Population Sex-Age Structure in Vietnam: New Evidences from the 2014 Intercensal Population and Housing Survey

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Abstract

This paper examines the population sex-age structure in Vietnam using data from the 2014 Intercensal Population and Housing Survey. It shows that the proportion of children has declined dramatically over time. The proportion of children 0-4 years old accounted for 14.6% of the population in 1979, dropping to only 9.4% in 1999 and 8.3% in 2014. Low fertility and high life expectancy have caused the population pyramid to appear drum-shaped, meaning Viet Nam's population pyramid in 2014 characterized an aging population. At the same time, the proportion of the population of working age has increased dramatically. The proportion of the population aged 65 years and older also increased, but at a slower pace. As a result, the overall dependency ratio has declined from 89.9% in 1979 to 63.6% in 1999, 46% in 2009 and only 44% in 2014. It is estimated that Viet Nam will complete the period of the golden population structure in 25 years, around 2040. Regarding sex structure, the sex ratio of Viet Nam has continued to increase, from 94.2 in the 1989 census to 97.3 in 2014. The sex ratio in urban areas was lower than in rural areas. Migration has had a large impact on differences in the sex ratio among regions.

1. INTRODUCTION

Viet Nam has achieved remarkable economic growth since the implementation of economic reforms. The gross domestic product (GDP) growth rate has been decreasing in recent years, but still has reached an average of about 5% per year. Incomes, living standards, and the health of people have improved as the mortality rate has decreased and average life expectancy has increased. Population and family planning programs in Viet Nam have contributed to a decline in the fertility rate during the last three decades. At the same time, reduced mortality and increased life expectancy have caused the age-sex structure of the population to change remarkably. The proportion of middle-aged and elderly people has tended to increase. In 2009, the number of people aged 60 and older accounted for 10% of the population. Understanding the age-sex structure of Viet Nam's population is becoming increasingly important.

Age and sex are the two of the most important factors affecting human health, the economy, and human society in general. For each person, their education, health, income and other welfare indicators depend on their age and gender. According to the life-cycle theory, people tend to have high incomes during their young adult and middle ages, and then lower incomes when they become old and retire (Deaton, 1986; 2005). Thus, income and expenditures for most people depend to a large degree on their age.

From the macroeconomic perspective, the age structure of a country's population is a key factor related to economic growth. Different populations have different age-sex structures. The age-sex structure of the population is a key factor affecting a country's labor force, production efficiency, economic growth and GDP, as well as social insurance (Bloom et al., 2011). Thus, findings about the age-sex structure of population

are very important for policy makers, especially for Viet Nam, a country in transition in terms of population and economic structure.

In 2014, Viet Nam's General Statistics Office (GSO) conducted the Intercensal Population and Housing Survey (IPS 2014). The 2014 IPS was a sample survey with a sample size of 5% of the total households in Viet Nam (1,121,850 households). The objective was to provide estimates of the size, structure and distribution of the population, as well as economic and social features at the provincial and district level. The information and data collected from the IPS 2014 can be used to analyze changes in the population over time for the whole country, for regions and for provinces to provide evidence for policymaking. Information from this analysis comprise an important input to the design and implementation of development programs, as well as social and economic strategies and policies, for various sectors for the period 2015-2020.

The main objectives of this study is to analyze the current situation, trends, and differences in the age-sex structure of Viet Nam's population, including the age-sex structure of the child, youth, and elderly populations by demographic, geographic and social-economic characteristics, using data from the 2014 IPS and other population and housing censuses of Viet Nam. In addition, this study will provide policy recommendations on the age-sex structure and other issues related to children, youth and the elderly in Viet Nam, based on results of the data analysis.

2. ASSESSMENT OF DATA QUALITY

2.1. The quality of data on the age-sex population structure

Population data by age and sex are important for population projections, and serve as the basis for forecasts of socio-economic indicators such as the size and structure labor

force, school enrollment, dependency ratios, etc. These data are also used to calculate demographic age-specific rates, such as the age-specific fertility rate, age-specific mortality rate, age-specific marriage rate, and age-specific migration rate. These indicators are, in turn, the basis for calculations of aggregate demographic rates such as the total fertility rate, life expectancy, and age at marriage. Therefore, the accuracy of population data by sex and age affects directly the accuracy of a range of other demographic indicators.

One type of common error related to age in population censuses, and in demographic surveys, is age heaping, which occurs most often for ages ending with the digit zero (0) or five (5). A simple index to asses this kind of error is Whipple's index, which is used to calculate the error by comparing the number of people reporting their age ending with the digit zero or five and the estimated number of people in these ages, with the assumption that the population is distributed uniformly by age (see: United Nations, 1990; Iwunor, 1993). Whipple's index ranges from 100 to 500. When the Whipple's index is 100, this indicates that no rounding exists for ages ending with zero or five. On the contrary, if all respondents report that their age ends with zero and five, Whipple's index will be 500.

The following standards are applied in evaluating the quality (accuracy) of responses on age based on Whipple's index:

- Less than 105:   very accurate
- 105 to 110:   relatively accurate
- 110 to 125:   fair
- 125 to 175:   bad
- > 175:   very bad

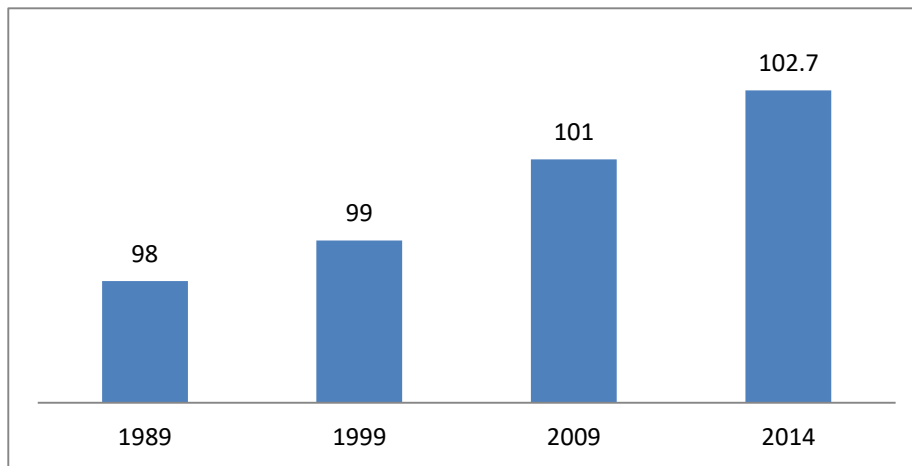Figure 2.1. Values using Whipple's index by year, Viet Nam, 1989-2014

Figure 2.1 presents Whipple's index from the Viet Nam population censuses since 1989 and from the 2014 IPS. The results indicate that almost no rounding to zero or five is found in the age data from these censuses and surveys in Viet Nam. According to the Whipple's standard, the responses on age in the population censuses in Viet Nam from 1989 to 2009 can be regarded as "very accurate". The Whipple's index calculation from the 2014 IPS is higher than estimates from the three previous censuses, but is still regarded as "very accurate".

Figure 2.2. Values of Whipple's index by sex, urban/rural residence, and geographic regions, Viet Nam 2014

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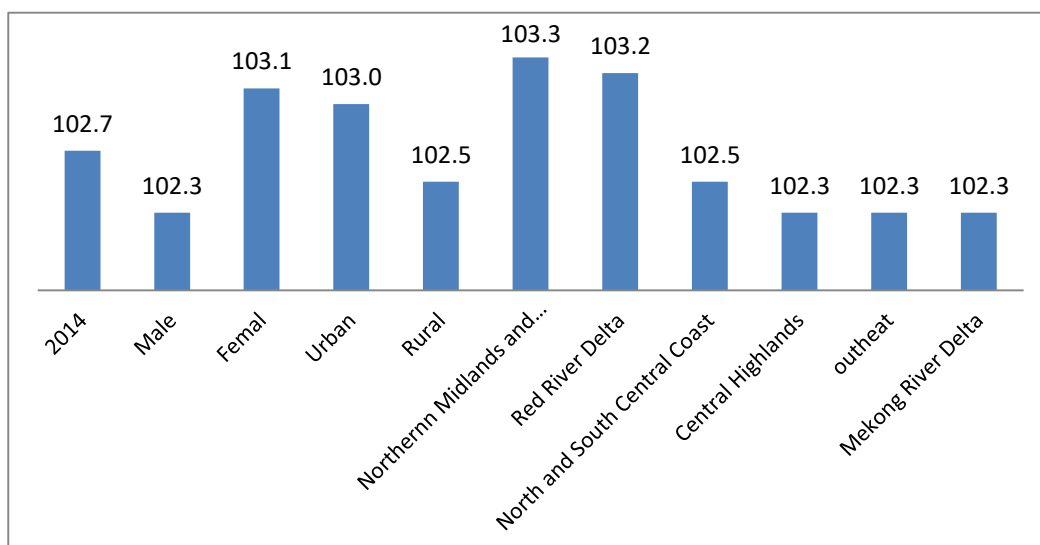
The Whipple's index does not allow determination, in a population census, of which ending digits are preferred when respondents state their age. Myer's blended index, together with respondents' age-specific indicators, can show whether there is any other ending digit preferred by respondents in population census data. The value of Myer's blended index can range from zero to 90. The higher the value of Myer's index is, the more preference there is for certain digits.

The Myer's blended index values in the population censuses in Vietnam are very low and have progressively improved over time (see Table 2.1). The Myer's blended index value was highest in the 1979 Population and Housing Census, at 4.1. The value was reduced to 3.5 in the 1989 Population and Housing Census and to 2.8 in the 1999 Population and Housing Census. The Myer's blended index value in the 2009 Population and Housing Census was higher by only 0.1 compared to the 1999 Population and Housing Census. These values are considered very small compared to the full range of this index (from 0 to 90). Even the Myer's blended index value in the 2014 IPS is only equal to 1.29, less than half of the value in the 2009 Population and Housing Census. In short, age heaping at ages ending with 0 or 5 in population censuses and surveys in Viet Nam is negligible.

Table 2.1 presents the Myer's index values by the ending digits for age for the population censuses in Viet Nam in 1989, 1999, 2009 and the 2014 IPS. These values indicate whether any specific age is preferred in the responses. These age-specific index values ranges from 0 to 10. In the numeric range from 0 to 9, if the value is 0, there is neither preference nor avoidance of any age ending with the number. If any value is higher than zero (positive), preference at the age ending with that number exists. If the value is less than zero (negative) there is an avoidance of age response for that number.

Table 2.1. The Myer's blended index and digit preference in the Viet Nam censuses 1989-2009 and IPS 2014

Ending digit	1979	1989	1999	2009	2014
0		-0.2	-0.1	-0.1	0.2
1		-0.2	-0.2	-0.3	0.3
2		-0.5	-0.3	-0.4	-0.3
3		-0.1	-0.1	-0.1	0.5
4		0.2	0.2	0.1	0.3
5		-0.1	-0.1	0.1	-0.2
6		0.3	0.5	0.5	-0.2
7		-0.7	-0.7	-0.4	-0.3
8		0.8	0.6	0.7	-0.2
9		0.5	0.1	0.1	-0.1
Blended index	4.1	3.5	2.8	2.9	1.3

Data in Table 2.1 indicate that in the three censuses of 1989, 1999, 2009 the ending digit for age that had the highest frequency was 8, followed by the ending digit of 6. The least frequent ending digit was 7, followed by the ending digit of 2. Meanwhile, in the 2014 IPS, the ages that had the highest frequency were those ending in 3, while the least frequent ages ended in 9.

One of the reasons why respondents often report their ages ending with 8 in censuses is because the population censuses in Viet Nam are conducted in years ending with 9 and age is determined by questions asking the year in which the respondents were born. When asked for the year they were born, many of the respondents tend to report being born in a year ending in zero (e.g., 1930, 1940, 1950), particularly those who do not remember their age precisely. Since the census takes place on April 1 in a year ending in 9 (1989, 1999, 2009), when age is calculated, about three quarters of those who declared being born in the years ending with 0 will have their age recorded as ending with 8, and the remaining quarter will have their age recorded as ending with 9.

In the 2014 IPS, ages ending with 3 were also popular due to rounding and the phenomenon of recalling the year of birth as ending in 0, as described above for the regular population censuses. Specifically, the preferred ending digit in the 2014 IPS was 3 because the census was conducted on April 1 of 2014 and thus when age was computed, the majority (three quarters) of those saying their birth year ended in 0 were documented as having an age ending with 3.

Although there is a slight preference for year of birth ending in 0, this preference does not affect the quality of the aggregated data for 5-year age groups, because a 5-year age group includes both a redundant group (people with last digit of age equal to 0), and the shortage group (people with last digits of age equal to 9 and 1).

Another index used by demographers to assess the quality of uniform distribution is the Age-Sex Accuracy Index (UNI) (United Nations 1990). This index reflects the accuracy of the population structure by sex and 5-years age groups. This index includes sex ratio points (SRS) and age ratio scores for each gender: ARM for men and ARSF for women. These indicators are calculated for all 5-year age groups from 0 to 74 years old. The composite index JS – the accurate indicator of age-sex distribution of population - is calculated using the formula:

$$JS = 3* SRS + ARSM + ARSF$$

Standards for quality of sex and 5-year age group distribution data using this index are:

- <20:   Accurate

- 20 to 40:   Inaccurate

- >40:   Very inaccurate

In general, the UNI index is used to assess the quality of data on population distribution by sex and 5-year age groups prior to making population projections, specifically to help determine whether or not there is a need for adjusting data prior to making projections.

Figure 2.3 shows the difference in the UNI index calculated for the population censuses conducted from 1979 to 2009 and the 2014 IPS. The figures show that for all five censuses and the IPS, the values of the UNI index are higher than 20 points. The 2014 IPS has the lowest UNI index value at 20.8 points, while the highest is the 1979 census at 25.1 points.

Figure 2.3. UNI index values, Viet Nam, 1979-2014
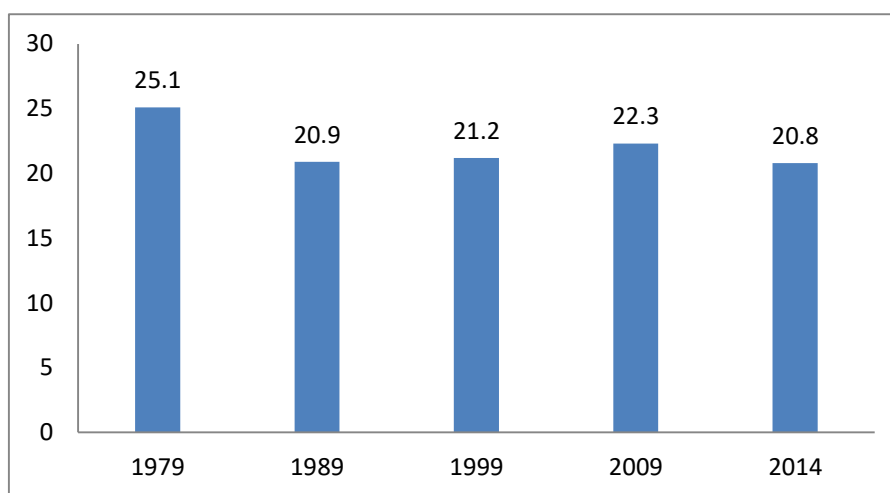
The results indicate that the degree of accuracy of the age and sex data in the censuses and 2014 IPS in Viet Nam, according to international classification, is not high. However, the relatively high UNI index values are, to a large degree, the consequence of war. This indicator developed by the UN for estimating the accuracy age-sex data is based on the assumption of the age and sex structure of a normal population. However, Viet Nam's population was affected seriously by wars that impacted the age and sex structure of the current population, especially the age groups

of 50 years old and higher. The sex ratio as well as the age ratio is quite unusual for these age groups in Viet Nam. In the 2014 IPS, the level of accuracy for these indicators was also affected in part by provisions of respondents (to be presented in the next section).

2.2 Adjustments to the age-sex population structure based on the 2014 IPS

The size and structure of the population, including the age-sex structure, depends on the respondents sampled in the survey. Therefore, when comparing the age-sex structure of different populations, it is important to pay attention to the differences in respondents among censuses and surveys.

The 2014 IPS, unlike previous full censuses that sampled from the entire population, did not interview people in the army and police force, as well as other the specific groups of people (as defined below). Therefore, to compare the age-sex structures between previous censuses and the 2014 IPS, it is necessary to adjust the age-sex structure of the 2014 IPS.

There are some methods for adjusting the data from the 2014 IPS, including:

- *Adjusting the data based on differences in the age-sex structure between full and sampled populations in censuses.*

Based on the difference between the population estimated for each age group from the 2014 IPS and the population enumerated from the full censuses in 1989, 1999 and 2009, the age groups of the 2014 IPS can be adjusted according to the following formula:

$$_5P_x^{tbTD}$$

$$_5P_x^{IPSđc} = {_5P_x^{IPSS}} \text{-----------------}$$

$$_5P_x^{tbm}$$

In which:

- $_5P_x^{IPSđc}$ = Adjusted population of age group x, x+5 in the IPS;

- $_5P_x^{IPSS}$ = Population of age group x, x+5 collected in the IPS;

- $_5P_x^{tbm}$ = Average sample population in age group x, x+5 of the three censuses 1989, 1999 and 2009;

- $_5P_x^{tbTD}$ = Average comprehensive population in age group x, x+5 of the three censuses 1989, 1999 and 2009.

The shortcoming of this method is that it only provides an adjustment for the shortage of the population in the 2014 IPS due to not including the army and police, but it does not address the shortage of specific people who were not covered in the 2014 IPS.

A second method for adjusting the data from the 2014 IPS is to:

- ***Adjust based on the difference between the projected age-sex structure and the 2014 IPS age-sex structure.***

As is well known, given the size of Viet Nam's population, the level of international migration is negligible; after five years, the population for the age group of 5 years and over is only affected by mortality, while the age of children in the 0-4 age group is affected by fertility (specifically the age-specific fertility rate, or ASFR) and mortality of children under 5 years of age. Therefore, it is possible to use 2014 IPS data to make projections about the population by component method, and thus determine changes in the population structure by age group.

After the end of the 2009 census, based on the results of the census, the General Statistics Office (GSO) conducted a population projection by component method. The results of this projection were announced in 2011 (GSO, 2011). The population of Viet Nam on April 1 2009 was found to be 85,847,000 people, while on April 1 2014 the population was estimated to be 90,654,400. Thus, compared with the total population of 90,493,400 people estimated directly from the 2014 IPS, the projected figure was higher by only 161,000. This difference is due to the difference between predicted fertility and mortality rates and actual fertility and mortality rates. However, this difference is very small, less than 0.2% of the population.

Another method for adjusting the data from the 2014 IPS is to:

- ***Adjust based on the age-sex structure of the population of people living in areas managed by the army, police and foreign affairs ministry in the 1989 census.***

In four population censuses that have been conducted in the country, only in the 1989 population census was population data published by sex and age, under two categories: i) the entire population, and ii) the population excluding people in "special groups". There are three special groups: people in areas managed by the Ministry of Defense, Ministry of Police and Ministry of Foreign Affairs. Using data on the total number and age-sex structure of the entire population minus the corresponding figures for the sectors of the population without the three special groups, we can estimate the number and age-sex structure of the three special groups. We can project the size of these special groups over time and add these groups to the population surveyed in the 2014 IPS. The limitation of this approach is that it does not provide information on the

differences in the number of people and age-sex structure of the three special groups between 1989 and 2014.

Another alternative approach to adjusting the data from the 2014 IPS is to:

- *Adjust based on the age-sex structure of the population from the 2009 census and fertility and mortality figures in surveys conducted in the last five years (2009-2014).*

Under this method, the adjusted age-sex structure in 2014 is based on the age-sex structure of the 2009 census and fertility and mortality figures collected during the five years from 2009 to 2014. This is a widely method used by the United Nations and demographers to update population projections. It should be noted that this correction is only applied to the country's population and is only used to analyze the changing age-sex structure over time. The results obtained in this way (calculated by GSO) are presented in Table 2.2.

Table 2.2. Age-sex structure of population in the 2014 IPS adjusted based on the age structure in the 2009 census and fertility and mortality figures collected in surveys conducted in the last five years (2009-2014)

Age group	Proportion of each sex			Proportion of total population		
	Male	Female	Both sex	Male	Female	Both sex
0-4	8.89	7.77	8.33	4.38	3.94	8.33
5-9	8.18	7.33	7.75	4.03	3.72	7.75
10-14	7.71	7.08	7.39	3.80	3.59	7.39
15-19	8.17	7.59	7.87	4.03	3.85	7.87
20-24	10.03	9.45	9.73	4.94	4.79	9.73
25-29	9.33	9.01	9.17	4.60	4.57	9.17
30-34	8.53	8.37	8.45	4.21	4.25	8.45
35-39	7.52	7.33	7.42	3.71	3.71	7.42
40-44	7.11	6.94	7.02	3.51	3.52	7.02
45-49	6.35	6.42	6.39	3.13	3.26	6.39
50-54	5.51	5.97	5.74	2.72	3.03	5.74
55-59	4.23	4.92	4.58	2.09	2.49	4.58

Age group	Proportion of each sex			Proportion of total population		
	Male	Female	Both sex	Male	Female	Both sex
60-64	2.74	3.35	3.05	1.35	1.70	3.05
65-69	1.89	2.33	2.11	0.93	1.18	2.11
70-74	1.34	1.88	1.61	0.66	0.95	1.61
75-79	1.07	1.65	1.36	0.53	0.84	1.36
80+	1.40	2.61	2.01	0.69	1.32	2.01
	100.00	100.00	100.00	49.31	50.69	100.00

Table 2.3 shows that the age indicators obtained by this method are more consistent with the actual trend (evident in census data) compared to the other methods described above. Therefore, the data on the age-ex structure of Viet Nam's population obtained by this method was used to compare data of age-sex structure over time in Chapter 3.

Table 2.3. Age structure and dependency ratio, Vietnam 1989-2014

	1989	1999	2009	2014
Proportion of population under 15 year of age	39.2	33.1	24.5	23.5
Proportion of population 15-64	56.1	61.1	69.1	69.4
Proportion of population 65 and over	4.7	5.8	6.4	7.1
	100	100	100	100
Dependency ratio				
Elderly dependency ratio	69.8	54.2	35.4	33.8
Child dependency ratio (65+)	8.4	9.4	9.3	10.2
Total dependency ratio	78.2	63.6	44.7	44

3. THE AGE-SEX STRUCTURE OF THE POPULATION OF VIETNAM

3.1. The age-sex structure

3.1.1. Changes in the age-sex structure of the population in Viet Nam from 1979 to 2014

As discussed in Chapter 2, since the population measured by the national censuses and the 2014 IPS differ, analysis of the age-sex structure of the country's population presented in this report is based on adjusted data to better estimate the structure of the

entire population. For the analysis of the age-sex structure of specific groups, unadjusted data was used.

Table 3.1 presents the age-sex structure of the population from the 2014 IPS by 5-year age groups. The figures show that the decrease in fertility was negligible over the past five years, and therefore the proportion of the population aged 0-4 was almost unchanged compared with the age group of 5-9, though the number of males in the latter group even increased by 0.58 percentage points.

Table 3.1. Age-sex structure of the population, Viet Nam, 2014

Age group	Male	Female	All
0-4	8.89	7.77	8.33
5-9	8.18	7.33	7.75
10-14	7.71	7.08	7.39
15-19	8.17	7.59	7.87
20-24	10.03	9.45	9.73
25-29	9.33	9.01	9.17
30-34	8.53	8.37	8.45
35-39	7.52	7.33	7.42
40-44	7.11	6.94	7.02
45-49	6.35	6.42	6.39
50-54	5.51	5.97	5.74
55-59	4.23	4.92	4.58
60-64	2.74	3.35	3.05
65-69	1.89	2.33	2.11
70-74	1.34	1.88	1.61
75-79	1.07	1.65	1.36
80+	1.40	2.61	2.01
Total	100	100	100

The proportion of children aged 0-4 was slightly higher than the 5-9 age group (8.33% versus 7.75%). The proportion of children in the population has decreased remarkably over time. Figure 3.1 shows that at the time of the 1979 census, the proportion of children in the 0-4 age group accounted for 14.6% of the population, but

in the 1999 census this figure was only 9.4%. The proportion of children 0-4 years

continued to decline further to only 8.3% in 2009.

Figure 3.1. Age-sex structure of children aged 0-14 in Viet Nam, 1979-2014
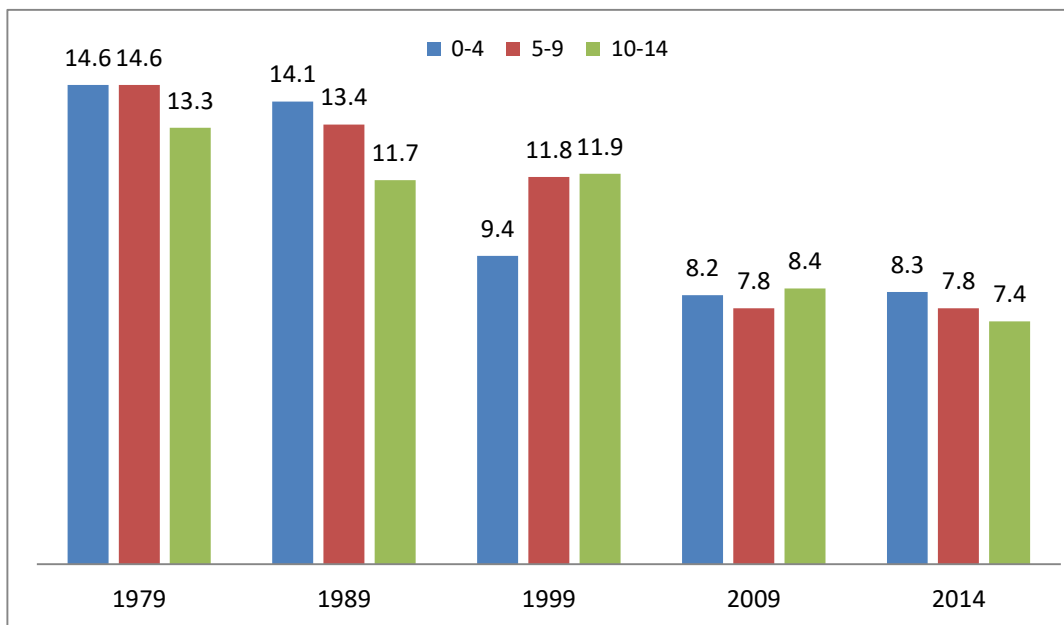
In the period 1979-2009, the proportion of children aged 5-9 years old fell from

14.6% in 1979 to 7.8% in 2009, with an annual average decline of 0.23 percentage

points. The proportion of children aged 5-9 fell the most during the 10 years from 1999

to 2009, from 11.8% in 1999 to 7.8% in 2009, an average annual decrease of 0.4 points.

Figure 3.2 shows that the population pyramids of the age-sex structure of the

population of Vietnam over four population censuses, from 1979 to 2009 and the 2014

IPS. The results show that the age-sex structure of the population in Viet Nam has

changed significantly over the past three decades.

The population pyramids in 1979 and 1989 have a similar shape and characterize

a population with relatively high fertility and mortality, especially the 1979 population

pyramid. The bars at the bottom of these two pyramids are larger than the other bars,

showing clearly the impact of wars on the age structure of the population. The body of

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the 1979 pyramid narrowed dramatically compared to previous population estimates of the population for the three age groups of 30-34, 35-39 and 40-44. In the 1989 pyramid, the sudden narrowing takes place in the three age groups of 40-44, 45-49 and 50-54. These are the age groups from who were strongly affected by the war against America during 1960 to 1975. However, it can be seen that the population pyramid in 1989 had narrowed more slowly than in population pyramid for 1979, reflecting the fact that mortality decreased more quickly in the years before this census compared to the years before the 1979 census. Both the population pyramids for 1979 and 1989 characterize the pyramid shape of a young population.

The pyramids of Viet Nam's population in 1999 and 2009 reflect a dramatic reduction in fertility, especially the population pyramid in 2009. The bar at the bottom of the 2009 population pyramid had narrowed significantly compared with the age group 5-9 because the fertility rate during the period 1994-1999 decreased significantly compared with the previous five years. According to the 1999 census, the total fertility rate (TFR) of period from 1989 to 1994 was 3.27 children per women, while the TFR during the period 1994 to 1999 was only 2.45. In the 2009 population pyramid, the three bars in the bottom corresponding to the three age groups of 0-4, 5-9 and 10-14 are narrower than three bars above which correspond to the age groups of 15-19, 20-24 and 25- 29. This is because the birth rate in the 15 years before the 2009 census (1994-2009) decreased faster than the preceding 15 years (1979-1994).

The population pyramid of Vietnam in 1999 is typical for a period of demographic transition in which the fertility and mortality rates drop quickly. The population pyramid in 2009 is relatively typical for a population at a later stage of demographic transformation, with low fertility and mortality and the beginning of

population aging. The consequences of wars on the age pyramid becoming fainter and are only discernible in the population aged 60-64.[1]

Because the fertility rate has stabilized at a low level in the last five years (2009-2014), in the population pyramid of Vietnam in 2014 the bottom bar (representing the age group of 0-4) is slightly wider than the next bar (representing 5-9 year olds), but it is still narrow. Low mortality and high life expectancy have made the body of the pyramid narrower and more like a drum-shaped tower. The proportion of the population aged 80 years or over was significantly higher in 2014 compared to previous censuses. The pyramid of Viet Nam's population in 2014 reflects an aging population (see also the 2014 IPS Major Findings report).

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[1] GSO (2010).

Figure 3.2. Population pyramid of the country, Vietnam, 1979-2014
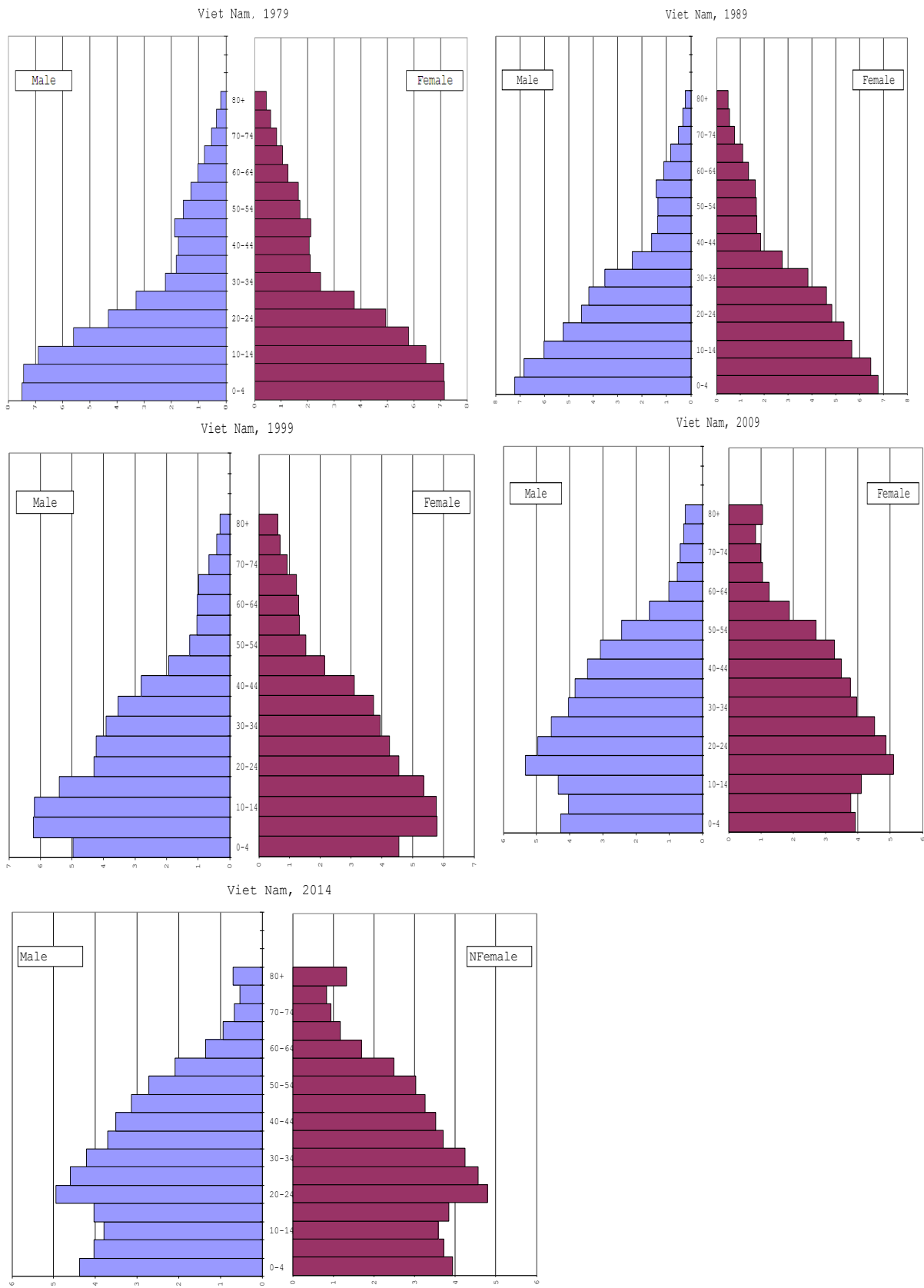
3.1.2. *Differences in the age-sex structure between urban and rural populations*

The age-sex structure of the population depends on fertility, mortality and migration. The differences in these three demographic rates between urban and rural areas are often very large. The TFR of rural areas is often greater than in urban areas. In 1989 and 1999, the TFR in rural areas was higher than in urban areas by a factor of 1.5 to 2. In the years from 2009 until 2014, this difference has been smaller but still in the range of 20% to 30% higher in rural areas.

Table 3.2 shows the proportion of the population by sex and age groups in both urban and rural areas of Viet Nam in 2014. Analysis shows that the difference in fertility between the two regions has affected the sex-age structure of the youth group. Because fertility in rural areas is higher than that in urban areas, the proportion of young population groups is higher in rural areas than in urban areas. However, differences in mortality rates between the two regions has affected the age-sex structure of middle-aged and elderly groups in the opposite direction, especially for the groups of people aged 25 to 69. The proportion of the population in all age groups is lower in rural areas than in urban areas, for both males and females. The proportion of people in the age group from 15 to 39 was comparatively high, especially in urban areas, due to the impact of migration. As we will see in the age-sex structure of migrants, migrants aged 15-39 account for a huge proportion of all migrants. According to data from the 2014 IPS, the proportion of male migrants in the three age groups of 20-24, 25-29 and 30-34 was 8.5%, 19.3% and 15.0%, respectively. Similarly, the proportion of female migrants in the three groups of females aged 20-24, 25-29 and 30-34 was 28.1%, 23.4% and 11.9%, respectively. The elderly proportion aged 65 years and above in rural areas is

higher than in urban areas mainly because of rural-urban migration of young people. There is a growing trend of more single elderly people living in rural areas.

Table 3.2. The proportion of the population by sex, age and by urban and rural areas, Viet Nam, 2014

Age group	Urban			Rural		
	Male	Female	All	Male	Female	All
0-4	8.23	6.97	7.58	8.63	7.69	8.16
5-9	8.01	6.96	7.47	8.49	7.72	8.11
10-14	7.20	6.40	6.78	8.30	7.72	8.01
15-19	7.10	6.70	6.89	8.43	7.79	8.11
20-24	8.69	9.00	8.85	9.25	8.42	8.83
25-29	8.84	9.18	9.02	8.82	8.09	8.46
30-34	8.81	9.06	8.94	7.97	7.76	7.86
35-39	7.96	7.93	7.94	7.39	7.26	7.32
40-44	7.78	7.48	7.63	7.15	7.01	7.08
45-49	6.84	6.75	6.79	6.57	6.64	6.60
50-54	6.50	6.65	6.58	5.80	6.37	6.09
55-59	5.25	5.53	5.39	4.41	5.08	4.75
60-64	3.22	3.72	3.47	3.01	3.59	3.30
65-69	1.92	2.42	2.18	1.83	2.33	2.08
70-74	1.40	1.78	1.60	1.32	1.92	1.62
75-79	1.01	1.46	1.24	1.09	1.74	1.42
80-84	0.76	1.12	0.94	0.90	1.53	1.22
85+	0.50	0.89	0.70	0.61	1.33	0.98

Figure 3.3 illustrates differences in the age-sex structure of Viet Nam's population in 2014 between urban and rural areas. The population pyramid for the urban population shows a narrowing trend in the bottom section, representing a falling fertility rate, similar to the pyramid for the entire country's population. However, the population pyramid of urban areas is significantly affected by the migration flow from rural to urban areas: due to rural-urban migration of young people, the share of young people in urban areas has increased over time. This has resulted in a rising proportion of the population in the age groups of 20-24 and 25-29 living in urban areas. The urban population band is largest for the age group 20-24, while the band in the rural population pyramid is largest for the age group 15-19. This phenomenon is consistent with the 2009 census pyramid representing urban and rural populations.

Figure 3.3. Urban and rural population pyramids, Viet Nam in 2014
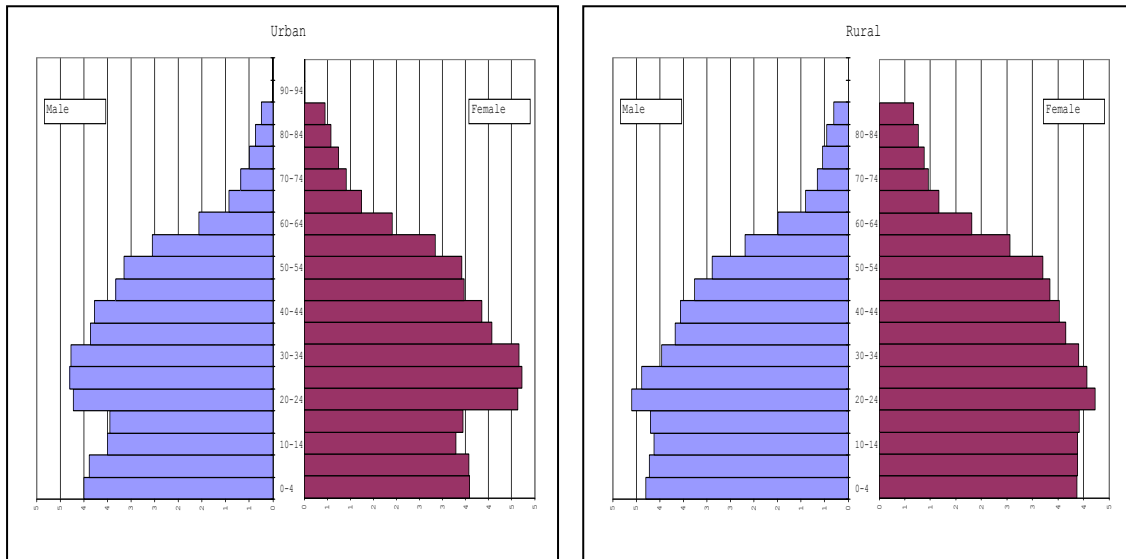
3.1.3. Differences in age-sex structure between regions

Because fertility, mortality and migration levels are different in the different geographical regions of the country, the age-sex structure of the population of these regions is also very different. The Southeast region has with the lowest TFR in the country, followed by the Mekong River Delta and the Red River Delta. The Central Highlands has the highest TFR, followed by the Northern Midlands and Mountains.

There are also differences in mortality between regions. The Central Highlands has the highest mortality rate (life expectancy at birth is the lowest, at 72.5 years), followed by the Northern Midlands and Mountains (life expectancy is 73.4 years). The Southeast region has the lowest mortality rate (life expectancy at birth is the highest, at 78.3 years), and the Red River Delta and Mekong River Delta also have low mortality rates, with a life expectancy of around 77 years.

Among the six geo-economic regions, the Northern Midlands and Mountains, North and South Central Coast and the Mekong River Delta regions have experienced

net negative out-migration rates over the past three years, while the Southeast has had a net positive in-migration rate.

These differences in fertility, mortality and migration have had a significant impact on the structure of the age-sex population by socio-economic region. Table 3.3 presents the structure by three large age groups of the population in the regions of Viet Nam.

Table 3.3. Proportion of population by geo-economic region, sex, and age group, Viet Nam, 2014

	Male			Female			All		
	0-14	15-64	65+	0-14	15-64	65+	0-14	15-64	65+
Whole country									
Northern Midlands and Mountains	27.5	67.6	4.9	25.4	67.0	7.6	26.5	67.3	6.2
Red River Delta	24.4	68.2	7.3	21.0	68.7	10.4	22.7	68.5	8.9
North and South Central Coast	24.8	68.7	6.5	22.3	67.8	9.9	23.5	68.3	8.2
Central Highlands	29.8	66.5	3.7	28.3	66.3	5.4	29.0	66.4	4.5
Southeast	22.7	73.1	4.2	19.9	73.8	6.3	21.3	73.5	5.2
Mekong River Delta	23.6	71.0	5.4	21.6	70.2	8.1	22.6	70.6	6.8

Table 3.3 indicates that the regions with the highest fertility – the Central Highlands and Northern Midlands and Mountains – also had the largest proportion of the population aged 0-14. The proportion of people in this age group among the total population in these two regions was 29.0% and 26.5%, respectively. The Southeast, Mekong River Delta and the Red River Delta had the lowest birth rates and the lowest proportion of people in the age group 0-14, with the corresponding proportion of 21.3%, 22.6% and 22.7%, respectively.

The Red River Delta and Mekong River Delta are the regions with the highest proportion of the population aged 65 and older, at 8.9% and 6.8%, respectively. The Central Highlands has the lowest proportion of people aged 65 and older, at around

4.5%. Differences in life expectancy and migration trends are the primary causes of differences in the age structure among the regions.

The Southeast, the region with the highest level of in-migration, also had the highest proportion of the population aged 15-64 (73.5%). High in-migration also reduced the proportion of the population aged 65 and older to only 5.2%. However, high levels of out-migration has raised the proportion of the population aged 65 years and above in the North and South Central Coast, to very high levels, up to 8.2%.

The population pyramids in Figure 3.4 show the influence of fertility, mortality and migration rates on the age-sex structure of the population in the regions of Viet Nam. Among the six regions, the population pyramid for the Southeast has the most distinctive shape. It is the narrowest at the bottom, particularly the bands representing the age groups 10-14 and 15-19, while the middle sections are large on both sides (representing men and women), especially the 25-20 age group. After the age group of 55-59, the body of pyramid is narrows quickly. This shape of the pyramid of the Southeast represents a population with low fertility and high levels of in-migration, and both factors have occurred over a long period in Viet Nam. The four bottom bars are very narrow, representing a low birth rate for at least two decades. The body of pyramid, however, representing the population aged approximately age 20 to 54, is affected by migration as the majority of migrants are of working age. A survey on internal migration in 2004 found that "more than 50% of the migrants said they moved to a new place to find work".[2] According to this survey, 69% of men and 71% of women migrated to Ho Chi Minh City, the major city in the Southeast region, for employment.

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[2] GSO (2005).

The two population pyramids of the Northern Midlands and Mountains and Central Highlands regions characterize a young population, with a relatively wide bottom section and a narrow top. The Central Highlands population is much younger than the population in the Northern Midland and Mountains. The three bars corresponding to the age groups 5-9, 10-14 and 15-19 of the Northern Midlands and Mountains are much narrower than the bar of the age group representing people aged 20-24 years. In comparison, the three corresponding bars in the population pyramid of the Central Highlands are very large, and only the bottom bar in the pyramid is a little narrower. This reflects low fertility rates in the Central Highlands during the past five years. The peak of the population pyramid of the Central Highlands is narrower than the peak of the Northern Midland and Mountains pyramid. This reflects the high mortality rate in the Central Highlands. The population pyramid of the Mekong River Delta region has a narrow bottom and shape overall, representative the low fertility rate in the Mekong River Delta during the last five years.

Figure 3.4. Population pyramids by socio-economic regions, Viet Nam, 2014
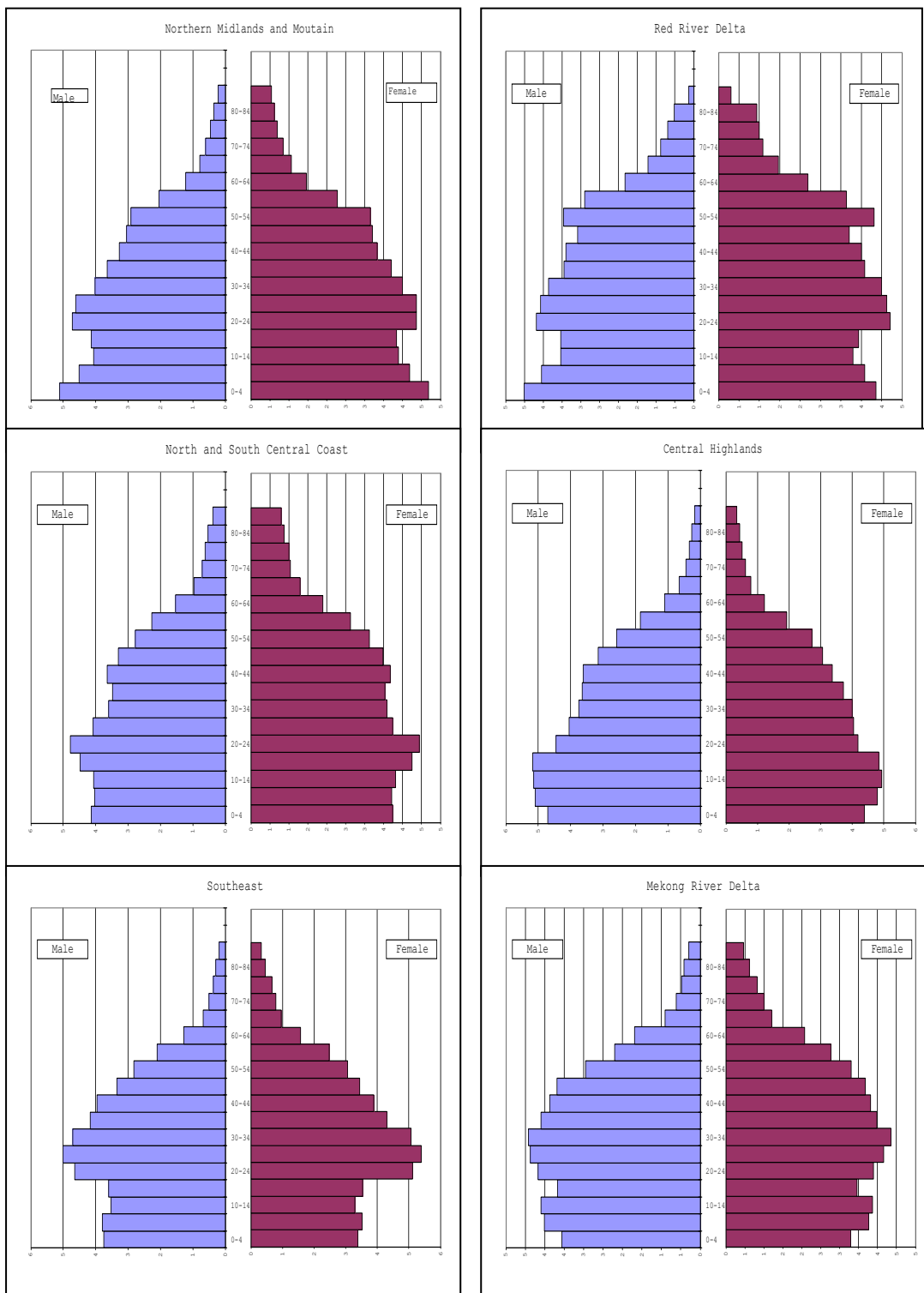
On the other hand, the shape of population pyramid of the Red River Delta is very different. Because the fertility rate during 1994-1999 and 1999-2004 decreased very fast, the size of the bars corresponding to the two generations of age groups 10-14 and 15-19 narrowed significantly. Moreover, the decreasing of the population in the reproductive ages in the period 1994-2004 (about 30-44 years old in 2014) also contributed to reducing the number of births in this period.

The population pyramid of North Central and South Central Coast is the only pyramid which is narrowed quickly in three groups 25-29, 30-34 and 35-39 but then expanded in the age group 40-44 years old. This happens to both male and female. Among six socio-economic regions, North and South Central Coast have the lowest proportion of the 30-34 age group.

3.1.4. Differences in the age-sex structure between provinces and cities

Due to differences in fertility, mortality and migration rates among provinces and centrally administered cities, the age-sex structure and population pyramids are very different among provinces. The age-sex structure of Viet Nam's provinces can be divided into three typical types:

The provinces with fertility, high mortality and low migration are primarily the highland provinces such as Lai Chau, Ha Giang, and others in the north, and Kon Tum in the south. The population pyramid of these provinces shows a modern, young population.

Figure 3.5. Population pyramids of Ha Giang, Lai Chau and Kon Tum provinces, 2014
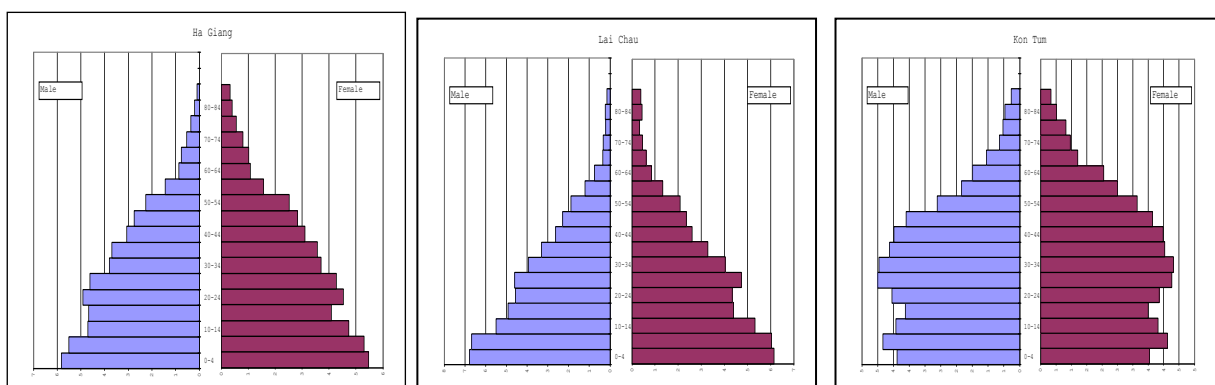

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Figure 3.5 shows three age pyramids illustrating the age-sex structure of the population of Ha Giang, Lai Chau and Kon Tum provinces. Ha Giang had a TFR of 2.51 for the 12 months prior to 1 April 2014 (the date the 2014 IPS was carried out). In terms of mortality, Ha Giang had an infant mortality rate (IMR) of 34.2 per thousand, lower than only Lai Chau (43) and Kon Tum (39). Ha Giang had a net migration rate in the 12 months prior to 1 April 2014 of -3.6 per thousand, with in-migration and out-migration equal to 5.1 and 8.7 per thousand, respectively. Like other populations with high fertility and mortality rates, the population pyramids of Ha Giang, Lai Chau and Kon Tum are triangular, with a wide bottom section and narrowing very rapidly at the top, reflecting a young population.

The provinces/cities which had low fertility and mortality but high positive net-migration include Ho Chi Minh City, Binh Duong and Da Nang City. Ho Chi Minh City had a TFR of 1.39 in the 12 months prior to the 2014 IPS, and an IMR of 7.9 per thousand, lower than the average level for the country. Ho Chi Minh City had a net migration rate in the 12 months prior to the survey of 5.5 per thousand, based on in-migration and out-migration rates of 16.9 and 12.1 per thousand, respectively.

Binh Duong Province had slightly higher fertility and mortality rates than Ho Chi Minh City (TFR of 1.44 and an IMR of 9 per thousand in 2014). However, this province had a net migration rate over the five years prior to the survey of 20.3 per thousand. This is the nation's highest net migration rate – four times higher than the corresponding rate for Ho Chi Minh City. The rate of in-migration and out-migration for the population of Binh Duong was 239.7 and 34.3 per thousand, respectively.

Figure 3.6. Population pyramid of Ho Chi Minh City, Binh Duong Province and Da Nang City, 2014
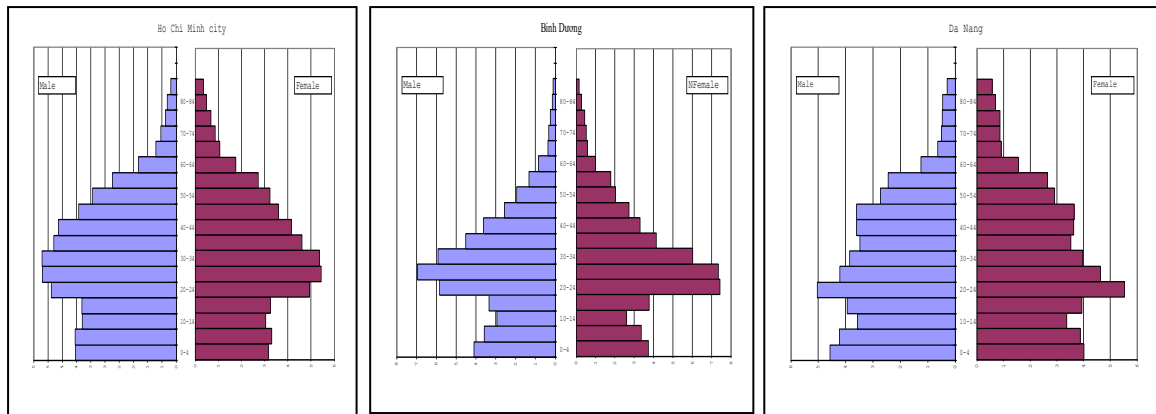
The population pyramids of Ho Chi Minh City and Binh Duong Province are very narrow at the bottom, especially that of Binh Duong. The bottom sections of the two population pyramids are narrow, not only due to low birth rates but also from high out-migration. The proportion of the population aged 15-19 years old and younger has decreased due to these factors. Like the bottom, the top of the pyramids of Ho Chi Minh City and Binh Duong are quite narrow, not due to low life expectancy but because of in-migration. Unlike most other provinces and cities, the population age group of 20-24 in both Ho Chi Minh City and Binh Duong accounted for the highest proportion of the total population in 2014.

However, the two population pyramids of Ho Chi Minh City and Binh Duong province have different characteristics as well. The population of 25-29 year olds in Ho Chi Minh City has decreased a slower pace than in Binh Duong. People have moved to Ho Chi Minh City for many reasons: studying, work, retirement, family, etc. Thus, there is a large variation in the age of migrants moving into the city. In Binh Duong people have moved to the province to seek employment primarily, especially to work in industrial zones and export processing zones, and these in-migrants are mostly of a

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young age. As a result, among migrants to the province of Binh Duong, the 20-24 and 25-29 age groups represent a very large proportion.

3.1.5. Differences in the age-sex structure between ethnic groups

Since the 2014 IPS was a sample survey, it is only representative for the seven ethnic groups with a population of one million or more. These groups include the Kinh, Tay, Thai, Muong, Khmer, Nung and Mong. The other ethnic groups are collectively referred as "other ethnic groups". As is the case with the national population, the age-sex structure of ethnic groups is not affected by internal migration. It is only affected by fertility and mortality. The main differences in fertility and mortality, as well as trends over time, result in differences in the age-sex structure of different ethnic groups.

Table 3.4. Proportion of population of major ethnic groups by three large age groups and sex, Viet Nam, 2014

Ethnic groups	0-14			15-64			65+		
	Male	Female	All	Male	Female	All	Male	Female	All
Kinh	24.4	21.8	23.1	69.6	69.3	69.5	6.0	8.9	7.5
Tay	24.9	23.7	24.3	70.5	69.2	69.8	4.6	7.1	5.9
Thai	29.5	27.2	27.2	66.6	67.1	66.9	3.9	5.7	4.8
Muong	26.4	24.9	24.9	69.8	67.8	68.8	3.8	7.3	5.5
Khmer	26.4	24.2	24.2	68.7	68.3	68.5	5.0	7.5	6.3
Nung	26.3	25.7	25.7	69.5	66.8	68.1	4.3	7.5	5.9
Mong	43.3	42.5	42.5	54.2	53.5	53.9	2.4	4.0	3.2
Other	31.5	29.9	29.9	64.1	64.3	64.2	4.4	5.8	5.1

The Mong had the highest fertility rate in 2014, and also the highest proportion of children aged 0-14. Table 3.4 shows that this age group accounted for 42.5% of the Mong population. The "other ethnic groups" and Thai ethnic group had the second and the third highest fertility rates. They also had the second and the third highest proportion of the population aged 0-14 (29.9% and 27.2%, respectively). On the other hand, the Kinh had the lowest fertility rate and also the lowest proportion of children aged 0-14, only 23.1%, around half the rate of the Mong.

Ethnic groups with a lower mortality will tend to have a high proportion of people aged 65 and older, and vice versa. Table 3.7 shows that the Kinh, who had the lowest mortality rate, also had a relatively high proportion of the population aged 65 and older, at 7.5% in 2014, while this proportion for the Mong, who had the highest mortality, was only 3.2%.

Figure 3.7 shows the population pyramids of seven ethnic groups with populations of one million and higher, and the "other ethnic groups". The pyramid of Mong most clearly illustrates the impact of very high fertility and mortality on the shape of the population pyramid. Due to high fertility, the bottom of the Mong pyramid is very wide, while due to high mortality, the pyramid itself is very sharp (narrow at the top).

The population pyramids of the other three ethnic groups have wide bottom bars that are almost equal, meaning that in the past 15 years the fertility rate has only decreased slightly. Because of high mortality, the other ethnic groups also have a narrow pyramid structure.

In the eight population pyramids of ethnic groups with populations of 1 million or more, the population pyramids of the Tay, Muong, Nung have bars in the bottom section that are much wider than the bars near the top. This is because fertility in the recent five-year period increased compared to the previous five-year period.

The Kinh, who make up 86% of the country's population, have the population pyramid similar to that of the whole country. Because the fertility rate of the Kinh has decreased for the past twenty years, the four bars at the bottom are almost equal. The mortality rate among the Kinh is low, and as a result the population pyramid of the Kinh

has narrow bars near the top. From the age group of 60-64 and above, the pyramid starts to narrow.

The population pyramids of the Tay, Thai and Muong ethnic groups have similar shapes. The bar representing the age group of 10-14 is quite narrow, proving that the fertility of these three ethnic groups decreased rapidly during 2000-2004. The population pyramids of these three ethnic groups in the 2009 census also had similar shapes.[3]

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[3] Tổng cục Thống kê (2011).

Figure 3.7. Population pyramid of ethnic groups with population of 1 million and higher, Viet Nam, 2014
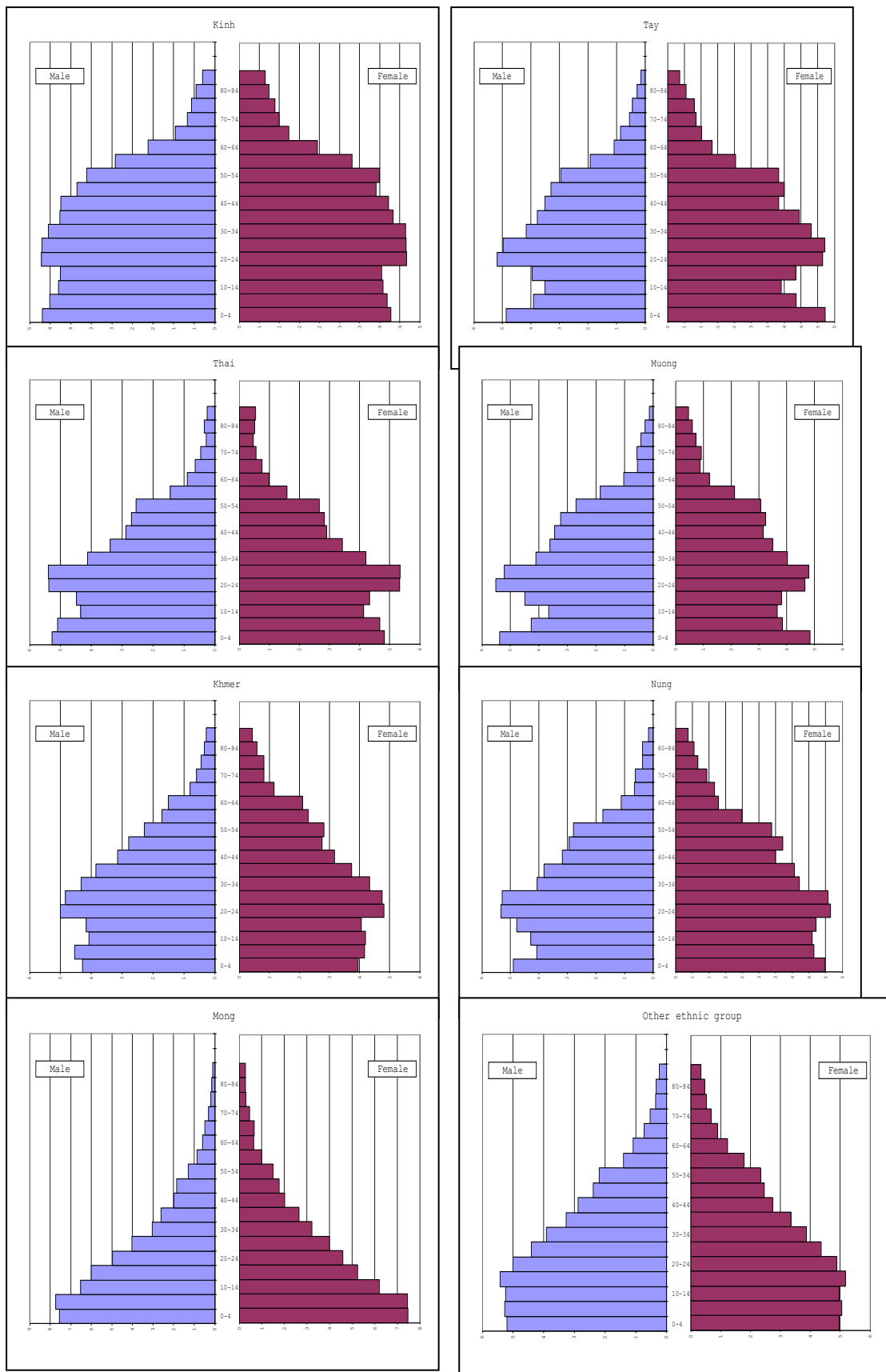
3.2. Sex structure of the population

3.2.1 Sex structure of the population

The sex ratio is used as a measure of the male and female composition of the population and is defined as the number of males per 100 females. This percentage is greater than 100 if the number of men is larger than the number of women and vice versa. For a closed population (without migration), the sex ratio of a population is affected by differences in the birth rate and in the mortality rates of men and women. For an open population (including migration), in addition to the above factors, the sex ratio is also affected by the difference in the sex of migrants. In developing countries, especially countries with high life expectancy and a large difference in the life expectancies of men and women, the sex ratio of the total population is usually less than 100. In many developing countries with low life expectancy, however, the sex ratio of the population is generally greater than 100 (see Figure 3.8). Migration also plays a big role in affecting the sex composition of the population. Among migrants, the number of men tends to be larger than the number of women.

Figure 3.9 shows the change in the sex ratio of Viet Nam from 1931 to 2014. The Second World War, and the wars in the periods 1946-54, 1955-1964, 1965-1975 and early 1979 caused the sex ratio of Viet Nam to continue to fall from 98 in 1931 to 94.2 in 1978, the lowest in the world at the time.[4] The peaceful period since then has gradually balanced the sex ratio of Viet Nam, with the ratio increasing to 97.3 in 2014. An increase in sex ratio at birth (SRB) in recent years also has contributed to the increase in the overall sex ratio of the population of Viet Nam.
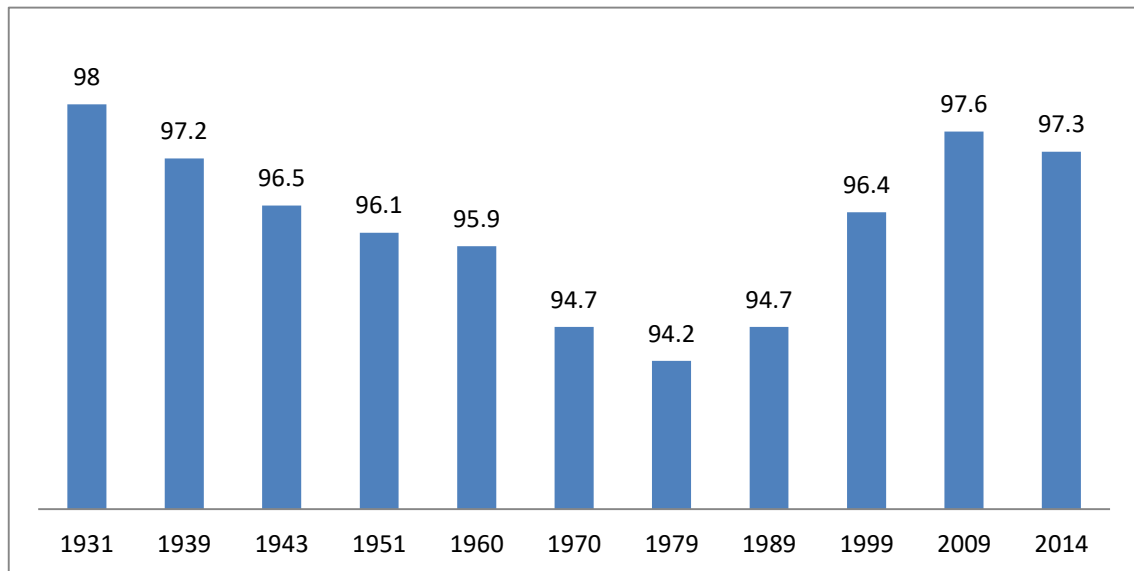
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[4] Tổng cục Thống kê (1991).

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Figure 3.8. Sex ratio of selected countries, 2015
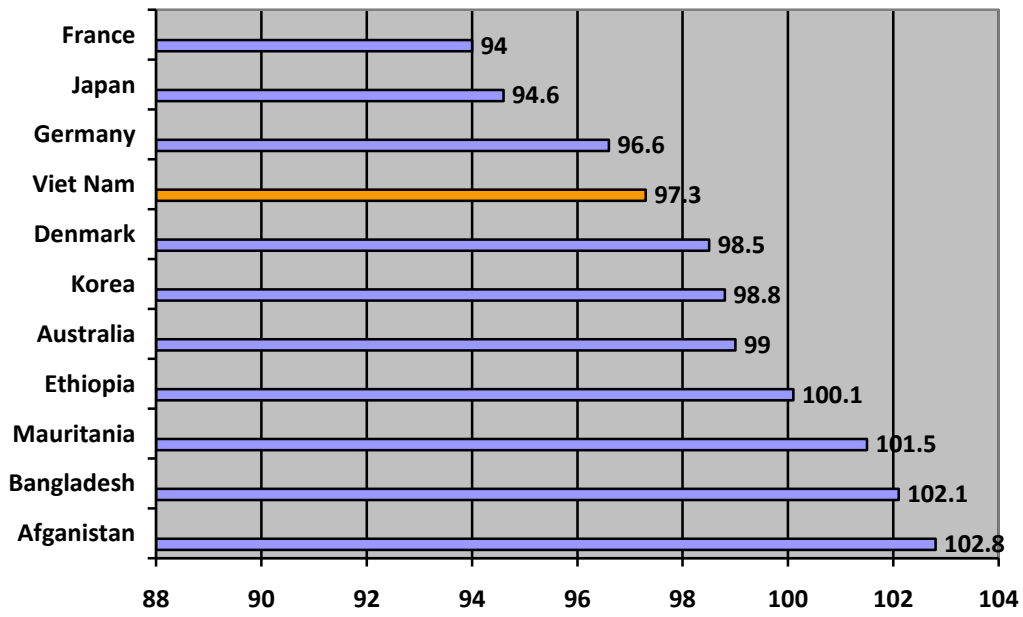
Figure 3.9. Sex ratio of population of Viet Nam, 1931-2014

3.2.2 Sex ratio by age

Due to biological laws, in all countries of the world the SRB is greater than 100; in other words, the number of boys born is greater than the number of girls born. However, because the mortality of boys tends to be higher than for girls, the sex ratio is reduced over time.

Table 3.5. Sex ratio by age, Vietnam, 1979-2014

Age group	1979	1989	1999	2009	2014
0-4	104.8	106.5	108.6	108.7	111.2
5-9	104.3	105.4	107.4	106.3	108.5
10-14	106.6	106.2	107.2	105.7	105.9
15-19	96.5	98.1	100.7	104.4	104.7
20-24	87.7	92.3	94.3	101.8	103.3
25-29	88.2	90.7	99.3	100.5	100.7
30-34	89.5	91.7	99	101.7	99.1
35-39	87.6	87.4	94.7	102	99.8
40-44	84.7	86.9	90.7	99	99.6
45-49	89.3	81.4	89.7	94.1	96.2
50-54	91.5	80.3	82.4	89.4	89.8
55-59	78	88.2	78.5	84.2	83.6
60-64	81.6	82.9	78.3	80.1	79.6
65-69	74.8	76.6	80.6	72.5	79.1
70-74	65.4	67.8	71.5	67.3	69.6
75-79	58.5	59.6	60.3	66.8	63.0
80+	45.8	46.9	48.3	49.9	52.1
Total	94.2	94.7	96.7	97.7	97.3

Figure 3.10 presents the sex ratio by age group from the 2009 census and the 2014 IPS. To evaluate data quality by age reported in these two surveys, it is possible to graph the sex ratio of the 2014 IPS according to the age cohort of the 2009 census (Figure 3.11). If the sex ratios from the two surveys are accurate, the curve plotted for 2014 will be slightly lower than the curve for 2009 due to differences in mortality by age between men and women in the period between the two surveys. The difference between the two curves allows assessment of the quality of each survey. Figure 3.11

shows that, in general, the curve of the sex ratio by age for 2014 is slightly below the curve for 2009.
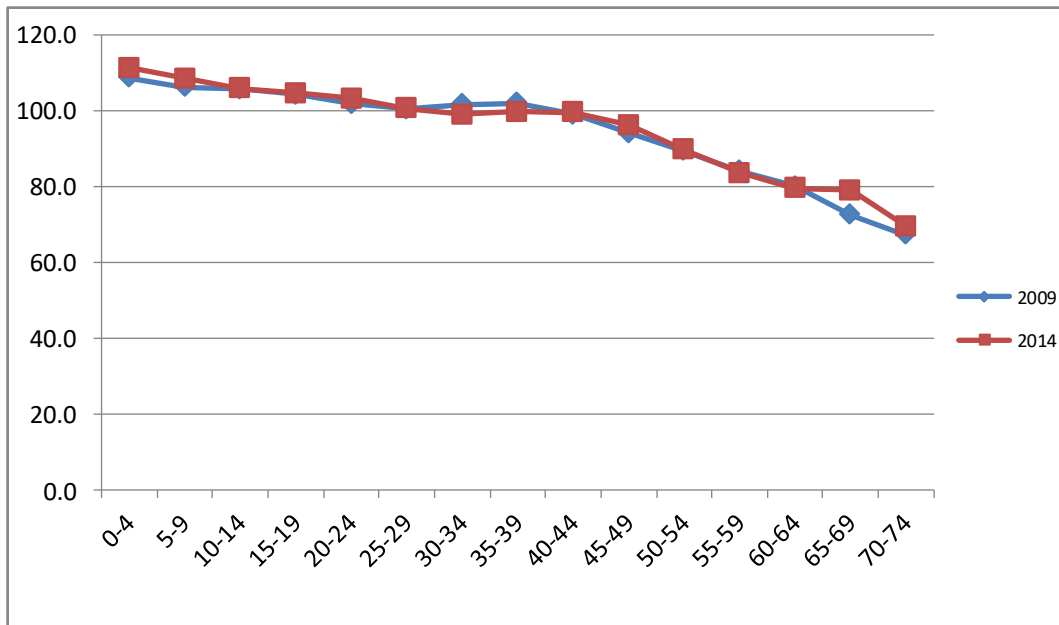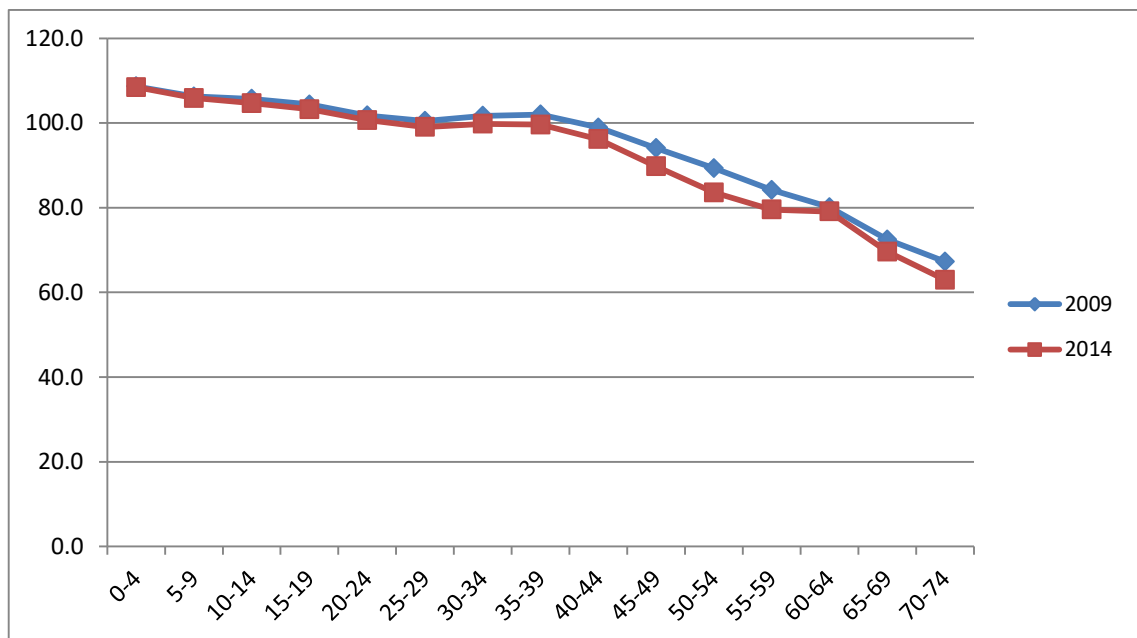
Figure 3.10. Sex ratio by age, Viet Nam, 2009-2014

Figure 3.11. Sex ratio by cohort, Viet Nam, 2009-2014

Age in 2009

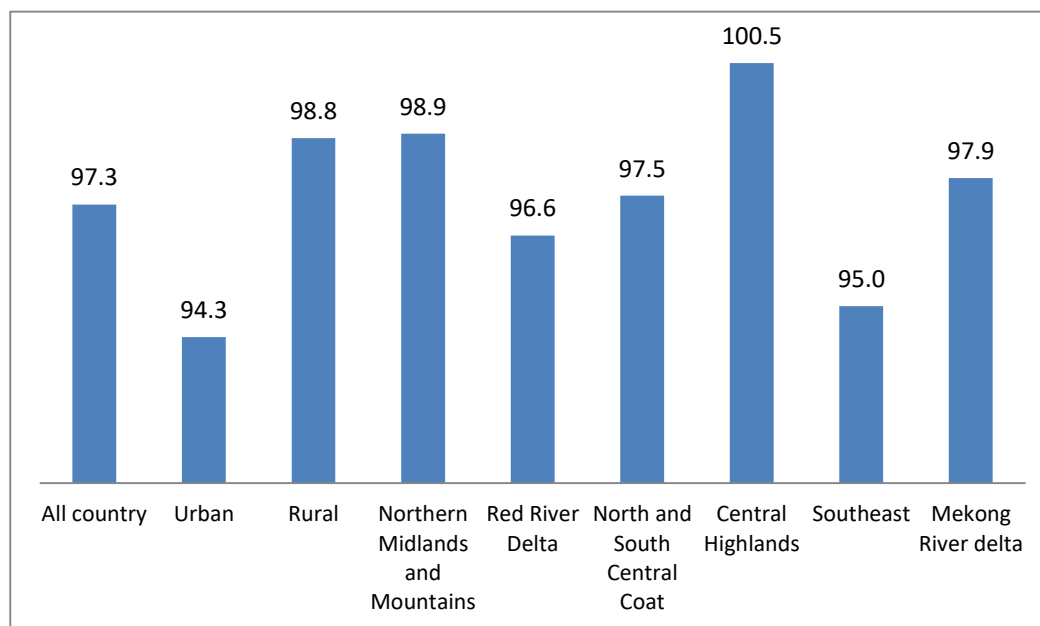### 3.2.3 Differences in the sex ratio between urban/rural areas and socio-economic regions

There are considerable differences in the sex ratio between urban and rural areas of Viet Nam. According to the results of the 2014 IPS, while the sex ratio in rural areas is 98.8%, this figure is 94.3% in urban areas. Migration and differences in life expectancy are the primary reasons for this difference in the sex ratio between the urban and rural populations. The more economically developed regions in Viet Nam, especially the large urban areas, are attractive to migrants. According to the 2004 Viet Nam Migration Survey, "Find a job to improve their lives is considered to be one of the main reasons of migration" (GSO, 2005).

Migration has a large impact on the difference in sex ratios among regions. The Southeast region had the lowest sex ratio in the country, at only 95 men per 100 women. Ho Chi Minh City, which accounts for 51% of the population of the Southeast region, had the lowest sex ratio of country. The Red River Delta had the second lowest sex ratio at 96.6 males per 100 females.

The region with the highest sex ratio in the country was the Central Highlands with 100.5 males per 100 females. This region has always had a sex ratio greater than 100. The region with the second highest sex ratio is the Northern Midlands and Mountains with a sex ratio in 2014 of approximately 99 men per 100 women.

Thus, the two most economically developed regions in country have the lowest sex ratios, and vice versa. The North and South Central Coast and the Mekong River Delta regions had sex ratios equal to 97.5 and 97.9, respectively.

Figure 3.12. Sex ratio by urban/rural areas and socio-economic regions, Viet Nam, 2014

3.2.4. Differences in the sex ratio between provinces

Figure 3.13 illustrates the differences in the sex ratio among 63 provinces and cities in 2014. Provinces in the Central Highlands and most provinces in the Northern Mountainous region had a high sex ratio, while most provinces in the Southeast and Red River Delta had a low sex ratio. Differences in migration, life expectancy and sex selection at birth are the primary causes of these sex ratio differences among socio-economic regions. The Red River Delta had a very high sex ratio among children, implying sex selection is more common.

Quang Ninh province had a high sex ratio as well, perhaps due to the large mining industry. Miners are mainly male migrants from the neighboring provinces of Hai Duong, Hung Yen, Thai Binh, Nam Dinh, while most of their wives and children live in their home provinces.

Figure 3.13. Sex ratio by province, Viet Nam, 2014

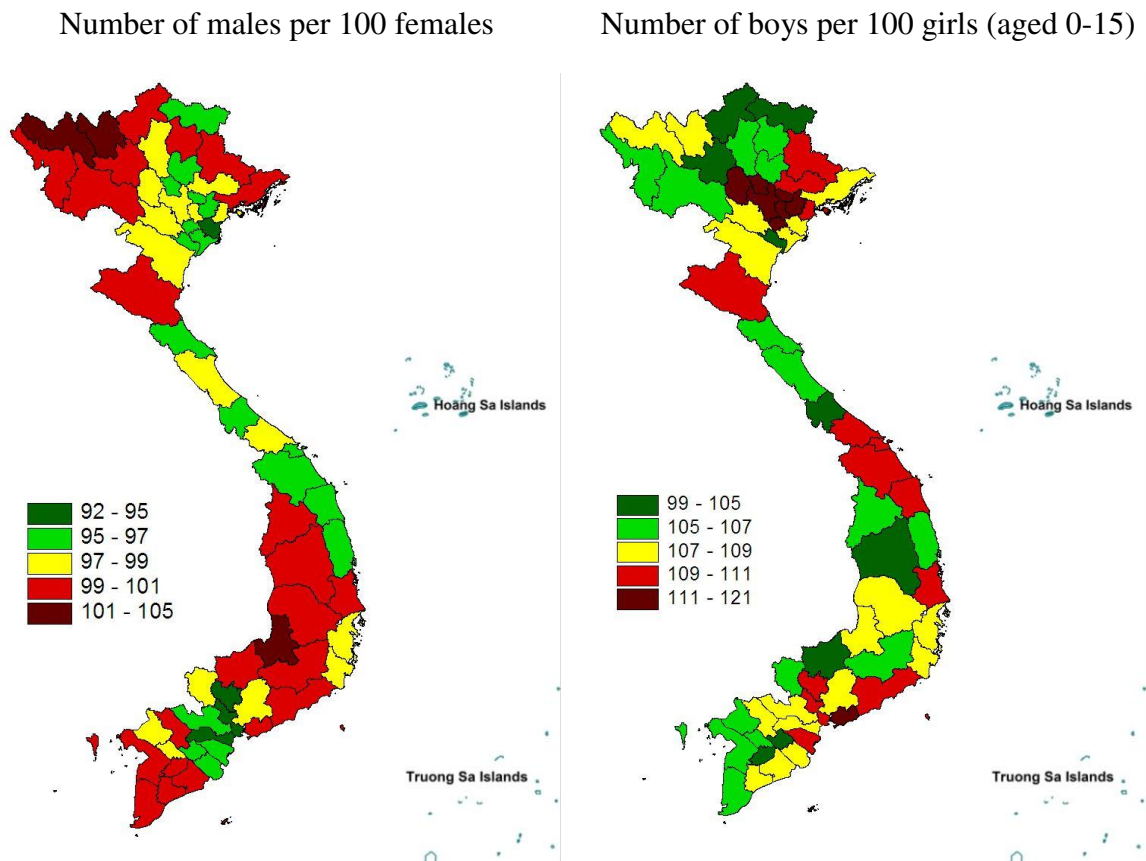Number of males per 100 females   Number of boys per 100 girls (aged 0-15)

Figure 3.14 shows that provinces with a low sex ratio are the provinces with a higher per capita income and vice versa. However, the sex ratio among children is higher in high-income provinces. This indicates that sex selection of children is more likely to occur in provinces with higher incomes. People in these provinces have better economic conditions and access to health facilities that are able to perform the selection of the sex of the fetus. Adults in these higher-income provinces also tend to have fewer children and prefer to have a son for any birth.

Figure 3.14. Sex ratio of provinces and per capita income, 2012

Overall sex ratio and per capita income | Sex ratio of children and per capita income
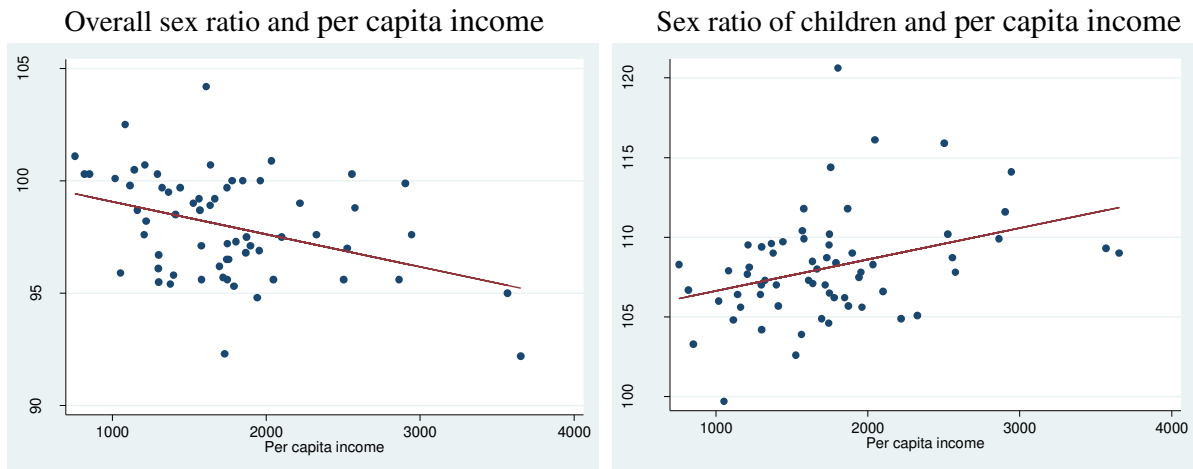
Source: Per capita income is estimated from the Viet Nam Household Living Standards Survey 2012
(Tổng cục Thống kê, 2014b)[5]

3.2.5. Differences in the sex ratio between ethnic groups

Like the sex ratio of the whole country, the sex ratio of each ethnic group depends on the sex ratio at birth and differences in mortality by sex. Figure 3.15 presents the sex ratios of ethnic groups with over 1 million people. It shows that the Khmer group had the lowest sex ratio at 96.1 males per 100 females. The second lowest is the Kinh with 96.7 males per 100 females. The Nung, Muong and Mong ethnic groups had sex ratios over 100 (101.9%, 101.8% and 101.1%, respectively). Thus, the difference in the sex ratio between the Nung, with the highest sex ratio (101.92), and the ethnic Khmer, with the lowest sex ratio (96.1), was 5.8 percentage points.

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[5] Data per capita income in 2014 (calculated from the Viet Nam Household Living Standards Survey 2014) has not been released.

Figure 3.15. Sex ratio of ethnic groups with a population of one million and over,
Viet Nam, 2014
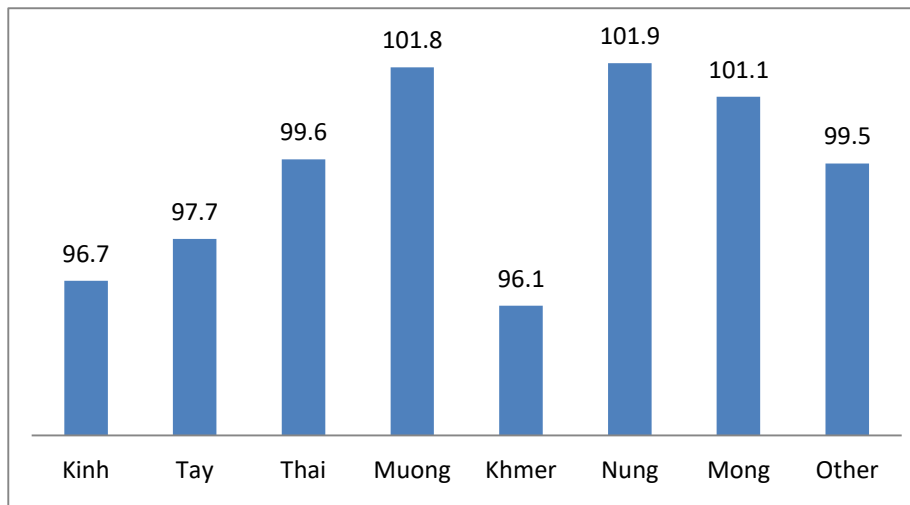
3.3 Dependency ratio

3.3.1. The dependency ratio in Viet Nam

Due to rapid fertility decline, especially in the period 1979-1999, the proportion of children aged 0-14 years in Viet Nam has decreased significantly over time − from 42.6% in 1979 to 39.2% in 1989, 33.1% in 1999, 24.5% in 2009 and to only 23.5% in 2014. Within only 10 years, from 1999 to 2009, the number of children aged 0-14 decreased by nearly 4 million, from 25.3 million in 1999 to 21.0 million in 2009. Meanwhile, the proportion of the population of labor force age increased dramatically, from 52.7% in 1979 to 69.1% in 2009. Over the past 15 years (1999-2014), the number of people aged 15-64 rose by 16.1 million, from 46.7 million in 1999 to 62.8 million in 2014. The proportion of the population aged 65 years and older increased, but not significantly; after 35 years, the proportion of people aged 65 years and older increased by 2.3 percentage points, from 4.8% in 1979 to 7.1% in 2009. Because the proportion of children dropped sharply, the young dependency ratio also decreased rapidly, from

80.8% in 1979 to 69.8% in 1989, 54.2% in 1999, 35.4% in 2009 and to only 33.8% in 2014. Thus, over three and a half decades, the proportion of dependent children fell by 2.4 times.

Table 3.6. Proportion of population by age group and dependency ratio,

Viet Nam, 1979-2014

	1979	1989	1999	2009	2014
Proportion of population					
0-14	42.6	39.2	33.1	24.5	23.5
15-64	52.7	56.1	61.1	69.1	69.4
65 and over	4.8	4.7	5.8	6.4	7.1
Dependency ratio					
Child dependency ratio	80.8	69.8	54.2	35.4	33.8
Elderly dependency ratio	9.1	8.4	9.4	9.3	10.2
Total dependency ratio	89.9	78.2	63.6	44.7	44.0

The proportion of the population aged 65 and older and the proportion of the population aged 15-64 have increased at an equal rate. As a result, the elderly dependency ratio has remained almost unchanged at around 9%. Because the child dependency ratio has dropped, the total dependency ratio has declined rapidly, but at a slower rate. Table 3.6 shows that in 1979 there was one working-age person for each dependent person. However, in 2014 there were 2.3 working-age people per dependent person. Thus, the total dependency ratio of the population in Viet Nam has decreased more than twice in the past 30 years. As a country's total dependency ratio reaches 50 (i.e., two people aged 15-64 per dependent person), the population is said to enter a period of the "golden population structure". Viet Nam is now in the period of the "golden population structure".

Figure 3.15 shows the child dependency ratio, elderly dependency ratio and total dependency ratios in 2015 for ASEAN countries calculated on the basis of the population aged 15-64. Viet Nam's total dependency ratio in is the fourth lowest in Southeast Asia. It is higher than only Singapore, Thailand, Brunei and Myanmar. Among 10 countries in the ASEAN region, six had a golden population structure. Only the populations of Malaysia, Cambodia, Philippines and Laos have not reached the golden population structure period.

Figure 3.16. Dependency ratio of ASEAN countries, 2015
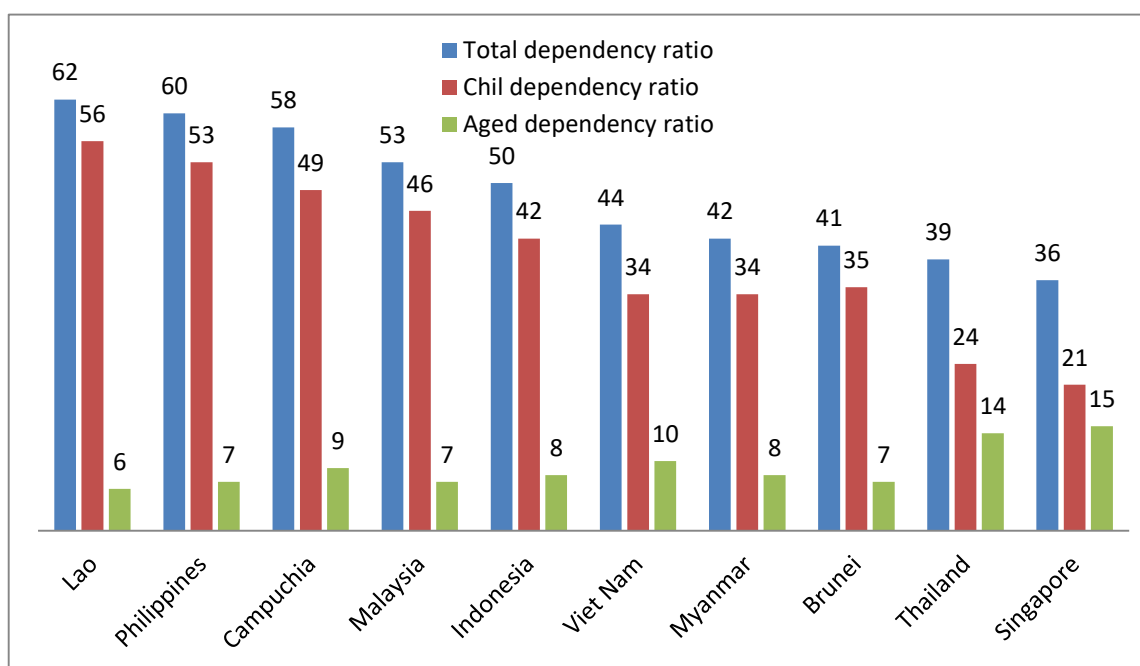
Source: United Nations, Population Division. World Population Prospects: The 2015 Revision. Population Database.

3.3.2. *Dependency ratio by socio-economic region and province*

Since the dependency ratio is calculated on the basis of the age structure of the population, the dependency ratio of a socio-economic region depends not only on fertility and mortality but also on migration between regions. Since the migration rate is

higher for a population aged 15-64, areas with a large flow of out-migration will have a higher child dependency ratio and vice versa.

Table 3.7. Dependency ratio by socio-economic regions, Viet Nam, 2014

Region	Total dependency ratio	Child dependency ratio	Elderly dependency ratio
All country	44.0	33.8	10.2
Northern Midlands and Mountains	48.5	39.3	9.2
Red River Delta	46.1	33.1	13
North and South Central Coast	46.4	34.4	12
Central Highlands	50.6	43.7	6.9
Southeast	36.1	29.0	7.1
Mekong River Delta	41.7	32.0	9.7

Among the six socio-economic regions, four – the Southeast, Red River Delta, Mekong River Delta and the North and South Central Coast – had a child dependency ratio between 29% and 34% (see Table 3.7). In addition to low birth rates, ranging from 1.6 to 2.0 children for the last 15 years, the Southeast region also had a low child dependency ratio due to in-migration: in-migration of young people increased the proportion of people aged 15-64 and decreased the proportion of children.

The Central Highlands and Southeast regions had the lowest elderly dependency ratios, with respective figures of 6.9% and 7.1%, while the Red River Delta and North and South Central Coast had the highest age dependency ratios at 13% and 12%, respectively. The Central Highlands's elderly dependency ratio was low due to the highest mortality rate among the regions and low life expectancy. In contrast, the elderly dependency ratio in the Southeast was low due to the in-migration of young people. The Red River Delta and the North and South Central Coast had high elderly dependency ratios because of high out-migration rates.

In the 2009 census, the Northern Midlands and Mountains, Red River Delta, Southeast and Mekong River Delta regions all had total dependency ratios under 50%; that is, they had the "golden population structure" period. In the 2014 IPS, only the Central Highland had a total dependency ratio slightly higher than 50, at 50.4%.

3.3.3. *Dependency ratio by province*

Due to large differences in fertility, mortality and net migration rates among provinces and cities, the dependency ratio of the Viet Nam's provinces and cities are also very different. Figure 3.16 compares 10 provinces with the lowest child dependency ratios and 10 provinces with the highest child dependency ratios. As explained above, the child dependency ratio depends on the birth rate and migration (out-migration or in-migration). Provinces with the lowest child dependency ratios are Binh Duong, Ho Chi Minh City, Hai Phong, Vinh Long and Can Tho. These provinces had low fertility and/or high immigration. However, provinces with a high child dependency ratio such as Lai Chau, Dien Bien, Kon Tum, Gia Lai and Dak Nong also had the highest birth rates in the country.

Figure 3.18 shows the elderly dependency ratios for the 10 provinces with the lowest values and the 10 provinces with the highest values. The five provinces with the lowest elderly dependency ratios were Binh Duong, Dak Nong and Binh Phuoc, Lai Chau and Kon Tum provinces. These provinces had either high mortality (Lai Chau and Kon Tum), high immigration (Binh Duong) or both (Binh Phuoc and Dak Nong). However, five provinces with a high elderly dependency ratio are Ha Tinh, Thai Binh, Ha Nam, Quang Nam, and Quang Tri. These provinces had the lowest mortality rate. and negative net migration rates.

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Figure 3.17. 10 provinces/cities with the highest child dependency ratios and 10 provinces/cities with the lowest child dependency ratios, Viet Nam, 2014
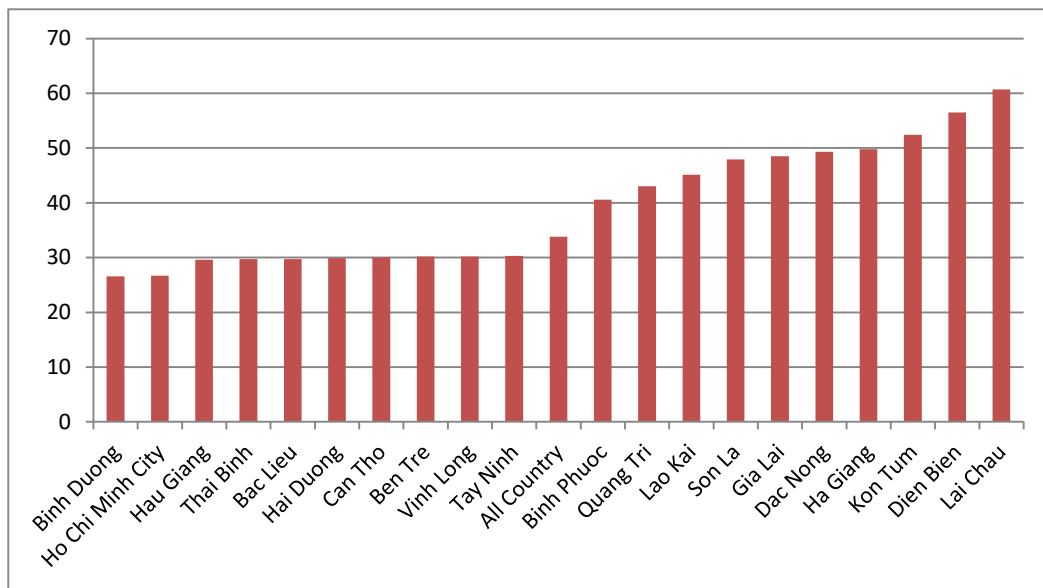

Figure 3.18. 10 provinces/cities with the highest elderly dependency ratios and 10 provinces/cities with the lowest elderly dependency ratios, Viet Nam, 2014
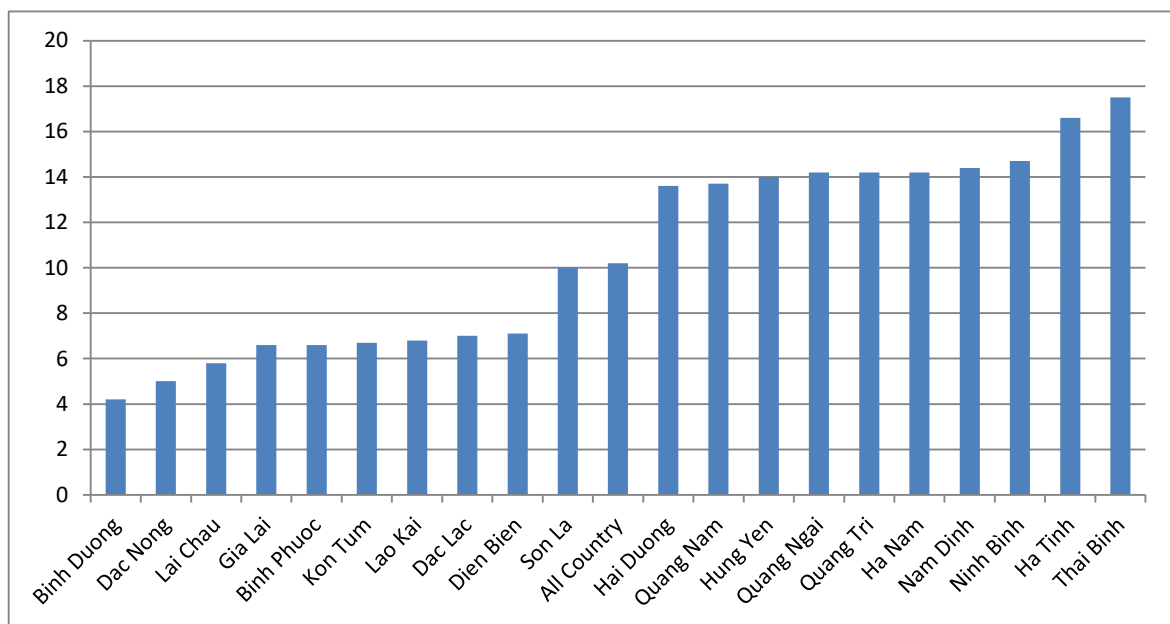

Figure 3.19 compares the 10 provinces/cities with the lowest total dependency ratios with 10 provinces with the highest total dependency ratios. Obviously,

dependency ratios are impacted by all the components of population change (birth, death, in-migration and out-migration). Provinces with lower a total dependency ratio tend to have at least one of the following elements: low fertility (small number of children), low life expectancy (low number of old people) or high level of positive net migration (the number of people of working age is higher), or a combination of two or more of these factors.

Figure 3.19. 10 provinces/cities with the highest total dependency ratios and 10 provinces/cities with the lowest total dependency ratios, Viet Nam, 2014
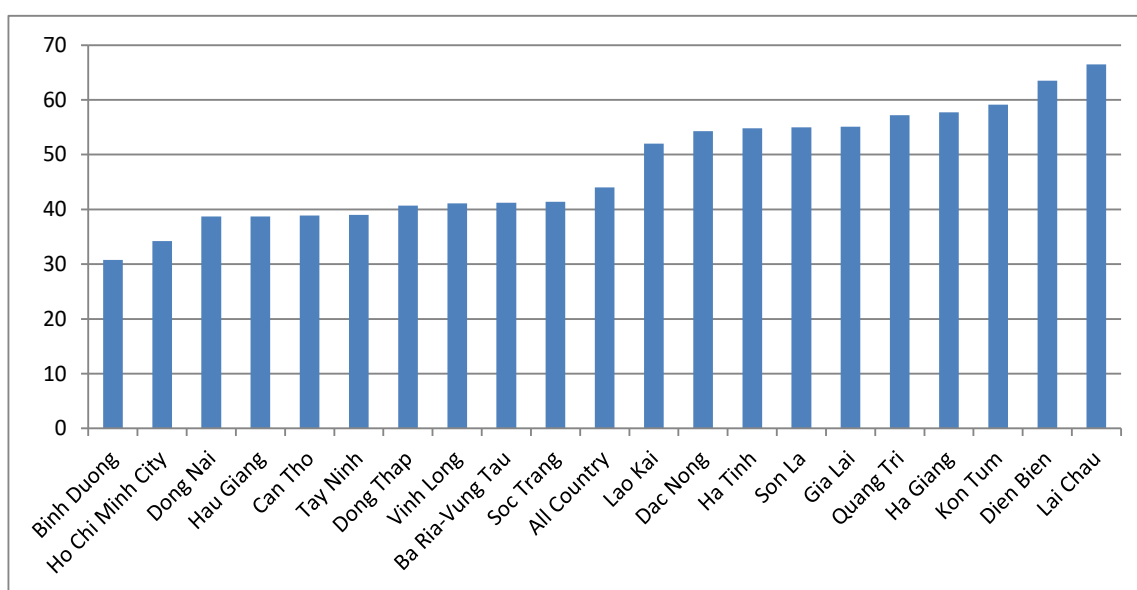
Among the 10 provinces and cities with lower total dependency ratios, Binh Duong, Ho Chi Minh City, Can Tho, Vinh Long and Hai Phong had both a low birth ratio and the highest positive net migration rates in the country. Lai Chau, Dien Bien, Kon Tum and Gia Lai, which had the highest total dependency ratios in the country, also had the highest fertility rates. The TFR in 2014 of these provinces was 3.20, 3.11, 3.04 and 2.27 children per woman, respectively. Quang Tri Province had the fifth highest dependency ratio in the country. It had the highest fertility rate in the North and

South Central Coast region, at 2.75 children per woman, as well as a low mortality rate of 7.74 per thousand and a negative net migration rate of -19.4 percent.

As of April 1 2014, 52 out of 63 provinces and cities nationwide with a total dependency ratio below 50%, i.e. they had reached the golden population structure. This was an increase of nine provinces compared with 2009. Among the 11 provinces that had not reached the golden population structure, six were located in the Northern Midlands and Mountains region, two in the North and South Central Coast (Ha Tinh and Quang Tri), and three in the Central Highlands (Kon Tum, Gia Lai and Dak Nong). Lai Chau had the highest total dependency ratio at 66.5%, meaning there were 1.5 people of working age to support each dependent person.

3.3.4. Dependency ratio by ethnic group

Differences in the age structure of ethnic groups affect their dependency ratios. Table 3.8 shows that there are significant differences in the child dependency ratio among Viet Nam's ethnic groups.

Table 3.8. Dependency ratio of ethnic groups, Viet Nam, 2014

	Total dependency ratio	Child dependency ratio	Elderly dependency ratio
Kinh	43.9	33.2	10.7
Tay	43.2	34.8	8.4
Thái	49.5	42.4	7.2
Muong	45.3	37.3	8.0
Khmer	46.0	36.9	9.2
Nung	46.8	38.1	8.6
Mong	85.6	79.7	5.9
Others	55.8	47.8	7.9

The Mong had the highest child dependency ratio at 79.7%. The set of "other ethnic groups" had the second highest child dependency ratio at 47.8%, while the Thai

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ranked third at 42.4%. Clearly high fertility, especially among the Mong, was the main reason leading to this phenomenon.

The Kinh had the lowest child dependency ratio at 33.3%, while the Tay ranked second at 34.8%. The three remaining ethnic groups with low child dependency ratios were the Khmer, Muong and Nung with ratios ranging from 37-38%. These groups had relatively low birth rates.

Table 3.8 also shows that there are differences in the elderly dependency ratio among ethnic groups with over one million people and the other ethnic groups with populations of less than one million. The Kinh had the highest elderly dependency ratio at 10.7%, and the Khmer had a slightly lower ratio of 9.2%. The Hmong had the lowest elderly dependency ratio, only 5.9% or half that of the Kinh. The Thai had the second lowest elderly dependency ratio, at 7.2%.

It is evident that the dependency ratio depends mainly on the child dependency ratio, because the value of the child dependency ratio is around three times higher than the elderly dependency ratio. Therefore, the Mong and the other ethnic groups had the highest total dependency ratios at 85.6% and 55.8%, respectively. Meanwhile, the Tay and Kinh had the lowest total dependency ratios at 43.2% and 43.9%, respectively. The remaining ethnic groups had total dependency ratios ranging from 45.3% (the Nung) to 49.5% (the Thai). Thus, among the eight ethnic groups with populations above one million, only the Mong and other ethnic groups have not entered the "golden population structure" period.

3.4. Prospects for the age-sex structure of the population of Vietnam

It can be said that the population of Viet Nam has begun to enter the era of an aging population.[6] "Demographic change" or "demographic transition" are the terms used by demographers to describe mortality and birth rates falling from high mortality and fertility to low mortality and fertility. This can be clearly seen in the population pyramids from 1979 to 2009. In order to study the future prospects of the age-sex structure of Viet Nam's population, the UN's forecasts from the "World Population Prospects" publication are useful. However, because the UN used data from the 1999 census for the population projections of Viet Nam, the projections do not match the actual population of the country. Even in the latest version (2008), the difference between the figures forecast by the UN and the population estimate from the 2009 census is 2.2 million people.

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[6] UNFPA (2009). Dân số và phát triển tại Việt Nam. Hướng tới một chiến lược mới 2011-2020. Hà Nội, Tháng 12 – 2009, trang 16.

Figure 3.20. Population pyramid of Vietnam in 1979, 2014, 2024 and 2034
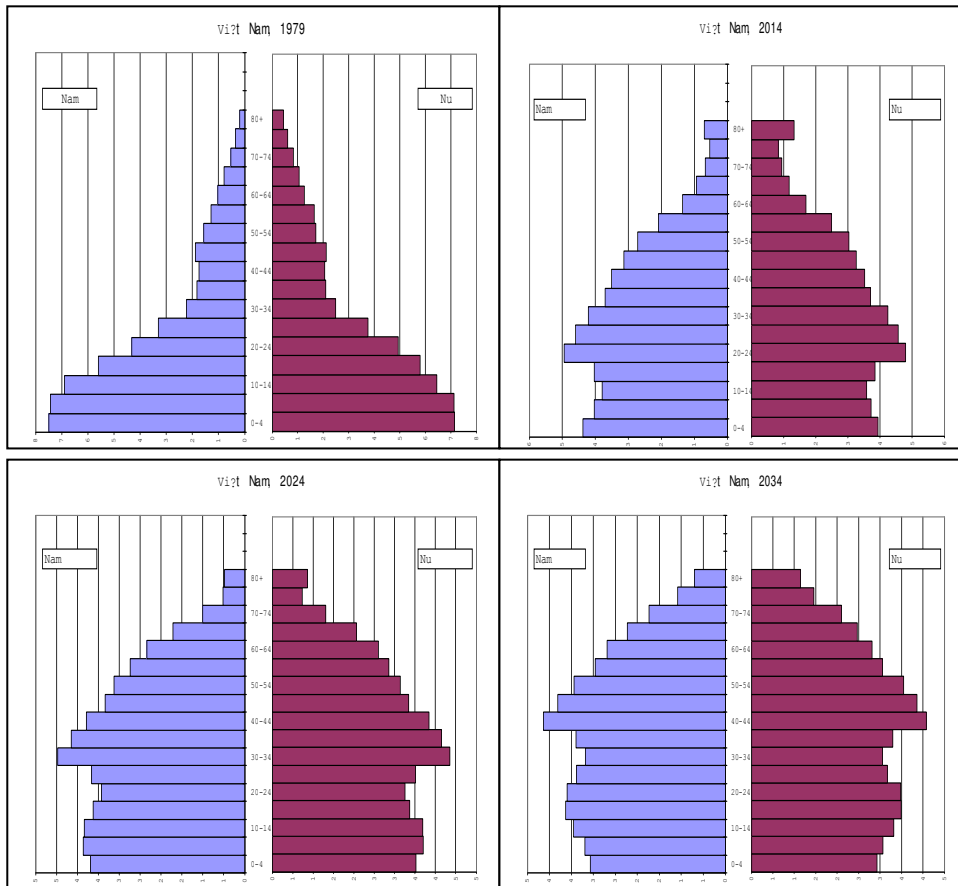
To project the age-sex structure of the population of Viet Nam, this monograph uses the results of population projections conducted by the GSO and published in *Viet Nam Population Projections 2009-2049*, Ministry of Planning and Investment, General Statistic Office, Hanoi, February 2011. Figure 3.21 shows the population pyramid of Viet Nam's population in 1979 and 2014, as well as projections for 2024 and 2034.

According to forecasts, the sex ratio of Vietnam will continue to grow and reach its highest level in about a decade (2024) at 98.9 males per 100 females. Then the sex ratio will decrease, but not significantly (see Figure 3.21).

Figure 3.21. Projected sex ratio of Viet Nam's population
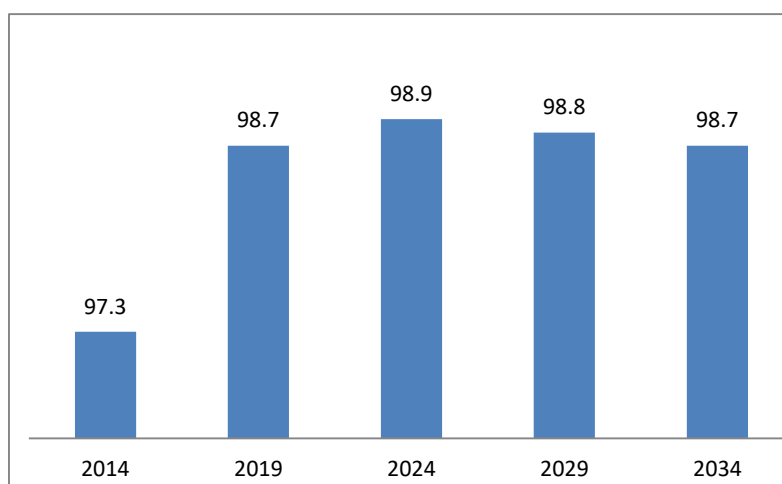
It is estimated that the total dependency ratio of the population of Viet Nam will reach its lowest level, at 42.9%, in 2019. After that, the total dependency ratio will start to rise and reach 51.2% in 2044. Thus, Viet Nam's population will end the period of the "golden population structure" in late 2040 (see Figure 3.23).

Table 3.9. Dependency ratio, Vietnam, 2019-2044

	2019	2024	2029	2034	2039	2044
Child dependency ratio	33.0	32.3	30.2	28.0	26.7	26.7
Elderly dependency ratio	9.9	12.6	15.9	19.0	21.9	24.6
Total dependency ratio	42.9	44.8	46.1	46.9	48.6	51.2

Figure 3.22. Total dependency ratio, Vietnam, 1979-2044
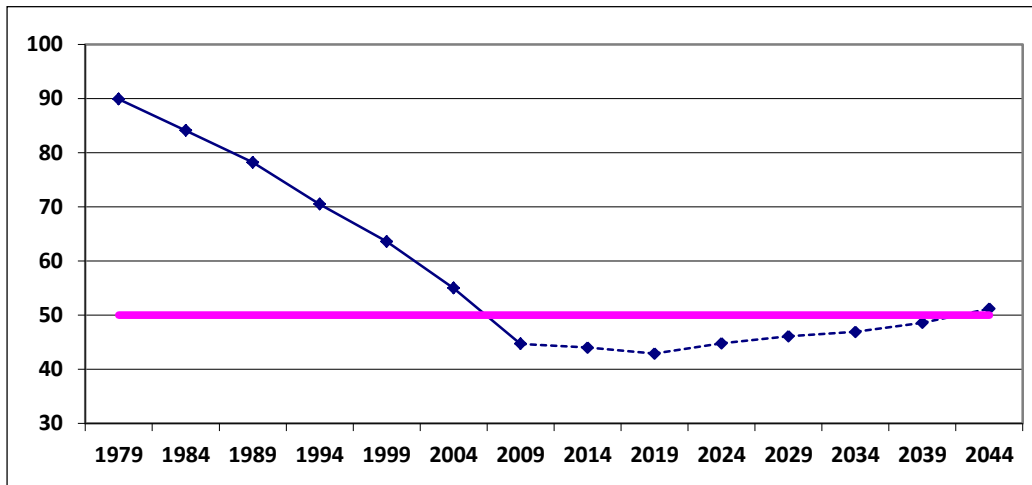
In the coming years, the life expectancy of Viet Nam's population will continue to increase while the total fertility rate will continue to decline or remain low. These trends will make Viet Nam's population older in the future. Currently, the population aging ratio, calculated based on the group of elder people aged 60 years and above, is 43.3%, meaning that for every 100 children under age 15 there are 43.3 people aged 60 and older. It is estimated that in 2024, this ratio will be 61.1%, and in another decade (2034), this ratio will be 96.7%, meaning that for every one child there is nearly one elderly person. In the late 40s of the twenty-first century (around 2047), in the population of Viet Nam, there will be more elderly people (aged 60 and older) than children.

Figure 3.23. Projected aging index of population in Viet Nam, 2014-2034
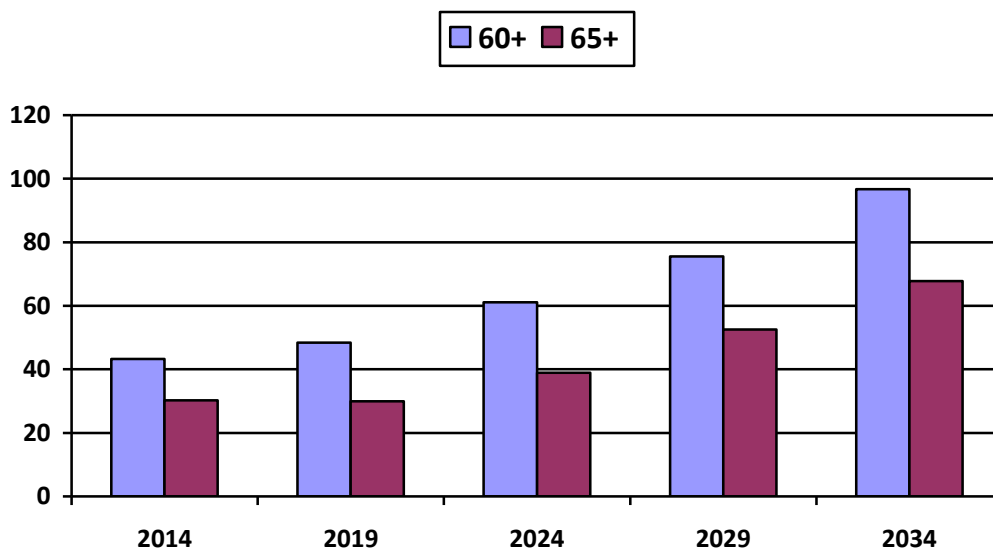
4. CONCLUSION

The age-sex structure of Vietnam has changed remarkably during the past three decades, particularly over the last 10 years. Therefore, national and local economic development policies should take into account these demographic changes in order to cope with them and take advantage of the opportunities they present. Economic policies should be more focused on assisting people in areas with a high young population structure and/or a high dependency ratio, in particular provinces and groups in the Central Highlands and Northern Midland and Mountains regions.

In 2014 there were 24 provinces and cities with a very high sex ratio of children aged 0-4, above 110%. In addition to communication campaigns about the negative effects of sex selection, such as the resulting surplus of men and social security problems, there should be stronger sanctions that aim to eliminate the disclosure of fetus gender and sex selection methods.

The fertility rate in the last 15 years in most provinces was low and stable. The proportion of children at kindergarten and primary schools age did not increase significantly. However when conducting planning related to preschool and elementary schooling, local authorities should pay attention to the number of migrants, especially young women who are often accompanied by children or who will have children, in order to avoid a shortage of schools and teachers.

Viet Nam is in the stage of demographic opportunity dubbed the 'golden population structure'. From a demographic perspective, this opportunity will last approximately 25 years. Therefore, in the current context of low labor productivity, improving the quality of the young workforce is of utmost urgency. The government should have policies and vocational training programs to meet the needs of the labor market, enhance the skills of workers, and contribute to improved labor productivity. Enhancing investment in improving the quality of reproductive health services for young people is also essential.

In addition, because there are differences in the age-sex structure of populations living in rural and urban areas and in different economic/geographic areas, and differences in the age-sex structure of ethnic groups, population policies must be designed according to the features of each population group.

References

Bloom, D., Canning, D., and Fink, G. (2011), Implications of Population Aging for Economic Growth, NBER Working Paper No. 16705.

Deaton, A. (2005), "Franco Modigliani and the Life Cycle Theory of Consumption", Research Program in Development Studies and Center for Health and Wellbeing, Princeton University.

Deaton, A. (1986), "Life-Cycle Models of Consumption: Is the Evidence Consistent with the Theory?", NBER Working Papers 1910, National Bureau of Economic Research, Inc.

Iwunor, C. (1993), Techniques for Integrated Projections. United Nations Development Programme, NIR/91/001 – Population and Development.

UNFPA (2009). Dân số và phát triển tại Viet Nam. Hướng tới một chiến lược mới 2011-2020. Hà Nội, 12 – 2009.