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# AFRICAN POPULATION ADVISORY COMMITTEE



Methods of Collection  
Estimates and Sources of  
Information Data for Africa

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## INTRODUCTION

All across the continent of Africa, national development efforts have been hampered by statistical data collection systems that provide policymakers, planners, and researchers with demographic and population data that are generally several years out of date and subject to concerns about accuracy and reliability. Economic and social dislocation during the 1970s and 1980s exacerbated this problem, undermining the slow but significant progress that was made in the 1960s to collect socioeconomic data.

In the last few years, however, substantial improvement has been made in the timeliness and quality of data, due both to the development of local institutions and human resources, as well as the provision of technical assistance and improved technology by international and bilateral donor agencies.

Accurate, reliable, and timely demographic data are essential to the efficient planning of development programs. Within these programs, all sectors can benefit from having an understanding of the size of the population base, the composition of the population by age and other characteristics, and the demographic changes taking place over time. Greater decentralization in these programs has shifted the focus from the national level down to much smaller geographic areas. Demographic information can also contribute to efficient economic development in the private sector, which is increasingly aware of the utility of accurate data. Thus, data dissemination and access are critical.

This document highlights the current sources of population data in sub-Saharan Africa and summarizes recent data collection activities.

These sources include:

- Population Censuses,
- Vital Registration Systems, and
- Household Demographic Surveys.

The strengths and weaknesses of each of the data sources are reviewed in terms of their theoretical advantages and disadvantages, and in terms of their specific implementation in the region. Finally, challenges to the collection of reliable demographic data and issues in the measurement of demographic processes in Africa are discussed.

## POPULATION CENSUSES

### BACKGROUND

Population censuses have traditionally been the bulwark of demographic data collection efforts in Africa as in other regions of the world. Almost all populations of the world have been covered by at least one census enumeration, generally in the past decade. In sub-Saharan Africa, 46 countries conducted population censuses in the 1980 round—for 13 of these countries this was the first complete census ever conducted. So far, 46 countries have conducted or plan population censuses in the 1990 round. Both of these figures represent substantial improvements for the region over the 1970 and earlier rounds of population censuses. In the 1970 round, for example, only 30 countries conducted censuses. Census dates since the 1970 round for African countries are shown in Table 1.

### DATA COLLECTED

Information collected in censuses includes the demographic and economic characteristics of individuals. Information such as age, sex, marital status, ethnic group, level of education, employment status, occupation, and industry are typically collected. For women, data on children ever born and children surviving for women are frequently collected, providing the inputs to various indirect demographic techniques for fertility and mortality estimation (discussed in more detail below). Population censuses also generally collect information on household structure and the relationship of individuals in the household to the household head.

Despite efforts by international organizations such as the United Nations to standardize the content of census questionnaires to some degree and to provide guidelines for minimum tabulations, considerable variation still exists. In the latest round of censuses, for example, several African countries did not collect data on children ever born. This item is of critical importance for the estimation of fertility levels. Considerable variation also exists in the collection of data on migration and several countries do not collect basic data on literacy.

Cultural factors can also contribute to a lack of standardization. For example, "standard" household definitions may prove problematic in cultures where polygamy is common. Extended family compounds in other areas may also be difficult to untangle into standard household types.

### ADVANTAGES OF POPULATION CENSUSES

Population censuses have several advantages compared to other data collection methods. First of all, for most countries, a census provides the most accurate available estimate of the total size of the population. As a result, census data collection efforts generally provide at least the initial sampling frame for subsequent surveys, and allow statisticians to adjust sample results to a national total.

A census provides complete geographic coverage of the country. Samples are, by their nature, selective and most areas will not be covered. Thus, a census can provide a complete accounting of the population down to the smallest geographic level.

**Table 1**  
**Census Dates for African Countries:**  
**1970 Round through 1990 Round**

Country	1970 Round (1965-74)	1980 Round (1975-84)	1990 Round (1985-94)
Angola	1970	1983(I)	—
Benin	—	1979(F)	1992
Botswana	1971	1981	1992
Burkina Faso	—	1975	1985
Burundi	—	1979	1990
Cameroon	—	1976(F)	1987
Cape Verde	1970	1980	1990
Central African Republic	—	1975(F)	1988
Chad	—	—	1993(F,S)
Comoros	1966	1980	1991
Congo	1974(F)	1984	1994(S)
Cote d'Ivoire	—	1975	1988
Djibouti	—	1983(F)	1993(S)
Equatorial Guinea	1971	1983	1994(S)
Ethiopia	—	1984(F)	1994(S)
Gabon	1970	1980	—
Gambia	1973	1983	1993(S)
Ghana	1970	1984	1994(S)
Guinea	—	1983(F)	1993(S)
Guinea-Bissau	1970	1979	—
Kenya	1969	1979	1989
Lesotho	1966	1976	1986

Liberia	1974	1984	1994(S)
Madagascar	—	1975	1993(S)
Malawi	1966(F)	1977	1987
Mali	—	1976(F)	1987
Mauritania	—	1977(F)	1988
Mauritius	1972	1983	1990
Mayotte	1966	1978	1991
Mozambique	1970	1981	—
Namibia	1970	1981	1991
Niger	—	1977(F)	1988
Nigeria	—	—	1991
Reunion	1974	1982	1990
Rwanda	—	1978(F)	1991
St. Helena	—	1976	1987
Sao Tome & Principe	1970	1981	1991(S)
Senegal	—	1976(F)	1988
Seychelles	1971	1977	1987
Sierra Leone	1974	—	1985
Somalia	—	1975(F)	1987
South Africa	1970	1980	1985
Sudan	1973(F)	1983	1993(S)
Swaziland	1966	1976	1986
Tanzania	1967	1978	1988
Togo	1970(F)	1981	1993(S)
Uganda	1969	1980	1991
Zaire	—	1984(F)	1994(S)
Zambia	1969	1980	1990
Zimbabwe	1969	1982	1992

SOURCE: Compiled from various United Nations and U.S. Bureau of the Census sources.  
(I) Luanda province only; (F) First census conducted; (S) Scheduled census date.

Similarly, a census provides users with the assurance that those with rare characteristics will be completely represented. For example, members of a small ethnic group, or those with particular educational characteristics may not be represented in a sample survey. Only a census can provide such a complete inventory of a country's population.

#### DISADVANTAGES OF POPULATION CENSUSES

Although a census can provide unique information, it is not the ideal method for every data collection effort. The very features that contribute to the advantages of a census can be liabilities as well.

Conducting a census is a huge operation, with many months spent in the planning, implementing, and processing phases. One of a census' disadvantages is that it requires a

large scale effort, with substantial costs both in monetary and human-resource terms. In conducting a census, highly trained statisticians, programmers and administrators are diverted from other important tasks.

Due largely to the time spent on data processing tasks, including data entry, editing, and tabulation, data collected in population censuses are generally not available for several years following the enumeration. Indeed, it is not unusual for some reports to be released five years or more after the census date. Such timing raises questions about the utility of the census data.

This situation has been compounded by the tendency of both researchers and policymakers to add additional items to the census questionnaire. Often, data that might be best collected in a sample survey are instead collected through the census operation. These increases in the census burden inevitably hinder the timely release of data.

Some countries have adopted a more efficient approach in which much of the detailed data to be collected has been moved to a sample within the census. Typically, 5 to 10 percent of households in such a design receive the longer and more detailed questionnaire. Such a strategy greatly reduces the interviewer and data-processing burdens and should result in more timely release of data.

A simpler strategy, which is being increasingly employed, is to select a scientific sample from the completed questionnaires and produce a sample tabulation of the results. For example, samples were selected from the recent censuses in Burkina Faso and Niger, as well as the earlier censuses in Zaire (1984) and Zimbabwe (1982). If efficiently done, this can provide policymakers with useful data in advance while the full results are being tabulated. However, this

needs to be taken into consideration early in the planning stage, so that the sampling can be completed competently.

In addition, developments over the past decade in microcomputer technology have greatly improved data processing speed and accuracy. Several African countries, including Burkina Faso, Niger, Tanzania, and Uganda, among others, have made good use of such technology in producing census results in record time. For example, census results for Burkina were available within two years of the field work; Niger completed data processing five months ahead of schedule; and Uganda published final 1991 census results in 1992.

Other concerns relate to how data on demographic events are collected in a census. The number and timing of births and subsequent infant and child deaths, for example, are best asked of the mother. Yet in most censuses, the head of

the household (who may be several steps removed from the person experiencing the event) is asked to provide the information. Perhaps even more suspect are data collected on contraceptive use in such situations. Nonetheless, such demographic information is routinely collected in many censuses.

Additional demographic data are sometimes collected. For example, information has been collected on deaths (including adult deaths) in the household, or whether the individual's mother or father are deceased (orphanhood data). These data are frequently used with various indirect demographic techniques to provide estimates of fertility and mortality. There are problems inherent in such data collection efforts; consequently estimates based on data from one source, for example a census, frequently do not fit well with estimates derived from a demographic survey.

A final concern relates to the quality of the census as a whole. Current census results sometimes appear inconsistent, even in terms of the total population size, with results from census enumerations a decade earlier. Administrative checks and demographic analysis can generally pinpoint the likely sources of error, which may be either in the current or the previous census. Nonetheless, such occasions can undermine public confidence in results. Likewise political interference in the census operations or in the release of census data can engender distrust.

## VITAL REGISTRATION SYSTEMS

Vital registration systems, if complete and accurate, offer the promise of reliable accounting of births and deaths over time, including additional information concerning, for example, the characteristics of the mother of the child (age, place of usual residence, etc.) or the characteristics of the decedent (e.g., age, sex, cause of death).

However, systems for the registration of births and deaths in Africa are very weak. In the region, for example, both the United Nations and the International Institute for Vital Registration and Statistics show only relatively small island nations with vital registration systems classified as "complete" (i.e., more than 90 percent complete)<sup>1</sup>. These include Cape Verde, Mauritius, Reunion, Sao Tome and Principe, St. Helena, and the Seychelles.

Several other African countries have vital registration systems but they are considered to be "incomplete." These included Botswana, Djibouti, Guinea-Bissau, Kenya, Rwanda, Sierra Leone, and Togo. Typically, estimates of the completeness of death registration in these countries range between 10 and 25 percent.

Vital registration systems exist in some other countries but may not be national in scope, covering, for example, only large urban areas. Such systems may be operated by municipal authorities rather than by a national agency<sup>2</sup>.

## HOUSEHOLD DEMOGRAPHIC SURVEYS

### ADVANTAGES OF VITAL REGISTRATION SYSTEMS

Where vital registration systems function well, they can provide a timely tally of births and deaths, by characteristic and by geographic area. Ideally, these events are registered within a short time of the event.

Once collected, these data can be used to examine levels and trends in fertility and mortality, to examine data on cause of death, and to look at variation between regions of the country, for example. Since data are collected continuously, and typically are published annually, data users do not have to wait several years for new data to appear, as is the case with a population census.

### DISADVANTAGES OF VITAL REGISTRATION SYSTEMS

Even a well-running vital registration system does not meet all of the needs of policymakers, planners, and researchers for demographic data. For example, a vital registration system does not provide the "denominators"—the population base—for the calculation of rates. These are based most often on census data. Furthermore, since only limited information is recorded on the birth or death certificate, insufficient data are available for many types of comparative analysis. For example, an analysis of fertility differentials by the educational attainment of the mother would typically require data from a demographic survey.

Where vital registration is less than complete, the difficulties are compounded. Incomplete registration limits confidence in any analysis based on the results, since the completeness of registration is likely to vary by geographic area and by the socioeconomic status of the household. In addition, incomplete vital registration systems are usually characterized by delayed registration, further hindering the publication and analysis of these data.

Beginning in the early 1970s much of the detailed data on fertility and mortality in Africa (as well as in the rest of the developing world) has been produced by a series of international demographic data-collection efforts. These began with the World Fertility Survey project, which collected data on fertility and contraceptive use in 41 countries between 1972 and the mid-1980s. Ten of these surveys were in sub-Saharan Africa—the locations and dates are shown in Table 2.

The Contraceptive Prevalence Survey project, carried out between 1978 and 1986, was intentionally narrow in scope, providing rapid feedback to program planners and policymakers on current levels of fertility and contraceptive use. Surveys were conducted in 43 coun-

tries—five in sub-Saharan Africa. The locations and dates of these surveys are also shown in Table 2.

Beginning in 1984, the Demographic and Health Surveys (DHS) Project has provided demographic data to a number of countries in the region. In addition to complete information on fertility and contraceptive use, data on the health status of women and children are collected. In the first two phases, the DHS project conducted 49 surveys, 21 of which were in Africa (see Table 2). Now in its third phase, the DHS Project plans to conduct 30 or more surveys in developing countries over the next five years with at least 14 in Africa.

In addition, a number of countries have conducted demographic surveys not connected with these large international efforts, although many were supported by foreign donor agencies or international organizations. For example, in the

late 1960s, several countries, including Ghana and Nigeria, carried out national-level sample surveys. In other cases surveys have been connected with ongoing operations, such as a household surveys program. In any case, the general methodology and approach is typically similar to that employed in the international efforts.

#### ADVANTAGES OF DEMOGRAPHIC SURVEYS

Demographic surveys (or household surveys collecting demographic data) have a number of advantages over other data collection methods. First of all, due to cost and resource considerations, a survey can be conducted with greater frequency than, for example, a census. Since sample sizes are limited, data collection, editing, and tabulation can generally be completed within a very short period of time, often a few months, especially with the use of microcom-

puters. Standardization of editing and tabulation routines in international survey projects can further speed the production of analytical results. The frequency with which surveys can be conducted make them important tools in evaluating family planning programs and in measuring the impact of other development programs in the area of population and health, for example, child survival programs.

Since the respondents in most demographic surveys focusing on fertility and family planning are women of reproductive age, information on births and their survival status is presumably of higher accuracy than data reported by the head of the household. Generally, the interviewers are more highly trained than in a census enumeration, and due to the longer questionnaire, may have a greater opportunity to establish rapport with the respondent. This can result in greater

accuracy in responses to potentially sensitive questions. The longer questionnaire also allows researchers to collect more in-depth information, for example, information on the cause of death of a child.

#### DISADVANTAGES OF DEMOGRAPHIC SURVEYS

Despite the several advantages of household sample surveys, such data collection efforts also have their limitations and liabilities. Since the data collected are often more complex, and perhaps sensitive, than the data collected in a census, the quality of the data, in terms of its reliability and accuracy, may be highly dependent on the quality of field operations, including the training and supervision of the interviewers. Some respondents may not be will-

Table 2  
African Demographic Surveys: 1977-1993

Country	Year	Type of Survey	Implementing Organization	Sample	Sample Size
Benin	1981-82	WFS	Institut National des Statistiques et de l'Analyse Economique	W 15-49	4,018
Botswana	1984	CPS	Ministry of Health	W 15-49	3,064
	1988	DHS	Ministry of Health	W 15-49	4,368
Burkina Faso	1992-93	DHS	Institut National de la Statistique et de la Demographie	W 15-49	6,000
Burundi	1987	DHS	Department de la Population, Ministere de l'Interieur	W 15-49	3,970
Cameroon	1978	WFS	Ministere de l'Economie et du Plan	W 15-54	8,219
	1991	DHS	Ministere du Plan et de l'Amenagement du Territoire	W 15-49	3,871
Cote d'Ivoire	1980-81	WFS	Ministere du Plan et de l'Industrie	W 15-50	5,764
Ghana	1979-80	WFS	Central Bureau of Statistics	W 15-49	6,125
	1988	DHS	Ghana Statistical Service	W 15-49	4,488
Kenya	1977-78	WFS	Central Bureau of Statistics	W 15-50	8,100
	1984	CPS	Central Bureau of Statistics	W 15-49	6,581
	1989	DHS	National Council for Population and Development	W 15-49	7,150
Lesotho	1977	WFS	Bureau of Statistics	EMW 15-49	3,603
Liberia	1986	DHS	Ministry of Planning and Economic Affairs	W 15-49	5,239
Madagascar	1992	DHS	Centre National de Recherches sur l'Environnement	W 15-49	6,000
Malawi	1992	DHS	National Statistical Office	W 15-49	4,000
Mali	1987	DHS	Institut du Sahel	W 15-49	3,200
Mauritania	1981	WFS	Direction de la Statistique et de la Comptabilite Nationale	EMW <51	3,504
Mauritius	1985	FPS	Ministry of Health	EMW 15-49	3,666
	1991	FPS	Ministry of Health/Univ. Mauritius	W 15-44	5,262

Niger	1992	DHS	Direction de la Statistique et des Comptes Nationaux	W 15-49	6,503
Nigeria	1981-82	WFS	National Population Bureau	W 15-49	9,727
	1990	DHS	Federal Office of Statistics	W 15-49	8,781
Rwanda	1992	DHS	Office National de la Population	W 15-49	6,000
Senegal	1978	WFS	Direction de la Statistique	W 15-49	3,985
	1986	DHS	Direction de la Statistique	W 15-49	4,415
	1992-93	DHS	Direction de la Prevision et de la Statistique	W 15-49	6,500
Somalia (5 cities)	1983	CPS	Ministry of Health	EMW 15-49	3,016
Sudan (N)	1978-79	WFS	Ministry of National Planning	EMW <51	3,115
	1989-90	DHS	Department of Statistics	EMW 15-49	5,860
Swaziland	1988	FPS	Ministry of Health	W 15-49	4,261
Tanzania	1991-92	DHS	Bureau of Statistics, Planning Commission	W 15-49	7,650
Togo	1988	DHS	Unite de Recherche Demographique	W 15-49	3,360
Uganda	1988-89	DHS	Ministry of Health	W 15-49	4,730
Zaire (4 cities, 2 rural areas)	1982-84	CPS	Institut National de la Statistique	W 13-49	5,548
		DHS	University of Zambia	W 15-49	6,500
Zimbabwe	1984	CPS	National Family Planning Council	W 15-49	2,584
	1988-89	DHS	Central Statistical Office	W 15-49	4,201

NOTES:

Type of Survey

CPS Contraceptive Prevalence Survey  
DHS Demographic and Health Survey

FPS Family Planning Survey  
WFS World Fertility Survey

Sample

W — All women of specified age  
EMW — Ever-married women of specified age

SOURCES

Population Information Program, The Johns Hopkins University, 1985, "Fertility and Family Planning Surveys: An Update," *Population Reports*, Series M, No. 8, September-October.  
Population Information Program, The Johns Hopkins University, 1992, "The Reproductive Revolution: New Survey Findings," *Population Reports*, Series M, No. 11, December.

ing to disclose information they consider to be personal in nature. This may influence the quality of their responses to other items on the questionnaire. The presence of a spouse or other household member during the interview may similarly bias the responses.

A well designed sample survey is dependent on the quality of the sampling frame that was used to select the respondents. Census population data are generally used, but must be updated for recent population changes. An incorrectly drawn sample will bias the survey results.

Sampling issues may also limit the utility of surveys for some types of data collection efforts. For example, estimates for sub-national geographic areas may not be possible without very large samples. Estimates of all variables will be

subject to sampling variation. Efforts to measure change in critical variables such as contraceptive prevalence, may be limited by this variation. Finally, studies designed to collect information on relatively rare events, for example, deaths in the household, by age and sex, require very large sample sizes.

But despite these limitations and potential disadvantages, sample surveys are a major source of demographic data in the African region. For some items, such as data on contraceptive use, retrospective data on fertility and child mortality, nutrition, etc., there are currently no other viable sources of data.

## CHALLENGES FOR THE 1990S AND BEYOND

The above review highlights the important methods of demographic data collection in Africa and the strengths and limitations of each. The following discussion presents several major challenges to the collection and utilization of demographic data in the region. These issues will be of continued relevance to the year 2000 and beyond.

### TIMELY COMPLETION OF CENSUS OPERATIONS

As has been discussed above, undue delays in making census results available can raise questions about the utility of conducting a census. Thus, the timely completion of census operations must be of high priority. In the 1990 round of censuses, a number of countries rescheduled the start of census operations or the start of enumeration. The reasons for these changes were

both internal and external. In a number of cases the delay has provided the census organization with the additional time needed to improve operations. In other cases, the delay was symptomatic of organizational and management problems within the agency.

Future data-collection efforts should benefit from further improvements in microcomputer hardware and software. But attention must also be paid to the development of human resources within the census organization and the efficient use of available international technical assistance. Several countries in the region have demonstrated the capability of conducting efficient and timely census operations. It is hoped that other countries can learn by example from their experiences.

## QUALITY OF DATA COLLECTION

Providing high quality data will continue to be a challenge for Africa. The region's situation poses a difficult physical environment for data collection; transportation and communication problems make quality control and timely collection of data important focal issues.

At the same time, limited skilled manpower and human resources make it difficult for data collection agencies to efficiently collect and analyze the data. For example, in many countries, skilled computer programmers are enticed to leave their jobs in the public sector by more lucrative private-sector offers.

Finally, civil and political unrest have sometimes interrupted the collection and processing of data. In some countries, entire census efforts have been wasted when completed census forms were destroyed.

Collecting data recognized to be of high quality is important in maintaining and strengthening the credibility of data collection agencies and in supporting programs and policies based on those data.

## DECENTRALIZATION OF DATA

Both the planning and evaluation of local development projects requires high quality data at an appropriate level of decentralization. Given the recent trend toward more local-level efforts, the need for census and other data collection efforts to provide such detailed data on a timely basis is paramount. Both national and international development agencies are increasingly demanding data for small geographic areas. Greater emphasis on evaluation of development programs will only serve to increase this need in the future.

Local authorities are also awakening to the usefulness of the data resources that in the past have been the purview of national governments. Meeting the demands of these users will be important in the design of future collection efforts.

## COORDINATION AMONG STATISTICAL AGENCIES

In most countries, statistical data are compiled by a variety of agencies. For example, data on schools and school attendance may be collected by the Ministry of Education, data on labor force by the Ministry of Labor, etc. Often, there is little contact or coordination among these various agencies. A key challenge for the 1990s is to improve coordination among these statistical agencies. This coordination may take the form of improved sharing of available data, joint collection of data, and jointly planned publications or analytical reports.

In recent years there have been several examples in the African region of inadequate planning and coordination, for example, conducting a demographic survey immediately on the heels of a census. In some cases both projects were undertaken by the same agency, with the result that vital staff were drawn off the initial operation to assist with the second. Such poor planning inevitably leads to decreased quality or project delays, often in both operations.

Growing recognition of the need for coordination among statistical agencies within and between countries is witnessed by the Addis Ababa Plan of Action for Statistical Development in Africa in the 1990s and the formation of the Coordinating Committee on African Statistical Development by the Joint Conference of African Planners, Statisticians, and Demographers.

## ANALYSIS AND DISSEMINATION

The importance of the collection of timely and high quality data notwithstanding, the best data in the world are worthless if they are inaccessible. Much of the blame for poor use of demographic data in Africa in recent years can be placed on insufficient attention to analysis and dissemination. Although there have been notable exceptions, most countries have been able to collect the data and perform the basic data processing tasks. The major hurdle is getting these data into the hands of those who need it, and providing the material in a form that is readily accessible.

At a minimum, this involves producing useful tabulations at appropriate levels of geographic and substantive detail, and conducting basic analysis of fertility, mortality, etc. But typically these publications are produced in limited quantity

and are aimed at a highly technical audience. Beyond this minimum, successful dissemination means exploring alternative avenues for communications, including reports with a more popular target audience, brochures and leaflets, and material for television and radio shows on population-related issues. These can be a source of national identity and pride. Increasingly, the private sector is becoming a data consumer, and assessments must be made of their data needs and appropriate dissemination approaches.

Some African countries have taken significant steps to improve their data dissemination. Senegal, for example, has produced regional analyses of population trends based on their recent census. In planning dissemination activities, however, care must be taken to ensure that these efforts do not result in signifi-

cant delays in the release of basic information. Some countries have experienced delays in printing regional reports that have stalled the release of national totals.

In sum, there is a growing awareness that analysis and dissemination cannot continue to be an after thought, assigned a relatively low priority and budget. Statistical organizations and international donor agencies are realizing that effective dissemination requires a full-time staff at the statistical organization. It is only by efficiently using the data that is collected that the cost of such operations can be justified.

## RELIANCE ON INDIRECT TECHNIQUES

Estimates of African fertility and mortality in the region have historically been heavily based on the application of indirect techniques. Much of this dependence has been engendered by the lack of data for direct measures.

Indirect approaches are approximate and depend on the methods' underlying assumptions. With changing conditions in the African region, indirect measures, which have served well in the past, may provide less and less satisfactory results. For example, most indirect measures of mortality rely on a combination of estimates of under-five survival and model patterns of adult mortality. As these patterns change and as the relationship between child and adult mortality varies, these measures may be totally unsuitable in the future.

As a result, the coming years will see increasing demands for the direct collection of fertility and mortality data. The DHS Project has already demonstrated that pregnancy histories can collect fertility data of reasonably high quality<sup>3</sup>.

## MEASURING MORTALITY LEVELS AND TRENDS

African fertility levels and trends are better known than are details on African mortality, particularly adult mortality, in part because techniques for measuring fertility have proven to be relatively robust, and present a less difficult data collection challenge. In the coming years, increasing attention needs to be paid to the measurement of mortality, both because of the challenge that it poses and its importance to measuring the health status of the population as well as service delivery and human resource issues. For example, the use of larger samples will be necessary, possibly with different approaches to eliciting more complete responses.

## AIDS AND MORTALITY

Another important reason for an increased emphasis on measuring mortality is the spread of HIV infection and the resulting increased mortality. Since adult AIDS mortality is to some extent independent of increases in infant and child mortality, traditional indirect measures will not provide accurate measures of adult mortality. Furthermore, the age pattern of deaths in a country experiencing an AIDS epidemic is quite different from traditional mortality models. Consequently, either new models will need to be developed or increased efforts to directly measure mortality will have to be undertaken.

AIDS is currently increasing the mortality of African adults, especially those between ages 25 and 40, and of infants and children. By the end of 1992, 209,000 AIDS cases had been reported by sub-Saharan African countries to the World Health Organization<sup>4</sup>. But WHO had estimated one year earlier that nearly 1 million AIDS cases had actually occurred in Africa<sup>5</sup>. If an adequate demographic measurement infrastructure were in place, policymakers and program planners would already have data on the impact of AIDS on their populations. As it is, demographic measures will reflect AIDS mortality only after several years. For example, recent DHS results from Zambia showed 15 percent increase in infant and child mortality over the 1977-81 to 1987-91 period<sup>6</sup>.

AIDS is just one example that demonstrates the difficulty of measuring rapid demographic change using the current demographic measurement infrastructure. Other examples, including the effects of famine, refugee movements, and other diseases, can be cited as well.

## THE ROLE OF MODELING

Without sufficient infrastructure to measure current demographic events, mathematical modeling can serve an important function in providing policymakers and program planners information about demographic events under certain specified scenarios. Population projections are a relatively simple example of demographic modeling and the use of information on demographic events in lieu of empirical data. John Stover's APAC document, *The Impact of HIV/AIDS on Population Growth in Africa*, assesses the results of several complex models of demographic and epidemiological processes.

## CONCLUSION

Models can provide useful insights and place abstract processes in more concrete demographic terms. Users should be aware of the limitations of the models they use, however, and ensure models are not imbued with mystical powers nor used to "prove" results that are, in fact, simply a product of their assumptions.

In the near term, the best demographic data for Africa will be produced by periodic sample surveys, supplemented by decennial censuses which will continue to provide population counts and characteristics for the entire country and subnational areas as well as providing the sampling frame for surveys.

Unfortunately, such systems are not sufficient to provide program planners and policymakers with information on short-term demographic events and fluctuations in demographic parameters, nor can they be easily and accurately estimated for small geographic areas. Additionally, adult mortality has not been well measured in African countries, and existing data collection methods have not proved to be suited to this task.

The data needs of African planners will become even greater in the years ahead. As urbanization swells the ranks of city dwellers; as drought, famine, and civil unrest lead to further population dislocation; as AIDS increases mortality levels, so do the needs for accurate and timely population and demographic data increase. Improvements are needed in conducting accurate censuses and in efficiently processing census data. Finally, with the increased decentralization of political and economic decision making in Africa, the need for effective vital registration systems has never been greater. The monetary costs and difficulties in establishing national vital registration systems must be weighed against the potential benefits of such systems, in terms of accurate and timely pro-

duction of national- and local-level data on births and deaths in the population.

The cost of these improvements in data collection in the region may appear high, but there are also costs inherent in inefficient data collection, in ignorance of important demographic changes, and in programs poorly planned due to lack of data. These are costs that can be turned into savings with improvements to the demographic data infrastructure. Ultimately, these savings can result in improved well-being for the population of the region.

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