

The Right to Sight: Distribution and Prevalence of Visual Disability in Indonesia

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The meaning of “human rights” can be very loose, and often each individual can have his/ her own interpretation of what human rights are. Indeed, human rights cover so many different concepts and issues of human condition. Yet, the basic idea of human rights can be defined as:

“...those rights, which are inherent in our culture and without which we cannot live as human being. Human rights and fundamental freedoms allow us to fully develop and use our human qualities, our intelligence, our talents and our conscience and to satisfy our spiritual and other needs. Human rights are based on “mankind’s increasing demand for a life in which the inherent dignity and worth of each human being will receive respect and protection” (United Nations, 1987, p.4)

One group of human rights is to guarantee an adequate standard of living to everyone, wherever he or she lives. Everyone “has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services’ (UN, 1948, article 25).

This paper narrows the focus to health, particularly with respect visual disability. Visual disability can be an important factor whether the persons can enjoy the today digital world, or perhaps the difficulty is actually an impact of excessive consuming the products in the digital world. Ageing population is another factor leading to the need to give attention to the sensory impairment such as vision. From a policy making perspective, discussed more later in this paper, treating visual disabilities is easier and cheaper than treating other disabilities such as hearing loss and walking difficulty. The paper utilizes the first availability of a data set on disabilities from Indonesian population census

This paper aims at providing reference statistics, distribution and prevalence, on visual disability estimated from the Indonesia 2010 Population Census. It takes into account differential by age, sex and place of residence. It also examines the extent Indonesians have the financial ability and accessibility to improve their visual ability; and the laws and their enforcement to help improving the visual ability.

The analysis with statistics on visual disability is put in the context of an overall paradigm change, from GDP to capability-oriented ones, and providing human rights. It also utilizes the current availability of statistics on disabilities (including visual disabilities) in 2010 Indonesia population census. It is the first nationwide data gathering information on this type of disability in Indonesia from the population aged 10 years and above.

Before analysing the statistics on visual disability, this paper briefly discusses the paradigm change, instead of GDP; disability as an issue of human right, capabilities, and market; ageing process in Indonesia which may raise the number and prevalence of disabilities and policies on vision disability in Indonesia. The analysis on prevalence and distribution of visual disability starts with a discussion on the measurement of the statistics.

Instead of GDP

GDP-oriented development policies have now been more increasingly questioned, as high economic growth and/ or high per capita income may not necessarily be equated with a broader measurement of welfare such as health, education, freedom to move, freedom from fear, clean environment, and justice. GDP-oriented development policies may result in income and wealth inequality as well as many other types of inequality. In turn, this inequality may result in feeling of injustice among people, especially among those who cannot compete in the market because of limitation in their abilities, including their physical abilities.

As argued by Sen (2009), GDP-oriented development, a resource-based approach to development, should be changed into another paradigm, with capability-based approach. Income and wealth are only means of development, rather than ends of development. Sen showed capability as freedom that a person has to do what the person wants, or as the person's actual ability to do so. The capability-based approach focuses on human lives, and not simply some detached objects such as income and commodity.

Therefore, Sen recommended the measurement of capability deprivation, which includes poverty and physical/ mental disability. There have been a large amount of studies

on poverty, but not on disability. This can be due to lack of interest on disability and/ or lack of availability of the data. Measuring poverty without taking into consideration the presence of disabled in the poor households can be misleading as the disabled may need more income than the able persons. Yet, as Sen showed, the disabled are the most deprived people in the world. They are often the most neglected. They are often poorer than the poorest as they need more money than the able-body persons. Some may be rich, but their disabilities may bring less freedom to enjoy life. Worse, Sen further indicated that most disabled are in developing countries, and often in the lowest bottom of the poor in terms of income. The relevance of disability in the overall development may have been under-estimated. Fortunately, most disabilities can be avoided, either by preventing or treating the disabilities.

Disability is here defined following WHO (2012), that it is a result of interactions between personal factors and conditions of health and environment. It is not simply a biological construct. It is neither merely a social construct. It is a general term, covering three levels. First is impairment in body function or structure. Second is limitation in activity. For example, inability to read or move around. Third is restriction in participation. People can be excluded from school or work. In short, people with disabilities cover those traditionally understood as disabled (such as wheelchair users, blind people, deaf people, and people with intellectual impairments).

Globally, visual disabilities (as one type of disabilities) are widely recognised as important causes to understand capability and well-being of the people. It is estimated that the magnitude of visual disability is huge, about 161 million globally, and among them approximately 37 million are blind (Kuper et al 2006).

Most visual disabilities are also avoidable. Avoiding visual disability may not bring high economic growth, but it can improve the well-being of people, by raising their capability, their freedom to do what they want to. At the same time, avoiding visual disability may also raise productivity, if there are appropriate employment opportunities using visual/ digitized facilities. There are nine types of avoidable blindness, namely, cataract, trachoma, childhood blindness (including vitamin A deficiency), onchocerciasis, refractive error, diabetic retinopathy, low vision, glaucoma, and age-related macular degeneration (ARMD).

Ageing population is another factor leading to the need to give attention to the sensory impairment, including vision. Visual impairment among the elderly is one of the major sensory difficulties (West et al., 1997). As people age, the normal function of eye tissue deteriorates, and a decline in vision occurs naturally with age. Presbyopia, cataracts, age-related macular degeneration, glaucoma, and diabetic retinopathy are the most common

causes of age-related visual impairment (Loh and Ogle 2004). More severe visual impairment can be a result of medical condition such as cataracts, glaucoma, age-related macular degeneration, and diabetic retinopathy. Cataracts is the main cause of low vision (Dineen et al., 2003). Except glaucoma, all of these eye problems are treatable and avoidable. Untreated visual impairment leads to physical handicap (Rudberg et al., 1993; West et al., 1997), increased incidence of fall (Jack et al. 1995, Lamoreux et al., 2008), depression (Tsai et al., 2003; Hayman et al., 2007), social isolation, dependency, and even mortality (Christ et al. 2008).

Therefore, with rising health problems among the older persons, this ageing population increasingly implies larger financial burden to take care of the older persons. Reducing the health problems – making the older persons healthy – will reduce the financial needs to take care of the older persons. At the same time, healthy older persons can also contribute to the society—paid or unpaid. More importantly, providing health care to everybody, including older persons is one of the basic universal human rights. Treating and avoiding visual impairment among older persons can much improve the well-being of the older persons, though not necessarily raising the GDP.

Human Rights, Capabilities, and Market

Reichert (2011) mentioned that there are three sets of human rights in the Universal Declaration of Human Rights. The first one includes political and individual freedoms such as the right to a fair trial, freedom of speech and religion, freedom of movement and assembly, and guarantees against discrimination, slavery and torture. This first group emphasizes on non-interference by government.

The second embraces the positive rights, to guarantee that everyone, regardless of the place of residence, has an adequate standard of living for the person and his/ her family, including food, clothing, housing, medical care and social services. A country such as the US has attempted to provide adequate standard of living for its citizen, but it does not see it as a human right. The third is the cooperation among various countries to promote the implementation of the universal declaration of human rights.

Reichert also discussed the cost of not fulfilling the rights. Some politicians and business leaders mention the cost of providing public services and fulfilling human rights. But, Reichert questioned the cost of not providing the services and fulfilling the human rights

by not providing health care services, people will get worse and the cost of taking care of them will be higher. If we do not fulfil the human rights, the impact can be much more costly. Framing health issues as human rights implies that it is not simply a “sick” person who should be cured, but it is an issue of human being, with all of its dignity. With this frame, the issue becomes an international concern, giving more pressure to countries to implement it.

Sen (2009) saw freedom as human rights. Freedom is seen as a process and culmination. Human capabilities give freedom to persons to do what the persons wants. This capability approach to development is different from resources based approach, which uses income and wealth as the indicators of development. The capability approach is similar to the second aspect of human rights mentioned by Reichert. Vision disability, or lack of vision ability, may reduce capabilities of population –raising capability deprivation-- particularly in gaining paid and unpaid benefit from their activities.

However, market mechanism cannot be relied to eradicate disabilities. Eradicating, or reducing disabilities, may not bring high economic growth. Therefore, government must make active programmes to eradicate disabilities. Development paradigm and its measurement must be changed from GDP-oriented development into capability based development.

Life in urban areas should be designed so that the environment prevents disabilities and can provide more facilities for those who are already disabled. The facilities may include medical facilities to treat the disabilities and public infrastructure to provide more freedom for those disabled. An example is a facility for wheel-chaired bound persons and signs written in such a way that those with some visual disability can read easily.

Demographic Changes in Indonesia

Indonesia has experienced a lot of demographic changes. Along with the era of democratization since 1998, the demographic changes have also been accompanied with different issues on human rights, such as those on regulating fertility, freedom to move, protection of overseas workers, and the rights of the older persons and other vulnerable groups (including those who have physical disabilities). Recently, Indonesia, as later discussed in this paper, has also been concerned with the right to sight, the right of the people to be able to see clearly.

In particular, Indonesian population has been ageing, a process of rising number and percentage of older persons, especially at sub-national levels. This ageing process can be accompanied with rising numbers and percentages of people with disabilities. Therefore, this ageing process may result in a major financial burden for the society to take care of the older persons, particularly those with disabilities. If we can reduce the number and percentage of disabilities, taking care of the older persons can be much easier. Even, the older persons, with less or no disabilities, can still contribute to the society, either in paid or not-paid activities.

As ageing population is more obvious in rural areas, disability may be seen more in rural areas. However, unhealthy environment and life styles in urban areas may result in higher disability prevalence in urban areas. The risk in urban areas may also be seen in more road accidents as visual disability increases with ageing population in an environment where safe and reliable public transportation in Indonesia is not widely available. Many people rely on riding motor-cycle to move.

Policies on Visual Disability in Indonesia

On 17 February 1999 the World Health Organization (WHO) and International Agency for the Prevention of Blindness (IAPB) launched a global initiative “Vision 2020: the right to sight”, to eliminate avoidable blindness by 2020. It is a worldwide partnership.

Blindness has been seen as a serious public health, social, and economic problem for members of the WHO, particularly the developing countries. Yet, up to 80 percent of global blindness can be prevented, by eliminating conditions that cause blindness and/ or using successful treatment to restore sight. About 51 percent of global blindness is because of cataracts, and yet cataracts can be successfully treated to restore the sight. About 43 percent of visual impairment (some difficulties) is because of uncorrected refractive errors and there are treatments which can successfully restore the sight.

The Vision 2020 identified five immediate priorities: cataract, trachoma, onchocerciasis, childhood blindness (including vitamin A deficiency), and refractive errors and low vision. These priorities were made based on the burden of the blindness and the availability and affordability of the program to prevent and treat them.

Most cases of cataracts are related to ageing process, though children may be born with the condition. It may also because of eye injuries, inflammation, or other eye diseases. Fortunately, cataract surgery is very effective in restoring the sight, as long as there are

adequate supporting staff, such as surgeons, nurses, related infrastructure, and affordable cost.

Relative to the efforts of avoiding other disabilities, technologies to avoid visual disabilities are available with relatively cheaper, simpler, and more successful treatment. For example, cataract surgery (for treating a common problem with visual disability) is relatively easy to be carried out and not expensive. It can restore the sight. However, there is no such procedure for hearing loss. Moreover, eye glasses can restore and correct sight completely, but hearing aid cannot restore hearing problem completely. Even contact lenses are progressing fast with the choices ranging from long-term to short-term uses, including disposable one (one time usage only). Lasik is also available to correct visual acuity. Furthermore, the cost of hearing aids is still much more expensive than the cost of eye glasses.

Uton Muchtar Refie, the Regional Director, WHO South-East Asia Region, mentioned during the Consultation of WHO Southeast Asia region in Jakarta, 14-17 February 2000, that avoiding these blindness has a far-reaching implications in development and quality of life. This is an inter-country consultation for development or regional strategies for vision 2020: the Right to Sight. One of the purposes of the consultation was to orient the participation on Global Initiative for Elimination of Avoidable Blindness' Vision 2020: the Right to Sight. He specifically indicated the rapid increase of burden from needless blindness as a result of rapid rate of population growth and rising percentage of older persons. He then emphasized the importance of WHO to have concerted actions and commitment to eradicate needless blindness.

Indonesia reacted quickly. The *Vision 2020 Indonesia* was launched by Megawati Soekarnoputri, the Vice President of the Republic of Indonesia, at the Presidential Place, on 15 February 2000.

The "Right to Sight" gained a strong political commitment during the fifty-sixth World Health Assembly, Geneva, by accepting the resolution WHA56.26 "Elimination of Avoidable Blindness" on 28 May 2003. More than 40 countries signed the resolution with Indonesia as one of them. The resolution urged all WHO members to set up national Vision 2020 plans no later than 2005, to establish a national coordinating committee for Vision 2020, to start implementation of the action plan by at least 2007, to include effective information system, and support the efficiency of the use of resources to eliminate avoidable blindness.

On 13 December 2006 the UN convention on the Rights of Persons with Disabilities (UNCRPD) was adopted. It is a human right instrument with an explicit, social development dimensions. The convention was opened for signature on 30 March 2007. Indonesia was quick to join the convention. It is the ninth country who signed the United Nations convention on the Rights of Persons with Disabilities in 2007. However, it took four years for Indonesia to finally ratify the convention, precisely on 18 October 2011 signed by the House of Representative.^{3 4}

With the ratification of the convention, there would be a similar view and understanding from all stakeholders to provide and improve services for people with any form of disabilities. The Convention was passed into Law in the following month when the government showed its intention to promote and protect the right of people with disabilities through enacting the Law no 19/2011 on Ratification of the Convention on the Rights of Persons with Disabilities. The law was legitimised and signed by the President on 10 November 2011. This law complements earlier measures taken by the Government, such as the implementation of the Law no 4/1997 on Persons with Disabilities, and Government Regulation no 43/1998 on Promotion of Welfare of Persons with Disabilities. As stipulated in Law no. 4/1997, persons with disabilities are grouped into three categories, namely, persons with physical disability, mental disability, and both physical and mentally impaired. Among persons with physical disability, they include persons with visually disability, hearing disability, and ex-chronically diseases, while persons with mental disability include persons with intellectual disability, and ex-psychotic.

In terms of policy, Indonesia has created the 2004–2013 INPOA (Indonesia National Plan of Action) on Persons with Disabilities, with eight main agendas, namely self-help organization and association of elderly with disabilities; women with disabilities; early warning and intervention; and education, training and work placement; access to surroundings and public transportation; access to information and communication including information and communication technology; poverty eradication through the enhancement of social protection and life expectations; and international cooperation.

In other words, on the policy point of view several steps have taken place. Yet, one of the challenges in monitoring the progress is that much of the existing data on the current situation of persons with disabilities in Indonesia is not easily accessible. However, the commitment from Government has been shown from the financial point of view in which the government provided special fund of IDR 61.2 billion in 2009, later increased to IDR 70.2 billion in the following year, for providing services for people with disabilities. Meanwhile,

some local Governments such as in Jakarta, West Java, Central Java and Bangka Belitung, have started promoting and protecting the rights of persons with disabilities.

The rights of persons in disabilities in participating in the general election have also been guaranteed, as stipulated in Article 164 of Law no. 10/2008 on the Election of Members of the House of Representatives, Regional Representative Council, and the Regional House of Representatives.

Indonesia Braille Printing House has conducted several efforts to improve services for persons with visual impairment such as printing Braille books as well as providing talking books, performing Braille printing exhibitions in several events, giving Braille library services, producing Braille magazines script, and providing internet services.⁵

Statistics on Visual Disability in Indonesia, 2010

Measurement

Lack of data collection and follow-up make assessment of the situation for people with disabilities difficult. The 2009 Susenas (National Socio-economic Survey) provided an estimate of 2.1 million Indonesians with disabilities, or 0.92% of the population. An earlier survey, the 2006 Susenas, estimated a higher figure of 3.1 million, or 1.38% of the population.

The 2010 Indonesian population census, with a much larger coverage than the surveys, started collecting information on different types of physical difficulties which can be used as a proxy to understand degree of disability. It is a self-assessment on physical/ mental difficulties. The census provided three domains of functional difficulties (sensory, movement and cognitive). Sensory difficulty included visual and hearing difficulties, movement difficulties include walking or climbing stairs, and taking care of themselves (overall daily living activities) and cognitive difficulties include remembering or concentrating.. Each question has three alternative answers: no difficulty, some difficulty and severe difficulty.

This paper limits its scope on vision difficulty, which is measured by the following question:

“Apakah (NAMA) mempunyai kesulitan Melihat, meskipun pakai kacamata” (Does [NAME] have any difficulty in seeing, though using eye glasses?). The respondent had three

options to answer: *tidak* (no), *sedikit* (some), and *parah* (severe). If the respondent can see clearly after using eye glasses, the respondent is not said to suffer any visual difficulties. Visual difficulty is measured in a distance of minimal 30 cm with sufficient light—if the respondent can see things clearly (size, form, and colour), then the respondent has no visual difficulties. Severe difficulty includes total blindness. It should be borne in mind, that the interviewer never measured it. The answer depends simply on the respondent's statement. (Badan Pusat Statistik 2011)

To understand the magnitude of visual disability, we use two types of measurements, namely, distribution and prevalence. The distribution shows how the number of population with visual disability is distributed by age. Prevalence is the ratio of population with visual disability in a given age group divided by the number of population in that age group.

Age Specific Distribution of People with Visual Disability

According to the 2010 population census, there were 5.82 million Indonesians revealing that they suffered from visual disability. This section discusses visual disability differential by sex and place of residence. Among the visually disabled, 47.8 percent live in urban areas, reflecting the national urbanization rate of 49.79 percent. The women having visual disability outnumber the men, with sex ratio about 0.80 or about 3.2 million women vs 2.6 million men. However, an examination at various age groups provides an interesting phenomenon. Table 1 provides the number of people with visual difficulty by age group and degree of difficulty. The table shows an increasing number of people with visual difficulty as age increases. The number jumps by 5 times among the prime working age population aged 35 to 54 years old from just 111.0 thousand among those aged 35-39 to 647.2 thousand people aged 50-54. Ultimately, this trend may affect the productivity of the labour force. The number of people with visual disability is much larger (2.7 million) among the older group aged 55-74 than the prime working age population of 35-54 (1.8 million). The former accounts for 30.3 percent and the later for 46.1 percent of the total visually impaired.

Among them, there are a half of a million people who report having severe difficulty in vision. However, as expected, the number of those suffering from severe difficulty is much smaller than the number of those suffering only some difficulties (5.3 million). See Table 1 and Figure 1. As seen in Figure 1, the number of people with severe difficulty is much

smaller in all age groups than those with some difficulty. Furthermore, the analysis in this section will also discuss the differences by sex and place of residence.

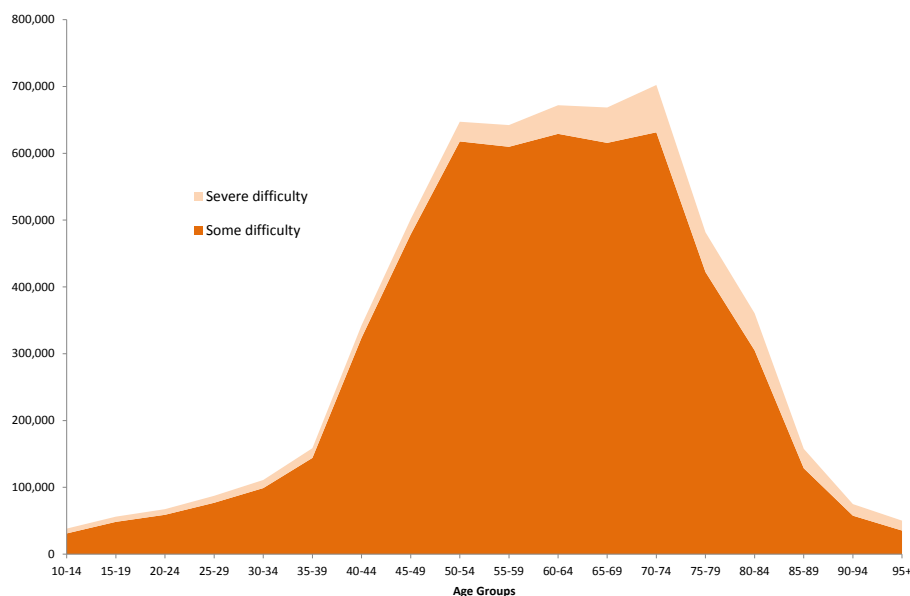
Table 1. Number of Population by Degree of Visual Difficulty and Age Group: Indonesia, 2010

Age	Number				Sex Ratio			
	No difficulty	Some difficulty	Severe difficulty	Total	No difficulty	Some difficulty	Severe difficulty	Total
10-14	22,503.5	31.0	7.2	22,541.8	106.02	86.15	113.5	90.76
15-19	20,565.7	48.4	7.8	20,621.8	103.52	67.73	114.16	72.93
20-24	19,656.7	58.9	8.4	19,724.0	98.29	68.21	110.01	72.51
25-29	21,121.1	76.9	10.4	21,208.5	99.14	70.2	110.85	74.21
30-34	19,657.1	98.9	12.1	19,768.2	100.55	73.17	105.21	76.18
35-39	18,299.1	144.1	14.5	18,457.7	101.9	72.52	103.66	74.97
40-44	16,146.6	323.8	18.8	16,489.2	101.66	84.21	95.96	84.82
45-49	13,515.5	478.5	22.8	14,016.8	100.36	95.74	98.32	95.85
50-54	10,897.0	617.7	29.4	11,544.1	103.05	100.02	95.73	99.82
55-59	7,796.6	609.7	32.5	8,438.8	109.27	101.44	91.66	100.92
60-64	5,380.3	629.1	42.8	6,052.3	94.93	82.54	73.45	81.93
65-69	4,021.9	615.6	53.0	4,690.4	92.33	78.5	68.08	77.62
70-74	2,751.7	631.4	70.8	3,453.9	82.34	70.37	60.6	69.33
75-79	1,495.0	422.3	59.5	1,976.8	76.99	67.13	57.91	65.94
80-84	781.9	305.0	55.5	1,142.4	76.83	66.33	55	64.48
85-89	279.9	128.6	29.1	437.5	75.56	66.76	54.86	64.43
90-94	95.7	57.6	17.3	170.6	64.33	57.1	45.62	54.29
95+	54.2	35.4	14.8	104.4	58.43	49.86	39.29	46.57
Total	185,019.3	5,312.9	506.9	190,839.2	100.77	81.23	70.54	80.24

Source: Compiled and calculated from BPS

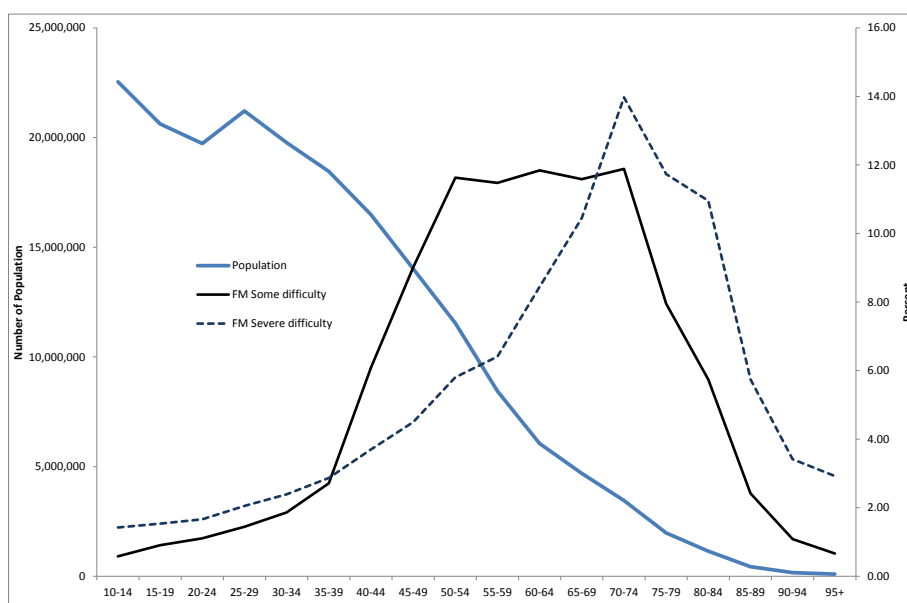
Figure 2 shows pattern of distribution of the number of population with difficulties by age groups, and contrasts them with the pattern of age distribution of the total population. As expected, the number of total population by age-group declines as people becomes older. This is in contrast to the pattern of people with visual disabilities. People with visual disabilities have an inverted U curve with a sharp peak for severe difficulties and relatively flat peak for some difficulties. The number of people suffering from severe visual difficulties rises with age, with its peak at age 70-74. This is different from those who reveal they only suffer some difficulties in visual ability, with a relatively flat peak flat at age 50-74. Note that this is the distribution of people with visual impairment by age.

Figure 1. Number of Population with Visual Difficulties by Age and Degree of Severity: Indonesia, 2010



Note: dark area refers to number of population with some difficulties
 light area refers to number of population with severe difficulties
 Source: calculated and drawn from Table 1

Figure 2. Number of Population and People with Disabilities by Age and Degree of Disabilities: Indonesia, 2010 (in percentage)

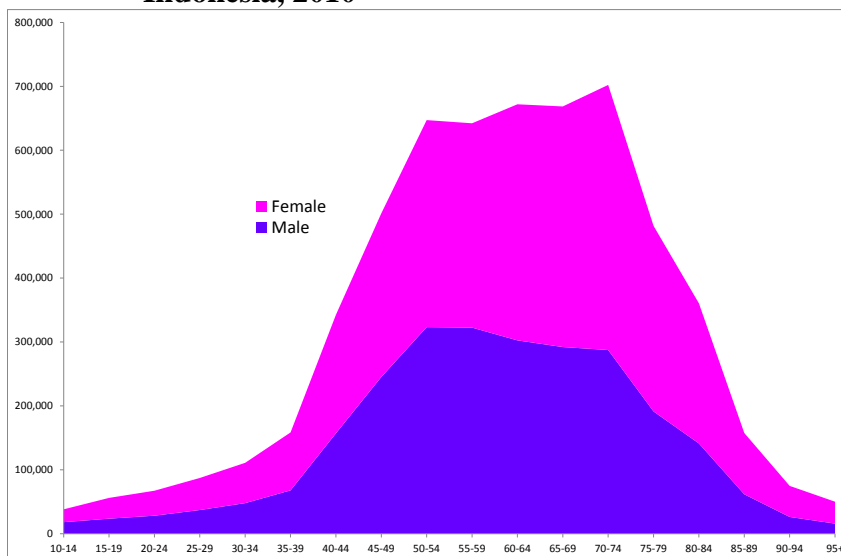


Source: calculated and drawn from Table 1

It is important to examine the differences between sex, particularly within the context of feminization of ageing population, where female older persons outnumber the male counterpart because of difference in their life expectancy. As seen in Table 1, sex ratios of the number of visual disabled in all age groups are less than 100, except the ages of 50-54. This means that the number of visual disabled women outnumbers that of the male counterparts. Taking into account the degree of visual difficulty, this table depicts a different pattern between those with some difficulty and severe difficulty. There are more women than men with some difficulty in nearly all age groups. However, for those with severe difficulty, the women outnumber the male after reaching 40 years old. Thus, the excess of young men with severe disability is seen among the young group (those aged 10-39 years old) when sex ratio above 100.

Regardless of degree of difficulty, Figure 3 provides sex differential of the age specific number of population with visual difficulty. It shows that the distribution takes an inverted-U shape with different peak. For male population, the number reaches its maximum at the aged of 50-54 and for female at much older age group of 70-74.

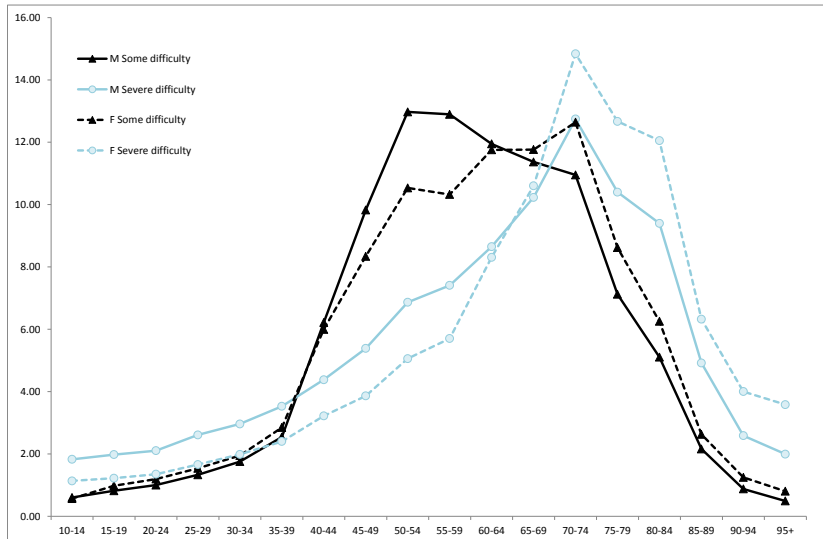
Figure 3. Age-Specific Number of Population with Visual Difficulty by Sex: Indonesia, 2010



Furthermore, Figure 4 presents that sex differs the distribution of visual difficulties according to the degree of difficulty. The highest percentage of male with some visual difficulty is reached among the younger are group of 50-54 than the female counterparts having the same degree of visual difficulty, with the peak of 70-74 years old. This indicates the extent to which female suffer from visual difficulty due to natural biological deterioration

than the males. Ageing leads to this suffering for female. The highest percentage of those having severe visual difficulty is seen among those age 70-74 years with older women having higher percentage than older men. Among the younger groups, as seen in Figure 3, the percentage of male with severe visual difficulty is higher than that for the female.

Figure 4. Age-Sex Distribution of People with Visual Disabilities by Degree of Disabilities: Indonesia, 2010 (in percentage)



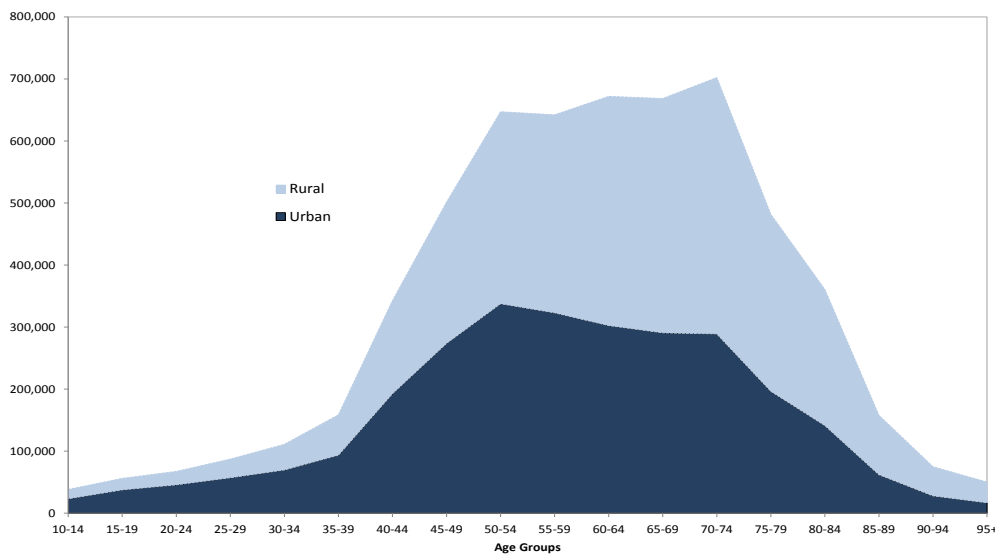
Place of residence can provide different living experiences in which urban areas are attributed with more advanced technology. Whether living in urban areas are more likely to differ than living in rural areas with regards to visual difficulty. Figure 5 shows the distribution of visual disability in urban and rural areas by age groups, with the dark one presenting the number in urban areas, and the light one in rural areas. Interestingly, the pattern shown in Figure 5 resembles that of Figure 3. In other words, the distribution of the number of population with visual difficulty by place of residence takes a similar pattern as that by sex. The urban pattern resembles the male pattern and vice versa.

The figure shows that before age 60, the light area is smaller than the dark one, revealing that the number of people with visual disabilities were larger in urban than rural areas. After age 60, another pattern is seen. The number of people with visual disabilities was higher in rural than urban areas. As seen in Table 2, the number of people aged 60 and above suffer from some visual difficulty is relatively large, 2.2 million, or 41.3 percent of the total population with some visual difficulty. A larger portion of elderly is even seen among

those with severe visual difficulty with 51.2 percent or 300 thousand older persons (two-third living in rural areas and one third in urban areas).

It is also interesting to find out that the largest number of people with visual disabilities in urban areas is found among those who are still at a productive age group, at 50-54 years old; and in rural areas, among the older age group, 70-74.

Figure 5. Number of Population with Visual Difficulties by Age and Place of Residence: Indonesia, 2010



Note: dark area refers to number of population with visual disabilities in urban areas
light area refers to number of population with visual disabilities in rural areas
Source: authors' calculation based on 2010 population census data

Yet, the cause of the urban rural differences is not clear, as we do not have the data. Is this difference because younger urban population are more aware of their visual difficulties? Are the younger urban population not interested to treat their visual disabilities? Do they have lifestyle that is harmful to their eyes?

The distribution of visual impairment for each degree of disability varies by rural-urban location. As seen in Figure 6, the starkly different pattern of distribution is seen among those living in urban areas, where the largest number of people with some visual disability is at the age of 50-54, while the largest number of people with severe disability is at the older age of 70-74. In rural areas, the two patterns are different but the two have the same peak. It occurs at the same age group of 70-74. Among the younger age group, people with some disability in rural areas are also much larger than that group with severe disability. This data hints that avoiding visual disability is relatively easy as most of them are with “some disability” only.

However, if the trend continues, the ageing process in Indonesia will be accompanied by rising capability deprivation and human productivity, as there will be likely an increase in avoidable blindness and other avoidable visual disabilities.

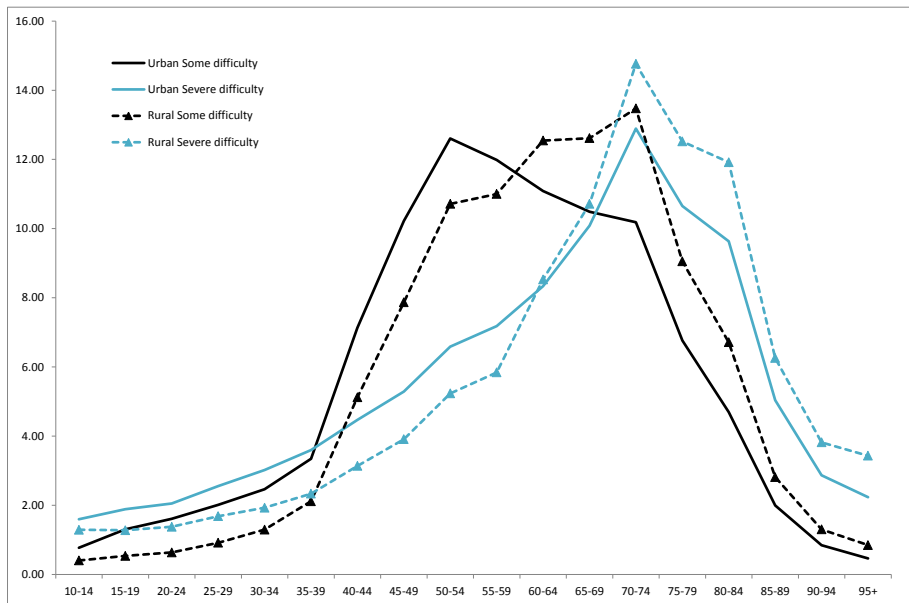
Table 2. Age-Specific Number of Population with Visual Difficulty by Its Degree of Difficulty and Place of Residence: Indonesia, 2010

Age	Urban (000)				Rural (000)			
	No difficulty	Some difficulty	Severe difficulty	Total	No difficulty	Some difficulty	Severe difficulty	Total
10-14	10,440.6	19.9	3.4	10,463.9	12,062.9	11.2	3.8	12,077.9
15-19	10,551.5	33.6	4.0	10,589.1	10,014.1	14.8	3.7	10,032.7
20-24	10,738.8	41.4	4.4	10,784.6	8,917.8	17.6	4.0	8,939.4
25-29	11,321.1	51.7	5.5	11,378.3	9,800.0	25.2	4.9	9,830.2
30-34	10,362.0	63.3	6.5	10,431.7	9,295.2	35.7	5.7	9,336.5
35-39	9,389.7	85.9	7.7	9,483.3	8,909.4	58.1	6.8	8,974.4
40-44	8,181.5	183.1	9.6	8,374.2	7,965.0	140.7	9.2	8,114.9
45-49	6,644.6	262.4	11.3	6,918.4	6,871.0	216.1	11.5	7,098.5
50-54	5,249.1	323.6	14.1	5,586.7	5,647.9	294.2	15.3	5,957.4
55-59	3,680.2	307.6	15.4	4,003.2	4,116.4	302.1	17.1	4,435.6
60-64	2,357.1	284.6	17.8	2,659.5	3,023.3	344.5	25.0	3,392.7
65-69	1,736.8	269.2	21.6	2,027.6	2,285.1	346.4	31.4	2,662.8
70-74	1,144.5	261.4	27.6	1,433.6	1,607.1	370.0	43.2	2,020.3
75-79	618.7	173.7	22.8	815.1	876.4	248.6	36.7	1,161.7
80-84	317.8	120.6	20.6	459.0	464.1	184.4	34.9	683.4
85-89	115.2	51.3	10.8	177.2	164.7	77.3	18.3	260.3
90-94	38.3	21.8	6.1	66.3	57.4	35.8	11.2	104.4
95+	21.6	12.0	4.8	38.3	32.6	23.4	10.1	66.0
Total	92,909.1	2,567.0	214.0	95,690.1	92,110.2	2,746.0	292.9	95,149.1

Source: Compiled and calculated from BPS

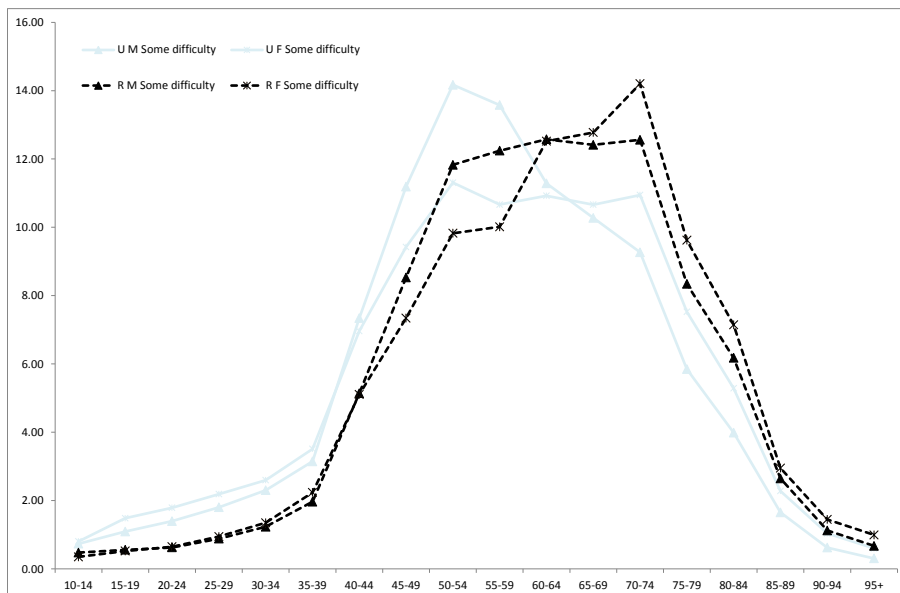
Figure 7 provides further detail of age-sex specific distribution of population with some visual difficulties in which both age and sex are interacting. The figure shows four different patterns with regards to age and sex differential. Rural male has a flat peak and so does urban female. Rural female with some difficulties has its peak at the aged 70-74 but urban male has its peak at 50-54 years old.

Figure 6. Number of Population and People with Disabilities by Age and Place of Residence: Indonesia, 2010 (in percentage)



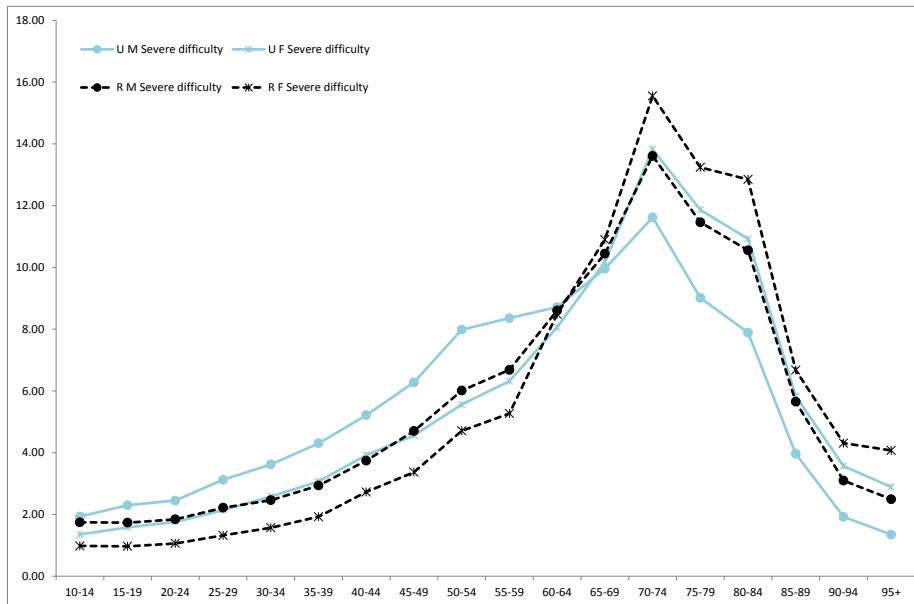
Source: authors' calculation based on 2010 population census data

Figure 7. Age-Sex Distribution of Population with Some Visual Difficulties by Place of Residence: Indonesia, 2010



However, as seen in Figure 8, the age-sex specific pattern of distribution of population with severe difficulty in urban and rural areas has relatively similar patterns. All patterns have their peak at the same age group, 70-74 years old.

Figure 8. Age-Sex Distribution of Population with Severe Visual Difficulties by Place of Residence: Indonesia, 2010



Age-Specific Prevalence of People with Visual Disability

The 5.82 million population of Indonesia suffering from visual disability contribute 3.05 per cent of total Indonesian population aged 10 years old and over. This consists of 2.78 percent having some difficulties and 0.27 percent having severe difficulties. Regardless of the degree of difficulty, the prevalence of visual difficulties varies by sex with female having higher prevalence than male (3.39 percent vs 2.71percent). In addition, the prevalence is also different by place of residence. The prevalence in rural areas is larger than that in urban areas (3.19 percent vs 2.91 percent). Taking into account both sex and place of residence, the prevalence is the highest for female in rural areas (3.58 percent) and the lowest for male in urban areas (2.62 percent). The other two groups are in between, with 2.81 percent for male in rural areas and 3.19 percent for female in urban areas.

As expected, the percentage of population suffering difficulties (either some or severe) rises with age. Interestingly, the percentages are higher among female population. The difference is relatively large among older persons, 60 years old and over. As seen in Figure 9, the age-sex specific prevalence of vision difficulties generally takes a J-shape, the prevalence of vision difficulties increases with age, especially at advanced ages. Therefore,

again, Indonesia's ageing population will soon make the issue of vision ability, as a human right, becoming much more relevant.

Figure 9. Age-Sex Specific Prevalence of Visual Difficulty: Indonesia, 2010

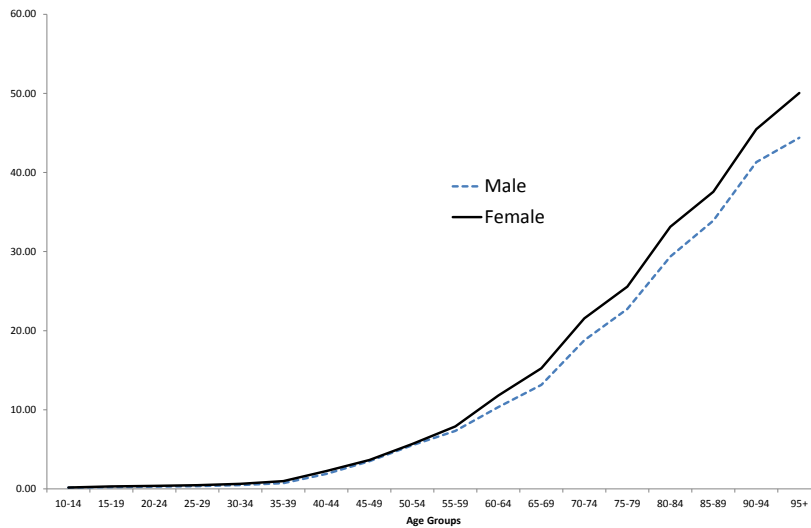
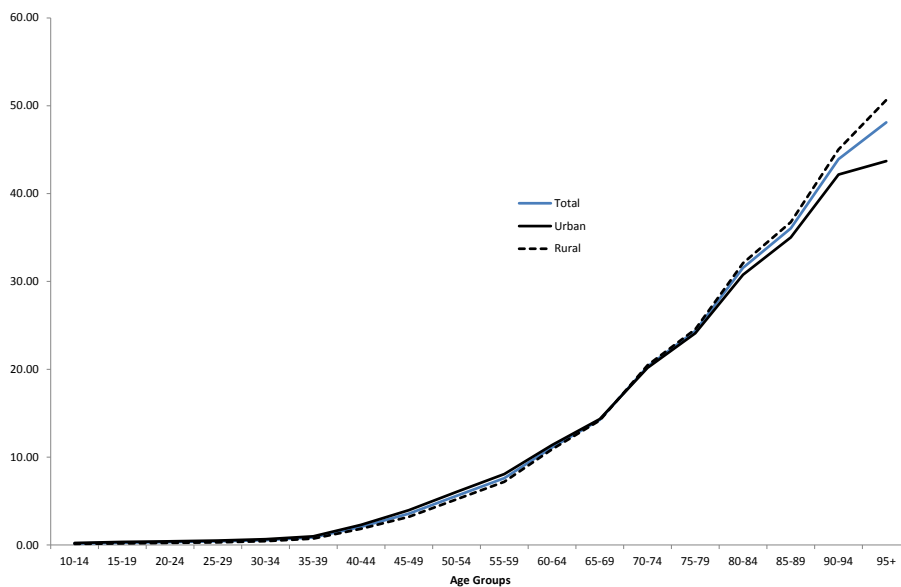


Figure 10. Age-Specific Prevalence of Visual Difficulty by Place of Residence: Indonesia, 2010



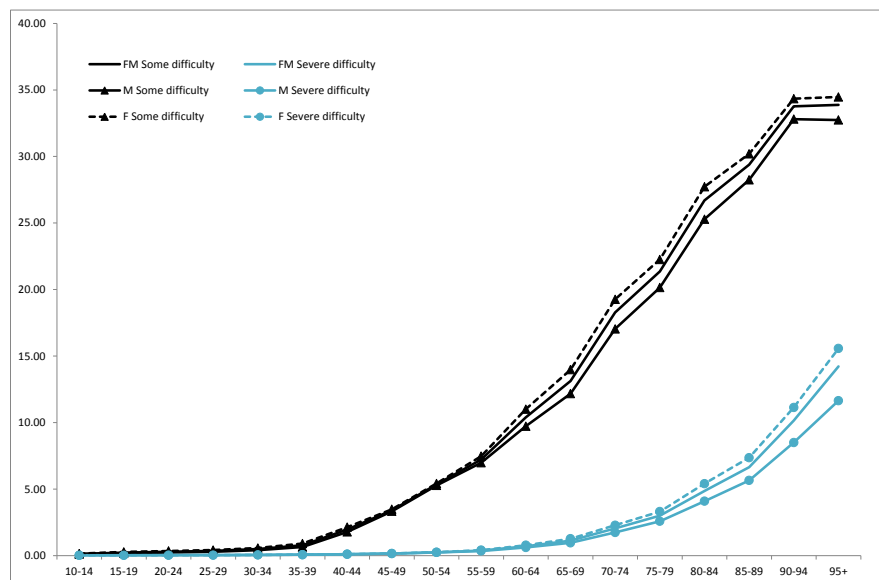
Source: authors' calculation based on 2010 population census data

Figure 10 shows an almost the same pattern of age-specific prevalence of visual disability in urban and rural areas, regardless of its degree of difficulty. It should be noted,

the prevalence in urban area for those under 70 years old is slightly higher than in rural areas. Unfortunately, we do not have data for previous dates, and hence we cannot know the trend. However, when those below 70 years old become older, the rate for those above 70 years old in urban can become higher than those in rural areas. If this is true, and the process of urbanization continues, the prevalence in urban areas can become higher than that in rural areas. As expected, among older persons aged 70 years and above, the prevalence is higher in rural than urban areas.

Comparing Figures 9 and 10, we can observe that the gap in prevalence between male and female is larger than the gap between urban and rural areas. In other words, sex is more influential than place of residence in differentiating the prevalence of visual difficulties.

Figure 11. Age-Specific Prevalence of Visual Difficulty by Degree of Difficulty: Indonesia, 2010



Source: authors' calculation based on 2010 population census data

As shown in Figures 11 and 12, the prevalence of disabilities (number of disabilities in a given age group divided by the number of population at that age group) shows a rising trend with age. The rates are similar at young age-groups. But, from age 25-29, the “some difficulties” start being higher than the ‘severe difficulties’. The gap is becoming larger the older the population. The rising prevalence for severe disability starts at the age of 50. This pattern is seen regardless of residence (rural-urban) and sex. As presented in Table 3, the prevalence of some visual difficulties ranges from as low as 0.14 percent for the youngest group, 10-14 years old, to as high as 33.88 percent for those 95 years and above. In contrast,

the prevalence of severe visual difficulties ranges from 0.04 to 14.22 percent for the youngest and the oldest groups. The higher prevalence among those with “some difficulties”, rather than “severe difficulties”, may imply that it is relatively easier to eradicate visual disability. The action should start as early as possible as visual disability may develop at younger age groups.

Figure 11 shows that the prevalence among female is higher than male for either some difficulties or severe difficulties. For severe difficulties, the gap between male and female is widening as age increases.

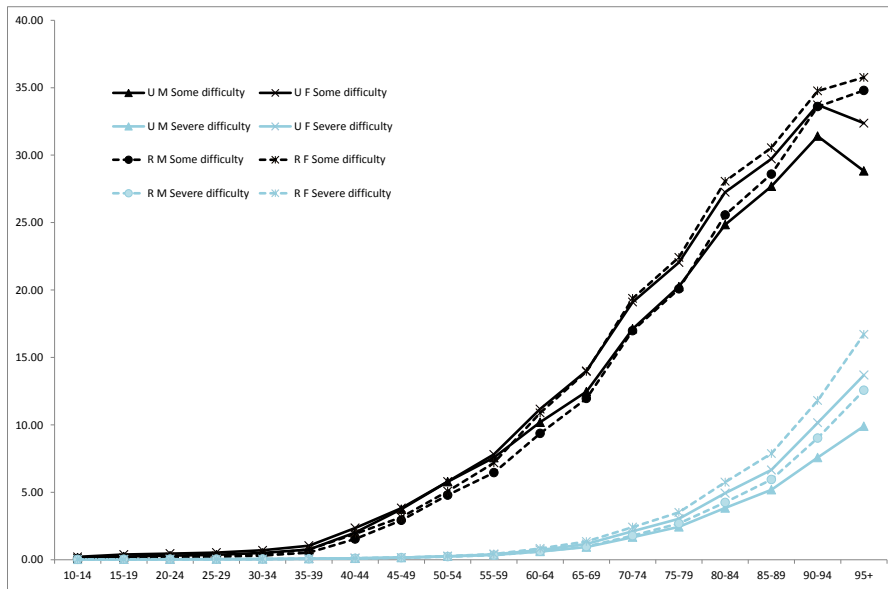
Table 3. Age-Sex Specific Prevalence of Population with Visual Difficulties by Degree of Difficulty: Indonesia, 2010

Age	Male + Female		Male		Female	
	Some difficulty	Severe difficulty	Some difficulty	Severe difficulty	Some difficulty	Severe difficulty
10-14	0.14	0.03	0.12	0.03	0.15	0.03
15-19	0.23	0.04	0.19	0.04	0.28	0.04
20-24	0.30	0.04	0.24	0.05	0.35	0.04
25-29	0.36	0.05	0.30	0.05	0.42	0.05
30-34	0.50	0.06	0.42	0.06	0.58	0.06
35-39	0.78	0.08	0.65	0.08	0.91	0.08
40-44	1.96	0.11	1.78	0.11	2.15	0.12
45-49	3.41	0.16	3.34	0.16	3.49	0.16
50-54	5.35	0.25	5.28	0.25	5.43	0.26
55-59	7.23	0.38	6.99	0.35	7.48	0.42
60-64	10.39	0.71	9.73	0.62	11.01	0.79
65-69	13.12	1.13	12.18	0.97	13.98	1.28
70-74	18.28	2.05	17.04	1.75	19.26	2.29
75-79	21.36	3.01	20.15	2.59	22.26	3.32
80-84	26.70	4.86	25.28	4.10	27.73	5.42
85-89	29.39	6.65	28.25	5.66	30.20	7.36
90-94	33.77	10.15	32.81	8.50	34.34	11.14
95+	33.88	14.22	32.74	11.65	34.47	15.57

As seen in Table 4, the prevalence of severe disability is higher among rural population than urban counterparts after they reach 70 years old. Among those below 70 years old, the prevalence of severe disability is higher in urban areas. The same pattern is seen among those with some difficulties: the prevalence is higher in urban areas for the younger ones, and higher in rural areas for the older ones. Figure 12 provides more complex pattern of age-specific prevalence of visual difficulties taking into account the sex and place

of residence as well as degree of difficulties. For both degrees of difficulties, the prevalence is the highest for female living in rural areas.

Figure 12. Age-Specific Prevalence of Visual Difficulty by Degree of Difficulty and Place of Residence: Indonesia, 2010



Source: authors' calculation based on 2010 population census data

In summary, the prevalence of visual disability takes a J-shape. However, the threshold of starting to accelerate varies by its degree of disability. The prevalence among people with some disability starts accelerating earlier than the prevalence of people with severe disability.

Table 4. Age-Specific Prevalence of Population with Visual Difficulties by Degree of Difficulty and Place of Residence: Indonesia, 2010

Age	Urban Some difficulty	Urban Severe difficulty	Rural Some difficulty	Rural Severe difficulty
10-14	0.19	0.03	0.09	0.03
15-19	0.32	0.04	0.15	0.04
20-24	0.38	0.04	0.20	0.05
25-29	0.45	0.05	0.26	0.05
30-34	0.61	0.06	0.38	0.06
35-39	0.91	0.08	0.65	0.08
40-44	2.19	0.11	1.73	0.11
45-49	3.79	0.16	3.04	0.16
50-54	5.79	0.25	4.94	0.26
55-59	7.68	0.38	6.81	0.39
60-64	10.70	0.67	10.15	0.74
65-69	13.28	1.06	13.01	1.18
70-74	18.24	1.92	18.31	2.14
75-79	21.31	2.80	21.40	3.16
80-84	26.27	4.49	26.98	5.11
85-89	28.92	6.09	29.70	7.04
90-94	32.92	9.26	34.31	10.72
95+	31.22	12.47	35.42	15.24

Table 5. Age-Sex Specific Prevalence of Population with Visual Difficulties by Degree of Difficulty and Place of Residence: Indonesia, 2010

Age	U M Some difficulty	U F Some difficulty	U M Severe difficulty	U F Severe difficulty	R M Some difficulty	R F Some difficulty	R M Severe difficulty	R F Severe difficulty
10-14	0.16	0.22	0.03	0.03	0.09	0.09	0.03	0.03
15-19	0.24	0.39	0.04	0.04	0.13	0.17	0.04	0.04
20-24	0.30	0.46	0.04	0.04	0.17	0.22	0.05	0.04
25-29	0.37	0.54	0.05	0.05	0.22	0.29	0.05	0.05
30-34	0.51	0.70	0.06	0.06	0.32	0.44	0.06	0.06
35-39	0.76	1.05	0.08	0.08	0.53	0.77	0.08	0.08
40-44	2.02	2.36	0.11	0.12	1.54	1.93	0.11	0.12
45-49	3.75	3.83	0.16	0.16	2.93	3.16	0.16	0.17
50-54	5.79	5.80	0.25	0.25	4.79	5.08	0.24	0.28
55-59	7.57	7.81	0.36	0.41	6.46	7.19	0.34	0.43
60-64	10.20	11.18	0.62	0.72	9.37	10.88	0.62	0.84
65-69	12.47	14.00	0.94	1.17	11.96	13.96	0.98	1.36
70-74	17.13	19.11	1.68	2.12	16.99	19.38	1.79	2.42
75-79	20.25	22.04	2.44	3.05	20.08	22.42	2.69	3.52
80-84	24.85	27.25	3.84	4.94	25.56	28.06	4.26	5.75
85-89	27.69	29.72	5.19	6.66	28.59	30.55	5.95	7.88
90-94	31.41	33.72	7.59	10.16	33.60	34.76	9.02	11.81
95+	28.82	32.37	9.90	13.69	34.79	35.76	12.57	16.72

Geographical distribution

The archipelago of Indonesia has an uneven distribution of the population across its major islands with Java Island, the smallest, a home to more than 55 percent of the population. The uneven distribution is reflected in the geographical distribution of population with visual difficulty. The visual disabled in Java Island comprises 52.1 percent or 3.03 million. Those living in Sumatra islands account for 22.63 percent, and the rest are spread in many other islands. Indonesia has 33 provinces with West Java and East Java the two provinces having the largest percentage of population with visual difficulty. Each contributes 18.23 percent and 14.48 percent.

In comparison to the national level, there are 22 out of 33 provinces having larger prevalence of visual difficulty as seen in Table 6. The prevalence of visual difficulty varies by province, with the highest in the province of Gorontalo (6.16 percent), followed by South Sulawesi (4.91 percent), and North Sulawesi (4.78 percent). It should be noted that the province of Gorontalo is also in the Island of Sulawesi, bordering with the province of North Sulawesi. The percentage of female population having visual difficulties in Gorontalo is even higher (7.19 percent). The lowest percentage was in Papua (1.10 percent), followed by West Papua (2.22 percent), two provinces in the Eastern Indonesia, often considered as not yet socially and economically advanced. The third and fourth lowest were in Central Java (2.13 percent) and Yogyakarta (2.28 percent), two Javanese provinces, in Java island, which is relatively more socially and economically more advanced than in the island of Papua.

Table 6. Number and Prevalence of Visual Difficulty by Province: Indonesia, 2010

	Province	Number		Prevalence	
		Some difficulty	Severe Difficulty	Some difficulty	Severe Difficulty
1	Aceh	117,338	12,734	3.35	0.36
2	North Sumatra	276,391	25,634	2.76	0.26
3	West Sumatra	154,096	15,116	4.05	0.40
4	Riau	122,589	9,707	2.89	0.23
5	Jambi	78,137	6,331	3.21	0.26
6	South Sumatra	182,887	17,054	3.09	0.29
7	Bengkulu	46,959	4,396	3.45	0.32
8	Lampung	166,791	15,747	2.73	0.26
9	Bangka Belitung	25,637	2,397	2.65	0.25
10	Riau Islands	34,508	2,410	2.64	0.18
11	Jakarta	270,390	16,372	3.41	0.21
12	West Java	975,550	85,438	2.82	0.25
13	Central Java	509,772	59,894	1.91	0.22
14	Yogyakarta	58,927	8,117	2.00	0.28
15	East Java	759,100	83,736	2.43	0.27
16	Banten	193,519	15,567	2.28	0.18
17	Bali	82,793	7,556	2.58	0.24
18	West Nusa Tenggara	103,121	12,100	2.91	0.34
19	East Nusa Tenggara	125,339	16,845	3.61	0.49
20	West Kalimantan	105,248	10,264	3.06	0.30
21	Central Kalimantan	54,865	4,787	3.16	0.28
22	South Kalimantan	88,217	6,864	3.05	0.24
23	East Kalimantan	90,256	6,133	3.25	0.22
24	North Sulawesi	80,224	7,667	4.36	0.42
25	Central Sulawesi	85,648	6,890	4.24	0.34
26	South Sulawesi	286,060	27,118	4.49	0.43
27	Southeast Sulawesi	66,381	5,666	3.92	0.33
28	Gorontalo	46,399	3,887	5.68	0.48
29	West Sulawesi	33,763	2,611	3.87	0.30
30	Maluku	35,554	3,190	3.10	0.28
31	North Maluku	23,056	1,939	2.96	0.25
32	West Papua	11,935	765	2.09	0.13
33	Papua	21,496	1,946	1.01	0.09
	Indonesia	5,312,946	506,878	2.78	0.27

Room for Improvement

Indonesia's visual disability is worse than the global condition, especially among the older persons (aged 60 years old and over). The percentage revealing that they have severe visual difficulties was 67.7 percent, much higher than 58 percent who were blind worldwide.

However, prevalence of severe impairment in Indonesia is relatively comparable to that in the US. On the other hand, prevalence on “some difficulties” in Indonesia is much higher than low vision in the US (Congdon et al. 2004). The number of people with low vision (equated with some difficulty) in the US was estimated to be 2.4 million, who were older than 40 years and above in 2000. The corresponding figure for Indonesians with some visual difficulty was doubled (4.8 million) in 2010. Therefore, there is plenty of room to reduce the number and prevalence in Indonesia, which will in turn reduce capability deprivation and help fulfilling the human rights of the people.

Saw et al (2003) showed that rates of low vision and blindness in some provinces in Sumatra, Indonesia, were similar to those found in other rural areas in developing countries. Blindness in these areas can be avoided, as most of them are caused by cataracts and uncorrected refractive errors. Blindness because of cataracts can be reduced by improving the overall infrastructure of eye care delivery and raising the quality of staff to treat the cataracts. Yet, though cheap in term of national income, the cost of having cataract surgery can be very expensive for the poor rural population. At the same time, though myopia can be fully corrected using eye glasses and the cost is relatively cheap, there was still a large part of population who were still uncorrected.

Concluding Remarks

This paper presents the most comprehensive estimate for distribution and prevalence of sensory difficulty, namely, visual difficulty. Issues on disability are now gaining momentum and have been discussed more often in Indonesia. However, at the same time, the increasingly digitized world may have brought more persons (particularly younger ones) to the digital world. This may harm their visual ability. The pressure from digital work has also gone in tandem with bad eating habits including unhealthy food and malnutrition. Therefore, modernization (economic growth) itself may have increased visual disability. Visual disability may also become a more urgent issue among the non-poor too. As the digital world is more widespread in urban areas, it is likely that urbanisation may lead to serious visual disability.

As the digital world will continue to exist, without proper prevention and treatment, this phenomenon can result in a huge capability deprivation, and hence productivity loss.

Furthermore, the statistics also show that visual disabilities may rise fast in urban areas. Worse, the peak of the suffering in urban areas was found among the productive-age groups.

Fortunately, most of the visual disabilities can be prevented and treated with affordable cost and high degree of success, including campaigning for good eating habit and good habit in using the eyes. This is cheaper than avoiding hearing disabilities. There is no such procedure for treating hearing loss as cataract surgery in treating visual loss. Even, eye glasses are now relatively much cheaper than hearing aids. However, prevention can be done for both cases, visual and hearing disability. Moreover, most of the visual disability is with only “some difficulties” and the probability of having visual disability is also much higher for only some difficulties than severe. Healthy lifestyles such as eating healthy food and doing exercise are likely to help reduce the probability of having both visual disabilities.

With relatively cheap cost, Indonesia can reduce much of its capability deprivation and even increase its productivity through avoiding visual disabilities. It can avoid rising visual disabilities in urban areas and therefore raising the welfare of urban population, without requiring much money.

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Notes

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- ³ The Jakarta Post, 19 October 2011. *RI ratifies UN convention on rights of persons with disabilities*<http://www.thejakartapost.com/news/2011/10/19/ri-ratifies-un-convention-rights-persons-with-disabilities.html>
- ⁴ The Jakarta Post, 19 October 2011. *RI ratifies UN convention on rights of persons with disabilities*<http://www.thejakartapost.com/news/2011/10/19/ri-ratifies-un-convention-rights-persons-with-disabilities.html>
- ⁵ Government Achievement and Challenges regarding the Enhancement of ICT Accessibility for PWD's in Indonesia ICT ACCESSIBILITY FOR PWD'S IN INDONESIA.<http://unpan1.un.org/intradoc/groups/public/documents/ungc/unpan040430.pdf>