaringan Subdistrict, North Jakarta, DKI Jakarta Province in 2021  
Source: Author’s fieldwork, 2021

**Figure 3.d** Buffer analysis service area of village public health centers in Penjaringan Subdistrict, North Jakarta, DKI Jakarta Province in 2021  
Source: Author’s fieldwork, 2021

**Figure 3.e** Buffer analysis service area of doctor’s offices in Penjaringan Subdistrict, North Jakarta, DKI Jakarta Province in 2021  
Source: Author’s fieldwork, 2021
The output of this study is a Map of Health Facilities Service Coverage in Penjaringan Subdistrict, North Jakarta, DKI Jakarta Province 2021. This map tells the coverage area of primary and secondary health facilities that handle the medical cases as this study’s main objective excludes the drugstores. According to the map in Figure 4, three villages are adequate for accessibility of health facilities to both primary and secondary health services such as Pluit, Penjaringan, and Pejagalan. Similar to the findings in Kotamobagu, where the radius of the reach of social facilities in Kotamobagu City has spread and reaches all existing settlements measured by the buffer method (Rumengan et al, 2019).

Meanwhile, in Kapuk Muara Village there is a small area in the north of the village that is covered by the service area of secondary health facilities. Although the inhabited portion of the Kamal Muara area...
is largely inside the service area, there is inadequate accessibility of health facilities especially in north Kamal Muara Village considering that area is a new reclamation island with the recent function for leisure and not for settlement yet.

4. Conclusion
Distribution and number of health facilities influence the adequate accessibility and suitability in an area. The service coverage of health facilities in the Penjaringan Subdistrict has not been able to reach all the villages. The small area on the north side of Kamal Muara has inadequate accessibility. As well as the spatial accessibility of health facilities, based on the facility-population ratio, each facility serves the population with a number exceeding the standard number of services listed in the SNI. Only drugstores and hospitals are suitable for the total population in Penjaringan Subdistrict. Meanwhile, at the village level, only hospitals are suitable for the total population in each village.

For further development could be increase quality and quantity of facilities, at least doctors’ office for fulfilling in very micro-scale. For further analysis, healthcare workers may be added as variables to know and reach an ideal number between facilities, number of people, and number of medical professionals. Hopefully, the recovery can be faster and more effective in the future.

5. Acknowledgement
The authors wish to thank Dinas Cipta Karya, Tata Ruang dan Pertanahan of DKI Jakarta for their help throughout the providing of spatial data of health facilities in the Penjaringan Subdistrict.

References
[1] Andersen K G, Rambaut A, Lipkin W I, Holmes E C and Garry R F 2020 The proximal origin of SARS-CoV-2 *Nat. Med.* 26(4) pp 450–452
[2] Nurhaliza N 2021 Clustering of data Covid-19 cases in the world using DBSCAN algorithms. *Indones. J. Inf. Res. Softw. Eng. (IJIRSE)* 1(1) pp 1–8
[3] Szpilko D 2020 Foresight as a tool for the planning and implementation of visions for smart city development *Energies* 13(7) p 1782
[4] Badan Nasional Penanggulangan Bencana (BNPB) 2021 Satgas Covid-19. URL: https://www.covid19.go.id/ Date accessed: 24 November 2021
[5] Badan Pusat Statistik 2020 Berapa kepadatan penduduk DKI Jakarta saat ini. URL: https://statistik.jakarta.go.id/berapa-kepadatan-penduduk-dki-jakarta-saat-ini/ Date accessed: 5 September 2021
[6] Liu J, Wu Y and Huang C 2020 Learning from COVID-19: a systems approach for public health governance
[7] Mohamad Z Z, Yang F C, Ramendran S C, Rehman M, Nee A Y H and Yin Y C 2020 Embedding eco-friendly and smart technology features in affordable housing for community happiness in Malaysia *GeoJournal*. pp 1–15
[8] Rahmati F, Ali M A and Kamraju M 2020 A study on strategic location of siliguri corridor and its issues *Int. J. All. Res. Educ. Sci. Methods (IJARESM)* 8(7)
[9] Bakar M A A, Samat N and Yaacob N S 2021 Spatial accessibility to health care services among children with cerebral palsy in Johor, Peninsular Malaysia *Geospat. Health* 16(2)
[10] Levesque J F, Harris M F and Russell G 2013 Patient-centred access to health care: conceptualising access at the interface of health systems and populations *Int. J. Equity Health* 12(1)
[11] Kibon U A and Ahmed M 2013 Distribution of primary health care facilities in Kano Metropolis using GIS (Geographic Information System) *Res. J. Environ. Earth Sci.* 5(4) pp 167–176
[12] World Health Organization 2020 Maintaining essential health services: operational guidance for the COVID-19 context: interim guidance, 1 June 2020 No. WHO/2019-nCoV/essential_health_services/2020.2 World Health Organization
[13] Delamater P L, Messina J P, Shortridge A and Grady S C 2012 Measuring geographic access to
health care: raster and network methods Int. J. Health Geogr. 11(1) pp 1-18

[14] Huerta M U, and Källestål C C 2012 Geographical accessibility and spatial coverage modeling of the primary health care network in the Western Province of Rwanda Int. J. Health Geogr. 11(1) pp 1-11

[15] Ergen M 2020 Using the buffer zone method to measure the accessibility of the green areas in Tokat Turkey Landscape Architecture - Processes and Practices Towards Sustainable Development pp 1-11

[16] Koliosisis P T and Papadopouloou M P 2017 The contribution of accessible urban greenspace in the quality of residents' life in the Attica basin Proc. 15th Int. Conf. on Environmental Science and Technology 31 August to 2 September 2017 (Greece: Rhodes)

[17] Ashiagbor G, Ofiori-Asenso R, Forkuo E K and Agyei-Frimpong S 2020 Measures of geographic accessibility to health care in the Ashanti Region of Ghana. Sci. Afr. 9 p e00453

[18] Masoodi M, and Rahimzadeh M 2015 Measuring access to urban health services using Geographical Information System (GIS): a case study of health service management in Bandar Abbas, Iran Int. J. of Health Policy and Manag. 4(7) pp 439–445

[19] Popoola O, Adegboyega Y and Obasanmi T 2016 Geospatial analysis of the distribution of health facilities in peri-urban area of Ibadan Nigeria In Eboboh O J, Ayeni D A, Egbe O C O, and Omole F K Proc. Joint Int. Conf. 21st Century Human Habitat: Issues, Sustainability, and Development

[20] Badan Standarisiasi Nasional 2004 SNI 03-1733-2004 tentang Tata Cara Perencanaan Lingkungan Perumahan di Perkotaan (Jakarta, Badan Standarisiasi Nasional)

[21] Kementerian Kesehatan Republik Indonesia 2015 Permenkes No. 33 Tahun 2015 tentang Penyusunan Perencanaan Kebutuhan SDM Kesehatan (Jakarta: Kementrian Kesehatan Republik Indonesia)

[22] Harjanti I M and Anulianingtyas S 2020 Identifikasi jangkauan pelayanan fasilitas publik di Kecamatan Jumo, Kabupaten Temanggung. Bhumipala J. Pengemb. Daerah. 1(1) pp 36–44

[23] Xu Y, Qin J, Zhou Y and Wu T 2020 Analysis and research of uncertain radius in constructing geospatial buffer J. Phys. Conf. Ser. 1732(1) p 012153

[24] Annishia F B and Prastiyo E 2019 the effect of prices and facilities on guest stay at the best western premier The Hive Hotel Jakarta Timur J. Hosp. Pariwisata 4(1) pp 1–85

[25] Parvin F, Ali S A, Hashmi S N I, and Khatoon A 2020 Accessibility and site suitability for healthcare services using GIS-based hybrid decision-making approach: a study in Murshidabad, India Spat. Inf. Res. pp 1–18

[26] Kementerian Perumahan Rakyat Republik Indonesia 2006 Peraturan Menteri Perumahan Rakyat Republik Indonesia No. 32 Tahun 2006 tentang Petunjuk Teknis Kawasan Siap Bangun dan Lingkungan Siap Bangun Yang Berdiri Sendiri (Jakarta: Kementerian Perumahan Rakyat Republik Indonesia)

[27] Kementerian Kesehatan Republik Indonesia 2017 Permenkes No. 9 Tahun 2017 tentang Apotek (Jakarta: Kementerian Kesehatan Republik Indonesia)

[28] Palm W, Webb E, Quevedo C H, Scarpetti G, Lessof S, Siciliani L and Ginneken V E 2021 Gaps in coverage and access in the European Union Europe’s J. Public Health 30(5) pp 165–1339