

(Client report for Statistics South Africa)

**POTENTIAL USE OF 2001 CENSUS DEMOGRAPHIC VARIABLES IN  
DECISION-MAKING, PLANNING AND DEVELOPMENT**

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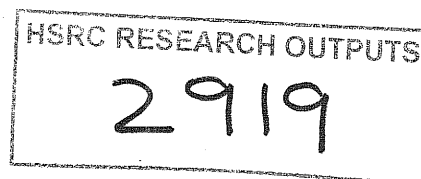
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## **ABSTRACT**

The paper provides an historical background to census taking in South Africa as a primary source of demographic information. It outlines the importance of demographic information for planning, and identifies the demographic variables in the 2001 population census of South Africa. Finally, the paper describes ways the demographic variables in the 2001 population census of South Africa can be applied in decision-making, planning and development.

## INTRODUCTION

The United Nations (1958) defines a population census as “the total process of collecting, compiling and publishing demographic, economic and social data pertaining, at a specified time or times, to all persons in a country or delimited territory”. All though censuses attempt to collect demographic, economic and social data pertaining to all persons in a country, this is never achieved in practice in any population census in the world, as there is always an element of undercoverage. The undercoverage of the population in censuses however, varies from country to country depending on the level of statistical development of the country. To this extent, the definition of a census provided by the United Nations is idealistic.

Population enumeration in South Africa dates back to 1652. The first reliable census was however in 1865 in the Cape Province. In 1904, a census covered what later became known as the Union of South Africa. The modern census in South Africa began in 1911 and has continued to date. Censuses in South Africa since 1911 did not consistently cover the entire union of South Africa; the last census covering the entire country during the apartheid era was that in 1970. The apartheid censuses of 1980, 1985 and 1991 excluded the former homelands – Transkei,

Bophuthatswana, Venda and Ciskei (TBVC). (See Khalifani, Zuberi, Bah and Lehkola: in press.)

Following the new political dispensation in South Africa and the first democratic elections of 1994, the first nationwide census since 1970 was carried out in October 1996. The 2001 population census was the second post-apartheid census in South Africa that attempted to canvass the entire country.

The UN's definition of census provides a broad framework for any country to give content to its census, as an aid to planning though this is not always is easy. For example, while some may see the main objective of a census as the determination of the number of inhabitants (see Shryock, Siegal and Associates 1976), others see the purpose of a population census as the supply of knowledge for the guidance of public policy (see Crone, 1990). Census planners are often caught between these two historically evolving views of the purpose of a census when designing the content of the census. South Africa's post-apartheid censuses of 1996 and 2001 questionnaires may be seen as an expression of the latter view as they are among the longest contemporary census questionnaires in the world. The census is a primary source of demographic information especially in countries where vital registration is non-existent or where it is of limited coverage and deficient. South Africa has included a variety of

demographic questions in its censuses. The demographic questions in the 1996 and 2001 post-apartheid censuses in South Africa were largely similar.

## **IMPORTANCE OF DEMOGRAPHIC INFORMATION**

Demographic information constitutes the bedrock of all socio-economic planning in any country. The collection, analysis and dissemination of accurate demographic information enable policy makers to plan for the future development of the country. Issues like the future size of the labour market, unemployment, job creation, poverty, environmental degradation etc among other factors, are intrinsically linked to demographic processes. Unfortunately, this link is usually not quite obvious and analysis of various socio-economic phenomena pertinent to informing planning, decision-making and development in the country are often done in isolation of demographic processes.

The objective of this paper is: (1) to identify the demographic variables in the 2001 census; (2) to describe ways the demographic variables in the 2001 census can be applied in decision-making, planning and development.

## **DEMOGRAPHIC VARIABLES IN THE 2001 CENSUS**

The demographic variables in the 2001 census may be broadly classified as: (1) Age and sex, (2) fertility, (3) mortality, and (4) migration variables. In combination, these variables determine the future development of any population with regard to size and structure (composition) of the population. Planning in the private and public sectors is often aimed at meeting some present and future “demands” by the population in order to improve the standard of living of people in the population. Knowledge about the age-sex distribution, fertility (including nuptiality), mortality and migration patterns in any population are therefore critical to planning to meet these demands. Insights into the magnitude of future demands in various sectors are usually obtained from population projections. Population projections however require population parameters as inputs, which include include the age-sex composition of the population, fertility, mortality and migration rates.

The impact of these variables determines the rate of growth of any population growth. The rate at which the population grows has implications for planning in all sectors of the economy. Additionally, each of the variables has implications for planning for different sectors of the economy. The demographic questions in the 2001 census within the broad classification noted above are identified in the following section.

The section also provides some illustrations about ways the demographic variables can be applied in decision-making, planning and development.

### **Age-sex variables**

The age-sex distribution of a population is a crosscutting variable in planning in the sense that planning in all sectors need to take into consideration directly or indirectly, the age and sex composition of the population.

The following questions in the 2001 census provide the information about the age-sex distribution of the population:

What is (the person's) date of birth?

Is (the person) male or female?

The age-sex distribution resulting from the above questions is valuable information for planning and decision-making as it is intrinsically linked to all aspects of the life cycle including childhood, education, marriage, childbearing, entry into the labour market, retirement, ageing, morbidity and mortality (Udjo, in press). As already noted, the age-sex distribution of the population is an important input in population projections. On the basis of the results of the projections, policy makers are sensitized about

the probable future size of the population at national and sub-national levels. This in addition to other information enables policy makers to make decisions about allocation resources among competing demands. The sectoral importance of age-sex distributions includes the following.

#### *Age-sex distribution and planning for education*

The age-sex distribution can inform planning in the education. For example, the number of persons of school going age among others, provides a yardstick for gauging the magnitude of current and future demand for school infrastructure, teachers etc if certain standards are to be maintained or improved.

If the age-sex distribution is tabulated against educational attainment planners could have indication of the extent of sex inequality in educational attainment at a given age in the general population. This could inform decision-making on appropriate interventions to address sex imbalance in educational attainment in the country.

#### *Age-sex distribution and labour market planning*

The age-sex distribution has implications for labour market planning in various ways. The ability of any government to create jobs among other



factors depends on the age-sex structure of the population. The age-sex distribution in South Africa gives an indication of the size of the population that would move in and out of the labour market in successive years. The current size of the labour market can be obtained from the age-sex distribution of the population. This provides some indication of the magnitude of additional jobs that need to be created to absorb new entrants into the labour market taking into consideration existing jobs. In general therefore, policies aimed at reducing unemployment need to take into consideration the size of the labour market as determined by the age-sex distribution.

It should be stressed however, that the size of the labour market is partly determined by fertility at the individual level. Put differently, the ability of policy makers to create jobs is partly dependent on the fertility of couples since the rate of childbearing partly determines the number of new entrants into the labour market in successive years.

A related issue to labour market considerations is economic dependency. Age dependency is often used as a proxy for economic dependency because of problems in defining economic dependency. An age dependency ratio is the ratio of children (0-14 group) and the elderly (65 years and above) to the working age group (15-64 years old). It is thus a proxy measure of the magnitude of people who are not working that are

dependent on the working population. This information can be obtained from age-sex distribution of the 2001 census. The main determinant of the magnitude of the dependency ratio in any population is the number of children aged 0-14 relative to the working age group. Thus, the age dependency ratio is a strong indicator of the magnitude of the “burden” of children on the working age group. A large burden of children potentially reduces the saving capacity of the labour force, which in turn potentially reduces investment and capital formation in the population. Economic policies designed to stimulate the economy would be enhanced if they are formulated with a knowledge of the magnitude of the burden of children on the working age group.

#### *Age-sex distribution and planning for social welfare services*

Information about the magnitude of the “burden” of children is important for planning in other ways. For example, the information could be used by policy makers to assess the adequacy and distribution of existing facilities (such as recreational centres) for children. This information could inform planning for the provision of additional facilities if necessary.

The age-sex distribution from the 2001 census provides a yardstick for measuring the current size of the elderly population by sex. The future size of the elderly population can be estimated from the current age-sex

distribution combined with other demographic variables. This information is critical to appropriate policy decisions with regard to resource allocation to meet present and future needs of the elderly population including old age benefits, old age homes and other pertinent social welfare services for the elderly. This may be important where the traditional support systems for the elderly may be eroding due to increasing modernization and urbanization.

#### *Age-sex distribution and planning for housing*

The 2001 census age-sex distribution is important for planning for the provision of housing units. Combining the age-sex distribution with the headship information (based on the relationship question) can be used to estimate future housing requirements. This is valuable information for planning in the housing sectors since it has implications for resource allocation.

#### **Fertility variables**

Fertility relates to the number of live births a woman has had. This has two components: lifetime fertility and current fertility. The former is measured by parity at each reproductive age group (children ever borne by women in each reproductive age group). The latter is measured by the

total fertility rate (the number of live births a woman would have if she survived up to age 50 years and experienced the current fertility rate at each reproductive age group).

The following questions constitute the fertility variables in the 2001 census:

(For women aged between 12 and 50 years at the time of the census)

How many children, if any, has (the person) ever had, that were born alive?

How many of these were boys?

How many of these were girls?

If (the person) has ever given live birth: when was (the person's) last child born?

Teenage fertility (fertility among women before the age of 20), and nuptiality (the demographic study of marriage and its dissolution) are two aspects of fertility.

The 2001 census provides indirect information regarding current levels of teenage fertility based on the question:

(For women less than 20 years of age at the time of the census):

How many children, if any, has (the person) ever had, that were born alive?

Direct information on nuptiality was collected on the 2001 census through the following question:

What is the (person's) PRESENT marital status?

The following illustrate how the fertility variables in the 2001 census can be used for decision making and planning.

#### *Fertility and planning for socio-economic demands*

Fertility is one of the direct determinants of population growth and age-sex distribution. The future size of the population and its age and sex composition are partly determined by the levels of fertility in the population. Consideration about the levels of fertility at the national and sub-national levels is therefore important for planning in all sectors.

Sustained high levels of fertility can increase some of the future socio-economic demands since high fertility fuels population growth. On the other hand, declining fertility may reduce future demand for certain kinds of services. Awareness of this is important for planning so that allocation of resources to some sectors can be reduced and diverted to others. A knowledge and quantification of the link between fertility and socio-economic demands thus enables decision-makers to allocate resources more efficiently. Apart from this and less obvious consideration, fertility levels have more obvious implications for planning in specific sectors. The following are some illustrations.

#### *Fertility and planning for education*

Sustained fertility decline decreases the proportion and number of persons in the school going age in the population. This in turn should decrease the cost of providing for education. The 2001 census fertility information in combination with other variables can provide insight in the assessment of present and future demands for schools, which would then inform planning in the sector.

#### *Fertility and the environment*

As already noted, high fertility fuels population growth, which could further put pressure on the environment. For sustainable development, environmental policies among other factors therefore need to take cognisance of fertility levels and trend.

For policy makers to provide adequate sanitation and safe water in the future they need information about the number of people that would require these services. One of the inputs that enable this assessment is fertility level of the population. The 2001 census fertility information is valuable in this context in providing base line information.

#### *Fertility and planning in reproductive health*

The level of fertility and teenage fertility in a population are among the commonly used indicators of reproductive health. The following are included in the Year 2000 health goals and objectives for South Africa.

1. Reduce proportion of births among girls aged less than 16 and 16-18 years to 5% and 10% respectively.
2. Increase clinic attendance for contraceptive and family planning services.
3. Reduce infant and child mortality and morbidity.
4. Reduce maternal mortality.

With regard to reduction of teenage pregnancy, information from the 2001 census can be used to gauge the magnitude of teenage pregnancy in South Africa. This could be used as base line information for monitoring the effectiveness of programmes designed to achieve reduction of teenage pregnancy.

Indirect insights into the other three health objectives could be obtained from the 2001 census fertility information. This is possible because a certain level of fertility implies certain levels of contraceptive prevalence (see Frank O, 1983). Also, certain levels of fertility usually imply certain birth intervals and hence certain levels of infant and childhood mortality and morbidity, and maternal mortality.

Information from the 2001 census regarding teenage pregnancy and fertility levels can therefore provide direct and indirect insights into the magnitude of certain reproductive health issues. On the basis of this, new policies may be formulated and/or existing ones revised.

Additionally, risk groups can be identified regarding some of the reproductive health issues outlined above by relating teenage pregnancy and fertility to other socio-economic variables (such as education and



income) in the 2001 census so that policies and intervention programmes can be more specifically targeted.

#### *Fertility and planning for the elderly*

As fertility declines, the proportion and also the number of elderly people in the population increases. This should lead to increase in geriatric diseases and demand for health services for the detection, management and treatment of geriatric diseases. Appropriate analysis of the fertility variables in combination with other demographic variables from the 2001 census can provide insight regarding the expected proportion and number of elderly persons in the future so that adequate health care services for the elderly can be planned for.

#### *Importance of marital patterns for planning*

Marital patterns (nuptiality) indirectly impact on some of the planning issues relating to population growth noted above since it is one of the direct determinants of fertility. Policies designed to impact on fertility levels are usually formulated within the framework of the direct determinants of fertility (including marriage patterns). Additionally, marital patterns may have implications for social welfare support at the level of

the household. A vulnerable group in this context partly due to marital breakdown might be households headed by females who have low levels of education as compared with other forms of household headship. The former might need more social welfare to alleviate poverty in such households. Information regarding marital patterns together with other socio-economic variables such as in the 2001 census could be used in assessing the need for such support.

### **Mortality Variables**

Mortality is the demographic study of death in human populations. The level of mortality is one of the indicators of the well being and health status of a population. It is also an indicator of the level of human development hence its inclusion in the construction of human development indices. The multi-dimensional approach to poverty recognises that the level of mortality is an indicator of poverty in a population.

There are several indices (measures) of mortality. The most commonly used measures include infant mortality rate, total mortality in the first five years of life (under five mortality rate), life expectancy at specific ages (including life expectancy at birth) and maternal mortality rate (maternal deaths per 10 000 women in the reproductive age group. Usually, it is the policy of every government to lower the level of mortality in the country.

For countries that have explicit or implicit policies relating to mortality or health goals (including South Africa), indices of mortality provide a yardstick for monitoring the success of programmes aimed at reducing mortality.

Because mortality is one of the components that determines population growth, it should be considered with other demographic variables in the planning process since it impacts on age-sex distributions, fertility (and migration, see next section).

The 2001 census included questions on mortality. These can be categorised broadly into two: *childhood* and *adult* mortality questions. The following were the childhood mortality questions.

(For women aged between 12 and 50 years at the time of the census):

How many children, if any, has (the person) ever had, that were born alive?

How many of these were boys?

How many of these were girls?

If the person has ever given live birth:

If boys: how many boys are still alive?

If girls: how many girls are still alive?

It is possible to compute indices of childhood mortality by sex on the basis of these questions. The adult mortality questions can further be categorised into indirect and direct adult mortality questions.

Indirect questions:

Is (the person's) own biological mother still alive?

Is (the person's) own biological father still alive?

Direct questions:

Has any member of this household died in the past 12 months?

Of those deceased:

What was the month and year of death?

What is the sex of the deceased?

What was the age in years at death?

Did the person die from an accident or through violence?

If the deceased was a woman under 50 years, did (the person) die while pregnant or within six weeks after delivery?

The indirect questions are referred to as the “orphanhood questions” for estimating adult male female mortality respectively. Although some researchers have misleadingly used the orphanhood questions to estimate the magnitude of orphans for persons less than 15 years in the context of HIV/AIDS, the questions were not designed for that purpose. They were designed for the estimation of adult mortality. Brass who developed the orphanhood questions cautions about the reliability of the orphanhood information pertaining to the younger persons (especially those less than 15 years of age) and recommends that this part of the information should not be used for estimation (see Brass 1971) as this part of the information is likely to be biased by the “adoption effect” (see Blacker 1977, Hill and Trussel, 1977, Timaeus, 1991, Udjo 1997).

Appropriate indirect techniques of analysis of the childhood and adult mortality questions can provide information about the levels and trend in mortality in the population and on the basis of this; future levels of mortality in the population might be projected. The direct questions can also be used to estimate the levels of adult and maternal mortality but only for the reference period for which the questions were asked. The following illustrate the usefulness of mortality information in planning.

### *Mortality and planning for health*

As noted above, the 2000 health objectives for South Africa include reduction of maternal mortality, reduction of infant and childhood mortality and morbidity. Certain indices of mortality can be computed from the mortality questions in the 2001 census and among others, used as base line information for planning with regard to the above health objectives. For example, indications from the 2001 census data suggest that childhood mortality has been increasing in recent years. Further analysis of the data might be able to identify vulnerable groups in the population and on the basis of this, policy makers could introduce appropriate intervention programmes to reverse the trend. Additionally, the information about trend in mortality from the 2001 census could form the basis of exploring other data sets to attempt to isolate factors that might be responsible for the trend and which could then form the basis of formulating intervention programmes.

### *Mortality and life assurance*

The 2001 census mortality information could inform decision making in the insurance industry. Assessment of mortality risks in the population is important in setting insurance premiums. Insurance premiums are not static as they are revised from time to time depending on new information

regarding mortality risks. The 2001 census provides the most recent data in this context at national, provincial and at smaller geographical areas.

### **Migration variables**

Migration usually refers to a process of moving from one administrative boundary to another with the intention of staying. Thus, migration has two broad components: international and internal migration. The former involves moves across international boundaries while the latter involves moves across administrative boundaries within a country. Information on migration from the 2001 census is based on the following questions.

International migration:

Was (the person) born in South Africa? (Including the former homelands)

In which country was (the person) born?

Is (the person) a citizen South African citizen?

Note that the above questions only provide information about immigration. Information about emigration is usually collected from administrative records.

Internal migration:

(For persons born in South Africa):

- (1) In which province was (the person) born?
- (2) Five years ago (at the time of Census '96), was (the person) living in this place?
- (3) If five years ago the person was not living in this place, where did (the person) move from?
- (4) If five years ago the person was not living in this place, in which year did (the person) move to this place?

Migration has socio-economic consequences for the state, community and individuals at the sending and receiving areas. An important consideration of the consequences of migration in planning is the volume of the "net flows" (balance between "inflows and outflows": immigration and emigration in the case of international migration; in-migration and out-migration in the case of internal migration). The volume of immigration, in-migration and out-migration by province as of 2001 can be estimated from



the 2001 census migration questions. This information combined with administrative records on migration could inform policy to mitigate the consequences of migration.

### *Migration and population growth*

Migration is one of the components of population growth affecting the size and composition of the population at the national and sub-national levels. This component is usually less important than the other demographic components (fertility and mortality) at the national level in less developed countries. However at the sub-national level (e. g. provincial level), it is an important determinant of population growth. The 2001 census can provide insight into the additional number of persons due to migration at the national and provincial levels, and at other small geographical areas that planning focuses on.

### *Migration and labour force planning*

The size and distribution of the labour market are partly determined by net migration. Some areas in the countries are characterized by inflows of people from neighbouring areas for employment related reasons. This could compound problems of unemployment (if any) in the receiving areas. Policy makers should be able to gauge and monitor the volume of

these movements so that appropriate policies can be put in place to cope with the resulting growth in the labour force to avoid undesirable consequences. The 2001 census migration information in combination with the age-sex distribution is useful in this regard.

#### *Migration and environmental planning*

Rural-urban migration accelerates the growth of urban areas. Increased urbanisation encroaches on the natural environment. Squatter settlements at the fringes of urban centres arising from rural-urban might deplete non-renewable resources and accelerate environmental degradation. The 2001 census migration information can provide a base line for gauging and monitoring rural-urban migration that can inform environmental policies to avoid undesirable consequences.

#### *Migration and planning for social services*

Migration often leads to increased demand for housing, education, health, sanitation, water, electricity, safety and security etc at the point of destination. Migration might exacerbate pressure on available infrastructure and social services especially in urban areas. Policy makers therefore need to take into consideration additional demands due to migration in planning resource allocation for the provision of infrastructure

and social services so as to maintain and improve the standard of living of the people and avoid social unrest. The 2001 census migration information in combination with other variables can provide insight into measuring the additional demand in various sectors due to migration.

## **CONCLUSION**

It is clear from the above discussion that demographic variables are intricately linked to all forms of planning in the private and public sectors. While some of the linkages are obvious in some sectors, they are less so in others. Lack of consideration of demographic variables in planning in one sector may have undesirable consequences in some others. For example, if the housing sector does not take into consideration-increased demand for housing and electricity due to natural increase or migration in some areas, this might accelerate environmental degradation in those areas. In view of this, a multi-sector approach in planning cannot be overemphasised.

Appropriate analysis of demographic variables in combination with some other variables can provide direct and indirect information that are relevant to planning in various sectors. An integrated national statistical database

that incorporates the results of such analysis and other indicators can be a facilitating instrument that informs planning at all sectors.

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