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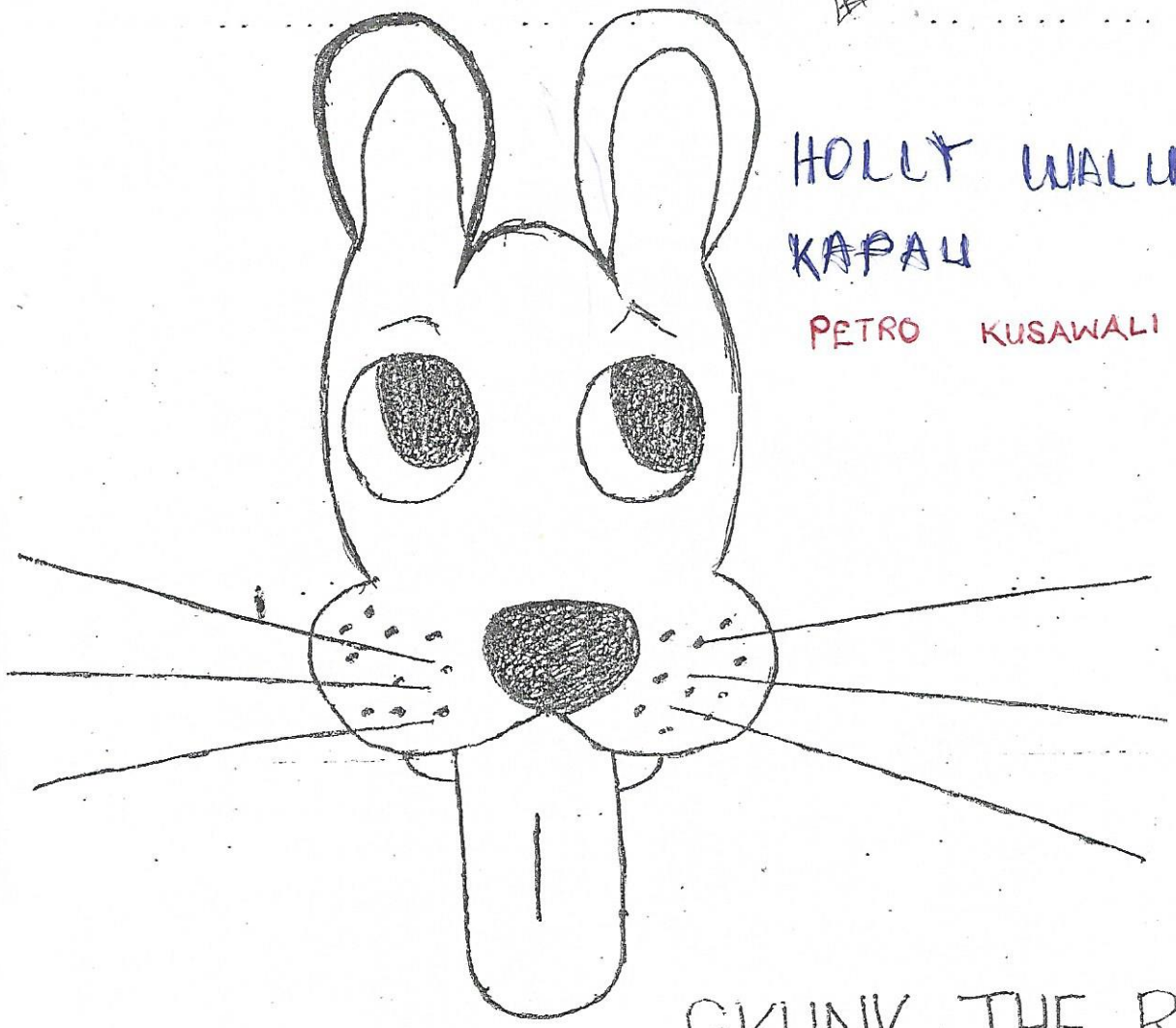

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SKUNK THE REAL SYMBOL

Preparatory Work for the Census

The preparatory work for the census is necessarily long in duration and involves many quite distinct activities.

It should be noted, however, that many of these activities may be interrelated but they also overlap to a large extent.

When planning these preparatory activities, techniques for project management should be employed

For purposes of presentation, these preparatory activities are divided into 18 somewhat arbitrary elements:

1. Legal basis for a census

Legal authority for the census is required for fixing primary administrative responsibility, for obtaining the necessary funds, for determining the general scope and timing of the census, and for placing a legal obligation upon the public to cooperate and give truthful answers and a legal obligation upon the enumerator to record the responses faithfully.

In addition, the confidentiality of the individual information should be strongly and clearly established in the census legislation and guaranteed by adequate sanctions so as to provide a basis for the confident cooperation of the public.

In countries that lack permanent legal authority for the taking of periodic censuses, it is important to act early to establish ad hoc legal authority or, preferably, legislation calling for a system of periodic censuses.

The principle of conceptual and organizational flexibility should be observed in drafting the census legislation

Thus, the inclusion of too rigid provisions regarding the type of data to be collected or the structure and relationships of the various parts of the census organization is undesirable.

Rather, necessary details should be contained in the census regulations promulgated by the census authorities.

Moreover, provision will have to be made, in either the legislation or the regulations, for sanctioning the use of simplified administrative procedures, including the appropriate delegations of authority for the procurement of equipment and supplies and the recruitment of personnel during the operational phase of the census.

2. Financial basis for censuses

A census is the primary source of data about the size and characteristics of the population; it provides a demographic profile of a country and is the basis for developing area sampling frames for use in surveys.

Censuses, however, are one of the largest and most costly statistical activities that governments and/or their national statistical offices undertake, and costs are on the rise.

As a result, countries have been forced to delay or even cancel a census owing to funding constraints.

Countries that have been able to secure partial funds or secure funds but at a late stage of their census preparation have been forced to compromise their data collection, data processing and dissemination of census results.

It is therefore recommended that all census operations including planning, enumeration, analysis and dissemination, be budgeted from the beginning and efforts made to mobilize the required funds.

Inflation should be taken into account, keeping in mind that duration has an impact on cost.

It should be emphasized, however, that censuses cannot be carried out merely by national statistical offices alone.

Rather, conducting a census should be seen as a national task involving all stakeholders.

Thus, governmental departments, nongovernmental organizations and the private sector end-users should be consulted (in all stages) to ensure the legitimacy and need for conducting the census and, at the same time, to improve the advocacy for sufficient funding.

Although the conducting of a census is principally financed by the Government, the census must be designed in partnership with all political actors so as to obtain their involvement in the census process.

In general, population and housing censuses are exclusively the responsibility of national Governments and structures; this is particularly true for funding the census.

Thus, all activities related to funding need to be elaborated, documented, justified and presented to all stakeholders in a transparent and comprehensive manner.

3. Budget and cost control

While no universal system of census budgeting and cost control can be suggested since financial practices vary greatly among countries, a few generally accepted principles can be noted.

First and foremost, effective planning and control of the various census operations are not possible without a very careful financial estimate of the cost of each census operation, including all of its components, no matter how small.

It is recommended to draft a detailed list of activities related to censuses and, as much as possible, to draft the budget in such a way that it corresponds to this list of activities.

Second, it is critical for this census plan and budget to be presented by national statistical agencies to their respective governments with adequate lead time, to facilitate the appropriation of sufficient resources from national budgets, or where appropriate, from the international development community.

Moreover, funding of the census must be accompanied and developed on a sound and adequate legal basis if effective national census operations are to be enabled.

Information on expenditures from the previous census classified by census phases, starting with the expenditure for different elements of the preparatory work and ending with expenditure for the dissemination of the census results, provides an important basis for estimating the budget of the census.

It is important that the persons at the administrative and supervisory levels who will be responsible for the execution of each operation participate in estimating the budget items.

Such an organization of the work presupposes detailed advance planning and "cost-consciousness" on the part of those responsible for a census.

Throughout the period of census taking and compilation of census results, the budget will have to be re-examined and performance compared with plans.

- 4. Census calendar

An indispensable element in the planning of a census is a calendar or timetable indicating the sequence and estimated duration of each of the component operations of the census.

At the early stages of census planning, a provisional calendar of selected key dates should be prepared as an overall framework for the census.

The calendar should be revised and made more detailed as planning proceeds, with the aim of establishing final dates as soon as practicable.

Such calendars are essential, since they indicate the dates on which each of the numerous operations that make up a census are to be started and completed, and they serve as a guide for measuring the progress of each stage of the census operation.

Serious delays in work, or errors in time estimates, can be detected by comparing the calendar target dates with the actual dates of each operation.

A census calendar is a very efficient instrument not only in the timing control of each census operation but also in the control of the complex of all census operations that are interdependent.

Therefore, when modifications in the census timetable are necessary, all related operations should be taken into consideration in order to avoid disruptions in the whole census programme.

Obviously, the time schedule will differ for each national census depending upon the general census plan and the resources that are available.

The census calendar usually shows the various operations grouped into three broad sectors: (a) pre-enumeration, (b) enumeration and (c) post-enumeration.

- 5. Administrative organization

In planning the organization and administration of a census, it is important to consider the role and relationship of the various executive and advisory organs.

National, subnational and local commissions and committees are frequently useful in the planning and preparations of a census.

Such bodies may be composed of representatives of governmental agencies and of non-governmental users of the census data, particularly those involved in policy-oriented analysis of census results and analytical studies of the social, economic and demographic situation of the country.

It is important, however, that their advisory and promotional functions be clearly defined and that the final responsibility for planning rest with the executive agency.

There are definite advantages in having an office continuously responsible for census work established as an integral part of the statistical system of a country.

6. Census communication activities: user consultations, census publicity and promotion of census products

Since the census is a national activity that is completely dependent for its success upon the wholehearted cooperation and assistance of the general public and many governmental and local organizations, the entire communications effort should be developed as a coordinated activity in close conjunction with the other substantive preparations for the census.

These communications activities are valuable not only for informing others about the census but also for providing census authorities with early and continuing information about the reactions to census plans and activities of the general public in various parts of the country and of key persons, groups and institutions.

7. Plans for the quality assurance and improvement programme

Most countries conduct population and housing censuses, once in 10 years. Thus current experience is limited but experience from previous population and housing censuses as well as other censuses such as agricultural census is very useful to plan for a quality assurance and improvement programme for the current one.

Moreover, numerous activities that compose the census operation have to be carried out in a limited time period.

This means that countries must employ a large number of persons for census work for a few weeks or months.

Usually a different set of persons are employed on a temporary basis for each of these operations. As a result, the quality of work is likely to vary from person to person, from one area to another and from one time to another.

It is therefore important to be able to measure how well each census operation is proceeding by building in quality assurance procedures throughout the census.

It should be stressed that a major goal of any quality assurance programme is to detect errors so that remedial actions can be taken even as the census operations continue.

Thus, a quality assurance programme should also be viewed as a quality improvement programme. Without such a programme, the census data when finally produced may contain many errors which can severely diminish the usefulness of the results.

Establishing a quality assurance and improvement system at the planning stage is crucial to the success of the overall census operation.

- 8. Mapping

There is widespread recognition that it is important for national statistical agencies to develop a continuing cartographic capability to serve their specialized cartographic needs.

Such a capability can make a major contribution to the population and housing census and other elements of the national statistical system.

A continuing cartographic capability within the statistical agency can also contribute to the analysis and presentation of census results.

Statistical agencies, however, are not mapping agencies and should not, for the most part, try to duplicate the functions of one.

Likewise, mapping agencies are not statistical agencies and often may not fully appreciate the statistical value of the information they hold or how best to present statistical information in map-based products.

Despite this, undertaking a census can provide a catalyst for the statistical and mapping agencies to work together to the benefit of both agencies and the community.

- 9. Small-area identification

Two somewhat different methods are available to provide the census with a flexible capability for generating tabulations in terms of a wide variety of geographical aggregations including those needed for public and private sector data uses at the local level.

The first method simply extends the traditional hierarchical system for coding all major and minor civil divisions so as to cover at the lowest level the enumeration area (EA), sometimes referred to as the "enumeration district".

The second method, which at greater cost permits finer geographical specificity, is usually based on some coordinate or grid system, such as that of latitude and longitude. This method is often referred to as a "geocoding system".

Particularly in the absence of a comprehensive system of street names, numbers or similar addresses, the first method, which uses the EA as the key unit for the production of small area data, is to be preferred.

- 10. Living quarters and household listing

A list of sets of living quarters, structures containing living quarters or households that are available at the start of the census is an aid in the control of the enumeration.

This is particularly in the absence of adequate and updated maps.

Such a list is also useful for estimating the number of enumerators and the number of schedules and other census materials needed in an area, for estimating the time required for the enumeration and for compiling provisional results of the census.

It is also very useful for determining the enumeration areas and for establishing necessary links between population and housing censuses when they are carried out separately.

Consideration should be given to providing permanent identification to streets and buildings, which can be used for successive censuses and for other purposes.

A listing of sets of living quarters, particularly in densely settled places, cannot be made unless streets have names and buildings have unique numbers.

Individual apartments in multi-dwelling buildings need to be numbered or otherwise unambiguously identified.

11. Tabulation programme and database design

In most countries, the tabulation programme represents a compromise between the full range of desired tabulations and the limits imposed by practical circumstances.

To ensure that this compromise is made transparently and efficiently it is important that planning the census dissemination task is started at the earliest stage of the census development cycle by a round of user consultations.

Once the census testing programme has identified a practicable range of data items to be included in the questionnaire, data users should again be consulted on the specific cross tabulations required and the relative priority for their production.

It is essential that the programme be outlined sufficiently early so that the procedures and costs involved may be investigated thoroughly before a final decision is reached.

The type of questionnaire and the method of enumeration may limit the kinds and amount of data that it is possible to collect.

Publication time and costs, and the data-processing resources available, will determine the number and complexity of the tabulations that can be produced within a reasonable time.

This will enable prospective census data users to make firm plans and the census data processing staff to complete all systems analysis, programming and testing work in a timely manner.

Other requests for statistical information by specialist users will be made subsequently. The databases of census information can be used throughout the intercensal period to address such needs.

It is important to plan the tabulation programme in such a way that final results can be issued within a reasonable period of time after the enumeration and before the information has become out of date for current needs.

It is desirable that the details of the tables be prepared and the order of their preparation be decided early in the planning so that the processing of the data will not be delayed.

Special tabulations may be requested at any time after the census enumeration.

Once the census database has been produced by recording, editing and correcting the raw data, tabulation software packages can be introduced.

These packages allow fast and relatively inexpensive production of tables for selected subsets of the total database or for alternative aggregates, assuming the information has been preserved in the database in terms of the needed detailed classifications.

12. Questionnaire preparation

While many of the principles of designing a statistical questionnaire will also apply to the design of the administrative instruments underpinning a register-based approach, those instruments may also be based upon specific requirements of the administrative programmes they address.

Further, where countries utilize the Internet to collect a proportion of their census information, it is possible that the layout and organization of the data collection instrument may differ from that of the paper questionnaire.

While many of the same principles (for example, clarity of wording, omission of unnecessary material) will apply to an Internet based collection of information, specialized advice should be sought regarding such issues as (a) the technology employed to present the questions to the respondent, (b) the method of capturing the response, and (c) quality assurance checks employed during the capture process.

A crucial principle is that questionnaire design must be regarded as part of an integrated process of satisfying users' demands by collecting, processing and disseminating information provided by respondents.

The type of questionnaire, its format and the exact wording and arrangement of the questions require the most careful consideration, since the handicaps of a poorly designed questionnaire cannot be overcome during or after enumeration.

Among the many factors that should be taken into account in designing the questionnaire are the method of enumeration, the type of questionnaire, the data to be collected, the most suitable form and arrangement of the questions and the processing techniques to be employed.

The method of enumeration governs to some extent the type of questionnaire that can be used (for example, single individual, single household or single set of living quarters, multiple household or multiple living quarters, combined population and housing). It may also impact upon where each type of questionnaire can be used and the framing of the questions and the amount of explanatory material that must accompany them.

Moreover, questions should not be offensive; in many cases this can be avoided by excluding extremely sensitive topics from the census questionnaire, but care must always be taken to consider the reaction of respondents when designing questions.

In addition, it should be noted that the quality of information collected in a census will be reduced if the questionnaire is excessively long.

These issues should be carefully assessed during the testing programme including the so-called pilot census, since poorly worded questions will not only collect poor quality data, but, by confusing respondents and/or enumerators, may also impact upon subsequent questions in the questionnaire.

The problem is more serious in the case of non-written languages.

If the housing census and the population census are to be carried out concurrently, it will be necessary to consider whether a single questionnaire should be utilized to collect information on both population and housing topics.

This will be particularly important where a single housing form is used to cover separate personal forms for each individual.

In turn, many decisions regarding the detailed design of the processing system are dependent on the final content, form and arrangement of the questionnaires.

Questionnaire design must be driven by a planning process based upon dialogue between the statistical agency and those demanding information.

This is essential if the questionnaire is to be designed to provide the information needed by users.

This will, in turn, determine the tabulation programme, as it is to some extent conditioned by the limitations imposed by the questionnaire.

13. Census tests

The testing of various aspects of a census plan prior to the enumeration is a very useful practice for all countries.

This is especially essential for countries without a long history of census taking and for those in which fundamental changes in census methods are being considered.

Census tests can be designed for different purposes and in different ways.

To yield full benefits, tests should be employed for all stages of the census, including enumeration, processing and evaluation of results.

They can be designed to provide information on the relative efficacy of alternative methods of enumeration and on the average time required for enumerating a single household or a single set of living quarters, which information is useful in estimating staff and cost requirements.

In addition, census tests serve as practical training for the nuclear staff of supervisors and other officials.

The first kind of tests carried out during census preparations are questionnaire tests.

Their purpose is to test the suitability of intended census questions, including their formulation and the instructions provided, as well as the suitability of the questionnaire design.

Such tests can be particularly helpful in assessing the suitability of the proposed material for enumerating specific population groups, as well as the general public.

These tests are also used for estimating the time requirements in enumeration.

It is practical to carry out questionnaire tests on a small scale in several purposively selected places. Because they are relatively inexpensive, repeated rounds of questionnaire tests may be carried out until a satisfactory questionnaire has been evolved.

Essential features of a pilot census are coverage of one or more sizeable administrative divisions and encompassment of the preparatory, enumeration and processing stages of a census, by which it thus tests the adequacy of the entire census plan and of the census organization.

In order to best serve this purpose, care should be taken for resemblance in conditions of conducting pilot census with the actual enumeration as closely as possible.

For this reason, it is often taken exactly one year before the planned census so as to conform to the expected seasonal patterns of climate and activity.

It is generally unwise to consider the pilot census a source from which to derive usable substantive data.

Apart from the sampling problems involved, such a use inevitably detracts from the central purpose of the pilot, which is to prepare for the main census.

14. Plan of enumeration

Several different approaches to enumeration are possible. Traditionally, each household is contacted and enumerated on a face-to-face basis.

This approach is still used in most developing countries and for at least part of the population in many developed countries.

In those circumstances where up-to-date and comprehensive address or population registers exist or can be established, the enumeration process often involves mailing out the census forms, or having the public mail back the completed forms, or both.

Whatever approach is to be used, the complete enumeration plan should be prepared well before the enumeration begins.

This involves (a) the determination of the enumeration method to be used and the basic procedures to be followed in the collection of the data and the control of the enumeration, (b) the procedures for the control of the quality of the data and (c) an estimation of the number of sets of living quarters and the probable size of the population to be enumerated so that the number of questionnaires and other materials required for the enumeration, and the number of enumerators and supervisors needed, can be properly ascertained.

With the advent of the Internet, several countries have also employed enumeration methods that allow respondents to submit their questionnaires through the online equivalent of their paper census questionnaires.

It should be noted that only contexts characterized by high penetration rates of information technology including the Internet have implemented this method, and always in conjunction with more traditional ones.

It should also be mentioned, however, that these options may never entirely replace more traditional enumeration methods and that, even where the society enjoys a high degree of using information technology, the majority of the population cannot be reasonably expected to prefer this mode of self-enumeration.

The universal enumeration of population and living quarters should be made exclusively on a geographical basis, that is to say, the country should be divided into census enumeration areas and each area should be small enough to be covered by one enumerator during the period of time allowed for the enumeration.

Other sources of information, such as registers of population or registers of properties, could be used to produce census data in countries that have established continuously updated population registers of high quality and good coverage.

Special attention should be given to the procedures to be followed for the enumeration of nomadic and semi-nomadic populations.

These procedures should take account of the specific difficulties in locating such population groups, which are characterized by movement from place to place

Special arrangements may also need to be made to enumerate homeless persons as well as the special categories, to the extent that these categories are included within the scope of the census.

Where their number warrants, additional information that would indicate the reason for homelessness may need to be sought.

15. Plans for data processing

Plans for data processing should be formulated as an integral part of the overall plan of the census, and those responsible for the processing of the census should be involved from the inception of the planning process.

Data processing will be required in connection with the results of census tests, compilation of preliminary results, preparation of tabulations, evaluation of census results, analysis of census data, arrangements for storage in and retrieval from a database, identification and correction of errors, and so on.

In addition, data-processing technologies are playing an increasing role in the planning and control of field operations and other aspects of census administration.

Data processing has an impact on almost all aspects of the census operation ranging from the selection of topics and the design of the questionnaire to the analysis of the final results.

Therefore, data-processing requirements in terms of personnel, space, equipment and software (computer programs) need to be looked at from the point of view of the census as a whole and at an early stage in the planning.

The existing data-processing staff will certainly need to be expanded somewhat and will probably need some upgrading in terms of skills, particularly if new computer hardware or software is to be used in the census.

Any needed training should be completed early enough so that those benefiting from the training can play an active role in census planning and operations.

Decisions will need to be made concerning the location of the various data-processing activities within the country, including the extent to which the processing work is to be decentralized.

Acquisition of both equipment and supplies can require long lead times; estimates of both data capture and computer processing workloads must be made early to enable timely procurement.

Closely related to the question of equipment is that of the provision of adequate space.

Although the maintenance of most personal computer equipment no longer requires adherence to rigid standards in terms of temperature, humidity, dust and so on, attention to issues related to power supplies is still important.

Inevitably, more important is the attention to be devoted to the maintenance of servers (especially heavy duty servers), where most of the information processing is likely to take place and saved, as well as the data transmission infrastructure.

The last issue is essential to ensure smooth and noise-less Internet and/or web communications between different units and centres engaged in census operations.

Moreover, in the case of traditional archiving, well-protected space for the storage of the completed census forms before, during and after processing will have to be secured.

In addition to considering the processing equipment to be used in the census, decisions will have to be made on the software to be used in editing and tabulating the census data.

It is very costly and time-consuming to develop software for census editing and tabulation.

Consequently, a majority of countries in recent years have turned either to one of the several portable software packages available for census editing or tabulation or to one of the commercially available personal computer spreadsheet, database or tabulation packages.

These packages can substantially reduce the extent of the systems analysis and programming tasks involved, although sometimes at a price in terms of loss of flexibility.

Each country may wish to assess its software requirements in the light of its own needs and resources and in the light of the general purpose and census software available.

Regardless of the software used, sufficient time will have to be allowed for training staff in its use.

Whatever software is chosen, it is certain that at least some degree of customization can be expected in order to meet the specific requirements of the census, especially with off-the-shelf, commercial software packages not specifically designed for census operations.

Therefore, a sufficient information technology (IT) workforce has to be available for software implementation.

Outsourcing some of the predominantly IT-related operations may be considered. Outsourcing should be implemented in such a way as to bring immediate economic and quality advantages to census operations.

Furthermore, national statistical offices should take adequate measures to ensure that outsourcing of census operations does not compromise data confidentiality and that necessary steps are taken so that the contractor does not have free access to the basic census databases.

It is worth mentioning that responsibility for hosting of census databases rests with the national statistical offices and that outsourcing of these activities is not recommended.

16. Plans for census outputs and dissemination

A census is not complete until the information collected is made available to potential users in a form suited to their needs. A wide range of statistical products can be made available to the public, the private sector, government agencies, local authorities and the academic and research communities.

The information may be included in published tables or reports for general distribution, produced as tables in unpublished form for limited distribution or stored in a database and supplied upon request either on magnetic and optical media or online.

A detailed plan for producing different census outputs should be guided by early user consultations to ensure data and information requirements will be met in a format commensurate with user needs and demands; such a plan will also be a useful guide to prioritizing data processing and tabulations.

Not all of the processed materials need to be disseminated widely or in a single format.

Tabulations required by only a few users can be supplied in unpublished form. Some data may not be tabulated until they are required at a later date.

The information stored in the census database allows fast and relatively inexpensive production of additional tables.

Countries may offer on-demand services to provide census information to users who require tables or other outputs not produced, or aggregates not available, through other means.

If suitable electronic dissemination is available to the census organization, custom tabulations from a separate, purposely-built online dissemination database might also be designed and extracted directly by end-users.

In this case, the census organization should prepare in advance and then implement an authorization and security policy, so that the risk of breaching confidentiality in data provided to outside users is avoided.

Printed publications, despite their production cost, remain in most countries the preferred vehicle for dissemination of the main results.

Target dates for publication should be determined well in advance and processing and printing programmes should be planned accordingly.

17 Staff recruitment and training

Early arrangements are necessary to secure the proper number and type of personnel required for each of the various census operations.

For reasons of efficiency and economy, it is important that the staff be selected on the basis of competence.

Consideration may also be given to the use of the same staff for successive operations, thus reducing the turnover of personnel.

While the preparatory and processing work generally calls for office employees possessing or able to learn certain specialized skills (cartographers, coders, data entry operators, programmers and so on); the enumeration stage usually demands a large number of persons capable of going to their assigned urban or rural enumeration areas and collecting the information according to specific definitions and instructions.

It is essential that the enumerators and, to the extent possible, their immediate supervisors be conversant with the languages or dialects of the area in which they will be working.

It is only prudent to recruit and train a somewhat larger field force than is required for the enumeration itself, as a certain amount of attrition is inevitable from the beginning of the training programme until the completion of the fieldwork.

Once the cartographic preparations are substantially complete and the questionnaire has been sent for printing, perhaps the single most important means that the census authorities have for influencing the success of the census is the training programme.

The contribution that a well-planned and executed training programme can make to the quality of the census results therefore cannot be stressed too strongly.

Such a training programme must of course focus on the widely dispersed and difficult to supervise field staff (namely, the enumerators and their immediate supervisors) but it must also cover others (for example, the higher-level supervisors, editors, coders, computer operators).

The entire census training programme should be designed to cover each phase of the work and provide an efficient and consistent means of effectively starting large numbers of employees in their work.

The programme will need to correspond closely to the needs of the various operations and, where appropriate, may include both theoretical and practical instruction, with emphasis on the latter.

In the case of the enumerators and their immediate supervisors, the training is most effective if it includes several opportunities for the trainees to participate in practice interviews and role-playing exercises, including in the use of adopted IT solutions.

In countries in which multiple languages are used, the method and content of the enumerator training programme will need to be suitably adjusted.

For example, if the questionnaire is printed in another language, provision will have to be made for instructing enumerators on the correct formulation of the census questions in the vernacular.

The training programme for editors, coders, operators of data recording equipment and so forth should also provide opportunities for the trainees to practice under the supervision of the trainers, the operations it is expected they will subsequently perform.

The intermediate- and higher-level technical staff, such as programmers and system analysts, may also benefit from special training programmes.

For them, the emphasis should usually be on recent technical developments of relevance to the forthcoming census and on the interrelationships among the various aspects of census plans and operations.

The organization and conduct of training courses should be entrusted to those having the necessary qualifications to carry out this task successfully, taking into account not only their professional abilities but also their ability in teaching.

This means that staff in charge of training should have certain qualifications that will enable them to stimulate the interest of trainees and to transfer the required knowledge, since otherwise well-qualified technical personnel who are unable to transfer their knowledge to the trainees in a satisfactory manner will be unsuitable as instructors for group training activities.

This must be taken into consideration when selecting instructors and it is recommended that objective criteria should be used.

In practice, however, it is difficult to find the necessary number of instructors who have both the professional and the teaching qualifications; for this reason, the instructors selected should themselves undergo training in how to organize and conduct training courses.

It is important that each training programme be made available in manual (booklet) form and distributed to the census organizers and training instructors.

It would also contribute to the uniformity of training, which is an essential factor for a successful enumeration, taking into account the great number of census instructors who will be engaged in training. Simple audio-visual aids (for example, film strips, posters, tape recordings) can also be used to help make the training more effective and uniform throughout the country.

It is very important to determine the time required to train staff for the various aspects of the census.

This depends on several factors: the type of function for which they are being trained, the level at which they will be performing, the complexity of the census, the educational level of the trainees, the number of instructors available and the funds available.

Usually, all courses last from one week to one month. It is strongly recommended that the training be carried out daily for a fixed period.

The results are not as good if training is provided for a few days per week, since with this approach, which draws out the length of the course, previous work is often forgotten and has to be repeated.

For this reason, it is also best to avoid completion of the training long before the start of the actual work. Any duration, however, may be fixed for the course, provided that the main principle namely that training should be long enough to permit the assimilation of the syllabus is not overlooked.

18. Avoiding gender biases and biases affecting data on minority populations

Gender-based stereotypes can introduce serious biases in census data and the conclusions drawn from these data.

There is much that can be done in the preparatory stages of the census to help minimize gender-based biases.

These preparatory activities are of two broad types: those related to census content and those related to census operations.

Issues of census content, including what information is sought and how, the definitions and classifications used, and the manner in which databases and tabulations are specified, are important in generating data needed to examine questions of gender equity.

In addressing these content issues, census planners and users will need to be alert to prevailing stereotypes so as to develop a census that both minimizes the influence of the stereotypes that respondents may hold and avoids further perpetuation of these stereotypes.

With regard to census operations, particular attention will need to be given to the selection, training and supervision of the field staff.

This involves ensuring that both men and women are recruited to the field staff (both as interviewers and supervisors) and that manuals and training materials cover gender bias issues just as they do other important sources of error.

Consultations with women's groups and others concerned with gender equity can help in addressing both content and operational issues.

Gender-related stereotypes and biases are concerns that have relevance for all countries.

Census authorities in a number of countries must also be alert to the possibility of stereotypes and biases affecting data on minority population groups.

Such groups may include ethnic, linguistic, national, racial and religious minorities and indigenous and nomadic populations.

As with gender issues, the problem will need to be addressed in terms of both census content and census operations.

Representatives of these minority groups can often provide census planners with important information and insights relevant to both census content and operations.

Thus, special efforts should be made to consult with them when planning the census.

In the case of minority populations living in isolated settlements or enclaves, such consultations are often critical for minimizing under enumeration among these population

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Brief History Of Census Taking In The World

The conduct of a census began in ancient times in Egypt, China, Palestine, and Rome. However, few results have survived from these early counts. These early ~~c~~ were undertaken to determine fiscal, labour, and military obligations. These were usually limited to heads of households, males of military age, taxpayers, or adult citizens. Women and children were seldom counted.

There are references to censuses in Chinese history for several centuries before Christ. The first of two enumerations mentioned in the Holy Bible was at the time of exodus that is 1491 B.C (Numbers Chapter 1) The second was undertaken at the order of King David in 1017 BC The Roman census was taken every 5 years and lasted for about 800 years.

Inventory of citizens and their property was taken for fiscal and military purposes. It is hard to say when the first census in the modern sense was undertaken, since censuses were long deficient in some important respects e.g. coverage- women and children were seldom counted. In Europe, Sweden's census of 1749 is sometimes regarded as the first, but those in some of the Italian principalities for example Naples, Sicily, go into 17th century. The first census of United States of America was in 1790 and was followed by censuses of England and France in 1801. These censuses began with objectives of determining military, tax and legal obligations.

Censuses in the 19th century changed their scope to meet other administrative needs as well as the needs of business, labour, education, and academic research.

Population Census Undertaking In Africa

Available records show that between the end of world war II in 1945 and March 1982 about 98 censuses of housing and/or population were taken in 46 of the 50 ECA member states. 4 states namely Chad, Congo DR, Djibouti and Ethiopia by 1982 had not taken any censuses. However, Congo DR and Ethiopia in 1984, Djibouti 1988 had carried out censuses. It is now only Chad, which has not yet conducted a modern census because of the civil war.

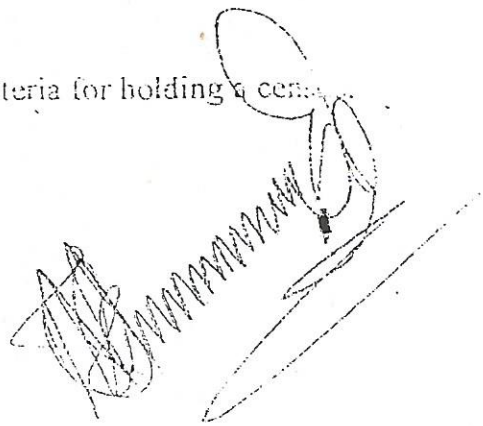
Population Census Undertaking In Zambia

Censuses of non-Africans in Zambia started as far back as 1911. The following censuses of non-Africans were conducted in 1921, 1931, 1946, 1950, 1956, and 1961. The first population census of Africans in Zambia was conducted in 1963. Thereafter comprehensive censuses have been conducted in 1969, 1980 and 1990. Ours 2000, 2010

Essential Features Of A Census

The United Nations has established a number of criteria for holding a census. The essential features are:

(i) Government sponsorship
(ii) Delimited territory
(iii) Simultaneity
(iv) Universality
(v) Individual enumeration
(vi) Processing and publication of results



1. Government Sponsorship

Considering that the census is a huge operation it requires government support both financially and manpower. It is only the government which can enact a law to compel people to provide information. In case of Zambia the Central Statistics Office (CSO)

Disadvantages

(i) It is difficult to calculate the permanent population of the country and its regional distribution. This information is essential for development planning.

(ii) Difficulties are involved in counting travelers (people in transit) and people temporarily present in places of enumeration and those without residence. This results in omissions

(iii) Completion of counting in a short period of time requires a lot of enumerators and hence a lot of expenditures.

2. Dejure Method of Enumeration

Dejure method enumerates people in terms of their habitual or usual place of residence. Visitors or people temporarily at the place of counting are excluded, those absent are included in the counting.

Advantages of dejure Method

(i) It provides the correct geographical distribution of the population, this information is valuable in solving economic, social and political problems of the country.

(ii) It minimizes the chances of double counting of population which may happen in defacto enumeration when people are aware of certain concessions to be granted on the population size.

Disadvantages

(i) It requires more complicated definitions and instructions.

(ii) Many people who do not have a permanent place of residence may thus be omitted, double counted or attributed to a wrong place or area.

(iii) There is a problem of definition of usual place of residence from legal residence or any other type of residence. Those maintaining more than one place of residence provide a problem of counting.

(iv) There is also a problem of determining what period is sufficient for it to be usual residence specification.

Effects Of Defacto & Dejure Methods On Population Size

The defacto method is commonly used in a number of countries in the world. The dejure method is used by countries like Morocco, USA, Cuba, Canada, Haiti France, Sweden and Norway.

In terms of the effect on population size by the two methods, Shryock & Siegel, 1973 ("Methods & Materials of Demography") found a quantitative difference of 3% in total population size obtained by the two methods. This analysis was based on seven countries.

Economic Commission For Africa Criteria (ECA) On Defacto & Dejure

The Economic Commission for Africa (ECA) recommends that the following criteria should be followed in the choice of either method.

(i) Easy of enumeration

(ii) likely accuracy of results

(iii) Needs of the user

(iv) Comparability with other definitions

is mandated to carryout a census every after 10 years and the legal backing is stipulated under Cap 425 of the Laws of Zambia.

2. Delimited territory
The census must be carried out in a well defined territory or demarcated area so that when the results are published they should pertain to that particular area.

3. Simultaneity
The census must be simultaneously carried out, that is enumeration should take place at the same time in all areas; "census night" or "reference night" is suppose to be applicable to all areas. In 1952, the Nigerian census did not satisfy this criterion. In Northern Nigeria enumeration took place in May/June/July 1952. In Western Nigeria enumeration took place in December 1952/January 1953. In Eastern Nigeria enumeration took place in May/June 1953

4. Universality
The census enumeration must include every person in the designed area without omission or duplication.

5 Individual Enumeration
The census must enumerate each person's individual characteristics that is age, sex, name, birthplace, nationality, etc.

6. Processing and Publication of Results
The census is considered complete only after the results have been published soon after the census is undertaken. In 1973, Nigeria conducted a census but results were not published. In 1979, Gabon conducted a census also results were not published. These two censuses were not considered complete.

Defacto And Dejure Enumerations
There are two methods of census enumeration; Defacto and dejure.

1. Defacto method of enumeration
It refers to an enumeration of persons physically present at a specified place on census night.

Questions Asked
(i) Usual members present
(ii) Visitors
(iii) How many people slept in this household last night?

Advantages of Defacto Method
(i) Simplicity and objectivity of definitions.
Here enumerators simply report all persons present in each dwelling or place of enumeration at a specified time.
(ii) No elaborate instructions.
Here no detailed instructions are required on who is to be excluded or included.
(iii) It facilitates international comparability as it can be applied universally without regard to differences in total conditions between countries such as in-migration and out-migration.

Given the above criteria, it should be noted that in a country with a large number of alien workers coming into it for short period of time, the defacto method may be more accurate than the dejure method. And in cases where many people leave the country in search of jobs, the dejure method is better than the defacto method

Methods Of Enumeration Used By Enumerators

There are two methods employed in the field by enumerators, these are:

(a) Canvasser and

(b) Householder

The canvasser and householder methods fall within the defacto and dejure methods.

1. Canvasser Method

The canvasser method involves visits by enumerators who with the help of the head of household record information needed on the qusetionnnaire(s) designed for the purpose.

Advantages of the Canvasser method

(i) Trained enumerators can interpret questions accurately and uniformly record the information consistently thus adding much value to the content of census data.

(ii) This is a very useful method in populations with large numbers of illiterates who could misinterpret questions.

(iii) Trained enumerators can handle larger and/or more complex questions than the general public.

Disadvantages

(i) The method requires a large number of enumerators, which can be costly.

(ii) There isn't much time for recall and consultation. Hence a high possibility of having content errors due to recall lapse.

(iii) It may generate uneasiness because of the presence of interviewers or enumerators and hence does not guarantee confidentiality.

(iv) There is a possibility of having biases brought about by enumerators.

2. Householder Method / Self Enumeration.

The method involves delivering a well defined questionnaire to the household head who then records the information, which is then collected by a census official or deposited at a specified point.

Advantages of Householder Method

(i) It is less costly because it requires fewer and usually less intensely trained enumerators

(ii) Respondents have more time to recollect, consult and obtain information thus minimising content errors.

(iii) It generates more confidence among respondents because of the assurance of the confidentiality of records.

(iv) Enumeration bias by enumerator is minimised

Disadvantages

(i) Cannot be used in most developing countries including Zambia because of low level of literacy.

(ii) Even the literate people might not understand the questions properly and hence there is likelihood of filling the questionnaire wrongly.

(iii) It leads to high non-response rate.

Enumeration Of Special Groups

The enumeration of special groups include those living in remote areas, those with difficult languages, those for whom the census has no meaning, the nomads, vagabonds, hotel residents, trumps, etc. [illegible] enumerate these groups enumerators are often given special instructions to track them down and record their particulars with reference to specific time of the census.

Advantages of a census

(i) A census is usually the best source for the total number of people present in an area at a particular time.

(ii) Data from a census are very comprehensive in coverage.

(iii) Census data provide information for population projections and calculation of vital rates.

(iv) Population census provides adequate socio-economic data at the local level, which can be used for development planning, and decision making.

(v) Population census provides a sample frame and reference for subsequent sample surveys

(vi) Census is the most important source of information for scientific study of the population of a country.

Disadvantages

(i) A census is a gigantic and expensive operation and so most African countries face technical, financial and qualified personnel problems. As a result data from census may not be timely (the complete report of the 1990 census of Zambia, for example came out in 1995) Censuses have also been carried out infrequently (for example, Ghana was unable to keep to the pattern of decennial censuses: 1960, 1970, 1984 and the census for 1994 has not been conducted.

(ii) A census provides data only as at the time of the census and fails to give any information about the population in the intercensal period.

(iii) The two standard methods for example a population (defacto & dejure) may yield a different size of population for the same subdivision of a country (for example: "people temporarily away from home" would be counted in one place by the defacto method and in another place by the dejure; they may also give slightly different total population figures for a country.

UNITED NATIONS RECOMMENDED QUESTIONS

1. Geographical Questions

(i) Place of residence

(ii) Enumeration area
(iii) Place of birth
(iv) Duration of residence
(v) Place of previous residence
(vi) Place of work

2. Personal/Children Questions
(i) Sex
(ii) Age
(iii) Relationship to head of household
(iv) Marital status
(v) Children everborn
(vi) Children living
(vii) Children dead
(viii) Literacy & education
(ix) Age at marriage
(x) Duration of marriage
(xi) Marriage order -- # of times a person is married.
(xii) Fertility
(xiii) Citizenship
(xiv) Nationality
(xv) Ethnicity
(xvi) Language
(xvii) Religion.
(XVIII)

3. Economic Questions
(i) Economic activity
(ii) Occupation
(iii) Industry
(iv) Employment status
(v) Income
(vi) Livelihood

Procedures In Census Enumeration *

A. Planning Stage

(i) Preparation of maps (CSA-Census Supervisory Areas, SEAs-Standard Enumeration Areas)

(ii) Listing of actual places

(iii) Determining data needs of users

(iv) Choosing questions to be asked and tabulating

(v) Deciding on the method of enumeration

(vi) Designing the questionnaire

(vii) Testing the questionnaire and procedures

(viii) Planning Data processing procedures

(ix) Acquiring vehicles and equipment to be used

(x) Conducting publicity compaign

B. Pretesting

(i) Conduct a pilot census

(ii) Conduct a Post Enumeration Survey (PES)

C. Collecting Data

(i) Recruitment of enumerators and supervisors

(ii) Collecting data using either dejure or defacto or both methods.

D. Receipt and Control

(i) Checking of number of questionnaires received from each Standard Enumeration Area (SEA)

(ii) Filling of control forms

E. Data Processing

Editing and Coding

Editing and coding are key steps in any survey operation. They constitute the link between the raw data collected by the interviewers and the input to the computer program.

Editing is a process designed to check that the information contained in the questionnaire is complete, recorded in the prescribed manner, and consistent; and to take appropriate action when these conditions are not fulfilled. Examples of types of editing, field, office, computer editing.

Coding is a process by which questionnaire entries are assigned a numeric code. Examples of coding, Pre-coded and manual coding.

Data Entry

After editing and coding is completed, the questionnaires are entered on a computer using a statistical software. e.g. IMPS, ISSA, COCENTS, SAS by trained data entry operators.

Quality Control

The purpose of quality control during data processing is to minimize the amount of error introduced. Errors can be made by failing to detect an error during manual editing

F Analysis and Publication

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After all the questionnaires have been entered in the computer, the data is analysed and the output is in form of cross tabulations or single tabulations of age, sex, geographical distribution of population by district and provinces, school enrollments, etc. When the whole analysis is complete an analytical report of the census is published.

Uses of Census Data

(i) Estimating the future population size and distribution which are fundamental to long term planning of many public programmes. For example, education needs (the number of school places and teachers), health needs (the number and location of hospitals) and manpower needs (employment of the population) and housing programmes.

(ii) Investigating the adequacy of the relationship between demographic and socio-economic processes.

(iii) Measuring the levels and trends in the standard of living of the population.

(iv) The allocation of parliamentary seats.

(v) The allocation of resources.

Vital Registration System

In contrast to censuses which are periodic (carried out every 5 or 10 years) vital registration system (VRS) involves a continuous and permanent recording of vital events pertaining to births, adoptions, deaths, marriages, divorces, legal separations, and annulments, etc. The recording of vital events is done shortly after they occur and within a specific period of time (for example, one year) in order to facilitate the calculation of vital rates. While VRS functions efficiently in developed countries it is yet to be established in many parts of the developing world. In those countries where they have been established considerable under registration of births and deaths occurs. In sub-Saharan African countries attempts have been made to improve VRS, the results have been disappointing. Analysis based on VRS seems to suggest that the rates of coverage VRS are deficient both in terms of coverage and recording of events.

Brief History of VRS

VRS started as a recording of events relating to religion, that is the question of "flock" those belonging to a religion or church. As part of the process the church recorded all vital events taking place within the church. It is worth to note that the registration was for religious purposes and not administrative. As early as AD 720, Japan had a system of registration of events of the Buddhists temperals. In Europe registration dates back to about the 15th century. In Britain, King Henry VIII ordered all baptisms and births to be recorded. Sweden established registration in parishes (religious units) in 1608. In 1638, the colonies of Massachussets and New Plymouth started registration and it spread to all parts of America.

The religious registration cover members of churches whereas civil registration encompasses only events.

Civil registration systems in most African countries are so inefficient. Reviewing progress achieved in the development and expansion of civil registration systems and vital statistics collection in Africa around 1985 the UNECA Secretariat noted that majority of the countries that have attained reasonable nation-wide registration coverage were small island countries like Cape Verde, Sao Tome Seychelles and Mauritius. A few other countries namely, Algeria, Egypt, Tunisia, and Libya have fairly satisfactory civil registration systems. In the rest of Africa registration is for

selected areas or selected populations mainly in towns. The situation in the former African colonies before independence was that colonialists instituted registration for Europeans to the exclusion of Africans. For instance in Kenya in 1904 registration of birth was compulsory for only Europeans. In 1906 registration of deaths was compulsory for Europeans. In the same year births and death registration was extended to Asians, and it was only in 1971 that registration of births and deaths was extended to the total population. I t should be mentioned that although a number of countries have recently showed interest in the development of civil registration systems and vital statistics collection not much progress has been made in the past two decades. Some projects have been implemented e.g. in Kenya, Ghana, Congo, and Niger and have failed to extend the basic infrastructure of the civil registration promulgation of registration for compulsory nation-wide registration as well as strengthening improved methodologies and coverage.

Methods of Collecting Vital Registration Data

There are two major methods of collecting vital registration data these are active and passive methods.

Active method

In the active method a state or government goes round to collect data of vital events through its registration personnel. There is also a semi-active approach in which reliance is placed on institutions like hospitals, churches, and clinics, to record vital events and submit returns to the central agency.

Passive method

In the passive method the state or government relies on the household or individual to register the event him/herself at the registration centre. This approach can work well if there is a highly literate population, which understands the need for registration.

The African countries use the dual record system. The dual record system has two [illegible] record sy[illegible] the continuous registration, and periodic household enumeration (PHE).

Continuous Registration

Here mostly teachers or headmasters are used to go round every week to find out any births, deaths and marriages as they occur in the communities and thereafter transmit these to the registration office e.g. Zambia uses the continuous record registration.

Periodic Household Enumeration (PHE)

Under the periodic household enumeration there is a specific period assigned to record vital events e.g. 3 months, that is every after 3 months you visit a household to record any vital events that may have occur since your last visit to that particular household. After wards you can compare the results using the two methods. In Africa only about 35% of the population is covered by the VRS.

Factors Hindering The Successful Implementation Of The VRS

(i) The passive nature of registration systems i.e. there is lack of public information or awareness for the need to register the events.

(ii) Prohibitive administrative costs of a vital registration system and insufficient funding by governments to cover such activities.

(iii) High illiteracy rates

(iv) A large proportion of births and deaths which do not occur in hospitals or which are not attended to by a Doctor/Medical personnel.

(v) The general perception by individuals that they derive little or no benefit from the registration of births and deaths.

(vi) The problem of travelling long distances to register makes people feel uneasy or shun the objective of the registration exercise.

Solutions To Some Of The Problems

* We can use some traditional mechanisms in the African setting. In Uganda for instance chiefs are used to assist in vital events registration. In Tanzania a 10 cell system has been devised to register vital events, every 10 households unit has a leader(Balozi) who co-ordinates and records events which he communicates to the next higher hierach.
Ethiopia also uses the urban dwellers association (population of 12,000) and peasants association (population of 5,000) to collect vital events.
* In order to achieve an appreciable success in registration there is need for greater improvement in education, publicity, as well as infrastructure.
* Some people have advocated the introduction of penalties but the point is that if people do not register they do not know why they should do that.
In some instances non-registered children are sometimes refused school admission. It is not an answer and this underscores the need to intensify education and publicity on the need to register vital events.

Advantages of vital registration system

(i) Data can be tabulated for many geographical areas

(ii) Detailed cross classifications, including causes of deaths, are not subject to some error.

(iii) Institutional continuity

(iv) Well suited for providing both long and short term time series data.

Disadvantages

(i) There is need for separate estimated population at risk. VRS cannot provide the denominator for CBR and CDR calculations.

(ii) There is limited range and depth possible in the collection of data on classifying variables.

(iii) The system is very difficult to administer and supervise because it is extensive in both time and space.

(iv) Difficult to establish occurrence of events when births and deaths (or knowledge of them) are not associated with individuals who can serve as informants (for example health workers or religious personnel).

Uses Of Vital Registration System

There are three main categories for the use of vital records and statistics.

Administrative uses

(i) Birth registration records provide the necessary legal and documentary evidence to certify a person's age, parentage, birthplace and nationality or citizenship

the household and characteristics of household members. The enumerator visits the same sample after an interval to record the changes that have occurred in the household composition. In addition, the enumerator asks specific questions about events, which have occurred since the previous round. Further visits may follow at appropriate intervals, so that the sample of households then becomes a sort of vital-rate "Panel."

MRS has been used in some African countries, for example, in Nigeria (Rural Demographic Sample Survey, 1955-66) and in Ghana (Ghana Living Standards Survey, 1988-1990).

Advantages of Multi-round Surveys

(i) The follow-up procedures after the first round represent a very light burden for the enumerators and this makes it an ideal vehicle for other quite types of enquiry.

(ii) It allows information to be obtained on vital events, namely, deaths and births and also migration.

(iii) It gives the age of a person as stated by him before he/she dies

(iv) Error of omission is reduced since the second and later rounds habitually reveal the exercise of persons omitted at the first round.

Disadvantages

(i) They are more costly than the single-round surveys.

(ii) It is complex to design and administer (dwellings have to be clearly identified so that they can be located again, and instructions covering them are more complex, requiring longer training of enumerators).

(iii) The periodic visits to the same household may result in respondent or interviewer fatigue.

(iv) The quality of fieldwork may vary from round to round, with the danger of interviewers reporting " no change" without serious interviewing.

(v) There is no built-in mechanism for the measurement of coverage error.

(vi) There may be omission of certain types of events. In particular, infants who are born after one round and die before the next can only be detected by the retrospective approach.

The Dual Record System

The dual record system (DRS) represents a further refinement in the effort to collect accurate and complete reference period data. It is often called "PGE" following its first large-scale application in the Population Growth Estimation project in Pakistan. In Africa, the method has been applied in Algeria, Liberia, Malawi, and Morocco. The DRS is based on the principle that if two independent data collection operations are set up to cover the same areas, most of the events they collect will be the same. In relatively few cases will one operation not detect an event missed by the other. The DRS obtains data on events in well-defined areas by two independent data collection systems. These are registration system (civil registration) and periodic household survey. The registration exercise involves the nomination of a local inhabitant as a Registrar in each sample area. He/she is normally assisted by sub-Registrars, each of whom is responsible for reporting all vital events in a small part of the area. Reports, including nil returns, must be made monthly by all Registrars and sub-Registrars. A multi round survey is conducted in the same area at fixed intervals

(ii) Birth registration certificates are used in the determination of person's eligibility for admission to school, to obtain a passport, to enter certain fields of employment and to vote in an election.

(iii) The death certificate is required for civic functions such as entitlement to family allowances, insurance claims, care of children, tax deductions, or benefits.

(iv) It can also provide legal evidence relevant to claims of property, to insurance claimed on the life of a deceased person, to the rights of a surviving spouse to remarry, or to claim for family allowance where the death creates financial need.

(v) Marriage and divorce records are the basis for claims involving the status of women, such as dependency, alimony payments, tax deductions and allowances, provision and allocation of specific types of housing. The divorce records are also important to establish the right to remarry.

(vi) In the initiation and maintenance of population registers, officially authenticated records of birth, death, marriage, and divorce are essential and invaluable.

Statistical Uses

(i) Vital statistics provide additional data independent of census, on measures of fertility and mortality, both for the entire nation and for small geographical areas; this allows the study of trends and patterns in fertility and mortality.

(ii) The sex ratio at birth provides a very important piece of information for use in population projections.

(iii) The data from vital registration gives information on the seasonality of births and deaths; this is important for the planning of related services.

(iv) The system may be used as a check on census enumeration, particularly of those in the infant and young-childhood age range, where under-enumeration is common.

(v) In populous countries, vital statistics can be useful in formulating population control programmes and for evaluating the effectiveness of such programmes.

(vi) In longitudinal surveys e.g. family genetic studies of fertility and mortality, the records of birth, death, marriage and divorce can be very useful.

Medical Uses

(i) Data about deaths and their causes as recorded on death certificates are essential in the planning of health services for specific areas and whole country. For example, the cause-of-death statistics are helpful in forecasting the future course of age-specific mortality.

(ii) Epidemiological studies based on morbidity data have a strong influence on the reduction of mortality and are usually based on records of vital statistics.

Demographic Sample Surveys

Given the fact that in developing countries people do not willingly register vital events, the collection of vital events data requires active procedures such as household surveys in which trained interviewers visit dwelling units and follow a specific procedure to obtain demographic data.

There are three types of demographic sample surveys that have been used in Africa single round surveys, multi-round surveys, and dual record systems.

Single Round Surveys

The term single round surveys (SRS) is used to refer to a one-time data collection effort.

In this case, the selected respondents are interviewed once only. The two approaches employed in a SRS for collecting birth and death data is the reference period procedure and the pregnancy/birth history procedure.

Reference Period Approach

The reference period approach asks a knowledgeable adult member of a household to report information concerning events that occurred in the household within a fixed (specified) reference period, usually the 12 months preceding the survey.

The main limitation of this approach is the under-reporting of events, especially, infant and childhood death reporting due to errors of dating (reference period error and age mis-reporting) and, errors of omission (respondent's forgetfulness or concealment of events e.g. children born to different husbands before the present marriage).

Pregnancy/Birth History Approach

The pregnancy/birth history approach records the sequence and spacing of all pregnancies/births and their survivorship along with the date of death (or age at death) for births which did not survive. This information is usually collected from the women whose fertility experience is being documented. This approach is generally considered to collect more complete period-specific data than does the reference period approach because it attempts to obtain data pertaining to all reproductive events directly from the women concerned, and because it employs probing questions to assist respondents in recalling events. However, pregnancy history data do not necessarily yield accurate period-specific estimates of fertility levels or time trends in fertility because it can suffer from the omission of events, and the misreporting of dates of occurrences.

An example of a survey that employs the single round is the Demographic Health Survey (DHS) funded by USAID and implemented by the Institute for Resource Development Inc/Westing house. The DHS has been carried out in Zambia in 1992 and 1996, the next one will be carried out in 2001.

Advantages of Single Round Surveys

(i) It is less expensive
(ii) It is flexible
(iii) It is easy to administer

Disadvantages

(i) Births and deaths are seriously under-reported
(ii) Non-sampling errors are high (i.e. errors introduced by the interviewer, respondent, Data entry etc)

Multi-round Surveys

The multi-round survey (MRS) also called follow-up survey is an attempt to overcome some of the sources of errors inherent in the single-round approach as regards the estimation of births, deaths, and migration. Basically, the idea is carry out a first round survey during which the enumerator prepares a list of persons to be followed by survey (selected as a probability sample) and record the composition

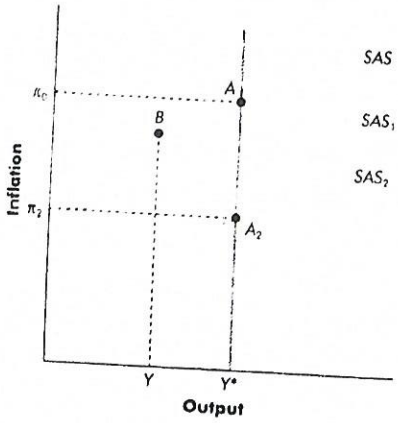
In the short run, trends in wages are largely given. The firm has some flexibility over earnings, as distinct from negotiated wage rates, because fluctuations in overtime and short time affect average hourly earnings. But this flexibility is limited. In the medium run, the firm begins to adjust the path of wages. In the long run, the process is complete and the economy is back at potential output.

We now use this analysis to think about the market for output. By distinguishing between supply in the short and long run, our model of output reflects *both* supply and demand, even in the short run. Nevertheless, its short-run behaviour is like the simple Keynesian case in which output is demand-determined. Its long-run behaviour is fully classical.

In Figure 21.7 the economy is at potential output at *A*. In the short run, the firm inherits a given rate of nominal wage growth (not shown in the figure). Previous wage negotiations anticipated remaining in long-run equilibrium at *A* with inflation π_0. By keeping up with inflation, nominal wage growth is expected to maintain the correct real wage for labour market equilibrium.

The short-run supply curve *SAS* shows how desired output varies with inflation, for a given inherited growth of nominal wages.

If inflation exceeds the expected inflation rate π_0, this helps firms by raising their output prices. The real wage is lower than expected. If this had been foreseen when wages were negotiated, the inherited nominal wage would have been higher; but it was not foreseen. Firms take advantage of their good luck by supplying a lot more output. They can afford to pay overtime to ensure that the workforce co-operates, and may also take on temporary extra staff.



Firms raise prices when wage costs rise. Each short-run aggregate supply schedule reflects a different rate of inherited nominal wage growth. For any given rate, higher inflation moves firms up a given short-run supply schedule. A persisting boom or slump gradually bids nominal wage growth up or down, shifting short-run aggregate supply schedules. When these shift enough to restore to the inflation rate at which AD and AS intersect, potential output is restored.

Figure 21.7 Short-run aggregate supply

Conversely, if inflation is below π_0, the real wage is now higher than anticipated when the nominal wage was agreed. Since labour is now costly, firms cut back output a lot. They move from *A* to *B* in Figure 21.7. Firms move along the short-run supply curve *SAS* in the short run.

If demand and output remain low, the growth rate of negotiated nominal wages gradually falls. With lower wage growth, firms do not need to raise output prices so quickly. The short-run aggregate supply schedule shifts down from *SAS* to SAS_1 in Figure 21.7. Lower inflation moves the economy down its aggregate demand schedule, increasing the demand for goods. If full employment and potential output are still not restored, negotiated wage growth falls again, leading to a short-run aggregate supply schedule such as SAS_2.

These short-run aggregate supply schedules give a realistic picture of adjustment to demand shocks. Because the short-run aggregate supply schedule is flat, a shift in aggregate demand leads mainly to changes in output not prices in the short run. This is the Keynesian feature. But deviations from full employment gradually change wage growth and short-run aggregate supply.

The economy gradually works its way back to potential output. That is the classical feature. We now clos adjustment in more detail.

We now combine the aggregate demand schedule with the short-run aggregate supply schedule to s how demand or supply shocks set up an adjustment process. In so doing, we now assume that the go market clears, even in the short run. Short-run aggregate supply gradually changes over time as w growth adjusts to the rate that restores full employment and potential output, placing firms eventuall their long-run aggregate supply schedule.

Output is no longer demand-determined when aggregate demand lies below the level of potential out In the short run, firms are also on their short-run supply schedules producing what they wish, *given inherited nominal wages*.

However, sluggish wage adjustment prevents immediate restoration of full employment. When aggre demand for goods falls, firms reduce output and employment. Since wages do not fall at once, ther involuntary unemployment. *Employment* is demand-determined in the short run.

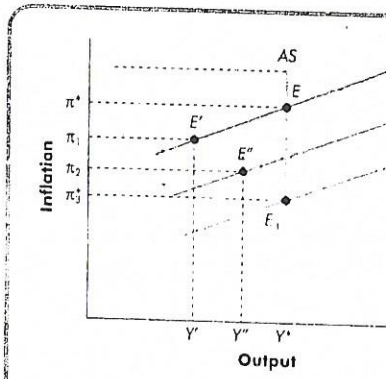
Figure 21.8 shows a downward shift in the aggregate demand schedule from *AD* to *AD′* because monet policy is tightened (a higher *ii* schedule in Figure 21.1). In the long run, aggregate demand must return potential output, and the economy will end up at E_3. Hence, the tighter monetary policy can be viewed a cut in the target inflation rate from π^* to π_3^*.

When monetary policy is first tightened, interest rates are initially raised since actual inflation at *E* is now above target. Aggregate demand shifts down to *AD′*. In the classical model there is an instant adjustment of prices and wages to keep the economy at full employment and potential output. Equilibrium inflation immediately falls to π_3^* and the new equilibrium is at E_3. Output remains at potential output Y^*.

These classical results are valid only in the long run. When adjustment of wages and prices is slow, the economy faces the short-run aggregate supply schedule *SAS*, reflecting the nominal wages recently agreed.

In the short run, the downward shift in *AD* causes a move from *E* to *E′*. Since firms cannot cut costs much, they reduce output to *Y′*. At *E′* the goods market clears at the intersection of the aggregate demand schedule *AD′* and the supply schedule *SAS*. Inflation has fallen a little because of lower demand, but output has fallen a lot. With lower inflation than the expectation built into nominal wage agreements, *real wages have risen*, despite the fall in output. Once firms can adjust employment, some workers are fired and unemployment rises.

In the medium run, this starts to reduce wage growth. With inherited wages lower than they would have been, firms move on to a lower short-run aggregate



Beginning at E, a lower inflation target shifts AD Given inherited wage growth, the new equilibri E′. Output falls from Y* to Y′, and actual inflati π1. Since wages have risen faster than prices de fall in output, unemployment rises. In the next w settlement, nominal wage growth slows, and the supply schedule becomes SAS′. Equilibrium is n and output recovers to Y″. Once wage growth s enough to make SAS_3 the supply curve, long-ru equilibrium is re-established at E_3.

Figure 21.8 A lower inflation target

supply schedule SAS'. The goods market now clears at E''. Output and employment recover a bit, but some unemployment persists. Since inflation has fallen, the central bank is less worried about the amount by which inflation exceeds its new target and cuts real interest rates, moving the economy down AD' to E''.

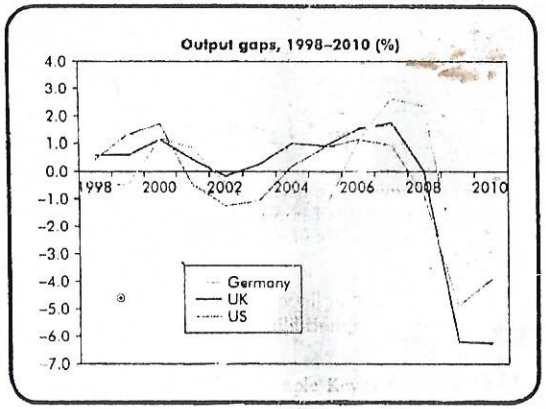
In the long run, adjustment is complete. Wage growth and inflation fall to π^*_3. The short-run aggregate supply schedule is SAS_3 in Figure 21.8. The economy is in full equilibrium at E_3, on AS, SAS_3 and AD'. Output is Y^* and the labour market is back at full employment.

The real world lies between the extreme simplifications of the simple Keynesian model and classical models. In practice, prices and wages are neither fully flexible nor fully fixed. A tougher inflation target has real effects in the short run, since output and employment are reduced. But after wages and prices adjust fully, output and employment return to normal. Inflation is permanently lower thereafter.

ACTIVITY 21.1

Output gaps 1998–2010

The output gap ($Y - Y^*$) is the percentage deviation of actual output Y from potential output Y^*. Each year the Paris-based Organization for Economic Cooperation and Development (OECD) estimates potential output for all its member countries. The diagram below shows estimates for the UK, US and Germany. Positive output gaps are booms; negative gaps indicate slumps.



The diagram shows the relative stability of the period 1998–2006. Central banks were successfully managing aggregate demand to keep it close to full capacity.

Of the three countries, Germany is the most dependent on manufacturing exports. China led the global economy into a boom in the first decade of the twenty-first century, and commodity prices were rising sharply by 2007/08. It should be no surprise that German exporters enjoyed this boom in the world economy. German demand and output were above their long-run sustainable level. This was true to a lesser extent in both the UK and US.

When the financial crisis hit, some economists thought that Germany would be relatively well insulated, since its regulation of banks had been more stringent than in the UK and US. Yet, the diagram shows that Germany, experienced nearly as dramatic a slump in aggregate demand as its Anglo-Saxon competitors. Sub-prime mortgages had found their way even into Stuttgart and Frankfurt. Even China did not escape. When aggregate demand in China fell in 2009, German exports were hard hit. Thus different countries experienced the crash through different channels. It originated in the US, and UK banks were then very exposed, but Germany suffered because all its export markets suffered.

The diagram shows how the upturn is slowly starting to take effect. It also confirms that for the next few years all major economies will have substantial spare capacity – the underlying assumption of the Keynesian perspective.

Finally, the diagram helps identify periods in which simple Keynesian analysis cannot be the whole story. Once the output gap has been eliminated, there is no spare capacity remaining, and the classical model is increasingly relevant.

Questions

There are two ways in which you might try to calculate potential output, and hence the output gap (i) statistically, by fitting trend lines through previous business cycles, or (ii) economically by trying to get an idea of the balance of aggregate supply and aggregate demand.

(a) If you wanted a quick procedure capable of being replicated across many countries, which of the two would you be inclined to choose?

(b) How might you build up an idea of an empirical economic model of the balance between actual output and potential output?

(c) A central bank reduces interest rates but is disappointed to find that this quickly generates higher inflation, not higher output. What can you infer about the initial level of the output gap? Why?

To check your answers to these questions, go to page 686.

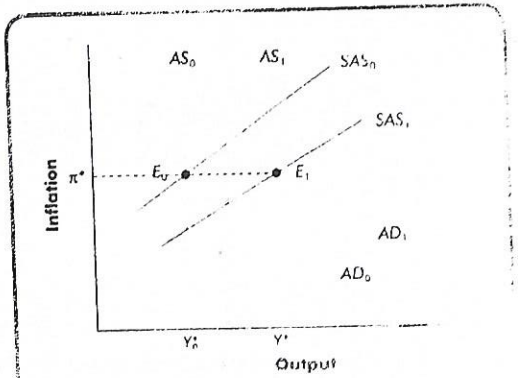
A permanent supply shock

A permanent supply shock changes potential output.

Suppose a change in attitudes towards women working leads to an increase in labour supply. Potential output rises. In the long run, aggregate demand must rise in line with aggregate supply. Lower real interest rates allow higher aggregate demand at the unchanged inflation target π^*. Provided monetary policy is loosened, the rightward shift in AD can match the rightward shift in aggregate supply. By accommodating the extra supply with looser monetary policy, the inflation rate remains π^*, and the economy moves directly to the new long-run equilibrium, from E_0 to E_1 in Figure 21.9.

Because of lags in diagnosing the shock, and in the response of consumption and investment demand to lower interest rates, Figure 21.9 exaggerates the ease of adjustment to a permanent supply shock. In practice, output may not jump all the way to the new level of potential output.

If the aggregate demand schedule does not fully and immediately shift to AD_1, output is below Y^*_1. This reduces inflation and the central bank responds with lower interest rates. Over time, the aggregate demand schedule will drift to the right until it reaches AD_1 in Figure 21.9.



A permanent rise in supply shifts AS_0 and SAS_0 to AS_1, SAS_1. By permanently reducing interest rates, the central bank shifts AD_0 to AD_1, meeting its inflation target π^* in the new equilibrium at E_1. If the central bank acts quickly no further shifts in SAS_1 are required.

Figure 21.9 A permanent supply increase

- These errors centre on the **content** of the survey such as **definition of survey objectives**, their **transformation into usable questions**, and the **obtaining** of responses.

- These errors concern the accuracy of measurement at the level of individual units.

1. For example at the initial stage wrong or **misleading definitions** and **concepts** on **frame construction** and **questionnaire design** lead to **incomplete coverage** and **varied interpretations** by different interviewers **leading** to **inaccuracies** in the collected data

2. **Inadequate instructions to field staff** are another source of error. For some surveys instructions are **vague** and **unclear** leaving interviewers to use their **own judgment** in carrying out fieldwork.
3. The interviewers themselves can be a source of error. At times the **information collected** on a given item for all units **may be wrong**; this is mainly due to **inadequate training of field workers.**

4. **Age reporting in Africa is a common measurement problem** through **age heaping** and **digital preference**. These and other examples of measurement error may be **attributable to respondents** or **interviewers** or both. At times there may be **interaction between the two**, which may contribute to **inflating such errors**.

Respondents can introduce errors because of the following reasons:

– **Failure to understand the survey question(s)**

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(d) Vital Statistics System

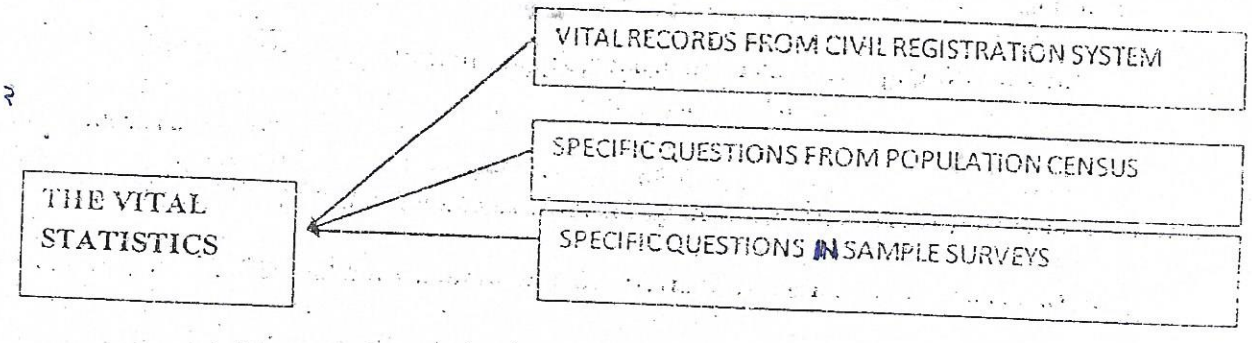
- The term, "*vital statistics*," refers to the statistical information that can be extracted from the civil registration system, such as the numbers and rates of births and deaths, causes of death, and other measures.
- ***When civil registration data do not exist or are deficient, some countries may have recourse to other data sources other than civil registration to estimate the necessary vital statistics.***
- A vital statistics system is ***defined*** as:

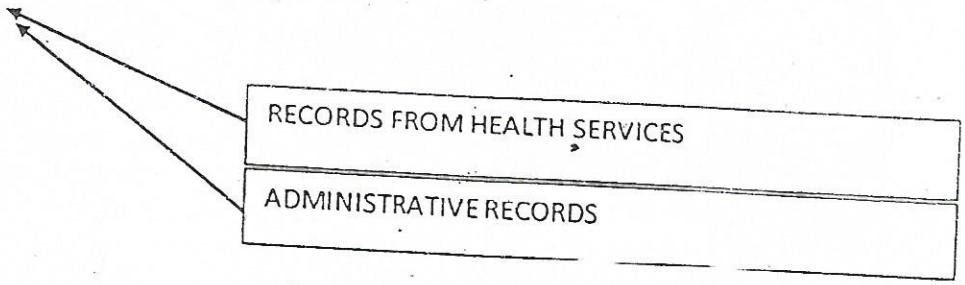
(i) Collecting information through ***civil registration*** or ***enumeration*** on the frequency of occurrence of specified and defined vital events, as well as relevant characteristics of the events themselves and of the person or persons concerned,

(ii) Compiling, processing, analyzing, evaluating, presenting and disseminating these data in statistical form. The main source is civil registration, supplemented by data from population census, sample surveys and administrative records.

- ***Civil registration is the method of choice as a source of data on vital events for the production of vital statistics, and other methods should not be exclusively relied upon except as temporary expedients until a satisfactory civil registration system is functioning.***
- ***Even when civil registration functions optimally, it must be complemented by population censuses and surveys***

2. Sources of data for vital statistics





NB: Case for Zambia.

- Health institutions issue birth records and medical cause of deaths for the purpose of registration of the vital events.
- The police also issue BID reports used for the same purpose.
- The headmen/chiefs also write confirmation of death letters.
- Baptismal certificates are also relied upon as evidence of birth (determining age and sex)

f. Priority in method of collection

- *The recommended method of collection for the development and maintenance of a vital statistics system is to establish a reliable civil registration system capable of yielding comprehensive data for the production of vital statistics to meet appropriate needs for such data on a continuous basis*
- *Even though civil registration includes all vital events (live birth, foetal death, marriage, divorce, annulment, judicial separation of marriage, adoption, legitimation and recognition), the vital events which comprise a vital statistics system are live births, deaths, foetal deaths, marriages and divorces*
- *First priority should be given to setting up procedures for the registration of (a) live births and (b) deaths, followed closely by (c) foetal deaths, because it is these events that are basic to the measurement of population growth rates and directly related to the measurement of key health indicators, such as infant and childhood mortality and life expectancy. The increasing importance given to the registration of foetal deaths is in recognition of their importance in measuring perinatal mortality and pregnancy outcomes*
- *Lower priority is given to collection of marriage statistics through civil registration because many marriages constituted by religious or tribal ceremonies and extra-legal consensual unions and temporary marriages often go unregistered.*

g. Principles for the collection and compilation of vital statistics/criteria for measuring effectiveness of national vital statistics programs

- The underlying purpose of a vital statistics system is to make available useful statistics for the planning, administration, and evaluation of public health programs and to provide basic statistics for demographic research.

1. *Universal Coverage*
   - A vital statistics system should include all vital events occurring in every geographic area and in every population group comprising the national area.
   - One of the basic premises of a vital statistics system is that every event should be reported for statistical purposes for all geographic areas and all population subgroups.

2. *Continuity*
   - The principle of continuity in the collection and compilation of vital statistics should be observed in order that the data may reflect short-term fluctuations, including seasonal movements, as well as longer-term movements.
   - Continuity is most easily achieved when civil registration is fully established, because monthly (or quarterly) and annual reporting become a routine part of the system.
   - Where supplements to civil registration, such as sample surveys, are employed to obtain estimates of vital rates, special efforts may need to be made to ensure that data become available on a frequent and regular basis.

3. *Accuracy of the statistics*
   - The time reference for the data should be the date on which the event occurred.
   - The geographic reference for the statistics may be either the place where the event occurred or the residence of the person to whom the event occurred

4. *Tabulation of sufficient detail to reveal important relationships*
   - Final tabulations for subnational geographic areas should be by place of residence
   - Tabulation by place of occurrence may also be useful for specific administrative purposes

5. **Timeliness of availability/ regular dissemination**
   - Finally, the data and their analysis need to be disseminated to be useful. Unless the data are available to the public, its willingness to support the system cannot be expected. A wide variety of dissemination media should be used, including printed publications, public use data tapes and disks, and the Internet.
   - The compilation of vital statistics should have as its ultimate minimum goal (*a*) the provision of total monthly or quarterly summary counts of live births, deaths, foetal deaths, marriages and divorces on a time schedule prompt enough to provide information for health intervention and population estimation programmes, administrative uses or other needs, and (*b*) the production of detailed annual tabulations of each type of vital event cross classified by its demographic and socioeconomic characteristics

6. **Confidentiality**
   - The civil registration method collects a variety of information about individuals within the population.
   - While all of the information collected has importance, some data, when specifically identified with an individual, may be highly personal and sensitive.
   - In order to elicit the full and honest provision of data to the system, the confidentiality of the information must be protected in such a way that those who provide information can be assured that it will be used only for the purposes described by law and/or in aggregated form where individuals are not identifiable

NB: *Taken together, these systems are known as civil registration and vital statistics systems*

I. USES/ADVANTAGES OF CIVIL REGISTRATION

- Civil registration has a dual purpose:
  - Administrative and Legal on the one hand
  - Statistical, Demographic and Epidemiological on the other.
- In the first purpose, the records generated have importance as legal records documenting the facts surrounding each registered vital event. In that sense, each vital record has an essential importance of its own.
- For the second purpose, the records may be aggregated to form a body of vital statistics which, collectively, convey important information about the persons described in the statistics in summary form.
- Those two purposes reinforce each other in a number of ways, but it is important to maintain their distinctiveness in discussing the uses and operation of civil registration.

Uses of civil registration records for administrative purposes

- Records documenting individual vital events serve many administrative and Governmental purposes.
  - Live birth records are the basis for many public health programmes for post-natal care of mother and child, and may be used, when needed, for programmes of vaccination and immunization, premature-baby care, assistance to disabled persons.
  - Death records are used to provide legal permission for burial or other disposal of deceased individuals.
  - They can also provide information of epidemiological importance, and indicate the need for preventive control measures. Death records are also necessary to clear a number of

administrative files, such as disease-case registers, population registers, social security files, military service files, electoral rolls, identity files and tax registers.

Uses of civil registration records for Individuals

– For the individual, the birth registration records provide legal proof of identity and civil status, age, nationality, dependency status etc., on which depend a wide variety of rights. The birth registration record may be required for establishing:

- Identity and family relationships for settling inheritance or insurance claims and arranging transfer of property.
- Proof of age for admission in schools, entry into services and professions, obtaining a driving license, exercising voting rights, entering into legal contracts, inheritance claims, marriage etc.
- Nationality or citizenship by birth, to obtain passport for foreign travel, qualify for voting privileges, own property
- Because of the increased national and international mobility of the population, vital records have taken on additional importance. For the migrant, it has become essential to have access to documents that can prove his or her civil status and nationality. To facilitate the process of identification, those documents should conform to internationally accepted standards. This is another reason to establish in each country a civil registration process capable of registering vital events on a current basis, including efficient procedures for providing documentation in cases where timely registration has not taken place.
- Marriage and divorce records provide documentation for the establishment of the civil status of individuals for such purposes as receipt of alimony allowances, claims for tax benefits, provision and allocation of housing or other benefits related to the marital status of a couple, and changing nationality on the basis of marriage. In addition, records of divorce are important for establishing the right of an individual to remarry and to be released from financial and other obligations incurred by the other party.

Use of Vital Records (statistics)

- Vital records are the records of events recorded as part of a civil registration system
- Some common uses of vital records are:
  - Preparing population estimates and projections;
  - Cohort and period studies;
  - Construction of life tables;
  - Preparing health indicators, such as infant mortality rates, neonatal mortality rates, post-neonatal mortality rates, maternal mortality rates, etc.;
  - Starting points in retrospective epidemiological studies;
  - Public health programmes in the absence of morbidity data, or for health education;
  - Maternal and child health services for planning and evaluation;

PROBLEMS/LIMITATIONS

- Developed countries have systems in place to register vital events (civil registration systems) that can be used to measure the number of births and deaths, with varying degrees of accuracy depending on the level of maintenance of the registers
- Fifty years after the United Nations first issued *Principles for a Vital Statistics System: Recommendations for the Improvement and Standardization of Vital Statistics*, developing countries still do not have complete and reliable registration systems of births and deaths
- Moreover, it appears that over time statisticians have decreased their use of civil registration systems as the source of vital statistics and have instead used censuses and sample surveys (with sometimes very large confidence intervals) as the data source for the vital statistics reported to the United Nations Statistics Division
- It is estimated that the coverage of vital events in the world has not progressed too far from the 50 percent level of the 1960s.

- It has been estimated that only around one-third of all WHO member countries have systems that are considered to be essentially complete and producing reliable data
- According to information on coverage of birth and death registration systems provided by countries to the United Nations Statistics Division for the *Demographic Yearbook*, only 54 percent of countries reported complete coverage for births and 52 percent for deaths for the period 1995 – 2004.
- Disparities among regions exist; for example, in Africa the percentage is much lower with only 16 percent and 9 percent of countries reporting complete coverage for births and deaths, respectively. In some countries, such as in the eastern part of the Economic Commission for Europe region, the registration systems have actually deteriorated during the last 20 years or so.
- The reasons for lack of progress vary. The following problems have been identified as affecting the availability and quality of vital statistics in many countries:

• **Under-enumeration of vital events**, for example, omission of registration of births when the newborn dies a few days after birth;

• **Misreporting of information**, such as the misreporting of age at death or the cause of death;

• **Changes in the legal/administrative framework**, for example, changes in registration procedures or problems with deficiencies in the registration law such as failure to make registration compulsory;

• **Problems associated with the organization of the civil registration systems**, for example, problems in the exchange of information with hospitals, ministries of health and statistics, or other administrations, and the failure to coordinate their roles (Moreover, statisticians rarely have full control of civil registration systems.);

• General lack of awareness of the need to register, or lack of incentives to register. (The costs to individuals for making an effort to register an event may outweigh the perceived benefits of registration); and

• Lack of political support at the highest levels of government for civil registration improvement projects and lack of long-term budgetary funding.

NB: What is the status in Zambia?

- Birth and Death registration is not adequately covered especially in villages and rural areas where there is no formal system of registration.
- People seem not to understand the value of obtaining birth and death certificates due to lack of sensitization.
- The department uses the data for administrative purposes only.
- The analysis of data in terms of national planning is done by Central Statistics Office (CSO).CSO is mandated to collect data on vital registration from the department for analysis purposes.
- CSO is expected to collect the raw data and process it into meaningful information
- Data captured by the department on vital registration is still on hard copies only in form of Birth, Marriage and Death registers.
- People in the rural areas are unaware of the importance of registering vital events.

PROSPECTS/OPPORTUNITIES

- Given the competition for budgetary resources, producing and maintaining national registration systems for statistical purposes is not an appealing argument, particularly in

less developed countries, since the system may not be considered cost effective if used only for statistics. Other forces in society will likely need to advocate for these systems.

- For example, civil registration systems provide the legal/reliable documentation on the identity of individuals. The improvement of existing registration systems is an area where statisticians do not have full control, given their role as data users rather than data producers.
- Training programs and public education may be the best means of improving civil registration and vital statistics systems.
- There is urgent need to computerize the records and store on disks and other storage devises.
- There is need for sensitization and awareness campaigns
- The department is on plan to decentralize the issuance of birth and death certificates to provincial and district levels.
- The department will, in the new structure, also aim to create sub-centres for registration of vital events in the village. The traditional leaders will have to be brought on board for the department to achieve its objectives

References

- UN (2001), ***Principles and Recommendations for a Vital Statistics System, Revision 2.***
- Jacob Siegal (2004), ***Methods and Materials of Demography***
- UN (1998), ***Handbook on Civil Registration and Vital Statistics Systems:*** *Policies and Protocols for the Release and Archiving of Individual Records*
- **Sources of vital statistics in India**
- WHO (2010), ***Civil Registration and Vital Statistics***

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Lecture # (3) DEM 210

#0977-929593

1. CIVIL REGISTRATION AND VITAL STATISTICS SYSTEMS

(a) Civil Registration

- This method of collecting vital statistics data is defined as the "*continuous, permanent, compulsory* recording of the occurrence and *characteristics of vital events* . . . in accordance with the *legal requirements of each country*" (United Nations, 1991, p. 16).
- The registration of all vital events must be done ***as they occur*** and must be maintained in order to be retrieved as required.
- This must be done by a permanent governmental agency with administrative stability. The underpinning, however, is that vital registration is legally required and there are penalties for failure to comply with the law. "The compulsion or legal obligation to register a vital event is the basic premise of the entire civil registration system. When registration is voluntary rather than compulsory, there can be no assurance of complete or accurate vital records or statistics" (United Nations, 1973, p. 159). ***Without specific penalties, the fact that it is compulsory is meaningless.***
- Civil registration is carried out primarily for the purpose of establishing the legal documents provided by the law. These records are also a main source of vital statistics. *Complete* ***coverage, accuracy*** and ***timeliness*** of civil registration are essential for quality vital statistics.

(b) Civil registration method

manner throughout the country, taking into account cultural and social circumstances particular to the country.

Organization (Features) of the collection of vital statistics

The basic features of a vital statistics collection system are:

Governmental Organization

- The registration systems may be classified as organized under centralized or decentralized control. Most nations have established a centralized national authority over registration.
- In some countries, it is the civil registration office, in others, the department of public health, and in others, the central statistical agency.
- Again, in some countries the same national agency is responsible for both registration and vital statistics, but in others two or occasionally three separate agencies control these two functions.
- Advantages of a central registration office include direct and effective control over the entire system, including a standard legal framework, uniform procedures, and consistent interpretation and enforcement of norms and regulations.
- In a decentralized system, civil registration is administered by major civil divisions, for example, the state, province, or department. Many countries with federated political systems have decentralized registration systems.
- The Statistical Office of the United Nations Secretariat undertook a Survey of Vital Statistics Methods during 1976–1979. Of the 103 countries reporting on the type of civil registration system, 88 were centralized and 15 decentralized (United Nations, 1985, p. 8).

- Is the *procedure employed* to gather the basic observations on the ***incidence of vital events*** and their characteristics which occur to the population of a country within a specified time period and upon which vital records with legal value are prepared and vital statistics are based.
- *This method should be distinguished from other methods that gather data about the population.* The civil registration method is distinguished from the enumeration method and the administrative method by the fact that it is ***continuous*** and ***permanent.***
- It records data on every vital event as it occurs and it does so with no lapses in the time period of collection.
- The ***enumeration method*** is the procedure used to gather population or other ***census*** or ***survey*** statistics. Enumeration employs a snapshot approach that gathers data on the population at a particular moment in time. It is often periodic, such as a decennial census.
- ***The administrative method produces population data as a by-product*** of various management controls. For example, automobile accident statistics may be produced as a by-product of Department of Transportation data. The tax system may produce income data as a byproduct of its control system.

(c) Civil Registration System

- A civil registration system refers to all institutional, legal, technical settings needed to perform the civil registration functions in a technical, sound, coordinated, and standardized

- Local registration areas are the basic units of a vital registration system. They must have clearly defined geographic boundaries and be small enough for the registrar to provide good registration services for the area and for persons reporting vital events to come to or communicate with the registration office without excessive difficulty. One of the most important responsibilities of the local registrar is to encourage the general population, physicians, midwives, and others to report occurrences of vital events promptly and to supply complete and accurate information about them.

NB: Discuss on the status quo for Zambia

- **Its registration is decentralized to all districts in the country**
- **Issuance of Birth and Death Certificates remains centralized to the office of the Registrar General in Lusaka due to certain security reasons although plans are under way to equally decentralize the operation**

Ended

Informants and Reporters

- The person responsible by law for reporting the occurrence of a vital event may or may not also be the source of the facts associated with the event. In most countries, a family member is responsible for reporting the occurrence of a live birth, fetal death, or death, together with certain personal information, but the attendant physician or midwife is also responsible for reporting the event along with certain medical information.
- The officiant, civil or religious, at the marriage is required to report it in about one-half of the countries; in the other half, the participants, bride and groom, are responsible. Reporting of divorces is the responsibility of the court in slightly more than half of the

countries and of one or both of the parties to the divorce in the remaining

(United Nations, 1985, pp. 20–22).

Place of Registration

- The United Nations recommends and, with few exceptions, the countries of th require registration of vital events in the local registration area where the event o Statistics tabulated by the United Nations from the 1976–1979 survey of practices show that the percentage of responding countries where vital ev registered by place of occurrence is 92 for births and deaths, 93 for fetal death marriages, and only 55 for divorces (United Nations, 1985, pp. 29–30).
- Tabulations are frequently made by area of usual residence of the mother, dece so forth; these are generally regarded as more useful for demographic purp tabulations by place of occurrence.

Time Allowed for Current Registration

- The registration record usually calls for both the date of the event and the registration. National laws usually specify the maximum interval permitted betw two dates for each type of vital event. The 1976–1979 survey shows that the tim for registering deaths tends to be shorter than for births—94% within 30 days compared with 73% for births (United Nations, 1985, pp. 26–27).
- The United Nations recommends that final tabulations for any calendar period based on events that occurred during that period and not on those registered. In from the 1976–1979 survey indicates that twothirds to three-quarters of the tabulated the records by date of registration (United Nations, 1985, pp. 34–35).

Content of Statistical Records

- The need for national vital statistics data is the primary determinant of what items should be collected on vital records. Another major consideration is international comparability. The United Nations has recommended lists of statistical items that should be included in the records of live births, fetal deaths, deaths, marriages, and divorces (United Nations, 1991, pp. 30–31).
- The World Health Organization recommended the form of the medical certificate of cause of death. Some of the recommended items are designated as priority items, that is, items all countries should include. Parallel listings of priority items for the various vital statistics records are shown in the Table below.

NB: Ask if Zambia has incorporated all the recommended items. Reference should be made to the articles (law) for Zambia which include the necessary forms.

LIVE BIRTH	DEATH	FOETAL DEATH	MARRIAGE	DIVORCE
Date of occurrence	Date of occurrence	Date of occurrence	Date of occurrence	Date of occurrence
Date of registration	Date of registration	Date of registration		
place of occurrence	Place of occurrence	Place of occurrence	Place of occurrence	Place of occurrence
Place of residence of mother		Place of residence of mother	Place of residence of bride and groom	Place of residence of divorcees
Sex	Sex	Sex		
Legitimacy	Cause	Legitimacy	Date of birth	Date of birth
Type of birth	Certifier	Type of birth	Previous marital status	Date of marriage
Date of birth of mother	Date of birth	Date of birth of mother		Number of dependant children
Number of children born to mother		Number of children born to mother		
Attendant at birth		Period of gestation		

DE 211: Sources of Demographic Data

Available data are a precondition of demographic analysis. Remember, it would be impossible to conduct demographic research without appropriate data. That is, to understand and analyze the topic and issues of demography, one must have access to appropriate statistics.

The analysts should consider a number of issues when using data. First is validity, which asks, do the data accurately represent what they claim to measure? The second is reliability, which asks, are the data externally and internally measured consistently? The third is that of data privacy and data suppression or underreporting.

Where Those Data Come From?

As the data can be divided into static (stock data) and dynamic (flow data) parts, the sources of the data are matched with the feature of different types of the data. In general, the static data come from population census and the dynamic data come from population registration system. In order to save time and money, sampling surveys are often used in collecting both static and dynamic population data. The population data mostly come from those three sources.

Stock data vs flow data

Stock data (static)

- Cross – sectional snapshot
- People
- E.g. size and structure of the Zambian population at Jan 2013

Flow data (dynamic)

- Demographic events during a time interval
- E.g. Births, deaths, marriages, divorces, internal migration, external migration from Jan 1 2012 to Dec 31 2012.

Registration Systems

A registration system is defined as "an individualized data system, that is, a mechanism of continuous recording, and/or of coordinated linkage, of selected information pertaining to each member of the resident population of a country in such a way to provide the possibility of determining up-to-date information concerning the size and characteristics of that population at selected time intervals" (UN 1969). The objective of the registration system is to collect the dynamic population data whereas that of the census is to collect the static population data. The feature of the registration system is that the number of events must be continuously recorded right after the events occurred. It differs from a census in that the registration system is conducted for both administrative and statistical uses.

Vital statistics registration is more focused on by demographers because it concerns the registration of births and deaths, including foetal death (stillbirths). Apart from this, marriages, divorces, adoption, migration, employment, etc can be attributed to civil registration.

Civil registrations sometimes combine with certificate. In many countries, for example, there are certificates for live births, identification card for adult citizens, marriage certificate for married, and green card for permanent residents, etc. In China, each family has household registration books (Hu Kou Ben) required by household registration system.

For the items in registration of vital events, demographic interests and legal or medical interests are quite different. The former include the date of occurrence, the usual place of residence of the decedent or of the child's mother, age and sex of the decedent, sex of the child (birth), age and marital status of the mother, occupation of the father, order of the marriage (first, second, etc.), date of marriage for the divorced, and so on. The latter include such items as

hour of birth, name of physician in attendance, name of person certifying the report, and date of registration. Some items such as weight at birth, period of gestation, and place of occurrence (instead of usual place of residence) are of marginal demographic utility but may be used in specialized studies.

Vital Statistics

A vital statistics system is defined as the total process of (*a*) collecting information by civil registration or enumeration on the frequency of occurrence of specified and defined vital events, as well as relevant characteristics of the events themselves and of the person or persons concerned, and (*b*) compiling, processing, analysing, evaluating, presenting and disseminating these data in statistical form. The vital events of interest are: live births, adoptions, legitimations, recognitions; deaths and foetal deaths: and marriages, divorces, separations and annulments of marriage

The main source of vital statistics is records of vital events from civil registration, which involves the continuous gathering of information on all relevant vital events occurring within the boundaries of a country. For the calculation of vital rates, civil registration data are usually complemented by census information, which also has national coverage. However, when civil registration data either do not exist or are deficient, countries have had recourse to data sources other than civil registration to estimate the necessary vital statistics. The use of complementary data sources has also been made to enrich and evaluate civil registration data or to gather information on demographic or epidemiological processes in a way that enriches the information obtained through civil registration.

Additional sources in a vital statistics system include specific questions on fertility and mortality added to population censuses, household sample surveys, vital records from sample registration and health records. For some countries,

the uses of these sources of data together with the application of indirect techniques of demographic estimation have been supplying some of the statistical indicators needed for planning purposes, mainly at the national level.

Vital statistics are an essential input for the planning of human development. Knowledge of the size and characteristics of a country's population on a timely basis is a prerequisite to socioeconomic planning. Because a population increases by the addition of live births and decreases by the subtraction of deaths, information about the number of live births and deaths occurring in a population is crucial for estimating the natural increase (or decrease) and the annual change in population size and structure for that population. Information on the number of live births occurring over a time period, classified by various characteristics of the women giving birth, constitutes the basis for analysis of the dynamics of reproduction. Information on deaths, classified by various characteristics of the deceased, especially age and sex, is necessary for calculating life-tables and estimating the probability of dying at various ages. The fertility and mortality estimates thus derived are essential for a variety of purposes, including an understanding of the growth dynamics of the population concerned; an assessment of the human aspects of socioeconomic development; the measurement of the risks of dying for males and females at specific ages for insurance and social security purposes; and for population projections.

Advantages of Vital Registration System

- Dynamic , continuous
- High coverage
- Long and short time series
- Comparison between countries and regions possible

Disadvantages of Vital Registration System

- Not always and not everything is reported
- Weak topical detail
- Errors concerning place of residence vs events
- Errors concerning person names
- No population at risk
- No information on migration

Population register

The population register is a mechanism for the continuous recording of selected information pertaining to each member of the resident population of a country or area, making it possible to determine up-to-date information about the size and characteristics of the population at selected points in time. Because of the nature of a population register, its organization, as well as its operation, should have a legal basis. Population registers start with a base consisting of an inventory of the inhabitants of an area and their characteristics, such as date of birth, sex, and marital status, place of birth, place of residence, citizenship and language. To assist in locating a record for a particular person, household or family in a population register, an identification number is provided for each entity.

Brief history of population registers

Population Registers are not a recent development. The earliest record a register of housholds and persons comes from the Han Dynasty in China during

census evaluation and for sampling frame of household surveys. Some countries use population registers to produce census-typed tables every five or 10 years in place of conducting regular census operations. If complete, population registers can produce data on both internal and international migration through the recording of changes of residence as well as the recording of international arrivals and departures.

Population registers represent one of the independent sources of data with which the population census results can be compared as part of the process of evaluating the accuracy of the latter. Comparison can be made between aggregates compiled from the two sources or by one-to-one matching of the corresponding records of the individuals so as to correct either the census or the population register.

Coordination arrangements between the population register and the civil registration and vital statistics systems

Some countries have separate agencies for the population register for civil registration and for vital statistics. It is recommended that, in such a situation, births, deaths, marriages, divorces and other vital events recorded by the civil registration system be used as the base for updating the population register. This provides an opportunity for both programmes to share and compare information while meeting their own separate objectives. The information on vital events should be transmitted to the agency responsible for vital statistics.

In some countries, the production of vital statistics is the responsibility of the population registration agency. In this instance, this agency is concerned not only with the registration of various vital events and their changes but also with the updating of the register and the compilation of vital statistics. The Norwegian and Bulgarian population registers are examples

the second century B.C. Household registration in Japan began in the seventh century, A.D., during the Taika restoration. The earliest population registers in Europe were the parish registers of Sweden and Finland, which originated during the seventeenth century. A system of registers was introduced in Hungary in the eighteenth century. By the beginning of the twentieth century, some form population registration was in operation in Belgium, Chile, China, Czechoslovakia, Finland, Germany, Hungary, Italy, Japan, Korea, Liechtenstein, Luxembourg, the Netherlands, the Ryukyu Islands, Spain, Sweden and Switzerland. At the end of 1967, population registers were known to be in operation in at least the sixty – five.

The population register can contain other socio-economic data, such as occupation or education. The population register should be updated by births, deaths, marriages and divorces, which are part of the civil registration system of the country. The population register is also updated by migration. Thus, the population register is the result of a continuous process, in which notifications of certain events, which may have been recorded originally in different administrative systems, are automatically linked to a population register on a current basis. The method and sources of updating should cover all changes so that the characteristics of individuals in the register remain current.

Main uses of the population register

The main administrative functions of population registers are to provide reliable information for the various purposes of government, particularly for programme planning, budgeting and taxation; for issuing unique personal identification numbers; for establishing the eligibility of individuals for various education, health, military service, social insurance and welfare and pension system; and for police and judicial references.

Population registers are also useful for population estimation, census plan

Administrative Records

Many types of social statistics are compiled from various administrative records as by-products of the administrative processes. Examples include health statistics compiled from hospital records, employment statistics from employment exchange services, vital statistics compiled from the civil registration system and education statistics from enrolment reports of the ministry of education.

The reliability of statistics from administrative records depends on the completeness of the administrative records and the consistency of definitions and concepts. It is therefore necessary to continuously improve and update the systems of recording, compiling and analysing such data. Wherever possible, it is advisable to use the same definitions and concepts used for other data sources. This would facilitate the comparability of data.

While administrative records can be very cost-effective sources of data, such systems are not well developed in most developing countries. This implies that in a majority of cases such data are unreliable. Even if the administrative recording processes are continuous for purposes of administration, the compilation of statistics is, in most cases, secondary. Statistical requirements that need to be maintained such as standardisation of concepts and definitions, adhering to timeliness and complete coverage are not usually considered or adhered to.

For most countries, information from administrative records is often limited in content as their uses are more for legal or administrative purposes. Civil registration systems are examples of administrative systems that many countries have developed. However, not all countries have been successful in this effort. Countries with complete vital registration systems are able to produce periodic reports on vital events, such as number of live births by sex; date and place of

of this type of arrangement and are under the administration of the respective statistical authorities of the countries. This is the preferred situation, where one agency is responsible for civil registration, the maintenance of the population register and the production of vital statistics.

If different agencies are responsible for different functions, the absence of good coordination between agencies might result in the production of different series of vital statistics which are inconsistent. Under this arrangement the coordination of the production of vital statistics is possible at two levels: the data-collection level and the data-processing level. At the data-collection level, one form, such as a multi-part form, is used to record the data and copies are sent to each organization for entry into its system. Thus, the same source documents serve as input into the respective systems.

The experience of some countries has shown that when a single record is used for both population register and vital statistics purposes, the most difficult task is handling confidential medical data on births, deaths and foetal deaths. A discussion of the problem of using the same form for registration and statistics can be found in the *Handbook on Vital Statistics Systems and Methods*, using the Norway population register as an example

The population register and the civil registration system contain common data elements, the use of which requires a method for record linkage between the population register and the civil registration databases. Both have personal identifying information in the database, such as name, age or birth date, sex or place of residence. The linkage then becomes a task for computer matching since the volume of records would make any manual approach very difficult. The use of unique personal identifiers simplifies the matching process.

births; number of deaths by age; sex; place of deaths and cause of death; marriages and divorces; etc.

Secondary Data

Demographic data may be divided into two main categories: primary and secondary data. The data directly collected through the three sources discussed above are Primary data (also called original data or micro data) which are the data that the individual documents are listed with various variables in statistical software, which can be used for data processing under the need of analysis. Primary data can be collected by both the governments and professional institutes through population censuses, registration systems, and sampling surveys. Secondary data are the data published in a tabulation type generated from primary data such as compendia, statistical abstracts, and yearbooks, or come from published textbooks, research reports, and professional papers.

Everything big starts little....failure is only the opportunity to begin again more intelligently.....lets go Mother Zambia, lets go Chipolopolo!! JOSEPH

THE UNIVERSITY OF ZAMBIA

SCHOOL OF HUMANITIES AND SOCIAL SCIENCE

DEPARTMENT OF POPULATION STUDIES

DE 211- TEST [2011/2012]

Time: One hour

Instructions:

i. *Attempt all questions*
ii. *All your answers must be brief*

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1. State whether **true** or **false:**
   (a) Static data come from population registration system
   (b) Flow data come from population census
   (c) The earliest population registers in Europe were the parish registers of Sweden and England, which originated during the sixteenth century
   (d) At the end of 1967, population registers were known to be in operation in at least sixty – six countries
2. According to the United Nations, Vital events include_____
3. Complete the following table on the history of registration of vital events

Development/ Event	**Year/period**
a)	2nd Century
Registration in Japan began	b)
Local or parish registers were kept by some churches in Europe	c)
d)	1837
The registration law was extended in a number of African countries to include all inhabitants residing within 10 kilometers from the registration centers.	e)
f)	November 1959
The birth and Deaths Registration Act Chapter 51 of the Laws of Zambia came into effect	g)
h)	December 1996

4. In the case of Zambia, List five sources of data for vital statistics

5. List the following:

a) Essential features of a census

b) Five (5) uses of population censuses

c) Three (3) uses of housing censuses

d) Two (2) methods of enumeration in the census

6. Briefly state what distinguishes the following

(a) **Civil registration** and **enumeration method**?

(b) **Population registers** and **vital registration system**?

7. Give 6 types of social statistics compiled from various administrative records as by – products of the administrative processes.

8. The United Nations has recommended lists of statistical items that should be included in the records of live births, fetal deaths, deaths, marriages. Complete the following table showing some of the recommended items designated as priority items, that is, items all countries should include.

LIVE BIRTH	DEATH	FOETAL DEATH
Date of occurrence	Date of occurrence	Date of occurrence
Date of registration	Date of registration	Date of registration
place of occurrence	Place of occurrence	Place of occurrence
Place of residence of mother		Place of residence of mother
Sex	Sex	Sex
a)	a)	a)
b)	b)	b)
c)	c)	c)
d)		d)
e)		e)

END

(e) The eight (8) uses of administrative data.