

**DETERMINANTS OF ACCESS TO DENTAL HEALTH SERVICES FOR PEOPLE WITH  
DIFFERENT TYPES OF DISABILITIES IN INDONESIA**

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TITLE

**DETERMINANTS OF ACCESS TO DENTAL HEALTH SERVICES FOR PEOPLE WITH DIFFERENT TYPES OF DISABILITIES IN INDONESIA**

A thesis submitted in partial fulfilment of the requirement for the degree of  
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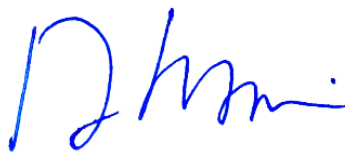
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Mochamad Nur Ramadhani, Indonesia

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## **LIST OF ABBREVIATIONS**

ASD	Autism Spectrum Disorder
BPJS	<i>Badan Penyelenggara Jaminan Sosial</i>
DHS	Dental Health Service
DMFT	Decay, Missing, Filling Teeth
DOH	Department of Health
ICF	The International Classification of Functioning, Disability and Health
IDR	Indonesian Rupiah
Km	Kilometre
LMIC	Low-middle income country
MIH	Master in International Health
MOF	Ministry of Finance
MOH	Ministry of Health
MOM	Ministry of Manpower
MORT	Ministry of Research and Technology
MOSA	Ministry of Social Affairs
PWD	People with Disabilities
SADE	Sensory Adapted Dental Environments
WHO	World Health Organization

## DEFINITION OF TERMS USED

Auxiliary health centre	A public health centre on a smaller scale. It helps to provide the community with health services, in order to increase the access to quality health care within the working area of the <i>Puskesmas</i> .(1)
BPJS Health	( <i>Badan Penyelenggara Jaminan Sosial Kesehatan</i> ) A single-player national health insurance institution in Indonesia.(2)
Cerebral palsy	A group of permanent developmental disorders of movement and posture that occurred in the developing brain during the foetal or infant phase. Cerebral palsy causes impairments of the motoric function.(3)
Dental caries	A tooth decay through a pathogenic process. It has underlying multifactorial aetiology between tooth, bacterial, and diet conditions.(4,5)
Disability	A condition of long-term physical, mental, intellectual, or sensory impairments. People with disability may face various barriers during interaction and hinder their full participation in society on an equal basis with others.(6)
Enamel	The outer surface layer of a tooth (mostly white) which consist of 95 per cent calcium hydroxyapatite (which is calcified or mineralized) and 5 per cent water and enamel matrix. Enamel is the hardest substance of a human body.(7)
Equity	Justice according to the right or natural law; equity to health services means that every people has the same right to get health services in the aspect of quality of service and financial considerations. (8)
Health facility	A location where health care is provided. First-line health facilities are clinics (public and private) and public health centres. Referral health facilities are hospitals.(9)
Health institution	A public or private organisation which provides or supports access to health services.(10)
Health service	Services that is provided during the presence of patients in the health facility.(10)
Periodontitis	A decay of periodontal tissue (gum, bone, or dental ligament). It is characterised by loss of tooth attachment to the periodontal tissues.(4)
<i>Posyandu</i>	( <i>Pos Layanan Terpadu</i> ) A health post in Indonesia which is placed in the neighbourhood.(1)
<i>Puskesmas</i>	( <i>Pusat Kesehatan Masyarakat</i> ) A public health centre in Indonesia. It is placed in the centre of a sub-district, and its working area is within the radius of 5 km.(1)



Rampant Caries	A type of dental caries that involves more than one tooth, appears suddenly and rapidly on more than ten healthy surfaces of teeth every year. Rampant caries forms a pattern of dental caries on teeth because of bad habits, such as prolonged bottle-feeding during childhood and sugary food intake right before sleep.(11)
Sedation	A pharmacological behaviour management technique by giving sedative and analgesic medication through the patient's airway in order to make the patient calm and relax so that dental treatments can be conducted cooperatively, especially to eliminate patient's anxiety.(12,13)
Sensory Adapted Dental Environments	A communicative behaviour management technique which modifies the settings of the dental room and equipment in order to make patients feel comfortable and relax during dental treatments.(13,14)
Special care dentistry	A branch or speciality in dentistry that provides dental health services for people with disabilities, including people with a physical, mental, intellectual, sensory disability, or combination of these disabilities, by a dental team. The dental team consists of a minimum of one dentist and one dental nurse. Special care in dentistry has developed and uses various methods during the dental treatment, such as sedation (ranging from minimal to deep sedation), general anaesthesia, physical and behavioural intervention, and dental disease prevention strategies.(15,16)
Tell-Show-Do	A communicative behaviour management technique conducted by the dentist to reduce patient's anxiety and to get the patient used to new dental treatments. First, the dentist tells the patient which dental treatment is going to be performed. Next, the dentist demonstrates the patient with a model or, for example, slow rotation of the dental handpiece. Last, the dentist performs the treatment which has been explained to the patient.(13,17)

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## **ABSTRACT**

### **Problem Statement**

People with disabilities (PWDs) have poorer oral health than people without disabilities. Dental problems of PWDs lead to serious health complaints besides their disability. High prevalence of untreated dental caries in Indonesian PWDs is associated with low access to dental health services (DHSs).

### **Objective**

This literature review aims to identify and analyse factors that determine access to DHSs for PWDs; and discuss possible interventions on how to enable adequate access to DHSs for PWDs in Indonesia. The study offers recommendations to the Ministry of Health (MOH) as the leading policymaker in the national health system.

### **Methods**

Peer-reviewed articles and grey literature from Indonesia and low-middle income countries in Southeast Asia were selected (2010 onwards) in both English and *Bahasa Indonesia*. A modified conceptual framework of access to health care by Levesque et al. (2013) was used to analyse the factors reinforcing and inhibiting the access to DHSs for people with a physical, mental, intellectual, and sensory disability.

### **Findings and Discussion**

Determinants of access to DHSs for PWDs are clustered into perception building on DHS needs, process of seeking DHSs, process of reaching DHSs, affordable DHS utilisation, and engagement of PWDs to DHS consequences. The most influential factors are low dental health literacy and education of PWDs, professional values of DHS providers, geographical location of dental health facilities, and PWDs' household income. The reinforcing and inhibiting role of the factors vary based on types of disabilities.

### **Conclusion and Recommendations**

Possible interventions might involve the MOH, central and local government, Indonesian dentists' association, and other stakeholders. In collaboration with stakeholders, the MOH is recommended to provide PWDs access to available and affordable DHSs with special care; in addition to distribute adequate number of dental specialists for PWDs in urban and rural areas of Indonesia.

**Keywords:** disability, access, dental health service, Indonesia, Southeast Asia

**Word count: 13195**

## **INTRODUCTION**

My name is Mochamad Nur Ramadhani, originated from Bandung, West Java, Indonesia, and I am a dentist with a physical disability. I suffered from bone cancer (Osteosarcoma) on my right femur in 2007 and got my right leg amputated in 2008. The disability does not hinder me from pursuing my dream as a dentist, and in 2018 I graduated as a dentist from Universitas Padjadjaran, Bandung. My dental practice is in West Bandung, a small private clinic in the border area, which is integrated with the national public health insurance.

Since my bachelor degree, I have been interested in conducting researches and organising programs which are related to people with disabilities (PWDs) because I would like to prove that disability is not a burden to the society. However, people with a disability form a potential of human resource for a country, and countries should optimise their capabilities and include them in the public development strategies. In the public health sector, I have already proven that a person with a disability can conduct medical treatments and contribute to the health system.

During my employment as a dental health professional, I was facilitating people with disabilities with free dental health consultation. Through this paper, I hope that the findings may help the Indonesian health system to improve access to dental health services (DHSs) for PWDs in Indonesia.

Access to health services gives people opportunities to get their health care needs fulfilled. It has five interrelated dimensions: approachability, acceptability, availability and accommodation, affordability, and appropriateness. Availability and accommodation are categorised as one dimension, which means health services physically exist and can be reached promptly. These dimensions are provided by the health system, especially health care institutions, as a health service supplier. They interact with the abilities of individuals as 'health service demanders' to achieve access to health services: the ability to perceive, to seek, to reach, to pay, and to engage health services (18).

Dental health problems are experienced by almost 100 per cent of humans in the world, for instance, dental caries and periodontitis, which need personal treatment by dentists (19). Therefore, access to DHSs is necessary for everybody.

According to The United Nations Convention on the Rights of Persons with Disabilities, PWDs are individuals who have long-term physical, mental, intellectual, or sensory impairments. They may face various barriers during interaction with others, hinder their full and active participation in society on an equal basis with others(20).

As the most populated country in Southeast Asia, Indonesia has over 36 million people with disabilities (21). PWDs have in general a higher prevalence of health problems than people without disabilities (22). Their access to DHSs is less as compared to people without disabilities because current DHSs do not meet PWDs' needs. Therefore, I am interested in studying what factors determine access to DHSs for people with different types of disabilities in Indonesia.

## **1) BACKGROUND INFORMATION ON INDONESIA**

### **1.1. Geography**

Indonesia is the biggest country in Southeast Asia, lying along the equator between the Indian Ocean and the Pacific Ocean. It has a land area of 1.916.862,2 km<sup>2</sup> and water area of 3.257.483 km<sup>2</sup> (6). As one of the largest archipelagic countries in the world with 16.056 islands, its five most prominent islands are, from west to east, Sumatera, Java, Kalimantan, Sulawesi, and Papua. The island with the least number of earthquakes (14 times/year) is Kalimantan whereas the island with the most considerable number of earthquakes is Nusa Tenggara. Indonesia has 34 provinces, 416 districts and 98 cities. It has two seasons, a wet season from October to March and a dry season from April to September, and is categorised as a tropical country(23,24).

### **1.2. Demography**

Indonesia is the fourth most populous country in the world. More than 265 million people are living in Indonesia and the annual population growth of 3,12 per cent by 2018. Almost 56 per cent of the Indonesian population lives in rural areas, and around 44 per cent of people in Indonesia are living in urban areas. The most populated island is Java, with almost 150 million people, while the least populated island is Papua with not more than 4,3 million people. The sex ratio was 101 males for every 100 females in 2015, and the median age of the population is 28,5. Eighty-six per cent of the population are Muslims, and the country comprises hundreds of diverse ethnic groups and cultures (24).

### **1.3. Socio-Economic information**

With a Gross Domestic Product per capita of \$3.846,86 in 2017, Indonesia is categorised as a low-middle income country (LMIC). It has become a member of the G-20 since 2008. Around 25 million people were living in poverty during March 2019. The economic sector grew by 5,02 per cent during the third quarter of 2019, whereas the inflation level in January 2020 was 2,68 per cent per year(25).

### **1.4. Education**

The Indonesian population had an average of 8,58 years of formal education in 2018. Over five per cent of the population graduated from senior high school level, whereas university alumni reached around four per cent (26).

### **1.5. Health status**

Health compliances were experienced by 31 per cent of the Indonesian population in 2018, which is an increase of around eight per cent compared to 2017. During the years 2017 and 2018, only 48,66 per cent of sick people undergo outpatient treatments in health facilities. Sick people who do not access the health facility mostly claimed that they could cure the diseases by themselves and claimed that medical treatments are not necessary (24).

### **1.6. Health system in Indonesia**

According to the national health system law, the Ministry of Health (MOH) on behalf of the central government organises the Indonesian health system, called "*Sistem Kesehatan Nasional*". It is assisted by the Department of Health (DOH) in each province and city/village level (27). Primary health care has been provided in 9.993 public health centres (*Puskesmas*), 8.841 private clinics, 8.876 general practitioners' private practices as well as 2.104 dentists' private practices all over Indonesia in 2018. Indonesia also has 2.813 hospitals as referral health facilities. To strengthen the health system, 283.370 community-based health facilities (*Posyandu*) provide mother & child care, immunisation for children, prevention and management of diarrhoea, family planning services, and nutrition care. From the aspect of the health workforce, Indonesia has up to 1.2 million human resources for health, including 93.628 medical doctors and 32.731 dentists.

Therefore, one medical doctor stands for over 2.800 patients, and one dentist stands for around 8.300 people in Indonesia (27,28).

Currently, 83 per cent of the population is covered by *Badan Penyelenggara Jaminan Sosial Kesehatan* (BPJS Health), the national public health insurance, which provides insurance coverage of general and DHS costs.

### 1.7. Disability in Indonesia

According to the national population survey in 2015, the prevalence of PWDs in Indonesia is 8,56 per cent among the population aged ten years or older. By province, North Sulawesi and Gorontalo in Sulawesi Island have the highest prevalence in the country at almost twelve per cent (see Figure 5, **Annex 1**) (21).

The primary national health survey in 2018 presents data in disability based on age groups, as shown in Table 1(21,29).

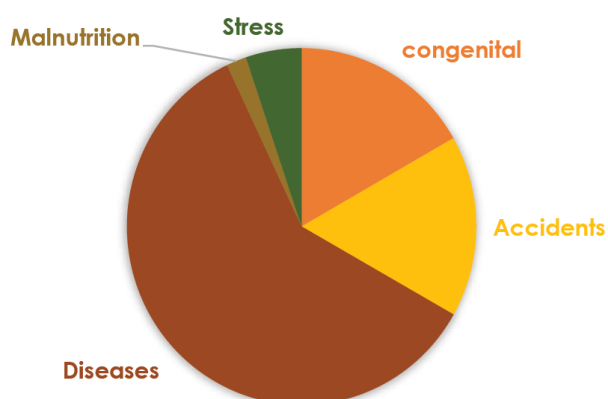
Table 1. Number of PWDs in Indonesia

Age group (in years)	Number of population (in thousands)	Proportion of disability (in %)		Number of PWDs (in thousands)	Residence of PWDs	
					Urban	Rural
0-4	23729.60	N/A		N/A	N/A	
5-17	5-9	3.30	2.50	1956.27	55,4%	44,6%
	10-14		3.50			
	15-17		4.20			
18-59	18-24	22.00	21.20	34446.71	49,8%	50,2%
	25-34		20.60			
	35-44		20.30			
	45-54		23.80			
	55-59		29.60			
over 60	24754.50	N/A		N/A	N/A	
Total population	265015.30	Total PWDs		36402.99		

Refer to the table above, the prevalence of PWDs in Indonesia is 13,7 per cent of the total population which means that it shows an increase by around five per cent compared to the previous survey in 2015(21).

Young age groups (between 5 and 17 years) of PWDs are living more in urban than rural areas. In contrast, the productive age groups (between 18 and 59 years) have their residence slightly more in rural than urban areas of Indonesia.

Figure 1. Cause of disability in Indonesia(22)



The data of prevalence in disability for age groups 0-4, 60 years and above are not available. The distribution of PWDs in Indonesia per province in 2018, is presented in **Annex 1** (Figure 6 and 7).

The causes of disabilities in Indonesia are shown in Figure 1. Diseases cause 60 per cent disabilities, and accidents cause 16 per cent. The lowest number of causes to disability is malnutrition with almost two per cent.

Indonesian law number 8 of 2016 categorised the types of disabilities as follows(30):

1. Physical disability
2. Mental disability
3. Intellectual disability
4. Sensory disability

Physical disability refers to the impairment of a person's motoric function. This type of disability includes amputation, spastic paralysis, paralysis of lower and upper extremities, cerebral palsy (CP), little people, stroke and leprosy-related physical disability (31).

Mental disability is defined as a combine-impaired function of mind, emotion, and behaviour. This type of disability is divided into two subtypes, psychosocial and developmental disability. Psychosocial disability includes mental illnesses or mental health disorders such as schizophrenia, bipolar affective disorder, depression, anxiety disorder, and personality disorder in a long period (diagnosed by a doctor) (31,32). Developmental disability incorporates autism spectrum disorder (ASD) and hyperactive disorder which both influence the social interaction of people with this type of disability(31).

Intellectual disability refers to an impaired intelligence (an Intelligent Quotient below 70) which reduces the ability to understand, learn, and apply new skills. It includes learning disability and Down Syndrome(31). According to the latest definition from the World Health Organization (WHO), children with ASD who have intellectual impairments are included under intellectual disability(33). The term 'mental retardation' was replaced by the American Psychiatric Association in 2013 with the term 'intellectual disability' which is generally used nowadays (34). Sensory disability is an impairment of one or more senses, including visual, hearing, and speech impairment(31).

## **2) PROBLEM STATEMENT, JUSTIFICATION, AND STUDY OBJECTIVES**

### **2.1. Problem statement**

Indonesia has a prevalence of 57,6 per cent of dental problems(35). The Decay, Missing, Filling Teeth (DMFT) value is 6,0, which means that on average, every person in Indonesia has six teeth with dental caries(35). This condition worsened as compared to 2013, when the national DMFT was 4,6(35). As one of the low-middle income countries (LMICs) in the world, Indonesia set a lower priority on oral health than higher-income countries(36).

People with disabilities have poorer oral health than people without disabilities(37,38). The factors may be related to their types of disabilities in maintaining oral health; for instance, people with visual impairments are not able to recognise dental problems visually through the mirror. Physically disabled people in specific those who have a disability in the upper extremities (for example, people with amputated arms, cerebral palsy, spastic paralysis) have limited movements in brushing their teeth. People with intellectual disability may have difficulties in understanding, learning new and complex skills, so they are not able to apply dental health behaviour by themselves(36,39,40).

In order to address these problems, the MOH invested only around 22 billion Rupiah (equivalent to 1.4 million Euro) in national dental health for the Indonesian population in 2019 and developed promotive programs(41). As a result, dental health education programs for PWDs have been implemented by using unique methods. For instance, tooth brushing using songs to children with visual impairments, to prevent dental caries by improving their dental health behaviour(42).

Teeth of people with disabilities which have been already decayed have to be treated immediately to avoid secondary complaints beside those that are often more directly related to their disability (43). They urgently need comprehensive DHSs in the dental health facility. The aim is not only to cure their dental diseases, but also to be provided with dental health promotion and prevention. Besides, tooth loss due to a decayed tooth has to be replaced by wearing an artificial tooth which is a rehabilitation phase of a comprehensive DHS (37,44,45).

The prevalence of untreated dental caries in Indonesian PWDs is higher than countries in Africa, East Asia, and North America, which is associated with low access to DHSs (38,45). Addressing this issue, the MOH of Indonesia has also invested in the national public health insurance coverage of around 83 per cent of the population to strengthen access to health services, including DHSs (46). However, only 25 per cent of people with disabilities utilise health services because the quality of health care does in the majority not meet their needs (47). For instance, people with a mental disability have to be treated by dental specialist in special care dentistry to manage the patient's behaviour during the dental treatment. They can be found mostly in referral hospitals of urban areas (28,48). First-line dental health facilities do not support special care for PWDs in both urban and rural area. Especially in rural areas, the medical equipment does not support the accessibility for PWDs to get quality health services (49). Hence, access to DHSs for PWDs is not merely about reaching available dental health facilities and using BPJS Health to pay their services (18).

According to the Department of Public Health Sciences of King's College London, providing access to health services is helping people to obtain appropriate health care in order to preserve or improve their health (50). Adopting the concept of access to health care by Levesque et al. in 2013, access to health services is people's opportunity to get their health care needs to be fulfilled. It has five interrelated dimensions: approachability, acceptability, availability and accommodation, affordability, and appropriateness. Availability and accommodation are categorised as one dimension, which means health services physically exist and can be reached promptly. These dimensions are provided by the health system, especially health care institutions, as a health service supplier. They interact with the abilities of individuals as 'health service demanders' to achieve access to health services: the ability to perceive, to seek, to reach, to pay, and to engage health services (18). In the context of DHSs, people's access to DHSs is a process of obtaining



their appropriate dental health needs. It is determined by the interaction between the ability of individuals and the health system's supply.

According to the international convention of 58<sup>th</sup> World Health Assembly, member states are urged to provide adequate and effective medical care to PWDs and facilitate their access to it even with additional devices, such as wheelchairs, prostheses, and other devices (51). In Indonesia, there should be an equal opportunity of access and services to health care provided to people with disabilities based on one of the national laws on health rights for people with disabilities, including their access to DHSs (52). However, there is a massive gap between the law and its implementation. Based on the problems described above, the researcher wishes to find out what factors reinforce and inhibit access to DHSs for people with different types of disabilities in Indonesia.

## **2.2. Justification**

The dental health status of PWDs is a significant concern in reaching equity to health services, especially in Indonesia, where the number of people living with a disability and DMFT value is high (6,23,28). Moreover, untreated dental problems of PWDs are worsened by their limitation in performing their proper daily life activities, including personal activities in improving their dental health (53). Examples of the limitations are: to perform dental health practices at home, to understand dental health instructions, to reach dental health facilities, and to choose appropriate DHSs. If these problems are not addressed, secondary complaints due to dental problems may occur to PWDs besides their complaints related to their disability (43). Dental problems form as one of the burdens of non-communicable diseases in Indonesia (54).

As one of the low-middle income countries in the world, Indonesia has limitations in the public infrastructure, level of people's education, and social security system which are factors that influence access to DHSs (27). The disparity between rich and poor people and the distribution of people living in Indonesia are both obstacles to the implementation of equitable access to health services, especially to the access to DHSs where the government pays low attention (27,36).

Analysing the determinants of access to DHSs for PWDs will offer an understanding of how to improve the implementation of policies leading to more equitable access to DHSs in Indonesia. Successful access to appropriate DHSs by PWDs means that DHSs are effectively utilised in order to solve their dental health problems. An improvement of the dental health status of PWDs increases their quality of life and equitable access to DHSs stimulates the achievement of 100 per cent UHC in Indonesia (18,54).

Research about the determinants of access to DHSs for PWDs in Indonesia has not been done yet. This literature research aims to identify the existing factors that contribute to accessing DHSs by PWDs. Besides, an analysis of these factors will give insight into the reinforcing and inhibiting roles of the various factors on the process of obtaining access to DHSs. Furthermore, this paper discusses possible interventions on how to enable adequate access to DHSs for PWDs in Indonesia. The study will offer recommendations to the MOH as the leading policymaker in the national health system.

## **2.3. STUDY OBJECTIVES**

### **2.3.1. Overall Objective**

To identify and analyse factors that determine access to dental health services for people with different types of disabilities (physical, mental, intellectual, and sensory disability) in Indonesia to make recommendations to the Ministry of Health about possible interventions to enable adequate access to dental health services for people with disabilities in Indonesia.

### **2.3.2. Specific Objectives**

- 1- To identify the existing determinants of access to DHSs for PWDs in Indonesia.
- 2- To analyse the factors reinforcing and inhibiting access to DHSs for people with a physical, mental, intellectual, and sensory disability in Indonesia.

- 3- To discuss possible interventions that enable adequate access to DHSs for PWDs in Indonesia.
- 4- To develop recommendations to the MOH to enable adequate access to DHSs for PWDs in Indonesia.

### 3) METHODOLOGY

This thesis was based on a literature review. Peer-reviewed articles and grey literature on access to DHSs with its components were selected as references for this study.

#### 3.1. Search Strategy

Peer-reviewed articles were collected from different sources, including PubMed, Google Scholar and Google search engine, KIT Library, journals in dentistry of Indonesian and Southeast Asian universities, ProQuest, and Cochrane library. Grey literature was explored from Indonesian university libraries, for example, unpublished articles and theses. Grey literature from the WHO, World Bank, MOH Indonesia, Indonesian dentists' association, Indonesian statistic centre, Indonesian disability reports, and the Indonesian primary health survey was also used. Snowballing technique was used on relevant peer-reviewed articles as well as grey literature. Personal experience of the writer as a dentist in Indonesia was used as a source of information.

Information was taken in English and Bahasa Indonesia from 2010 onwards, and the Boolean search strategy was the guidance to use appropriate search strings and combinations in search engines(55), see Figure 2. Search strings were explored to specify the findings and are shown in Table 2.

Figure 2. The Boolean search strategy of access to DHSs for PWDs in LMICs in Southeast Asia(55)

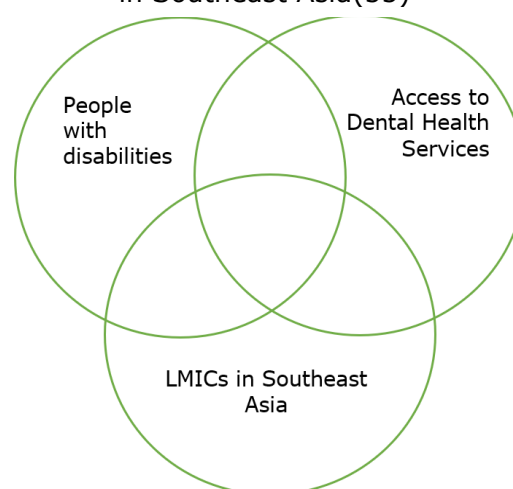


Table 2. Search strings used in the literature review

Search terms for	Search strings
<b>Types of disability</b>	'disability' AND/OR 'physical' 'mental' 'intellectual' 'sensory' AND/OR 'Indonesia' 'Southeast Asia'
<b>Approachability and ability to perceive</b>	'PWDs' AND/OR 'outreach' 'transparency' 'literacy' 'beliefs' 'information' 'educational background' AND/OR 'DHS' AND/OR 'Indonesia' 'Southeast Asia'
<b>Acceptability and ability to seek</b>	'PWDs' AND/OR 'gender' 'culture' 'personal autonomy' 'social background' 'social attitude' AND/OR 'DHS' AND/OR 'Indonesia' 'Southeast Asia'
<b>Availability, accommodation and ability to reach</b>	'PWDs' AND/OR 'geographical access' 'transportation' 'appointments mechanism' 'hours opening' 'architectural characteristics' 'climate' 'profession' AND/OR 'DHS' AND/OR 'Indonesia' 'Southeast Asia'
<b>Affordability and ability to pay</b>	'PWDs' AND/OR 'cost' 'income' 'health insurance' AND/OR 'DHS' AND/OR 'Indonesia' 'Southeast Asia'
<b>Appropriateness and ability to engage</b>	'PWDs' AND/OR 'utilisation' 'quality of care' 'adherence to care' 'coping styles' 'behaviour pattern' AND/OR 'DHS' AND/OR 'Indonesia' 'Southeast Asia'

#### 3.2. Inclusion Criteria

Inclusion and exclusion criteria for this study were determined in order to select specific literature and are shown in Table 3.

Table 3. Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
<p><b>Peer-reviewed and grey literature about</b></p> <ul style="list-style-type: none"> <li>- group of physical, mental, intellectual, and sensory disability</li> <li>- access to BPJS Health-integrated health facilities for PWDs</li> <li>- the utilisation of DHSs in Indonesia</li> <li>- access to DHSs for PWDs in Southeast Asian LMICs</li> </ul>	<ul style="list-style-type: none"> <li>- articles from Singapore</li> <li>- sources older than 2010, except the latest definition of terms used</li> <li>- sources in other languages, except English and Bahasa Indonesia</li> </ul>

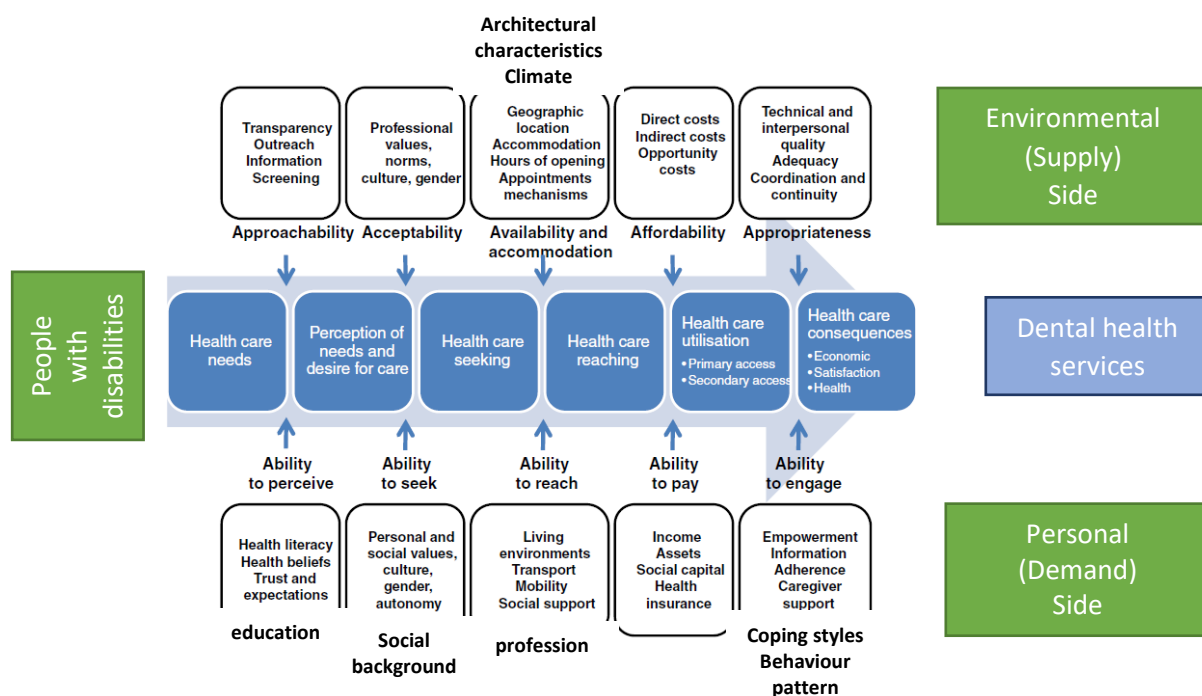
### 3.3. Limitations to the study design

There are possible limitations in information to determine the contributing factors to the access to DHSs for PWDs in Indonesia according to the conceptual framework based on the existing literature. However, literature from LIMCs in Southeast Asia was also used as references. Real experience from the writer as a dental health professional in Indonesia was included to overcome the limitation.

### 3.4. Conceptual Framework

In this paper, the conceptual framework of access to health care by Levesque et al. (2013) (see Figure 8, **Annex 2**) with some modification is used to analyse the factors determining the access to DHSs for people with different types of disabilities (see Figure 3).

Figure 3. The framework of access to DHSs for PWDs



The original conceptual framework was established in order to describe broad dimensions and determinants of access to health care by integrating the demand and supply-side factors that reinforce or inhibit the process towards obtaining health care. The supply factors are provided by the health system, whereas the demand factors are abilities of individuals, as 'health care demanders', to get their health care needs to be fulfilled(18). This model was chosen because it places the dimensions systematically for analysing the process of obtaining access to DHSs for PWDs in Indonesia. The demand side refers to PWDs, which interact with the health system of the country in the supply side.

Other frameworks of access to medical care were considered, but are not used in this study, for example, the framework of access to medical care by Lu Ann Aday (1974) and the framework of access to health care by Roy Penchansky (1981)(56,57). The framework by Lu Ann Aday (1974) conceptualised the access to medical care as a goal of reaching the health policy so that the focus of this framework is more on the policies in the health system(56). Roy Penchansky's model in access to health care (1981) focuses more on how to improve the quality of health care(57). Both frameworks do not describe the process of obtaining access to health care whose determinants are going to be analysed in this study.

A modification was done to clarify that the upper dimensions refer to the supply or environmental factors, and the underlying dimensions belong to the demand or personal factors. The modification was inspired by The International Classification of Functioning, Disability and Health (ICF) where the activities and social participation of PWDs are determined by contextual factors (environmental and personal factors)(58). This concept will strengthen the framework for analysing the determinants of obtaining access to DHSs for PWDs in Indonesia.

In the modified conceptual framework (Figure 3), access to DHS starts with DHS needs. The first process to obtain the access to DHSs for PWDs is building their perception about DHS needs and desire to care, determined by approachability, on the supply side, and PWDs' ability to perceive, on the demand side. Secondly, the process of seeking DHSs for PWDs is determined by the acceptability of DHSs and PWDs' ability to seek DHSs. The process of reaching DHSs by PWDs is determined by the availability and accommodation, and their ability to reach DHSs. Next, the utilisation of both primary (first-line) and secondary (referral) DHSs is determined by affordable DHSs and PWDs' ability to pay DHSs. Finally, the process of engaging PWDs to DHSs' consequences (economic, satisfaction, dental health outcome) is determined by the appropriateness of DHSs and PWDs' ability to engage DHSs. In the end, enabling the whole process of obtaining access to DHSs indicates an effective utilisation of DHSs by PWDs(18).

On the supply side, approachability includes transparency, outreach, information, and screening. Transparency in DHSs means that information from health institutions about DHS delivery, such as appropriate professionals, resources and the financial aspects of DHSs for PWDs are publicly accessible and available. Dental health outreach for PWDs means providing DHSs by mobilising dental health practitioners to places where individuals with disabilities live or where the community of PWDs gather, for instance, special schools or institutions, and disabled people organisations. Information refers to any dental health information which purpose is to promote dental health, DHSs, and to help PWDs perceiving DHS needs. Dental health screening is a significant effort to detect and treat dental problems earlier in order to prevent complications.

Acceptability of DHSs for PWDs is influenced by the professional values of DHS providers, norms, culture, and gender. Professional values relate to the competences of DHS providers in treating PWDs' dental problems based on their needs. Norms are values and attitudes of DHS providers during the DHS delivery to PWDs. Culture refers to PWDs' beliefs that are associated to the systems of dental treatments and procedures for PWDs. Gender means that specific gender of DHS providers could influence the acceptability of DHSs for PWDs.

Availability and accommodation of dental health facilities is also a dimension on the supply side, influenced by geographic location, hours of opening, and appointment mechanisms of DHSs. Geographic location means that whether dental health facilities are physically existing and promptly accessible for PWDs. Hours of opening of DHSs for PWDs in Indonesia means that visiting hours are generally available based on regular schedule (8 a.m. to 4 p.m.) or emergency hours (24 hours). Appointment mechanisms include the methods of making appointments and appropriate visiting hours for PWDs in dental health facilities. Adopted from the environmental factors in the ICF, architectural characteristic

of dental health facilities means that building of a dental health facility is constructed friendly and accessible for PWDs. Climate refers to the influence of the dry and rainy season in Indonesia to the availability and accommodation of DHSs.

Affordability of DHSs is influenced by direct, indirect, and opportunity costs of dental health facilities. Direct costs are money needed that is targeted to the use of dental treatment, for example, drugs, dentists' and nurses' services, radiograph tools, and dental materials. Indirect costs are money needed that is not directly related to the use of dental treatment, for example, dental health administration, medical record of patients, and maintenance services for the facility or building. Opportunity costs are related to the money needed that are estimated to cover forgone benefits caused by a particular use of human resources, materials, or services in a dental health facility.

Appropriateness of DHSs for PWDs include technical and interpersonal quality of DHS providers, adequacy of dental treatments, coordination and continuity of DHSs(18). Technical quality relates to DHS procedures and patient's behaviour management of DHS providers; and interpersonal quality is the provision of appropriate dentist-to-patient communication for PWDs. Adequacy refers to the performance of DHS providers in achieving appropriate DHS outcomes. Coordination means that whether a communication between dental health practitioners who treats PWDs, with other medical or health practitioners, for example, medical doctors, nurses, or pharmacist, produces sufficient DHS outcomes. Continuity refers to whether continuous dental treatments produce appropriate DHSs for PWDs.

On the demand side, PWD's ability to perceive DHS needs is determined by their dental health literacy and education, beliefs about dental health and sickness, as well as their trust and expectations on DHS providers. PWDs' ability to seek refers to their personal autonomy to choose DHS options, personal values and social background (adopted from the personal factor of ICF), gender and culture. Personal values are related to their types of disabilities, and social background refers to PWDs' socio-economic condition.

PWDs' ability to reach DHSs depends on their living environment, transport (urban or rural), mobility (age or types of disability-related), social support (family or personal assistant), and profession (adopted from the ICF; for example, restrictions of absent from work). Their willingness to pay after reaching the health services is contributed by the factors: personal income, assets, social capital, and health insurance.

Finally, PDWs' ability to engage in DHSs is influenced by empowerment, information during dental treatments, adherence, and DHS providers' support (18). Adopted from the ICF, coping styles and behaviour pattern are added to PWDs' ability to engage DHSs. Empowerment means that PWDs in Indonesia are empowered to participate in the decision making of dental treatments. Adherence means that PWDs are cooperatively following the treatment steps and willing to come back for a visit if required. DHS providers' support is interpreted as any kind of support given by the dentists in order to reach effective dental treatment outcomes, for example, motivation. Coping style is related to PWDs' behaviour during their dental visits, based on their cooperation. Behaviour pattern refers to the maintenance of PWDs' dental health behaviour in order to produce sufficient dental health outcomes.

In this study, the framework was used (in a structured way) to identify all existing supply and demand factors that play a role for PWDs to access DHSs in Indonesia. The findings – based on the literature study – were used to analyse the reinforcing and inhibiting factors in the process of obtaining access to DHSs, based on the types of disabilities (physical, mental, intellectual, and sensory disability). Furthermore, the framework was used as a guidance to discuss possible interventions as well as to formulate the conclusion and recommendations on enabling adequate access to DHSs for PWDs in Indonesia.

## **4) FINDINGS: WHAT DETERMINES ACCESS TO DENTAL HEALTH SERVICES FOR PWDS IN INDONESIA**

### **4.1. Supply/Environmental factors**

#### **4.1.1. Approachability**

##### Dental Health Information

Dental health information influences the approachability of dental health professionals to promote DHSs to PWDs in Indonesia. Parents of children with Down Syndrome in Surabaya city were provided with dental health information by dental public health practitioners. Specific messages delivered were the optimal time to brush their children's teeth, food and drinks that are favourable for their children's dental health, and time to visit the dentist for their children's dental health check-up. Those dental health practices have to be in the same level of parents' responsibilities as the attention to their children's self-care activities, such as urination, defecation, bathing, and menstruation (for female children)(59). Furthermore, the study reveals that most of the parents of children with Down Syndrome have a responsive parenting style which supports the application of the delivered dental health information. Therefore, providing dental health information to parents of children with Down Syndrome is an essential value for the approachability to DHSs for their children because of the developed perception of the parents in including dental health of their children as their responsibility(59).

##### Transparency in DHS

People with an intellectual disability in Indonesia do not obtain access to transparent information, as it should be implemented according to the national law number 89 of 2015. According to the law, DHSs for people with intellectual disability are provided by paediatric dentists or dentists who are certified in special care dentistry using specialised dental equipment in a team. The team consists of a minimum of one dentist and one dental nurse who is directly involved during dental treatment. Transparency in information helps people with intellectual disabilities, their family members, or their personal assistants to decide about the appropriateness of DHSs. Information regarding the coverage of dental treatment for people with an intellectual disability by the national public health insurance and the amount of money needed for DHSs are not available in public. So, people with intellectual disability are not targeted and reached by DHSs with transparent information about appropriate DHSs in Indonesia(60).

##### Dental health outreach

Children with visual-sensory disability from The National Special Needs School Type A, Jakarta city were provided dental hygiene training by paediatric dentists in their school. Instructions, demonstrations, teeth brushing practices were conducted to the children by using songs and a dental model. The children's tactile abilities enable practitioners to make use of demonstration on a dental model, prepared by the dental health practitioners, while instructions were given verbally. The children were instructed to brush their teeth at home with the methods they had learnt at school. After one week of observation, it has proven that this method improves the dental hygiene of children with visual impairments. Therefore, this practice is an example of supporting the approachability of DHS to people with visual-sensory disability through dental health outreach because it encouraged the children to learn the behaviour in maintaining their dental health and the outreach program was successfully done(42).

##### Dental health screening

People with a physical disability are experienced dental health screening on dental hygiene and caries in Makassar city by dental health providers(61). In Bandung city, screening on oral hygiene was targeted to people with cerebral palsy. The screening exposed that oral hygiene level of people with cerebral palsy is in inadequate criteria(62). People with an intellectual disability were screened on malformation of a specific tooth which resulted over 80 per cent of people with an intellectual disability need proper and early treatment

due to the malformation of their teeth (62,63). Dental diseases of people with bipolar disorder were examined by dental health practitioners in the psychiatric hospital of North Sumatera and resulted in a prevalence of dental problems of around 21 per cent (64). According to the examples mentioned above in Indonesia, the existing dental health screening activities for PWDs are good examples of how DHSs can improve its approachability. Dental health screening for PWDs offers opportunities for dentists to detect problems and provide instant advice about prevention and treatment of dental problems. For example, people with cerebral palsy are advised to visit the dentists to undergo dental scaling treatment in order to prevent tooth loss due to inadequate oral hygiene. Another example is the advice given regarding early treatment on tooth malformation in people with an intellectual disability which will prevent chewing, sucking and swallowing problems. Such advice will build PWDs' perception about a need for using DHSs(62,63).

#### **4.1.2. Acceptability**

##### Professional values

Specific professional values of dental health providers are necessary to treat PWDs with special care needs. A study in Jakarta city has proven that effective communication and behaviour management of dentists to patients with a hearing-sensory disability can reduce their anxiety during dental treatments(65). Almost 70 per cent dentists in first-line dental health services of Bandung city possess the knowledge of providing oral health services for children with disabilities (37).

Sedation and anaesthesia procedures are critical professional skills in order to provide appropriate DHS to people with mental, sensory and intellectual disability(48,60,66). However, the acceptability of dental health practitioners is related to the availability of specialists in paediatric dentistry and oral surgery. Their specific competence is the ability to treat patients (not only children) with special care. Indonesia does not possess specialists in special care dentistry yet.

Additionally, dental treatments with general anaesthesia can also be performed by an oral surgeon. According to the data from the Indonesian dentists' association (per 10th July 2020), only around 1.5 per cent of the total number of dentists in Indonesia are specialists in paediatric dentistry. Only 1.6 per cent dentists in Indonesia are oral surgeon, and most of them are practising in the dental health facilities of urban areas (see Table 8, **Annex 3**)(28). A similar study in Malaysia mentioned that special care dentistry is inadequately trained during the dental school, which influence their professional values after being a dentist(67). Therefore, the professional values of dental practitioners generally inhibit the acceptability of DHSs for PWDs with special care needs in Indonesia.

##### Norms, culture, and gender

Studies regarding the acceptability of DHSs for PWDs based on the norms, culture and gender values in Indonesia has not been found yet.

#### **4.1.3. Availability and accommodation**

##### Geographic location

The availability of DHSs based on the geographic location inhibits people with special care needs in rural areas because of the insufficient number of dental specialists available in rural areas, especially for people with a mental disability(28,48). In a dental hospital of Jakarta city, general anaesthesia procedure was done in order to provide effective dental treatment to children with a mental disability(12). However, people with ASD (mental disability) were ignored by the public health centre, only because they need special DHSs(68).

From the example above, the availability of DHSs which accommodate treatment needs for people with a mental disability is distributed only in urban areas of Indonesia. Public health centres with DHSs are placed in every sub-district with a working area of 5 km in radius(1). However, they do not provide appropriate DHSs for people with a mental disability. As a result, they are referred to the hospital, which is geographically far from their residence.



### Architectural characteristics

There was no study found in Indonesia which mentioned the influence of architectural characteristics of dental health facility for PWDs in Indonesia. However, research was done in Thailand regarding access to DHSs for people with a physical disability, especially adults who are using wheelchairs. Over 78 per cent wheelchair users in Thailand do not attend DHSs in 2017 because they are not supported with reasonable accommodation for using their wheelchair in the dental health facility(69). Adopted from a similar situation in Thailand, no evidence shows that the architecture of dental health facilities in Indonesia supports the accommodation of people with a physical disability.

### Hours of opening

Dental hospitals in big cities, such as Jakarta, Bandung, Yogyakarta and Makassar, provide regular and emergency hours with dental specialists who are competent in special care dentistry (70–73). Therefore, the opening hours could form a reinforcing factor of available DHSs for PWDs in big cities of Indonesia.

### Climate

There was no study found regarding the influence of climate on the access to DHSs for PWDs in Indonesia.

### Appointments mechanisms

Adequate appointment mechanism with proper visiting hours for people with a mental disability was found in the teaching dental hospital of Bandung city. They are patients of paediatric residents because of their study requirements to provide special care for people with kinds of disabilities (including mental, intellectual, and sensory disability)(66). This system is applied in other paediatric dentistry's specialist programs in Indonesia which supports the access to appropriate DHSs for people with special DHS needs. However, according to a law study regarding the rights on the dental health of people with intellectual disability, they are not supported by sufficient visitation hours, proper dental health resources and equipment as stated in the law number 89 of 2015(60). The statement above is related to the appointment mechanism of every public health centre and clinics as first-line dental health facilities. They are not able to provide adequate visiting hours for people with an intellectual disability because of the equal estimation time given for each treatment per patient in the dental health facility(60).

#### **4.1.4. Affordability**

##### Direct and indirect costs

Direct and indirect costs of the *Puskesmas* and clinics come from BPJS Health. The national health insurance institution provides every month in the amount of IDR 2000/members registered in the first-line dental health facility (equivalent to 0.15 Euro) for the direct and indirect costs. There is no distinction between people with and without disabilities in the costs provided by BPJS Health to dental health facilities. As a result, first-line dental health facilities are not able to provide special care to PWDs because the equipment used and procedures cost higher than the services to people without a disability in the same dental problem (74,75). Following the regulation of the health system, people with special care needs have to be referred to the hospital, where adequate facilities are available, and BPJS Health's full coverage system for hospitals supports the affordability of PWDs. It means that PWDs who follow the referral procedures, do not have to pay additional costs (76).

##### Opportunity costs

There was no study found yet which discusses specifically the opportunity costs of DHSs for PWDs in Indonesia.

#### **4.1.5. Appropriateness**

##### Technical and interpersonal quality

In the dental teaching hospital of Bandung city, children with intellectual and mental disability are provided with specific interventions. Children with a mental disability experience DHSs with modified behaviour management called Sensory Adapted Dental Environments (SADE) in order to prevent defensive reaction and anxiety of the patient during dental treatment (66). Children with an intellectual disability are provided with various behaviour management techniques, such as tell-show-do. Also, general anaesthesia is conducted during the DHS (77). Thus, behaviour management skills and general anaesthesia for children with intellectual and mental disability might play an essential role in appropriate technical and interpersonal quality of DHSs (66).

#### Adequacy

A study was conducted in a public health centre in Ponorogo district, East Java, regarding the health service, including DHSs, for intellectually disabled people. The result was that people with an intellectual disability, who were in needs of DHSs, were referred to the general hospital in order to provide them with adequate DHSs (78). Due to limited specialised human resources and equipment in providing DHSs and other curative health services in the public health centre of Ponorogo district, DHSs for people with an intellectual disability cannot be provided. Besides, another literature mentioned that private clinics are not appropriate for treating PWDs, especially people with an intellectual disability. They need special dental treatment procedures by dental specialists, as private clinics do not have sufficient equipment for conducting those procedures; and human resources for certain PWDs. Special treatment procedures mentioned that are needed for adequate dental treatments are the procedures during dental emergencies, giving anaesthesia or sedation, which requires much time and complex procedures(77,79). Based on the examples above, adequacy could be a barrier of access to DHSs for people with intellectual disability in Indonesia, especially in first-line dental health facilities.

#### Coordination and continuity

The dentist in the dental teaching hospital in Bandung city, who is in charge of the DHS of a patient with a mental disability, coordinates with the medical doctor about the specific diagnosis of the patient with mental disability in order to choose appropriate behaviour management techniques during the dental treatment(66). During the first appointment, the patient was provided with introduction and behaviour management services by the dentist in order to make the patient comfortable during dental treatments(66). From the coordination with the medical doctor, the dentist learnt that the appropriate intervention during the second dental visit was to give the patient a specific communicative behaviour management, tell-show-do. The aim is to reduce the patient's defensiveness during the dental treatment in the second dental visit. As a result, dental treatments to that patient with a mental disability were successfully done on the second dental visit(66). From this example, coordination across medical or health practitioners and a continuous DHS indicate reinforcing appropriate DHSs for people with a mental disability.

## **4.2. Demand/ Personal factors**

### **4.2.1. Ability to perceive**

#### Dental health literacy and education

Surveys were done in Yogyakarta city and west Sumatera, and they reveal that poor oral health in children with an intellectual disability is associated with their low dental health literacy. It influences their perception about dental healthcare badly, as a result of their difficulty in understanding dental health education and the importance of their oral health condition (36,80). In Bandung city, the community of people with a physical disability (amputees) have not experienced dental health education before, which is one of the causes of their low dental health literacy; and is an existing factor that inhibits their perception from accessing DHSs (40).

Children with a visual-sensory disability in the National Special Needs School Type A, Jakarta city experience dental health education in toothbrushing using dental model and songs which is a supporting factor to their ability to perceive DHS needs(42).

Hence, low dental health literacy and less dental health education programs for people with intellectual and physical disability could inhibit their ability to perceive needs for DHSs. People with visual-sensory disability's perception about DHS needs might be reinforced by dental health education.

#### Dental health beliefs

The dental health beliefs of PWDs, in general, are determined by religious values. As most of the Indonesian population are Muslims, the lesson learnt from the religion is that the health, including dental health and disability, is a blessing from God and the human has to maintain it properly. Another lesson learnt from Islam is that diseases, including dental health problems, have to be cured patiently with prayers and should be treated by a professional. These values encourage PWDs to learn how to recognise dental problems as a part of their perception about DHS needs (79). Therefore, dental health beliefs of PWDs might be a facilitating factor of access to DHSs for PWDs in Indonesia.

#### Trust and expectations

Research on the dental health needs of children with an intellectual disability resulted that their parents expect a professional and specialised-skilled dentist who is competent to undergo dental treatment for their intellectual disabled children(36). They prefer to choose hospitals as the appropriate dental health facility for their children. So, trust and expectations of parents of children with intellectual disability on the specification of DHS providers reinforce the ability to perceive DHS needs(36,81). Parents of children with ASD (mental disability) prefer dentists whom they trust and know their family well(68). Therefore, the perception of the parents about trust and expectation to the dentists indicate reinforcing people with mental and intellectual disability to access DHSs.

### **4.2.2. Ability to seek**

#### Personal values and social background

Parents assist children with Down Syndrome in seeking appropriate DHSs, based on parents' desired quality of care(59,81). Low and middle household income of people with an intellectual disability prefer to visit hospitals because general and dental hospitals employ dental specialists who provide special need services. Furthermore, PWDs in low and middle household income expect an affordable cost for the DHS and a waiting time of no longer than 15 minutes(81,82). These preferences help PWDs in the process of seeking appropriate DHSs based on their personal needs and socio-economic level. Based on the findings, personal values and social background of people with intellectual disability in Indonesia indicate reinforcing their ability to seek DHSs.

#### Culture, gender, and personal autonomy

Studies about the influence of culture and gender to PWDs' ability to seek DHSs were not found. People with a mental disability have to be directed by their family members or personal assistants to seek DHSs. The cause is that people with a mental disability are not able to recognise their dental problems by themselves and they have low awareness on their personal dental health, as a result of their disability, which affects their personal autonomy(68). Thus, personal autonomy might inhibit people with a mental disability to seek DHSs in Indonesia.

### **4.2.3. Ability to reach**

#### Living environments

A study regarding the dental health of people with bipolar disorder (mental disability) was done in the psychiatric hospital, North Sumatera Province. The result was that their living environment as an inpatient in the psychiatric hospital supports their access to DHSs(64). In general, living environments are divided into urban and rural areas. The number of PWDs living in rural areas is slightly more than in urban areas(21). Indonesia consists of around 80 per cent of rural areas (see Table 9, **Annex 4**), and the living environment of PWDs in rural areas is a barrier to access of DHSs because the distance to the hospitals is more than 5 km and public transportation is not common (see Table 10, **Annex 4**) (83).

### Transport

People with physical disability are supported by public transportation, modified personal vehicle, and family or neighbourhood's assistance to reach dental health facilities(40). People with visual-sensory disability in West Java experience insufficient public infrastructure, for example, sidewalk guides and audible traffic signs, which accommodate them to reach dental health facilities for DHSs(39,84).

### Mobility

People with a physical disability who are residing in social homes are troublesome in getting permission to go outside from their caretaker, including for health purposes. So, it inhibits their mobility in accessing dental health facilities(61).

### Social support

Intellectually disabled people are assisted by their family members or personal assistants to reach the dental health facility(36). According to the study about the dental health of people with ASD in Jambi city, people who have an ASD (mental disability) are supported by their family members for transport to dental health facilities(68). Socially supporting people with mental and intellectual disability indicates facilitating their ability to reach DHSs.

### Profession

Around 30 per cent of the total PWDs in Indonesia are employed, so that they have to follow the rules of their employees, including their working time(21,85). Employed people with physical disability are not able to reach DHSs during working hours because of the consequences. They are not paid for leaving from work because of sickness(74).

## **4.2.4. Ability to pay**

### Health insurance

In general, the government has provided the population with a mandatory national health insurance membership which covers the DHS costs comprehensively(75). The Ministry of Social Affairs (MOSA) categorises PWDs who are living below the poverty line or unemployed as subsidised members of BPJS Health. So, the government fully pays PWDs' BPJS Health membership premiums. PWDs who are working in the formal sector (only one per cent of the total PWDs in Indonesia) pay their membership premiums through payroll tax for health. PWDs in the informal sector pay a flat rate for their premiums through out-of-pocket spending every month in advance(85). Parents pay BPJS Health's premiums of their children with a disability. The national health insurance scheme enables PWDs to utilise DHSs without financial hardship by following the tiered health referral system(76). Another study was found in rural areas of Indonesia that there are still children with a mental disability who are unsubsidised so that they are not able to utilise DHSs because of the inability to pay by out-of-pocket spending(59,86).

### Income and assets

People with mental, hearing-sensory and physical (cerebral palsy) disability in Indonesia have a high prevalence of untreated dental caries, and it is associated with their low family's household income. Low household income results in a low perception about DHS need, and it inhibits their ability to pay special DHS needs(86). Literature about the dental health status of PWDs in Malaysia states that poor oral hygiene status and their untreated dental problems are associated with a low monthly household income (87). Hence, low household income and assets of PWDs might inhibit the ability to pay DHSs in Indonesia.

### Social capital

A study regarding the social capital for people with intellectual disability was done in a village in East Java, and it resulted to an economic activity of the community in the village to support people with intellectual disabilities to undergo medical treatments, including dental treatments, because the lives of intellectually disabled people are their

responsibilities. Their family members and the community support people with intellectual disability(88). Therefore, social capital for people with an intellectual disability could facilitate their ability to pay appropriate DHSs in Indonesia.

#### **4.2.5. Ability to engage**

##### Empowerment

People with speech-sensory disability are facilitated with a model of consultation (technology-based), which helps them to communicate actively with their dental health providers. Empowerment using supportive equipment reinforce people with a speech-sensory disability to be engaged in appropriate DHSs, through the improvement of the quality of doctor-to-patient communication (89).

##### Information to dental treatments

Information regarding dental treatments given to PWDs is presented in the form of an 'Informed consent' which is signed by the patient, parents or personal assistant who are legally responsible to the patient. Children with a mental disability in the teaching dental hospital, Bandung city, were informed both to the patient and their parents about dental treatment planning. After the explanation, the dentist and parents sign the informed consent. Information and agreement to dental treatment determine the engagement of people with mental disability to achieve an adequate DHS with additional support from their parents(66).

##### Adherence and DHS provider's support

Studies regarding the contribution of adherence and DHS providers' support for the engagement of PWDs in Indonesia were not found.

##### Coping styles

The case study in the teaching dental hospital in Bandung city found that people with a mental disability have a defensive coping style at the beginning of their dental treatment(66). Furthermore, people with an intellectual disability do not cope emotionally with the complex referral system and long waiting time. They could visit private hospitals that provide those special care, but they face financial barriers to fulfil the financial requirements because of poverty(36).

##### Behaviour pattern

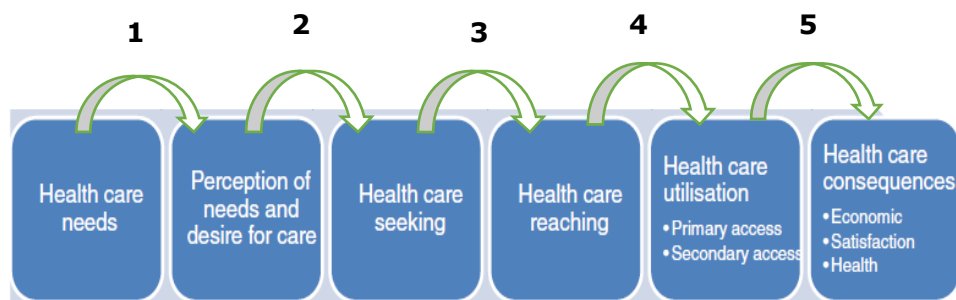
It has been found that the dental behaviour pattern of people with an intellectual disability in Indonesia resulted in a different pattern of dental caries and periodontal problems, for example, dietary pattern and low frequency of dental visits. The effect of a different dental behaviour pattern could inhibit their dental health outcomes (45). Thus, dental behaviour pattern of people with an intellectual disability in Indonesia could be an indication of a low engagement to DHSs.

## 5) DISCUSSION: ANALYSING FACTORS REINFORCING AND INHIBITING ACCESS TO DENTAL HEALTH SERVICES FOR PWDS IN INDONESIA

### 5.1. Existing factors

This sub-chapter analyses the factors identified above, according to the reinforcing and inhibiting role in the process of obtaining access to DHSs for people with a physical, mental, intellectual, and sensory disability in Indonesia (Figure 4). Those factors are under the large clusters of determinants of access to DHSs. These clusters are: 1) the perception building on DHS needs; 2) the process of seeking DHSs; 3) the process of reaching DHSs; 4) affordable DHS utilisation; and 5) the engagement to DHS consequences.

Figure 4. The process of obtaining access to DHSs for PWDS in Indonesia (left to right)



Based on the findings, not all identified factors are existing in every type of disability in Indonesia. Some factors are interrelated and targeted to a specific type of disability. However, factors that generally belong to all PWDS in Indonesia are hours of opening, direct and indirect costs, dental health beliefs, living environment, and health insurance.

#### Factors related to all disabilities

Proper opening hours (regular and emergency) are only found in hospitals of big cities in Indonesia. This factor is interrelated with the living environment of PWDS. PWDS who are living in urban areas have better access to proper opening hours of DHSs than PWDS in rural areas. Hours of opening and living environments reinforce PWDS who are living in urban areas but inhibit PWDS in rural areas to reach DHSs. However, it depends on the geographical location of available dental health facilities, transportation, and the capacity of people with different types of disabilities to reach DHSs.

Direct and indirect costs of dental health facilities are interrelated with health insurance as the costs are originated from BPJS Health. PWDS who are members of BPJS Health have paid their premiums in advance, or they are fully-subsidised by the government, and they do not need to pay additional costs for any dental treatments as long as they follow the referral system. Most of PWDS who need specialised DHSs have to be referred to the hospital. Direct and indirect costs, provided by the health insurance to dental health facilities, generally do not contribute to the low access to DHSs for PWDS in Indonesia. However, to provide special care in the first-line dental health facilities, the current direct and indirect costs are still a barrier for implementation. This factor could also inhibit PWDS in seeking DHSs because of financial consideration, such as health insurance and treatment costs, is (from another literature) known as a factor of seeking DHSs for PWDS in Indonesia, as a result of PWDS' low-middle household income and poverty(74,90).

In general, sick people in Indonesia who do not access the health facility mostly claimed that they could cure the diseases by themselves and claimed that medical treatments are not necessary, but not for PWDS. They are reinforced by dental health beliefs which are strongly influenced by their religion, not only for people with a physical disability, but also for people with a mental, intellectual, and sensory disability.

### Physical disability

According to the findings, dental health screening reinforces people with a physical disability in building their perception about DHS needs by providing immediate advice and approaches for improving their dental health during dental health screening. However, studies were found in urban areas of Indonesia; and reports on dental screening to PWDs in rural areas were not available. Low dental health literacy and education of people with a physical disability might inhibit their perception building on accessing DHSs due to unimplemented dental health education programs. Dental health literacy and dental health screening are contradicting factors because the studies found were in two different locations and communities, even though dental health literacy and education can be built during dental health screening.

In reaching DHSs, they are reinforced by adequate transportation but inhibited by their mobility and profession. The cause is that people with a physical disability who are living in social homes get less approval for leaving home by the caretaker. Employed people with a physical disability do not get permission for accessing DHSs, although both public and private transportation means facilitate them. Architectural characteristics of the dental health facility are still hindering them from accessing DHSs, which is reported in a similar situation in Thailand. For example, the path for wheelchair users, its degree of steepness, and the availability of special toilets for PWDs are forms of reasonable accommodation that are not optimally implemented yet in most dental health facilities of Indonesia.

The household income of people with cerebral palsy was mentioned as inhibiting their ability to pay DHSs. Their income might not be sufficient for paying health insurance premiums. Based on the writer's expertise, the dental health coverage of people with cerebral palsy should be fully-subsidised by the government because of the type of disability. Based on this analysis, the reinforcing and inhibiting factors of people with a physical disability were presented in Table 4.

Table 4. Factors of access to DHSs for people with a physical disability\*

<b>Type of disability</b>	<b>Cluster of determinants</b>	<b>Reinforcing factor (+)</b>	<b>Inhibiting factor (-)</b>
<b>Physical</b>	1) Building the perception about DHS needs	Dental health screening	Dental health literacy and education
	2) Process of seeking DHSs		
	3) Process of reaching DHSs	Transportation	Architectural characteristics Mobility Profession
	4) Affordable DHS utilisation		Income (cerebral palsy)
	5) Engagement to DHS consequences		

\*Blue cells stand for factors that are not specifically existing for people with a physical disability.

### Mental disability

Dental health screening for people with a mental disability reinforces them not only to perceive DHS needs but also to receive prompt dental treatments by dental health professionals after the day of dental health screening. Trust and expectations to DHS providers reinforce parents to understand appropriate providers needed for their children with a mental disability. For adults with a mental disability, family members could assist them in understanding the DHS needs.

Dentists' professional values as inhibiting factors are related to the low availability of specialised DHSs that children with mental disability need promptly. For example, children with ASD are more prone to dental injury on their anterior teeth (13). However, dental emergency treatments with appropriate behaviour management techniques by dental specialists do not exist in most of the first-line dental health facilities in Indonesia.

The living environment of mentally disabled people is only a facilitating factor for people with a psychiatric disorder who are inpatients of a psychiatric hospital. Their general and dental health are monitored by health professionals and the personal assistant in the hospital.

People with ASD are reinforced by social support to reach DHSs. However, the geographical location of DHSs hinders people with mental disability to reach specialised DHSs. The factor is interrelated with the availability of appropriate DHS professional values. People with a mental disability currently need to be treated by a specialist in paediatric dentistry or oral surgeon who are competent in special care dentistry. Based on the distribution of dentists (Table 8, **Annex 3**) and the criteria of urban and rural areas in Indonesia (Table 9, **Annex 4**), dental professionals with those specialised skills do not cover all areas of Indonesia. Therefore, geographical location is an inhibiting factor of reaching appropriate DHSs for people with a mental disability.

Appointment mechanisms are contradicted with the income of mentally disabled people's household income because proper appointment mechanisms are existing in private dental hospitals of big cities where BPJS Health does not cover the costs of the DHSs. As a result, people with a mental disability have to pay DHSs by out-of-pocket spending. Families of people with a mental disability in Indonesia have an average of low-middle income, so that inhibits their ability to pay DHSs.

Technical and interpersonal quality of dental health providers engages them to appropriate DHSs through modified behaviour management practices, such as SADE, tell-show-do and giving clear and short commands during the dental treatment (13). Defensive coping style of people with mental disability inhibits their engagement to appropriate DHSs. Nevertheless, coordination and continuity systems applied in the dental hospital and informed consent to people with mental disability reinforce producing appropriate DHS outcomes, which could also be applied to people with physical, intellectual, and sensory disabilities. Informed consent encourages PWDs to take part in the decision making of their dental treatment for desired DHS outcomes, and satisfaction (91). Based on this analysis, the reinforcing and inhibiting factors of people with a mental disability are presented in Table 5.

Table 5. Factors of access to DHSs for people with a mental disability\*

Type of disability	Cluster of determinants	Reinforcing factor (+)	Inhibiting factor (-)
<b>Mental</b>	1) Building the perception on DHS needs	Dental health screening Trust and expectations (ASD)	
	2) Process of seeking DHSs		Professional values Personal autonomy
	3) Process of reaching DHSs	Living environment Social support (ASD) Appointment mechanisms	Geographical location
	4) Affordable DHS utilisation		Income
	5) Engagement to DHS consequences	Technical and interpersonal quality Coordination and continuity Information to dental treatments	Coping styles

\*Blue cells stand for factors that are not specifically existing for people with a mental disability.

#### Intellectual disability

Dental health information, dental health screening, trust and expectations on DHS providers are predisposing factors to perceive DHS needs for people with intellectual disability(90). Similar to people with a mental disability, those factors lead to understanding the need for prompt and appropriate dental treatment for people with an intellectual disability. However, transparency in DHSs details, such as the costs of special



care and low dental health literacy and education, inhibit their perception about access to DHSs.

In seeking appropriate DHSs, people with an intellectual disability are inhibited by the professional values of DHS providers because of the needs for special care. The type of special care needed is dental treatment with pharmacological behaviour management techniques. For example, people with Down Syndrome are more prone to rampant caries due to a thin enamel structure of their teeth (caused by genetic) and as a result of a prolonged bottle-feeding during their childhood(92). Treating rampant caries in people with special care needs appropriately, including people with Down Syndrome, is by performing restoration of all infected teeth in sedation or general anaesthesia procedure by dental specialists. That type of special care is not available in most first-line dental health facilities in Indonesia. Moreover, personal values and social background reinforce people with an intellectual disability to visit hospitals for DHSs.

Social support by family members helps people with an intellectual disability to reach dental health facilities promptly. Inhibiting determinants still exist due to the geographic location of available specialised DHSs and inadequate appointment mechanisms for people with an intellectual disability. The social capital of the village or neighbourhood supports them in being able to pay those specialised DHSs.

Appropriate technical and interpersonal quality of dental health providers might exist only in hospitals of big cities in form of performing specific interventions and behaviour management techniques, such as tell-show-do and sedation. Furthermore, adequacy, coping styles, and behaviour pattern are still barriers to obtain satisfactory DHS outcomes. Based on this analysis, the reinforcing and inhibiting factors of people with an intellectual disability are presented in Table 6.

Table 6. Factors of access to DHSs for people with an intellectual disability\*

Type of disability	Cluster of determinants	Reinforcing factor (+)	Inhibiting factor (-)
<b>Intellectual</b>	1) Building the perception about DHS needs	Dental health information Dental health screening Trust and expectations	Transparency Dental health literacy and education
	2) Process of seeking DHSs	Personal values and social background	Professional values
	3) Process of reaching DHSs	Social support	Geographical location Appointment mechanism
	4) Affordable DHS utilisation	Social capital	
	5) Engagement to DHS consequences	Technical and interpersonal quality	Adequacy Coping styles Behaviour pattern

\*Blue cells stand for factors that are not specifically existing for people with an intellectual disability.

#### Sensory disability

The factors for sensory disability in the results are including visual, hearing, and speech-sensory disability. The process of getting the perception about appropriate DHS needs is reinforced by dental health outreach and dental health education for visual-sensory disability. Unique methods were done on dental health outreach and education to people with visual-sensory disability. The particular needs of sensory disability in DHSs are appropriate patient's behaviour management because of a higher risk of anxiety(65). It influences their seeking of appropriate DHSs; the professional values of dentists inhibit people with hearing-sensory disabilities because of the availability of specialised DHSs for them. It might be associated with the low availability of DHS professionals who understand and apply sign languages to communicate with patients with hearing-sensory disability. However, people with hearing-sensory disability could be accompanied by their family member or personal assistant in the dental room for helping them in communication with the dentist.

People with a visual-sensory disability could be inhibited by transportation means and public infrastructures, such as low availability of audible traffic lights, tactile paving, and useful sounds in public transportation in reaching DHSs. The household income of people with hearing-sensory disability was found inhibiting their ability to pay DHSs. It could be associated with the inability to pay health insurance premiums. However, they could apply for the fully-governmental subsidisation of BPJS Health premiums. Empowerment methods using technology reinforce the effective utilisation of DHSs by people with a speech impairment. Nevertheless, technologies should also be used to engage people with hearing and visual-sensory disability to DHS consequences. Based on this analysis, the reinforcing and inhibiting factors of people with sensory disabilities are presented in Table 7.

Table 7. Factors of access to DHSs for people with a sensory disability\*

Type of disability	Cluster of determinants	Reinforcing factor (+)	Inhibiting factor (-)
Sensory	1) Building the perception about DHS needs	Dental health outreach (visual) Dental health education (visual)	
	2) Process of seeking DHSs		Professional values (hearing)
	3) Process of reaching DHSs		Transportation (visual)
	4) Affordable DHS utilisation		Income (hearing)
	5) Engagement to DHS consequences	Empowerment (speech)	

\*Blue cells stand for factors that are not specifically existing for people with a sensory disability.

## 5.2. Potential factors

The potential factors below were not found in the literature. They are based on the writer's experience and expertise as a dentist who was directly providing DHSs for people with disabilities in Indonesia.

### Norms, culture and gender

Indonesian norms, culture, and gender are generally contributing factors in the health system. Religious values influence them; for example, women tend to visit female health practitioners or have to be accompanied by their husbands. However, specific studies regarding the contribution of norms, culture and gender in accessing DHSs by PWDs were not found. According to the writer's expertise, PWDs in Indonesia prioritize professional values above other aspects of seeking appropriate DHSs. Further studies should be conducted through the Ministry of Research and Technology (MORT) regarding these specific factors.

### Climate

Climate is a co-factor of opening hours and appointment mechanisms. It could be a barrier to opening hours during rainy seasons because dentists might cancel all their appointments due to heavy rain and flood. Also, a barrier for PWDs to visit dental health facilities due to extreme weather could happen. Thus, climate influences access to DHSs for PWDs and other patients, and due to increased climate issues, this could be a potential factor in the future, due to climate change or emerging climate-associated oral diseases.

### Opportunity costs

Allocating budget for opportunity costs of first-line dental health facilities could be a reinforcing factor of available dental equipment and professionals. They are needed for the provision of geographically accessible specialised DHSs for PWDs in public health centres and clinics so that PWDs are less needed to be referred to hospitals.

### Adherence

Adherence to DHSs is influenced by many practices, for example, PWDs' adherence during the first dental visit, family support, and personal dental care at home. If those practices are performed, adherence should be a reinforcing factor in producing appropriate DHS outcomes.

### DHS provider's support

The personal motivation given by DHS providers to PWDs as patients during their dental visits should be a contributory factor to the engagement of DHSs because it influences PWDs' comfort to attend dental appointments and follow DHS providers' instructions.

Based on the analysis of factors from four different types of disabilities and disability in general, the most influential and mentioned factors of access to DHSs for PWDs are:

1. **Dental health literacy and education;** related to appropriate methods needed on promoting dental health for each type of disability.
2. **Professional values;** related to the need for competencies in special care dentistry, such as sedation, communicative behaviour management, technical and interpersonal skills. This factor is potentially interrelated with DHS provider's support and adherence for adequate DHS outcomes.
3. **Geographical location;** related to the need of available dental health facilities with special care, transportation, proper visiting hours and appointment mechanisms, specific architectural characteristics and dental health facilities in PWDs' living environment.
4. **Income;** related to the affordability of DHSs by health insurance coverage, in addition to the direct and indirect costs needed by dental health facilities.

## **6) DISCUSSION: POSSIBLE INTERVENTIONS TO ENABLE ADEQUATE ACCESS TO DENTAL HEALTH SERVICES FOR PWDS IN INDONESIA**

Following the process of obtaining access to DHSs (Figure 4, page 18), this chapter discusses possible interventions to enable adequate access to DHSs for PWDS in Indonesia, based on the factors analysed in chapter five.

### **6.1. The perception building on DHS needs**

Dental health literacy and education are the most influential factors in the perception building on DHS needs for PWDS. Considering the limitations of each type of disability, possible interventions on improving PWDS' dental health literacy could be an implementation of dental health education programs with unique methods that are appropriate for the understanding of every type of disability. For example, using songs and dental models for people with visual-sensory disability (continue current programs). Also, providing people with physical disability in upper extremities with electric toothbrushes, sign languages for people with hearing-sensory disability and using animations for people with intellectual and mental disability.

Stakeholders involved are the MOH, DOH, Indonesian dentists' association, communities of PWDS, and family members of PWDS. Dental health education programs could be implemented in the community of national Paralympic athletes, special needs schools, and public health centres.

The challenges might be how to achieve the outcomes of dental health education programs, PWDS' motivation to attend dental health education programs, and how to convince PWDS the urgency of a routine dental health education program. Strategies could be applying rewards system to PWDS and including these programs into their daily activities of the community and special need schools frequently. Also, training for dentists on how to achieve the outcomes of the dental health promotion to PWDS could be organized by the Indonesian dental association. Online training could nowadays be relevant to provide dentists from all areas of Indonesia with nationally standardized materials and methods, adopted from a successful online training for dentists in conducting dental health promotion to persons with disabilities in a developed European country(93).

### **6.2. Interventions on seeking DHSs for PWDS**

Professional values of DHS providers are the most influential factors in seeking DHSs for PWDS who need special care. They have high risks of severe dental anxiety and uncontrolled behaviour reaction during dental treatment. So, they have to seek for dentists who are competent in special care dentistry.

A small number of dentists with those competencies requires possible interventions to increase the number of dental specialists (in special care dentistry). In priority, they could be distributed to areas with a higher prevalence of PWDS (see **Annex 1**). Stakeholders involved in this policy are the MOH, the Ministry of Finance (MOF), Indonesian dentists' association, and the dentists.

Challenges to the implementation are formed by the low availability of appropriate equipment to conduct those specific services in most of the first-line dental health facilities and the motivation of dental specialists to practice in rural areas. Their willingness to practice in rural areas depends on the personal and the local government's interest because it could be associated with the funding source of the residency. Most of the funding for the high-priced residential school is private own-funded. As a result, most of the dental specialists choose dental health facilities in urban areas according to their personal interests.

Strategies to implementation might be providing scholarship programs from the MOF, local or central government with commitment contracts to be employed in specific-needed areas. Providing specialised dental equipment and dental nurses could support dental specialists during dental treatments. Another strategy is to include the practice of special care dentistry into the curriculum of training that is organized by the Indonesian dentists' association, without overlapping the competence of a specialist.

### **6.3. Enabling PWDs to reach DHSs**

According to the analysis, the geographic location of dental health facilities is the most influential factor in reaching DHSs for PWDs in Indonesia. Possible interventions to enable PWDs in reaching DHSs include the interventions on its interrelated factors, such as transportation, visiting hours, appointment mechanisms, and specific architectural characteristics of dental health facilities.

#### Intervention focusing on geographic location

Stakeholders involved are the MOH and the DOH. Intervention could be increasing the availability of dental health facilities with special care, mainly in rural and specific (decided by the MOH and DOH) areas of Indonesia.

#### Intervention on transportation

Stakeholders involved are the central and local governments. Intervention on the transportation of PWDs to reach DHSs could be to facilitate visual-sensory disabled people with a support cane, audible traffic lights, tactile paving, and useful sounds in public transportation, in addition to providing paths and other public infrastructure for wheelchair users in both urban and rural areas.

#### Intervention directed at visiting hours and appointment mechanisms

Stakeholders involved are the MOH, DOH, and dentists. Intervention on appointment mechanisms could be implementing a waiting time of below ten minutes before treatment. The length of the dental consultation needs to be estimated more than for patients without disabilities, especially during the first dental visit. Those interventions could be standardized as one of the regulations for the DHS delivery in Indonesia.

#### Intervention on architectural characteristics

Stakeholders involved are the MOH, DOH, and government. Possible intervention to the architectural characteristics of dental health facilities is to provide adequate space for the mobility of wheelchair users in the dental health facility and make tactile paving built inside the dental health facility for people with visual-sensory disability. As a strategy for implementation, those aspects could be applied as indicators for accreditation of dental health facilities (both public and private).

### **6.4. Interventions for an affordable DHS utilisation**

Household income is the most influential factor in the process of utilising affordable DHSs by PWDs in Indonesia. This factor is interrelated with health insurance, direct and indirect costs.

Intervention on household income and health insurance of PWDs might involve the government (central and local), MOH, MOSA, the Ministry of Manpower (MOM), BPJS Health, and the PWDs themselves. The MOSA and MOH could categorize PWDs according to mild, moderate, or severe-level of disability. The government could fully-subsidize BPJS Health premiums of severely disabled people for appropriate DHSs. Depending on the specific assessment from the MOH, MOSA, and MOM, mild and moderate level of disability could assist them with appropriate employment so that they can pay BPJS Health premiums (94).

For interventions on the direct and indirect costs of the dental health facility, BPJS Health could increase the budget allocation for specialised dental treatments in first-line dental health facilities or implement a reimbursement system for dental treatments of people with specialised needs in private facilities. Stakeholders involved are the MOH, DOH, MOF and BPJS Health. Challenges might be related to the limited national health budget, which affects the provision of resources for specialised DHSs. Strategies to implementation could be a collaboration of the MOH and the MOF to increase the national revenue for health, primarily to provide subsidisation for affordable utilisation of DHSs by PWDs in Indonesia.

### **6.5. Engaging PWDs to DHS consequences**

The engagement of PWDs to DHS consequences is substantially influenced by the technical and interpersonal quality, which are interrelated with the professional values of DHS providers. Intervention on technical and interpersonal quality might involve dentists, PWDs, and their family members or personal assistant. Dentists could implement various behaviour management techniques and dentist-to-patient communication styles to engage PWDs in the dental treatment processes to achieve adequate DHS outcomes, such as SADE and tell-show-do. Besides, DHS provider could educate PWDs' family members or personal assistants to help PWDs in engaging DHS consequences, for example, assisting PWDs in their oral health behaviour and maintain PWDs' regular dental visits.

### **6.6. Limitations and strengths of the study**

-A limited number of peer-reviewed studies were found regarding those determinants that contribute to access DHSs by PWDs. The articles found mainly consist of studies within a defined geographical area and one has to be careful to extrapolate the data of these studies to a national level. Besides, the variety of cultures and religions, geography, population density, and level of urbanisation in a country with more than 16.000 islands (small and large), may require tailored policies and interventions to ensure that PWDs have better access to DHSs. Studies consulted were predominantly done in cities or urban areas. There is a clear need to conduct further researches in the rural areas of Indonesia, focusing on the access to DHSs for PWDs.

-This study was able to specify the determinants into reinforcing and inhibiting factors of access to DHSs for PWDs in four major types (physical, mental, intellectual, and sensory disability) and discuss possible interventions on the factors to enable adequate access to DHSs for PWDs in Indonesia.

## 7) CONCLUSION AND RECOMMENDATIONS

### 7.1. Conclusion

In conclusion, low access to DHSs for PWDs in Indonesia is influenced by factors which are essentially clustered under large determinants of the process in obtaining the access to DHSs for people with different types of disabilities in Indonesia. These determinants are the perception building on DHS needs, the process of seeking DHSs, the process of reaching DHSs, affordable DHS utilisation, and the engagement of PWDs to DHS consequences.

Most influential factors of the perception building on DHS needs are dental health literacy and dental health education of PWDs in Indonesia. These factors are related to appropriate methods needed for promoting dental health for each type of disability. Besides, dental health screening, dental health beliefs, and transparency to specialised dental treatments also contribute to this process.

The professional values of DHS providers strongly determine the process of seeking DHSs. These values are related to seeking specialised skills for DHSs, such as sedation, communicative behaviour management, technical and interpersonal skills. Personal values and social background of PWDs influence the process of seeking appropriate DHSs as well. The geographic location of dental health facilities is the most influential factor in PWDs' process of reaching DHSs. This factor is interrelated with other factors, such as transportation; opening hours, appointment mechanisms and architectural characteristics of dental health facilities; and PWDs' living environment. Also, the social support of PWDs' family members, neighbourhood, or communities contributes to the success of reaching DHSs for PWDs in Indonesia.

The most influential factor in utilising affordable DHSs for PWDs is their household income. It is interrelated with their capacity to pay health insurance premiums and affects the direct and indirect costs of dental health facilities in providing DHSs for people with special needs. Social capital is currently a contributing factor in the ability to pay specialised DHSs by people with intellectual disabilities in Indonesia and could be a potential factor for other types of disabilities in the future.

After reaching dental health facilities and utilising DHSs, PWDs' engagement to DHS consequences, such as their satisfaction on the dental health outcomes and costs, is essential to achieve an effective DHS utilisation. It is determined by technical and interpersonal quality, adequacy, and support of DHS providers, which are interrelated with the professional values of dentists. Besides, providing informed consent before the dental treatment empower PWDs to be active in the decision making of dental treatments, and maintaining PWDs' personal dental health behaviour pattern could contribute to desired dental health outcomes.

Factors reinforcing and inhibiting access to DHSs for PWDs in Indonesia vary based on types of disabilities. Possible interventions to enable adequate access to DHSs for PWDs might involve a broad spectrum of stakeholders. These are the central and local government, MOH, MOF, MOSA, MOM, MORT, DOH, BPJS Health, Indonesian dentists' association, dentists, communities of PWDs, family members, or personal assistant of PWDs, and the PWDs themselves.

### 7.2. Recommendations

Recommendations are mainly targeted to the MOH as the leading policymaker in the national health system. Besides, the implementation of possible interventions discussed is also recommended to other key stakeholders in Indonesia.

#### The Ministry of Health

1. The MOH should **set up new geographically accessible dental health facilities with special care services for PWDs both in urban and rural areas**. Those dental health facilities should be supported with dental nurses, appropriate dental equipment, and materials for conducting specialised dental treatment procedures,

for example, sedation and anaesthesia equipment. Also, appointment mechanisms for people with special needs should be considered to have extended visiting hours, especially during their first visit to provide extra time for the introduction and advanced behaviour management.

2. The MOH should **distribute current dental professionals with competencies in special care dentistry to both urban and rural areas of Indonesia**, including dentists and dental nurses. This intervention could be integrated with the current MOH program called "Nusantara Sehat", which distributes health professionals to rural and border areas of Indonesia. A national health program to improve the dental health status of PWDs in rural and border areas of Indonesia should be included in "Nusantara Sehat".
3. The MOH should, in collaboration with BPJS Health, the MOM and the MOF, **improve existing DHSs with affordable special care services** by increasing the national revenue for health and implementing a subsidisation system for severely disabled people. Mild and moderate disabled people could be assisted in the job seeking by the MOM to generate personal income for paying BPJS Health premiums.

#### The Government

4. The central and local governments should **develop existing public infrastructure to be better accessible for PWDs**, starts from public transportation, paths for pedestrians, and architectural characteristics of dental health facilities. The government should provide audible traffic lights, tactile paving, and useful sounds in public transportation for visual-sensory disabled people, in addition to paths for wheelchair users. For example, the width of each door should be more than one meter; an elevator should be available, the degrees of steep paths should be standardised, using frictional grounds, and provide automatic doors in dental health facilities.
5. The central government should support the MOH and the MOF to **publish scholarship programs for specialist in special care dentistry** in order to increase the number of dental professionals in providing special care, primarily to distribute them to rural areas of Indonesia. The government should include "paediatric dentistry and disability" or "special care dentistry" into one of the subjects that are funded in the current MOF's scholarship scheme called "Indonesia Endowment Program for Education". Oral surgery should be included in the scholarship scheme as oral surgeons conduct dental treatments with general anaesthesia, which is helpful for people with special care needs and people with severe dental problems. A commitment contract should be established between the MOH, MOF, and the scholarship holder in order to apply their professional skills after graduating as dental specialists in the rural areas of Indonesia for a specific agreed time.
6. The government, through the MORT, should **encourage researcher in dental science to conduct further studies** about the influence of potential factors, such as norms, culture, and gender, to the access to DHSs for PWDs in Indonesia. The aim is to find out broader possibilities on making interventions.

#### Badan Penyelenggara Jaminan Sosial Kesehatan (BPJS Health)

7. BPJS Health should **issue a guideline on the coverage of DHSs for PWDs** with the health insurance scheme. The guideline includes the service provision, visiting hours, referral, and appointment mechanisms for PWDs in order to create an equitable DHS delivery based on their capacity to pay. For example, implementing a



reimbursement system for dental treatments of people with specialised needs in any dental health facilities.

#### Indonesian dentists' association

8. The Indonesian dentists' association should, in collaboration with the DOH, dentists, and communities of PWDs, **implement dental health education programs to communities of every type of disability**. In the field, a collaboration with family members, personal assistants, and community leaders of PWDs should be performed to perpetuate the programs. Monitoring and evaluation of the outcome should be done in order to maintain or improve the quality of dental health education. Rural areas with a high number of PWDs should be prioritized, as the current situation is only focused on urban areas.
9. The Indonesian dentists' association should **organise training in special care dentistry for general dentists**. The aim is to prepare general dentists in dental health facilities performing adequate technical and interpersonal skills, such as sedation and other behaviour management techniques, for PWDs without overlapping dental specialists' competences.

## ANNEXES

### ANNEX 1: Distribution of PWDs in Indonesia

Figure 5. The percentage of Indonesian PWDs in age >10 years old per province in 2015\*(21)

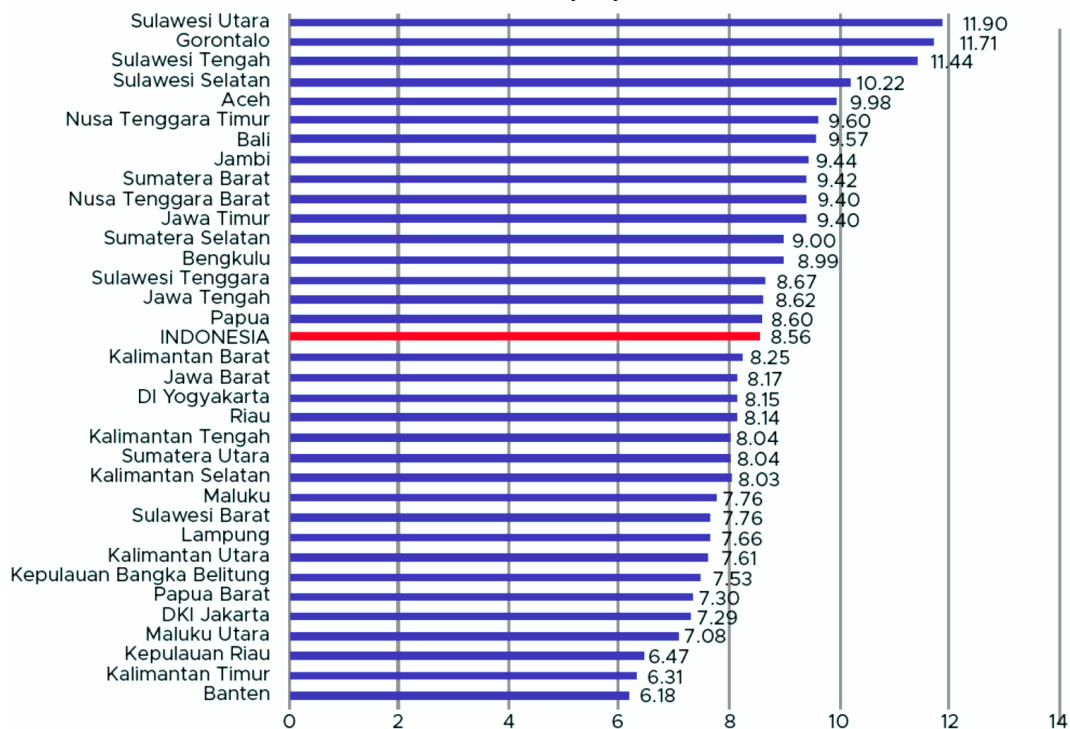


Figure 6. The percentage of Indonesian PWDs in age 5-17 years old per province in 2018\*(21)

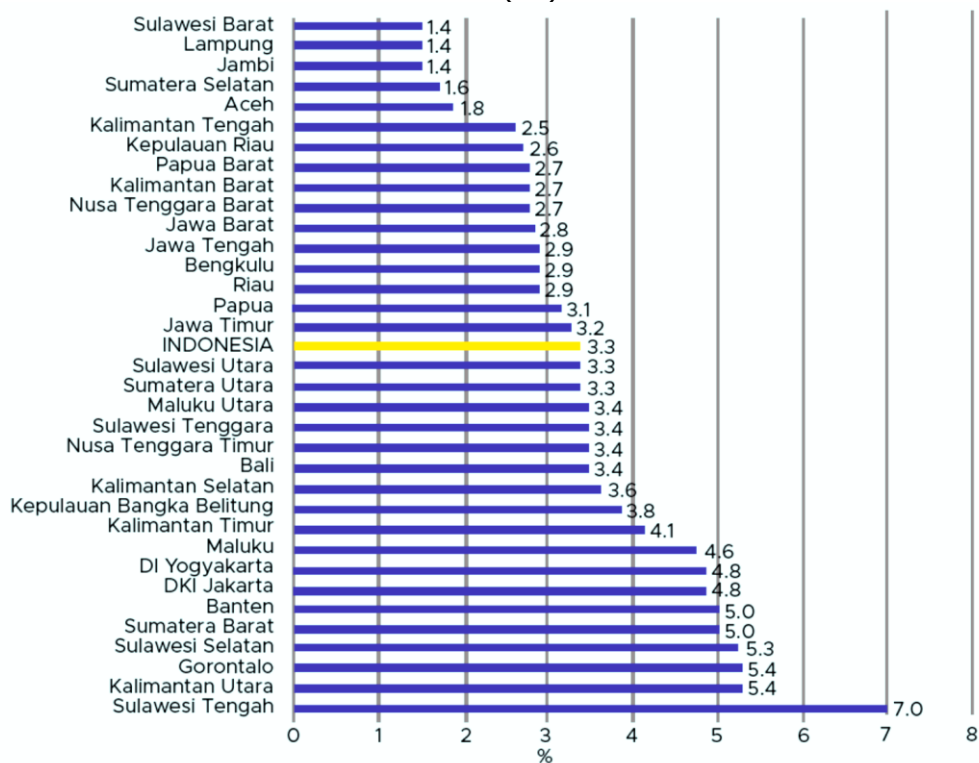
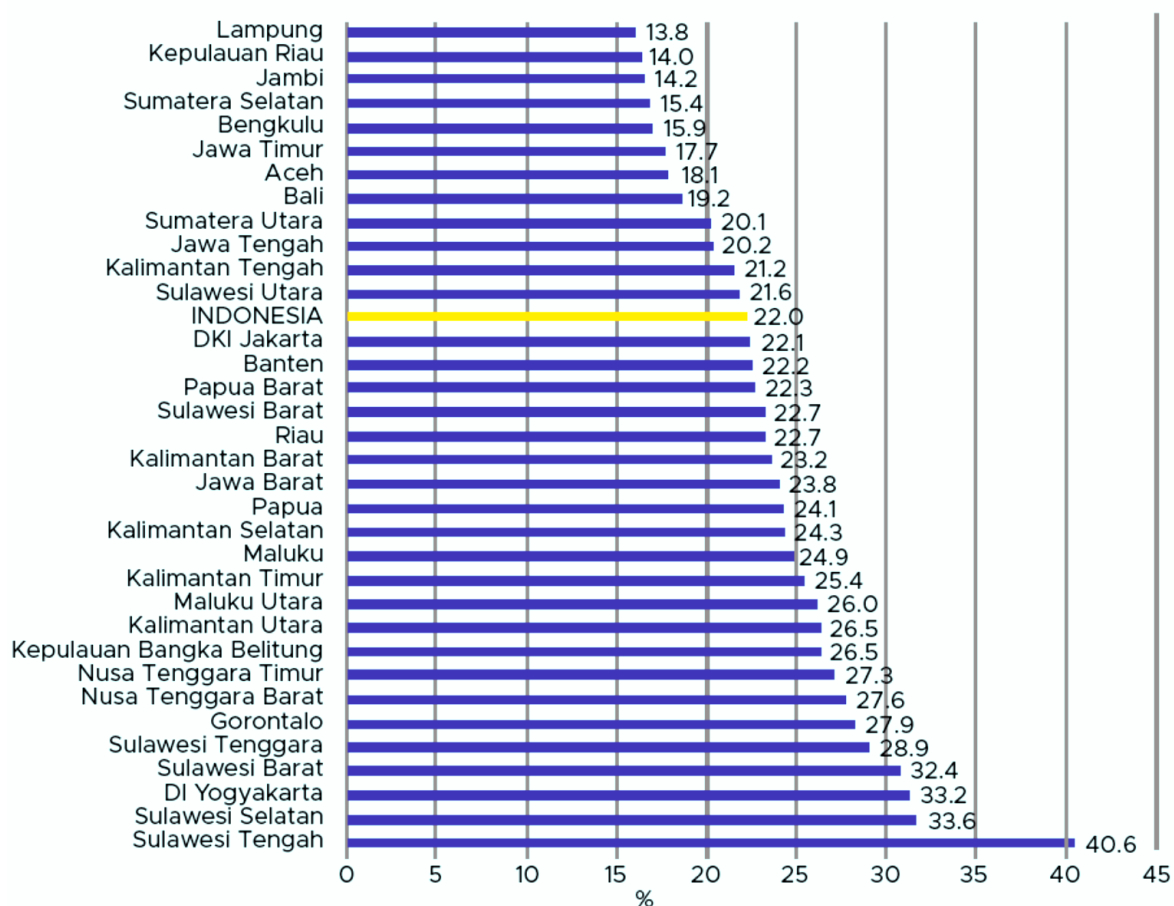


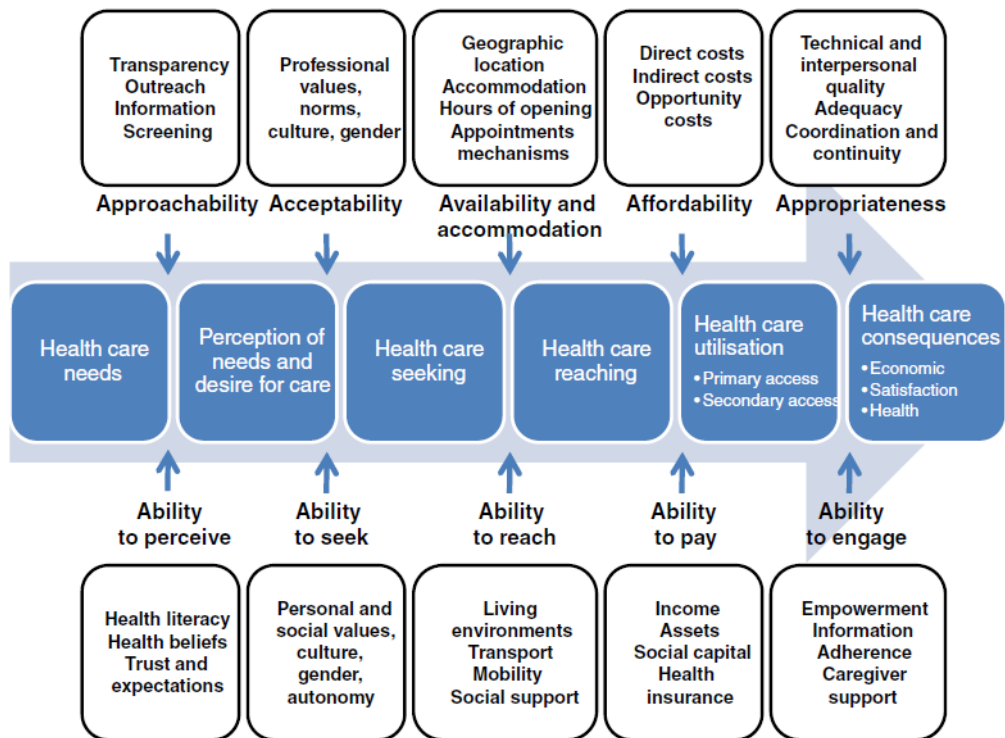
Figure 7. The percentage of Indonesian PWDs in age 18-59 years old per province in 2018\*(21)



\*Translated terms ("*Utara*" = north, "*Selatan*"= south, "*Timur*"= east, "*Barat*"= west, "*Tenggara*"= southeast)

ANNEX 2: The original framework of access to health care by Levesque et al. (2013)

Figure 8. Original framework of access to health care(18)



## ANNEX 3: Distribution of dentists in Indonesia

Table 8. Data of dentists and dental specialists per province in Indonesia(28,83,95,96)

No.	Province	Number of dentists (GP) per province	Number of Paediatric dentists per province	Number of oral surgeons per province	Number of other specialisations per province	Total number of dentists and specialists per province
1	Nanggroe Aceh Darussalam	597	6	6	32	641
2	North Sumatera	1844	6	15	91	1956
3	West Sumatera	750	5	7	24	786
4	Riau	815	4	9	34	862
5	Kepulauan Riau	312	3	5	15	335
6	Jambi	312	3	2	11	328
7	South Sumatera	588	4	3	31	626
8	Kepulauan Bangka Belitung	130	1	6	12	149
9	Bengkulu	142	0	1	7	150
10	Lampung	323	3	9	9	344
11	Banten	1563	22	20	102	1707
12	DKI Jakarta	4848	127	106	769	5850
13	West Java	4356	96	100	420	4972
14	Central Java	2125	24	43	168	2360
15	DI Yogyakarta	868	41	30	191	1130
16	East Java	3997	100	55	583	4735
17	Bali	1021	8	11	57	1097
18	West Nusa Tenggara	214	4	4	11	233
19	East Nusa Tenggara	235	0	3	7	245
20	West Kalimantan	244	4	2	16	266
21	Central Kalimantan	161	2	4	10	177
22	South Kalimantan	355	4	5	24	388
23	East Kalimantan	627	9	17	47	700
24	West Sulawesi	106	0	1	8	115
25	South Sulawesi	1287	9	13	101	1410
26	Southeast Sulawesi	255	1	2	8	266
27	Central Sulawesi	167	1	2	4	174
28	Gorontalo	75	0	1	0	76
29	North Sulawesi	239	1	2	9	251
30	Maluku	88	1	3	4	96
31	North Maluku	63	1	0	5	69
32	Papua	157	0	2	10	169
33	West Papua	67	0	0	1	68
<b>Total</b>		<b>28931</b>	<b>490</b>	<b>489</b>	<b>2821</b>	<b>32731</b>

ANNEX 4: Classification of urban and rural areas of Indonesia

Table 9. Number of urban and rural areas of Indonesia per province(83,95,96)

No.	Province	Number of urban areas (sub-district)	Number of rural areas (sub-district)
1	Nanggroe Aceh Darussalam	730	5725
2	North Sumatera	996	4748
3	West Sumatera	350	663
4	Riau	223	1420
5	Kepulauan Riau	121	232
6	Jambi	175	1196
7	South Sumatera	362	2795
8	Kepulauan Bangka Belitung	111	250
9	Bengkulu	156	1322
10	Lampung	271	2133
11	Banten	571	964
12	DKI Jakarta	267	0
13	West Java	2659	3221
14	Central Java	2715	5861
15	DI Yogyakarta	191	247
16	East Java	2836	5670
17	Bali	269	446
18	West Nusa Tenggara	271	695
19	East Nusa Tenggara	184	2652
20	West Kalimantan	134	1760
21	Central Kalimantan	85	1426
22	South Kalimantan	259	1722
23	East Kalimantan	210	1225
24	West Sulawesi	41	562
25	South Sulawesi	473	2492
26	Southeast Sulawesi	176	1911
27	Central Sulawesi	132	1646
28	Gorontalo	129	490
29	North Sulawesi	349	1309
30	Maluku	95	811
31	North Maluku	101	962
32	Papua	115	3446
33	West Papua	29	1338
<b>Total</b>		<b>15786</b>	<b>61340</b>

Table 10. Criteria of urban and rural areas in Indonesia(83,95,96)

Criteria				The availability of urban facility		
population density (per km <sup>2</sup> )	score	Percentage of farming households	score	Urban facility	Criteria	Score
<500	1	>70.00	1	a. Kindergarten school	yes or =< 2.5 km* > 2.5 km*	1  0
500-1249	2	50.00-69.99	2	b. Junior High School		
1250-2499	3	30.00-49.99	3	c. Senior High School		
2500-3999	4	20.00-29.99	4	d. Traditional market	yes or =< 2 km* >2 km	1 0
4000-5999	5	15.00-19.99	5	e. Shopping centre		
6000-7499	6	10.00-14.99	6	f. Cinema	yes or =< 5 km* >5 km	1 0
7500-8499	7	5.00-9.99	7	g. Hospital		
>8500	8	<5.00	8	h. Hotel/Billiard/ Salon	yes no	1 0
				i. percentage of household's telephone	8.00 or less more than 8.00	1 0
				j. percentage of household's electricity	90.00 or more less than 90.00	1 0

\*The distance was measured from the village office

Total score= score of population density+ score of farming households+ score of available urban facility

If the Total score is 10 or more than 10, the area is categorized as an urban are.  
If the total score is less than 10, the area is categorized as a rural area.(83,95,96)

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