Technical Papers

A Programme for Measurement

of Life and Death in Ghana

CONTENTS

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FOREWORD

The development of an efficient vital registration system is a long range program. The developing countries cannot wait for complete registration of vital events. The need for vital statistics for social and economic planning is now. One alternative is to establish a sample registration system such as Ghana has done.

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A Programme for Measurement of Life and Death in Ghana

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INTRODUCTION

The civil registration method may be defined as the continuous, permanent and compulsory recording of the occurrence and the characteristics of vital events by means of legislation which makes registration compulsory. Continuous and permanent recording of vital events are made, primarily, for their value as legal documents and, secondarily, for their usefulness as a source of statistics. Vital events in Ghana include live births, deaths and foetal deaths. The principles for a vital statistics system are described and published by the United Nations Statistical Office (United Nations, 1953 and 1973).

The civil registration system in Ghana dates as far back as 1888 with the enactment of the Cemeteries Ordinance, the main objective of which was to regulate the burial of human bodies in certain areas. The provision for registration of deaths became an essential activity incidental to the regulation of burial of human bodies. The Cemeteries Ordinance of 1888 which first established the registration system was, however, public health oriented in that it provided for only the registration of deaths, and its objective was to regulate the internment of dead bodies in the principal towns in the then Gold Coast Colony. In 1891, the Cemeteries Ordinance was amended to make room for new provisions, but the regulation of burials as the main objective of the registration law remained unchanged.

Though the 1891 Ordinance was meant to bring about improvement in the registration system, it was the Burials Ordinance of 1912 that laid down the foundation of a modern registration system in Ghana, and this was because the Ordinance provided many of the essential features of the present conventional vital registration system. Under the Births, Deaths and Burials Ordinance of 1912, the registration system was extended to include births. In 1926, another Ordinance was enacted and this replaced the Ordinance of 1912. The registration system established under the Births. Deaths and Burials Ordinances of 1912 and 1926 functioned only to provide birth and death registration facilities in the few more urbanised headquarters and commercial towns in the country. The registration facilities were provided for the resident population of these towns which were thought to have the most need for birth and death records. In effect, therefore, the existing registration system could not produce adequate and efficient vital statistical data which reflected the fertility and mortality picture of the entire country.

The 1926 Ordinance sought to provide better and more efficient ways for registration of births, deaths and burials and it remained in force until 1965 when it was replaced by the present Vital Registration Legislation, "The Registration of Births and Deaths Act," often referred to as "Act 301 of 1965 and amended by N.L.C. Decree 285 of 1968." The Act (Births and Deaths Registry, 1968) makes provisions for the registration of births and deaths compulsory in all parts of the country. Thus, the objectives of the present registration system established under the Registration of Births and Deaths Act of 1965 are, on the other hand, threefold: 1) to promote public health in the country; 2) to extend birth and death registration facilities to the entire population of the country and establish an efficient system of birth and death registration records for people in the country; and 3) to obtain vital statistics data which are adequate and efficient enough for deriving reliable demographic estimates and for public health planning.

Consequently, units of registration areas have been defined in terms of geographical units rather than towns, and the entire geographical area of the country is to be brought under compulsory registration. The Registration of Births and Deaths Regulations were implemented during 1970 (Births and Deaths Registry, 1970).

CIVIL REGISTRATION SYSTEM

State of present registration system

In spite of the efficient legal provisions and organisational prescriptions contained in the current

vital registration law, the registration system has, up to date, not attained any appreciable level of efficiency. Currently, the civil registration system is covering 257 registries[1] and 96 reporting centres [2] and represents about 34.4 percent of the entire population of Ghana.

The Appendix table shows the distribution of registries and centres and percent coverage according to region by urban and rural areas. The percent coverage shows the percentage of the population covered in each region and for Ghana which has registration facilities. During 1975 to 1976, registries have been opened in all the urban areas of Ghana providing registration facilities to all towns with a population of 5000 and over. In other words, all urban areas of Ghana are now under registration. The Central Registry will now concentrate its efforts to improve registration in these urban areas. It has been planned by the Government to provide registration facilities to the rural areas so that by 1982 the entire country will be covered. This will be according to the Project submission of September, 1975 with minor modifications (Government of Ghana, 1975).

Need for efficient registration system

There is much concern about the deficiencies in the country's vital registration system and this derives from the fact that in the wake of the country's rapid advance towards development, the need for the formal documentary proof of the facts of births and deaths is becoming more important in the country. At the moment, death registration records are required for establishing the fact of death and the identity of the deceased for the purposes of collecting benefits under the social security and other welfare schemes; and birth registration records are also required for establishing the age, parentage, and nationality of an applicant for a passport, and, in the urban areas, the age of the child on his admission to school.

The potential uses of birth and death registration records in many situations and under many en-

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1 *Registry Office:* A Registry is located in a selected town within a Registration District where completed registration forms from centres are sent for the events to be formally recorded in the Registries, and serial numbers are assigned finally to all the registration forms before they are submitted to the Central Registry Office. Registration for the local town is also done by this office. It is also at the Registry Office that birth and death certificates are issued to informants and the fee collected. For further information, refer to the Act 301 and Regulations L.I. 653 made under the Act.

2 *A Centre:* This is a sub-registration Office. The reporting centre is located in a selected village within a Registration District where a part-time registration assistant completes the registration forms partially and submits them to the Registry Office where legal registration (that is, recording of particulars in the Register) is effected and certificates issued.

actments of Ghana such as those relating to Wills, Ghanaian Nationality and Resident Permits are, therefore, immense and in the next few decades or years these vital records shall be indispensable requirements in the conduct of social life and public affairs in the country. It is, therefore, planned to establish an efficent registration machinery for the production of these records for failure to do so will create enormous problems for the people of this country in the near future.

The concern about the state of the country's vital statistics was also formally expressed in a population policy statement published in March, 1969. In the policy statement, which outlined the action programmes to be implemented to control the rate of growth of the country's population, the government expressed concern about the deficiencies of the country's statistical and research services in obtaining more reliable demographic measurements especially those relating to age and sex distributions, migratory movements and vital events. The reorganisation and expansion of the country's vital registration system to provide a source of efficient vital statistical data for more precise demographic estimates and public health planning was, therefore, one of the major action programmes envisaged for the expansion and development of the country's statistical and research services.

It is also well known that it takes decades to build an efficient vital statistics system and the time comes sooner or later when national planning authorities and public health organisations urgently need facts on which to base action. Unless the long "lead-time" required to improve the vital registration system is taken account of, the facts will not be there.

Reasons for inefficiencies

The difficulty in realising the objectives of the vital registration system proposed under the Registration of Births and Deaths Act of 1965 is attributable to lack of funds for the establishment of a field machinery that would carry the registration facilities to the doorsteps of the people. Such a field machinery has been found to be essential, especially in a country like Ghana where generally there are very few incentives or motivative factors on the part of the public to report births and deaths for registration.

No one would deny that there are tremendous difficulties in effectively registering the births and deaths in Ghana. There is substantial illiteracy, large sections of the population lack access to the main

channels of communication and there are administrative problems of providing registration offices within their reach. All these difficulties and many others are well recognized. Even in these circumstances, it may be expected that good recording and reporting can be achieved. In spite of all these defects and problems, the Ghanaian registration system can be improved to the stage where it will be a useful tool for guidance. But this cannot be done without substantial long-range effort.

Organisation: Its location and status

The central executing agency for implementation of the provisions of the Registration of Births and Deaths Act 301 of 1965 is the Births and Deaths Registry under the Central Bureau of Statistics. The agency existed as a Division of the Ministry of Local Government until January 1972, when it was transferred from the Ministry and established as a division under Central Bureau of Statistics within the Ministry of Economic Planning. The change in the administrative location of the agency was effected in anticipation of the implementation of the births and deaths registration expansion programme, and it was aimed at ensuring a more efficient administrative machinery for the execution of the programme. The Central Registry is the central office in Accra headed by the Registrar. The office is responsible for the execution, coordination and supervision of registration machinery and handles all the legal and administrative aspects of civil registration and the vital statistics system.

The country has been divided into Registration Regions which coincide with the country's administrative regions. There are 9 such regions and each is headed by a Regional Registration Officer of Births and Deaths. The regions are further subdivided into registration districts which are headed by a District Registrar of Births and Deaths. A group of registration districts forms an administrative district. Within a registration district, the field organisation consists of a network of local registration offices which are primarily responsible for executing legal provisions of the Act within their respective registration areas. Within a registration area, attempts are being made to operate reporting centres manned by part-time registration assistants.

Ghana is divided into 9 administrative regions and no serious problems of geographical coordination of the registration activities will be anticipated. Each high level of the geographical hierarchy in the proposed hierarchical network of registration units shall, therefore, function as the coordinating unit for its lower segments, and the headquarters of the executing agency shall be the apex of the hierarchy of coordinating units.

Coordination of activities of the registration system

The vital registration system is a multidisciplinary activity involving legal, administrative, statistical, demographic, and medical functions. To ensure efficient performance of these functions, therefore, and also utmost economy in operational costs, the programme shall be established and operated as an interagency cooperative undertaking with the Ministries of Health, Local Government and Education and the Central Bureau of Statistics as the major cooperating agencies. In this cooperative undertaking, the Ministry of Local Government shall request the local authority councils to establish and maintain controlled burial grounds in all the towns in the councils' areas so as to prohibit the disposal of dead bodies without prior registration of the deaths. Furthermore, the local authority councils and the Ministry of Education shall provide certain categories of their staff, particularly the field health personnel and school teachers, for engagement as part-time registration assistants in the rural areas. In order to maintain the interest, zeal and efficiency of these part-time registration staffs, it has been envisaged to increase their remuneration. The Ministry of Health in collaboration with the executing agency shall provide guide notes, instructions and manuals for the completion of medical certificates of cause of death. The Vital Statistics Unit of the Central Bureau of Statistics is responsible for the processing and publication of the statistical data from the registration returns, and a very close working relationship shall be maintained with the Demographic and Social Statistics Division of the Central Bureau of Statistics, especially in the selection of sample areas, division of sample areas into registration units and preparation of field maps for the registration and sample units. Much use shall be made of the geographical and demographic infrastructure established by the Demographic and Social Statistics Division of the Central Bureau of Statistics.

Two-level coordinating committee

To ensure efficient coordination of functions and a cooperative working relationship among the cooperative agencies, a two-level coordinating committee is proposed. The Working Committee on Vital Registration is already established while establishment of the high level National Committee on Vital and Health Statistics is still under consideration.

The functions of the Working Committee shall be:

a) To examine and resolve the day-to-day problems of the field operations;

b) To propose measures and activities which shall contribute to an efficient vital registration system in the country;

c) To assign to cooperating agencies specific duties and projects under the programme; and,

d) To evaluate the general progress of the programme.

Its membership is restricted to high level representatives of the executing agency, the principal cooperating agencies and institutions or organisations which have, or may have, ongoing field projects relating to vital registration and statistics.

The National Committee on Vital and Health Statistics will be a higher level coordinating and policy recommending body comprised of the Commissioners of all the principal cooperating agencies and top level representatives of other agencies and organisations which are concerned with, or shall be involved in, the registration programme. Members of the Working Committee should also be the members of the National Committee.

The functions of the National Committee will be harmonized and will coordinate the purposes and various interests which the registration system should serve or cater for, and it shall also have power to review the needs and problems and progress of the registration programme.

EVALUATION OF THE SYSTEM

Provision for critical evaluation of the efficiency of all procedures, from the creation of legal records to the compilation of the statistical publications themselves, is an essential element of a good system of vital statistics. The provision of appropriate methods for evaluating the various facets of the system, and for constant vigilance to see to it that approved methods are applied and that any necessary remedial action is taken, is a primary function of the offices responsible for vital statistics.

Evaluation of the *reliability* of vital statistics involves; 1) measuring the *quantitative* accuracy with which vital events are either registered or reported in a survey, and 2) measuring the *qualitative* accuracy with which the characteristics of the events are reported by the informant and inscribed or recorded by the registrar or interviewer (United Nations, 1973).

Detection of errors and assessment of their extent may be accomplished in two ways which for convenience may be designated as the *direct* and *indirect* methods. The *direct* method is the more fundamental and refined one. It consists of checking the individual entries of the register or other type of record against corresponding records from an independent source in order to discover any omissions. The method is analogous to a postcensus field check of the population census whereby a set of independent records is produced in such a way as to be considered more accurate than the originals and, therefore, capable of being used to produce adjustments in the original records. The method is also analogous to the matching of two independent sets of records for estimating parameters from the joint evidence (United Nations 1955, 1961 and 1972). The *indirect method* of detecting and possibly assessing the extent of errors consists of 1) scrutinizing for plausibility and consistency of the statistical results derived from the records and comparing these for compatibility with the corresponding numerical data from another time period or from a similar geographical area; and, 2) comparing results with corresponding aggregates and rates obtained from an independent source.

Looking at the limitations of data collected on vital statistics at present in Ghana as well as the coverage which is estimated at 34.4 percent of the entire population of the country, a rough quantitative evaluation of the present status of vital statistics data has been carried out by the Registry. The total live births and deaths registered each year throughout the country made only 26 percent and 22 percent, respectively, of the expected total live births and deaths during the year 1974, and these have been mainly live births and deaths of residents in the urban areas. If, however, as proposed in this paper, a sample registration system (recently termed as the dual record system) is implemented in Ghana, the system has in-built evaluation techniques.

STEPS RECOMMENDED TO IMPROVE REGISTRATION SYSTEM

Long-range programme

The civil registration system in Ghana aims at establishing a nationwide birth and death registration system capable of carrying birth and death registration facilities to the doorsteps of the entire population. This is to establish in the country an efficient birth and death registration records system for the entire population, and it is also to produce vital statistics data of a high degree of efficiency for deriving reliable estimates of the country's population, for evaluating the country's national population pro-

grammes - including the National Family Planning Programme - and for planning the country's social, economic and health development programmes.

This cannot be achieved in a short period. To achieve these objectives, it is recommended that a phased programme of gradual expansion of the registration services extending over a period of 5 years shall be followed. Later on, the Central Registry should concentrate its efforts to further improve registration in rural and urban areas of the country.

The first programme component, the Experimental Registration Project, shall be undertaken as a pilot registration system in 3 local authority areas (2 rural and 1 urban). This pilot scheme shall be undertaken to test the suitability of the field organisation to be established and field procedures to be followed during the implementation of the main project.

The main project shall be implemented in 5 phases. The first phase shall involve the establishment of an effective civil registration system in 1/5 of the country, and each of the subsequent phases shall involve the addition of 1/5 of the country to areas already brought under effective registration.

Attempts will also be made to establish and strengthen the Central, Regional, District and Local Registration Offices throughout the country in a phased manner as we learn through experience.

Short-range programme

Where a civil registration system is lacking or deficient, and efforts to improve this situation are being made but it will take decades to improve its efficiency for reliable statistics, probability sampling can be applied as a short-range programme at the level of data collection; specifically, by delimiting a registration area of reasonable size, by establishing a sample of households to be surveyed, or by a combination of both. Even in developed countries where a registration system is efficient and reliable, sampling may prove of great utility in the investigation of topics not included in the legal records but required for producing the full gamut of tabulations recommended.

It is, therefore, recommended that a sample registration system (dual record system) be established in Ghana to estimate live birth and death rates for the country's rural and urban areas as well as to evaluate continuously the ongoing expansion programme of civil registration. The sample registration system is discussed in detail later.

National committee on vital and health statistics

A high level Advisory Committee for improvement of Births and Deaths Registration should be formed to gear up the successful implementation of the expansion programme in the country.

Review of provisions of the act and regulations

Time allowed for current registration. The Registration of Births and Deaths Act 301 of 1965 and the Regulations provide the legal framework within which the project activities should operate. Some of the provisions of the Act and the Regulations, such as those relating to statutory periods for the registration of a birth or death, requires review to make them harmonious with the operational requirements in urban and rural areas. Notwithstanding the importance of immediate registration in fostering complete and accurate coverage in providing current case registers and in promoting current statistics, it is an acknowledged fact that considerations of national topography, climate, communications, culture and so forth, must have a bearing on the determination of the maximum time periods which should be allowed by law for the registration of vital events. In a country like Ghana where communications and transportation facilities are poor, where registration offices are far apart, and where seasonal changes bring hardship, registration periods of short duration may only discourage compliance. This is especially true when the expiration of the legal registration time period brings with it a fee for late registration and later on the person has to adopt special legal procedures such as swearing of affidavits before registration could be effected. The need for flexibility in the law governing the time allowed for registration is exemplified by the provisions of the country for two periods; one, for events occurring in urban or settled areas, and another, for those which take place in more isolated parts of the country.

Definition of events for registration. According to the Act, all the live births, deaths and foetal deaths are to be registered, while in practice only live births, deaths and late foetal deaths (stillbirths) are being registered. Further, there should be a separate register for foetal deaths and the events should not be added or entered in either the live birth or death register. Uniform registration practices with respect to live births are desirable. The most important consideration from the statistical point of view is to provide for a clear line of tabulation demarcation between live births and stillbirths (late foetal deaths) and to establish rules for statistical reporting which will render the resulting statistics comparable for national and international use.

Notification system. In Ghana, the Registration of Births and Deaths Act 301 of 1965 and the Regulations provide the legal framework for Registrars and Informants. A third type of person called a notifier plays an important role in some good registration systems, though not in all. "The NOTIFIER is the individual who, in some countries, is responsible by law for informing the registrar of the occurrence of an event, but the report by which this is accomplished has no value except as a 'NOTIFICATION' or control on registration. It cannot be converted into the legal registration record; the notifier does not sign the register; his report can only provide a 'lead' as a result of which the registrar may take steps to obtain the information required from legal registrant (United Nations, 1955)". The notifier is nearly always the medical or nursing attendant present at the birth or death. The definition given stresses what the notifier cannot do, but the value of a good notification system can be great in countries where vital registration is still very incomplete. The notification system, as recommended, if developed on a sound basis, can bear better results as the country's health services expand over a period (Memorandum GHA/72/PO4, 1975).

Training courses

Training courses suggested in the project document (Government of Ghana, 1975) are being organised. Departmental seminar and conference type refresher courses are recommended as the field work progresses. In addition, short-term training courses for a sample registration system (dual record system) are also recommended.

Publicity

The plans on a publicity campaign for civil registration should be prepared in consultation with the Ministry of Information. Publicity regarding the system is not fully in existence at present. The National Publicity Committee and Regional and District Publicity Committees should be set up. These committees will ensure dissemination of information on civil registration to the general public for public education. For the present, all the efforts should be concentrated in urban areas of the country. As the programme expands, publicity should cover areas in which the expansion programme will be carried out. It requires preplanned advance ground work to be done to motivate chiefs, elderly persons, church authorities and youth clubs, etc., so that the inhabitants of these areas would understand the benefits of the system. Posters, pamphlets and handouts for publicity should be designed, printed and circulated. Programmes should be drawn up for radio and television talks and panel discussions including public lectures on the usefulness of births and deaths registration for the public. All mass communication media, such as the press, radio, television, posters and hoardings, as well as personal contacts with local people, should be employed to educate the Ghanaian public on administrative and statistical uses of civil registration. Regional Registration Officers and field staff, in addition to their duties, will also be requested to educate their subjects on the uses and importance of civil registration in areas selected for phased expansion. In addition, the beating of drums in rural areas with a message to the public should be tried out.

Incentive

It should be borne in mind that public response to registration should increase only if people concerned realise the need of getting the birth and death certificates so that these may be used as documents of evidence to prove the events. The certificates issued should be more attractive and of a specified colour so that the subjects concerned would like to preserve them. There is little demand for these certificates in Ghana. It is, therefore, essential that the publicity programmes suggested above be supplemented by creating incentives for the public to register and acquire birth and death certificates. Introduction of birth and death certificates for the needs of the general public have already been discussed. However, one more suggestion may sound fantastic but experience is gradually revealing that the Registrar is the only pivot on whom rests the completeness of the registration of vital events. His or her apathy or devotion to duty can completely change the complexion of registration efficiency. One of the basic functions of the Registrar is that he or she should keep informed of every vital event that takes place in his or her jurisdiction. Therefore, the registrar plays the main role in the system. To lure the registrar to be more alert and effect complete registration, an additional incentive in the form of a cash award will have to be made. The Registrar of the area having less or negligible underregistration may be given this incentive which will automatically enthuse others to work more devotedly. These awards may be expensive, but the expenditure is in the right direction. With better results, the publicity money could be diverted to this fund for payments on awards. This is only a suggestion, but some other incentives may be recommended.

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Control on receipt of returns

Control on receipt of monthly returns should be exercised at Central, Regional and Registry levels. Controls should be exercised both for promptness and for complete reporting. It should be ensured at each level that not only the reports are received in time but that they are also received from all reporting units, since failure to control the number of reports to be received will adversely affect the collection, compilation and analysis of the data centrally.

Registers and statistical report forms

The old registers and statistical report forms were in use prior to July, 1974. These forms were too detailed and cumbersome. The Working Committee on Births and Deaths Registration, therefore, recommended that the forms be revised and the revised forms have been in use since July, 1974. In this connection, it is suggested that any such changes in procedures may be affected from the beginning of the following calendar year.

In this connection, it can further be pointed out that the national statistical report for live birth, death, and foetal death might take the form of an individual unit document or a multiunit list report. In Ghana, the statistical report form is an individual unit document. In either case, the registrar is responsible for its completion as well as for entering the vital event in the register. The question arises as to the relationship of these two documents, the register and the statistical report, especially in respect to content. "Are the items of information on the statistical report those which appear in the register?" "Are statistical reports of live birth, death, and foetal death limited by the same provisions as determined by the content of legal registers?" This requires careful examination of legal provisions and amendment of present regulations.

Instruction manuals for registrars

The widespread use of instruction manuals is a modern development of public administration. The idea that the functions of an operation or job functions of a registrar could be set forth clearly, step by step, and the elements clearly distinguished, has done much to increase efficiency in many fields. Their use in connection with vital registration has had a similar effect. The consensus of opinion is that such instruction manuals are indispensable aids in securing more complete and accurate registration. A manual of instructions for registrars has been completed, cyclostyled and distributed for use during 1976. This manual can also be revised from time to time to keep it up to date. This will provide a ready made coordinating mechanism in that there will be a constant need for the central registry office to keep in touch with the local registration unit.

Inspection

Since local registrars constitute the periphery of the registration administration, there is value in a system of inspection or supervision or review to ensure that the various registration units are following instructions and carrying out their responsibility in an acceptable manner. Inspection of the registers is one effective method of improving the efficiency of the registrar. Inspection and interchange of work practice experience constitutes a method of improving efficiency. It is, therefore, recommended to inspect each registry by the state and/or regional officials or full time supervisors at least twice in a year.

Publication programme

A tabulation programme should first meet national needs. Only secondarily should such a programme seek to meet international needs, although, it is recommended that at all times the achievement of international comparability should be a goal. This has been suggested in the United Nations Principle 410 for a set of "desired basic tabulation."

The design of a tabulation programme, however, should take into account accuracy and completeness of coverage of the basic data. Looking at the limitations of data discussed previously, it can be concluded that an extensive tabulation programme is useful only when the degree of completeness exceeds 90 percent in a country. Thus, it is advisable to bring out only a Minimum Tabulation Programme for Vital Statistics for the present. For many years to come, tabulation should be limited to simple tables and more attention focused on efforts to cover the entire population of the country under the registration system and on achieving either complete registration or reliable sample survey coverage.

At present, the responsibility to collect, compile and publish the vital statistics data lies with the Vital Statistics Unit of the Central Bureau of Statistics. The Vital Statistics Unit should, therefore, concentrate its efforts on the Minimum Tabulation Programme already suggested (Memorandum GHA/72/PO4/1975). The annual tabulation plan suggested can be tested on 1974 and/or 1975 data already supplied to the Vital Statistics Unit. On completion, the Registry shall publish an annual vital statistics report for the country. The annual report is not compiled at present. In addition, a quarterly Vital

Statistics Newsletter prepared by the Registry has been in existence. A mailing list for its circulation is already prepared by the Registry and Newsletters are circulated.

Cause of death

The data on causes of death are of great public health importance. But in Ghana, mortality data by age group and sex are defective as is the case in most developing countries. There are no ample medical and diagnostic facilities available in the country particularly in rural areas. There is scarcity of medical doctors. Also, the enforcement of Section 18 of the Act 301 is unknown. The Section provides that, "the medical certificates stating the cause of death shall be issued free of charge by the medical practitioner who was last in attendance during the illness of the deceased, and this certificate shall forth with be delivered to the Registrar." Later on, these certificates are sent to the Biostatistics Division of the Ministry of Health for tabulation.

It is suggested that these certified cause of death data should be coded according to the detailed list of 3 digit categories, with or without 4 digit subcategories, of the International Statistical Classification of Diseases, Injuries, and Causes of Death (World Health Organization, Revision 1965). The degree of detail suggested in cross-classification is by cause, sex and age group by rural, urban and region. These tabulations should be included in the annual vital statistics publication.

Further, the recommended groupings for analysis by the International Classification of Diseases should be in accordance with:

a) The detailed list of 3 digit categories, with or without 4 digit subcategories, or,

b) The list of 150 causes for tabulation of morbidity and mortality (List A) or,

c) The list of 50 causes of tabulation of mortality (List B).

SAMPLE REGISTRATION SYSTEM (DUAL RECORD SYSTEM)

Genesis

The increasing acuteness and awareness of the population problem in Ghana and the deficiencies in the statutory civil registration system have greatly intensified the need for a quick and reliable yearly estimate of live birth and death rates on a current and continuous basis. The absence of reliable vital statistics has greatly handicapped the planning, execution and evaluation of the process of economic development. A census is an important source of information indicating socio-economic and demographic characteristics of popula-

tion, but it is usually taken once in ten years. In order to measure short-term changes in the growth of population for various purposes like projecting the future trends in population, in evaluating the results of both national health and family planning programmes, etc., there is constant need for sources other than census.

Objectives of the system

The main objective of the Sample Registration System is to provide reliable estimates of live birth and death rates for Ghana as well as separately for rural and urban areas. The sample registration system of areas is contemplated to provide estimates of live birth and death rates in situations where the total system is inefficient. This is in accordance with the objective of obtaining estimates of the rate of population growth with minimal delay as an aid to development planning, while at the same time promoting registration for the legal and administrative advantages which it confers. Also, the methods and field procedures will be used in the expansion and development of the Civil Registration System in Ghana (UNFPA Project Progress Report, 1976).

Different phases of the system

The present methods and field procedures developed in Ghana, however, raise serious problems and obstacles in the implementation of such a system in the country. Looking at the above-mentioned facts, it is envisaged that a manageable sample (20 rural and 5 urban enumeration areas) would be taken in 3 local authority areas (2 rural and 1 urban) in order to study the methods and field procedures in the experimental phase. If the experiment is favourable, a small probability sample for the country (30 rural and 10 urban EAs) would be tried out for a pilot scheme before a full-scale sample registration system is implemented in the country. The different phases of implementation of the Sample Registration System in Ghana are as follows:

Stage	Areas and Sample Units
Experimental	3 local authority areas (2 rural and 1 urban)--Sample of 20 rural and 5 urban areas (EAs)
Pilot	Country, rural and urban areas--Sample of 30 rural and 10 urban areas (EAs) for the country (a sub-sample of the main sample)
Full-scale	Country, rural and urban areas--Sample of 180 rural and 60 urban sample areas (EAs) for the country (main sample)

Sample design

Rural. The sample design proposed is a unistage stratified simple randon sampling without replacement. The primary sampling unit is an enumeration area according to the 1970 Census (Population Census of Ghana, 1970). The universe is the entire rural area of Ghana by 1970 Census definition. In the rural areas of the State, stratification will be made on the basis of administrative regions and population size classes of EAs (*viz.,* less than 700, 700 to 999 and 1000 or more). A frame of enumeration areas will be drawn up and 180 enumeration areas will be selected at random in each region within each stratum. The sample units allocated to each stratum and region will be in proportion to the population in the stratum and region.

Urban. The urban sample design is a unistage stratified simple region sampling without replacement. The primary sampling unit is an enumeration area according to the 1970 Census. The universe is the entire urban area in Ghana by 1970 Census definition. The four urban strata proposed are as follows:

Stratum I;	Towns with population 50,000 and above,
Stratum II;	Towns with population 20,000 to 49,999,
Stratum III;	Towns with population 10,000 to 19,999, and,
Stratum IV;	Towns with population less than 10,000.

A frame of enumeration areas will be drawn up and 60 enumeration areas will be selected at random in each stratum and region. The sample units allocated to each stratum and region will be in proportion to the population in the stratum and region.

Sample size

For the assumed live birth and death rates, 240 enumeration areas should estimate the live birth rate with about 1 percent error. While for death rates, a standard error of about 2 percent is good enough. The full-scale sample can be determined and should be large enough to give live birth and death rates within an agreed upon threshold of standard error for the country estimates.

Basic structure of the system

The field investigation under the Sample Registration System essentially consists of continuous registration and/or enumeration of births and deaths by a registrar (part-time or full-time) and an independent survey of the same unit every 6 months by a supervisor (full-time). The vital events obtained through these 2 methods will be matched. Unmatched and partially matched events will be reverified in the field to obtain an unduplicated count of correct births and deaths in the sample area. A base-line survey of the sample unit will also be carried out in order to provide a population base for working out vital rates. The essential features of the system are:

- A base-line survey of a sample unit to obtain usual resident population of the sample area;
- A continuous (longitudinal) enumeration of vital events by the registrar;
- An independent 6-month survey of births and deaths by the supervisor also bringing up to date the household schedules;
- The matching of events enumerated as part of continuous enumeration and listed during the course of half-yearly surveys; and,
- A field reverification of unmatched and partially matched events.

The registration system to be adopted under the Sample Registration is *de jure* system, *i.e.,* to cover a group of persons whose usual place of residence is in the sampe unit. However, in order to ensure that the events of visitors to the sample area do not get mixed up with the events to the usual residents, the visitors' events will also be recorded. Thus, the Sample Registration System will adopt both *de jure* and *de facto* methods of registration so that both the maintenance of the registry in the area (based on occurrence) and calculation of vital rates (based on residence) could be achieved.

CONCLUSIONS

A far-reaching analysis of the civil registration system has been conducted and the authors have reached the conclusion that the problems and difficulties concerning the development and expansion of the civil registration system in Ghana are partly of an organisational and administrative nature and partly related to trained personnel and sampling technique. The discussions also reveal that both vital registration and sample registration systems should be a priority programme in Ghana over a number of years to come. Unless the long "lead-time" required to improve civil registration is taken account of, the facts needed for planning the country's programmes will not be there for many years.

A vital registration system has been tried by many countries, as in the case of Ghana, but, as a rule, only the industrialised countries have been able to depend on that system for reliable national statistics. The appearance of alternative methods (e.g., single-round survey, multi-round survey, sample registration system, or dual record system, or population growth estimation (PGE technique) is relatively recent and can be attributed largely to two important developments, both largely demographic in nature. One is the great increase in the rate of population growth, which has been most pronounced since the middle of this century. The second development is the particularly rapid growth of population in the developing countries at a time when these countries are exercising new independence and feeling the surge of new hopes and aspirations. The sample registration system (dual record system) is, of course, only one of the variety of systems and devices that have been proposed for the measurement of population change. Like most of the others, it is a product of the past 30 or 40 years. Thus, the sample registration system is only one of a number of devices that have been employed to produce up-to-date information of population change to supplement the results of the traditional census. Certain features of the system, however, give promise of greater completeness and accuracy of results then can be achieved by simple systems, and it is largely for this reason that interest in the dual record approach has grown. The methods and field procedures developed under the dual record system can also be used to improve and expand the present civil registration system in Ghana.

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APPENDIX

NUMBER OF REGISTRIES, REPORTING CENTRES AND PERCENTAGE OF POPULATION COVERED, URBAN/RURAL BY REGION AS OF MARCH 1976, GHANA

Region	No. of Registries and Centres			1970 Pop. of Registries and Centres		Percentage of Coverage		1970 Population of Regions	1970 Population of Registries & Centres U + R	Percent Coverage
	Urban	Rural	Centres	Urban	Rural	Urban	Rural			
All Regions	155	102	96	2,472,456	470,292	28.9	5.5	8,559,313	2,942,748	34.4
Western	15	10	9	207,343	40,120	26.9	5.2	770,087	247,463	32.1
Central	22	11	17	258,636	56,647	29.1	6.3	890,135	315,283	35.4
Greater Accra	14	3	5	726,553	24,371	85.3	2.9	851,614	750,924	88.2
Eastern	33	20	20	310,073	84,856	24.6	6.7	1,261,661	394,929	31.3
Volta	15	14	2	151,096	38,525	16.0	4.0	947,268	189,621	20.0
Ashanti	19	19	11	440,526	84,562	29.7	5.7	1,481,698	525,088	35.4
Brong Ahafo	21	6	9	169,072	47,548	22.1	6.2	766,509	216,620	28.3
Northern	10	10	11	148,320	51,009	20.4	7.0	727,618	199,329	27.4
Upper	6	9	12	60,837	42,654	7.1	4.9	862,723	103,491	12.0