

CENTRAL STATISTICAL AUTHORITY (CSA)  
POPULATION ANALYSIS AND STUDIES CENTER (PASC)

ON THE COMPLETENESS OF EXPERIMENTAL SAMPLE  
VITAL REGISTRATION SYSTEM IN RURAL ETHIOPIA

BY  
TESHOME TOGA CHANAKA  
AND  
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ADDIS ABABA  
JULY 1991

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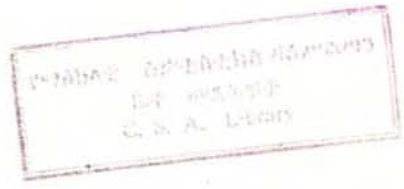
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## 1. INTRODUCTION

### 1.1 Perspectives of Vital Registration System

The purpose of this report is to trace the importance and usefulness of vital registration system in general and to provide an overview of the Experimental Sample Vital Registration System (ESVRS) in Ethiopia in particular.

Vital Registration System (VRS) is one of the conventional methods of obtaining data on vital events, namely, births, deaths, migration (in/out), marriages, divorces, separations, annulments, adoptions, legitimations and recognitions, etc. In essence, vital registration system is a process of reporting and recording vital events shortly after their occurrence. Since the events, by definition, are reported and recorded as soon as they occur, and continuously, the coverage is expected to be complete. Moreover, information obtained from vital registration system is considered to be more reliable than those collected by retrospective method which calls for later visit by an interviewer and recall of events by respondents.

Since the continuous registration system offers data possibility that can't be easily duplicated in other system, its potential as a source of demographic data in the analysis of population dynamics has been well recognized. And an enthusiastic efforts have been made to establish and develop vital registration system in statistically less developed nations in the post war periods.

For instance, several principles, recommendations and resolutions have been made at international, regional and national levels to foster the system. Among others, the principles and recommendations for vital statistics system reiterated by the United Nations, the recommendations outlined in the World Population Plan of Action by the 1974 World Population Conference in Bucharest which, later on, was confirmed by the 1984 International Conference on Population in Mexico City; and the resolution of the Economic and Social Council of the United Nations deserve a prior and particular mention. The financial and technical support received from various UN agencies

to foster vital registration system in developing countries is also worth mentioning (for details of the recommendations and more discussions on the subject, see, UN, 1973, 1974, 1984). Furthermore, the establishment of the International Institute for Vital Registration and Statistics (IIVRS) to promote and compile vital statistics demonstrates not only the importance of the system but also its necessity.

Despite the pressing needs for vital statistics, various recommendations and enormous efforts made to establish and develop efficient vital registration system; the system either doesn't exist or even where it exists, it doesn't yield adequate and necessary data in most of the developing countries.

## 1.2 Uses of Vital Records and Vital Statistics

If vital events are reported and recorded accurately, completely and timely, the resulting data can be of individual and public benefits and these can be used for legal and statistical purposes.

Firstly, individual records establish a person's civil status and the facts on which they are based. Proofs or evidences of these facts such as age, place of birth or death, parentage, causes of death, etc. are essential information required for many official and legal purposes.

Record on birth provides documentary proofs of identity and civil status on such characteristics as age, nationality (citizenship) and parentage. In many countries, evidence on personal identity are required to obtain travel documents, own properties, jobs in regular civil services, enter school, participate in politics, ..., etc.

Death record is important in settlements of inheritance, insurance and pension of dead persons and in getting burial permits, especially in urban centres. Marriage record certifies the legality of marriage, attests the responsibility to support family, legalizes births and ensures the right to claim inheritance and pension when one of the spouses dies. On the other hand, divorce record enables to obtain legal

certificate of dissolution of marriage and ensures the right of re-marriage, among other things.

Secondly, from the point of view of statistical functions, information on the registration of vital events collectively forms data basis for vital statistics which are employed in reckoning birth, death, marriage, divorce and migration rates and rate of population growth. These rates, in turn, are indispensable for evolving and monitoring development strategies for any society. For example, the indicators resulting from vital registration system provide valuable inputs in the formulation and evaluation of public health programmes, child care projects, family planning programmes and migration (internal and external) policies of government, etc.

### 1.3 Advantages and Disadvantages of Vital Registration System (VRS as a Source of Demographic Data)

The intrinsic features of efficiently functioning vital registration system as a source of demographic data are continuous flow, accuracy and timeliness. Specifically, the advantages of vital registration system over other sources of demographic data (censuses and surveys) are as follows:

- a. institutional continuity that leads to continuous flow of data on vital events, coverage of entire universe of events and availability of vital statistics on annual basis;
- b. permits analysis of vital events even at the lowest administrative unit because the coverage of vital registration system is expected to be all over the country;
- c. well-suited for providing both short-term and long-term time series data that eases trend analysis;
- d. facilitates international comparison of data since in principle, similar if not identical definitions and classifications are used; and

- e. allows comparability of data over time and space within a country.

The major limitations of VRS are:

- a. requires separate estimates for population at risk which is usually obtained from censuses;
- b. relatively inflexible to changes in content and procedures and limited range and depth is possible in data collection for most of the classifying variables; and
- c. not easy task to organize, administer and supervise in developing countries, because it is extensive both in time and space.

## 2. STATUS OF VITAL REGISTRATION SYSTEM IN ETHIOPIA

### 2.1 Existence and Development of the System

The task of registration of vital events and compilation of vital statistics are usually entrusted with some government agency or ministry. The organizational set up and the responsible agencies may differ from one country to another. The provision for registration of vital events is usually pronounced through legal statements and decrees of government. Ethiopia is no exception to it. The provision for vital registration is to be found in three major legal Enactments of Government of Ethiopia. These are the 1959 Ethiopian Government Civil Code, the 1972 Order and Proclamation to establish Central Statistical Office (CSO) and the 1976 proclamation to consolidate the Urban Dwellers' Associations<sup>1/</sup> and

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<sup>1/</sup> Urban Dwellers' Associations (UDAs') are cooperative societies of urban dwellers formed under the government Ownership of Urban Land and Extra Houses Proclamation of 1976. These are mass organizations through which government mobilizes people at grass root level. These associations participate directly in political, economic and social activities of the locality.

municipalities. All these proclamations clearly stated that vital events should be registered and certified.

The Civil Code of 1959 gave the legal provision to the Ministry of Interior to register vital events, The aim and content of this registration, it was stated, was to ensure each citizen its legal right and civil status. However, the civil code did not indicate recording of any other characteristics related to the events which were important for social and economic planning. It was also stated in the civil code that births, deaths and marriages should be registered under any circumstances, that is, registration of vital events was supposed to be compulsory in nature.

The 1972 Order and Proclamation to establish CSO\* stated that the Central Statistical Office should collect data on births, deaths, marriages and divorces. Furthermore, the 1976 proclamation to consolidate Urban Dwellers' Association and Municipalities stated that all urban dwellers' associations should have a register each for birth, death and marriage events. Unfortunately, none of these government and mass organizations took any initiative until now to set up a nationwide vital registration system in the country.

However, CSO initiated an experimental sample vital registration system (ESRS) in 1976 in few selected urban centers<sup>2/</sup> and Farmers' Associations<sup>3/</sup>. The thrust of this experimental exercise was solely to appreciate technical, legal, administrative, logistic and financial problems that could possibly arise at the initial stage so as to develop better strategies before launching the programme (VRS) nationwide (CSO, 1977).

\*now called Central Statistical Authority (CSA).

<sup>2/</sup>Included were 13 urban dwellers' associations (sample selected) in Addis Ababa and Addis Alem and Sheno urban centres in Shoa.

<sup>3/</sup>Two Farmers' Associations (FAs) from Addis Alem Wereda and two Farmers' Associations (FAs) from Kesem Wereda (both in Shoa) were selected. Note that while urban dwellers are organized into Urban Dwellers' Association, the peasants in rural areas were organized into Farmers' Association at various levels (Kebele, Wereda, Awraja, Kifle Hager and National) under the proclamation to provide for the Public Ownership of Rural Lands (Proclamation No. 31 of 1975). FAs are the most important mass organizations at village level.

The launching of National Integrated Household Survey Programme (NIHSP) by CSO around 1980 to meet the paucity of socio-demographic data provided an opportunity for incorporating the Experimental Sample Vital Registration System (ESVRS) into NIHSP. The programme was materialized only in rural part of the country. The first Experimental Sample Vital Registration System was made part of the Rural Integrated Household Survey Programme (RIHSP) in September 1982 and the programme, particularly the registration of vital events continued until August, 1986. CSO began its new scheme of Experimental Sample Vital Registration in late September 1986 in light of the experiences gathered in the conduct of sample registration for the last four (1982-86) years.

Although the programme (ESVRS) has been in operation for last four years (1982/83 - 1986/87) the household surveys were available only for 1982/83 and 1986/87 rounds. Since one of our major objectives in this study is to compare the coverage of vital events by dual recording (registration and survey), we were constrained to confine our analysis to that of 1982/83 and 1986/87.

## 2.2 Objectives of the Experimental Sample Vital Registration System

The Experimental Sample Vital Registration System was designed with the following principal objectives in mind:

- a. It was designed to provide data on births, deaths, migration and population growth rates and rates of marriage and divorce and their socio-demographic correlates. Since the system is at its embryonic stage, it has a limited area and population coverage and thus it is not expected to fill in the dearth of data by itself but it is hoped to complement the available data from other sources in the country.
- b. As the establishment of a nation-wide vital registration system is inevitable, it was expected that the experiences gathered in the course of administering (ESVRS) will be immensely valuable in launching the nation-wide vital registration system in the long-run.

4/ The National Integrated Household Survey Programme (NIHSP) was developed within the framework of the African Household Survey Capability Programme (AHSCP). It was primarily devised to provide socio-economic and demographic data in an integrated form on a continuous basis through the establishment of a durable survey taking capability. Of the Urban and Rural components of NIHSP, the latter has been accorded the priority to form the first

- c. The Experimental Sample Vital Registration System will also gradually introduce and diffuse the uses and values of vital records to individuals and the public.

### 2.3 Coverage and Content

As part of the Rural Integrated Household Survey Programme (RIHSP), both the 1982/83 and 1986/87 Experimental Sample Vital Registrations and Household change surveys covered only the rural sedentary population in twelve out of fourteen regions of the country<sup>5/</sup>. Like other surveys in RIHSP, the Experimental sample vital registration system was, at the start, designed to cover a sample of 500 selected Farmers' Associations (FAs) in the twelve regions but it actually covered 479 FAs (Table 2.1). The sample size was increased from 500 FAs in 1982/83 to 745 in 1986/87. Out of the 745 FAs selected only 672 were eventually covered in the first and second rounds of the household survey and the registration (see also Table 2.1).

The experimental sample vital registration system is a dual recording system in nature and thus uses two approaches in data collection, viz: i) household survey and ii) continuous registration of vital events.

a. Household Survey:- The household survey was basically designed to study changes in household composition as a result of vital events in a specified period of time-usually 12 months. The survey is carried out twice in a year. In round -1 of the survey base line or initial population and its basic characteristics are collected. The first round surveys were conducted in September, 1982 and September, 1986 for the 1982/83 and 1986/87 registrations, respectively. In order to identify changes in household composition as a result of vital events experienced by members of the household, the second round surveys were undertaken a year after in each case.

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<sup>5/</sup>Eritrea and Tigray regions are not covered in the Rural Integrated Household Survey Programme (RIHSP).

Table 2.1. Number of Farmers' Associations (FAs) Selected and Actually Covered in Household Surveys (Both Round-1 and Round-2) by Region

Region	Number of FAs and Year of Survey					
	1982/83			1986/87*		
	Selected	Actually Covered	% Covered	Selected	Actually Covered	% Covered
12 Regions	500	479	96	745	672	90
Arssi	34	34	100	60	57	95
Bale	34	32	94	34	34	100
Gamo Goffa	34	30	88	34	33	97
Gojjam	36	36	100	139	124	89
Gondar	36	36	100	36	35	97
Hararge	35	33	94	35	35	100
Illubabor	35	32	91	33	33	100
Keffa	35	35	100	35	34	97
Shewa	100	94	94	220	178	81
Sidamo	35	32	91	35	35	100
Wellega	49	48	98	47	45	96
Wello	37	37	100	37	29	78

The information collected in the surveys and vital registration system are provided in Table 2.2. As could be seen from the Table the 1986/87 survey has a wider content and wealth of information on population at risk than the 1982/83 survey.

\* As obtained from the preliminary results.

b. Continuous Registration:- This is a process of recording vital events continuously as they occur. Normally, it immediately follows the household survey (base-line survey i.e. round -1) and continues until the end of the year before the 2<sup>nd</sup> round household survey is conducted.

The content of registration of birth, death, marriage and divorce for two periods (1982/83 and 1986/87) are also presented in Table 2.2. There seems to be no substantial changes in the formats of vital registration from 1982/83 to 1986/87 excepting that the basic characteristics in the 1982/83 are only asked for the population experiencing vital events and not for the population exposed to the risk as in the 1986/87. Also in the 1986/87 partial information on children ever born (CEB) by sex and their survival status was asked for mothers who gave birth during the registration period and concerning parentage, only mother's characteristics was included. Furthermore, only in 1986/87 death registration information on religion, ethnicity and education of the deceased persons and type of treatment received were included.

Table 2.2 Contents of Household Change Survey Schedule and Vital Registration, Rural Ethiopia, 1982/83 and 1986/87

Variables	1982/83	1986/87
<u>Household Survey Schedule*</u>		
<u>Round -1</u>		
Round	No	Yes
Relationship to Head of Household	Yes	Yes
Sex	Yes	Yes
Date of Birth	Yes	No
Age	Yes	Yes
Marital Status	Yes	Yes
Religion	No	Yes
Ethnicity	No	Yes
Educational Level	No	Yes

Table 2.2 (Contd.)

Variables	1982/83	1986/87
<u>Round -2</u>		
Age	No	Yes
Marital Status	No	Yes
Educational Level	No	Yes
Change in Household (Vital events) <sup>a)</sup>	Yes	Yes
Date Change Occurred	Yes	Yes
Area of Origin/Destination	Yes	Yes
Reason for Migration <sup>b)</sup>	Yes	Yes
<u>Vital Registration</u>		
a. <u>Birth Registration</u>		
Sex of Child	Yes	Yes
Date of Birth	Yes	Yes
Date of Registration	Yes	Yes
Attendant at Delivery	Yes	Yes
<u>Parental Background<sup>c)</sup></u>		
Age of parents	Yes	Yes
Education of parents	Yes	Yes
Occupation of parents	Yes	No
Religion of parents	Yes	Yes
Ethnicity of parents	Yes	Yes
Marital Status of parents	No	Yes
Children ever born by sex and survival status	No	Yes
b. <u>Death Registration</u>		
Relationship to head of household	No	Yes
Sex of deceased	Yes	Yes
Age at death of deceased <sup>d)</sup>	Yes	Yes
Marital Status of deceased	Yes	Yes
Religion of deceased	No	Yes
Ethnicity of deceased	No	Yes

Table 2.2 (Contd.)

Variables	1982/83	1986/87
Education of deceased	No	Yes
Occupation of deceased	Yes	No
Date of death of deceased	Yes	Yes
Cause of death of deceased	Yes	Yes
Type of treatment received by deceased	No	Yes
Date of registration	Yes	Yes
<u>c. Marriage Registration</u>		
Sex of bride and groom	Yes	Yes
Age at marriage	Yes	Yes
Type of marriage arrangement	Yes	No
Previous marital status	Yes	Yes
Educational level	Yes	Yes
Occupation	Yes	No
Religion	Yes	Yes
Ethnicity	Yes	Yes
Date of marriage	Yes	Yes
Order of marriage	No	Yes
Date of registration	Yes	Yes
<u>d. Divorce Registration</u>		
Sex of divorcees	Yes	Yes
Age at divorce	Yes	Yes
Number of times married	Yes	No
Number of children under 18 years	Yes	Yes
Number of dependents	Yes	No
Educational Level	Yes	Yes
Occupation	Yes	No
Religion	Yes	Yes
Ethnicity	Yes	Yes
Reason for divorce	Yes	Yes

Table 2.2 (Contd.)

Variables	1982/83	1986/87
Date of Divorce	Yes	Yes
Date of registration	Yes	Yes

Note:- Yes = Variable interviewed. No = Variable not interviewed.

- a) In the 1982/83 exercise 'Reason for change in the Household' was asked.
- b) In the 1982/83 Reason for move was included in a).
- c) In the 1986/87, it was asked only for the mother of the child.
- d) In 1986/87, date of death was registered in days (if less than a month), in months (if less than a year) and in years (if a year or more).
- e) In 1982/83 cause of death was reported either by physician or lay reporter.

In 1982/83, the relationship of the reporter to persons experienced the events was also asked.

- \* Pertaining to all members of the household in both rounds (Round - 1 and Round - 2).

#### 2.4 Sample Selection

The multi-purpose surveys under Rural Integrated Household Survey Programme (RIHSP) share common Primary Sampling Unit (PSU) in a single area stage design. In this sample framework the geographical and administrative division of the country is used for the first level of stratification, that is, the Awraja (sub-regions) formed the strata. There were 77 strata from the 12 regions included in the survey, with an average of about six strata per region. Within each stratum the Farmer's Associations (FAs) are used as PSUs. It was first decided to select a total of 500 PSUs (FAs), about 2.6 percent of the total FAs in the 12 regions. The allocation of the 500 FAs to the 12 regions took into account the size of the regions, with additional restriction of selecting at least 34 PSUs from a given region, assuming that 34 FAs are reasonable minimum sample size to provide estimates at regional level. After allocating the 500 PSUs to the 12 regions, the number of FAs to be selected from each stratum has been

determined in such a way as it is proportional to the number of FAs in each of the Awrajas. PSUs are then selected without replacement with probability proportional to size (PPS). The size being the number of individuals in the FAs. All households in the selected PSU were completely covered (for details, see, CSO, 1983).

## 2.5 Training and Supervision

Providing training to the personnel to be involved in the collection and processing of data is a crucial step in obtaining accurate information and hence the training of field staff at all levels was considered as part and parcel of the survey programme. In view of this, professionals and technicians (working in the head office) including the regional statistical office heads, supervisors, enumerators, editors and coders were given the necessary training (both class-room and practical field training). The training was conducted at different stages.

At the first stage, training was conducted at the headquarters involving the professional staff responsible for a particular survey, regional statistical office heads and technicians. The trainers at the first stage were mainly the study directors, who were fully involved in the preparation of study design, survey questionnaires and registers and had experience in the day-to-day activity of experimental sample vital registration system. Those who received training at the headquarters of Central Statistical Authority (CSA)\* were in turn involved in training enumerators and supervisors at regional level (the second stage training).

\*By defining the powers and duties of the Government of Peoples' Democratic Republic of Ethiopia, the Central Statistical Office (CSO) is given the status of 'Authority' and officially known as Central Statistical Authority (CSA) (See Proclamation No. 8/1987).

The second stage training was carried out at regional level. The trainees were supervisors and enumerators while the tutors were those who took the first stage training at head office. The enumerators for the survey programme were locally recruited (i.e. from the region in which the survey was to be conducted) in order to ensure greater familiarity with the area and the people.

At third stage, training was given to editors and coders at the head office.

Besides the training given at each stage, instruction manuals were prepared and handed into each individual involved in these tasks of enumeration, supervision, editing and coding of data.

Another important aspect of the fieldwork is the supervision of data collection in the field. This is usually done by the permanent supervisory staff stationed mostly at the regional/Awraja headquarters. Regular supervision is also expected to be provided by the professionals and technicians drawn from different departments of CSA. But this was hardly materialized due to financial and other related constraints.

## 2.6 Methods of Data Collection in VRS

There are two methods of registration of vital events, namely active and passive types. The active type of registration is a method whereby the registrar goes around his assigned registration unit to canvass the events, while in passive type of registration the registrar in charge waits in his office for informants to come and report the occurrence of vital events in their areas.

Initially, in the experimental sample vital registration the method of registration was designed to be passive type. In doing so, the FAs were divided into smaller units (zones) and an informant was assigned in each zone to inform the vital events to the registrar. A registration system based on the passive type depends on the good will, cooperation and motivation of the public and seems to work well in societies where the registration of vital events is compulsory by law.

Due to lack of cooperation, motivation and appreciation of uses of vital events on the part of the people of rural Ethiopia and in absence of laws and legislation regarding compulsory registration of vital events, the method of registration was shifted from passive to active type or combination of both.

### 3. COMPLETENESS OF REGISTRATION OF VITAL EVENTS

#### 3.1 Overview of Completeness of Coverage

A comprehensive evaluation of the status of development of civil registration and vital statistics involves assessment of various aspects of the registration and statistical processes. These include adequacy and effectiveness of registration laws and regulations, promptness and completeness of registration, efficiency of services in providing certification of vital events, quality and completeness of data, efficiency of data processing, adequacy and usefulness of data produced, timeliness in providing data, etc. Of these perhaps the most useful simple index of status of vital registration is the measure of completeness with which births and deaths are registered (IIVRS, 1986).

The major challenge that surrounds vital registration system in statistically developing countries is incomplete coverage of vital events and thus vital statistics derived from VRS remained inadequate and unsatisfactory. In view of this fact, evaluation of VRS and measuring completeness of registration are primary tasks and basic issues in data analysis.

Report on the organization and status of civil registration and vital statistics in various countries of the world surveyed by International Institute for Vital Registration and Statistics (IIVRS) discerns that registration system in fewer than half the countries of the world may be considered adequate in so far as registration is concerned. Surveys from IIVRS, United Nations and UNECA for various countries on completeness of

registration of births and deaths indicate that in about half of the countries of the world birth registration is 90% complete, whereas death registration is even worse. The situation in sub-Saharan Africa is desperate where there is no single country that met the criterion of satisfactory completeness of registration (IIVRS, 1986).

In this report an attempt is made to assess the completeness of registration of vital events in rural Ethiopia based on the results of the experimental sample registration and household surveys in 1982/83 and 1986/87\*. There are different methods and approaches by which the degree of completeness of vital events can be evaluated. The method used here involves checking consistency of results obtained by registration and household survey with those from other survey. In this case, the results from 1981 Demographic Sample Survey (DSS) are used as standard against which coverage of vital events obtained by registration and survey are measured. The rationale for using DSS, 1981 as standard is justified by the fact that this is the only reliable recent set of data\*\* against which the results from registration and survey could be compared. DSS, 1981 is the first of its kind in terms of coverage, content and methodology. The survey was based on probability sample and covered all 12 regions of the country. The data were collected by a batch of well trained enumerators under close scrutiny of experienced supervisors (see for greater details the methodological report on RIHSP, CSO, 1983).

We have also measured the degree of closeness of vital events obtained by household change survey and continuous registration. The completeness of vital events measured here include crude birth rate, crude death rate and infant mortality rate.

\*The data collected by the 1986/87 registration and household change survey are now at processing stage, only the preliminary results are utilized here to prepare the present report.

\*\*This holds true until the 1984 Population and Housing Census data are completely processed.

Here are some points to bear in mind while evaluating the completeness of vital events obtained by household survey and continuous registration: i) the vital events based on survey and registration data are obtained directly while the events (i.e., those based on 1981 DSS data) against which these were compared for measuring coverage were obtained by using indirect techniques. Indirect method was applied on the assumption that these rates are usually under-reported in the surveys and censuses in statistically less developed countries. Therefore, indirect techniques were employed to derive a plausible set of estimates of vital events; ii) in this comparison of vital events (births and deaths) collected by registration and household survey of 1982/83 and 1986/87 with those estimated from the 1981 DSS, it was assumed that there has been no change in fertility and mortality between 1981/82 and 1982/83 on one hand and 1981/82 and 1986/87 on the other, especially among the rural population. This assumption is not unrealistic because the changes in fertility and mortality usually take place at slow pace unless all-out concerted efforts are launched at national and regional levels to reduce the level of fertility and mortality. No such effort is in sight. The level of contraceptive use is very low and health services are still very rudimentary and therefore, there is no reason to believe that fertility and mortality will decline appreciably between 1981/82 and 1986/87 without any serious effort.

### 3.2 Coverage of Birth

Table 3.1 presents percentage completeness of enumeration of births by survey and registration in 1982/83 and 1986/87, taking the estimates based on the Demographic Sample Survey (DSS), 1981 as the standard. Compared with the estimated birth rate derived indirectly using 1981 DSS data, we find births are

Table 3.1 Percentage Completeness of Births (CBR) in Registration and Survey Compared to Estimates Based on 1981 Demographic Sample Survey (DSS 1981) by Region

Regions	CBR (1982/83)		CBR (1986/87)		CBR (1981) DSS <sup>a)</sup>	% Completeness <sup>b)</sup>			
						1982/83		1986/87	
	Survey	Regist.	Survey	Regist.		Survey	Regist.	Survey	Regist.
Arssi	41.3	42.2	39.3	41.3	50.6	81.5	83.1	77.6	81.5
Bale	44.3	46.9	37.1	40.2	47.5	93.2	98.5	78.1	84.5
Gamo Goffa	31.7	32.4	37.6	36.2	56.1	56.5	57.5	67.0	64.5
Gojjam	33.1	39.6	37.0	34.8	55.3	59.9	71.6	66.9	62.9
Gonder	34.4	28.5	40.2	39.4	51.6	66.7	55.0	77.9	76.4
Hararge	41.4	37.5	39.8	31.6	55.7	73.8	67.1	71.4	56.7
Illubabor	24.7	25.1	27.7	28.6	41.8	59.1	60.0	66.3	68.5
Keffa	30.8	27.1	34.0	36.1	49.3	62.4	54.9	68.9	73.1
Shewa	28.4	31.0	36.1	35.6	54.6	52.0	56.6	66.1	65.2
Sidamo	33.5	30.4	33.1	29.3	54.7	61.2	55.3	60.5	53.5
Wellega	33.3	32.7	29.2	29.8	48.8	68.3	67.1	59.9	61.1
Wello	28.9	30.3	42.3	42.9	38.6	74.8	77.9	109.5	111.0
12 Regions	32.5	32.6	36.6	35.6	52.2	62.2	62.4	70.0	68.1
Mean	33.8	33.6	36.1	35.5	50.4	67.4	67.0	72.5	71.6
Std. Dev.	5.6	6.3	4.2	4.7	5.4	11.2	13.1	12.6	14.9

Note:-

- a) Obtained using the adjusted age-specific fertility rates from the 1981 Demographic Sample Survey. The adjusted age-specific fertility rates were obtained indirectly employing P/F ratio method.
- b) The results of Demographic Sample Survey (DSS), 1981 indicated in a) used as standard.

under reported both in survey and in registration. And this holds true for all regions, irrespective of the periods under study with the lone exception being Wollo in 1986/87. The births in Wollo seem to be over reported measuring against the standard in 1986/87. This is more of an exception rather than the rule. Considering the rural areas as a whole, the coverage of births in registration and survey against the standard was only 62 percent in 1982/83. The Coverage is, however, improved in 1986/87. This is what is also expected. The coverage is expected to improve as the experience of data generation increases with the passage of time. The coverage of birth in survey and registration is 70 and 68 percent respectively in 1986/87. However, if the outlier i.e, Wollo is removed from the purview of analysis, the coverage of birth in survey and registration turns out to be 69.5 and 67.4 percent respectively.

The coverage of birth is not uniform across the regions. One finds considerable regional variation in the coverage of birth irrespective of the year and sources of data collection. For instance, in 1982/83 coverage of birth varied from 52% in Shewa to 93% in Bale (survey) and from 55% in Gonder to 98% in Bale (Registration). The regional variation in coverage of birth is slightly higher in 1982/83 than in 1986/87 as measured by standard deviations, with more variation in registration than in survey in both the periods. The coverage of births have been consistently high in Bale followed by Arssi in both periods irrespective of methods of data collection used.

### 3.3 Coverage of Death

Here both crude death rate and infant mortality rate are used for measuring the coverage of deaths by registration and survey taking once again the estimates based on 1981 DSS as standard. Considering the 12 regions i.e., rural Ethiopia as a whole the coverage of deaths in registration and survey were 61 and 57 percent respectively in 1982/83. There has been very little improvement or change in the coverage of deaths over the four-year period, 1982/83 to 1986/87.

Under-reporting of death is noticed in every region except-

Table 3.2 Percentage Completeness of Deaths (CDR) in Registration and Survey Compared to Estimates Based on 1981 Demographic Sample Survey (DSS 1981) by Region

Region	% Completeness <sup>b)</sup>								
	CDR (1982/83)		CDR (1986/87)		CDR (1981) DSS <sup>a)</sup>	1982/83		1986/87	
	Survey	Regist.	Survey	Regist.		Survey	Regist.	Survey	Regist.
Arssi	13.0	15.6	21.9	22.9	16.5	78.5	94.2	132.3	138.4
Bale	14.4	16.5	11.9	12.9	15.9	90.5	104.3	74.8	81.1
Gamo Goffa	14.5	17.2	15.8	17.3	26.8	54.1	64.1	58.9	64.5
Gojjam	12.8	15.4	14.2	13.2	24.2	52.9	63.7	58.7	54.6
Gonder	12.5	13.2	14.7	13.8	23.7	52.8	55.7	62.0	58.2
Hararge	17.9	17.3	23.3	21.1	26.3	68.0	65.7	88.5	80.2
Illubabor	16.6	18.5	16.6	19.1	23.7	70.2	78.2	70.2	80.7
Keffa	20.3	18.4	18.3	19.3	28.6	70.8	64.2	63.9	67.4
Shewa	10.2	12.1	11.3	10.7	26.7	38.1	44.9	42.3	40.0
Sidamo	13.3	13.0	11.3	10.7	19.3	68.8	67.7	58.4	55.3
Wellega	15.3	16.4	14.1	13.6	17.1	89.7	96.1	82.6	79.7
Wello	12.7	13.2	9.9	10.5	17.9	70.8	73.6	55.2	58.5
12 Regions	13.6	14.6	14.4	14.2	23.7	57.3	61.5	60.6	59.8
Mean	14.4	15.6	15.3	15.4	22.2	67.1	72.7	70.6	71.5
Std. Dev.	2.6	2.1	4.0	4.1	4.4	14.8	16.8	22.1	23.7

Note:-

- a) Obtained using the CBR in Table 3.1 and the estimated growth rates of each region in 1981, i.e CDR is obtained by subtracting RNI from CBR ( $CDR = CBR - RNI$ ). For estimated growth rate See, Demographic Sample Survey Report, CSO 1985.
- b) The results of DSS, 1981 indicated in a) used as standard.

Table 3.3 Percentage Completeness of Infant Deaths ~~Rate~~ in Registration and Survey  
Compared to Estimates Based on 1981 Demographic Sample Survey (DSS 1981)  
by Region

Region	IMR(1982/83)		IMR (1986/87)		IMR (1981) DSS <sup>a)</sup>	% Registration Completeness <sup>b)</sup>		
	Regist.	Survey	Regist.	Survey		1982/83 Regist.	1986/87 Survey	Regist.
Arssi	135	115.9	143.9	182	74.2	63.7	79.1	80.5
Bale	170	88.6	104.2	234	72.6	37.9	44.5	85.0
Gamo Goffa	95	81.9	121.5	170	55.9	48.2	71.5	67.4
Gojjam	92	50.7	65.4	208	44.2	24.3	31.4	77.5
Gonder	93	58.6	73.7	145	64.1	40.4	50.8	79.5
Hararge	101	86.8	106.4	164	61.6	52.9	64.9	81.6
Illubabor	70	69.6	67.3	142	49.3	49.0	47.4	103.4
Keffa	127	96.2	104.6	166	76.5	57.9	63.0	92.0
Shewa	73	62.5	77.4	172	42.4	36.3	45.0	80.7
Sidamo	88	47.6	60.7	120	73.3	39.7	50.6	78.4
Wellega	89	55.1	64.4	118	75.4	46.7	54.6	85.6
Wello	80	37.2	51.2	135	59.2	27.5	37.9	72.7
12 Regions	95	66.3	83.1	160	59.4	41.4	51.9	79.8
Mean	101	70.9	86.7	163	62.4	43.7	53.4	82.0
Std.Dev.	28	22.2	27.4	32.9	11.9	11.2	13.3	8.8

Note:-

- a) IMR is based on  $q(2)$  values. These are estimated from West Model Life Table. Infant mortality rates presented here are the mean values of IMR obtained by employing Brass, Trussell, Sullivan and Feeney techniques.

Table 3.4 Coefficient of Correlation (r) on Percentage Completeness and  $\chi^2$  Goodness of Fit Test for Survey and Registration Data

Statistics	1982/83			1986/87		
	CBR	CDR	IMR	CBR	CDR	IMR
Correlation Coefficient (r) <sup>a)</sup>	0.88	0.92	-	0.93	0.97	0.90
Chi-square ( $\chi^2$ ) <sup>b)</sup>	4.03*	2.40*	-	3.34*	1.11*	42.32**
Chi-square ( $\chi^2$ ) <sup>c)</sup>	72.94**	38.12**	-	56.54**	37.32**	650.82**
Chi-square ( $\chi^2$ ) <sup>d)</sup>	77.54**	30.45**	310.99**	64.79**	37.69**	466.57**

Source: Tables 3.1, 3.2 and 3.3

Notes:-

- a) The Correlation Coefficient is between Survey and Registration % completeness
  - b)  $\chi^2$  is calculated using the Registration results as 'Expected' and Survey as 'Observed'
  - c)  $\chi^2$  is calculated using the 1981 DSS as 'Expected' and Survey as 'Observed'
  - d)  $\chi^2$  is calculated using the 1981 DSS as 'Expected' and Registration as 'Observed'
- \* Not significant at .05 level.  
 \*\* Significant at .01 level and below.

in 1986/87 the deaths were over-reported in Arssi in both survey and registration. As it was the case in birth data, deaths were seriously under-reported in Shewa region (coverage was less than 45%).

In the case of Infant Mortality Rate (IMR) the coverage seems to be even lower than in CDR and CBR. In all the regions, deaths under one year were under-counted in both registration and survey. The coverage seems better in 1982/83 than in 1986/87. In 1986/87 deaths under one year were better reported in the registration than in the household survey\*. In Wollo, Gojjam, Shewa, Sidamo and Illubabor regions, the coverage of infant deaths were less than 50 percent.

It may be further observed that the degree of coverage of birth and death is almost the same whether this was obtained through continuous registration or household survey as indicated by the finding of strong positive correlation between the results obtained from two sources. Application of goodness of fit test ( $\chi^2$ ) also suggests no significant difference between the survey and registration in obtaining vital events. This could arise from the fact that both survey and registration were carried out by the same person.

#### 4. Estimates of Missing Events and Completeness of Coverage.

An attempt is also made to examine whether coverage of vital events, particularly births and deaths improves if events reported and missed by registration and survey are identified. To identify the events reported and missed by survey and registration calls for matching the events recorded by two sources. In this study one way matching procedure was adopted to identify the events reported and missed by two sources and this was illustrated below:

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\*The  $\chi^2$ - test indicates significant difference in infant mortality rates obtained by household survey and registration in 1986/87.

Registration	Survey		
	Reported	Not Reported	Total
Reported	$m$	$u_2$	$n_2$
Not Reported	$u_1$	$Z$	$v_2$
Total	$n_1$	$v_1$	$n$

Where  $n_1$  = Number of events reported by Survey

$n_2$  = " " " " " Registration

$m$  = " " " reported by both sources

$u_1$  = Obtained indirectly by  $n_1 - m$

$u_2$  = " " by  $n_2 - m$

$Z$  = events missed by both systems which is estimated by  $u_1 u_2 / m$

$n$  = the estimated total number of events which is  $(n = m + u_1 + u_2 + Z)$ .

One precondition of matching is that the Survey and Registration should be conducted independently so that events reported in source 1 ( $n_1$ ) and source 2 ( $n_2$ ) are independent selections from the total events. In case of the Experimental Sample Vital Registration system examined here, both registration of events and household survey were done by same person. Under the circumstances, it is possible that the enumerator-cum-registrar might have reported the same events in both systems without maintaining the independent nature of collecting the data. Therefore, the assumption of independence in carrying out survey and registration is likely to be violated. In other-words, events reported in the household survey ( $n_1$ ) and in the registration system ( $n_2$ ) might possibly be non-independent selections from the total number of events ( $N$ ) that have occurred during the reference period. In spite of this possible violation of assumption of independence we have carried out the exercise of matching only for illustrative purposes. Moreover, we have tried to minimize the biases arising from failure to meet the independence assumption by stratifying the events into smaller areas as suggested by Chandrasekaran and Deming (1981).

The matching was based on 10 percent probability sample of FAs (Farmer's Associations) selected from various strata, classified on the basis of level of crude birth rate (CBR). Within each region FAs were stratified into three strata based on the level of crude birth rate. Stratum I consists of FAs with CBR 40 and above, Stratum II consists of FAs with CBR 20-39, while Stratum III consists of FAs with CBR less than 20. From each region a ten percent (10%) sample of FAs were drawn. The FAs were selected with a probability equal to their proportion in each stratum. This has yielded 68 FAs.

Based on result of this matching, CBR and CDR were estimated\* to be 44.4 and 19.5 per 1000 rural population respectively in 1986/87. This yields a coverage of births and deaths by 85 and 82 percent respectively in 1986/87. The coverage of birth according to survey and registration were 70 and 68 percent respectively while the coverage of death was 71 percent in both survey and registration in 1986/87 (see Table 3.1). The present findings amply demonstrate that the coverage of vital events improves considerably if these (events) were jointly collected by survey and registration rather than obtained by one single source.

## 5. ISSUES, PROBLEMS AND PROSPECTS

### 5.1 Issues and Problems

It is well recognized that the vital registration system is a potential source of demographic data and social indicators of a country. Despite its long history in some countries and of recent origin in others, unfortunately the existing civil registration and vital statistics systems in many countries of the world have not yet been developed to the extent where they can adequately serve the purpose for which they were established.

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\*The estimates of events (births and deaths) were obtained for each selected FA and these were summed over 68 FAs to obtain estimates of events (n) for all the selected FAs. The result was multiplied by 10 to get estimate for rural Ethiopia (the raising factor 10 is given by  $\frac{1}{P}$ , where P is the probability of selection of sample size, which is .10) and this was divided by mid-year population to obtain the crude birth and death rates.

The issues and problems in the development of vital registration system and compilation of vital statistics are the same, or at least similar in nature in these countries. These involve, inter alia, availability of laws and regulations that make registration compulsory, organizational structure of the system, identification of responsible agencies for development of the system and compilation of vital statistics, availability of adequate manpower, fund and equipment to carry out the project and cooperation of the public in reporting the events.

In fact, as stated by Linder (1981) and International Institute for Vital Registration and Statistics (IIVRS) (1986), the basic issues and problems challenging vital registration system can broadly be grouped into three:

- a) Relatively Interactable Problems:- This group of problems are those solvable within the framework of long-range social and economic development of a country, i.e. they can't be solved within the registration system itself. Such problems are connected with the geography of the country, nomadic and settlement patterns and uneven distributions of population with their concomitant transportation and communication problems that vastly influence the operation of an effective civil registration system.

The nature of population also plays a decisive role in the registration activity. A predominantly rural and largely illiterate population are not suitable for attaining high degree of coverage of vital events. This group of population may lack motivation and incentive for registration due to their unawareness of the usefulness of vital records and vital statistics. The lack of cooperation from the public is one of the major bottlenecks in the registration process which usually leads to delay or even (in extreme cases) resistance to registration and falsification of reported information.

- b) Problems Solvable but require Additional National and International Technical and Financial Assistance:- Included in this category are inadequacy of staff, low

level of education of registrars, insufficiency of essential forms and supplies, transport for supervision or training staff, office space, modern record storage, document reproduction equipments, data processing facilities, printing facilities etc. As indicated above these problems are solvable but not with usual staff and regular budget. These require additional resources both in terms of trained manpower and financial from local and/or outside agencies.

- c) **Immediately Solvable Problems:-** By and large this group of problems can be solved within the scope of a country, contingent upon the priority and importance given to the process by the government and the authorities concerned with. These mainly deal with adequacy of legislation of vital registration, the nature of civil registration institute, the methods of coordination of the different elements of the system and the priorities given to the whole enterprise by the government.

The problems that sample vital registration system in rural Ethiopia face are basically the same as those discussed above. On the basis of the 1982/83 registration and household survey results, an evaluation of the system was attempted; The problems encountered were connected with identifying responsible organization to carry out the task of registration, cooperation and motivation on the part of the general people and officials, registration personnel (level of education), legislation and administrative problems.

## 5.2. Future Prospects

To improve the quality and quantity of vital registration data, it calls for an integrated and coordinated efforts from various bodies concerned with the process from higher level officials both within and outside CSA, the public, the registrar and supervisory staff.

In order for sample vital registration programme to achieve its goals, particularly with respect to completeness of registration of vital events, the system will have to rely heavily on the cooperation of members of the community.

In this regard, it is necessary to motivate and educate the public on the usefulness and importance of vital records and vital statistics that they render both to individuals and the public. Emphasis should be placed especially on reporting of vital events timely, accurately and completely. The motivational task should not be given to the registrars and local level leaders only but it needs the involvement of higher level officials and professionals both at the national and local levels.

The system should continuously be monitored and evaluated and corrective steps for improvements should be taken. Regular and close supervision not only by the usual field supervisors but also by higher level government officials, professional and technical staff at the national and local levels should be done regularly. There should be a built-in supervision system.

At present registration and survey are done by the same person. This practice should be discontinued. The tasks of registration and survey should be carried out by two different groups of people to ensure reliability of the data and to improve coverage. To attain universal coverage of the vital events the tasks of registration should be the primary responsibility of the registrars as much as possible.

Since the Sample Vital Registration System is believed to pave the way for setting up nationwide civil/vital registration system in the future, it should be given the priorities it deserves by all concerned.

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