DEMOGRAPHIC WINDOW BY RELIGION AND ETHNICITY: INDONESIA, 2000-2050[1]

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1. INTRODUCTION

Indonesia—a country having more than 1,000 ethnic and sub-ethnic groups and six official religions each with many *aliran* or sects-- has undergone a relatively fast demographic transition. According to the Central Board Statistics of Indonesia, the total fertility rate fell from 5.6 in the late 1960 to 2.3 by the year 2000. Therefore, the total fertility rate has dropped by more than double within three decades. Expectancy of life at birth increased during the same period by almost 20 years to 65 in the end of the twentieth century.

The fast demographic transition inevitably brings about changes in the age structure of population. The baby boom generation, born between 1960s and 1970s, shaped a broad base population pyramid. This results in a high young dependency ratio (the ratio between the numbers of population under 15 years old and population 15-64 years old) at about 82 in 1971. On the other hand, the old dependency ratio (the ratio between the number of population above 65 years old and the number of population 15-64 years old) was only 5. Along with the fast fertility decline, the age structure of the Indonesia's population has been getting old. The young dependency ratio quickly declined to 47, while the old dependency ratio increased to 7 in 2000. Indonesia has ended the twentieth century with a total dependency ratio of 54.

In this paper, we estimate that Indonesia has reached replacement level in 2000-2005, a condition that has been projected since early 1990s as shown in Ananta and Arifin (1991). We also project that Indonesia will experience the second demographic transition, when NRR <1 with fluctuating fertility level and changing norms toward more individualization and less control from the government and society at large, after 2005. The changes in norms on family life will include those on the life of the elderly and the attitude of the younger (the children) toward the older (the parents) generations.

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We also estimate that Indonesia as a whole will open the demographic window of opportunity, when the total dependency ratio starts being smaller than 50, in 2005. Indonesia starts enjoying the demographic window of opportunity at almost the same time as Indonesia enters the second demographic transition. Since 2005, the young dependency ratio will keep declining and old dependency ratio will keep rising with a declining total dependency ratio until 2020. After 2020, financing and taking care of the elderly will become an increasingly difficult problem. The window will be closed, when total dependency ratio starts larger than 50 per 100 productive age population, in the year 2035 (in slower fertility decline scenario) or 2040 (in faster fertility decline scenario).

How about the demographic transition and demographic window for different religious and ethnic groups? Are they similar, or starkly different? Nevertheless, there has never been any projection of Indonesian population by religious and ethnic groups—there are more than 1000 ethnic and sub-ethnic groups, with the Javanese and Sundanese as the two largest groups, and six official religions with Muslims as the largest religious group. The absence of such a projection is attributable to the lack of data on fertility and mortality by ethnicity and religion. There had not been any information on ethnicity since the 1930 population census. Fortunately, the 2000 population census has provided a breakthrough by collecting information on ethnicity and religion. This paper utilizes this rich information by producing estimates of fertility and mortality by ethnicity and religion, projecting the population of Indonesia by ethnicity and religion, and discussing the demographic window of opportunity, in relation to the second demographic transition, of Indonesian population by ethnicity and religion.

The second section of this paper briefly reviews the concept of the second demographic transition, especially as related to changes in social norms. It also describes the experiences of the successful implementation of Indonesian family planning program, which has involved a lot of social changes. It briefly discusses a consequence of the success of the family planning program-- the ageing in Indonesia, with a focus on the attitudes of the children to the elderly parents. Section 3 examines the current Indonesian ageing by ethnic and religious groups. Section 4 focuses on the projection of the ageing population--on the timing of the second demographic transition and demographic window by ethnic and religious groups. In Section 5, we put together all results examined in previous sections.

2. First and Second Demographic Transition

2.1 From Social to individual interest

The first demographic transition is often described as a transition from a condition of high fertility and mortality to the one of low fertility and mortality, regardless how the transition has occurred. The transition is finished when fertility has reached below replacement level fertility with total fertility usually below 2.2 and infant mortality rate below 30 deaths per 1000 live births.

During the process of fertility transition, fertility has increasingly entered the calculus of conscious choice. People have been considering the economic cost and

benefit of having children. The value toward children have changed from investment and old age security to consumption goods, where parents emphasize more on the human capital of the children and the their own welfare. When these parents become old, they may not necessarily expect contribution from their children.

The first demographic transition is followed by what Van de Kaa (1987) calls as the second demographic transition. He focuses on the explanation of the second demographic transition in Europe, where fertility has been under replacement level for a long time. He maintains that the behaviour of individuals in the second demographic transition is much less influenced by the social and institutional norms, but more by individual values. This is very different from the condition in the first demographic transition, where government can influence the process of transition. The fundamental changes in the values are related to marriage, childbearing and family relationship.

He explains that in the first demographic transition, the decline in fertility is mostly because of interest in raising the welfare of family-parents and children. In the second demographic transition, the change in fertility is more dominated by interest in the individual rights and self-fulfilment. Fertility depends more on the individuals than norms or government intervention. Marriage in the second demographic transition becomes precarious. If it does not bring enrichment, the marriage is likely to break up

Therefore**,** the second demographic transition is featured with the rising individualisation, implying that social and institutional norms have becomes less and less important in determining individual behaviour. The new norms give more weights to the interest of the individual. The accentuation of individual autonomy and self-actualisation has been the most basic distinction between the first and second demographic transition. Along with these changes, there will be greater tolerance for libertarian culture and alternative life styles. This emerging value comes at the same time as the emergence of "post-materialist" value, stressing on grass-root democracy, self-actualisation, tolerance and ethical autonomy.

Lesthaeghe (2000) mentions the destandardisation of patterns of home leaving and household formation as another feature of the second demographic transition. The classic ordering, particularly between age 18-30, is: finishing school, entering labour force, leaving home through marriage, and becoming parents. The new sequence is: single living, sharing dwelling with age mates, premarital cohabitation, and parenthood before marriage with or without partner. These sequences occur before the end of education or before the entry into the labour force.

McDonald (1994) explains this second demographic transition as a shift from a social system emphasizing on the well-being of the family as a whole to the one on the well-being of the individual members of the family. The well-being of the family as a whole can also be seen as the well-being of those holding the power or status, including the relatives, the reference groups, and the religion. In other words, what is regarded as "immoral" in the society, especially with respect to family life, has changed from one where outside intervention is acceptable and desirable to the one where marriage is simply the business of the couple.

The low fertility regime in Indonesia (especially in some province) may unavoidably result in values changes among families in Indonesia. McNicoll (1997) argues that in the long run the pressure of urban life and high-consumption lifestyles will change families everywhere, including Indonesia. Attitudes and behaviour on patriarchal

will decline further. Individualism will be on the rise; decision about and on family becomes the decision of the respective couple, not the decision of the extended family or even the larger society. Hull (2002) concludes that many Indonesian women have been abandoning the officially recognized social norms on family

In short, the key aspect of the second demographic transition is a change from parenthood to partnership in marriage. Yet, nobody has discussed beyond the stage of parenthood, in particular the stage of being old—the elderly. What are the behaviour of the elderly people who were born and growing up in the second demographic transition? What are the attitudes of the young population, who were born during the second demographic transition, toward the old population? How does society in the second demographic transition perceive life in the old age? Consistent with the view on the family, those experiencing second demographic transition may also assert more individual autonomy and self-actualisation, and may have different ways to present their respect and care for the elderly. Respect and care may not necessarily be shown by living in a close proximity and direct contribution to the parents. It may change to contribution through public institution.

The future younger generations, particularly those who were born and growing up during the second demographic transition may learn more individual autonomy and self actualisation and they may claim their rights and condone too much control from their parents. They may ask for independence of the older generations as the older generations have taught them to be independent. The future elderly themselves may not expect too much contribution from their children because, when they were still young, old-age security may not have been their motivation to have children.

Therefore, it is important to examine when Indonesia (and its various ethnic and religious groups) starts entering the second demographic transition, characterized with NRR < 1). Differences in the timing among different groups may bring differences in social norms (including those on the relationship between children and, particularly, elderly parents) among different groups.

2.2 Family planning program and ageing in Indonesia

There is a debate on the latest figures of TFR in Indonesia. If we believe in the data from the 2000 Population Census, the TFR should be 2.34 in 1996-1999. If we believe the data from the Indonesian Demographic Health Survey, the TFR should be 2.6 in 1999-2002. Here, in this paper, we take a "middle" ground, that TFR estimated using the population census refers to the 2000-2005. With this assumption, Indonesia has finished its first demographic transition, by achieving slightly below replacement level fertility, in 2000-2005.[1] Thus, Indonesia will start being in its second demographic transition by 2005.

It should be noted that these are figures for Indonesia as a whole. Some other regions are behind and have not finished the first demographic transition. Some others have finished earlier, in beginning of the 1990s and will therefore enter the second demographic transition earlier. Societies with different religions and ethnicities may also experience different stages of demographic transition. Hence, they may have different values and norms regarding family and life in general, including those on the elderly.

At the beginning, in the late 1960s, Indonesian societies still perceived that children were source of *rejeki* (fortune)—*banyak anak banyak rejeki*; more children, more fortune-- and that practicing contraception was against traditional or religious values. Hull (2003) describes that this perception had been used by some Islamic groups which had been deprived from openly criticizing the secularist government as an issue to indirectly attack the government—they criticized the national family planning program. Some books, based on Islam, condemning family planning program, had been circulated in the province of East Java, though polices had soon banned the circulation of the books.

Therefore, as described by Niehof and Lubis (2003), the government of Indonesia had worked hard to win the participation of religious group, especially the Muslims, from village to national level, in campaigning for the use of contraception. Many closed-door discussions with religious leaders had been conducted. Later on, leaders of various religious groups have given their interpretation of the religious teaching in favour of the use of contraception. Hull (2003) shows that religious objections had then shifted to the more specific issues, such as coercion of the use of family planning and inappropriate use of contraceptive.

In the beginning of the program, family planning policies had been influenced by the perception of conservative and middle class women, whose roles are only as mothers and wife's with no individual needs and economic roles. In fact, women in many societies in Indonesia had contributed a lot to the household economy—they worked in the market economy or helping the men in the market economy. (Lubis and Niehof, 2003) Later on, the family planning programs have moved to focus on *keluarga sejahtera* (the welfare of the family).

During the implementation of the program, different approaches had been used for different ethnic groups. For example, in Bali, where Hinduism is the majority religion, they used the traditional institution of *banjar* (very unique in Bali), a place where the Balinese gather for ceremonial and recreational purposes. Java, where the majority is Muslims, is different from Bali. They use *paguyubuan*, similar but not as important and rooted as in the *banjar*. The *paguyuban* seldom has monthly meeting as the *banjar* does. (Lubis and Niehof, 2003)

With this experience in family planning program and fertility decline, it is therefore interesting to examine the life cycle pattern after parenthood and especially during the old ages. A particular interesting question is on the attitude of the younger generations toward the older one. In many Asian countries, including Indonesia, the norms are that sons and daughters must respect and take care of the elderly parents. In the *bahasa* Indonesia*,* the word *dituakan* literally means that somebody is placed in a status as an old person; if somebody is *dituakan,* the person has obtained respect from the society, where the society will come to him/ her for advice. The word chairperson or head (of program or institution) is translated into *ketua*, where tua means *old,* and hence to be a *ketua* somebody should have that feature of *tua* (old).

In the society of Minangkabau, with matrilineal system, daughters have more responsibilities in taking care of the parents, and sons in taking care of their sisters and the children of their sisters. It is likely, therefore, that, for example, creating a nursing home in West Sumatra, the home province of the Minangkabau, may be seen as a humiliation for the women, as if the women can no longer do their duties to take care of the parents.

The Javanese, for another example, would say that the sons and daughters as "*ora ilok*" (not proper) or even "*kurang ajar*" (very bad) and they may get "*kualat"* (revenge), if they do not take care of their parents. Do-Le and Rahardjo (2002) mention the concept of *mikul dhuwur, mendhem jero* in the Javanese society, meaning that the young should honour, respect, and care the elderly for their wisdom. Such an expression is also found in almost all ethnic groups in Indonesia.

In short, being *tua* (old) is not necessarily bad, even, people gain respect as they become *tua*. Furthermore, Schroder-Butterfil (2003) argues that whether the elderly need practical and financial support is an empirical matter, and not to be assumed. In her study in a village in East Java, Indonesia, she finds that half of the elderly are healthy and the majority of the 60-69-olds are economically independent. As mentioned in Suleeeman (2004), unlike in the Western countries where children should leave the parents at age 18, many unmarried children still stay with the parents in Indonesia. If they get married but they do not have their own houses, they may still stay with the parents. Even if they have children, they may still stay with their parents if they have not been able to find their own house.

Schroeder-Butterfil also finds that many of the elderly in the village have supported their own unmarried children and even taken care of their grand children because the parents are busy (e.g., migrating to other countries), divorced or have died. Though the high fertility level in the past and relative immobility of the people may have resulted in the relatively large supply of younger generation to take care of the elderly in the village, the out migration (to urban areas or overseas) have resulted in the "skip-generation"—that the elderly need to become the surrogate parents.

A question may arise on whether the elderly work because they are willing to do so or they work because they are forced by economic needs. Rahardjo and Do-Le (2001) find that the majority of the poor elderly work in agriculture or informal sector. They have meagre income and no saving. Indeed, the poorest of the elderly may have to earn money to help the family as long as they can, perhaps until they die, by sacrificing their own welfare.

Therefore, we should be careful in using the measurement of old dependency as defined by the ratio of number of population aged 65 to number of population aged 15-64. The population aged 65 and over may be still independent and they may even still support the children, nephew, and even the grand children, regardless of whether they do it because of their own willingness to contribute to the family or because being forced by the poverty of the family. As also mentioned in *World Population Ageing: 1950-2050*, the dependency ratio simply provides a rough, yet important, approximation to the burden of dependency.

Furthermore, the younger generation have been brought up during the end of the first demographic transition and the beginning of the second demographic transition. Changes in the norms during the second demographic transition in Indonesia may be faster than those which have occurred in developed countries—as the first demographic transition also occurred in a relatively much shorter period than what happened in the developed countries. The younger generation--which will be characterized with rising individual autonomy, independence, and self-actualisation-- may impose the same things to the older generation. Being *tua* can then simply mean "old" as the word "*tua*" literally

means; it may no longer carry the notion of "respect" and "power" and hence the *orang tua* (old people) merely means a burden the young generation must shoulder.

What will the norms in the future be, especially if each of the various ethnic and religious groups starts entering the second demographic transition in different times? Will the future elderly parents still function as parents for the unmarried children and those married children without any house? Will parents remain being surrogate parents? Will there be sufficiently large number of children or nephews to take care of the elderly, as fertility becomes very low?

Will the norms that children are obliged to take care of the elderly parents remain in the next 20 or 50 years? Will the young in each religion and ethnic group still provide the same respect and honour and care to the elderly, or they start seeing that being *tua* or old is something ugly, undesirable, and burdensome as many commercial advertisements have praised the condition of being young and have sold ways to prevent being old? Indeed, Do-Le and Rahardjo (2002) have shown that the traditional norm--that the family takes cares of the elderly—has been disappearing in Indonesia. The current Indonesian elderly cannot expect as strong support from the younger generation as the earlier elderly had used to do. With these changes, the measurement of old dependency ratio with the ratio between the old population and the productive age population becomes more relevant.

The transition in many developed countries show that initially the care of the elderly is in the hand of the family. With the advance of the economy, the care shifts from the family to the public sector, fully or partially. Will the same thing happen in Indonesia? Will people from different ethnic and religious groups respond differently to the change of the care of the elderly? If they have different stages of demographic transition, will they have different responses? Currently, as mentioned in Do-Le and Rahardjo (2002), there has been no general institutional care of the elderly.

Therefore, as suggested by Schroeder-Butterfil, we should conduct studies on norms regarding intergenerational and familial relation to understand the extent of the dependency of the elderly on the younger generation. Because of lack of such studies, in this paper, we simply approach the issue from the timing each ethnic and religious group enters the second demographic transition, assuming that being in the second demographic transition implies fast changes from behaviours more influenced by social and institutional values to the ones more influenced by individual values.

3. CURRENT INDONESIAN POPULATION

3.1 Age composition

The population of Indonesia has changed from a young population toward an old population. The young dependency ratio has declined a lot from 82.46 in 1971 to 46.81 in 2000, while the old dependency ratio has risen a little from 5.11 in 1971 to 6.98 in 2000. Overall, the total dependency ratio declined from 87.57 in 1971 to 53.79 in 2000. In other words, the rise in old dependency ratio has not been large enough to compensate the decline in the young dependency ratio. If we follow Robine (2004), Indonesia has not opened the demographic window because the total dependency ratio in 2000 is still larger

than 50.0, though Indonesian population has so far enjoyed a declining total dependency ratio.

The ageing proportion rose slowly from 2.05% in 1971 to 4.54% in 2000—the proportion in 2000 is still too small to consider Indonesia as an ageing society. With a rough criterion, a society with a proportion of the elderly below 5% can be considered as a young population; between 5% and 10%, as an "intermediate" population; and above 10%, as an old population. Therefore, in 2000, Indonesia is still considered as a young population, close to "graduating" into an intermediate population. Nevertheless, as argued by Ananta, Anwar, and Suzenti (1997), the problem in Indonesia may not be reflected by the proportion of the elderly, but by the absolute number of the elderly and the associated social and economic conditions of the elderly and the surrounding. They mention that Indonesian elderly live in more limited economic infrastructures than their counterparts in developed countries.

Indeed, in the year 2000, there were 9.1 million elderly, more than twice the number of total population of Singapore in 2000—and yet these 9.1 million do not live in a place like Singapore, where the elderly can go relatively freely to many places without too much fear, can go to better health facilities, and have children with better per capita income. This number of the elderly in the whole Indonesia is also a little higher than the number of population in Jakarta in the same year. We may just imagine if the whole population in Jakarta consists of only the elderly people, living in the currently existing social, economic, and political conditions of Jakarta.

3.2 Religious composition[2]

The government of Indonesia officially recognizes six religions: Islam, Protestantism, Catholicism, Hinduism, Buddhism, and Confucianism. Each Indonesian citizen must have a religion. The majority of Indonesian population is Muslims, consisting of 87.51% of the population in 1971 and 88.22% in 2000. The Christians (covering the Protestants, Catholics, and other Christians) formed 7.39% in 1971 and 8.92% in 2000. The Hindus and Buddhists have declined in percentage, although in absolute term they are still increasing. The Hindus comprised 1.81% of the population in 2000, declining from 1.94% in 1971, while the Buddhists declined from 0.92% in 1971 to 0.84% in 2000. Furthermore, the "Others" (consisting of Confucians and those who follow other than the six officially recognized religions) have declined even sharper, from 1.42% in 1971 to 0.2% in 2000. In the period of 1971-2000, the Christians have the highest growth rate, at 2.48% annually, compared to 1.86% for the Muslims. As shown in Table 1, the growth rate of the Hindus and Buddhists were slower than that of the Muslims (Suryadinata, Arifin, and Ananta, 2003)

The "others" have the lowest total dependency ratio (48.72), and they are the only group which has opened the demographic window, with a total dependency ratio below 50.0 in the year 2000. The highest young dependency ratio is seen among the Christians, followed by the Muslims, and the other religious followers. The highest old dependency ratio is observed among "others", followed by the Muslims, and the Christians. The "others" have the highest ageing proportion and they are the only group which has been considered as "intermediate" population, while the Muslims and Christians are still categorized as young populations in the year 2000.

Table 1. Number, Percentage, and the Growth Rate of Religious Followers: Indonesia, 1971 and 2000

Religious follower	1971		2000		Annual growth rate
	Number	%	Number	%	%
Muslims	103,579,496	87.51	177,528,772	88.22	1.86
Christians	8,741,706	7.39	17,954,977	8.92	2.48
Hindus	2,296,299	1.94	3,651,939	1.81	1.60
Buddhists	1,092,314	0.92	1,694,682	0.84	1.51
Confucians	972,133	0.82	-	-	-
Others	1,685,902	1.42	411,629	0.20	-4.86
TOTAL	118,367,850	100.00	201,241,999	100.00	

Source: Suryadinata, Arifin and Ananta (2003).

In 2000 the highest ageing proportion is seen among "others" (6.80%), followed by the Hindus (6.11%), Buddhists (5.81%), Muslims (4.56%), and Christians (3.83%). Those who follow Hinduism, Buddhism, and other religions (including Confucianism) have been considered as "intermediate" population because the ageing proportions have been larger than 5.00%. On the other hand, the Muslims and Christians are still categorized as young populations. The Hindus and Buddhists are the only two groups which have enjoyed the demographic window of opportunity in 2000. See Table 2

The composition of religious groups among the elderly is a little different from that of the total population. In the year 2000, Muslims constitute 88.69% of the elderly population; Christians, 7.47%; and "others", 3.83%. The percentage of Christians among the elderly are smaller than those in the whole population; while the percentages of the Muslims, Hindus, Buddhists, and "others" among the elderly are larger than those in the whole population. In other words, the elderly consist of relatively more Muslims, Hindus, Buddhists, and "others" relative to the whole population.

Table 2. Population, Dependency Ratio and Ageing Proportion by Religion: Indonesia, 2000

		Muslim	Christian	Hindu	Buddhist	Others	Total
0-14	('000)	53,851	5,863	970	434	133	61,250
	%	87.92	9.57	1.58	0.71	0.22	100.00
15-64	('000)	115,579	11,410	2,459	1,163	250	130,861
	%	88.32	8.72	1.88	0.89	0.19	100.00
Elderly (65+)	('000)	8,088	682	223	98	28	9,118.90
	%	88.69	7.47	2.45	1.08	0.31	100.00
Dependency	Young	46.59	51.38	39.43	37.29	53.24	46.81
Ratio	Old	7.00	5.97	9.08	8.47	11.19	6.97
	Total	53.59	57.36	48.51	45.76	64.42	53.77
Ageing Proportion (%)		4.56	3.80	6.11	5.81	6.80	4.53

3.3 Ethnic Composition[3]

As shown in Table 3, in 2000 the Javanese and Sundanese are the two largest ethnic groups with a wide difference in percentage. The third largest, the Malay, is even very much smaller, followed by the Batak and Madurese. The remaining population consists of many, and still smaller, ethnic groups such as the Minangkabau (2.72%), Betawi (2.51%), and Bugis (2.49%).

The lowest total dependency ratio in 2000 is seen for the Madurese and the highest for the Batak. The Javanese has the second lowest ratio, followed by the Sundanese and Malay. In 2000, the Javanese and Madurese are the only ethnic groups which have opened their demographic windows.

The Javanese has the highest ageing proportion (5.29%), followed by the Sundanese and Madurese. The lowest proportion is seen among the Malay (2.81%) and Batak (3.02%). In other words, the Javanese is the only ethnic group with "intermediate" population, and the remaining ethnic groups are still considered as young populations.

Table 3. Population, Dependency Ratio and Ageing Proportion by Ethnicity: Indonesia, 2000

		Javanese	Sundanese	Malay	Batak	Madurese	Others	Total
Population	('000)	83,866	30,978	8,950	6,891	6,772	63,635	201,093
	%	41.70	15.41	4.45	3.43	3.37	31.64	100.00
0-14	('000)	23,255	9,522	3,070	2,475	1,877	21,015	61,214
	%	37.99	15.56	5.01	4.04	3.07	34.33	100.00
15-64	('000)	56,175	19,914	5,629	4,209	4,569	40,260	130,756
	%	42.96	15.23	4.31	3.22	3.49	30.79	100.00
Elderly (65+)	('000)	4,436	1,542	251	208	326	2,360	9,123
	%	48.62	16.90	2.76	2.28	3.57	25.87	100.00
Dependency	Young	41.40	47.82	54.53	58.80	41.09	52.20	46.82
ratio	Old	7.90	7.74	4.47	4.95	7.14	5.86	6.98
	Total	49.29	55.56	58.99	63.74	48.23	58.06	53.79
Ageing Proportion (%)		5.29	4.98	2.81	3.02	4.82	3.71	4.54

The ethnic composition of the elderly is not the same as the one for the total Indonesian population. The Javanese constitute 48.62% of the elderly population, a larger percentage than 41.70% among the total population. The second largest ethnic group among the elderly population is also the Sundanese, comprising 16.90% of the elderly population, a little higher than 15.41% in the total population. The third largest elderly population is the Madurese, instead of the Malay as shown in the total population. The Madurese constitutes 3.57% of the elderly, higher than 3.37% in the total population. The Malay, which constitutes 4.45% of the total population, only forms 2.76% of the elderly population. The percentage of the Batak in the elderly population (2.28%) is also lower than that in the total population. In other words, the elderly population is heavier toward the Javanese, Sundanese, and Madurese, with a particular weight in the Javanese.

4. PROJECTION OF ELDERLY INDONESIAN POPULATION

4.1 Assumptions

As far as we know, the estimation on TFR and IMR by ethnicity and religion presented in this paper is the first of such information on Indonesian demography, thanks to the breakthrough made by the BPS (Indonesian Central Board of Statistics) in starting the collection and publication of information on ethnicity and religion in the 2000 population census. There has been no such information for earlier periods, and therefore we do not have information and we cannot estimate TFR and IMR for earlier periods.[4]

We have two scenarios of fertility (Table 4) and one scenario of mortality (Table 5) for each ethnic and religious group. Scenario-1 refers to a faster decline in fertility; and scenario-2, a slower decline in fertility. The projection by ethnicity is restricted to the five largest ethnic groups: the Javanese, Sundanese, Malay, Batak, and Madurese. The remaining ethnic groups are categorized under "others", and our discussion is focused on the five groups because the "others" is too heterogeneous. Because of the relatively small size of the population of the Hindus, Buddhists, and followers of other religions, we group them into "others" in the projection period, 2005-2050.

Table 4. Two Scenarios of TFR by Religion and Ethnicity:
Indonesia, 2000-2050

	2000-2005	2005-2010	2010-2015	2015-2020	2020-2025	2025-2030	2030-2035	2035-2040	2040-2045	2045-2050
Religious Followers						**Scenario 1**				
Muslims	2.3204	2.1634	2.0250	1.9031	1.7958	1.7011	1.6177	1.5443	1.4796	1.4225
Christians	2.7091	2.4899	2.2988	2.1322	1.9869	1.8603	1.7500	1.6538	1.5699	1.4968
Others	1.9817	1.8318	1.7047	1.5971	1.5059	1.4286	1.3632	1.3077	1.2607	1.2209
						Scenario 2				
Muslims	2.3204	2.2347	2.1593	2.0928	2.0342	1.9825	1.9370	1.8970	1.8616	1.8305
Christians	2.7091	2.5668	2.4428	2.3347	2.2405	2.1583	2.0867	2.0243	1.9698	1.9224
Others	1.9817	1.9641	1.9474	1.9314	1.9162	1.9016	1.8878	1.8745	1.8619	1.8499
Ethnic Groups						**Scenario 1**				
Javanese	1.9586	1.8186	1.6991	1.5970	1.5098	1.4353	1.3718	1.3175	1.2711	1.2315
Sundanese	2.5466	2.3278	2.1399	1.9786	1.8401	1.7213	1.6192	1.5316	1.4564	1.3918
Malay	2.8590	2.6309	2.4308	2.2552	2.1012	1.9661	1.8475	1.7435	1.6523	1.5723
Batak	3.1830	2.8975	2.6376	2.4010	2.1857	1.9896	1.8112	1.6487	1.5008	1.3662
Madurese	2.0762	1.9591	1.8486	1.7444	1.6460	1.5532	1.4656	1.3830	1.3050	1.2314
Others	2.6652	2.4933	2.3391	2.2008	2.0768	1.9656	1.8659	1.7765	1.6963	1.6244
						Scenario 2				
Javanese	1.9586	1.9062	1.8615	1.8233	1.7907	1.7629	1.7391	1.7188	1.7014	1.6866
Sundanese	2.5466	2.4127	2.2977	2.1990	2.1142	2.0415	1.9790	1.9254	1.8793	1.8398
Malay	2.8590	2.7045	2.5690	2.4501	2.3458	2.2543	2.1740	2.1036	2.0418	1.9876
Batak	3.1830	3.0410	2.9118	2.7941	2.6870	2.5895	2.5008	2.4200	2.3464	2.2795
Madurese	2.0762	2.0493	2.0240	2.0001	1.9775	1.9562	1.9362	1.9172	1.8993	1.8824
Others	2.6652	2.5552	2.4566	2.3681	2.2888	2.2177	2.1539	2.0967	2.0454	1.9994

Table 5. Scenario of Mortality (Expectancy of Life at Birth): Indonesia, 2000-2050

	2000-2005	2005-2010	2010-2015	2015-2020	2020-2025	2025-2030	2030-2035	2035-2040	2040-2045	2045-2050
Religious Followers					**Female**					
Muslims	66.60	69.67	72.88	76.24	79.75	83.43	83.94	84.42	84.89	85.33
Christians	67.65	70.20	72.85	75.60	78.46	81.42	81.91	82.39	82.85	83.29
Others	69.60	72.04	74.57	77.19	79.89	82.70	83.12	83.52	83.91	84.28
					Male					
Muslims	62.77	65.61	68.59	71.71	74.96	78.36	81.92	82.27	82.61	82.93
Christians	63.80	66.15	68.60	71.13	73.75	76.48	79.30	82.22	82.50	82.77
Others	65.60	68.01	70.50	73.09	75.78	78.56	81.44	81.74	82.04	82.32
Ethnic Groups					**Female**					
Javanese	69.28	71.96	74.75	77.64	80.65	83.77	84.19	84.60	84.98	85.36
Sundanese	65.22	68.51	71.97	75.60	79.41	83.42	83.97	84.50	85.01	85.49
Malay	65.79	68.39	71.09	73.90	76.82	79.86	83.02	83.48	83.91	84.34
Batak	68.06	70.16	72.33	74.56	76.87	79.24	81.69	82.09	82.47	82.85
Madurese	62.13	64.55	67.07	69.68	72.39	75.21	78.13	81.17	81.69	82.19
Others	64.98	67.56	70.25	73.04	75.94	78.96	82.10	82.59	83.07	83.52
					Male					
Javanese	65.33	67.84	70.45	73.16	75.97	78.88	81.91	82.21	82.50	82.78
Sundanese	61.44	64.53	67.77	71.18	74.76	78.52	82.46	82.82	83.17	83.49
Malay	61.99	64.08	66.24	68.48	70.79	73.18	75.65	78.20	80.84	81.14
Batak	64.17	66.13	68.16	70.25	72.40	74.62	76.90	79.26	81.69	81.93
Madurese	58.49	60.47	62.51	64.62	66.80	69.05	71.38	73.79	76.28	78.86
Others	61.21	63.60	66.08	68.67	71.35	74.14	77.03	80.04	80.42	80.78

As shown in Table 6, we project that Indonesia as a whole will open the demographic window of opportunity in 2005. The total dependency ratio will decline into the minimum at around 43 in the scenario-1 or 45 in scenario-2 in 2020. In other words, the lowest dependency ratio for Indonesia as a whole will be seen in 2020, regardless the scenario of fertility decline. After 2020, the rising percentage of the old dependency ratio will exceed the decline in the young dependency ratio. The total dependency ratio will keep rising after 2020. In scenario-1, the demographic window will be closed in 2040; but in scenario-2, the window will be closed five years earlier, in 2035.

Table 6. Two Scenarios of Dependency Ratio: Indonesia, 2005-2050

	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Scenario 1					**Population ('000)**					
0-14	60,750	60,231	59,570	57,941	55,596	52,918	50,079	47,138	44,109	40,995
15-64	142,993	155,341	166,322	175,973	183,401	188,428	191,392	191,186	189,282	184,595
65+	10,734	11,915	14,025	17,625	23,465	31,373	39,928	48,973	56,839	64,752

					Dependency Ratio					
Young	42.48	38.77	35.82	32.93	30.31	28.08	26.17	24.66	23.30	22.21
Old	7.51	7.67	8.43	10.02	12.79	16.65	20.86	25.62	30.03	35.08
Total	49.99	46.44	44.25	42.94	43.11	44.73	47.03	50.27	53.33	57.29
Scenario 2					**Population ('000)**					
0-14	60,753	60,910	61,560	61,811	61,209	60,200	59,084	57,988	56,861	55,576
15-64	142,993	155,341	166,322	175,976	184,075	190,408	195,252	197,455	198,517	197,418
65+	10,734	11,915	14,025	17,625	23,465	31,373	39,928	48,973	56,839	64,752
					Dependency Ratio					
Young	42.49	39.21	37.01	35.12	33.25	31.62	30.26	29.37	28.64	28.15
Old	7.51	7.67	8.43	10.02	12.75	16.48	20.45	24.80	28.63	32.80
Total	49.99	46.88	45.44	45.14	46.00	48.09	50.71	54.17	57.27	60.95

4.2 Elderly Population by Religion

In scenario-1, the Muslims will start entering the second demographic transition with NRR=0.986 in 2005-2010; the Christians, with NRR=0.951 in 2020-2025; and "others" with NRR=0.904 in 2000-2005. In scenario-2, the Muslims start in 2015-2020 and "others" in 2000-2005. The Christians will enter in the second demographic transition much later, in 2035-2040. Whatever the scenario, "others" have entered the second demographic transition the earliest; while the Christians, the latest, especially in scenario-2. Hence, "others" have started to experience changes in the norms toward accentuation of individual autonomy and self-actualisation the earliest, and even much earlier than the Muslims and Christians if we follow the scenario-2. See Table 7.

Table 8 shows that in whatever scenario, the "others" always has the highest ageing proportion, followed by the Muslims and the Christians. "Others" will become an ageing society (with the proportion higher than 10.0%) in 2025, while the Muslims in 2030. The Christian will become an ageing society in the year 2030 if we follow scenario-1 or in 2035 if we follow scenario-2.

Table 7. Net Reproduction Rate (NRR) by Religion: 2000-2050

Religious Followers	2000-2005	2005-2010	2010-2015	2015-2020	2020-2025	2025-2030	2030-2035	2035-2040	2040-2045	2045-2050
Scenario-1										
Muslims	1.026	**0.986**	0.947	0.905	0.862	0.822	0.782	0.747	0.716	0.689
Christians	1.209	1.139	1.074	1.011	**0.951**	0.896	0.843	0.798	0.758	0.723
Others	**0.904**	0.852	0.805	0.762	0.724	0.690	0.659	0.632	0.610	0.591
Scenario-2										
Muslims	1.026	1.019	1.01	**0.995**	0.977	0.958	0.936	0.918	0.901	0.886
Christians	1.209	1.175	1.141	1.107	1.072	1.039	1.006	**0.976**	0.951	0.928
Others	**0.904**	0.914	0.92	0.922	0.921	0.918	0.912	0.906	0.900	0.895

Note: **bold** number indicates the start of entering the second demographic transition

Table 8. Ageing Proportion by Religion: Indonesia, 2005-2050

Religious Followers	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
					Scenario 1					
Muslims	5.03	5.24	5.82	6.97	8.93	11.55	14.29	17.20	19.78	22.54
Christians	4.23	4.62	5.36	6.52	8.20	10.20	12.38	14.70	16.86	19.19
Others	6.62	7.16	8.23	9.83	12.08	14.79	17.66	20.85	23.53	26.49
Total	5.00	5.24	5.85	7.01	8.94	11.50	14.19	17.05	19.58	22.30
					Scenario 2					
Muslims	5.03	5.23	5.78	6.87	8.72	11.18	13.68	16.25	18.41	20.63
Christians	4.23	4.60	5.31	6.42	8.00	9.86	11.83	13.85	15.65	17.50
Others	6.62	7.12	8.11	9.57	11.61	13.99	16.41	18.95	20.88	22.86
Total	5.00	5.22	5.80	6.90	8.73	11.13	13.57	16.09	18.21	20.38

In both scenarios, the lowest total dependency ratio for Muslims is seen in 2020. For Christians, the lowest dependency ratio will be seen in 2025 for scenario-1 and 2020 for scenario-2. For "others", it will be in 2020 for scenario-1 and 2015 for the scenario-2. As mentioned in Section 3, "others" are the only religious group which has opened the demographic window in the year 2000. The Muslims will open the window in 2005 and the Christians, in 2015, whatever the fertility scenario. All groups will have closed their windows in 2035 in scenario-2 and 2040 in scenario-1. The Christians will have the shortest demographic window of opportunity, about 30 years in scenario-1 and 20 years in scenario-2; while the "others" will have the longest window, 40 years in scenario-1 and 30 years in scenario-2. See Figures 1, 2, and 3.

Figure 1. Young, Old and Total Dependency Ratios of Muslim Population: Indonesia, 2000-2050

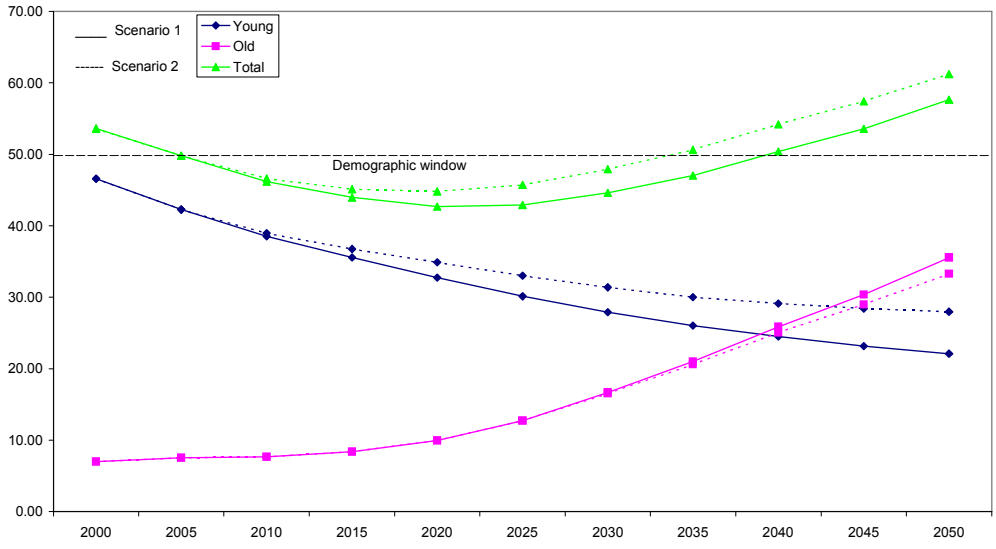


Figure 2. Young, Old and Total Dependency Ratios of Christian Population: Indonesia, 2000-2050

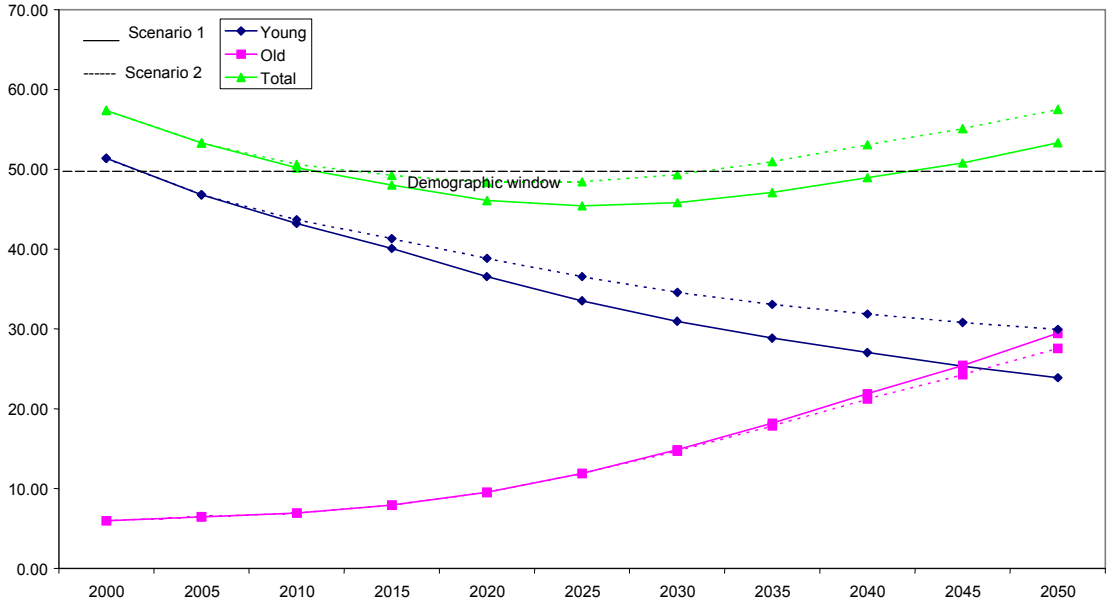
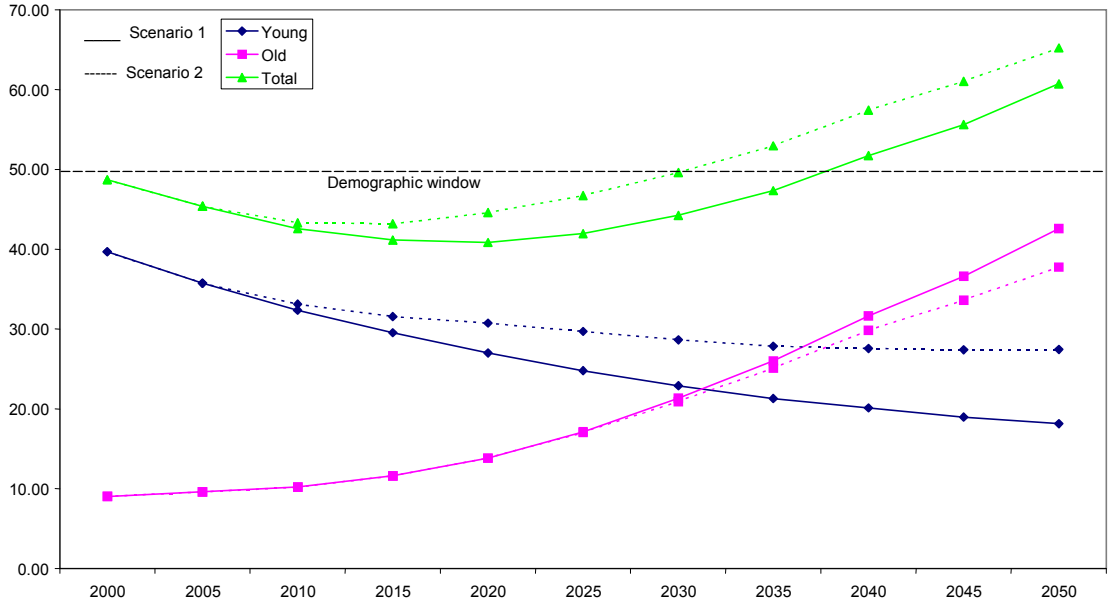


Figure 3. Young, Old and Total Dependency Ratios of Other Religious Groups: Indonesia, 2000-2050



In short, the "others" will have the following features: having the oldest population, starting the second demographic transition the earliest, and experiencing the longest demographic window. The Christians are the opposite: having the youngest population, starting the second transition the latest, and experiencing the shortest window. The Muslims are in between.

The composition of the elderly in 2050 is a little different from that in 2000. The percentage of the Muslims in the elderly population will be 88.82%, slightly larger than 88.69% in 2000. The percentage of the Christians will also increase from 7.47% in 2000 to 8.44% in 2050. On the other hand, the percentage of the elderly from other religions will be 2.74%, slightly lower than 3.83% in 2000. See Table 9.

Table 9 Percentage Distribution of the Elderly by Religion: Indonesia, 2005-2050

	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Muslims	88.63	88.15	87.70	87.58	87.86	88.33	88.59	88.74	88.79	88.82
Christians	7.66	8.10	8.52	8.74	8.66	8.43	8.34	8.31	8.37	8.44
Others	3.71	3.75	3.78	3.69	3.48	3.24	3.07	2.95	2.83	2.74
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

4.3 Elderly Population by Ethnicity

Table 10 reveals that there is a big difference in the timing of the start of the second demographic transition among different ethnic groups. Whatever the scenario, the Javanese and Madurese may have entered the second demographic transition before the year 2000, and may have entered as early as in 1990-1995. In contrast, other ethnic groups will start entering the second transition only as early as in 2010-2015 for the Sundanese, and even much later, in 2025-2030, for the Malay and Batak if we follow scenario-1. If we follow scenario-2, the Sundanese will enter the second transition much later, in 2025-2030, 30 years after the Javanese and Madurese; the Malay will start the second transition in 2040-2045, 50 years after the Javanese and Madurese; the Batak will never experience the second transition during our projection period (2000-2050).

This big difference in the timing of entering the second transition may result in different norms among different ethnic groups. For example, in the year 2030, the Javanese and Madurese may have become much more oriented to individual values and self-actualisation compared to the Malay and Batak. With regards to the discussion on young and old dependencies, the Javanese and Madurese in 2030 may have left the traditional norms discussed in Section 2, while the Malay and Batak in the same year may still stick to the traditional norms.

Table 10. Net Reproduction Rate (NRR) by Ethnicity: 2000-2050

Ethnic Group	2000-2005	2005-2010	2010-2015	2015-2020	2020-2025	2025-2030	2030-2035	2035-2040	2040-2045	2045-2050
Scenario-1										
Javanese	***0.890**	0.845	0.803	0.763	0.726	0.694	0.663	0.638	0.615	0.596
Sundanese	1.109	1.049	**0.994**	0.939	0.883	0.832	0.783	0.741	0.705	0.674
Malay	1.251	1.183	1.121	1.060	1.001	**0.944**	0.892	0.842	0.799	0.760
Batak	1.425	1.325	1.227	1.133	1.041	**0.954**	0.872	0.795	0.724	0.659
Madurese	***0.875**	0.849	0.823	0.796	0.768	0.736	0.701	0.666	0.629	0.594
Others	1.157	1.113	1.071	1.030	0.986	**0.942**	0.900	0.857	0.819	0.785
Scenario-2										
Javanese	***0.890**	0.886	0.88	0.871	0.861	0.852	0.841	0.832	0.824	0.817
Sundanese	1.109	1.088	1.068	1.043	1.014	**0.986**	0.957	0.932	0.910	0.891
Malay	1.251	1.216	1.184	1.152	1.117	1.082	1.050	1.016	**0.987**	0.961
Batak	1.425	1.390	1.355	1.318	1.280	1.241	1.205	1.166	1.132	1.100
Madurese	***0.875**	0.888	0.901	0.913	0.923	0.927	0.926	0.923	0.915	0.908
Others	1.157	1.140	1.125	1.108	1.087	1.063	1.038	1.012	**0.988**	0.966

Note: **bold** number indicates the start of entering the second demographic transition.
*the NRR may have been below 1.0 in 1990-1995 or earlier.

Table 11 describes that whatever the scenario, the Javanese and Madurese always have the two highest ageing proportions throughout the whole projection period, the 2000-2050. The Malay and Batak have the two lowest ageing proportions. The Javanese will be an ageing society (with ageing proportion larger than 10.0%) in the year 2025 whatever the fertility scenario, while the Madurese is an ageing society in 2025 only under scenario-1. In both scenarios, the Javanese, Madurese, and Sundanese are already ageing societies in 2030. The Malay and Batak will become ageing societies later, in 2035 (scenario-1) or 2040 (scenario-2).

Table 11. Ageing Proportion by Ethnicity: Indonesia, 2005-2050

Ethnic Group	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
				Scenario 1						
Javanese	5.97	6.34	7.02	8.44	10.79	13.93	17.22	20.54	23.55	26.81
Sundanese	5.03	5.02	5.59	6.62	8.43	10.83	13.46	16.44	19.15	21.75
Malay	3.25	3.46	3.95	4.87	6.36	8.23	10.12	12.52	15.08	17.78
Batak	3.43	3.76	4.27	5.19	6.58	8.24	10.05	11.93	13.84	16.49
Madurese	5.81	6.20	7.10	8.34	10.14	12.41	14.47	17.15	19.14	21.85
Others	4.12	4.32	4.93	5.83	7.27	9.10	11.20	13.68	15.81	18.12
				Scenario 2						
Javanese	5.97	6.32	6.96	8.29	10.50	13.40	16.36	19.22	21.68	24.20
Sundanese	5.03	5.01	5.53	6.50	8.21	10.43	12.80	15.40	17.65	19.66
Malay	3.25	3.45	3.92	4.80	6.21	7.96	9.68	11.81	14.01	16.25
Batak	3.43	3.74	4.20	5.04	6.29	7.72	9.19	10.61	11.93	13.71
Madurese	5.81	6.18	7.03	8.18	9.84	11.87	13.60	15.78	17.20	19.09
Others	4.12	4.31	4.89	5.76	7.12	8.84	10.78	13.01	14.83	16.74

As shown in Figures 4, 5, 6, 7, 8, and 9, the Javanese and Madurese will be the first groups reaching their lowest total dependency ratios--in the year 2020 (scenario-1) or 2015 (scenario-2). They will be followed by the Sundanese in the year 2025 (scenario-1) or 2020 (scenario-2). Next is the Malay, who will reach their minimum total dependency ratio in the year 2030 (scenario-1) or 2025 (scenario-2). The Batak will obtain their lowest ratio after the Malay, in the year 2035 or 2030.

The Batak will be the last, among the five largest ethnic groups, in achieving the lowest ratio. They will just open the demographic window of opportunity in the year 2025 in scenario-1, and they will never enjoy the demographic window in scenario-2. This is very much later compared to the Javanese and Madurese who have even opened the window in the year 2000. The Javanese and Madurese will close their window in the year 2040 (scenario-1) or 2035 (scenario-2). The Sundanese will open the window in the year 2010, regardless the scenario and close in the year 2040 (scenario-1) or 2035 (scenario-2). The Malay will open the window later, in the year 2020 and close it in the year 2045 (scenario-1) or 2040 (scenario-2).

In scenario-1 (faster fertility decline), all of the five largest ethnic groups will simultaneously enjoy the demographic bonus for about 20 years, during 2020- 2040. The Madurese will have the longest window (45 years), followed by the Javanese (40 years), Batak (35 years), and Sundanese (30 years). In scenario-2 all five ethnic groups (except Batak) simultaneously enjoy the window for about 15 years (2020-2035). The Javanese and Sundanese will enjoy the longest window (35 years), followed by the Sundanese and Malay (25 years), while the Batak will never enjoy the window.

In short, among the five largest ethnic groups in Indonesia, the Javanese and Madurese are the first groups starting the second demographic transition—in early 1990s. They are also the first groups opening the demographic window—in the year 2000. These two groups have the highest ageing proportion and the longest length of demographic window—40 or 45 five years. They are in striking contrast to the Batak, the fifth largest ethnic group in Indonesia, who will just enter the second demographic transition in 2025-2030 (scenario-1) or years after 2050 (scenario-2). The Batak are also the last group, among the five, to open the demographic window of opportunity. They will start opening the window in 2025 (scenario-1) at the same time they enter the second demographic transition, or the Batak will never enjoy the demographic window if we follow scenario-2. The Batak, along with the Malay, have the smallest ageing proportion.

The ethnic composition of the elderly in 2050 will be very different from that in 2000. Table 12 shows that the percentages of the Javanese and Madurese will decline while the percentages of the Sundanese, Malay, Batak, and other ethnic groups will increase. The percentage of Javanese, for example, will decline from 48.60% in 2000 to 43.84% in 2050. On the other hand, the percentage of the Batak, for instance, will increase from 2.30% in 2000 to 3.23% in 2050.

Table 12. Percentage Distribution of the Elderly by Ethnicity: Indonesia, 2005-2050

Ethnic Group	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Javanese	48.96	48.93	47.80	47.51	47.38	47.41	46.93	45.74	44.77	43.84
Sundanese	15.49	14.81	14.79	14.78	14.98	15.22	15.45	15.74	15.99	15.96
Malay	2.97	3.11	3.25	3.43	3.60	3.71	3.77	3.94	4.20	4.43
Batak	2.43	2.63	2.76	2.89	2.96	2.95	2.97	2.97	3.05	3.23
Madurese	3.81	3.79	3.79	3.64	3.41	3.19	2.94	2.84	2.70	2.66
Others	26.34	26.73	27.61	27.76	27.68	27.52	27.93	28.77	29.30	29.89
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

5. Concluding Remarks

Learning from the experiences of the already developed countries, especially those which have been below replacement level for a long time, Indonesia after 2035 or 2040 may go through the same problems as those countries have had. Or, will Indonesia experience the problems earlier than 2035? With the heterogeneity of ethnic and religious groups in Indonesia, will each group follow a similar path of demographic transition and demographic window of opportunity? Will each of them first enter the second demographic transition, with the accompanying fast changes in social norms, and later enjoy the demographic window of opportunity, or each of them will first open the demographic window and then start entering the second transition?

Table 13 shows that, in scenario-1, the Christians are the last group who starts the second demographic transition, 20 years after the "others" entered the second demographic transition as early as in 2000-2005. The Muslims start in 2005-2010, not long after the "others". It is likely, therefore, that the "others" and Muslims will have experienced changes in the norms, including those on the relationship between children and elderly parents, toward individual values and self actualisation much earlier than the Christians do—about 15 to 20 year difference. The "others" elderly in 2025, for instance, may have been very independent, while the Christian elderly may remain maintaining close support from the younger generations. The Christian elderly may still live nearby their children, nephews, grand children and grand nephews and they may even still play as surrogate parents to the grand children and grand nephews.

The Christians are also the last group and the "others" are the first group to enjoy the demographic window of opportunity, though the difference is not as big as the one on the timing of the second demographic transition. The "others" and Muslim start enjoying the demographic window almost at the same time they enter the second demographic transition. The Christians will start enjoying the window ten years before they enter the second demographic transition. The Christians are also the last group to close the demographic window and as a result, the length of the window of opportunity of the Christians is the same as that of the Muslims (35 years), a little shorter than 40 years among the "others". The "others" and Muslims will close in 2040; while the Christians, in 2045.

In scenario-2, the difference among different religious followers is larger. The pattern is the same, but the time difference is greater. The "others" still enter the second demographic transition in 200-2005, but the Christians will start entering the second demographic transition 30 years later, in 2035-2040, rather than 2020-2025. The Muslims will enter it in 2015-2020, 10 years later than the "others". Therefore, differences in the norms among different religious followers can be great.

The Christian will start enjoying the demographic window in 2015, rather than 2010, 15 years after the "others", or 10 years after the Muslims. The Christians will end the demographic window in 2035, at the same time as the Muslims, and 5 years after the "others" will. Therefore, the Christians will have the shortest length of demographic window—only 20 years—compared to 30 years for the "others" and Muslims.

The "others" enjoy the window at the same time as they start the second demographic transition. The Muslims will open the demographic window 10 years before they enter the second demographic transition; while the Christians will start enjoying the demographic window 20 years before they start the second demographic transition.

Table 13 demonstrates that the difference among ethnic groups is more striking than the one among religious groups, and even more in scenario-2. Let us see first what happen in scenario-1. On one hand, the Javanese and Madurese have entered the second demographic transition as early as the beginning of 1990s, while the Malay, the Batak, and "others" will enter the second demographic transition 25 or 30 years later, in 2025-2030. Therefore, the norms among the Javanese and Madurese will be very different from those among the Malay, the Batak, and "others". The Sundanese will be in between.

In the year 2030, for example, there may be no Javanese and Madurese elderly functioning as surrogate parents because the grand children do not live around the grand parents and therefore the burden of the Javanese and Madurese elderly in 2030 may be smaller than that in 2000. In contrast, the Malay in 2030, for example, may just enter the second demographic transition and they may still cling to the traditional values of the relationship between children and elderly parents. The elderly parents may still help the younger generation.

The Javanese and Madurese entered the second demographic transition five years before they enjoy the demographic window. On contrast, the Malay, Batak, and "others" will enjoy the demographic window before they enter the second demographic transition. The Sundanese opens the demographic window at the same time as they start the second demographic transition. Furthermore, the Javanese and Madurese will have the longest length of demographic window (40 or 45 years), 10 years longer than those of the Malay, Batak, and others (30 or 35 years). The Sundanese is between the two (Javanese and Madurese on one hand and Malay, Batak, and "others" on the other hand). In other words, the Javanese and Madurese will have the longest opportunity to benefit from the age structure of their population.

The difference is more apparent in scenario-2. The Javanese and Madurese started the second demographic transition in early 1990s, but the Malay and the "others" will start entering the second transition only in 2040-2045, 50 years after the Javanese and Madurese did. Even, the Batak will be still in the first demographic transition in 2045-2050, the end of our projection period. The difference in the norms will become very great, especially between the Javanese and Madurese on one hand and the Batak on

the other hand. The attitude on the relationship between the young and elderly among the Javanese and Madurese in 2050 will be very much different from the one among the Batak. For example, the Javanese and Madurese elderly will be very much independent, but the Batak elderly will still depend on the strong support from their younger generation.

The Javanese and Madurese entered the second demographic transition before enjoying the demographic window; the Sundanese, Malay and others will enjoy the window before they enter the second transition. The Batak will never enjoy the demographic window and, during the projection period until 2050, they are also still in the first demographic transition.

With the above scenarios of second demographic transition and demographic window of opportunity by ethnic and religious groups, many important issues emerge. They are the issues the already developed countries have faced, but the issues in Indonesia may become more complicated because of the heterogeneity in the timing of the second demographic transition and demographic window.

Here are some of the questions the Indonesians should be prepared from now. Will Indonesia have shortage of young labour? Will Indonesia, or a certain ethnic and religious groups, make a pro-natalist policy? Will Indonesia promote policy of bringing more people from outside Indonesia, and what will the impact on ethnic and religious composition be? Will Indonesians be politically prepared to welcome foreigners to work in Indonesia?

Will Indonesia, or a particular ethnic and religious group, experience earlier starting ages of having chronic disease and spend longer years in not healthy life—because of the boom and advertisement of businesses related to unhealthy life pattern and the advances of medical technology? Will Indonesia choose policies which promote healthy life style and will Indonesian government and societies be brave enough to fight against lucrative businesses which promote unhealthy life styles, such as smoking, eating food with a lot of sugar, salt, less vegetable etc.? Will Indonesia promote the active life of the elderly? Will Indonesia raise the retirement age, currently at 55 for civil servants and 65 for academicians?

How will Indonesia take care and finance the elderly? Will the future elderly be prepared to face changing norms regarding the relationship between children and parents, particularly on the relationship between the sons and daughters with the elderly parents? Will the future elderly remain being surrogate parents? Will the young generation prefer to use public institution, rather than individual support, to finance their parents? How large will be the variation in norms among different ethnic and religious groups?

These are not easy questions. Further, and deeper, studies on changes in norms should be conducted to produce a better anticipation on the inter-generational support in the future, especially in different ethnic and religious groups and in relation with the second demographic transition. Nevertheless, the macro quantitative information examined in this paper may provide important insights to better anticipate the future inter-generational support and therefore to help solve the ageing issues before they become insurmountable.

Table 13. Second Demographic Transition and Demographic Window By Religious and Ethnic Groups, Indonesia.

	Start of Second Demographic Transition	Demographic Window		
		Start	End	Length
Religious Groups				
Muslims				
Scenario-1	2005-2010	2005	2040	35 years
Scenario-2	2015-2020	2005	2035	30 years
Christians				
Scenario-1	2020-2025	2010	2045	35 years
Scenario-2	2035-2040	2015	2035	20 years
Others				
Scenario-1	2000-2005	2000	2040	40 years
Scenario-2	2000-2005	2000	2030	30 years
Ethnic Groups				
Javanese				
Scenario-1	1990-1995	2000	2040	40 years
Scenario-2	1990-1995	2000	2035	35 years
Sundanese				
Scenario-1	2010-2015	2010	2045	35 years
Scenario-2	2025-2030	2015	2035	20 years
Malay				
Scenario-1	2025-2030	2015	2045	30 years
Scenario-2	2040-2045	2020	2040	20 years
Madurese				
Scenario-1	1990-1995	2000	2045	45 years
Scenario-2	1990-1995	2000	2035	35 years
Batak				
Scenario-1	2025-2030	2020	2055	35 years
Scenario-2	>2050	never	never	never
Others				
Scenario-1	2025-2030	2010	2040	30 years
Scenario-2	2040-2045	2010	2035	25 years
Indonesia				
Scenario-1	2000-2005	2005	2040	35 years
Scenario-2	2000-2005	2005	2035	30 years

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Table A-1. Two Scenarios of Dependency Ratio by Religion: Indonesia 2005-2050

	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Muslims					**Scenario 1**					
Young	42.27	38.52	35.57	32.73	30.14	27.93	26.01	24.52	23.19	22.12
Old	7.54	7.66	8.38	9.95	12.76	16.71	21.01	25.86	30.37	35.53
Total	49.81	46.19	43.96	42.68	42.90	44.63	47.01	50.38	53.56	57.65
Christians										
Young	46.82	43.23	40.09	36.56	33.51	30.95	28.86	27.04	25.37	23.90
Old	6.48	6.93	7.93	9.53	11.92	14.87	18.21	21.89	25.43	29.43
Total	53.30	50.17	48.02	46.09	45.43	45.82	47.07	48.93	50.79	53.33
Others										
Young	35.75	32.38	29.53	27.01	24.80	22.90	21.30	20.10	18.99	18.15
Old	9.62	10.20	11.61	13.84	17.15	21.33	26.03	31.63	36.62	42.58
Total	45.37	42.58	41.15	40.85	41.95	44.23	47.33	51.73	55.61	60.73
Muslims					**Scenario 2**					
Young	42.27	38.95	36.74	34.87	33.01	31.38	30.02	29.14	28.43	27.97
Old	7.54	7.66	8.38	9.95	12.71	16.54	20.60	25.06	28.99	33.26
Total	49.81	46.61	45.12	44.82	45.72	47.92	50.62	54.20	57.42	61.23
Christians										
Young	46.82	43.69	41.33	38.83	36.55	34.60	33.08	31.87	30.81	29.93
Old	6.48	6.93	7.93	9.53	11.88	14.72	17.86	21.21	24.27	27.57
Total	53.30	50.62	49.26	48.36	48.43	49.32	50.94	53.08	55.08	57.49
Others										
Young	35.75	33.12	31.57	30.75	29.70	28.67	27.86	27.59	27.40	27.43
Old	9.62	10.20	11.61	13.84	17.03	20.92	25.10	29.83	33.62	37.77
Total	45.37	43.33	43.18	44.59	46.73	49.59	52.96	57.42	61.02	65.20

Table A-2. Dependency Ratio by Ethnicity: Indonesia, 2005-2050

	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Javanese					**Scenario 1**					
Young	37.09	33.32	29.93	27.32	24.98	23.07	21.45	20.21	19.17	18.42
Old	8.70	9.03	9.82	11.74	15.12	19.92	25.26	31.06	36.72	43.38
Total	45.79	42.35	39.75	39.06	40.10	42.99	46.72	51.28	55.89	61.79
Sundanese										
Young	45.01	41.35	38.10	34.47	31.49	29.01	26.84	25.07	23.47	22.05
Old	7.68	7.48	8.17	9.53	12.11	15.67	19.73	24.60	29.25	33.92
Total	52.69	48.83	46.27	44.00	43.60	44.68	46.57	49.67	52.72	55.97
Malay										
Young	48.67	45.95	44.08	39.91	35.91	32.81	30.44	28.73	27.11	25.61
Old	4.99	5.23	5.93	7.16	9.23	11.90	14.69	18.43	22.57	27.17
Total	53.66	51.19	50.01	47.07	45.15	44.71	45.13	47.16	49.68	52.78
Batak										
Young	52.19	48.59	46.38	42.38	38.25	34.32	31.02	28.28	25.77	23.54
Old	5.40	5.80	6.53	7.79	9.75	12.06	14.63	17.37	20.20	24.40
Total	57.60	54.39	52.91	50.17	47.99	46.39	45.65	45.65	45.97	47.94
Madurese										
Young	37.57	33.26	30.93	28.76	26.84	25.12	23.42	22.01	20.46	19.14
Old	8.49	8.80	10.01	11.72	14.32	17.73	20.88	25.25	28.52	33.30
Total	46.06	42.06	40.94	40.48	41.16	42.86	44.30	47.27	48.99	52.44
Others										
Young	47.27	43.29	40.59	37.64	34.81	32.44	30.41	28.78	27.20	25.87
Old	6.33	6.47	7.29	8.53	10.56	13.26	16.45	20.41	23.88	27.85
Total	53.60	49.77	47.87	46.16	45.37	45.70	46.86	49.19	51.08	53.72
Javanese					**Scenario 2**					
Young	37.09	33.84	31.32	29.86	28.34	27.05	26.02	25.43	25.07	24.98
Old	8.70	9.03	9.82	11.74	15.05	19.67	24.65	29.85	34.61	39.90
Total	45.79	42.87	41.14	41.60	43.39	46.72	50.67	55.28	59.68	64.88
Sundanese										
Young	45.01	41.86	39.48	36.99	34.85	33.04	31.50	30.39	29.42	28.59
Old	7.68	7.48	8.17	9.53	12.06	15.49	19.30	23.73	27.73	31.47
Total	52.69	49.33	47.65	46.52	46.91	48.53	50.79	54.11	57.15	60.07
Malay										
Young	48.67	46.41	45.33	42.16	38.87	36.35	34.57	33.51	32.53	31.61
Old	4.99	5.23	5.93	7.16	9.20	11.79	14.42	17.88	21.59	25.53
Total	53.66	51.64	51.26	49.32	48.08	48.13	48.98	51.39	54.12	57.14
Batak										
Young	52.19	49.44	48.79	46.84	44.25	41.54	39.43	38.07	37.03	36.24
Old	5.40	5.80	6.53	7.79	9.68	11.84	14.11	16.39	18.56	21.65
Total	57.60	55.24	55.31	54.63	53.93	53.38	53.54	54.47	55.59	57.89
Madurese										
Young	37.57	33.76	32.35	31.47	30.63	29.93	29.24	28.98	28.53	28.29
Old	8.49	8.80	10.01	11.72	14.25	17.49	20.34	24.17	26.70	30.28
Total	46.06	42.56	42.36	43.19	44.88	47.42	49.58	53.14	55.23	58.57
Others										
Young	47.27	43.66	41.61	39.52	37.35	35.52	34.02	32.97	31.97	31.20
Old	6.33	6.47	7.29	8.53	10.53	13.15	16.19	19.88	22.97	26.37
Total	53.60	50.13	48.89	48.05	47.88	48.67	50.21	52.85	54.94	57.57

Figure 4. Young, Old and Total Dependency Ratios of Javanese Population: Indonesia, 2000-2050

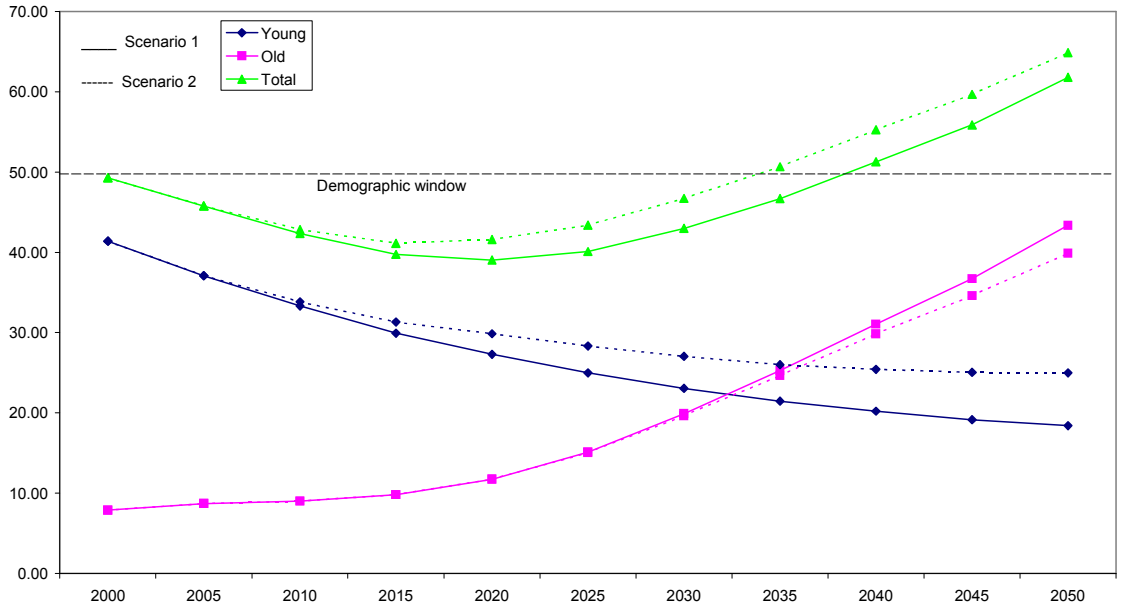


Figure 5. Young, Old and Total Dependency Ratios of Sundanese Population: Indonesia, 2000-2050

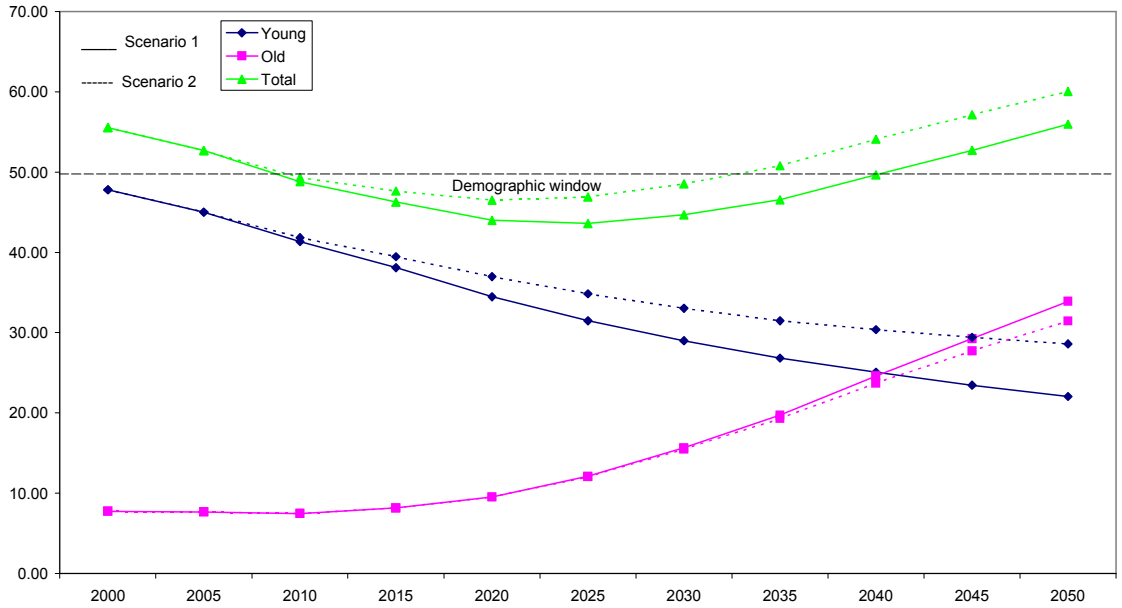


Figure 6. Young, Old and Total Dependency Ratios of Malay Population: Indonesia, 2000-2050

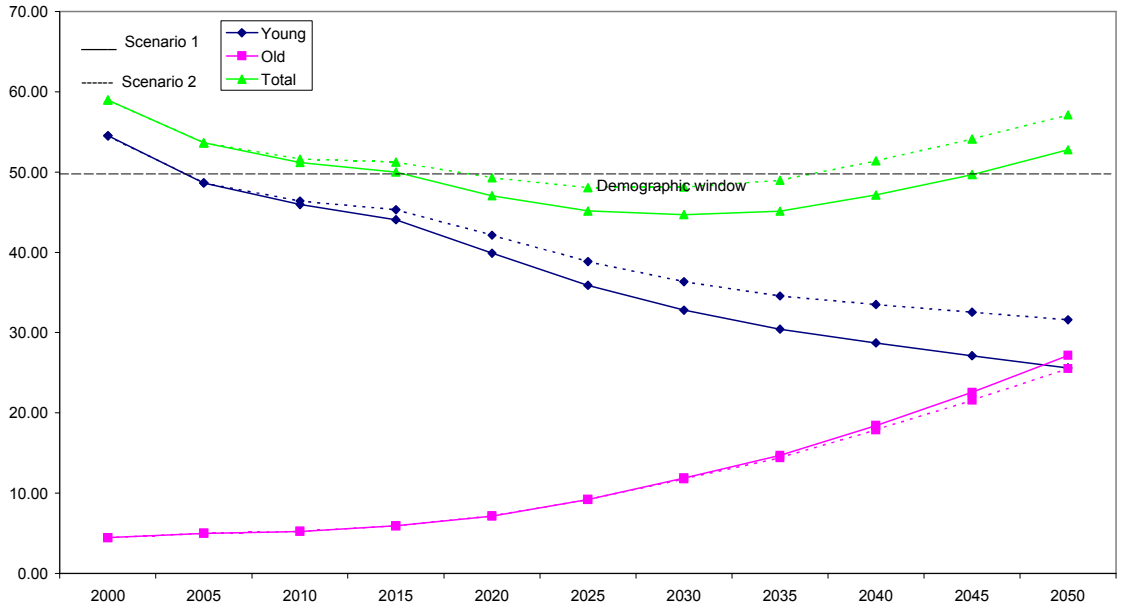


Figure 7. Young, Old and Total Dependency Ratios of Batak Population: Indonesia, 2000-2050

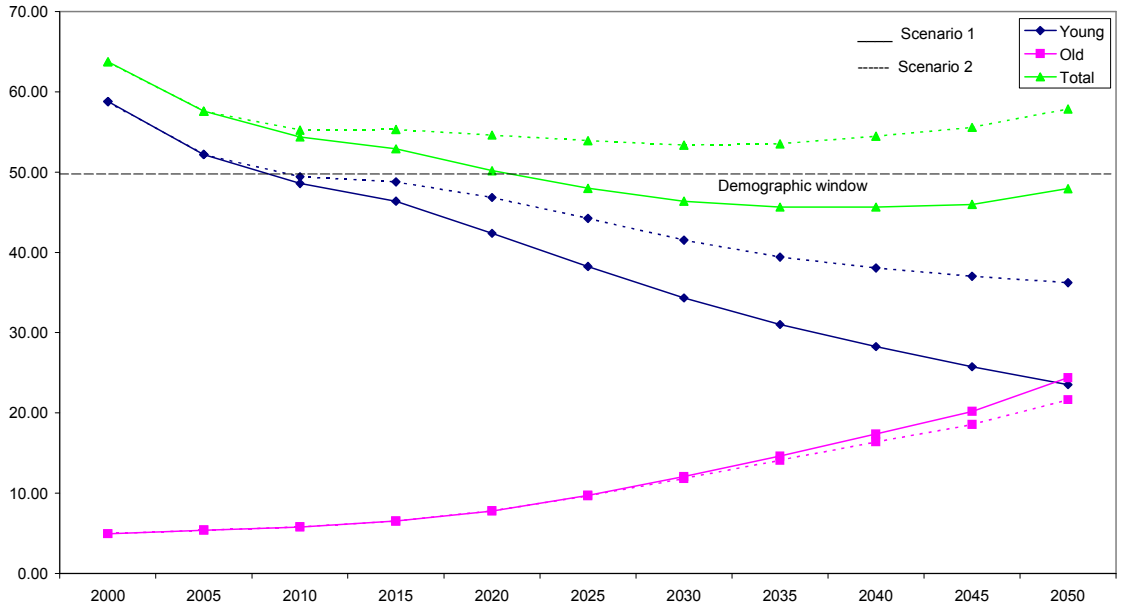


Figure 8. Young, Old and Total Dependency Ratios of Madurese Population: Indonesia, 2000-2050

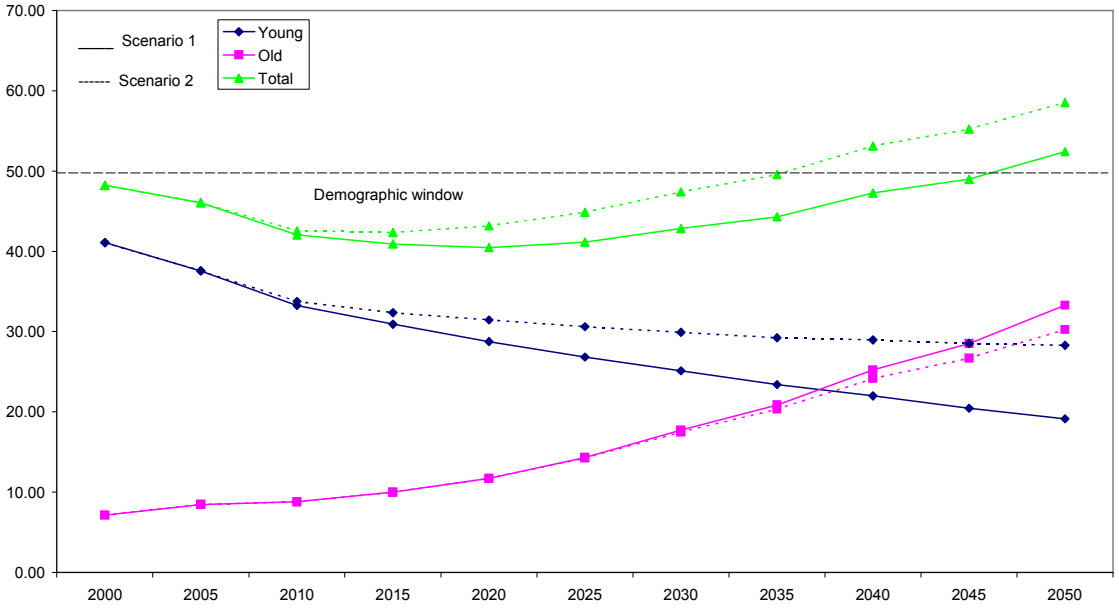
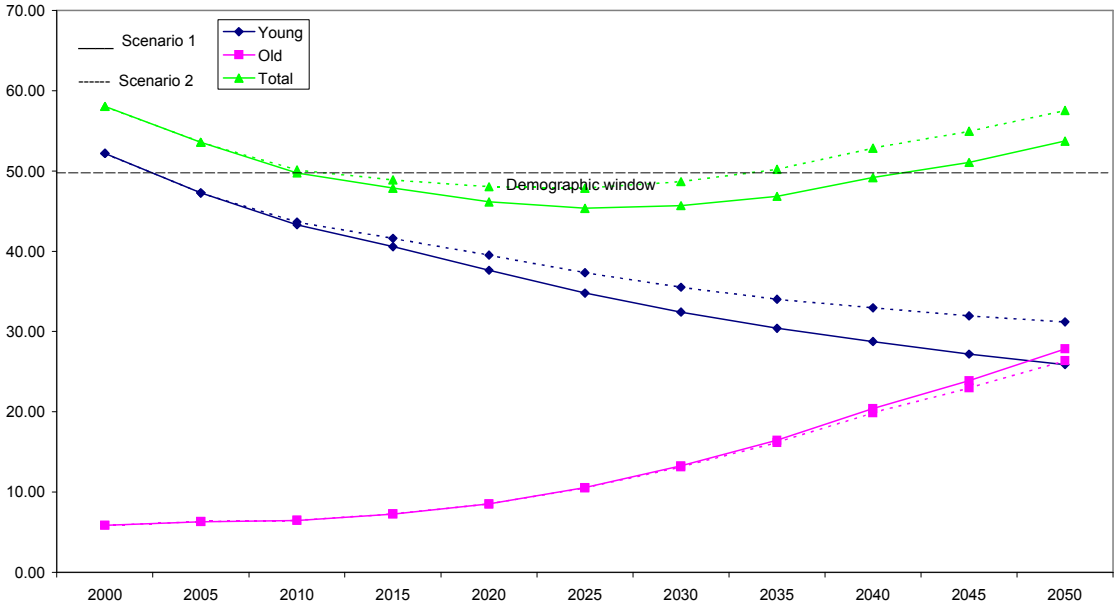


Figure 9. Young, Old and Total Dependency Ratios of Other Ethnic Groups: Indonesia, 2000-2050



Notes:

[1] We assume an IMR of 47 per 1000 in 2000-2005, using the estimated IMR derived from the 2000 population data. Our estimate may be too high, but we allow for a relatively fast decline in the projection of the infant mortality, assuming that the health situation is much better after 2000 than during the severe crisis in 1997-2000.

[2] We do not discuss the fertility rate, or whether a particular religious group has entered the second demographic transition, because we do not have the information for the year 2000 or before. See note iv for more explanations on this issue

[3] We do not discuss the fertility rate, or whether a particular ethnic group has entered the second demographic transition in the year 2000, because we do not have the information for the year 2000 or before. See note iv for more explanations on this issue.

[4] As mentioned in Section 2.2, we believe that the fertility estimates, supposed to refer to the period of 1996-1999, using the 2000 population census are too low. Therefore, we use the estimated rates to refer to the period of 2000-2005, rather than 1996-1999. Consistently, we cannot use the population census data to estimate TFR by ethnic and religious group for the period 1996-1999. We then use these estimates to refer to the period 2000-2005.

Because of the absence of data on fertility and mortality by ethnic and religious groups in earlier periods, we have problems in knowing the likely recent trend of TFR and IMR. Yet, but we still need to know what happen in the recent past as a guide to see the future. Therefore, we calculate the rates of growth of particular provinces assumed as proxies for religions and ethnicities. The following are the provinces chosen as proxy for the ethnic and religious groups.

Suryadinata, Arifin and Ananta (2003) found that the Javanese mostly resided in three provinces, namely, Central Java, Yogyakarta and East Java. Furthermore, the Javanese exclusively formed the population of Central Java. With this in mind, the future trend of Javanese's total fertility rate (TFR) is assumed to follow the Central Java's TFR. The Sundanese dominantly resided in West Java. We then use the past trend of West Java's TFR as a proxy for the trend of the Sundanese's fertility.

Similarly, we use the past trend of East Java's TFR for the Madurese, the trend of North Sumatra's TFR for the Batak, and the Riau's TFR for the Malay. "Others" ethnic groups are assumed to follow West Sumatra.

The trend of TFR for the Muslims follows the trend in Indonesian urban population because future Indonesian population will become more urbanized with Muslims as the majority . The Christian is assumed to followed the trend in the province of East Nusa Tenggara, where the Christians were the majority. The TFR for "Other religious" groups uses the TFR of Jakarta.