4

SOURCES OF DEMOGRAPHIC DATA AND DATABASE FOR PROJECTION

4.1 Introduction

Three sources of data are generally used to estimate demographic parameters. These are national census, sample survey, and registration. These systems are basically different from but complementary to one another. Each is best suited to satisfy the need for data on specific types or aspects of population phenomena. Evidence from previous chapters on population dynamics and population projection in Indonesia demonstrated that the national population census was utilized as the main data source for estimating demographic indicators, i.e. population size, total fertility rates, infant mortality rates and number of migrants. Several large and small sample surveys have also been used. Another data source, such as the registration system, is rarely used due mainly to its unreliability.

Officially, the first attempt to collect demographic data in Indonesia was made in the early 19th century. It was the period of the British Interim government (1811-1816), when the Lieutenant Governor, Sir Thomas Stamford Raffles introduced the '*land rent*' registration system, in which population data were collected (Nitisastro, 1970). The information collected, however, covered only small parts of Java and was partly collected from non-official documents (i.e. reports from the head of village or guesswork).

The importance of having good data on population became apparent at the beginning of the 20th century. Two population censuses were conducted in 1920 and 1930, which provided information on the population of Java and other Indonesian islands as well. After Indonesia became independent in 1945, the government of Indonesia conducted the first modern population census in 1961. Since then, the population census has been carried out regularly every ten years. The censuses in the earlier periods (i.e. 1920 and 1930) yielded little more than population totals and some basic information such as current residence, citizenship and literacy. More basic information was recorded in the 1961 census. Since 1971, censuses have procured some other demographic information (e.g. number of children ever born and who survived, and place of residence 5 years ago) which allowed standard fertility, (child) mortality, and migration estimation techniques to be applied. Hence, it is not surprising that population census data are employed as the main data sources for demographic analysis in Indonesia.

Apart from flaws such as underenumeration and inaccurate answers, the census does not provide data on a number of essential characteristics of the population. For instance, they do not provide data on the number and timing of pregnancies or information on adult mortality. Therefore, other demographic data such as surveys and registration systems have been utilized. However, as in many developing countries, Indonesian registration data are still deficient and seldom used as main data sources to measure demographic parameters. All of these data sources, however, have contributed to increased availability of population information in Indonesia.

This chapter focuses on the link between understanding and utilizing available demographic data sources in Indonesia to estimate demographic parameters. It starts by exploring Indonesian demographic data sources on population censuses in section 4.2, large and small sample surveys in section 4.3, and registration data in section 4.4. It contributes to the identification of research needs in input data for population projections in section 4.5, which relates to the next chapter on demographic measurements for projection purposes. Lastly, section 4.6 concludes this chapter.

4.2 Population Census

The most recent population census, which was carried out in 2000, is the 7th regular population census in Indonesia or the 5th modern census. The first and second population censuses were conducted in 1920 and 1930 when the country was ruled by the Dutch colonial government. Thereafter, it was planned that censuses would be conducted regularly every ten years. The third census, however, which actually should have been done in 1940, had to be cancelled because all efforts and financial resources were to be utilized for the liberation war of the Netherlands against the occupying German forces. On August 17, 1945, the Republic of Indonesia was proclaimed. Socio-economic and political conditions were still unstable after several years of independence. All activities were concentrated on efforts to restore those conditions. Again, for a period of time the regular census, which should have been carried out in 1950 and 1960, had to be postponed.

In 1961, sixteen years after the proclamation of independence, the first modern population census was conducted by the government of Indonesia. Government Regulation (Act no. 6/1960 and Act no. 7/1960) states that Indonesian population census is to be conducted every ten years. Further census dates are 1971, 1980, 1990 and 2000. Since 1980, the population census has been carried out in the year ending with "0", to make it consistent with the international practice. Over time, the population censuses have been improving its enumeration methods and processes, and variables covered as well. This subsection intends to discuss these two issues, i.e. enumeration system and variables covered, in Indonesian population census.

4.2.1 Population Enumeration

In general, population census employs two stages in its operations, namely *complete* and *sample* enumeration. In complete enumeration, basic information (such as name, age, sex, and place of residence) is collected. While, in sample enumeration more detailed information (such as fertility, mortality, migration, and family characteristics) is collected. In order to record everyone in the enumeration, Indonesian census has applied both the *de jure* and *de facto* system of recording. The *de jure* approach counts people in the usual place of residence (where they formally lived), while the *de facto* counts people where they are found at the time of census. Table 4.1 shows the region covered, along with their enumeration methods, in each of the population census that have been carried out in Indonesia. Every population census has a different definition on the population enumerated as the legal residents of a particular region (i.e. *de jure* and *de facto* systems).

The first population census was conducted in November 1920. It covered only small parts of Java and other islands. In Java, the census applied the *de jure* approach, and a compilation was made from the figures provided by the village heads. The population data of other islands were also recorded, but unlike Java, it was based on information supplied by the local heads of the administration and guesswork was involved (Nitisastro, 1970).

In October 1930, the second population census was conducted throughout the entire country. The census used two concepts of enumeration: *de jure* and *de facto*. Similar to the first census in 1920, the enumerated method applied in Java and the rest of country was different. In Java the census was conducted on a *de jure* basis and a category of persons "temporarily present" was defined and comprised those people enumerated at a particular place on the day of the census but who indicated that their usual place of residence was elsewhere. The *de facto* principle was adopted in the rest of Indonesia, presumably because of the difficulty of deciding whether the many contract workers such as those in Sumatra were "temporarily present" or permanent residents.

Instead of using the terms complete or sample enumeration, the second census applied *periodical* and *instantaneous* enumeration. Periodical enumeration comprised collecting base information that had been regularly collected in the previous census from the people. It was used for checking the available information from the previous census and bringing it up to date. Instantaneous enumeration collected new information that had not been collected before. These two enumeration methods were applied in Java. In the rest of Indonesia, four different methods were employed. First, the periodical and instantaneous enumeration methods were carried out in a few areas, primarily in the cities. Second, only periodical enumeration was used in most of Sumatra and small parts of other islands. Third, a count by the head of village applied to large parts of Kalimantan and parts of other islands. The last method, the guess method, was applied in areas where none of the first three methods was possible (Nitisastro, 1970).

The third population census was carried out across the country in October 1961. However, in a few areas with security problems (e.g. in South Sulawesi) the enumeration was conducted in December 1961. Irian Jaya and East Timor, which at that time were still occupied by the Dutch and the Portuguese forces, respectively, were not covered.[1] Later on, the total population in the official report included an estimate of Irian Jaya's population at about 758,000.

The 1961 census employed a combination of *de jure* and *de facto* approaches to enumerate the population. Temporary persons who were located at their place of work on the night of census and had been away from home for less than 3 months were enumerated as population belonging to their place of origin (Ueda, 1964). Due to various reasons, partly economic and political, not all the tabulations planned in the 1961 census were actually produced (Cho et al., 1980; Hugo, 1982b). Data processing was only completed in three provinces (Jakarta, Yogyakarta, and East Java), and data for the rest of Indonesia had to be drawn from a preliminary 1-percent sample tabulation of the census returns. Hence, complementary to the census, a post-enumeration survey was conducted in the same year and some demographic surveys were carried out in each of the subsequent three years. Two rounds of the national social and economic surveys (*SUSENAS*), which will be further discussed in section 4.3.2, were carried out. The first survey in 1963 was limited to Java, and the second survey in 1964/1965 covered the whole territory of Indonesia. The 1961 census and those post-enumeration surveys were a very valuable guide for the planner of the 1971 census and many aspects were improved for the 1971 census. This improvement was valuable in the data processing stage as a result of more advanced computer technology.

The fourth population census was carried out in 1971 and covered the whole territory of Indonesia excluding rural areas in Irian Jaya and East Timor[2]. The complete enumeration, in which information on age was coded in broad age groups (i.e. 0-4, 5-14, 15-24, and 25+), was carried out in September 1971. Sample enumeration, which collected more detailed information on the characteristics of individuals and households, was conducted in late September and early October 1971. It was collected from 3.8 percent of the total number of households (Suharto and Abdulmadjid, 1973; Cho et al., 1980). Since then, sample enumeration was conducted independently of complete enumeration, so that the sample enumeration could be used as the post-enumeration check of the complete census. The 1971 census enumeration like that of the 1961 census was conducted on the basis of *de jure* and *de facto* but employed a 6-month instead of 3-month absence criteria. For persons having no permanent residence such as homeless persons, crews of Indonesian ships sailing in Indonesian waters and those living in mobile or floating houses, the *de facto* method was used.

In 1976, East Timor was annexed to Indonesian territory. Furthermore, accessibility on rural Irian Jaya had improved. Since then, the fifth and sixth

[1] Irian Jaya (former Dutch New Guinea) was not transferred to Indonesia in 1949, which gave rise to a political conflict (*Konfrontasi*). It was only settled in 1962.
[2] In 1971, East Timor ws not yet part of Indonesia.

population censuses in 1980 and 1990, conducted in September through early October, covered East Timor and rural Irian Jaya. The recent census in 2000, however, covered only 26 provinces. A referendum in East Timor in August 1998 resulted in independence for East Timor. Therefore, the seventh population census, which was conducted in June 2000, had to exclude East Timor from the enumeration.

Table 4.1. Population censuses in Indonesia by region covered and enumeration methods, 1920-2000

No.	*Month/Year*	*Region Covered*	*Enumeration Method*
1.	November 1920	A few parts in Java and the rest of Indonesia	*De jure*, head of village report
2.	October 1930	Indonesia, excluding Irian Jaya & East Timor	*De jure* for Java & *De facto* for rest of Indonesia
3.	October 1961	Indonesia, excluding Irian Jaya & East Timor	*De jure/de facto* 3-month absence criteria
4.	Sept.-Oct. 1971	Indonesia, excluding rural Irian Jaya & East Timor	*De jure/de facto* 6-month absence criteria sample enumeration: 3.8%
5.	Sept.-Oct. 1980	Entire Indonesia	*De jure/de facto* 6-month absence criteria sample enumeration: 5.8%
6.	Sept.-Oct. 1990	Entire Indonesia	*De jure/de facto* 6-month absence criteria sample enumeration: 5.8%
7.	June 2000	Indonesia, excluding East Timor	*De jure/de facto* 6-month absence criteria complete enumeration (sample enumeration: 100%)

Sources: Summarized from Nitisastro (1970), Suharto and Abdulmadjid (1973), Cho et al. (1980), Hugo (1982b), Mamas (1992) and ICBS (2000).

The last three population censuses in 1980, 1990 and 2000 utilize a similar *de jure/de facto* basis as the 1971 census enumeration. The population recorded concerned people who have stayed for six months or longer, and those who intended to stay even though their length of stay was less than six months. Short-term movers are enumerated at their usual place of residence and hence are not regarded as movers. The 1980 and 1990 population censuses had two rounds of enumeration, i.e. complete and sample enumeration. The sample enumeration increased from 3.8 percent in the 1971 census to 5.8 percent in the 1980 and 1990 censuses. Mamas (1992) mentioned that the main advantage of the 1990 census compared with previous censuses was in its data processing. It has changed from the system of centralization

to decentralization. This new system has solved many problems that usually appeared in the previous censuses, i.e. problems of transport of documents from small areas and the storage system in the central office.

The most recent population census in 2000 collected demographic information completely from whole enumeration (100 percent). Though the number of questions is much reduced, the full coverage may allow the estimation of demographic parameters at district level. At the time the census took place, however, accessibility in some regions (i.e. northern parts of Aceh, southern parts of Maluku, Jaya Wijaya in Irian Jaya, and other places where political and ethnical turbulence occurred) was not possible due to security reasons (ICBS, 2000). Therefore, sample enumeration was still applied in those areas and the size of population was estimated.

4.2.2 Variables Covered

It has been mentioned that in Indonesian population census there are two types of enumeration; complete and sample enumeration, except in the last census in 2000. Two types of questionnaire schedules are used: an individual schedule and a household schedule. Common information, i.e. name, sex, age, relationship to head of household, and marital status, is gathered through the individual questionnaire, which is usually collected in complete enumeration. More detailed information from a household and its members, i.e. name, sex, age, citizenship, religion, socioeconomic characteristics, number of children ever born from a woman, information on housing conditions, current and previous places of residence, are obtained from the household questionnaire, which is collected in sample enumeration. These variables are collected similarly in all population censuses, except in the earlier censuses in 1920 and 1930. Furthermore, the 2000 census used only complete enumeration, and some variables (i.e. household circumstances), which were covered in the previous censuses, are omitted.

Table 4.2 shows that variables covered in the census are continually expanded. Definitions used in some variables have also changed over time, such as population coverage as we discussed earlier. Extended variables can be seen in the modern censuses (i.e. after the 1961 census) as opposed to variables covered in the 1920 and 1930 censuses. These extended variables concern information about relationship of respondent to the head of household (status in family), age classification, level of education, religion, place of birth, place of previous residence, children ever born and surviving, labor force information, and facilities in a household.

The 1920 and 1930 censuses considered age group in recording and tabulating data on population by sex. It had very crude age group classification. The 1920 census differentiated only two age groups: children and adult, while the 1930 census provided three age groups: (1) children who could not yet walk, (2) other children, and (3) adults. In the 1961 census, age of population was included in the question. The age refers to the respondent's age in completed years. Since the 1971 population census, information collected on respondent's date, month, and year of birth are recorded according to the European calendar system. This system is used to

determine the age of the respondent, which was rounded down or the age refers to the respondent's last birthday.

Questions on main language usually asked in the census were not addressed in the 2000 census. Such information was used indirectly to ascertain ethnicity among the Indonesian population (e.g. see Nitisastro, 1970). However, the 2000 census has explicitly collected information on ethnicity. In the manual of this census, more than 300 ethnic communities are listed. This variable is somehow more accurate than indirect information on main language and gives another opportunity to scholars to learn more about ethnicity in Indonesia.

Questions related to migration have been collected since 1930. Although it did not include an explicit question, the 1930 *Volkstelling* has information on the place of last residence and place of birth (e.g. provincial level). Thus it was overwhelmingly the richest data source available to examine population mobility pattern during the colonial period (Hugo, 1982). In 1961, questions about place of current residence and place of birth were posed to the respondents. Therefore, lifetime migration could be examined from this information (e.g. see McNicoll, 1968; Withington, 1976; Hugo, 1978). In 1971, population census contained more personal data on the individual place of birth (province), place of previous residence, and the duration of residence in the previous place. Since 1980, question on the previous residence has been fixed for 5 years. Then the question addressed was where respondents lived 5 years ago prior to the census. Using this variable, recent migrant data can be derived from the census. Prior to the 2000 census, the geographical unit for place of residence was the province. In the 2000 census, *province* and *district* have been used as a geographical unit of analysis. Unfortunately, questions on the duration of residence in present province, i.e. to capture short-term migration, and the place of previous residence (i.e. province) have been omitted in the 2000 census.

Questions related to fertility and child mortality analyses have been addressed since 1961. Information on the number of children ever born and children surviving are collected. Information on number of marriages and age at first marriage, date of last live birth, and age of children are also collected in the census. Thus indirect estimation methods have been applied to measure the total fertility rates (i.e. the own-children and the last live birth methods) and infant mortality rates (i.e. the Brass and the Trussell methods). Other variables on household circumstances and socioeconomic situation are also collected, except in the 2000 census.

Table 4.2. Variables concerning individuals and households: Indonesian census, 1920-2000

Variables	*1920*	*1930*	*1961*	*1971*	*1980*	*1990*	*2000*
Individuals							
1. Name	Y	Y	Y	Y	Y	Y	Y
2. Sex	Y	Y	Y	Y	Y	Y	Y
3. Age	Cat.	Cat.	Y	Y	Y	Y	Y
4. Relation to head of HH			Y	Y	Y	Y	Y
5. Marital status	Y	Y	Y	Y	Y	Y	Y
6. Citizenship	Y	Y	Y	Y	Y	Y	Y
7. Ethnicity							Y
8. Religion			Y	Y	Y	Y	Y
9. Language	Y	Y	Y	Y	Y	Y	
10. Ability to read and write	Y	Y	Y	Y	Y	Y	
11. Educational level			Y	Y	Y	Y	Y
12. Current residence	Y	Y	Y	Y	Y	Y	Y
13. Place of birth		Y	Y	Y	Y	Y	Y
14. Previous province		Y		Y	Y	Y	
15. Place of residence 5 years ago					Y	Y	Y
16. Duration of residence in present province				Y	Y	Y	
Households							
This form was used more to collect information concerning the household, including, type of HH and its circumstances			Y	Y	Y	Y	
For ever-married women							
1. Number of children ever born			Y	Y	Y	Y	Y
2. Number of children still Alive			Y	Y Y	Y Y	Y Y	Y
3. Date of first marriage					Y	Y	
4. Date of last live birth					Y	Y	
5. Age of children							
For persons aged 10+							
1. Type of economic activity			Y	Y	Y	Y	Y
2. Job status			Y	Y	Y	Y	Y
3. Occupation			Y	Y	Y	Y	Y
4. Industry			Y	Y	Y	Y	Y
5. Activity in agriculture sector			Y	Y	Y	Y	

Notes: Cat = category, 1920: (1) children and (2) adults, 1930: (1) child who could not yet walk, (2) other children, and (3) adults.
Place of birth and residence 5 years ago was recorded in province only, except in the 2000 census (province and municipality/regency).

Sources: Summarized from Nitisastro (1970), Suharto and Abdulmadjid (1973), Cho et al. (1980), Hugo (1982b), Mamas (1992), questionnaires of the 1990 and 2000 population censuses (mimeograph).

Basic demographic variables, which were covered in the 1990 and 2000 population censuses, are as follows:

1. Population: - name and sex
   - age (*year*) and date of birth *(month and year*)
   - current residence (*province, district, sub-district, village*)
   - relationship to head of household
   - marital status, religion, citizenship/ethnicity, education

2. Fertility: questions posed to ever-married women (*aged 10 years and above*)
   - number of children ever born (*alive & dead*)
   other variables covered in the 1990 census,
   - age (*year*) and date of first marriage (*month and year*)
   - number of marriages
   - date of last birth (*month and year*)
3. Mortality: questions posed to ever-married women (*aged 10 years and above*)
   - number of children ever born (*alive & dead*)
   - number of children still alive

4. Migration: - current residence (*province, district, sub-district, and village*)
   - place of birth (*province, in the 1990 census)*
   (province and district, in the 2000 census)
   - place of previous province (*the 1990 census only)*
   - duration of residence in present province (*the 1990 census only)*
   questions posed to persons aged 5 years and above
   - residence 5 years ago (*province, in the 1990 census)*
   (province and district, in the 2000 census)

4.3 Sample Surveys

Since the early 1950s, a number of demographic surveys were conducted in Indonesia. During the 1950s and 1960s, for example, there were a number of large-scale sample surveys, which posed demographic questions. However, since these surveys are limited in coverage and accuracy, they have not been fully exploited. However, since the 1970s, population surveys in Indonesia got better in coverage and organization. Utilization of high technology facilities and better methods has also improved the quality of those surveys. These large and small sample surveys have provided an important source of information for analyzing demographic and economic trends in Indonesia, as well as behavioral studies of individual and family decision making.

Both government and non-government institutions have organized the surveys in Indonesia. The *Badan Pusat Statistik* (Central Bureau of Statistics, known as BPS[3]) is the government institution that is responsible for Indonesian statistics. Other government institutions, i.e. the Ministry of Population and the Ministry of Health, are also involved in conducting the surveys. National and international non-

[3] Prior to 1999, the term of BPS stood for Biro Pusat Statistik [Central Bureau Statistics].

governmental institutions, such as the *Lembaga Demografi Universitas Indonesia* (Demographic Institute, University of Indonesia, known as LDUI), Macro International Inc., and the RAND Co., have participated in organizing some surveys in Indonesia.

With regard to the information collected, the Indonesian CBS distinguishes two different types of statistics, namely economic and social welfare statistics. The economic statistics include censuses on agriculture and national economics, surveys on manufacturing, trade and services, finance and prices, and cross-sector surveys. The agricultural and economic censuses are conducted every ten years, and always in a year ending in "3" for the agricultural census (e.g. 1983 and 1993) and ending in "6" for the economic census (e.g. 1986 and 1996). The social welfare statistics include the population census, intercensal population survey (*Survai Penduduk Antar Sensus,* SUPAS), Indonesia Demographic and Health Survey (IDHS), National Social and Economics Survey (*Survai Sosial dan Ekonomi Nasional,* SUSENAS), Housing and Dwelling Survey, National Labor Force Survey (*Survai Tenaga Kerja Nasional*, SAKERNAS], and the Wages Survey. The population census is conducted every ten years, and since 1980, it has always been conducted in a year ending in "0" (e.g. 1980, 1990 and 2000). Between two censuses, usually in a year ending in "5" (e.g. 1985 and 1995) the intercensal population survey (SUPAS) is carried out.

Most demographic surveys that are conducted by the ICBS fall under the category of social welfare statistics. The ICBS collaborated with the Ministry of Population, the Ministry of Health, and the Macro International Inc. in organizing the IDHS. To collect more specific information on morbidity and cause of death in Indonesia, the Ministry of Health conducts the Household Health Survey (*Survai Kesehatan Rumah Tangga*, SKRT). Those surveys mostly cover large samples and aim for estimation of demographic indicators at national or regional levels.

The LDUI conducted the fertility and mortality (FM) survey in 1976. Furthermore, in 1993, 1997 and 1998, the LDUI and the RAND Co. conducted the Indonesian Family Life Survey (IFLS). These surveys covered relatively large samples in some regions of Indonesia. Other institutions and scholars have conducted small and regional surveys in Indonesia. Among others are the survey of population mobility in West Java (Hugo, 1978), population movement in Yogyakarta's villages (Mantra, 1981a), demographic survey in Teminabuan, Irian Jaya (Lautenbach, 1999), and labor circulation in East Java (Spaan, 1999). Unlike the surveys conducted by the ICBS, the main objective of these surveys is to examine the behavioral relationship, instead of estimating demographic parameters at regional or national levels.

Regarding the region covered, the surveys can be divided into two types, namely (1) national and (2) regional. The national survey is defined as a survey which covers the whole nation and usually involves large samples. The regional survey covers some regions or a particular region and it is representative only at regional level. As the focus of this present chapter is on utilizing the available data in order to estimate basic demographic variables (i.e. population, fertility, mortality, and migration), this section overviews some selected surveys that relate to those

aspects. The selected surveys include the data from SUPAS, SUSENAS, IDHS, SKRT, and IFLS, where national survey are concerned, and the demographic survey in Irian Jaya and the circular migration in East Java, where regional surveys are concerned.

4.3.1 Intercensal Population Survey (SUPAS)

The intercensal population survey (*Survai Penduduk Antar Sensus,* known as SUPAS) attempts to fill gaps in population information between two censuses. The SUPAS is designed to provide demographic data complementary to the census. In Indonesia, this survey was organized three times after the second modern census in 1971. Table 4.3 shows all the SUPAS that have been conducted in Indonesia. These were conducted in 1976 (i.e. between the 1971 and 1980 censuses), in 1985 (i.e. between the 1980 and 1990 censuses) and in 1995 (i.e. between the 1990 and 2000 censuses).

The first SUPAS, which was conducted in three stages, was held in March 1976. At that time, only 23 provinces were covered (whole of Indonesia, excluding East Nusa Tenggara, East Timor[4], Maluku and Irian Jaya). In the first stage, enumeration of basic demographic characteristics had been done for 257,100 households. In the second stage, detailed information on social and economic characteristics (particularly on the workforce) was collected from 60,733 households. The last stage, which comprised the Indonesian section of the World Fertility Survey (WFS), collected information on fertility from 9,136 households (cited in Hugo, 1982). The second and third SUPAS were conducted in one stage. They were held in September 1985 and September 1995 throughout 27 provinces in Indonesia. The 1985 SUPAS covered about 125,400 households, while the 1995 SUPAS covered about 206,848 households. The three SUPAS use a similar *de jure/de facto* approach as the 1980 census enumeration. Those people who have stayed for six months or longer in a particular region and those who intended to stay even though their length of stay was less than six months are recorded as population in that region.

In terms of its sample size, the sample size in SUPAS is relatively small compared to the census. For example, the 1985 SUPAS covered about 125,400 households or 0.35 percent sample (Alatas, 1995). Meanwhile, the 1990 census covered about 2,000,000 households or 5 percent sample (Mamas, 1992). Therefore, demographic variables (i.e. fertility, mortality, and migration) that are estimated from the SUPAS data are often incomparable with the variables estimated using the census data (i.e. see Chapter 2). In a study on migration data, for example, Speare (cited in Hugo, 1982) found that the 1976 SUPAS data could not be used to estimate the volume of migration streams due to the small number of respondents interviewed. Furthermore, Alatas (1995) found that inter-provincial migrant data derived from the 1985 SUPAS were questionable. The number of recent migrants in 1980-1985 was smaller compared to the recent migrants derived from two censuses (i.e. the 1980 and 1990 censuses). Another study by Larson (1987) also found that the number of males aged 5-9 years old appeared to have been overenumerated in the 1985 SUPAS.

[4] East Timor was not yet attached to Indonesia when the 1976 SUPAS was conducted.

Table 4.3. Intercensal population survey (SUPAS) by region covered and enumeration methods, Indonesia, 1976-1995

No.	*Month/Year*	*Region Covered*	*Enumeration Method*
1.	March 1976	23 Provinces, excluding East Nusa Tenggara, Maluku, Irian Jaya, and East Timor	*De jure/de facto* 6-month absence criteria Stage I: 257,100 households. Stage II: 60,733 households. Stage III: 9,136 households.
2.	September 1985	Entire Indonesia	*De jure/de facto* 6-month absence criteria sample size 125,400 HH.
3.	September 1995	Entire Indonesia	*De jure/de facto* 6-month absence criteria sample size 206,848 HH.

Sources: Summarized from Hugo (1982b) for 1976 SUPAS, and Alatas (1995) for 1985, 1995 SUPAS.

In general, data collected in the SUPAS are similar to the data collected in population census. It consists of information on basic demographic data and socioeconomic aspects. Variables covered in the SUPAS, however, have particular features compared to the census. For example, information relating to fertility and mortality has been expanded. Ever-married women are asked about date of births and survival status of all children ever born (instead of only last live birth as in the 1980 and 1990 censuses). If the children had died, the age of children when they died is also asked. In migration questions (i.e. place of residence 5 years ago), the unit analysis used is not only province, but also municipality, district and village. Such information can be potentially used to assess population mobility at a level lower that the province (i.e. inter-municipality, inter-district, and inter-village). Furthermore, a question on the reason to migrate has also been included. In the 1985 SUPAS, four alternative reasons were offered: work, education, transmigration, and open reason or others, whereas 8 reasons were given in the 1995 SUPAS.

Regardless of the sample size, the SUPAS has indeed the potential to facilitate the drawing up of socioeconomic characteristics of the individual or households related to their demographic behavior. Information on demographic variables covered in the 1995 SUPAS is as follows:

1. Population:
   - sex and age (*exact age in year*)
   - place and date of birth (*month and year*)
   - relationship to head of household
   - marital status, religion, and citizenship
   - current residence (*province, district, sub-district, village*)

2. Fertility: questions posed to ever-married women (*aged 10-54 years*)
- number of marriages
- age and date of first marriage (*month and year*)
- number of children ever born (*alive and dead*)
- sex of children
- birth date of children (*month and year*)

3. Mortality: questions posed to ever-married women (*aged 10-54 years*)
- number of children ever born (*alive and dead*)
- survival status of children
- age of children when they died (*exact age*)

4. Migration:
- current residence (*province, district, sub-district, village*)
- place of birth (*province and district*)
- place of previous residence (*province and district*)
- duration of current residence in present *village*

questions posed to persons aged 5 years and above
- residence 5 years ago (*province, district, sub-district, village*)
- main reasons for migration from residence 5 years ago (*i.e. work, looking for a job, education, marriage, following family, following relative, housing, and open reason/others*)

4.3.2 National Social and Economic Survey (SUSENAS)

The National Social and Economic Survey [*Survai Sosial Ekonomi Nasional*, known as SUSENAS] is a large sample survey that has been conducted since the early 1960s. The survey is organized in order to answer the demand for Indonesian population statistics in general and socioeconomic statistics in particular. The census and SUPAS are indeed organized periodically in Indonesia. However, these are conducted once in 10 years. Meanwhile, demands for Indonesian statistics on planning and development process are more frequent. Therefore, other surveys (such as the SUSENAS) are organized more often than the census or SUPAS.

Table 4.4 lists information about all the SUSENAS in Indonesia that has been conducted since 1963 up to the recent period. It shows the month and the year survey was conducted, number of household samples and region covered. Prior to 1990, the survey was organized irregularly. For instance, in the 1960s there were four rounds of the SUSENAS, conducted in 1963, 1964/1965, 1967, and 1969. In the 1970s, it was conducted in 1970, 1976, 1978, and 1979. In the 1980s, the SUSENAS was almost conducted annually, except for 1983 and 1988. Since 1990, the SUSENAS has been organized regularly once a year.

The SUSENAS was designed to cover all the regions of Indonesia. However, in the first and third rounds of this survey (in 1963 and 1967), regional coverage was restricted to Java. In addition, the second SUSENAS (1964/1965) covered all Indonesia except for East Timor, Maluku, and Irian Jaya. The provinces of Irian Jaya and East Timor, respectively, prior to 1976 and 1982 were excluded from the survey due to regional authorization. Since 1982, the survey has been conducted in all 27

regions. The sample size of households covered in the SUSENAS varies over time. For instance, it was about 16,000 households in 1963 and 24,000 households in 1967. Since 1993, at least until the 1999 SUSENAS, the number of households selected has been broadened to cover more than 206,240 households. It is expected that from this large survey, socioeconomic parameters in smaller administrative units (i.e. municipality or regency instead of province) can also be obtained (Surbakti, 1995).

The SUSENAS collects information on demographic, social and economic indicators of the population in Indonesia. It has certain purposes, which vary and depend on priorities governing the survey period in questions. For example, in the early times (i.e. in 1963, 1964/65, and 1967), the SUSENAS was carried out as complementary post-enumeration surveys of the 1961 census. Information on demographic variables, particularly on fertility and infant mortality, was captured in the survey. From 1969 to 1981, the SUSENAS focused on consumption behavior and attempted to evaluate the seasonal effects (i.e. rainy or dry) on the demand and supply of consumer commodities in Indonesia. Thus the survey collected more information on consumption variables and it was conducted in several periods (i.e. based on the seasonal periods; rainy usually from September to January or March and dry season from April to August).

In general, data collected in this survey are classified into two groups: *core* and *module* data. The *core* data consist of basic information from observed population and these are always required in every SUSENAS. *Module* data consist of certain information from the population observed and these are different in every SUSENAS. Prior to 1992, the core data consisted of only 5 questions; these were four demographic characteristics (i.e. age, sex, relation to head of household, and marital status) and education. Since 1992, additional information has been collected in the core data; these concern the five original questions and the workforce, health of children under five, fertility, mortality, consumption, housing and settlement, and access to the mass media. For ever-married women aged less than 50 years old, the following questions are asked: age of first marriage, children ever born and still alive, and ever used and current contraceptive methods. For children aged 0-4 years, information on their health status is also sought from their mother, i.e. delivery process, duration of breastfeeding, nutrition, and immunization. Regarding mortality variables, the number of household members who have died within 12 months prior to survey is recorded. Information on name, age at death, sex, relationship to head of household, marital status, and criminal activity in which may have caused their death are also collected.[5] The fact is that these additional variables have considerably contributed towards the provision of a data source for demographic estimation. Some questions used in the recent core data were used in the *module* data in the previous surveys.

[5] In the 2000 SUSENAS, the observation period was extended into 36 months (three years) prior to survey. Besides information on age at death, information on month and year when the event occurred was also recorded (personal communication with Mr. Wien, ICBS, through e-mail).

Table 4.4. The National Social and Economic Survey (SUSENAS) in Indonesia, 1963-1999

Period/Year	*Month*	*Household Sample*	*Region covered*
1960s			
1963	Nov-Dec	16,000	Java
1964	Dec(64)-Jan(65)	21,000	Entire Indonesia, excluding East Timor, Irian Jaya and Maluku
1967	Aug-Oct.	24,000	Java
1969*	Aug-Dec(69) and Jan-Apr(70)	19,000	Entire Indonesia, excluding East Timor and Irian Jaya
1970s			
1976*	Jan-Apr, May-Aug, Sep-Dec	17,000	Entire Indonesia, excluding East Timor
	Sep-Dec	78,000	and Irian Jaya
1978*	Jan-Mar, Apr-Jun, Jul-Sep, Sep-Dec	6,300	Entire Indonesia, excluding East Timor
1979*	Feb and Sep	54,000	Entire Indonesia, excluding East Timor
1980s			
1980*	January	102,000	Entire Indonesia, excluding East Timor
	Feb-March	58,000	
1981*	Jan-Mar, Apr-Jun, Jul-Sep, Sep-Dec.	15,000	Entire Indonesia, excluding East Timor
1982	Sep-Dec	94,000	Entire Indonesia
1984	February	50,000	Entire Indonesia
	November	15,000	
1985	February	30,000	Entire Indonesia
1986	February	41,000	Entire Indonesia
1987	January	49,000	Entire Indonesia
1989	January	32,720	Entire Indonesia
1990s			
1990	February	49,000	Entire Indonesia
1991	February	49,000	Entire Indonesia
1992	February	65,600	Entire Indonesia
1993	Jan-Feb	202,500	Entire Indonesia
1994	January	206,240	Entire Indonesia
1995	January	206,240	Entire Indonesia
1996	January	206,240	Entire Indonesia
1997	January	206,240	Entire Indonesia
1998	January	206,240	Entire Indonesia
1999	January	206,240	Entire Indonesia

Note: * It was conducted several times in order to identify seasonal effects on consumption behavior.

Source: Surbakti (1995) for periods 1963-1995.

As stated before, the SUSENAS was conducted in irregular interval periods prior to 1990. It was conducted four times in 1960s and three times in 1970s. Since 1990, it has been conducted more regularly at one-year intervals. Since the survey was not conducted regularly, module and core data collected were not similar. For example, the 1983 and 1984 SUSENAS collected consumption data. In 1985, however,

consumption data were not collected. Instead the data on health, workforce, education, tourism, nutrition, criminality, and cultural matters were considered as modules in the survey. After that, consumption data were collected once in three years. At the same time, together with consumption data, the expenditure data of household are also collected. Since 1992, the module data have been categorized into three regular modules: 1) consumption, 2) tourism, criminality, socio-culture, and prosperity, 3) health, education, and housing settlement. For example, the third module was conducted in 1992, the first module in 1993, and the second module in 1994, and the third module was again conducted in 1995. Each module is used regularly once in three years.

Since the SUSENAS data often provide demographic information, not only are economists interested in this survey but also demographers. For example, the SUSENAS data were used in Indonesian population projection (see Chapter 3). The ICBS (1973) used the 1967 SUSENAS data for estimating initial fertility and infant mortality levels. Iskandar (1976) used the 1964 SUSENAS data for estimating the distribution of fertility rates by age groups. In the recent survey, information which was sought concerned demographic variables as follows:

1. Population:
   - sex and age (*year*)
   - relationship to head of household
   - marital status
   - education
   - current residence (*province, district, sub-district, village*)

2. Fertility: questions posed to ever-married women (aged 10-54)
   - children ever born (*alive and dead*)
   - age at first marriage (*year*)
   - contraceptive used

3. Mortality: questions posed to ever-married women (aged 10-54)
   - children ever born (*alive and dead*)

   questions posed to head of household
   - number of household members who have died within 12 months prior to survey (*sex, age at death, relation to head of household, marital status, caused by accident/violent means*)

4. Migration: no question related to migration

4.3.3 Indonesia Demographic and Health Survey (IDHS)

After launching the family planning program in 1970, various exercises were conducted in Indonesia to evaluate the progress of the program. The exercises included collecting information related to the family planning program from several surveys or census. The surveys concerned were: the Indonesian fertility survey or the 1976 SUPAS part III conducted in Java and Bali; the 1984 Indonesian contraceptive prevalence survey conducted in five urban areas in Java; the 1985 SUPAS; the 1987

SUSENAS; and the 1980 population census. Furthermore, in 1986, the family planning and nutrition survey was conducted in East Java and Bali and the variation of achievement study was conducted in five provinces in 1987.

The information derived from those data sources, however, did not satisfy the program managers. More specific data were needed related to the fertility variable and family planning achievement, e.g. regional fertility levels and differentials, level of use of various contraceptive methods, and the utilization of private sources for contraceptive methods. Hence, in 1987 the Indonesian CBS with technical assistance from the Demographic and Health Survey Program conducted the 1987 National Indonesia Contraceptive Prevalence Survey (NICPS). Later on, this survey became known as the first model of Indonesian Demographic and Health Survey (IDHS). The name IDHS was used for the first time in 1991. Since then, the IDHS has been conducted three times, i.e. in 1991, 1994 and 1997.

The difference between the NICPS and IDHS lies in the variables covered. The IDHS added health variables to the survey, while in the NICPS these variables were not covered. Therefore, in terms of the collaborating institutions, the Indonesian Ministry of Health was not involved in the first survey. The Indonesian CBS and the National Family Planning Board always work together in all series of the surveys. The IDHS is also part of the worldwide Demographic and Health Surveys project, which is managed by Macro International Inc. in several developing countries, and funded by the U.S. Agency for International Development (USAID). These surveys are designed to provide information on levels and trends of fertility, infant and child mortality, family planning and maternal and child health.

Table 4.5 lists all the Demographic and Health Surveys that have been carried out in Indonesia. The first survey or the 1987 NICPS was conducted in September to December 1987. It covered 14,141 households and interviewed 11,884 ever-married women aged 15-49 from 20 provinces. Seven other provinces, i.e. Jambi in Sumatra, Central and East Kalimantan, East Nusa Tenggara, East Timor, Maluku and Irian Jaya were omitted due to logistical difficulties and considerably less dense-population. Since 1991, the survey has been conducted throughout all Indonesian regions.

The 1991 IDHS was conducted in May to July 1991. About 26,858 households were involved and 22,909 ever-married women aged 15-49 years were interviewed in this survey. The 1994 IDHS was conducted between July and November 1994. It covered 33,738 households and 28,168 ever-married women aged 15-49 years. Meanwhile, the 1997 IDHS dealt with 35,362 households and carried out during June to August 1997. Complete interviews were obtained from 28,810 ever-married women aged 15-49 years.

The NICPS and IDHS utilize two types of questionnaires: for households and individuals. In the household questionnaire, which involved the head of household, general information related to the characteristics of the household members and its current circumstances was obtained. Questions asked about the household members are: place of residence, name, relationship to head of household, sex, age (*year*), education, parental survivorship, and marital status. In the questionnaire for

individuals, which involved ever-married women aged 15-49 years, a complete set of questions relating to fertility and nuptiality, pregnancy and breastfeeding, infant mortality, contraceptive prevalence, and knowledge and attitude towards contraceptives used are asked. Table 4.6 shows the variables covered in the IDHS. In 1991, variables covered were expanded and information about immunization and child health was collected. Furthermore, in the 1994 and 1997 IDHS, additional variables were collected, e.g. information about knowledge of AIDS and maternal mortality, as well as household expenditure, and service availability for family planning and health variables.

Table 4.5. The Indonesia Demographic and Health Survey (IDHS) by region and sample covered, 1987-1997

No.	*Month/Year*	*Region covered*	*Sample*
1.	NICPS Sept.-December 1987	Entire Indonesia, excluding Jambi, Central Kalimantan, East Kalimantan, East Nusa Tenggara, East Timor, Maluku and Irian Jaya	14,141 households (HH), 11,884 ever-married women aged 15-49 years
2.	IDHS May-July 1991	Entire Indonesia	26,858 households (HH), 22,909 ever-married women aged 15-49 years
3.	IDHS July-November 1994	Entire Indonesia	33,738 households (HH), 28,168 ever-married women aged 15-49 years
4.	IDHS June-August 1997	Entire Indonesia	35,362 households (HH), 28,810 ever-married women aged 15-49 years

Sources: the 1987 NICPS, The IDHS in 1991, 1994, and 1997.

Fertility information is collected using two procedures. First, each woman is asked a series of questions about the number of live births and the number of children surviving. Children are identified by sex in order to minimize the error and to improve reporting as well as to allow estimation of sex-specific mortality rates. Second, a full birth history is obtained from each woman, and for each live birth the following information is collected: name, sex, month and year of event (birth), whether the birth was single or multiple (since the 1991 IDHS), and the survival status of the child. For children who are alive, the woman was asked whether the child was living in the household or away. For children who died, the age at death was recorded. In other words, the time of events (birth and death of child) are recorded according to the time of occurrences. Using this information, one could estimate directly the fertility and infant mortality rates from the data collected.

Table 4.6. Variables recorded for respondents in household and women aged 15-49 years, NICPS 1987 and IDHS 1991, 1994 and 1997

Variables Covered	*NICPS 1987*	*IDHS 1991*	*IDHS 1994*	*IDHS 1997*
Household				
1. sex	Y	Y	Y	Y
2. age	Y	Y	Y	Y
3. relation to head of HH	Y	Y	Y	Y
4. marital status	Y	Y	Y	Y
5. current residence	Y	Y	Y	Y
6. education	Y	Y	Y	Y
7. housing facilities	N	Y	Y	Y
***Respondent*: Women 15-49 years**				
A. respondent's background:				
- age (in completed year or month)	Year	Month	Month	Month
- date of birthday	Y	Y	Y	Y
- duration of live in current residence	Y	Y	Y	Y
- education	Y	Y	Y	Y
- marital status	Y	Y	Y	Y
- access to information	Y	Y	Y	Y
- religion	Y	Y	Y	Y
- language used daily	N	N	Y	Y
B. Reproduction				
- birth history	Y	Y	Y	Y
- children ever born (alive & dead)	Y	Y	Y	Y
- sex and age of children	Y	Y	Y	Y
- date of children's birth	Y	Y	Y	Y
- if dead, how old they were	Y	Y	Y	Y
- single or multiple birth	N	Y	Y	Y
C. Knowledge/practice of birth control	Y	Y	Y	Y
D. Pregnancy and Breast feeding	Y	Y	Y	Y
E. Marriage				
- marital status	Y	Y	Y	Y
- number of times married	Y	Y	Y	Y
- date of first marriage	Y	Y	Y	Y
- age at first marriage	Y	Y	Y	Y
- age at first sexual intercourse	Y	Y	Y	Y
- time of last intercourse	Y	Y	Y	Y
F. Fertility preference	Y	Y	Y	Y
G. Spouse's background and work	Y	Y	Y	Y
H. Immunization and health		Y	Y	Y
I. Knowledge of AIDS		N	Y	Y
J. Maternal mortality		N	Y	Y
K. Household expenditure		N	Y	Y
L. Health and family planning service		N	Y	Y

Sources: NICPS 1987, IDHS 1991, 1994, and 1997

However, some characteristics of the surveys have to be kept in mind. First, interviews are conducted only among living women, and there is no information on the fertility of women who had died before the survey. In other words, the women interviewed in a household must survive to the survey date in order to be included in the observation. Second, it is a retrospective survey. All information on states and events (i.e. pregnancy, contraceptive used, marital union, birth, and death of child) relating to the women refer to the date before the survey and they are self-reported (Blossfeld and Rohwer, 1995; Namboodiri and Suchindran, 1987). Information on demographic variables captured in the recent IDHS is as below:

1. Population: questions posed to the head of households about the members
   - sex and age (*year*)
   - relationship to head of household
   - marital status
   - education
   - current residence (*province, municipality, district, village*)

2. Fertility: questions posed to ever-married women (*aged 15-49*)
   - age (*year*) and birth date of a woman (*month and year*)
   - all children ever born (*alive and dead*)
   - sex and birth date of children (*month and year*)
   - age at first marriage (*year*)
   - survival status of children: *alive or dead*
   - contraceptive used
   - pregnancy history and the outcome
   - calendar data for last 5 years (*monthly*) concerning reproductive status
   - number of marriage
   - age or date of first marriage (*month and year*)
   - fertility preference

3. Mortality: questions posed to ever-married women (*aged 15-49*)
   - all children ever born (*alive and death*)
   - survival status of children: *alive or dead*
   - age when the children died (*month* for infant death and *year* for others)
   - brother and sister of the same mother who had died (*sex, age in year when they died, and marital status*)

4. Migration: no question related to migration

4.3.4 National Household Health Survey (SKRT)

In order to support the government's policies on health issues, the Indonesian Ministry of Health has organized the National Households Health Survey (*Survey Kesehatan Rumah Tangga,* known as SKRT). The survey had been conducted five times since 1972 (i.e. in 1972, 1980, 1986, 1992 and 1995). Prior to 1992, although some variables were taken into consideration for their representative value for the whole of

Indonesia, the SKRT covered only a few provinces in Indonesia (e.g. the 1986 SKRT covered 7 provinces). The inclusion of provinces was based on health conditions in those provinces indicated by IMR (lower, middle and higher), geography, and ethnicity. Since 1992, the survey has been covered in all 27 provinces and conducted in collaboration with the ICBS and the Ministry of Population/National Family Planning Coordinating Board (NFPCB).

The SKRT has three main objectives: 1) to investigate the level of maternal health and pregnancy outcomes; 2) to derive information on morbidity, disease patterns, disability, prevalence and nutritional status of population; and 3) to investigate diseases which cause death in general and perinatal death in particular. Based on these objectives, the survey has three component studies. These are: follow-up study of pregnant women, morbidity/disability study, and mortality study.

In the follow-up study of pregnant women, all pregnant women are revisited at least two times during the survey. Firstly, when a woman was pregnant, and secondly, when a woman is in her postpartum infecundable period (i.e. 42 days after giving birth). In the study of morbidity/disability, selected members of household samples are revisited several times and asked about their conditions, which relate to morbidity/disability. In the third study on mortality, death cases reported from household samples are looked into by using the *verbal autopsy* technique. The health history of a person who had died is sketched with the help of the head or other members of a household. Then, the cause of death is ascertained based on information from the *anamnesis* (interview) between interviewer and the household member. The classifications on causes of death used in the SKRT are based on the *International Classification of Diseases* (ICD) from the World Health Organization (1977, and 1992).

Since 1992, the SKRT has been integrated into other national surveys (i.e. SUSENAS and IDHS). The integration is in terms of the designed sample used and the questions related to population health addressed in the survey. In the 1992 SKRT, for example, the survey was integrated with the 1992 SUSENAS. The sample involved was 65,664 households, which was similar to the 1992 SUSENAS. The survey was conducted just after the 1992 SUSENAS (in February 1992). Follow-up study of pregnant women was conducted within 9 months, mortality study was conducted within 3 months, whereas morbidity/disability study was integrated in the 1992 SUSENAS. Among those who were reported to have died within 12 months prior to the 1992 SUSENAS, 1235 death cases were investigated on the cause of death.

The 1995 SKRT was the fifth survey and integrated with the 1994 IDHS and the 1995 SUSENAS. The follow-up study of pregnant women used samples designed in the 1994 IDHS sample (35,400 households). About 1937 pregnant women were identified in the 1994 IDHS. Only 1553 women (i.e. 80 percent from the sample) could be visited in the first visit. About 1149 women (i.e. 59 percent) could be visited twice. Study on morbidity/disability used a designed sample from the *module* sample in the 1995 SUSENAS (i.e. 65,664 households). About 10 percent from these samples were used in the morbidity study, and only 50 percent (3,750 households) of those selected samples could be visited, from whom information on morbidity/disability was

collected. Meanwhile, the third study on mortality derived information from the sample *core* in SUSENAS (i.e. 206,240 households). Based on the data of household members who died within 12 months prior to the SUSENAS survey, 3,484 cases were investigated on the cause of death.

This survey has some limitations, particularly the mortality study (i.e. under-reporting and verbal autopsy technique). In the mortality study, for example, from 65,664 households covered in the 1992 SKRT, only 1528 death cases were reported. From those reported cases, 80 percent (i.e. 1235 cases) occurred within 12 months prior to the survey with known causes of death (Iskandar and Wahyono, 1993). Death cases reported in other surveys were also small: 905 cases in 1980, 2052 cases in 1986, and 3484 cases in 1995. Hence, the results obtained from this survey should be interpreted with care. However, the survey can be used to describe the general health condition among Indonesians. The follow-up study from pregnant women is a potential source for estimating maternal mortality (Soemantri, 1995). Furthermore, evidence on the causes of death indicates an epidemiological transition in Indonesia from infectious diseases to degenerative diseases (Suwandono et al., 1999).

No attempt is made here to provide detailed information on the questionnaire content since the survey material is not at hand. In addition, they are comprehensively discussed elsewhere (i.e. Budiarso, 1981; Budiarso, Bakri, and Santoso, 1986; Soemantri, 1993). Although variables covered in the survey include mortality data, it cannot yet be used for estimating the demographic parameters of interest in this present study (i.e. population, fertility rate, mortality rate, and migration).

4.3.5 Indonesia Family Life Survey (IFLS)

The Indonesia Family Life Survey (IFLS) is a large-sample survey that was conducted in collaboration between the Demographic Institute, University of Indonesia (LDUI) and the RAND Co. In order to maximize representation of the population, to capture the cultural and socioeconomic diversity, and to be cost effective given the size and terrain of the country, the IFLS was conducted in 13 provinces in Indonesia. These are the four provinces in Sumatra (i.e. North Sumatra, West Sumatra, South Sumatra, and Lampung), all five provinces in Java, and four provinces in the rest of Indonesia (i.e. Bali, West Nusa Tenggara, South Kalimantan, and South Sulawesi). Other provinces were excluded due to the high cost. The province of Aceh in particular was excluded due to political violence and potential risks to the interviewers. Furthermore, the selection of those provinces was based on the proportion of population in those provinces to the total national population. Legal population in a particular region is enumerated on *de jure/de facto* basis as defined in the 1990 census.

The IFLS was conducted three times, in 1993, 1997, and 1998. The most recent round of IFLS took place in mid-2001 and in collaboration between the Population Research Center of Gadjah Mada University (PPK-UGM) and the RAND Co. The first IFLS (IFLS1) was carried out between August and December 1993. Using the 1993 SUSENAS sample design, the IFLS1 randomly selected 7,000 households or 30,000

individuals in 13 of the 27 provinces in Indonesia. The resulting sample represents 83 percent of Indonesia population. The second IFLS (IFLS2) was fielded four years later, between August 1997 and January 1998. The IFLS2 attempted to interview the same respondents as in the IFLS1. For a household, which had moved within 13 provinces as used in IFLS1, the respondent was interviewed in the new place. Excluding the households in which everyone had died, the IFLS2 succeeded in interviewing 94 percent of the IFLS households. When fieldwork was drawing to a close, Indonesia was caught in a major economic crisis. Then, in order to measure the immediate impact of the crisis, the third IFLS (IFLS2+) was conducted in August to December 1998. The IFLS2+ interviewed 25 percent of the sub-sample of the IFLS2 households (i.e. 2,066 households) in 7 out of the 13 IFLS provinces. Those provinces were 2 provinces in Sumatra (i.e. North Sumatra and South Sumatra), 3 provinces in Java (i.e. Jakarta, West Java, and Central Java) and 2 provinces in the rest of Indonesia (i.e. West Nusa Tenggara and South Kalimantan).

The contents covered in this survey complement and extend other surveys in four ways (Frankenberg et al., 1995). *First*, it is a multi-purpose survey, collecting a broad array of demographic health, and economic information on individuals, households and communities in the same survey, instead of separate surveys. This effort is expected to expand the scope of analyses by allowing analyses of interrelated issues, which is not possible in other single-purpose surveys. It is not surprising that the questionnaire used in this survey consists of several module questionnaires that have been addressed in other surveys (e.g. calendar data in fertility section as in the IDHS, economic indicator data as in the SUSENAS). *Second*, the information collected in this survey is not only current but also retrospective for most topics. It is aimed to allow the study of life event history analysis (i.e. history of education, employment, migration, fertility and marital status). *Third*, as the information on well-being (i.e. health, economic status, and family support network including transfer) is collected by using three different age groups of respondents (i.e. younger, middle-aged, and elderly), then it allows another analysis of the relations among generations, particularly on well-being of elderly people. *Lastly*, the IFLS links the household-level data to community-level data on public services and economic infrastructure. This linking of individual, family and community data is aimed to support the researcher in a better understanding of how circumstances influence an individual and family behavior.

In short, the IFLS brings an interdisciplinary perspective to five broad areas: (1) economic well-being; (2) health status of adults and children; (3) fertility, family planning, and contraception; (4) education, migration, employment and earnings; and (5) family and social support, transfers and living arrangements. Over time, the IFLS has acquired several new features. For example, module revisions by incorporating new topics or new phenomenon (i.e. economic crisis), maximizing re-contact with the original IFLS1 respondents, characterization of service availability, and improvement in the quality of fieldwork (i.e. editing the data entry by using a microcomputer during the fieldwork).

No attempt is made here to describe all variables contained in the IFLS since these are beyond the scope of this chapter. These variables have been comprehensively discussed elsewhere (i.e. Frankenberg et al., 1995; Duncan et al., 2000). This section focuses on some information that potentially can be used as sources for estimating basic demographic parameters (i.e. population, fertility, mortality, and migration). The following variables are derived from the IFLS:

1. Population: questions posed to the head of households about the members
   - relationship to head of household
   - sex, age (*year*), and date of birth (*month and year*)
   - marital status
   - current residence (*province, district, sub-district, village*)

2. Fertility: questions posed to selected ever-married women (*aged 15-49 years*)
   - age (*year*) and birth date (*month and year*)
   - marital history
   - number of marriages, details of every marriage were solicited i.e. age (year) when marriage took place and/or terminated, education, and marital status
   - pregnancy history
     calendar data for last 10 years (*monthly*)
     concerning reproductive status
   - all children ever born (*alive and dead*)
   - sex and birth date of children (*month and year*)
   - survival status of children (*alive or dead*)
   - contraceptive used

3. Mortality: questions posed to selected ever married women (*aged 15-49 years*)
   - children ever born (*alive and dead*)
   - surviving children
   - age of children who had died (*month* for infant death and *year* for others)

   questions posed to head of households, spouse or senior household members aged 15 years and above
   - parents who have died
     (*sex*, *age in year when they died, chronic disease before death, place of death*)
   - brother and sister of the same mother who had died
     (*sex, age in year when they died, marital status, chronic disease before death, place of death*)
   - children who had died within 12 months prior to survey
     (*sex*, *age in year when they died, marital status, education, place of death*)

4. Migration: questions posed to selected household members (*aged 15 years+*)
   - age (year) and birth date (*month and year*)
   - place of current residence, birth, residence when respondent was 12 years old (*province, municipality, district, and village*)

- did migration take place after marriage ?
- migration history since respondent was 12 years old, place of destination (*province, municipality, district, village*) distance (*kilometer*), reason, type of migration (*individual or group*), knowledge about destination (*has visited place before, knows someone, or a new place*).
- Circular migration within 24 months prior to survey.

4.3.6 Regional Surveys

This section reviews selected regional surveys. In fact, there are many regional surveys that have been conducted in Indonesia. Nevertheless, in this subsection two surveys are given as examples. They are a demographic survey in Teminabuan, Irian Jaya and a circular migration survey in East Java. Extensive analyses on these surveys are documented in Lautenbach (1999) and Spaan (1999), respectively.

The first survey was conducted in Teminabuan, a district in Irian Jaya, organized by the Netherlands Foundation for Advancement of Tropical Research (WOTRO), and in collaboration with the Indonesian Institute of Science (*Lembaga Ilmu Pengetahuan Indonesia*, LIPI). It constitutes a part of a multidisciplinary research programme entitled '*Irian Jaya Studies, a Programme for Interdisciplinary Research*' (ISIR). Where demographic research was concerned, it was initiated for an in-depth study on migration. Due to the technical and time constraints, it was decided that demographic survey in which the issue of migration was included was the most feasible. The information on household composition, date of birth of household members, birth and deaths within 5 years prior to survey date, causes of deaths, socioeconomic situation of the family, education and language are collected from each sampled household. Fertility histories were solicited from ever-married women aged 15 years and above. In addition, migration histories of adult household members (aged 18 years or above at the survey time) were compiled.

Fieldwork of the survey took place in May to September 1996. Data from the 1995 population registration provided by the Teminabuan district office was used as sample design. About 6254 individuals from 1401 households who resided in 20 villages were selected in the survey. Lautenbach (1999) has widely described this survey and explored the results obtained. Since accessibility of many areas in Irian Jaya is still limited, these areas are under-studied. However, this survey has significantly contributed to greater insight into demographic variables (i.e. fertility, mortality, and migration) in the study area in particular and Irian Jaya in general.

The second example is a survey on population mobility in three villages in East Java. The survey was conducted as part of the *Social Science Projects* concerning farming systems and the social transformation processes in rural East Java. The project was executed by the Interdisciplinary Research Project (INRES), the Dutch-Indonesian research projects at the Brawijaya University, Malang, East Java. The study aimed to examine the linkages between processes of economic development, social transformation, and population mobility (i.e. internal and international) in particular regions in East Java.

The field survey was carried out between November 1990 to April 1991. About 744 households from three villages were selected. The households selected were not so much intended to be representative but more on the basis of comparability among three distinct areas, i.e. in terms of the regional developments. The following information was collected from households sampled: household composition, number of migrants in household, employment, and household resources. At community level, the village administrative offices were asked to provide information on the general regional socioeconomic situation, regional development and demographic data in those villages.

Among the households sampled, 24 households were chosen for in-depth study of migrants and 36 households for non-migrants. Some adult household members from those selected households were treated as international migrants (i.e. 12 respondents), circular migrants (i.e. 16 respondents), and commuter (i.e. 2 respondents). Information on their education, work history, mobility history, modes of recruitment, financing of migration, working conditions at destination, remittance, motivation and aspirations was collected. Next to migrant case studies, a number of case studies on employment brokers in each village were conducted. It resulted in information on the system of labor recruitment, their social networks and cost of mediation. The information for case studies was collected between August 1991 and January 1992.

Spaan (1999) documented circular labor migration in East Java using data from the survey. Since studies on temporary migration (i.e. circular) and international migration are scarce in Indonesia, this study has significantly contributed to the understanding of population mobility in Indonesia, particularly international labor migration. Although the study is based on case studies and limited to particular study areas, it gives an empirical example of the characteristics and patterns of migration in Indonesia in general and East Java in particular.

4.4 Registration Data

Another data source in Indonesia is registration data. In general, the main purpose of a registration is to record certain life cycle events (i.e. marriage, birth, death, divorce/marital dissolution, and migration) and as such, it is a valuable statistical data source. In Indonesia, the registration is also aimed for administrative purpose as we will discuss later. Regardless of the quality and its reliability, registration is important because it records particular events over a given period and it affords the opportunity to estimate the yearly rates.

Historically, population registration was introduced in Indonesia for the first time during the British colonial rule under Lieutenant General Raffles in 1815. Registration was implemented on the basis of a '*polisi regelement*' [police regulation], and involved to all segments of the population. The village headmen were responsible for registering the people residing in their area. This system was enforced throughout the whole country and applied to all groups of people. In the period of Dutch colonial government, all population registration activities were

terminated because the new colonial government wanted to reduce routine expenditure (Suhartono, 1984).

In 1849, a special population registration limited to the European population was introduced and in 1919 this system was expanded to include the Chinese and other oriental. Furthermore, in 1929, the registration system for the first time was introduced in Yogyakarta to cover all residents. Under this system, events such as *births*, *still births,* and *deaths* had to be reported to the village headman. It was known as the "*tripikat*" [three copies] system and is currently coordinated and administrated by the Ministry of Health. In 1939, population registration was extended further to cover all residents in Java. After independence in 1945, registration was prevalent in all Indonesian regions.

Nowadays, at least six major population registrations are administrated independently for different segments of population. These are collected by each of the following offices: the Ministry of Interior, the National Family Planning Coordinating Board, the Ministry of Justice, the Ministry of Religious Affair, the Ministry of Health, and the Central Bureau of Statistics. The following subsections attempt to elaborate the registration systems of those offices.

4.4.1 Role of the Ministry of Internal Affairs

Since 1978, in a follow-up to the *President's Decree* No. 52/1977, the Directorate General of Regional Government and Autonomy (*Direktorat Jenderal Pemerintahan Umum dan Otonomi Daerah*, known as PUOD), the Ministry of Internal Affairs, was appointed as an organizer of population registration in Indonesia, from the lowest level (i.e. village) to the higher level (i.e. district, municipality or regency, and province).

Information collected in the civil registration includes vital events such as births, deaths and migration, which are experienced by individuals or household members and are reported to the village authorities. The population register covers all of Indonesia's geographical areas. However, there are wide local variations in the extent to which these regulations are followed. Population data based on this registration system are obtained from administrative records of village authorities. At the regional and national levels, data are obtained by combining records of all villages. This exercise uses the *de jure* approach. In other words, persons recorded in the population register are those who are legal residents of the respective area. Several forms and documents provided at the village level are as follows (Tukiran, 1991):

A-1: Family registration card (Kartu Keluarga/KK)
A-2: Population identity card (Kartu Tanda Penduduk/KTP)
A-3: Birth report
A-4: Still birth or birth death report
A-5: Death report
A-6: Residence move report
A-7: Record of village population

A-8: Record of mutation resident
A-9: Monthly record of village

The registration data collected from the village level are summarized in document A-9 and then submitted to the higher administrative levels. At the higher administrative level, those population registration data are aggregated in the following documents:

B-1: Report of population in district, *Indonesians*
B-2: Report of population in district, *Indonesians* and *foreigners*
B-3: Report of population in district, *foreigners*
B-4: Report of population in regency/municipality, *Indonesians*
B-5: Report of population in regency/municipality, *Indonesians* and *foreigners*
B-6: Report of population in regency/municipality, *foreigners*
B-7: Report of population in province, *Indonesians*
B-8: Report of population in province, *Indonesians* and *foreigners*
B-9: Report of population in province, *foreigners*

The reporting system above shows that the accuracy of data at village level significantly affects the accuracy of data at higher levels. Once there are some errors in the village data, it will be accumulated to the higher levels. An assessment of some documents at village level is provided as follows.

Regarding a family registration card, every household in Indonesia whether living as a nuclear or an extended family possesses a family registration card. It consists of information on the address of a household (i.e. village, district, regency and province), composition and demographic variables of household members. Demographic variables, such as name, sex, relationship to the head of household, place and date of birth, marital status, religion, citizenship, education, literacy, work status, entry date to the present village, previous residence, and name of parents, are recorded. Meanwhile, identity cards are compulsory for all Indonesians aged 17 years or ever married. Information on name, sex, blood type, marital status, work status, place and date of birth, and address of resident is recorded.

In fact, in view of the type of data recorded, registration is important as a demographic data source. It provides basic demographic data particularly on vital events over a given period. However, in its implementation registration is plagued by some problems, which cause the data to be unreliable. Let us take the case of the identity card and family registration card. One has to be registered as a resident of a certain region in order to obtain an identity card in that region. As such, the family card is a pre-requisite. Most temporary migrants in Jakarta or other big cities, for example, often have more than one identity card. There is hardly any effort to check or prevent duplication. It means that once we use the identity cards as a data source for estimating population size, then double-counting is inevitable. Take the example of a job application for business purposes in Jakarta. A regional identity card is one of the documents required. Hence, many migrants have registered themselves as members of resident families in Jakarta (i.e. friends or relatives). Economic reasons

constitute the motivating factor on the applicants and the officer who provides those documents.

Other registration documents (i.e. the birth, death and migration reports) are not favored among Indonesians. Written document reports have less valued than verbal or oral cultural testimonies, particularly among rural communities. Besides that the officers in charge have not yet succeeded in encouraging people to register. In short, population registration data from the Ministry of Internal Affairs are not without shortcomings. The data procedures are far from accurate and population estimates based on this system consistently under-represent the actual situation.

4.4.2 Role of the National Family Planning Co-ordinating Board

In order to ascertain the potential target and to evaluate of the family planning program in Indonesia, the National Family Planning Coordinating Board (*Badan Koordinasi Keluarga Berencana Nasional*, known as BKKBN) focuses on collecting data from eligible couples and those practicing contraception. Data collection is organized by the fieldworkers from the regional family planning office.

Data on population and contraceptive prevalence are recorded in a form called R/I/PUS, which is similar to the family card (*A-1 form*) in population registration. The difference lies in some extended variables that are covered in this form, such as contraceptive use dynamics. Using the census system, the data are collected directly from the household in Indonesian regions once a year. In addition, every fieldworker at district level has to make a monthly report to be submitted to the national office in Jakarta and the municipality or district office.

Similar to the population registration system, the accuracy of the data recorded in the family planning program depends on the collection system at the lower level, i.e. the district level. In fact, regional coverage by every fieldworker differs. Districts in Java and the rest of Indonesia are governed by different situations in terms of geographical access and distances. In addition, the fieldworkers are already overburdened by duties related to other family planning programs, and may not give priority to data collection. Hence, very often the data recorded are based on the secondary reports from the voluntary workers and not directly observed.

4.4.3 Role of the Ministry of Justice

Looking at all registrations, the registration coordinated by the Ministry of Justice is only one that has a legal basis, namely *Kantor Catatan Sipil* [Civil Registrar's Office] (Sugito, 1976:4). This office issues vital documents, such as birth certificates and marriage certificates. In the birth certificate, basic information is recorded, i.e. date and place of birth, name of child, names of his/her parent (mother and father), and date of registration. In a marriage certificate demographic information of the couples is recorded. It includes name, place and date of birth, occupation, address of current residence, and date of marriage.

The information collected, however, is extremely rudimentary and only covers a small part of the total Indonesian population. Although a regulation from the *Majelis Perwakilan Rakyat* [People's Consultative Assembly, known as MPR] was passed in 1966 to encourage people to undertake registration, only a small number of the population have done so. Some people do have birth certificates mostly for administration purposes, e.g. to enroll in school or to apply for a job. In other words, the people do not understand the main purpose and consequences of this registration either for the government or for themselves. In the case of marriage registration, some people (i.e. particularly the Muslim community) prefer to register their marriage at the Ministry of Religious Affairs, instead of the Civil Registrar's Office. In some cases it may be possible that a marriage is registered in both offices, especially for those who intermarry (i.e. different ethnicity or religion).

The Ministry of Justice is also responsible for registration of international mobility. Act no. 9/1992 section 2 and 3, concerning immigration, states that any person who enters and departs from the territory of Indonesia is required to posses a valid travel document and to pass through inspection by an authorized *immigration official* at an *immigration checkpoint*. The immigration official is appointed by the Ministry of Justice. The registration documents issued by the Ministry of Justice are passports or travel documents and disembarkation/embarkation cards at the Indonesian border. Both registration systems deal with international travelers, people who enter and depart from the country. Thus, the data collected are potential data sources for international migration. However, some limitations are inherent in the process of collecting these data, particularly its management and the accuracy.

Consider a passport or travel document. Different ministries issue several types of passports or travel documents depending on the purpose of the travel. The Ministry of Foreign Affairs issues a diplomatic passport (*black in color*) and a service passport (*blue in color*) for people who travel out of the country on behalf of the governmental offices. The Ministry of Religious Affairs issues a Hajj/pilgrim's passport (*brown in color*) for people who travel to Saudi Arabia, Middle East for religious purposes. Meanwhile, the Ministry of Justice issues an ordinary passport (*green in color*) for people who travel for other purposes, e.g. a tourist or on private business. Thus, the potential to overlap is present. One person may have more than one document. For example, a person who has an ordinary passport may also have a service passport once he/she has to travel on behalf of his/her office, i.e. the governmental offices. As there is an immigration office in every regency or municipality level, a person may also have two ordinary passports when he/she has been registered in two family registration cards [*Kartu Keluarga*]. In short, the registration data from these travel documents are still far from accurate.

In terms of a disembarkation/embarkation card, information collected focuses on the characteristics of travelers. It includes the type of travel document used (i.e. ordinary, service, diplomatic, or pilgrim passports), name, sex, place and date of birth, citizenship, place and country of residence, last place of embarkation, purpose of entering or leaving the country, length of stay, and date of departure or arrival. The data collected may be used as an alternative source of international

mobility data in Indonesia. However, due to technical and management problems, not all information recorded in this card has been fully managed or documented. It is because the purpose and utilization of this card are mainly for checking at the immigration checkpoint. Follow-up program on compiling and recording all information provided in this card has not been done. Only information on the total number of international travelers distinguished by sex and place of embarkation/disembarkation has been reported. In other words, the data derived from this registration are also far from reliable.

4.4.4 Role of the Ministry of Religious Affairs

Life cycle events recorded by the Ministry of Religious Affairs cover marriages, divorces, and reunion of the Muslim population. This office is called the *Kantor Urusan Agama* [Religious Affairs Office, known as *KUA*] and it is stationed in every district in Indonesia.

Consider a marriage certificate (*Buku Nikah*), where information collected pertain to date of marriage, identity of couple (i.e. name, place and date of birth, residential address, occupation, and religion) and their family background (i.e. name of parents, place and date of birth, residential address, occupation, and religion). However, the data collected do not concern the total population. A marriage certificate collects information on a few demographic variables from the couple and their parents, not from all household members.

A common custom in Indonesia is that the bride often hosts the wedding ceremony. Thus the marriage will be registered in the religious affairs office of the district where the bride lives. Soon after a marriage takes place, the bride follows the bridegroom or the way around. Both of them may also move to places different from their usual residence. Therefore, reporting and recording marriage data from this office is insufficient and statistically the data do not meet national needs.

4.4.5 Role of the Ministry of Health

The Ministry of Health has organized a system of vital registration since the late 1960s. It is called the three copies (‘*tripikat*’), which covers information on (1) births, (2) deaths and (3) still births. The village headmen have the responsibility of collecting these data, which are reported by the villagers who reside in their areas. The data collected are recorded in three different forms, i.e. forms of A-3, A-4, and A-5 (see section 4.4.1). Information in this registration system is collected from all groups of people. This registration, however, is not backed by a regulation.

Another system to record information on the health status of children and mothers at village level is carried out by the *Posyandu* (*Pos Pelayanan Terpadu,* or integrated health service center), the monthly village gathering where volunteers promote child and maternal care and nutrition. The Ministry of Health through the health centers and hospitals at district level supports this activity. This is one of the programs that have been conducted by the government of Indonesia under the

umbrella program of Health for All (HEA), as signed at the UN conference in Alma Alta in 1979. Nevertheless, the purpose of the program is not data gathering. Therefore, the information collected in this program cannot be used as a data source in demographic analysis.

4.4.6 Role of the Central Bureau of Statistics

Since 1968 the CBS has reactivated it efforts to gather information on total population at village level classified by sex, adult/child category, citizenship, and land area of the village. This activity has been carried out regularly in the middle and the end of the year. It is successful in view of the reporting and recording of the information. The coverage in Java is complete, while in the rest of Indonesia it reached about 95 percent of coverage one year after the report time (ICBS, 1994a; 1994b). The delay occurred in difficult areas, such as East Timor, Maluku and Irian Jaya. After 1975 the scope of information gathered broaded with the inclusion of Chinese citizens resident in Indonesia and Indonesians of Chinese descent.

Information recorded in this system is obtained from village records and collected by *Mantri Statistik* stationed in each sub-district. Several forms are used (which is different from the village registration form):

A-1: Report of total population at district level: Indonesians and foreigners
B-1: Report of total population at district level: foreigners
C-1: Report of total population at district level: Chinese
A : Report of total population at regency/municipality level: Indonesians and foreigners
B : Report of total population at regency/municipality level: foreigners
C : Report of total population at regency/municipality level: Chinese

As the methods used and timing of data collection are different from the census and intercensal survey, the data on total population estimated from this registration system are also significantly different from those data sources. Persons recorded in the population register are those who are legal residents of the respective area. Furthermore, it is collected from the report of village registration. Thus, the accuracy of the data collected again goes back to the accuracy at the village level which is the first step in the data collection system.

However, in the absence of more comprehensive data sources, registration statistics, when carefully used comprise a useful sampling frame and a valuable source of demographic events for individuals as has been shown in studies of Jakarta (Heeren, 1965; Eander, 1965), West Java (Hugo, 1978) and East Java (Steele, 1980).

4.5 Database for Projection

Population projections employ data on the age-sex composition of the base population as the base data as well as on factors of population change, i.e. fertility, mortality, and migration, during a specific period of time (base period). Rees and

Woods (1992) have pointed out that multiregional projection would be a great value in population research in developing countries if only an adequate database could be established. Using previous descriptions on data sources in Indonesia, this section focuses on the base data needed for Indonesian multiregional projections. As regional surveys covered only small samples and are not representative, for this time, we exclude those surveys as part of the data sources considered. This section focuses more on the establishment of base data from census and survey data and the problems encountered. The types of data derived from those data sources are also discussed.

4.5.1 Types of Data

In most cases, demographic events (i.e. birth, death, and migration) recorded in census and surveys are observed retrospectively and thus incomplete. It refers to a particular period only and truncates at the census or survey time. The period of observation is called *observation window*. If the observation window is one year, we observe the events during a period of 12 months. As the estimated demographic parameters refer to a certain period, particularly more recent period, then the observation window becomes important. Before using the data from censuses and surveys, it is necessary for us to understand the types of data observed in those data sources. The following data types are distinguished (Willekens, 1999):

a. Micro data: data on individuals in a population (sample) during the observation windows.
   a.1. Event data:
      - occurrence of an event in observation period
      - time of occurrence: the time is generally measured as the duration of exposure to the risk of experiencing the event.
   a.2. Status data:
      - current status, i.e. migrant status and marital status at one point in time
      - status at two points in time (transition data): i.e. current status and status at a previous point in time (e.g. residence 5 years ago, at birth, or at age 12 years).
      - Status at several points in time: i.e. current status and status several points in time (e.g. current residence and residence 5 years ago and at birth or at age 12 years).

b. Grouped (macro) data
   b.1. Events: number of events during the period of observation.
   b.2. Transition data: number of persons who have different status at different points in time.

Given the data types described above, life events that are recorded in Indonesian censuses and surveys can be distinguished as micro data that consist of event and status data. On the other hand, macro data are often found in the reports.

The next section will elaborate the data types that are recorded in the censuses and surveys. It starts with base data for population, fertility, mortality, and migration.

4.5.2 Population Database

Since the registration data are inadequate, population data for projections are often derived from population census. This is due to the fact that the census is mainly aimed at collecting data on population size as well as other basic demographic variables. Indeed, compared to other data sources, the main features of the census are in its sample and region covered. It covers larger samples and entire regions in a country. Nevertheless, before accepting the census or intercensal survey to serve as base population data in the present study, the data should be evaluated to detect errors and to correct them.

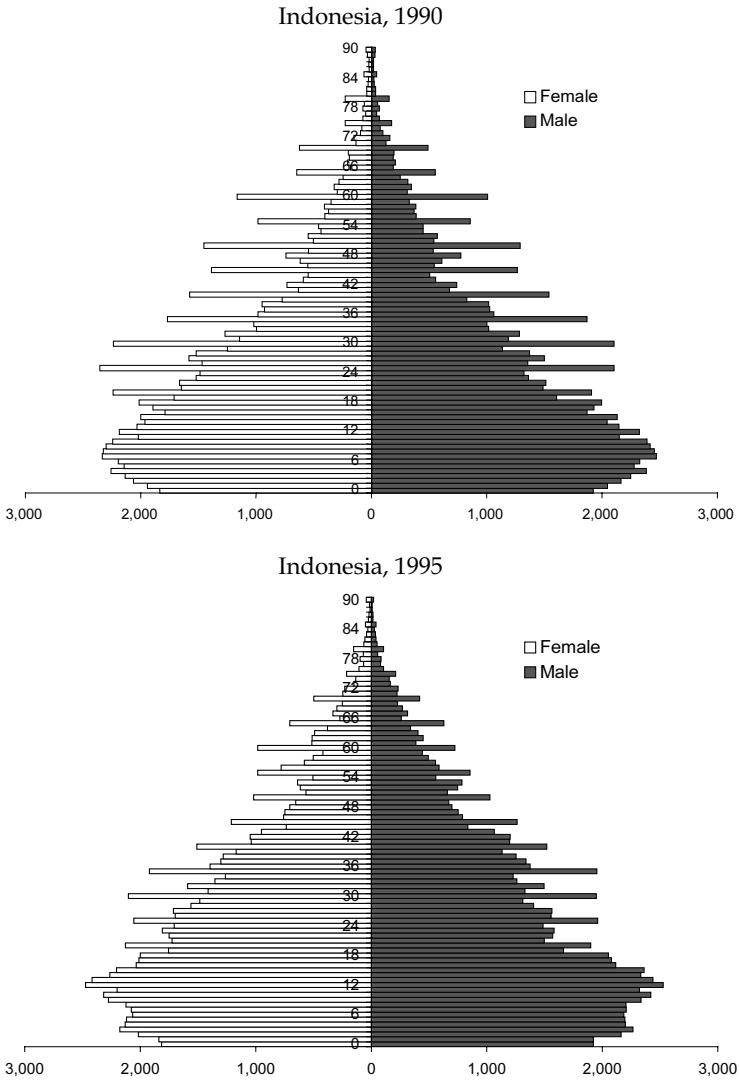
Base population data needed for multiregional projection consists of the number of population disagregated by age, sex, and current place of residence. Single years of age are needed in order to obtain a single-year projection period. In addition, the unit analysis of administrative regions considered is the province. As discussed in the previous section, Indonesian census does record information on age in terms of year as well as date of birth (i.e. month and year) and administrative units in terms of province, district, sub-district, and village for current residence. Therefore, it is easy to obtain base population data for males and females in single years of age and provincial current residence. Nevertheless, the enumeration in census and intercensal survey is not perfect. At least two measurement problems may be encountered, namely age misreporting and place of usual residence.

The first problem on age misreporting is often caused by non-response, recall error, and incorrect response. Mamas (1992) mentioned that it is very difficult to obtain correct answer to the question on age of respondent in Indonesian census and surveys, especially among the older generation who have a low level of literacy or education. Some respondents could not recall their age. Several approaches have been used in order to answer this age question; i.e. using a historical event calendar (independent days in 1945) or comparing their age to other respondents who know exactly their own age. In case those approaches do not work, then guesswork is done. Often in this guesswork, respondents would give their age according to particular digits (i.e. figure ending in 0 and 5). This phenomenon is well known as "*age heaping*" or digit preference. Using the population pyramid of single year age, Figure 4.1 shows that in the 1990 census and the 1995 intercensal survey the age preference problem still persisted. Various methods have been developed to detect age misreporting. The ICBS has applied analysis of digit preference and age ratios (Mamas, 1992). Techniques on adjustment methods, i.e. quasi-stable population, reverse survival, and moving average, have been used to make some corrections (see Chapter 3, section 3.3.1).

The second problem is about the place of usual residence. It relates to the enumeration system, which employs *de jure* and *de facto* approaches in Indonesian censuses and surveys. Within this framework, a person may be counted in the usual

place of residence or in the location where he/she is found at the time of census. The census may count a person more than once. Hence, it would be entail overenumeration in one place and underenumeration in another place. For instance, when a member of family has a job in a place different from his/her usual residence, then he may be enumerated at two places. During work, he/she may live in the working place and during the holidays he/she may live in his/her region of origin. Nowadays, some old parents live with their children while still keeping their house in their place of origin. Temporal change in residence could be a source of errors. In addition, usual residence in a certain region is also defined using the minimum length of stay of 6 months or determined in terms of intention to stay in that region in spite of the current length of stay being less than 6 months; in other words, the number of people staying in one region including temporary visitors (i.e. those who have stayed more than 6 months).

Figure 4.1 Age heaping problem in Indonesian data, 1990 and 1995



Sources: the 1990 census and the 1995 SUPAS

As the base population data will be derived from the census and intercensal survey, the present study has to consider the above shortcomings. An adjustment method may be used to correct the misreported data. This will be discussed further in Chapter 7 on the construction of the base data for projection. Meanwhile, the problem of usual residence may still not be easy to correct. The present study will use basically the information on the current residence as provided in the census and survey.

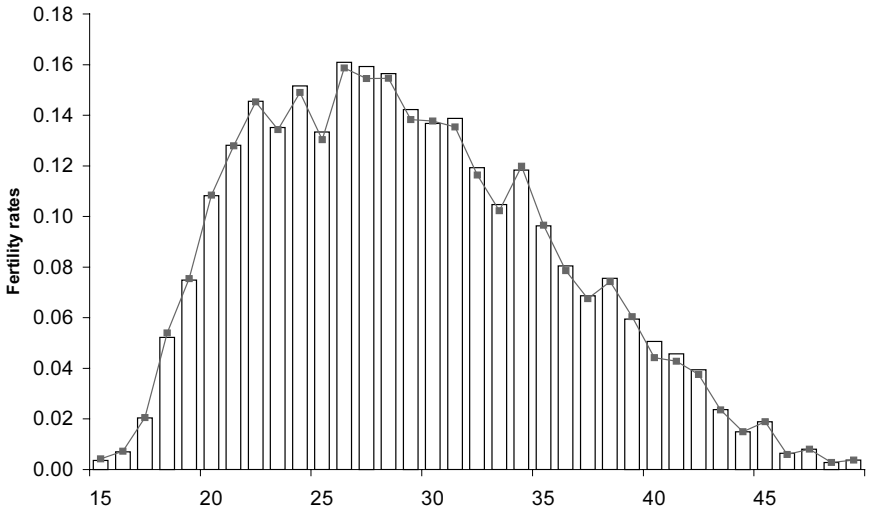
4.5.3 Fertility Database

Data sources that provide information related to the fertility behavior are the census, the intercensal survey, the SUSENAS, the IDHS and the IFLS. Information on fertility derived from the census, the intercensal survey, and the SUSENAS is mostly transition data, i.e. cumulative number of children ever born during a woman's life. There is hardly any information about timing, e.g. age of a woman when she gave birth. With these data, the indirect method (i.e. Brass method) is applied to estimate the fertility rates. On the other hand, the IDHS and the IFLS record the event data, which provide time of occurrence (i.e. birth date of children and age of the mother). In the direct method, the fertility rates are calculated directly from the birth history by determining the number of live births (event) and women exposed to risk during a particular period, i.e. the recent period prior to survey.

In this research, the direct estimation method is considered for estimating fertility rates. Regarding the main objective of the data sources, the IDHS data are the best data source that will be used for estimating fertility rates. The IFLS data can not be used as a data source since it fails to show the levels and patterns of fertility in each province. Nevertheless, as seen in Figure 4.2, the fertility rates obtained from the IDHS data are still not perfect. The irregularities appear in the age patterns of fertility rates. Therefore, this problem should also be corrected later when constructing the base fertility data. A detailed method to estimate the fertility rates in this research will be discussed throughout in Chapter 7.

In practice, the IDHS data provide a rich source of information on fertility both at national and regional levels. Information on children was collected from their mothers who were the respondents in the survey. For each child born, the mother was asked about the date of birth, gender and highest level of education completed by the child (reported within broad categories). Moreover, the mother was also asked whether the child still lives with the mother and, if not, the age at which the child left home or died. The data include detailed information about the mothers, including their current age, ethnicity, educational level, and complete marital histories.

Figure 4.2. Irregularities concerning age patterns of fertility rates, Indonesia, 1995-1997



Source: the 1997 IDHS

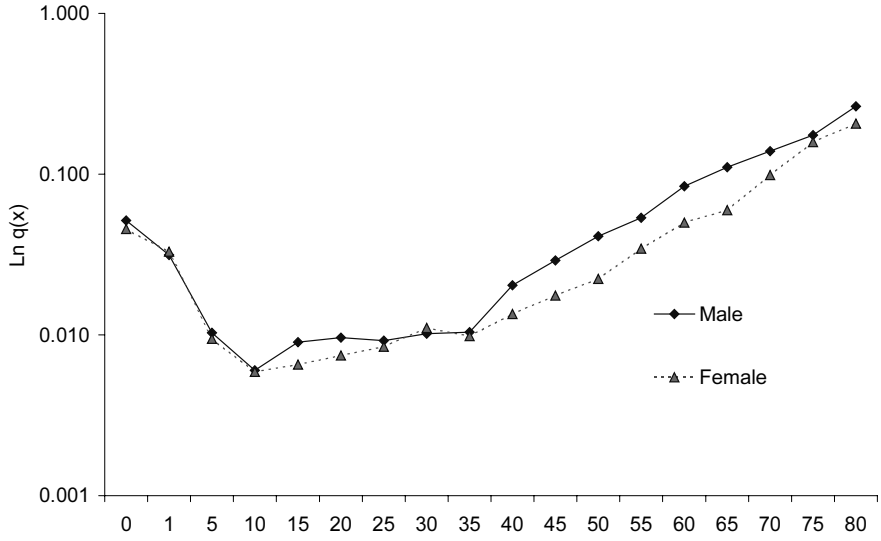
4.5.4 Mortality Database

As Chapter 2 shows, adult mortality (death) data by sex and age are very difficult to obtain from the census data. In the previous projections, adult mortality data were often estimated by using an indirect method, i.e. the patterns from the West model life table. Meanwhile, data on infant mortality are provided in the IDHS data. The data on infant mortality recorded in the IDHS are event data, it consists of the time of occurrence of an event (e.g. age of children when they died). Furthermore, some surveys have recorded data on adult mortality, e.g. the SUSENAS and the IFLS.

Since 1992, the SUSENAS has included a question on adult mortality. It recorded deaths among the households' members that occurred within 12 months prior to the survey date. As the occurrence time of the event was recorded, in terms of age of respondent when the event occurred, then mortality data in this survey are categorized as event data. Nevertheless, the exact time (date and month) of the occurrence was not known. Therefore, it can be assumed that the occurrence of the event (death) was in the middle of the observation period (i.e. 12 months). Thus the adult mortality rates can be estimated from these data.

On the other hand, the IFLS recorded data on infant and adult mortality (i.e. parent, brothers or sisters, adult household members). As the time of occurrence is recorded, these data are then considered as event data. However, the region and sample covered in this survey are limited. The main notion of this survey is to see the interaction among variables, such as mortality and household circumstances, and to show the levels and trend of mortality in every province in Indonesia. Therefore, we cannot yet use the IFLS as an alternative data source for estimating adult mortality.

Figure 4.3. Irregularities in age patterns of mortality, Indonesia, 1996



Source: The 1996 SUSENAS

Based on those facts, mortality data in this present study will be taken from two data sources: the IDHS and the SUSENAS. The IDHS provides data on infant mortality, while the SUSENAS has information on the number of household members who had died within 12 months prior to survey. The irregular age patterns however also appear in mortality rates obtained. Thus, the approaches used for estimating mortality rates will consider model age schedules.

4.5.5 Migration Database

As was pointed out in the sections on data sources, Indonesian data on migratory movement particularly international migration are relatively poor as compared with the data on fertility and infant mortality. This section deals with data sources for both internal and international migration data.

4.5.5.1 Internal Migration

The question on internal migration has been addressed in the census, the intercensal survey and the IFLS. For population projection, i.e. see Chapter 3, primary sources of information on internal migration are census and intercensal survey data. The information collected is as follows:

- *current residence*
- *residence 5 years ago*
- *place of birth*
- *duration of stay in the current residence*

Using the information on residence status at two points in time (i.e. the current residence and the residence 5 years ago or residence at birth date), the census and intercensal survey typically provide *status data*. It indicates whether a person has changed his/her residence status or not. For the younger ages, such as 0-4 years old, migrant data can be obtained by comparing the place of residence at the time of census with the place of birth.

Since the data are obtained by comparing the place of residence of a person at the beginning and at the end of a fixed interval length (i.e. 5 years), then it can be referred to as migrant data (Rees and Willekens, 1986). Table 4.7 shows how the migrant data can be obtained and estimated. The indexes *i, j*, and *k* refer to regions. Consider migrant data code 04 and 05. The first migrant (code 04) resided in region *i* since he was born up to 5 years prior to the census date. When the census was carried out, he had moved to region *k*. Meanwhile, the second migrant (code 05) was born in region *i*, and 5 years prior to census date he had moved to region *j*. During the census time he was a resident of region *k*.

Table 4.7 Migrants and non-migrants in Indonesian census and survey

Classifications	*Typology*	*Code*	*Residence*		
			Birth Place	*t-5*	*T*
Age 0-4	Migrant	01	*i*		*k*
	Non-Migrant	02	*i*		*i*
Age 5+	Migrant				
	- Lifetime*	03	*i*	*j*	*i*
	- Recent native	04	*i*	*i*	*k*
	- Recent non-native	05	*i*	*j*	*k*
	Non Migrant				
	- Stayed	06	*i*	*i*	*i*
	- Recent	07	*i*	*j*	*j*

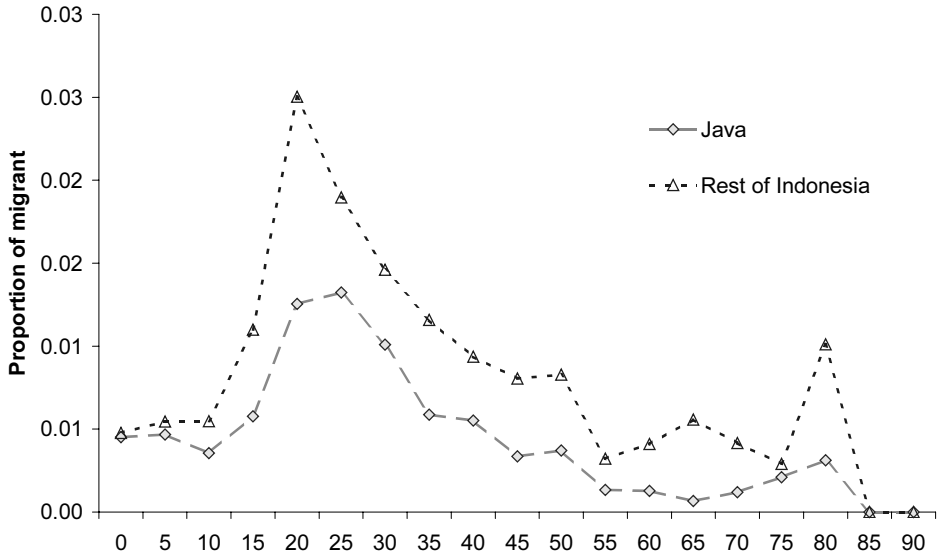
Notes: * Lifetime migrants are defined as persons who were enumerated at the time of census or survey in a place different from the place where they were born.

Using additional information on the duration of stay in the current residence and assuming that migration might take place in the middle of the duration period; the *status data* (migrant) can be converted to the *event data* (migration). Hence we can calculate the migration rates from the census and the intercensal survey. Due to smaller samples in the intercensal survey, we only use the census as data sources. Nevertheless, in some cases when the migrant data are tabulated by sex and age (i.e. single-year and even five-year age groups), the problem of zero sample or no events has been found.

Another data source, which provides information on internal migration as event data, is the IFLS. In migration history, the time of occurrence was recorded. Thus, the event data can be obtained from these data. The IFLS, however, does not attempt to show the levels and patterns of migration for every province. The IFLS is

an appropriate source to study the interaction between migration variables and other variables, i.e. households' socioeconomic characteristics. As with fertility and mortality, the IFLS could not be used as a data source for inter-provincial migration. In addition, the irregularities of age patterns are also apparent in migration (see Figure 4.4). Missing and incomplete data problems are also found in some regions. Therefore, the model age schedule will be applied to construct the base migration data.

Figure 4.4. Irregularities in age patterns of migrants proportion, Indonesia, 1990-1995



Source: the 1995 Intercensal Population Survey (SUPAS)

4.5.5.2 International Migration

It has previously been discussed that there are several data sources that can be used as data sources for deriving international migration. For example, the Ministry of Justice has collected information on arrivals and departures of passengers at the official borders of the national territory. In addition, the Ministry of Justice plays a decisive in checking the number of passports produced and some other document required for travel abroad. From the Ministry of Labor we can obtain the number of people sent abroad to work. However, such data are still not processed in such a way as to render them useful for statistical purposes. In other words, this information on international migration is still unreliable.

In view of such problems with the data, the international migration variable is often excluded in the population projection. Hugo (1995) pointed out that research on international migration in Indonesia is still limited due to a number of reasons. First, the scope of international movements was very small until about two decades ago and is still limited to elite groups. Second, there is a lack of adequate data collection systems either to measure stocks or flows. Third, an increasing proportion of international migration is undocumented or illegal. Fourth, little attention has

been given to the family as a unit of study. Consequently, there is a lack of accumulative knowledge on international migration in Indonesia. In order to meet this challenge, this present research will start to use the international migration variables.

To begin with, potential information derived from the census has to be assessed. Data for immigrants are derived from the information on the number of people who have resided abroad 5 years ago. Meanwhile, figures on emigrants can be obtained from the immigration data collected by the Ministry of Justice. The data include information on the number of passengers who are going and coming from abroad in every embarkation point and the number of people who have travel documents (i.e. passports).

4.6 Conclusion

This chapter presented an account of demographic data sources. It shows that the number of data sources in Indonesia has significantly increased. National population census is a data source that has been widely used and carried out since the early 20th century. Over time, the enumeration methods have improved along with the quality of data. Variables covered have also extended and more information has been collected on the demographic variables (i.e. number of children born, infant death, and migrant data).

In accordance with improvements in national development and institutional collaboration, more regular surveys that focus on national or regional dimensions have been conducted. The collaboration between national and international agencies has contributed to regular surveys on demographic aspects: i.e. IDHS and IFLS. The national surveys are often used to show the levels and patterns of demographic variables in every subnational region. Regional surveys are used to show the characteristics of demographic variables in a certain region. Moreover, both national and regional surveys are correlated and give more possibilities to analyze demographic changes in Indonesia and its regions.

In Indonesia, the registration system was started a long time ago and involved some governmental institutions. The data obtained, however, are still far from accurate. It is even still inadequate in areas with poor communications or where the level of education is low. Double collecting of similar information often appears in the implementation of this registration system. An individual does not have a single registration number. Furthermore, lack of information makes people unappreciative and unclear about the significance of the registration data. In addition, there is still no appropriate national institution to regulate and enforce the population's participation in the registration system.

Nevertheless, those data sources provide information on demographic variables (i.e. fertility, mortality and migration) in the form of event and status data. From event data, person-time exposure can be measured to estimate the event rates. From status data or transition data, risk sets can be measured to estimate event probabilities.

Assessments of the data sources indicate that the data from censuses and surveys are mainly used as base data for estimating demographic variables. Gathering or developing the base data, ensuring that they are of adequate quality, adjusting them where necessary by means of demographic techniques, and assessing their comparability among regions are all activities that ensure the success of the projection process. Once the base estimates of demographic parameters are derived, we must make reasonable and consistent assumptions about the future course of fertility, mortality, and migration. In the next chapters we will elaborate those topics further.