

BUTAJIRA DSS ETHIOPIA

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LOCATION OF BUTAJIRA DSS SITE, ETHIOPIA: Monitored Population 40,000

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1. BUTAJIRA DSS SITE DESCRIPTION

1.1 Physical Geography of the Butajira DSS Area

The Butajira Rural Health Programme (BRHP), centred on the Butajira DSS, is located in Meskan and Mareko District, Gurage Zone, in the Southern Nations, Nationalities and Peoples Regional State (SNNPRG) in Ethiopia. The estimated size of the District is 797 km², of which Butajira town covers approximately 9 km². The area is located 130 km south of Addis Ababa and 50 km to the west of Zway town in the Rift Valley, 8.2° north latitude and 38.5 ° east longitude. Climate varies from arid dry lowland areas at altitudes around 1,500 m (tropical climate) to cool mountainous areas up to 3,500 m above mean sea level (temperate climate). The main wet season occurs between June and October, with the remaining months predominantly dry. Day-time temperatures are typically between 20-30 °C, with night-time temperatures falling close to freezing at higher altitudes. The lowland areas are drought prone and have been affected during the main droughts in Ethiopia.

1.2 Population Characteristics of the Butajira DSS Area

The District's population is currently estimated at 260,000, corresponding to a density of around 325 per km². The DSS area covers a sample within the District, following ten communities initially sampled from the entire District using a probability proportional to size technique. The DSS population is currently estimated at 40,000 (year 2000). Nine of the ten sites are rural and one is located in Butajira town.

The main ethnic grouping is Gurage, which is further divided into minor ethnic groups or tribes. The Meskan, Mareko, Sodo, Siliti and Dobi are major tribal groups. Two-thirds of the people follow the Islamic religion, with Orthodox Christianity as the second dominant religion in the area. The major language is Guragigna with variations among different tribal groups. Amharic, the national language, is widely spoken in the area, and is also an important written language. Only a minority of individuals, generally in the younger age groups and in the urban area, understands foreign languages such as English. The main occupations are farming in rural areas and small-scale business in town. There are 30 schools in the district including one technical school and one high school, the rest being primary schools. About 77% of the population are illiterate. Illiteracy is greater among the rural population and females.

Most houses in rural areas are round huts built from timber and mud, with thatched roofs. In the town, housing is typically dense and crowded, usually with zinc roofs. The main water sources in rural areas are rivers and wells, while in town there is tap water, though not piped to every household. Sanitation in general is poor and only a few houses have latrines. An all-weather gravel road connects Butajira town with the capital, Addis Ababa, but other villages in the district are generally connected to the town only by dry-weather roads. The town of Butajira has 24 hour electricity and telephone services, neither of which extend to rural areas. The only health centre in the District, located in Butajira town, has so far been the highest level of health care available, with the nearest referral centre some 100 km away. At present, a new district hospital is being constructed and commissioned in the town. A growing number of private clinics and dispensaries are also available in the District.

Health problems have predominantly been associated with infectious and maternal causes, often exacerbated in the rural areas by difficulty of access to health care. However, trends towards higher incidence of non-communicable diseases are being observed.

The population has also been subject to a number of influences at national level, including the long-term Ethiopian civil war (up to the defeat of the Mengistu regime in 1991) and the more recent border conflict with Eritrea. Whilst the study area was not directly involved in these conflicts, conscription programmes and the diversion of national resources into military activity have had detrimental nation-wide effects. Similarly, severe and recurring droughts have had a considerable effect on rural populations at different times, particularly in lowland areas.

2. BUTAJIRA DSS PROCEDURES

2.1 Introduction to the Butajira DSS Site

The Butajira Rural Health Programme (BRHP) was initiated in mid 1986 with a complete census of the ten sampled *kebeles* (*kebele* is the smallest administrative unit in Ethiopia) in the District of Meskan and Mareko. Soon after, by January 1987, a DSS with continuous registration of vital events was initiated. The major aims were to develop and evaluate a system for continuous registration of births and deaths, to generate valid data on fertility and mortality and to provide a study-base for essential health research and intervention in the area (Berhane *et al.* 1999).

The BRHP is primarily a collaborative research undertaking between the Department of Community Health, Faculty of Medicine, Addis Ababa University in Ethiopia, and the Division of Epidemiology, Department of Public Health and Clinical Medicine, Umeå University, Sweden. The collaboration started as an individual doctoral study project (Shamebo, 1993). Later, it grew into a departmental collaboration along with the development of the study base infrastructure and involvement of multidisciplinary researchers. The original DSS population in 1987 was around 28,000 and grew over 10 years to about 37,000 active individuals, with over 60,000 individuals involved at some time during this first 10 years of monitoring.

Studies in Butajira have been conducted in a set of nine randomly selected (probability proportionate to size technique) rural *kebeles* (known as Peasants' Associations) and one urban *kebele* (known as Urban Dwellers' Association). Data have been collected monthly by visiting each household. The DSS operates as an open cohort system that is dynamic. The individual person-times contributed are aggregated to serve as denominators for calculation of various health and demographic indices. So far, three complete censuses (in 1986, 1995, and 1999) have been done. The extent of similarity between the 1994 national census and the DSS database illustrates the quality of the continuous registration system. Currently, the survey interval is being changed from monthly to quarterly. Data are handled using custom-made software based on the dBase system.

Events registered by the BRHP are birth, death, marriage, new household, out-migration, in-migration and internal move (migration within the BRHP DSS *kebeles*). Household and environmental variables are measured during the censuses. The study-base is now well established and is being utilised for other more focused studies on essential health problems of the country using qualitative as well as quantitative research methods. So far research in the area of childhood respiratory illnesses, reproductive health, mental health and other infectious diseases have been conducted utilising the study-base infrastructure.

The intensity and diversity of the research activities also necessitated a wider participation of multidisciplinary researchers. The participating researchers have backgrounds in obstetrics (Berhane 2000, Andersson 2000), paediatrics (Muhe 1994), epidemiology & biostatistics (Shamebo 1993), sociology, psychiatry (Alem 1997), nursing and public health. At present over 50 field staff are working in the DSS.

BRHP has contributed to human resource development and the building of research capacity at the Faculty of Medicine, Addis Ababa University. Several training opportunities have been offered at masters and doctoral levels. The doctoral training is conducted in a sandwich model that allows doctoral researchers to stay close to their mother institution and carry on their routine responsibilities. This sandwich model of training has also significantly reduced the risk of the brain drain that may occur when people are sent for long-term training abroad. Doctoral training is offered by European Universities, mainly by Umeå University, Sweden. The Master of Public Health (MPH) programme is conducted by the Department of Community Health, Faculty of Medicine, Addis Ababa University.

2.2 Butajira DSS Data Collection and Processing

The Butajira area was originally selected for the establishment of the DSS for several reasons. At a distance of 130 km from the city of Addis Ababa, it was considered to be beyond the direct influence of the municipal area, but at the same time not impracticably far from the University. In the mid-1980s, civil war raged in the northern part of Ethiopia, hence a location to the south was preferred in the interests of long-term continuity. The District in question also offered a diversity of developmental, geographical, ethnic and religious parameters within a relatively discrete area. As time has passed, the extent of this diversity and its major consequences for many population parameters has become increasingly apparent.

2.2.1 Field Procedures

a) Initial Census

The initial census of the population in the selected villages was done in 1987 to obtain the baseline population and to establish a system of DSS with continuous registration of vital and migratory events at a household level. At that time the total population was 28,780. Any adult member of the household above the age of 15 years was eligible to respond to the monthly household interviews, carried out by a team of secondary school graduate enumerators who were based in the kebeles. Each vital event was registered on a separate form at the household level. Basic demographic, social, housing conditions and health care utilisation characteristics were recorded for each household at entry into the DSS and during each re-census process (Berhane *et al.* 1999).

b) Regular update rounds

Due to circumstances, the first overall update of the 1987 census was not done until 1995, which was, in retrospect, too long an interval. A further update round was then conducted in 1999.

c) Continuous surveys

From the 1987 census until 1999, continuous monitoring was carried out during monthly visits to each household. However, in the light of experience both here and elsewhere, quarterly household visits were phased in during 1999/2000.

d) Field Supervision and Quality Control

Data quality assurance mechanisms have been instituted at several points to ensure the integrity of the data. The most critical of these is field supervision. Field supervisors perform the immediate

supervision of data collection procedures on a daily basis. Their tasks include checking of each completed data form and visiting randomly selected households each month on a weekly-distributed timetable. The research assistants perform the next level of supervision. They are responsible for the overall supervision of the data flow from the household level to the computer system. Research assistants also perform data checking at the field level in randomly selected households. Researchers also work in the field to provide on-site technical assistance and guidance as well as checking data quality. More recently, with the advent and easy availability of the Global Positioning System (GPS), mapping exercises at the household level have been carried out.

2.2.2 Data Management

Data entry for the DSS was initially processed as text strings, but since 1994 has been performed using software based on the dBase IV platform. This program as developed for Butajira includes procedures for automatic consistency checking as well as more sophisticated facilities for data management and retrieval. Since an indigenous calendar is used in Ethiopia, which runs 2,809 days behind the international equivalent and has 13 months in a year, there are serious obstacles to using proprietary packages for handling longitudinal data.

Data entry is currently done in Butajira, which enables any inconsistent questionnaires to be sent back to the field immediately. This is a significant improvement over earlier periods when data operations were centralised in Addis Ababa.

Data have been manipulated and analysed using dBase, Epi-Info and the Cohort program developed by Umeå University, which performs person-time based analyses of events in dynamic cohorts. National and international publications and scientific conferences have been the main routes of dissemination of information. Community feedback meetings have been held periodically.

3. BUTAJIRA DSS BASIC OUTPUTS

3.1 Demographic Indicators Generated by the Butajira DSS Site

The study population was observed to increase from a baseline population of 28,616 in 1987 to 37,323 at the beginning of 1997, implying a mean yearly growth rate of 2.7%. The major difference in population growth between areas was explained by urbanisation, with a marked excess of births to deaths and net migration into the urban area.

The population profile is typical for sub-Saharan Africa, with 4.3% of person-time in the first year of life, 14.4% in the next four years, 29.9% in the 5-14 age group, 48.6% in the 15-64 age group and only 2.8% in the over 65 years group. The age dependency ratio was therefore 106%, and the male:female ratio was 0.94.

During ten years of monitoring a total of 5,143 deaths and 15,667 births were registered in the area, from a total of 336,074 person-years of follow-up. Thus, by relating the observed total number of deaths to this study base, the crude mortality rate was 15.3 per 1,000 person-years. A total of 71,004 person-years were observed among women aged 15 to 44 years, representing 2,367 reproductive lifetimes and hence an overall fertility of 6.6 births per woman. The maternal mortality ratio has been estimated by several methods, and is believed to be around 600 per 100,000 live births (Berhane *et al.* in press).

The under-five deaths represent 48% of all mortality. Half of the under-five deaths occurred during the first year of life, and 53% of these before 2 months of age. From the age-specific mortality rates we can estimate the cumulative mortality throughout life. Thus, among live births 4.2% are estimated to die during the first two months of life, 8.0% before one year, 16.6% before 5 years, 36% before 15 years, and 56% before 65 years. There were substantial variations between areas with regard to under-five mortality, with rates ranging from 80 per 1,000 person-years in the urban area to 219 per 1,000 person-years in the lowlands. From the age-specific mortality rates a life expectancy at birth of 50.8 years is estimated, 49.3 years for males and 52.3 years for females.

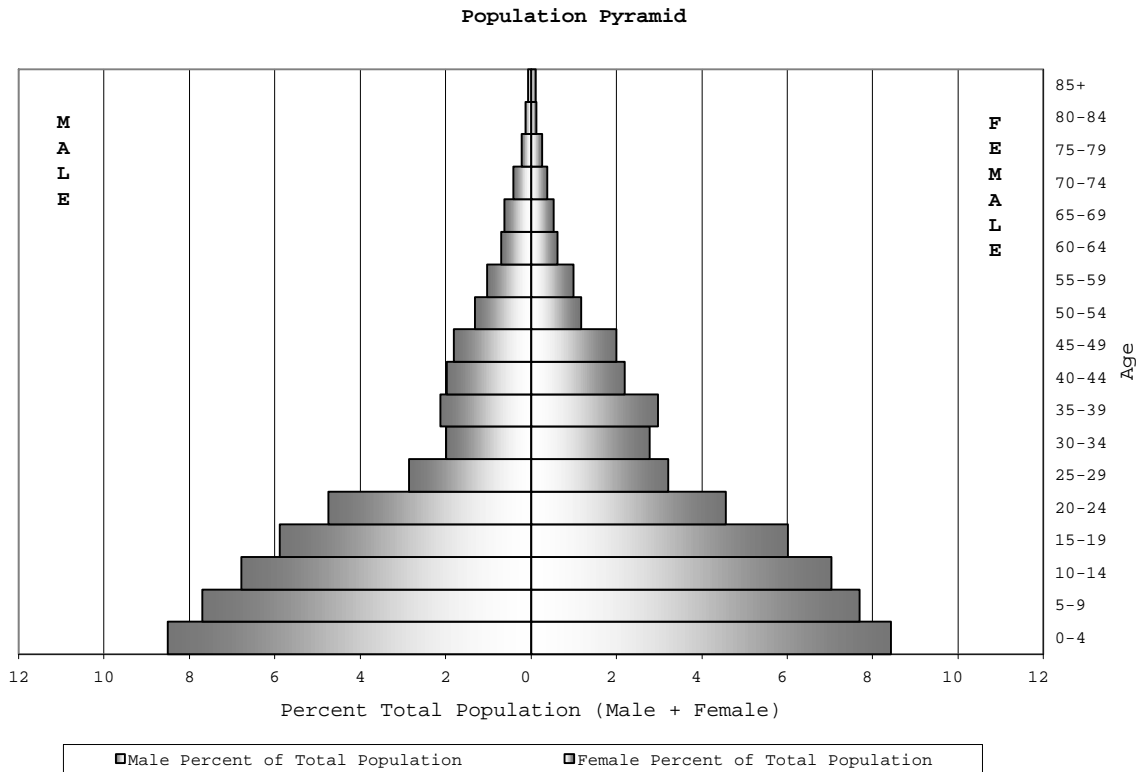


Table 1. Age and Sex Specific Mortality in the Butajira DSS Site, 1995-1999.

** Omitted in web version **

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