

# STUDIES FOR HEALTH PLANNING IN RURAL SOMALIA

Community perceptions and epidemiological data

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Umeå University, 1994

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LICENTIATE THESIS

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## ABSTRACT

This thesis explores whether people's opinions about perceived health problems and priorities and epidemiological data could support each other in the formation of future primary health care programmes. To accomplish this a combination of quantitative and qualitative methods were used to analyse the health problems of two Somali villages. Villagers expressed their perceived health priorities, mortality was monitored by an epidemiological surveillance system and morbidity data collected in a cohort study. The acceptance and use of some primary health care tools were investigated by interviews and epidemiological studies. In individual and group interviews the villagers expressed malaria, jaundice, diarrhoea and respiratory diseases to be major health problems. It should be noted, that respiratory infection was the major disease problem among children and the main cause of death among children as well as adults. In spite of this, it was not considered as a top health problem by the villages. Respiratory infections are usually treated by self-care or traditional medicine. This may be an indication of failure of the primary health care to address such a common and serious health problem.

Most mothers perceived child diarrhoea as a condition in which oral rehydration therapy and feeding were logical parts of its management. Literate mothers were generally more active in the treatment of diarrhoeal diseases. Almost all mothers recognised the value of the growth chart as useful for the control and promotion of their children's health and/or growth. They recognised the normal growth pattern on the chart but had some difficulties in interpreting subnormal growth. However, they questioned whether any benefit could be gained from growth monitoring alone, if it was not integrated into appropriate village health services.

Thus, professionally assessed health needs and people's perception of health problems and needs for health services should be seen as complementary entities supporting each other in the planning and implementation of health care programmes.

**Keywords:** *health planning, community participation, epidemiology, mortality, morbidity, growth monitoring, oral rehydration therapy, Somalia*

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## Abbreviations

ARI	Acute Respiratory Infections
EPI	Expanded Programme on Immunisation
CHW's	Community Health Workers
MOH	Ministry of Health
ORT	Oral Rehydration Therapy
PHC	Primary Health Care
SRC	Supreme Revolutionary Council
SAREC	Swedish Agency for Research Co-operation with Developing Countries
SNU	Somali National University
SOMAC	Somali Academy of Science and Arts
TBAs	Traditional Birth Attendants
UN	United Nations
UNICEF	United Nations Children Fund
USAID	United States Agency for International Development
USC	United Somali Congress
VHWs	Village Health Workers
WHO	World Health Organisation

## ORIGINAL PAPERS

This licentiate thesis is based on the following papers:

- I Excess female mortality in rural Somalia- is inequality in the household a risk factor?  
Submitted for publication.
- II The growth chart -a road to health chart? Maternal comprehension of the growth chart in two Somali villages. *Paediatric and Perinatal Epidemiology* 1990, 4:340-350
- III Diarrhoea among children in rural Somalia: Maternal perceptions, management and mortality. *Annals of Tropical Paediatrics*, in press.

These papers will be referred to by their Roman numerals I-III.



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## BACKGROUND

### Community perspectives on health

#### *Cultural context*

There are no uniform or static definitions of health and illness throughout the world. Instead they vary between individuals, cultural groups and social classes. The Somalis conceive health as a balanced relationship between human beings and between human beings and their environment which maybe attributed to the will of God [1,2]. The Somali word *caafimaad* – health– is a desired quality of peace and prosperity/fertility which depends on God's will [3]. Highly industrialised societies' descriptions of health also include physical, psychological and behavioural aspects [4]. Thus health is viewed as more than just the absence of disease [5].

Illness has been described as a process affecting a person, while disease is a process that affects an organ [4]. Illness is an emotional matter for the patient, his relatives and, in many cultures, even neighbours and friends [3,4]. The emotional reaction and the value attributed to a patient's misfortune are influenced by his personality, background, cultural, social and economic context and may therefore be interpreted quite differently [6,7]. Attitudes to health and illness may be closely related to cultural normative practices, shared fashions of perception and social specified roles such as the patient–doctor interaction [7]. Health is maintained and ill–health prevented by specific habits and lifestyle including those involving food and drink, dress, work, rest and religion. In some societies, good health and good luck are supported by the use of charms, amulets and religious medallions [4,8].

Many African rural villagers differentiate between illnesses, each of which has a different cause and requires a particular treatment [2,6,9]. They are characterised by a pluralistic health system [7,10]. It has been pointed out that the selection of care is made from a wide range of therapeutic options [11,12], and the perceived cause of illness is a major determinant of the choice of treatment [6,13]. The priorities of the communities do not always coincide with the views of the professionals who plan and implement development programmes often based on a variety of assumptions about what they consider as being the health problems of a particular community [14,15,16]. In the extended family settings in rural Somalia an individual is hardly ever left to care for his/her own problems [10]. In the event of an illness visits to the sick person and gifts to hasten recovery are almost compulsory. Therefore health educators must listen to and understand the words the people use for diseases, treatment procedures, and the way in which they live if they are to help change such societies' health behaviour. That is why a community analysis of perceptions about health, illness and health requirements and



priorities is vital [15,17], particularly if the health workers' expectations and the health interventions envisaged by health professionals are to meet the expectations of the community. One may wonder, however, whether an equitable service alone is enough to produce equity in health without dealing with underlying factors such as social, educational, cultural and economical problems.

In the Somali society, religious tradition gives men precedence over women [17]. Women are culturally subordinated; they have neither rights of land- or livestock ownership nor may they take part in the management of the community, or even of their own household economy. Almost all family decisions are made by men and women are rarely, if ever, consulted. Even important decisions or deliberations concerning women's private lives, such as marriage and divorce, are exclusively dealt with by men and made by men. Women may be responsible for the sale of household products such as milk, eggs, vegetables, salads and fruit (Figure 1), but they do not control the distribution or the use of household resources.

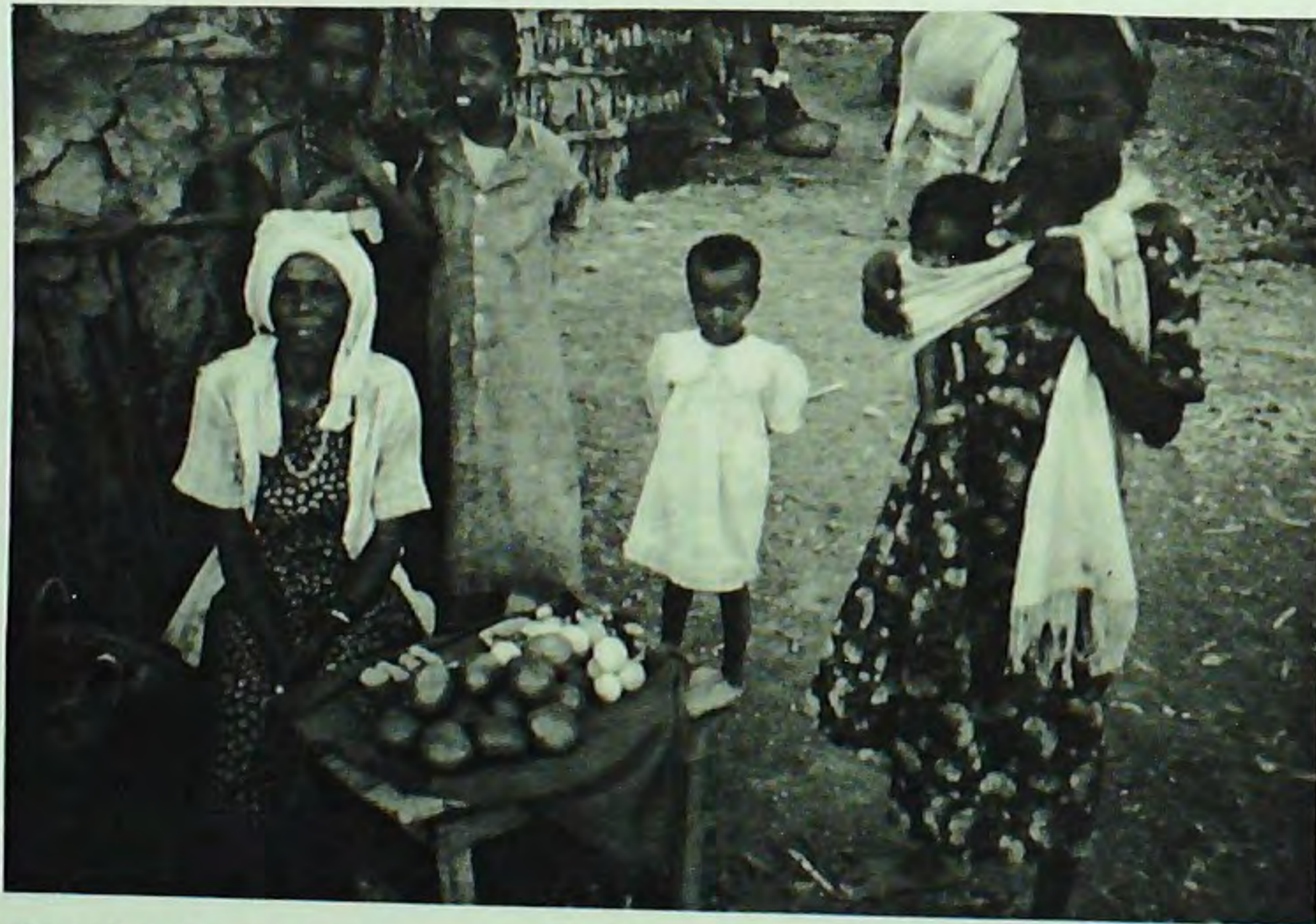


Figure 1. A Somali village woman selling fruit

In the countryside, the birth of a boy is often considered to be a blessing and is enthusiastically welcomed while the birth of a girl is only reluctantly accepted. As a village woman said "a

woman has to bear a male child to avoid the constant nightmare of threats from her husband which include threats of divorce, verbal abuse, maltreatment and diminished interest". In addition women neither carry the family name nor extend the clan lineage [17]. For the similar reasons, only 9% of the female children knew how to read by the age of 10-14 years compared to 40% of the boys in the same age group. The situation was even worse in adulthood [17]. Somali women have neither been secluded nor are they, except rarely in towns, seen veiled, probably because of the need for women's labour in the nomadic and semi-nomadic economy [18].

In the villages both men and women are fully aware of the existence of social inequalities and both recognise their distinct roles. Women are engaged in activities throughout the day and have little free time. Their social interaction generally takes place while carrying out their domestic duties. In contrast, men are free between sundown and bed-time, in the periods just after harvest and during afternoons when there is no work to be done in the fields. Men spend their leisure time seeing relatives and friends, going to men's public meeting places such as tea-shops and village squares, where they play a number of traditional games or just discuss issues of interest. Men also gather in the mosque and have social interaction after religious duties.





Figure 2. A rural Somali mother processing maize to make *soor* (starch) for her family

Health has been declared a fundamental human right [19]. This expresses implicitly that the state has a responsibility for the health of its people. Currently, health care services are criticised because they are predominantly urban-orientated but have not been able to solve the health problems of the growing cities and the city poor [20]. Most of these services are curative in nature and accessible to only a minority of the population [21,22]. The present concern in many countries is not only to reach the whole population with adequate health care services, but also to secure an acceptable level of health for all by the year 2000, through the application of primary health care programmes [23].

After independence, Third World countries have not only failed to improve the living standard of their populations, but they have also failed to help improve the process of power-sharing throughout their political, social, cultural and economical structures and often conserved and reinforced inequalities [24]. Nowadays, in many developing nations, a third of the adult population is ill at any given time and a third of all children fail to develop properly in mind and body because of the continuous undermining of economic and social conditions [25]. Health and other services for most of the poor are either non-existent or are available because of the efforts of local communities [26]. Yet the scandal is that in the last decade many developing countries, particularly in the poorer parts of the world, have been forced by *economic adjustment* policies in the past to severely curtail services for the poor [27,28]. Meena added "...maternal and infant mortality rates have increased during these adjustment periods"; she continued "...school drop-outs have increased especially among female students/pupils whose labour is required to supplement that of their mothers in various survival strategies" [28].

#### *Health care and communication*

Traditional people often describe illness in *personalistic* and *naturalistic* terms [29]. According to a personalistic explanation misfortune is believed to be caused by the will of a supernatural or a God, a human being or a witch, and a non-human being or spirit-jinn. Naturalistic thinking considers illness to occur when improper personal hygiene is practised, from eating bad food, or from contagious diseases and vectors, or to arise when the body's inner equilibrium is disturbed [29]. This type of understanding of illness has been reported from Somali and other African communities [6,10,30]. Several authors have agreed that whatever the cause of disease in African thinking, it can ultimately be traced back to God [1-3,10,30,31].

In most rural Somali communities, when a person falls ill, no matter whether there is a modern health service or not, his relatives or neighbours and friends first try to find the cause of the disease and to apply treatment accordingly [10,31]. If this remedy does not work then most of the time the sick person is accompanied to several healers, such as *sancoole* (a general practitioner) [8], religious healers, herbalists, magicians and bone-setters for diagnosis and treatment [32]. Often, after failure of treatment by *traditional medicine*, then he/she will be brought to consult western health workers [10]. That people prefer to first consult traditional instead of western medicine may be because bio-medicine is primarily interested in the recognition and treatment of disease (*curing*) while healers provide the sick person, family,



and community with meaningful and culturally accepted explanations of illness and related issues [7]. Appropriate channels of communication between health workers and the traditional societies do not exist [3,4,7].

Rural people in the developing societies have their own sense of the world, one which is very different from that of the urban dweller [33]. Rural Somalis have an effective and inclusive communication network which should be taken into account in any development programme. When two Somalis meet on a country road, even if they do not know each other, they normally exchange greetings, and news, by enquiring about their respective localities and even about people's health, farming, livestock and rain situation as well as about matters of security. Person to person communication in the streets, at meetings, at the market or water-hole, while going to and coming from field work and wherever they meet and get chance to talk is part of the life of the rural Somalis. In this way news spreads rapidly.

Therefore, in the rural Somali context, popular communication may provide an alternative to mass media communication, which is often controlled by people who have little interest in promoting the needs of the poor. The technology that rural Somalis might need is more likely to be what the people can own and control, such as locally-produced plays, poems, legends, story-telling, ceremonies, rituals, songs, music and dances when applicable, and hand-drawn leaflets. Communication with people in their own language or dialect is of paramount importance.

Another communication channel used by the Somalis, particularly by the riverine communities, has been decision making by groups of elders [1]. An individual can make decisions that affect his household(s), farm and livestock, and sometimes about his children's and grandchildren's households. Decisions concerning matters such as security, water, government institutions and other organisations are made by clan and sub-clan councils of elders usually guided by a head *Malaaq* and representatives of various sub-clans in the area called *Gob*. Unfortunately these traditional leaders' functions were abolished by the late military regime and the legacy of that will be discussed latter.

In Africa, health workers often remained confined to their stations, isolated from the community they were supposed to serve [34]. One way-communication appeared the method of their choice instead to interact with their communities. In addition the Somali rural people who live in the fertile land between the Somali Jubba and Shabeelle rivers neither speak nor understand the pastoral nomads' *Maxaa dialect* written since 1973 [35,36]. In my experience, one-way-communication between the administration and the rural people with this language barrier, with no dialogue or feedback, was common in the inter-riverine region of Somalia.

Sometimes the administrators used an interpreter whom the people did not trust. The existence of this language barrier between these communities and the health workers has been reported previously [3].

The rural Somali people might well appreciate the advantages of technology-based media such as radio and television, particularly if it reflects their own ideas, opinions and cultural values. The mass media such as radio and television have the capacity to reach different communities and to publicise new health programmes. They also create mass awareness of health issues, and promote new health knowledge and behaviour [37]. However, interpersonal two-way communication is often necessary to change oral societies' individual beliefs and behaviour [33,37]. Therefore awareness of the differences in cultural context is very important, as is the need to cater to the specific needs of rural people when promoting health [33,38].

## Somalia

### *Socio-demographic characteristics*

Prior to 1969, Somalia, at the Horn of Africa, had eight administrative regions. When the military took power they divided the country into 17 regions and 87 districts. Every district is divided into sub-districts (*beelo*) and hamlets (*tuulooyin*). In 1986, Somalia had an estimated population of 8.5 million, of which 44% were nomads, 31% settled people (mostly farmers) and 24% were urban dwellers [39]. The country comprises the former colonies of Italian Somaliland (in the south) and British Somaliland (in the north). The colonies both achieved independence in 1960 and formed the Somali Republic, which has a geographical area of 637,000 square kilometres and is bounded by the Indian Ocean, the Gulf of Aden and the neighbouring states of Kenya, Ethiopia and Djibouti [18].

Reports suggested that, with the exception of small minority communities, the country's population is composed of one ethnic group, the Somali, who are divided into five main patrilineal groups or clans [36,18]. The Digil and Mirifle, locally known as *Reewin* (Rahawyn) [36], are mainly sedentary agricultural people and live exclusively in the south between the two Jubba and Shabeelle rivers (Figure 3). The Hawiye, Daarood, Isaaq and Dir are pastoral nomads who live in the remainder of the country. The Digil and Mirifle rely more on territorial alliance than traditional lineage structure ties in their political and social organisations [18]. They mainly speak the *Maai dialect*, which is different from the pastoral nomads' *Maxaa dialect* [18,35,36]. The *Maxaa dialect* has also been the state official language since it was written in 1973. Therefore, the Digil and Mirifle who live in the inter-riverine region of the



country neither speak nor understand the written pastoral dialect [35,36], and, as a matter of fact, the region was unfairly left out in the participation in state organised political, socio-economic and cultural development efforts [18,36]. These Somalis have traditionally been marginalised and as a consequence they were alienated from much of their land by urban-based land-looters who belonged to the elite and senior government officials [40]. During the 1974-75 famine, the inter-riverine people lost much of their lands when the government organised resettlements. About a quarter of a million pastoralist people were transferred from the central and Northeast of the country and permanently resettled in the inter-riverine region in the south [36]. The inter-riverine communities were also the main losers during the violent movement of 1991-2 [40].

Many Somalis claim Arab ancestry, because of their cultural affinity with the Arab world and with Islam, but they have kept their own Somali tongue (East Cushitic language) [18]. Arabic, English and Italian are also spoken [41].



Figure 3. Map of Somalia

Somalis are predominantly Sunni Muslim of the Shafi law [1,18]. Religion is of great importance in Somali Social life. Children are commonly sent from every corner of the country to the Qur'an school for some years early in their schooling. Religious institutions may be more influential and more active in the south than in the north [1,18]. The best known *dhariqooyin* 'brotherhoods' in the riverine region are the Qaadiriyah, Axmediyah and Saalixiyah. However, Somali religious men *culimo or wadaado*, have little influence in Somali political life, though they might have participated in settling social disputes [18]. However, these religious men are very powerful in judicial matters, such as marriage and divorce [1]. Despite the centuries of the presence of Islam in Somalia many both southern and northern communities commonly practice pre-Islamic Zar type rites such as Mingis, Boorane, Nuumbi, Saar, Beebe, Aw-daare, Baraakin, Ruuxaan, etc.. In the south, particularly in the Afgooye district, and the Mogadishu and Marka areas, there have been annual communal festivals such as *dabshid* 'fire-lighting'. In the Afgooye and Wanleweyn districts there have also been the solar new year celebration, best known as *istun* 'stick fight'.

### Economy

The economy is traditionally based on herding camels and other livestock such as domestic cattle and goats [1]. There is also an important agricultural sector in the south. The marine natural resources have hitherto been under-exploited. Small urban industries engaged in processing agricultural, animal and fishing products had been established which mainly served the domestic market. Despite its natural resources, Somalia was in 1989 one of the least developed countries in the world, with an estimated annual per capita income of 280 US dollars [42].

Local grain production was controlled, and farmers were obliged to sell their products to the state agency at fixed prices. The agencies stored and arranged their distribution and sale [18]. Imported goods were similarly regulated through a state agency. The State also regulated the export of livestock, hides, and bananas [18]. These restrictions against economical development and liberalisation coupled with a high military profile, the Ogaden conflict, widespread corruption, low salaries and the refugee influx might have contributed to the downfall, in late 1980s, of Siyad's military dictatorship.



### *Political development*

The Somali Republic was established in 1960 by the union of Italian and British Somaliland, the principle of self-determination being thus applied to two of five Somali communities (the remaining three being those in Djibouti, Ethiopian-Ogaden and Northern District of Kenya) [18]. The ambition to complete the national unity, symbolised by the five-pointed star on the Somali flag, has been a dominant factor in internal and external Somali politics ever since the colonial superpowers made a deal with the Ethiopian conquest state, which has promoted instability in the Horn of Africa [18].

The newly formed Somali Republic had a succession of civilian governments elected to some extent in accordance with democratic principles [18]. The majority of the people are pastoral nomads deeply rooted to their traditional clan divisions and sub-divisions which they see as a guarantee for security of life and prosperity of individual members [18]. For example, if a Somali commits a crime – such as murder – against another Somali from a different clan or sub-clan, the customary legal system seeks to solve the problem without delay. The clan or sub-clan leaders whose member committed the crime will initiate a negotiation and offer the customary *sabeen* – initial act of good faith – to the offended clan or sub-clan leaders through culturally existing channels and both groups will seek a peaceful solution. The former will arrange a collective blood compensation called *diyo* or *mag* from among its members and deliver this to the offended clan or sub-clan. Usually according to customary law 100 camels should be paid for a murdered man and fifty for a murdered woman [18]. This customary solidarity has been used by the Somalis since time immemorial to solve their daily social problems [43]. Thus, family ties and clan nepotism became more important than education and ability during the post-independence era of the 1960s. As a result, the government was at that time serving clan interest rather than the interest of the Somali nation [18,36].

Some young officers, mainly from the army, impatient with the corruption, nepotism, and the political and economical failures of previous civilian governments, seized power in a coup on October 21, 1969; later called "the Bloodless Revolution". General Mohamed Siyad Barre, commander of the army, became the head of the Somali Revolutionary Council (SRC) and head of state. He concentrated power firmly in his hands. Somalis considered his regime as based on the president's Daarood family connections [18]. The SRC, renamed the country the Somali Democratic Republic. It initiated a process to abolish traditional clan ties and divisions. The death sentence was to replace the blood compensation paid traditionally in inter-subclan feuds [18]. Among other measures introduced by SRC were a Somali family law, the traditional sultans, chiefs and elders were renamed "peace-makers" (Nabad doono) and became, at least in theory, members of the state civil servants [18].

Siyad Barre's regime was characterised by numerous violations of human rights, including torture, lengthy and arbitrary detention of suspected political opponents, keeping prisoners under harsh conditions without medical attention, and execution after rigged trials [44,45]. In the early 1980s a threat to Siyad Barre's totalitarian system first appeared when a growing number of clan-based political factions emerged [46]. He was ousted from power on January 1991 by the militia of the United Somali Congress (USC), and he went into exile in Nigeria.

Unfortunately the power vacuum led the country to sink into a bloody civil war and total collapse. Law and order broke down and chaos and anarchy fomented by criminal elements and clan war-lords caused the disintegration of society. Since then tens of thousands of people have been killed or wounded and many more have suffered from starvation. Hundreds of thousands have been displaced or expelled from the country [47,48]. The Secretary General of the United Nations Boutros Boutros-Ghali called this situation "a grim symbol of human tragedy, misery and degradation" [49]. Since December 9, 1992 Somalia has officially been a protectorate of the United Nations under UN resolution 794 which aims to restore hope and catalyse political dialogue between the various Somali factions and to secure passage of humanitarian relief to the Somali people. However, the situation has been mishandled by the UN in many respects [50].

### *Health care system*

Western medical practices and facilities were introduced to the Somalis by the British and Italians at the end of the last century. The initial health measures included the provision of hospitals, dispensaries and mobile sanitary units intended to make the country safer for expatriates. Little was done to improve the health situation of the Somali population until the eve of the independence [51]. In 1959 an institute was established in Mogadishu aimed at training auxiliary doctors. Teams consisting of health officers, public health nurses and sanitarians were trained for work in health centres of the rural towns and larger villages. Economic difficulties curtailed this scheme [51]. Another more pragmatic experiment was the training of 'clan aid agents', which failed because of the political situation and a lack of close supervision and support caused by the nomadic nature of population [52].

Several challenges faced the newly formed Somali government after independence in 1960. Britain and Italy had left two separate medical systems, with different procedures, different languages. Neither system was designed to address the health problems of the Somali people. In 1960, there were 67 physicians, of whom only three were Somali, 56 health assistants, two



dentists, eight pharmacists and 77 certified midwives. There were 19 hospitals and 33 health centres [51].

Since independence there have been seven National Development Plans, which have included health programmes, including the latest in 1987–91 [8]. The early plans mainly gave priority to capital development and led to the construction of a number of hospitals and several other medical facilities, and these have suffered from extreme operational shortcomings, with lack of appropriate staff and equipment, ever since [8,53].

A major step forward was taken in 1973 when the Medical Faculty of the Somali National University was established [8]. In the same year there was a national 'Rural Development' campaign. Although the campaign was primarily concerned with the towns and larger villages, the nomadic population was included in 1974–5. The most tangible aspects of the campaign were the spread of literacy, mass immunisation, simple treatment and health education taken to many people [8,42]. The presence of the campaign's health workers in the rural areas enabled steps to be taken to reduce the effects of malnutrition and communicable diseases [8]. Unfortunately the campaign ended because of the major drought of 1975 and the subsequent war with Ethiopia [42].

The population's right to health '*irrespective of their census and status*' was expressed in articles 55 and 56 of the constitution of the Somali Democratic Republic in 1979 [51]. The commitment of the government to these articles was reaffirmed by its agreement with the World Health Assembly Resolution on Health For All by the year 2000, at Alma Ata in 1978, and its commitment to Primary Health Care (PHC) as the means of achieving this [54,55]. The Ministry of Health (MOH) should promote and provide preventive, curative and rehabilitation services through community involvement [54,55]. Eighty-five to ninety per cent of the rural and nomadic population was recognised to be out of the reach of the national health services [54]. However, the newly set up MOH's charter was a 'top-down' approach with a centralised planning structure for the health care system [42]. The organisation of the health care system was outlined in the plan based on a network of regional, district, sub-district and hamlet levels, and their activities were co-ordinated from the MOH headquarters by three director generals of preventive, and curative services, and of administration and planning [55].

Although the MOH had been collaborating with bilateral and international agencies such as the Italian government, WHO, UNICEF, USAID and others [42], health-care development stagnated during the late 1970s through the 1980s. The lack of epidemiological data, which has been one of the main obstacles to adequate health planning in Somalia may have contributed to this. Appropriate epidemiological data supplemented with data on perceived

needs and priorities of the community would help policy-makers, planners, managers and educators to get a better understanding of what the community health priority needs are [18,27].

### **Health problems**

Valid data on the types of diseases from which the Somali population suffers or on the factors which influence the population's health are not available [8]. There are a number of reasons for this. First, there was no disease surveillance system either during the colonial or the post-colonial periods. Second, recent health information has mainly been gathered by foreign health personnel who had little knowledge of the attitudes of the Somali communities to different health problems and their solutions [8]. The National Health Plan of the late 1980s reported that acute respiratory infections (ARI), diarrhoeal diseases, pulmonary tuberculosis, malaria and intestinal parasites were considered the five leading communicable diseases and that information was based on a survey of four Somali regions in 1984. However, it is not clear whether the survey covered different Somali communities such as urban poor, rural nomads, semi-nomads, farmers, fishermen as well as the urban wealthy sections. Which methods were used to collect the information were not reported. According to some reports, there was no valid information on the health problems of the rural and nomadic Somali populations, which make up the majority of the country's inhabitants [31,53]. Moreover, very little has been known about women's health situation, by social class, age, ethnicity, urban, semi-urban and rural, as well as women's participation in economic and societal management, and marital status [56]. Historically women have been a catalyst in the continuing process of societal change, production and living [57]. In addition, family health care has been a woman's responsibility. Women in rural Somalia may have been doing physically demanding and dangerous jobs. Yet, the well-being of these Somali mothers and their female children needs to be examined and brought to the attention of the policy makers and planners. Similarly women's health skills, attitudes and beliefs towards primary health care tools and strategies should also be assessed. Even in communities where health is poor, there is data needed if decisions on priority are to be made.

### **AIMS**

In the early 1980s the Somali government published a new national health plan which recognised the past neglect of preventive services and the inaccessibility of health services to the vast majority of the population [54]. The plan emphasised the extension of health services



to the rural population, but there was little valid information on the health needs of this rural population [31,53]. Research is needed to show the relative cost-effectiveness and benefits of alternative means of meeting rural health care needs [58]. This reality made the Medical Faculty of the Somali National University reorientate its curriculum in the early 1980s and launch a combined programme of student field training and research activities in rural areas. The short-term aim of these research activities has been to perform four case studies corresponding to the main Somali cultural groups; farmers, semi-nomads, fishermen and pastoral nomads in the Afgooye district. The results from these different communities would also be used as pilot intervention studies in the same district and the outcome would contribute as a base for further promotional and evaluational health programmes in different parts of Somalia.

The implementation of this task was given to the Medical Faculty's Department of Community Health to develop research capabilities among its staff and to find ways in which the health system and the community could together support people's capacity to solve their own problems by generating self-reliance rather than dependency. As part of these activities, a Somali-Swedish Research Collaboration Project on Epidemiology in the Planning for Primary Health Care was initiated [17]. This specific sub-study is centred on the promotion of community participation in epidemiological research, trying to learn how to work with and influence communities to identify their health problems.

The overall aim of this study is to explore whether people's opinion about perceived health problems and priorities and epidemiological data could support each other in the formation of future primary health care programmes.

Specifically, the aims are:

- to contrast villagers' perceived health problems and priorities with epidemiological studies of morbidity and mortality;
- to assess the acceptability and use of two PHC tools, the child growth chart and oral rehydration therapy, in a rural traditional society.

## MATERIAL AND METHODS

### The villages

Lamadoonka, *the two hills*, and Buulalow, *the cattle village*, are two neighbouring southern Somali villages (Figure 3). The villages are situated in Afgooye District in Lower Shabeelle region, on the tarmac road between Mogadishu and Baydhabo town, some 10 km from Shabeelle river and 40 km from Mogadishu. They have been chosen as representative of the large dry-land farming area between the Shabeelle and Jubba rivers. Between 1982 and 1990 a Somali-Swedish collaborative research project was in progress in this area aiming to use epidemiological methods as a tool for the planning of primary health care. Socio-anthropological studies and a demographic surveillance system formed the background to a set of specific studies [18].

In 1987 the total population of the two semi-nomadic villages was estimated at 2,456 inhabitants [18]. The villagers main farming crops are maize, sorghum and beans, and some sesame, tomatoes and cotton. A seasonal nomadic pastoralism is part of the life of a minority of the population. Domestic cattle (Figure 4) are the main source of milk and ghee, and they often make a surplus both from milk and ghee selling at Afgooye and Mogadishu markets going by unscheduled trucks (Figure 5).



Figure 4. A cattle herd going to graze





**Figure 5.** An overcrowded truck is the only means of transportation for the villagers going to the towns and cities.



**Figure 6.** Young girls and women collecting water for their households from the Lamadoonka village well

Each community had at the time a well and a water pond. During the dry-season, '*Jilaal*', between January and April, the well is the only source of water. The villages had no piped water supply and it was the responsibility of the women to collect water for their households (Figure 6).

In these villages the people live in compounds which often consist of a round '*Mundul*' hut and/or a rectangular '*Arish*' (Figure 7), enclosed by a fence. The average household consisted of five members, although it could contain up to 18 individuals. Poultry were kept within the compound, cleaning it from the maize husks. The families who had cattle – and stayed in the village – kept it close to the compound. Only some compounds had pit latrines. Most of the families in the villages were using kerosene lamps as there was no electricity. Both villages had a few corner shops, elementary and intermediate schools and a health post. They also had Qur'an schools. These villages acted as centre for water, health care, education, etc., to the other smaller surrounding villages. The villagers were cultivators with nomadic origins, farmers with their origins either among the original cultivators or imported as slaves, and a small '*Eyle clan*' which had become Somalised but may originally have been hunters and gatherers. Although the former two groups consider themselves as belonging to the *Geledi* sub-clan group of the dominant Digil in the Afgooye District, there is usually no intermarriage between the two. The same is valid for the cultivators with nomadic origin and the Eyle tribe. The *Eyle* group's presence is rather more apparent in Buulalow village than in Lamadoonka. In both villages pre-Islamic cultural concepts are still prevalent and often integrated into the dominant Sunni Islamic culture [1].





Figure 7. A village view with traditional huts

Both villages had headmen village committees elected by the district authorities. They were supposed to settle minor disputes and ensure that centrally planned programmes for the villages were implemented. There were also traditional leaders such as sub-clan and religious leaders. Traditionally they have been very influential in legal and social questions through a council of elders which Haakonsen called *odeyaal* or *aqilyaal* and through the assembly, *shir*, made up of all adult men in any particular grouping [1].

Since the mid 1980s some basic health services, run by the Ministry of Health in collaboration with the WHO were provided free of charge. Health centres had been built in collaboration with the Medical Faculty, Somali National University, and maintained by the villagers and staffed by community health workers (CHWs) (Figure 8). The CHWs were trained at the district hospital for some months. They were trained to diagnose common conditions including malaria, bronchopneumonia, diarrhoeal diseases, anaemia in pregnancy, intestinal parasitosis and skin conditions such as ulcers, scabies and mycosis and to supply chloroquine, some antibiotics, ferrous sulphate, oral rehydration salt, pain killers such as paracetamol and acetyl-salicylic acid and some skin ointments and solutions. Traditional birth attendants (TBAs) were given an additional training in the district hospital for some weeks, mainly on how to conduct

a safe delivery and were provided with a delivery kit. Both CHWs and TBAs were supposed to be continuously supervised by the district primary health care team but this never occurred. In 1987–1988 some immunisation programmes were carried out, but increasing social and economical problems and the approaching civil war terminated them.



Figure 8. Lamadoonka Village Health Worker at the health centre

From the mid 1980s, these communities in the Lower Shabeelle area had been used as "rural training centres" for medical students by the Medical Faculty of the Somali National University. Research activities were integrated with the training of these medical students. The villagers in the study area took an active role in the planning and performance of both health and research activities. Formal and informal meetings between the village committees and the research team were important parts of these activities (Figure 9). Discussions were held with religious leaders, women's groups and traditional healers. Later, results were fed back to the community from the on-going studies (Table 1). This not only emphasised the close link between the surveys and the health services, but also built up confidence between villagers and researchers. Therefore, the community participation in the research was essential to obtain informed consent as well as to increase knowledge about health.





Figure 9. A meeting between village leaders and research member

In the villages there were several traditional healers including the *sancoole* or general practitioner. Among his activities were extraction of tooth buds, uvulectomy, scarification, skin burning, the use of herbs and fumigation. There were also religious healers, exorcists (Figure 10), magicians and bonesetters, whose activities overlapped those of modern health care workers [2,32].



Figure 10. One of the exorcists of Lamadoonka village

#### Sources of data

This thesis emanates from the above-mentioned neighbouring communities and is based on four sources of data: a demographic surveillance system mapping the mortality pattern, a growth chart survey, and a cohort study of child health. In addition, focus group discussions were held on demographic information, child growth monitoring, childhood diseases and management, and on perceptions of health problems and actions. Thus, a combination of quantitative and qualitative methods were used to explore the health problems in the area. Table 1 shows the general outline and the relationship between the four sub-studies. The material and methods used are introduced in the following sections.



**Table 1.** Research problems, designs, materials and methods involved in the four sub-studies which form the basis for this thesis. The Roman numbers refer to the three original papers

Problem area	Design	Material	Method	Time	Papers
Mortality	Demographic surveillance	9610 person years	Village register	1987-1989	I
Demographic information	Feed back of information	4 groups	Focus group sessions	1987	
Maternal comprehension of growth chart	Survey	199 mothers	Interview	1988	II
Perceptions on growth monitoring	Feed back of information	2 groups	Focus group session	1989	
Child morbidity	Cohort	431 children	Fortnightly home visits	1987-1988	III
Perceptions on child health	Survey	220 mothers	Questionnaire	1988	
Community perceptions of health and action	Survey	106 individuals	Open-ended interviews	1990	This thesis
	Neighbourhood meetings	16 groups	Focus group sessions	1990	

### *Interviews and focus group discussions*

The study was performed in two phases according to a design suggested by Patton [59] and by Khan [60,61]. The first phase consisted of standardised open-ended home-based individual interviews with the villagers selected to participate in the study. Between February and March 1990, 112 subjects from both villages were invited to participate in a interview study and 106 took part. In each of the 4 sections of the two villages 6-7 male and 6-7 female participants were arbitrarily selected. All subjects were adults, who were not formal or informal leaders, or belonged to other influential groups such as school teachers, traditional healers, shopkeepers, etc.

In a second phase, all 106 respondents were invited to participate in two-hour follow-up focus group discussions scheduled during the subsequent days. Twenty of those invited (12 men and 8 women) did not turn up for the discussion, for reasons that we were unable to identify. All participants knew each other.

During the individual interviews questions were asked in Somali and the answers directly translated into English and filled into the forms. Social and economic background data were registered and the interviewees were asked about their perceptions of major health problems, what actions should be taken and for their opinions on present health services.



**Figure 11.** Women's focus group discussion

In the focus group interviews the villagers' spontaneous comments on the subjects under inquiry were registered. The following items were included in the interviews: the inequality between men and women in education, the high neonatal mortality and the frequent teenage pregnancies.



Data from individual interviews were analysed using the Quest epidemiological software [62]. Focus group data were processed by a content coding method. A list of key ideas was generated for each topic under discussion. It was noted which views were expressed how many times and by how many groups and sexes. It was possible to distinguish between the opinion of the majority, of few groups and of only one group.

Focus group discussions with village committees and traditional leaders (only men), and women's groups were also held. To discuss the results of the first demographic census, ten male village leaders and ten women's group participants were selected from each village. The group sessions were held on Friday morning-- the traditional Muslim holiday-- and took place in the health centres of the two villages. The main aim of the discussion was to describe and document the village leaders' and women's group's spontaneous reactions to the local demographic data such as population distribution by sex and age, marital status and literacy of the villagers. During the discussions the responses were tape-recorded, transcribed in Somali and later translated into English.

The results of the growth chart study were discussed in focus group sessions with mothers from both villages. Two focus group sessions with 10 mothers were held in each village. The participating mothers were selected arbitrarily from four different sections of each village. The group sessions with the Buulalow village mothers were performed under some shady trees on a Friday morning and those with the Lamadoonka mothers on a Friday afternoon (Figure 11). The villagers chose both time and place. During the focus group interviews the mothers were shown the four growth curves which had been used during the previous empirical study of the comprehension of growth charts (Paper II). During the group sessions mothers' perceptions and views on child growth, health and how these are inter-related were discussed. The mothers were asked about the possible reasons for poor growth and health in various periods of infancy and early childhood. The mothers also discussed growth monitoring and its possible role in village health services. The main purpose of the focus group sessions was to detect the village mothers' attitudes and behaviour about the comprehension of growth monitoring. The discussions were tape-recorded, transcribed in Somali and later translated into English.

Information on the mothers' knowledge, attitudes and behaviour towards child health problems was gathered in both villages. An open-ended interview was performed at the end of the prospective child morbidity study in 1988. There were 252 mothers or other female substitutes who had children under 5 years of age. Of these, 220 were interviewed about their perceptions of child health and disease.

### *The demographic survey*

In December 1986, a cross-sectional demographic census was performed to give a picture of the socio-demographic structure of the population of the Lamadoonka and Buulalow villages. This was followed from 1987 through 1989 by a continuous survey of vital events. The initial population of the villages was 2,456 inhabitants. During the subsequent years all births, deaths, in- and outmigrations were registered and the activities were maintained in collaboration with both formal and informal village leaders, CHWs, and TBAs. A research team member checked and followed up the registered events on a weekly to monthly basis. Census reviews were performed after one and two years, cross-checking the registrations made by the surveillance system. Causes of death and symptoms prior to death were registered through a structured interview with relatives utilising a 'verbal autopsy' procedure [63], which was performed by one of the members of the research team. The study base formed 9610 person years for the demographic analysis and estimations of mortality rates and survival (Paper I).

### *The growth chart survey*

A one-year longitudinal study of nutrition, morbidity and growth of children aged under five was started in the villages. The growth chart was introduced to the mothers for the first time at the start of the study. The median, as well as lines indicating grade I to II malnutrition according to Gomez are marked on the Somali growth chart. The significance of the growth curve was explained; the normal growth curve was shown and the meaning of more rapid, or decreasing weight were explained together with the ominous significance of a child losing weight. In the monthly home-based examinations, the current direction of growth was discussed with the mother. An evaluation was performed after one year of monthly weight measurements. Two hundred and twenty-six mothers of children under five years of age in the villages were invited to participate in the evaluation; of these 19 had moved away, 4 refused to take part, and 4 were ill and unable to participate. Thus, 199 mothers were included in the study (Paper II).





Figure 12. An interviewer with a respondent

The interview was performed in a standardised manner by the author (Figure 12). During the interview the mothers were asked to link a set of four growth curves to a set of four pictures (Figure 1, Paper II). Before combining charts and pictures the mothers were tested on their understanding of the pictures. Photographs of Somali children were used as models in the preparation of the drawn pictures.

#### *The child morbidity study*

A longitudinal study was performed between April 1987 and April 1988, starting with all children aged under five years in the villages and including all children born in the villages during the study year. During the period 431 children were followed; 210 boys and 221 girls. Of these 89 were born in the study year. The demographic survey system of vital events was used to identify the newborn children. Children were registered and some background data were collected during the first contact with their mothers. The interviews and measurements took place at the respondent's house and were performed by members of the Department of

Community Health. In ten per cent of the possible occasions the interviewees -- mother, surrogate mother, or father -- were absent or not available. Thus, a total of 8,914 visits were included in the study. All health problems in the children under five years of age during the preceding 14 days and any subsequent actions taken in the household due to health problems were noted. The treatments were classified as traditional or western and notes were made which described the treatment. The definition of diarrhoea used in this study was the Somali mothers' own perception of diarrhoea. The mothers used the word '*shuban*' which means pouring liquid. It describes the liquidity of the stool and the rapid motion of the bowels. '*Shuban*', therefore is used for one single or several loose stools. Paper III focuses maternal perceptions regarding the causes and the management of childhood diarrhoea.

## RESULTS

### Health problems and priorities: villagers views and epidemiological observations

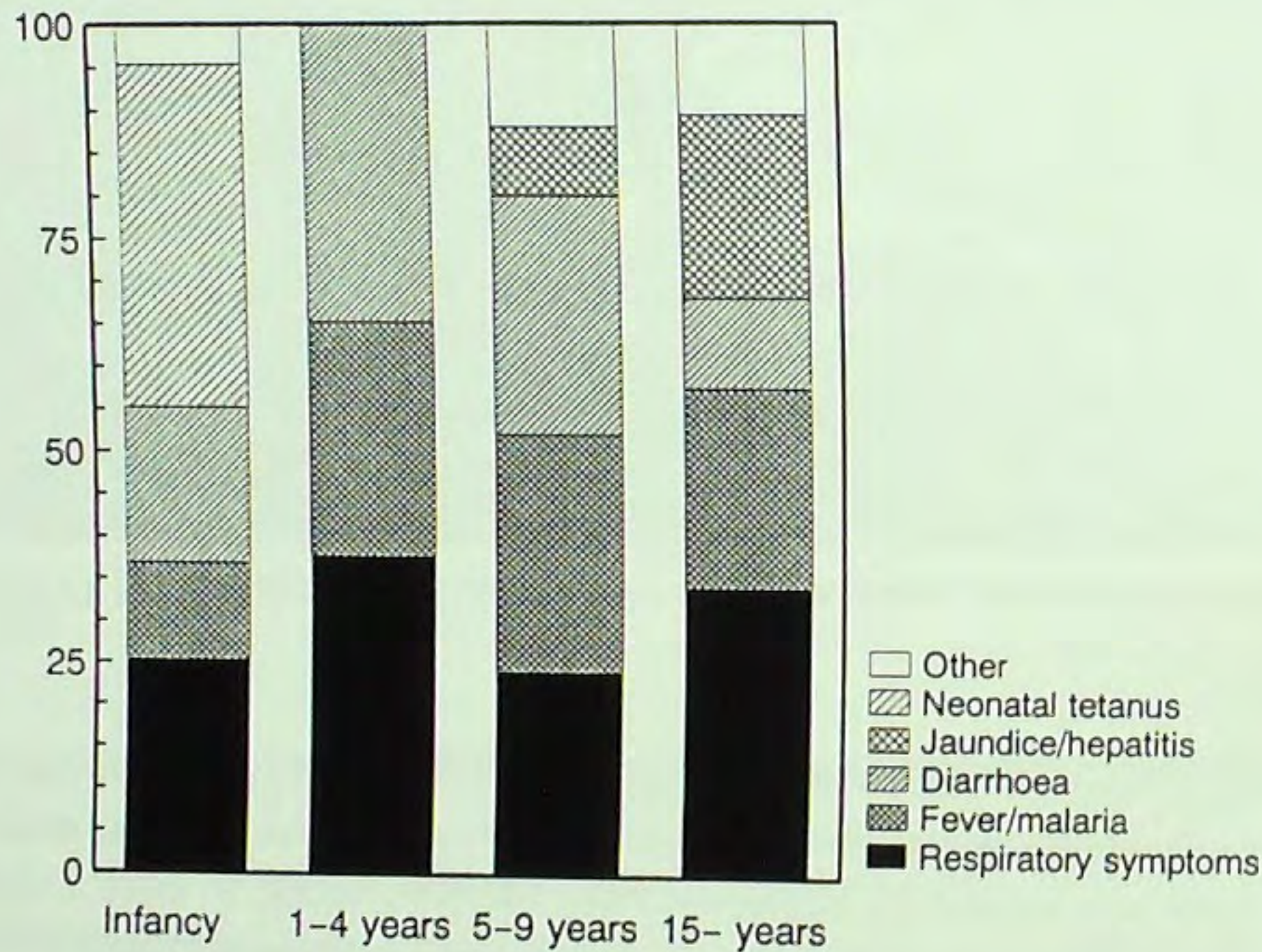
More than a third of the 106 villagers interviewed considered malaria to be the major health problem in their villages (Table 2). The villagers also mentioned health problems such as jaundice, diarrhoea and respiratory symptoms. There were only small differences in the responses given by men and women and by the people in two villages, respectively.

Table 2. Distribution of perceived major health problems in the villages

Major health problem	Percentage distribution		
	Men	Women	Total
Malaria	43	31	37
Jaundice	24	31	27
Diarrhoea	12	13	12
Respiratory symptoms	10	13	11
Other problems	8	9	9
No health problem	4	4	4
<b>Total cases</b>	<b>51</b>	<b>55</b>	<b>106</b>



Malaria was also considered one of the most important health problems in the communities in the group interviews. However, the groups mentioned jaundice as the major health problem. Men suggested malaria more often than women did. All women's groups from Lamadoonka felt jaundice to be the main health problem, while in Buulalow they viewed diarrhoeal diseases as their dominant health problem. In the focus group sessions respiratory symptoms were not mentioned at all as an important health problem.



**Figure 13.** Symptoms before death

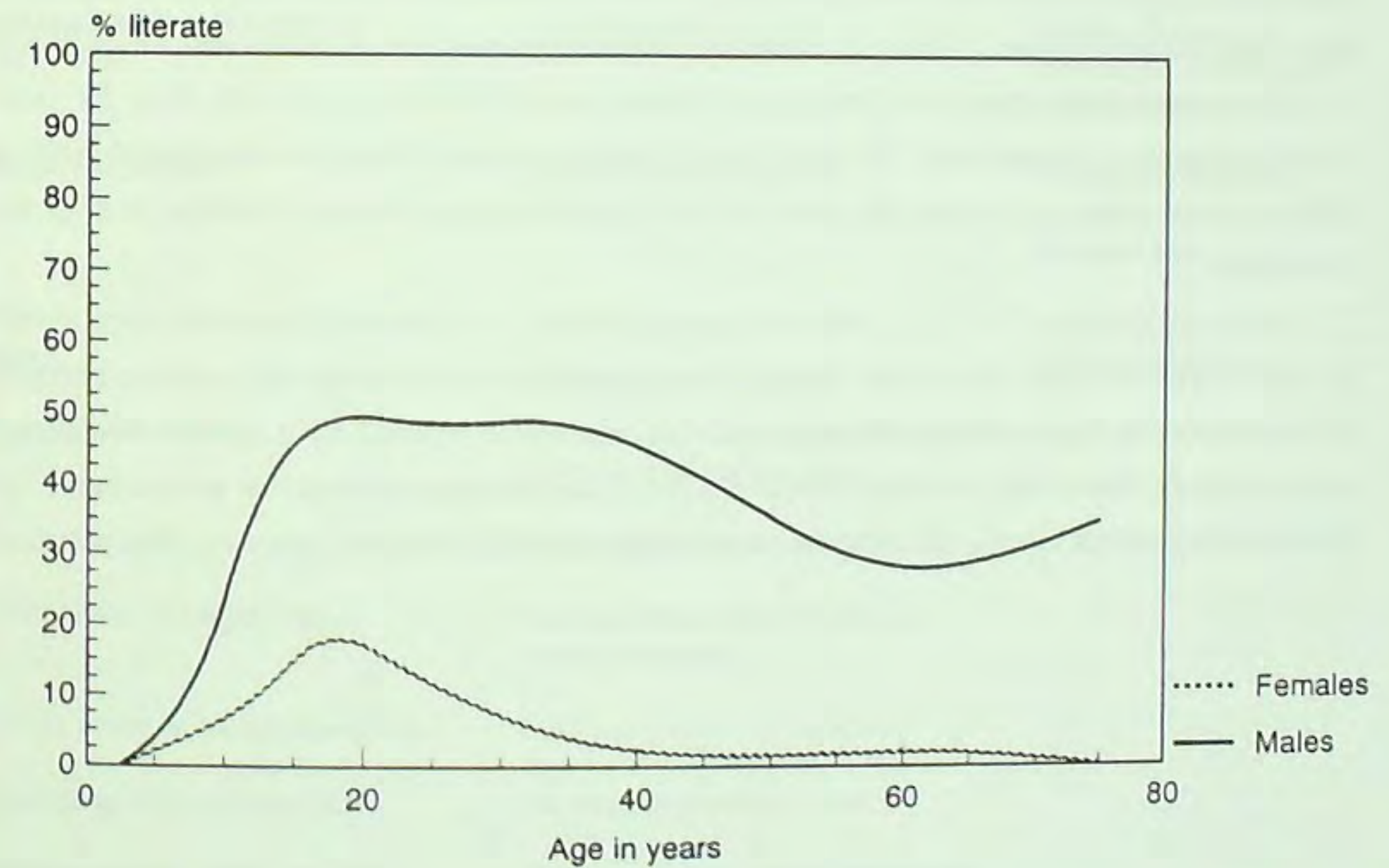
In the epidemiological survey data, there were no gender differences in mortality risks during infancy and childhood. Predominant symptoms in children prior to death were respiratory symptoms, diarrhoea and fever/malaria. However, in newborn babies a major proportion of the deaths was caused by neonatal tetanus. Diarrhoea, fever/malaria and respiratory infections constituted the second major cause of death in infants, as well as in children in the age group 1-4 years (Figure 13).

When entering their reproductive lives, women had a greater risk of dying than men (Table 1, Paper I). The dominant symptoms prior to death from the age of 15 years and onwards were respiratory symptoms (32%) and febrile conditions (22%). Twenty per cent of adult deaths

were due to an outbreak of epidemic hepatitis that especially affected pregnant women, and diarrhoea caused one tenth of the adult deaths.

At birth the girls had a life expectancy of 31 years and boys 33 years. The life expectancy from 15 years was 48 and 52 years for women and men, respectively (Figure 2, Paper I).

Marked gender differences were noted in both school-age and adult literacy. Almost half of the adult men below 50 years of age could read and write, while only a few percent of the adult women could do so (Figure 14). Among the children 10-14 years of age, 40% of boys knew how to read compared to only 9% of girls.



**Figure 14.** Literacy in relation to age and sex

This inequality in education is commented upon in the following quotations recorded in focus group sessions with both men and women. Young daughters were seen as manpower in the household and the agricultural production, which could be disturbed by schooling.



"...the fathers do not allow their daughters to go to school - they should fetch water, replaster the huts and herd the cattle.

Men in these villages also considered education of the girls, even in the Qur'an school, as empowerment and a potential danger to the male dominance.

"...daughters should help their mothers both at home and in the field instead of studying. Often, we do not let girls even to study the Qur'an, in case they will attempt to compete with males and divorce their husbands if they disagree for some reason".

When assessing gender differences in mortality in relation to marital status, literacy and subsistence, the mortality risks were generally lower in households where the head - usually a man - was literate (Figure 3, Paper I). However, illiterate women living with a literate head had a higher mortality risk than those having an illiterate head. The life expectancy from 15 years was 63 years for a literate male, 50 years for an illiterate woman living in a household with an illiterate head, compared to only 41 years for an illiterate woman having a literate head in the household.

It should also be noted that in the Somali semi-nomadic culture men and women perform different roles in their ordinary life. Most of these roles are defined by a system of cultural values, beliefs, norms and attitudes. Below is a list of the division of labour by gender based on the author's personal familiarity with the people concerned (Table 3).

**Table 3.** The division of labour and responsibilities by gender with respect to livestock, agricultural and household tasks.

Male	Female	Both
Camel grazing and rearing	Firewood collection	Cattle, goat/sheep, grazing/rearing
Camel milking	Fetching water	Cow, goat/sheep milking
Slaughtering animals	Food processing, cooking and distributing	Sewing/planting, weeding and harvesting
Hunting	Cleaning household	Weaving traditional cloths
Clearing fields	Selling milk and other animal products	Working in a shop/-teashop
Ploughing fields	Child care	Shopping
Participating in socio-political gatherings	Domestic washing	Making clay pots for cooking and for carrying and keeping water
House construction	Nomadic hut construction	Dancing for entertainment or during Zar-type treatment rites
Cutting house pole/beams, lintels and doors	Attending during child birth	Attending Qur'an and ordinary schools
Sporting activities	Harvesting branches, grass and sewing materials for thatching hut	
Entitled to hold community responsibility	Selling vegetables, salads and fruits	
Accountable as a legal witness	Sewing baskets, mats, brooms and woven containers	
Selling livestock, maize or sorghum	Performing female circumcision	
Performing male circumcision	Plastering or mudding house	
Making wooden containers, dishes, spoons, mortars, pestles, head-rests, male/female combs and walking sticks	Cutting, processing the traditional <i>asal</i> for painting wooden and woven articles	
Making hoes, axes, arrows bows and knives handles	Processing animal hides and painting them for making leather	
Making metal tools like knives, arrows, hoes and axes	Plaiting ropes and painting them with traditional <i>asal</i>	
Digging water pond and channels		
Legalizing marriage and divorce		
Making sandals for men and women from cow and camel hide		



The mortality risks for women increased when having one more source of income in addition to farming or having mixed sources of incomes, and this was particularly so from 45 years of age and onwards (Table 3, Paper I). This phenomenon was not observed in men within the same age groups.

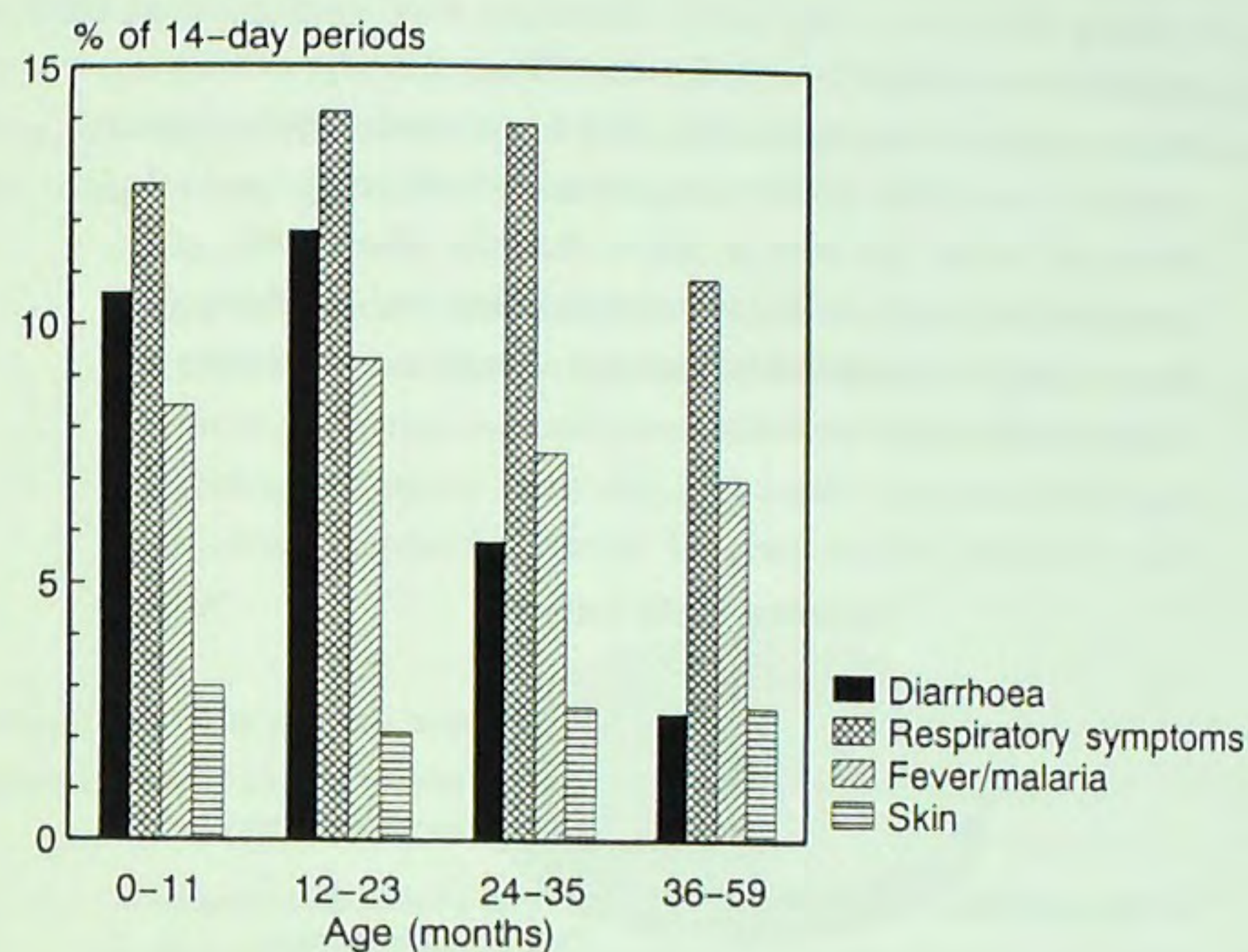
The middle aged women in this society had a disadvantaged position. They were seen as child producers and as workers in the household and the farm. When their abilities to fulfil these tasks were reduced or ended, they lost their values in the eyes of some men.

*"...men seek a fertile woman and divorce the old one. Old women also loose their capacity to work and there is much work to do"*

In the villages cultural values concerning marriage are to a large extent dictated by Islamic law. Because of this, men overwhelmingly agreed in group discussions that 15 years or younger was the normal age for marriage and first pregnancy. They commented in the following way:

*"...if daughters are well grown physically and have had their menstruation no matter what age, they are ready to be married"*

In the epidemiological monitoring of child morbidity the problems were respiratory symptoms followed by fever/malaria and diarrhoea (Figure 15). Diarrhoea was the second most common symptom during the first two years of life.



**Figure 15.** Proportion of 14-days recall periods with disease symptoms in rural Somali children 0-4 years of age as observed during 1987-88

Figure 16 shows the approaches to the different perceived health problems suggested by the villagers. For "qandho/dhilmaanyo" -fever/mosquito- or malaria problem the majority of the villagers suggested that the health post and health workers be consulted (80%). Further, for jaundice they suggested traditional treatment (48%), such as camel milk, sour milk, goat broth, and liquids with sugar, honey and fruit. Use of herbs and skin burning (especially both wrists and epigastrium) were also recommended. For diarrhoea they were willing to use both treatments offered by health post (39%) and dietary treatments (54%) such as sour milk, tea with sugar and lemon, fruit and honey. For respiratory symptoms they suggested a particular diet (67%) such as raw egg, oil and sugar.

During the study years there were increasing problems with chloroquine resistant malaria in this area [64]. Inadequate and insufficient anti-malaria activities through the primary health care may in fact be part of the problem. This might have been the case in the villages, as commented upon by one of the villagers:



"...before the health post was built in the village – Qandho/dhilmaayo – malaria was without permanent shelter, because everybody was chasing it away from his/her own household with smoke and other traditional ways. But now it seems that the disease has got a permanent base in the health centre where it lives and invades us from time to time. That is not what we expected. Can the health workers find a better solution to this problem?"

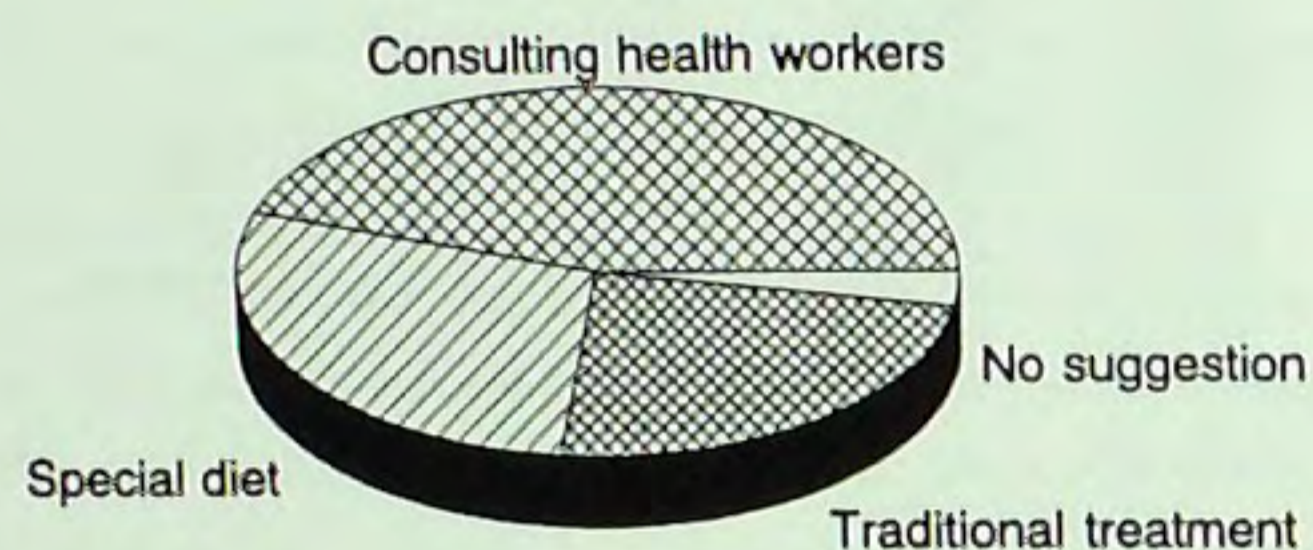


Figure 16. Suggested actions for the perceived health problems

In the group interviews additional treatments suggested for malaria were the cleansing of the bowels, popularly known as *qarasbax* with different locally available herbs as well as modern laxatives.

In the epidemiological monitoring of child morbidity the majority of the children suffering from respiratory problems had been given traditional treatment rather than "modern" by their parents.

The villagers underlined the necessity of their own participation in the planning for appropriate village health services:

"...it is not wise to hand-feed an adult camel. Because, on one hand you don't know whether you fed enough or not, on the other hand you cannot be sure about his preferences and choices. That is what the health people are doing with respect to this village, I am afraid".

Some child health services were performed during part of the study period. Vaccination services were initiated by the research team and later on taken over by the district health services. The impact by vaccinations like the tetanus vaccination of pregnant women was rapidly recognised and appreciated by the villagers.

"...toddobo gaado! – neonatal tetanus – is the evil of the earth! I lost two children due to neonatal tetanus. After I knew the efficacy of the vaccine in preventing neonatal tetanus from our village health worker I took three subsequent injections. As a result, I got this shining and sweet child. Vaccination should be given highest priority in this village"

However, these basic primary health care services need to be continuously offered if a mutual confidence between care providers and the population should be created.

"...recently there was a nice monthly child growth monitoring activity in this village, but it was discontinued. I wonder what is wrong with our children! Maybe they are too dusty to be weighed with the equipment of the health post, or maybe the health workers did not like our children who sometimes accidentally urinated on the scales".

Some villagers stated that they had had little, if any benefit from the primary health care services, but hoped that the research activities should lead to improved health care activities.

#### Acceptability and use of two PHC tools: the growth chart and oral rehydration therapy

The growth chart and oral rehydration therapy are examples in order to illustrate how the villagers accept and view such primary health care tools. Almost all of the mothers rated the growth chart as good for the control and promotion of their children's health and/or growth (Paper II). Two mothers did not see any practical value and one mother saw weighing as just a way to scare her child. Almost all mothers recommended that weighing and use of growth chart should be introduced in other Somali villages (Paper II). At the start of the interview almost all mothers were able to present their own children's charts and were able to hold the chart in a correct position (Paper II). Four percent of the mothers did not see any value in using the chart, while all the others mentioned the promotion of child health and/or growth.



Village mothers expressed their opinions regarding growth monitoring activities in neighbourhood meetings. They recognised the usefulness of growth monitoring in detecting underlying problems so that action could be initiated as soon as possible.

*"...it is necessary to check the child's weight. If it is in good health its level of growth will go up. If the baby is badly cared for and is sick then its growth will decrease".*

*"...the benefits we find in weighing the baby are that, when we are told that the child's weight is too low, then we are forced to take action soon to improve the baby's health".*

The mothers' ability to combine curves and pictures is shown in Table 2, Paper II. The mothers had no difficulty in recognising normal growth. However, they had considerable difficulties in distinguishing between the two charts A and D, both showing retarded growth at different ages of the child. Due to difficulties in correctly interpreting the pictures, some mothers could not combine chart and picture. For those who could, the maternal ability to interpret the charts differed statistically significantly from that expected by chance alone.

The characteristics such as maternal age, number of children and literacy of mothers who correctly and incorrectly interpreted the charts did not differ between the two groups. An exception to this was the understanding of a progressive growth retardation in relation to a lower maternal age and a smaller number of children, and a fall during the second year of life followed by a later catch-up in relation to literacy (Figure 2, Paper II).

Most mothers suggested no action to the normal growth pattern (84%), but different actions in responses to the other curves, including either western or traditional treatment or a combination of various treatments. Suggestions were more frequently in favour of western therapy than traditional ones, and food was not suggested in response to any of the growth curves (Figure 3, paper II).

In focus group sessions mothers expressed that the weighing of their children identifies growth faltering and threatening health problems earlier than would otherwise be the case.

Some mothers acknowledged that their positive views on growth monitoring emanated from experiences during the repeated weighing of their children during the child health study. However, some were questioning if the growth monitoring supplied any extra information to what they already knew.

*"...we know if our children are healthy and growing well by their physical appearance and how they are becoming heavier month after month; how they take the breastmilk and other milk; comparing with children of the same age; we also look how they entertain themselves. If children fail to be in line with one or more of these expected elements then that might be a sign of poor health"*

Moreover, in these villages traditional growth monitoring activities were universal.

*"...when the child is in good health its body grows well. This we get to know by using our traditional growth monitoring tool Gasiir -a thin string that is loosely tied permanently around lower waist of the child to monitor the growth. If the child is not properly fed it loses weight and becomes sick".*

However, the mothers clearly stated that growth monitoring without the supply of appropriate health services was of no use.

*"...since time immemorial we monitored our children's growth with those methods and tools. What extra benefit do we get from weighing the baby? As the health centre is without supplementary food for mal-nourished children and has no medicine for the sick child?"*

The mother's acceptance and use of oral rehydration therapy included maternal dietary factors, such as those lactating mothers eating food left overnight, hot chilli sauce, fatty mutton meat, mango fruits or various traditional laxatives. Similarly, diarrhoea could be attributed to fatigue of the lactating breast-feeding mothers' breast-feeding without taking a shower after hard work away from home. Further, teething may cause diarrhoea as a natural phenomenon. During focus group sessions the mothers commented on childhood diarrhoea and breast-feeding during pregnancy:

*"...if the mother continues to breast-feed her baby while she is pregnant this may cause diarrhoea and loss of weight of the baby. The mother should wean her baby when she is pregnant".*

The lactating mother should avoid eating foods, which she had not eaten the first weeks after delivery, otherwise the child may get diarrhoea, according to the mothers. Further, the mother



should also avoid breast-feeding if she becomes pregnant, because her breastmilk may contain child health incompatible substances and thus may cause diarrhoea.

One third of the mothers emphasised the importance of giving foods and fluids to the child during an episode of diarrhoea, while the rest argued for certain restrictions or provisions of special dietary advises for the treatment of the diarrhoea episode. Only two mothers suggested not giving any foods or fluids during a diarrhoea episode. Sour milk, boiled rice, water with lemon and sugar, tea with lemon and sugar were generally viewed as good foods for children with diarrhoea. In contrast meat, tomato sauce, beans and fresh milk were considered harmful. Still, mothers emphasised that the children's wishes were important and to even let them eat unsuitable food in order to avoid their abdomen drying up, which could lead to dangerous consequences.

Fifty-four per cent of the 235 children with a registered episode of diarrhoea were given oral rehydration therapy (ORT). Thirty-four per cent of the diarrhoeal disease episodes were treated with ORT: 29% by UNICEF Oral Rehydration Solution (ORS) and 5% by home-made sugar and salt solutions. Traditional treatments were given in 15% of the diarrhoeal disease episodes, antibiotics (10%) and other pharmaceuticals (20%). Thirty-five per cent of the episodes were not given any treatment. There were traditional therapies like Qur'an healing, use of herbs, fumigation, uvulectomy, extraction of tooth buds and skin burning (Paper III).

More frequent occurrence of diarrhoea was reported from households consisting of only one building, where the mother had given birth to few children or when the child was below 12 months of age at the start of the study (Table I, Paper III).

ORT was more frequently given to children in households with one to two children than to children in larger households (Table I, Paper III). Non-farming mothers, compared to farming mothers, and mothers with infants less than 12 months of age were also more frequently using ORT. The ORT use did not differ between literate and illiterate farming mothers (Table I, Paper III), but non farming literate mothers used ORT significantly more often. Actually, literate mothers were using some treatment, ORT and/or traditional therapy, more frequently than illiterate mothers (Paper III).

## DISCUSSION

This thesis attempts to study two perspectives of health in a rural Somali community: the villager's health service requirements and the professional assessments of morbidity together

with the utilisation of some primary health care services. There is an increasing awareness of the need for a "bottom-up" view of health care delivery and for community participation in both the planning of primary health care which provides for services to socio-economically vulnerable groups such as women and children [17,27,57,65]. The communities' priorities may vary depending on their ethnic setting, socio-economic status and political background. However, the priorities set by the community often differ from those suggested by health care professionals who plan and implement development programmes according to their view of what the community requires [57,65,66,67]. These data cannot be claimed to represent statistically the region or the nation. On the other hand, such survey would hardly manage to grasp the dynamics of community interaction and health behaviour.

### Perceived and observed needs for health service

In general, the study showed good agreement between perceived health problems according to the interviews and mortality as well as with child morbidity as registered by the epidemiological survey (Table 4). However, there was an epidemic of hepatitis in the villages when the interviews were performed and therefore was mentioned by many as a major health problem [68].

Table 4. Major health problems in the villages

Perceived problems	Child morbidity survey	Mortality survey
1. Fever/malaria	1. Respiratory symptoms	1. Respiratory symptoms
2. Jaundice	2. Diarrhoea	2. Fever/malaria
3. Diarrhoea	3. Fever/malaria	3. Diarrhoea

Malaria, jaundice and diarrhoea were seen as major health problems. The villagers complained that these were not adequately addressed by primary health care. However, respiratory infections, despite being the major health problem and the main cause of death in children, were generally considered to be a serious health problem by the villagers. Respiratory infections were usually treated by self care or traditional medicine, which may reflect the inability of primary care to address this common health problem. In practical terms, this indicates the need for appropriate communication between primary health care workers and the public, as well as an efficient health service delivery.



## Appropriateness of two PHC tools

Growth monitoring is important in child care. However, its appropriateness in both health education and in the assessment of childhood growth problems has been questioned, particularly when it is used in illiterate populations [69]. Most illiterate mothers related pathological growth patterns to diseases and suggested use of health services and medical treatment in overcoming them (Figure 3, Paper II). The mothers did not usually associate retardation of growth to nutritional problems such as the lack of food or an inappropriate diet. They recognised the value of the growth chart in promoting their children's health and growth. However, they questioned the benefit from weighing children if not being combined with necessary health services and treatments for their children's diseases. This highlights the need for an appropriate and efficient health service with empathic health workers who are prepared to listen to and understand the needs of the village mothers.

The growth chart study mainly addresses the health education aspect of child growth. The growth chart was an appropriate and useful tool in these illiterate mothers, providing they were given the ability to make household decisions regarding matters affecting child health and that appropriate health services were available.

A majority of these rural Somali mothers saw childhood diarrhoea as a condition which should be logically treated by oral fluid and feeding. We found that literate non-farming mothers were more active in the treatment of episodes of diarrhoea, as well as in the use of oral rehydration therapy (Paper III). Similar findings have been reported from other countries [70,71]. The impact of education on health may be exerted indirectly through improving the way villagers view hygiene, diet and domestic practices. There may also be a direct impact by allowing villagers to make rational decisions on health care [72]. The recognition of diarrhoea in children and its management are influenced by such factors as maternal age, level of education, number of children and the child's gender [73,74] and the situation was similar in these Somali villages (Paper III). Perhaps young, educated mothers were more open-minded and prepared to put new knowledge into practice for their children's sake than were older mothers [72,75]. Educated mothers were probably more likely to discuss the need to take a sick child to the attention of health workers with the household's decision-makers and would also be more likely to use western health care methods and to spend more time explaining what had been the child's problem as well as to listen to the advice received. However, educated women may not act alone if cultural restraints prevent them from doing so [69]. This emphasises the need for improvement in mothers' rights in family decision-making. Further it highlights the need to assess the father's view of and role in child health and disease management.

As summarised in Table 3, village mothers had little time in which to perform their large number of daily household duties. This probably allowed them to devote more time to the care if they had fewer children, particularly when the children were infants, when they were culturally felt to be more fragile and in need of care and attention.

Both these examples show that the services made available by the PHC may only be appropriate when local culture and practices are taken into account. Even when a western view of the causation of disease is at variance with local traditions, it may still be possible to agree on acceptable treatment of common health problems. The starting point should always be the practices already available within the local community. Village women have used rehydration with fluids for a long time and growth monitoring of sorts was practised by attaching the *Gasiirt* string round the baby's hips. Every new practice needs to be thoroughly justified as it takes more of the women's time.

## Looking forward

Women are disadvantaged in the Somali cultural system and this is even reflected in their mortality (Paper III). Thus there was an excess mortality in women of reproductive age from the age of 15 years (Figure 2, Paper I). Gender inequality is an intrinsic part of the Somali culture [76]. This is found in both the Qur'an and Somali folk stories, songs and proverbs. "Men have authority over women as Allah made the one superior to the other, and because men spend their wealth to maintain women. Good women are obedient" [17]. Women are considered to be intellectually inferior to men. This is illustrated by a Somali proverb, which says that "intelligence is not found where there is milk" (milk being associated with women).

The rural Somali congratulation to newly-weds is "*wiil iyo caano*", which means "wish you boy and milk" (milk, here, referring to camels). The birth of a girl is often celebrated less enthusiastically than that of a boy. This may be due to the fact that the strength of the family lineage depends on the number of sons [56]. A second reason may be that the birth of a girl could be associated with family disgrace that could occur any time during her adulthood. The Somali culture views a girl as a temporary member of the household, who is cared for until she marries and brings home the customary dowry. Fewer girls enrol in the village school and more fail to complete the course of education than boys. This could be due to the fact that the girls assume a heavier burden of household duties and care of their younger siblings.



Divorce has been reported to be associated with an increased mortality in many countries [77]. In Bangladesh, divorced and widowed women were at greatest risk of dying [78] and a similar pattern was seen in these Somali communities, particularly after the women reached the menopause (Figure 4, Paper I). Men remarried despite getting older and women were left alone without access to their husband's livestock or land [76].

As stated in the results, the health workers in the villages not only failed to address the major causes of death, such as respiratory infections, they also failed to mobilise the villagers and take advantage of their skills in story-telling, arts, drama and sport. Thus the views of the community, including those of women are needed if communities, households and individuals are to take a more appropriate and active role in addressing their health problems.

In Africa, the system of western health care often maintains a one-way communication in its interaction with local communities [34]. The health workers are reluctant to share their professional power with the local people [79]. This may be because of the cultural isolation of African politicians from their roots in the community [14], particularly in rural regions where the people pose no threat to their continued power [22]. This situation may worsen in regions where there is a language barrier which prevents communication between government and farmers or herdsmen; as has occurred in rural riverine Somalia [18,35,36,41]. Furthermore, the riverian region have suffered deliberate political marginalisation, and constant disturbances during both the colonial and post-colonial eras with looting and misappropriation of land and livestock by the late military regime [40]. One important example was the abolition of traditional area leaders by the military regime together with the simultaneous collusion of high-ranking officers with wealthy citizens to appropriate their lands [40]. This has had long-term consequences on communities, including those in the Afgooye District, in which residents may not trust administrations or improvement efforts, including those in the health care sector. It may take considerable time to overcome these prejudices and promote health care activities in rural semi-nomadic communities mistreated in this way.

The health care problems of these rural Somali communities appear to be linked to poverty, poor nutrition, lack of education and poor sanitation. Appropriate and effective methods of controlling these problems should be based on improving the above-mentioned conditions and increasing the villagers' awareness of the importance of preventive health practices. Most major health problems suffered by the villagers could be avoided by relatively simple, low-cost, health interventions. These include improving the villagers' knowledge about breast-feeding, child nutrition, immunisation and their access to clean water and improved household sanitation, personal hygiene as well as the management of respiratory infections, malaria and diarrhoea in addition to improved agricultural and husbandry practices. These interventions

should, in the short term, aim at influencing measurable outcomes while in the long term they should focus on the design of programmes and their effects on various factors at both household and community level. These include the influence of women on the socio-economic structure of the community, the participation of women in household management, the decision of work and time utilisation, and parents' notions of health and nutrition.

In many instances, illiteracy is the main obstacle to general socio-economic and national health development in under-developed countries [79]. Despite the inclusion of women in adult literacy campaigns during the 1970s, they neither had the time nor the ability to complete their studies [17]. Primary and secondary education as well as adult literacy are necessary to make people aware, understand and deal with their local problems [14]. Functional literacy together with the access to educational opportunities for both men and women will do much to improve the peoples' quality of life. Literate and educated people will benefit from health education and they will be better fitted to take part in solving everyday personal and community problems [14,79]. In practical terms, literacy should provide community members with the power to define, analyse and implement solutions to their own problems.

This thesis addresses the local health conditions at both village and household levels, and particularly problems of inequality and health. In order to allow the communities to become self-reliant, the information gathered should be made available to inter-riverine Somali policy-makers and local leaders in order to plan for post-war rural health care. Basic health care and essential health research also need an epidemiological perspective. This means that local data must be gathered on the health of the community, its morbidity and mortality as well as data on the availability of and acceptability of health services, and on the community's view of health topics. This approach is not simply a matter of counting heads in a village, but must relate to cultural patterns and values. When such data are suitably presented to the villagers from whom it was gathered, valuable communication may be generated that increases our understanding of the causes of problems and of the community's needs. The thesis has shown that valid and useful epidemiological data can be generated through villagers' participation in data gathering that may be useful in local planning. Peoples' views of their needs are also important when assessing possible shortcomings of health services.

Professionally-assessed health requirements and the health needs of the people should be considered as complementary entities that provide valuable information on the community and for the design of health care programmes. Primary health care tools and strategies need to be adapted to local cultural conditions and, where possible, be based on local health care traditions that are already working. Primary health care should complement, rather than compete with, current useful traditional practices. Even if some primary health care initiatives,



such as infant growth monitoring, may be levers for a number of health promotion activities it is important to realise that they require time to be sacrificed from the women's hard-pressed timetables, and they must be well justified if they are to be successful. Finally, when primary health care is being planned, due consideration must be given to the social and gender distribution of health care resources. The provision of non-discriminatory health services could, however, only partly compensate for the gender bias in health. The traditional support for gender inequality in terms of literacy, marital status and decision-making, manifested in the excess mortality in women and children, need to be met by improving the social status of women together with better utilisation of women's knowledge of health matters.

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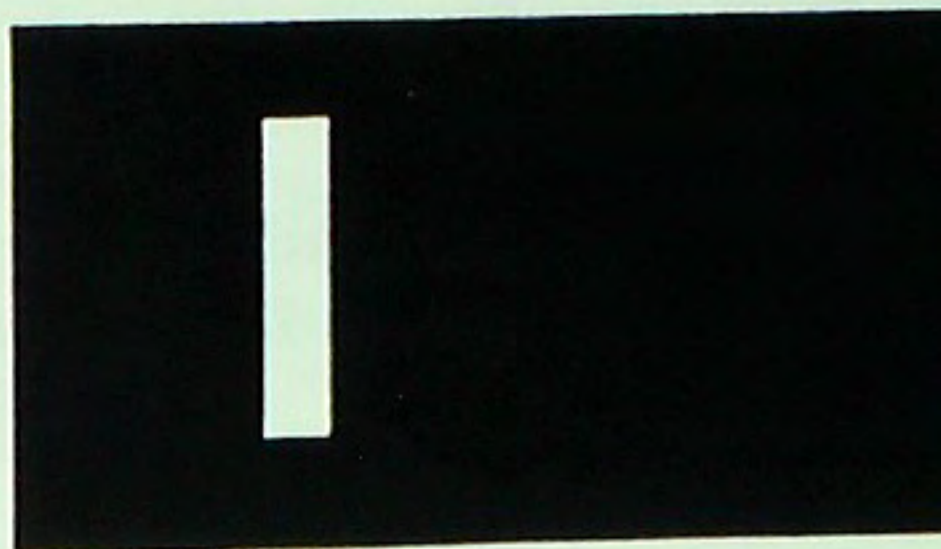
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## Excess female mortality in rural Somalia – is inequality in the household a risk factor?

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Gender differences in mortality risks in rural Somalia by age were studied to assess their relation to literacy, marital status and family economy using a demographic surveillance system between January 1987 and December 1989. In all 6948 person-years form the basis for the demographic analysis and estimations of mortality rates and survival. Both sexes showed similar mortality risks in infancy and childhood, but females demonstrated a greater risk of dying during their reproductive life than males. Symptoms of infectious diseases dominated the mortality pattern, eg respiratory symptoms, diarrhoea, fever and jaundice. Bivariate analyses disclosed pronounced mortality differences related to marital status and literacy. Gender differences were particularly expressed in divorced middle-aged women. Illiteracy in women doubled the risk of dying from 15 years and onwards. Most at risk were illiterate women living with literate men. Multivariate analysis showed after adjustment for marital status and literacy of head of household that an excess female mortality was associated to a household situation, where the head of household or the woman did not subsist on farming but on other, mainly commercial, activities. To conclude, gender differences in a number of factors in the household – literacy, marital status and especially source of income – were disadvantageous for the women, increasing the mortality risk. The provision of non-discriminatory health services could partly compensate gender bias in health. Education of women, female autonomy and participation in decision-making must be improved, otherwise gender inequalities in health will persist.

*Key words:* Mortality, gender, equality, marital status, Africa

### INTRODUCTION

Both genetic and environmental factors influence gender differences in mortality. Genetic factors give females a better survival and decreased vulnerability throughout life [1,2]. Historically there has been an excess female mortality in deprived societies [3], and also in developing countries today [4]. The pattern is reversed in more developed countries. Further, maternal mortality was probably exceedingly high in ancient societies [5].

The main reason for the high female mortality is the low status of women in societies of hunters and gatherers, as well as in some societies of farmers and herdsmen.



The probable determinants of improved female survival are reduced discrimination, more female autonomy with improved decision-making ability, property rights for women, a reduced patrilineal marriage pattern, improved female literacy and efficient maternal health care [6].

Modernization, eg improved family economy and education, does not automatically imply a strengthened female position. In Taiwan, gender-based stratification still exists and has been intensified during the period of rapid economic growth [7]. The same phenomenon is also reported in India [8]. Economic progress in rural areas, such as land reforms, could also enhance gender bias in care causing increasing gender differences in the prevalence of malnutrition [9]. Little is known about changes in gender roles and even changes in mortality during transition of a society from traditional farming and herding in rural area exposed to influences from urban areas, state activities, commercial activities and westernization.

Female literacy is strongly associated with improved child survival [10]. However, the consequences of gender inequality in literacy for female health in adulthood has rarely been addressed. Nor is it known if modernization may even be an impediment to improved female health and enhance the gender inequality.

We therefore assessed the gender differences in mortality risks by age in rural Somalia, and evaluated their relation to literacy, marital status and family economy.

## MATERIAL AND METHODS

### *Study area*

The study was performed in two villages, situated some 10 km from the Shabeelle river and 40 km from the Somali capital, Mogadishu. In these villages, chosen as being representative of the semi-arid agricultural area between the Shabeelle and Jubba Somali rivers, a Somali-Swedish collaborative research project had been in progress with the aim of using epidemiological methods for the planning of public health. A field study base was established, where socio-anthropological and demographic data formed the background to a series of specific studies [11,12]. The inhabitants in this dry-land area were subsistence farmers, and they did not constitute a wealthy segment of the Somali society. A minor proportion of the population practised nomadic pastoralism part of the year and some bred cattle and a had certain surplus from milk production.

In these villages in the Lower Shabeelle area "rural training centres" for medical students had been established by the Medical Faculty of the Somali National University. Community health workers were trained, traditional midwives were given additional training, simple health centres were built by the villagers and basic health care was provided. Research activities were integrated with the training of medical students in these communities.

### *Study base*

A demographic surveillance system was running from January 1987 to December 1989. After an initial census (2456 inhabitants) all births, deaths, in- and out-migration were registered through an intensive collaboration with village leaders, village health workers and traditional birth attendants. In all 6948 person-years form the basis for the demographic analyses and estimations of mortality rates and survival.

Demographic data were registered by community health workers and traditional midwives in the villages and cross-checked by one of the researchers (O.H.M) on regular weekly or fortnightly visits. Symptoms prior to death were registered by the same researcher through a structured interview with relatives [13]. A census review was performed after one and two years, cross-checking the registrations made by the surveillance system. Few errors were found regarding births and deaths, but a number of corrections were performed regarding in- and out-migration.

### *Definitions*

Literacy is defined as the ability to read and write. In this society many adults were trained in reading and writing during a literacy campaign in the seventies. Marital status is defined as "married" when man and woman are legally married with or without co-habiting. "Single" means being unmarried or divorced. Very few men in these villages were having two wives, and this was therefore not included in the analysis. Main source of income was defined as "farming" if that -with or without animal husbandry - was considered to constitute the main source of income by the interviewee. "Other" sources of income were judged to constitute an economically rather homogeneous group including commerce, craftsmanship and technical professions such as electrician, plumber etc. The persons having "other" sources of income were generally judged to be economically better off than the majority of the subsistence farmers.

### *Statistical methods*

Mortality rates and survival were calculated by use of the Quest epidemiological and statistical program, using the Density method [14]. Cumulative mortality was analyzed by the Cox proportional hazards model (EGRET software, Epidemiological Graphics Estimation and



Testing package, Statistical and Epidemiological Research Corporation, Seattle, Washington, USA).

## RESULTS

The mortality risks during the life span followed the classical U-shaped curve (Figure 1). Females showed a tendency to lower mortality risks in infancy and childhood, but a greater risk of dying during their reproductive life than males (Table 1). The pattern of symptoms prior to death was similar among children and adults; with a predominance of respiratory symptoms (33% of deaths) followed by febrile conditions (21%) from the age of 15 years. A hepatitis epidemic caused many deaths, especially among women (19% of adult deaths).

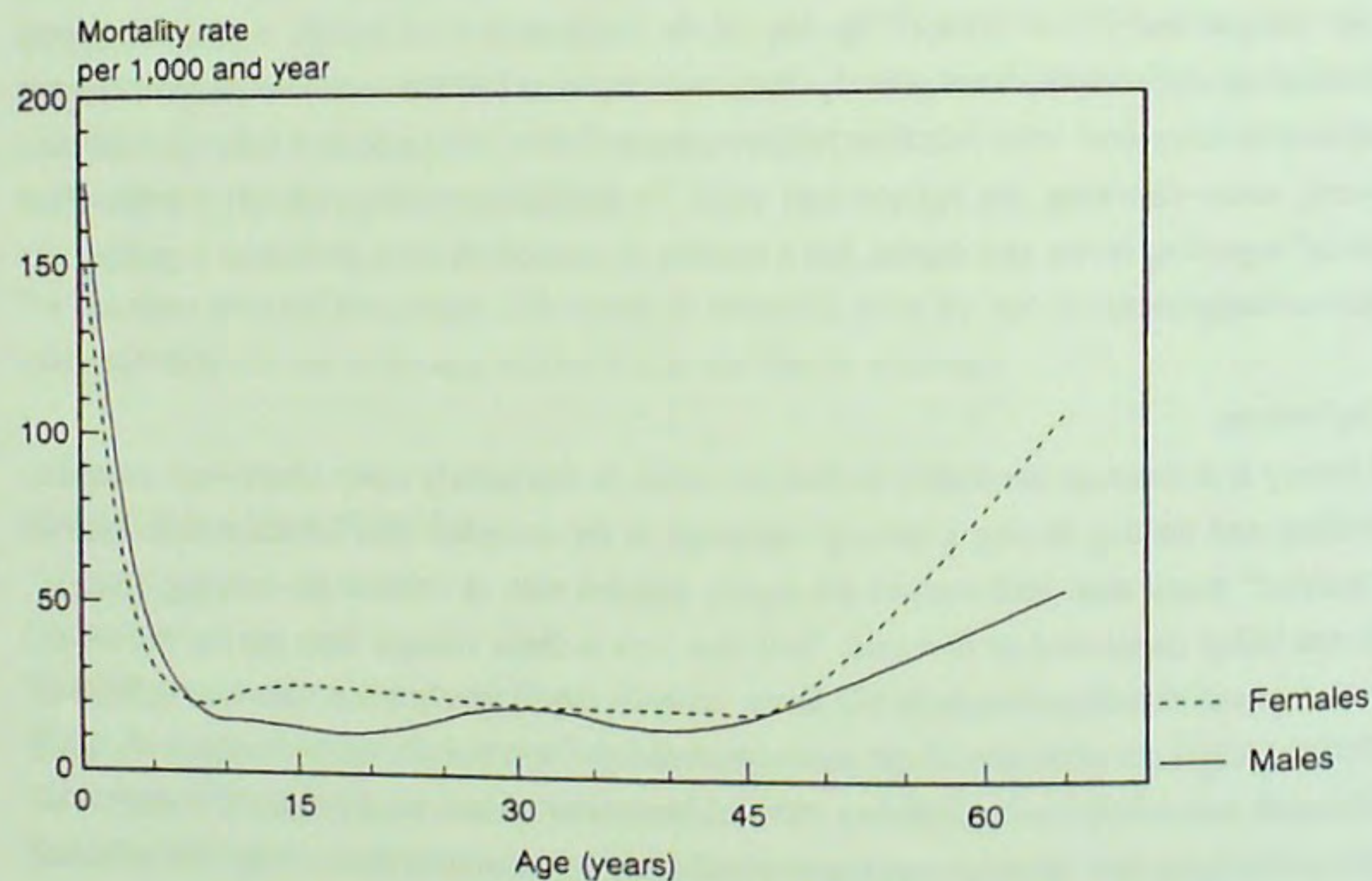


Figure 1. Mortality rate per 1,000 by age and gender as seen during 1987-89 in two Somali villages. (Smoothed curve).

Table 1. Sex differences in mortality risks. Relative risks of female mortality in relation to male mortality in different age intervals in the demographic surveillance in two Somali villages 1987-89.

Age interval (years)	Male	Female	p-value
0	1.0	0.83	0.56
1-4	1.0	0.92	0.71
5-14	1.0	0.95	0.83
15-44	1.0	1.65	0.03
45-	1.0	1.32	0.18

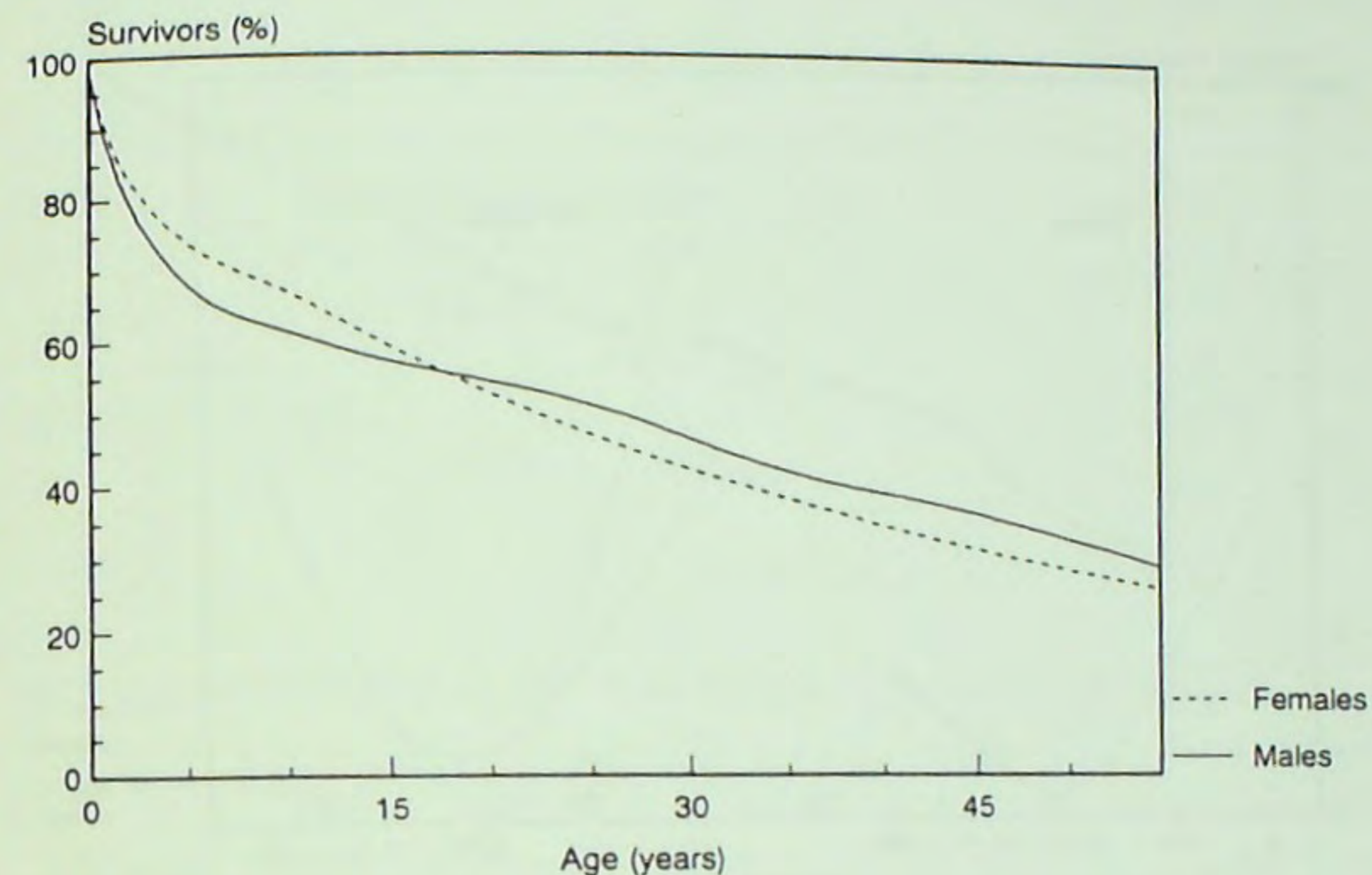
One tenth of the adult deaths occurred in conjunction with diarrhoea (Table 2). Maternal mortality was not specifically studied, due to the study dimensions. However, during the two year study period 213 number of births were registered and 2 female deaths specifically related to childbirth. Further, 2 female deaths between the ages 15-49 were due to anaemia, probably pregnancy related. An unknown but considerable proportion of the 15 women dying with jaundice were pregnant or had recently delivered.



**Table 2.** Symptoms prior to death from a demographic surveillance of two Somali villages 1987-1989. Number of cases of listed symptoms as well as person years included in the analyses for each sex and age interval.

Symptoms prior to death	0-14 years		15-49 years		50+ years	
	Male	Female	Male	Female	Male	Female
Respiratory	11	20	5	2	11	21
Diarrhoea	20	8	3	5	0	4
Fever/Malaria	12	10	5	5	5	10
Tetanus	10	7	0	0	0	0
Measles	3	4	0	0	0	0
Jaundice	0	2	4	15	3	1
Anaemia	0	2	0	2	0	1
Delivery complication	0	0	0	2	0	0
Malnutrition	10	10	1	2	0	0
Accident	1	0	1	1	0	0
Other	5	1	3	2	4	1
<b>Total</b>	<b>72</b>	<b>64</b>	<b>22</b>	<b>36</b>	<b>23</b>	<b>38</b>
<b>Person-years</b>	<b>1538</b>	<b>1531</b>	<b>1363</b>	<b>1524</b>	<b>542</b>	<b>450</b>

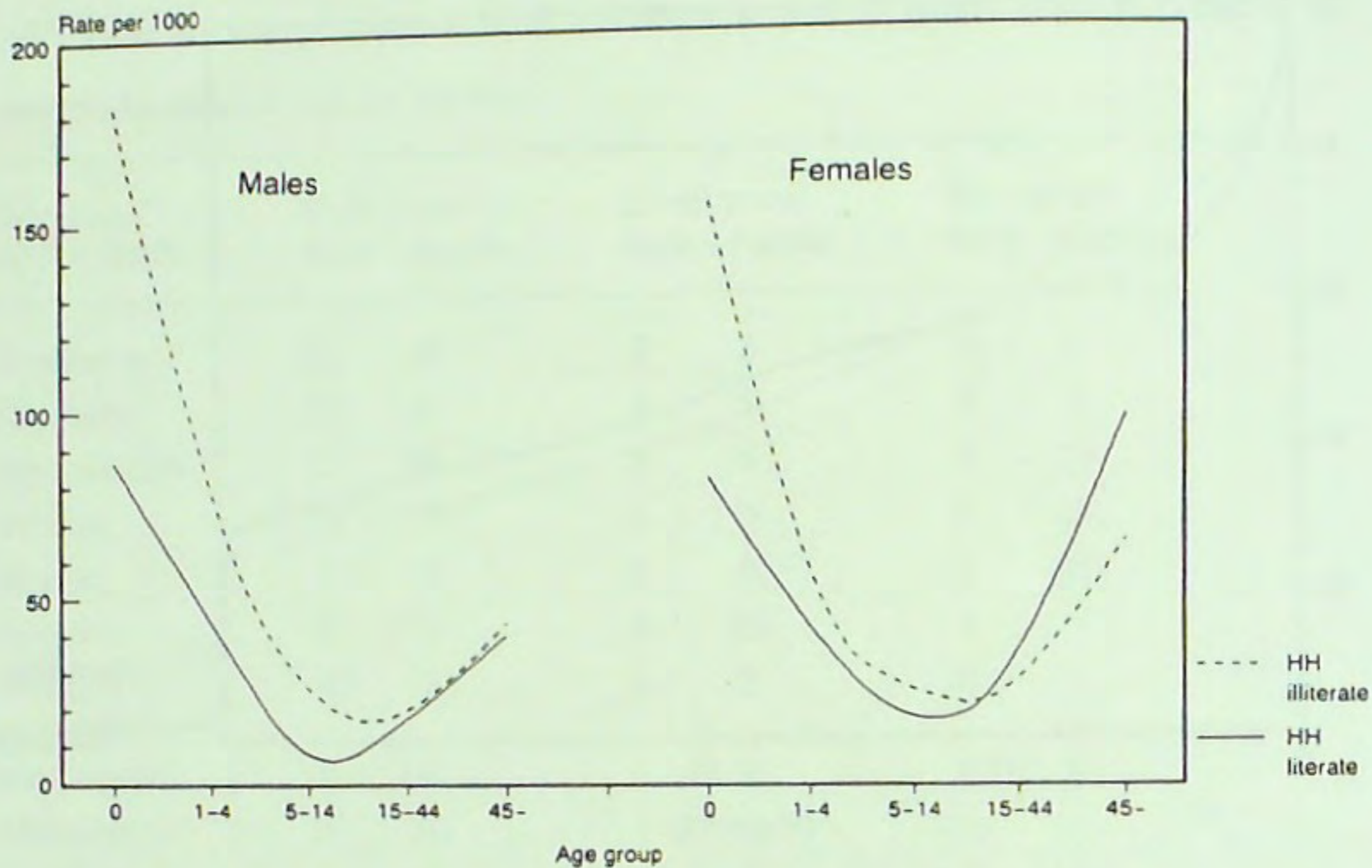
The start of the reproductive years implied higher mortality risks for women compared to men (Figure 2). The life expectancy at birth was 31 years for girls and 33 years for boys. From 15 years the young women and men had life expectancies of 48 and 52 years respectively.



**Figure 2.** Survival pattern over age by gender based on the observed mortality rates (%) during 1987-89 in two Somali villages. (Smoothed curve).

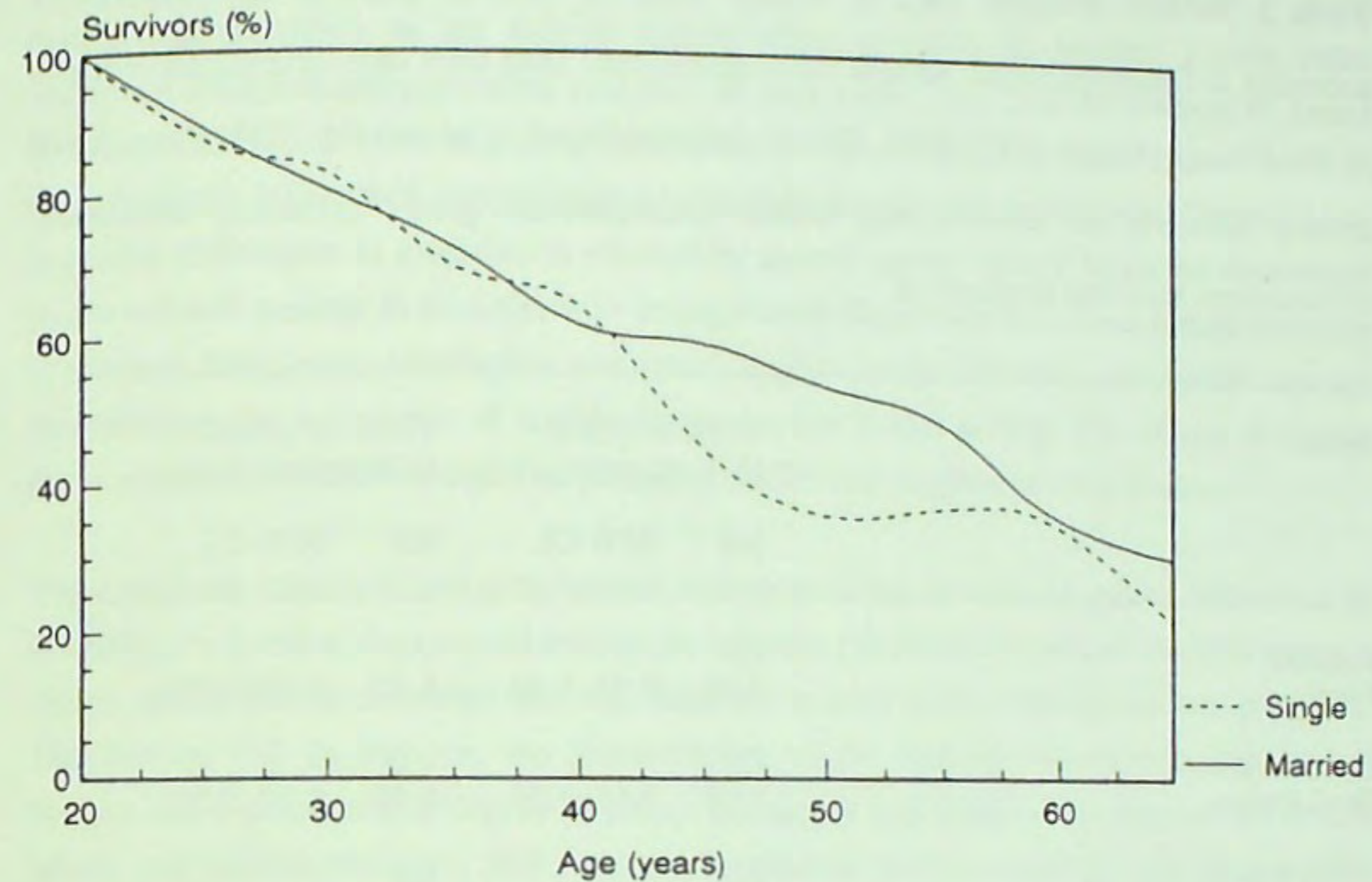
Gender differences in mortality in relation to marital status, literacy and subsistence were first analysed by bivariate technique. The mortality risks were generally lower in households where the head of the household (usually male) was literate (Figure 3). This influence differed in male and female members of the household. Older women living in a household with a literate head had higher mortality risks than those having an illiterate head. The life expectancy from 15 years was 63 years for a literate male, 50 years for an illiterate woman living in a household with an illiterate head, but only 41 years for an illiterate woman with a literate head of household.





**Figure 3.** Mortality pattern per 1,000 over life spans by gender and literacy of head of household in two Somali villages. (Smoothed curve).

Many women were divorced or widowed by the time their reproductive years ended. By the age of 50 more than one third of the women were living singly while only one out of ten men did. Males remarried when getting older while women became or remained single. Leaving reproductive life and becoming single also increased mortality risks in women (Figure 4). In men no difference in survival pattern between single and married status was shown.



**Figure 4.** Female survival (%) by marital status in rural Somalia from 20 years and onwards. (Smoothed curve).

Mortality risks for females were increased when living in a household with another main source of income than farming, or having mixed sources of income. This pattern was most pronounced from 45 years of age and onwards and was present even when adjusting for marital status and literacy of head of household (Table 3). The survival pattern among men in the corresponding age intervals was not related to source of income.



**Table 3.** Relative mortality risks of women from 15 and 45 years of age respectively according to Cox proportional hazards survival analyses. Data from demographic surveillance of two Somali villages 1987–1989. "Head" indicates head of household. "Other" source of income indicates an economically rather homogeneous group including commerce, craftsmanship, technical professions.

Factor	From 15 years (679 women)		From 45 years (230 women)	
	RR	95% CL	RR	95% CL
Married	1.0		1.0	
Single	0.89	0.44–1.80	1.07	0.37–3.09
Head illiterate	1.0		1.0	
Head literate	1.08	0.61–1.90	0.93	0.39–2.22
Head, woman farming	1.0		1.0	
Head farming, woman other income	2.17	1.11–4.25	4.56	1.62–12.83
Head other income, woman farming	1.84	0.82–4.15	5.64	1.38–22.99
Head, woman other income	1.97	0.90–4.30	5.26	1.85–14.98

## DISCUSSION

This study highlights trends in the transition of gender differences in mortality. An excess female mortality was seen after the age of 15, which was most pronounced during the reproductive years. This was not found among the young girls. The increased mortality risk in women was shown to be related to female illiteracy and further non-married (or divorced) women had a poorer survival after the reproductive years. The mortality risk was also higher for women, especially after 45 years of age, living in households partly or entirely dependent on other economic sources than farming. The reproductive health of women in this area has also been found to be impaired by anaemia and undernourishment [12]. The results from this cohort study indicate a severe toll of reproduction. Although only 213 births were registered during the study period 2 definite cases of maternal deaths were reported. Further, the cases of anaemia and excess female deaths, mainly due to infectious diseases are also indications of high maternal mortality in the area. The reproductive burden could be one explanation for the excess female mortality and the prolonged negative health effects could give an explanation to enhanced differences even after the reproductive period.

Several characteristics in the Somali society affect mortality in women. Family roles, traditional lifestyles and preventive practices all play a part [12]. One determinant of excess female mortality could also be female discrimination. Identification of these characteristics on the community level could contribute to a better understanding of the societies. The alteration in gender differences in mortality is affected by several causal factors which are determined by the cultural context. In societies with strong female discrimination excess female mortality is obvious from birth, which was not found in this study. However, our results are not contradicting the hypothesis of female discrimination in this setting. The effects of female discrimination on mortality could be perceived as different degrees of discrimination.

There are both historical and geographical examples of the reversal of gender differences in mortality. In Sweden the reversal took place between the Middle Ages and the 18th century, but an excess female mortality was still reported in other parts of Europe as late as the late 19th century [5]. In Sweden, the characteristics of the farming society with independent farmers and a considerable degree of female autonomy and considerable demand for female labour may explain this early shift, whereas it occurred later in countries with more crofters and landless farm workers. The high literacy rate in Sweden, especially in women, may also have contributed to improved female survival.

An increase in female mortality from the age of 15 was reported from the 1960s in a Malaysian aboriginal population. This was considered to be mainly due to reproductive deaths, as the society was considered to be sexually egalitarian. Recently declining gender differences have been noted which could be due to improved maternal health care [15].

Excess female mortality has been consistently reported from South-East Asia [4]. A quotation from the the 1951 Census Report of India still appears valid: "there is a traditional fondness for male issue in most parts of the country and a corresponding dislike of female children. All affection and care is bestowed on male children while female children are not much cared for" [4]. This is still seen to-day in the practice of female foeticide in India [16].

### *Determinants of female autonomy and status*

In societies in which women have high economic productivity and where there is considerable demand for female labour, discrimination of the woman is less prevalent [17]. In the Kerala-example of empowered women with greater female literacy and low infant and child mortality, there were similar morbidity risks in the sexes in spite of the deprived environment [18]. This contrasts with northern India, where female mortality in childhood exceeds that of males [19]. In northern India women's autonomy is poor and they have little control of



property, marriage, or the care of children [20].

There is also gender related geographical pattern in mortality in Africa. In western Africa, where women are more actively engaged in agriculture and trade, mortality rates for boys and girls are similar [6], while towards the Horn of Africa with dry land plough cultivation there is an excess female mortality [6].

#### *Marital status*

Married people live longer than unmarried people and, among the unmarried, it is the divorced who have the highest death rates [21]. Divorced or widowed women are most at risk in societies, such as in Bangladesh [22] and northern India where laws and custom usually exclude widows from access to their husbands' property resulting in dependence on their sons. When their children are unable to provide necessary support, the elderly are reduced to begging [23].

Divorce is very common these villages. The bivariate analysis showed single marital status to be a risk factor for excess female mortality. By middle age men have remarried while women are abandoned. As said in a focus-group discussion in the villages "men seek a fertile woman and divorce the old one. Old women also lose their capacity to work and there is much work to do" [12]. Traditionally, and according to Sharia law, divorce is exclusively a man's right. In exercising this right the husband must pay the woman a small amount of money or crops or other equivalent goods called "Meher" as predetermined by law. A woman can ask for divorce from her husband in very extreme circumstances such as suspected infertility of the husband, or his proven negligence to the wife's well-being. In these cases the women risk completely losing their "Meher" and may also repay all he has spent on her during their marriage preparations, particularly if he disagree her reasoning for divorce.

Widowhood also carries economic disadvantage with it. The patrilinear marital pattern leaves the woman homeless and landless and this increases the woman's risk of disease and death. The divorced Somali women's situation could have similarities to that of the widowed females in patrilinear parts of India, as both have an excess mortality [20].

#### *Modernization and health service*

Economic growth, brought by industrialization in urban areas, by economic progress in rural areas, or by land-reforms, does not immediately imply an improvement in the status of women [7-9]. How modernization affects the status of women depends on the characteristics of the society.

Depending upon the cultural context, health services could both enhance and decrease sex bias in treatment and mortality risk. Gender inequalities could be revealed by different immunization patterns and PHC clinic attendance [6]. Modern health care may be the most important factor in maintaining gender differences in mortality as boys are more likely to be treated than girls [24]. On the other hand, specific interventions such as maternal health care [15], and nutritional programmes, which do not discriminate between the sexes, could improve the situation for the disadvantaged girls [9]. The custom of female circumcision in Somalia, where almost all girls are still circumcised [25], further strengthens female discrimination and oppression. Apart from the risk of fatal bleeding or infection immediately after the mutilation, there is also an increased risk of delivery complications and maternal death after female circumcision [26,27].

#### *Literacy*

Education could be the pivot of the process of growing gender equality. School attendance by girls and boys should serve as a marker. However, literacy in itself does not improve the status of women. Maternal literacy did not improve the girls' position in Bengali villages [9]. One main condition for change is maternal confidence, based on an improved status of women, improved ability to participate in decision-making, and female literacy. The consequences of a literacy campaign in a society where women have a low status is evident in the Somali setting. A literacy campaign mainly took place during the 1970s aiming at all adults, irrespective of sex. In the two Somali villages included in this study, almost half of the adult males under the age of 50 could read and write, compared to only 3% of the women [12]. This illustrates the tragic consequences of inequality. As stated by men in a focus group discussion: "daughters should help their mothers both at home and at farm instead to study. Often, we do not let females study, not even the Qur'an. They may attempt to compete with males and divorce their husbands if they disagree for some reason" (12). Despite the fact that the campaign included women, they had neither the time nor the possibility to complete the studies. Further, they were not able to use their knowledge. A similar gender pattern was seen in school attendance among children.

As shown by bivariate analysis an excess female mortality in relation to male reading ability was evident. The multivariate analysis did disclose that this negative health effect of a literacy campaign was due to socio-economic factors as non-farming subsistence. Thus, roughly the male learned to read, learned to earn his subsistence in other ways than the traditional farming and herding, and than he divorced and remarried.

As shown in this study, this gender inequality further eroded the position and health of females with disastrous consequences for their health. Literate males had a life expectancy



that exceeded that of their illiterate wives. Not only did married women have a shorter life expectancy than their husbands, but they also did not live as long as their sisters who were married to illiterate husbands.

Provision of a non-discriminatory health service could partly compensate for gender bias in child health [9]. However, the education of women is necessary if discriminatory behaviour towards women is to be eliminated [23]. Literacy campaigns must also be specifically aimed at women. Thus understanding the status of women is important in the process of social change. Female autonomy and decision-making ability must be improved if inequalities are to be reduced.

#### ACKNOWLEDGEMENTS

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## The growth chart – a road to health chart? Maternal comprehension of the growth chart in two Somali villages

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**Summary.** Growth monitoring is so far not implemented on a large scale in the Somali health services. Available reports indicate that growth faltering is common. However, the use of growth charts as a tool for health education has been questioned. This study examines the ability of 199, predominantly illiterate, rural Somali mothers to understand the growth chart message after an intensive period of growth chart use and education. During a home-based interview the mothers were asked to combine a set of four growth curves with a set of four pictures, showing the corresponding developments of four children. The mothers managed significantly better to interpret the charts than could be expected by chance alone. Maternal age, number of children and literacy did not differ much between those who correctly and incorrectly combined pictures and charts. Almost all mothers recognised the value of the growth chart as being good for the control and promotion of their children's health and/or growth. We conclude that the growth chart may be an applicable and appropriate tool even with illiterate mothers, provided that other prerequisites for successful growth monitoring, e.g. appropriate health services, are available.



## Background

The growth chart has been used all over the world to monitor the weight development of children under 5 years of age. Plotted on the chart, the weight observations indicate the direction of growth, i.e. the growth velocity of the child. Printed lines often give the median weight for boys and the third percentile for girls and indicate the normal direction of growth over age. In addition to the diagnostic, monitoring and surveillance functions of the growth chart, it has served as a tool for health education of the parents. The charted development of the child's growth forms the basis for discussion of nutrition, childhood diseases, general health and development. For this the mother's correct understanding of the growth chart is a prerequisite. In the original description of the chart, Cuthbertson and Morley advocate that 'although the majority of mothers are illiterate, they can be taught that their children must "walk along the path" on the chart. If the child is under weight, or fails to grow, this can be demonstrated to the mother and she is helped to feed and care for him better.'<sup>1</sup>

Only a minority (approximately 25%) of the Somali population has access to health services. Primary child care services, including growth monitoring, are rarely available in the rural areas. The use of growth charts is thus a technology which so far has not been implemented on a large scale.

Available reports on child health in Somalia indicate a general retardation in growth during the first years of life. Some 20% of children under 5 years of age were wasted (weight for height) in an urban study<sup>2</sup> and a few studies in rural areas indicate a high prevalence of moderate and severe malnutrition (weight for age).<sup>3,4</sup> This is a strong motive for the use of growth charts in primary health care. However, the use of the growth chart in health education in developing countries has been discussed, and the mothers' ability to grasp the message of the growth curve has been questioned, especially for illiterate mothers.<sup>5-7</sup> In particular, little experience is available from African countries.

This study examines the ability of a group of rural Somali mothers to understand the growth chart after an intensive period of growth chart use and education.

## Material and methods

The study was performed in the villages of Lama Doonka and Buulalow in Afgooye district, some 40 kms south-west of Mogadishu. The villages are situated in the dry-land farming area between the rivers Jubba and Shabeele. Both villages have a simple health post, staffed by a village health worker. Most mothers (90%) were illiterate, i.e. were neither able to read nor write.

In a longitudinal study of nutrition, morbidity and growth of all children under 5 in those villages, the growth chart was introduced for the first time to the

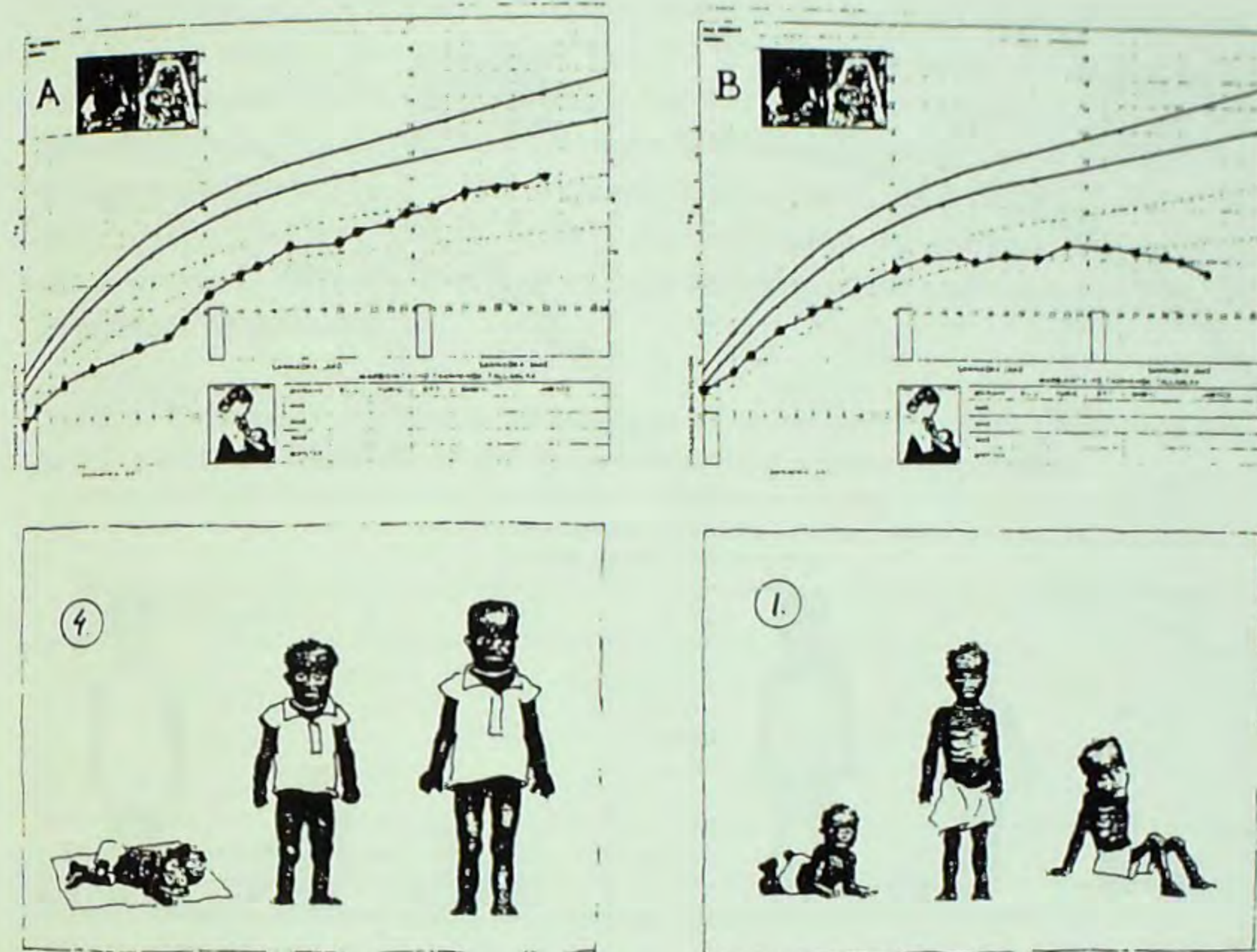


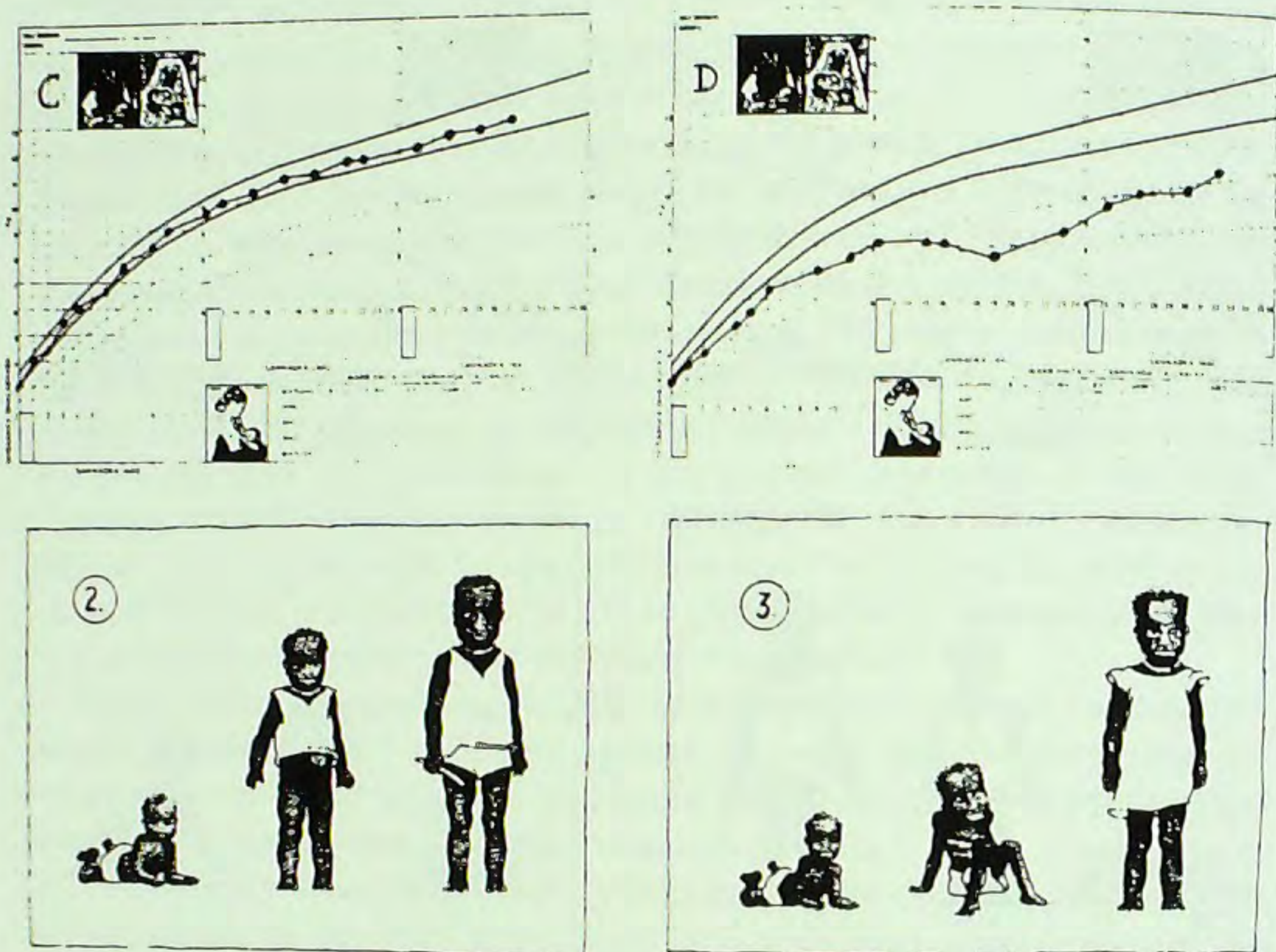
Figure 1. A set of four growth curve charts, correctly combined with corresponding

mothers at the start of the study. On the Somali growth chart, the median is marked as well as lines indicating grade I to III malnutrition according to Gomez. The meaning of the direction of the growth curve was explained; the *normal growth* parallel or even faster than the printed lines on the curve, the *danger sign* when the curve is diverging and the *very dangerous sign* when the child is losing weight. In the monthly home-based examinations the current direction of growth was discussed with the mother. This evaluation was performed after 1 year of monthly weight measurements. The village health services were, during this year, supported by the visiting research team, which included medical doctors, at least once per week. Basic health services, e.g. oral rehydration therapy and treatment of some infections, were provided by the village health workers, supported by the doctors in the study team. Food supplements were not offered.

Two hundred and twenty-nine mothers (being mothers of all children under 5 years in the villages) were invited to take part in this evaluation; of these 19 had moved away, 4 refused to participate, 4 were ill and unable to participate and 3 had not received the growth chart due to the age of their children (over the age of 5). Thus, 199 mothers were included in this study.

The interview was performed in a standardised manner by a senior member of





drawings of a child's appearance at 6 months, 1.5 and 3 years of age.

the Community Health Department. During the interview the mothers were asked to combine a set of four growth curves (chart A-D) with a set of four pictures (pictures 1-4), showing the corresponding developments of four children at about 6 months, 1.5 and 3.5 years (Figure 1 pp. 342-343). The intention was to investigate the mothers' comprehension of the charts as expressed by pictures of developing children rather than by abstract words. The curves showed the following developments: (A) an early growth retardation with later catch-up; (B) a progressive growth retardation; (C) a normal growth and (D) a weight fall during the second year of life followed by a later catch-up. The four curves were printed on a 80 x 120 cm board, having reserved space for the four pictures.

Before combining charts and pictures the mothers explained their understanding of the pictures. Photographs of Somali children were used as models in the preparation of the drawn pictures.

*Statistical methods*

The evaluation of mothers' ability to correctly combine growth charts and drawings has been made by comparing the number of correct combinations with the frequency that can be expected by chance alone.

Since there are 24 possible combinations of four charts and four drawings, one of which is correct, the probability is 1/24 to select this randomly. It is obvious that if three combinations are correct, the fourth is automatically given, so this probability of three correct combinations is 0. Similarly, it can be shown that the chance probabilities of 2, 1 and 0 correct combinations are 6/24, 8/24 and 9/24 respectively. The first row of Table 1 thus represents the theoretical probability distributions to correctly combine various numbers of alternatives under the null hypothesis of guessing.

**Table 1.** Theoretical probability distributions of correct combinations of drawings and growth charts by chance alone and the corresponding expected frequencies

Possible number of correct combinations	Probability of number of random correct combinations					Eligible number of mothers
	4	3	2	1	0	
4	1/24	—	6/24	8/24	9/24	71
3	—	1/24	3/24	9/24	11/24	86
2	—	—	2/24	8/24	14/24	28
1	—	—	—	6/24	18/24	10
0	—	—	—	—	24/24	4
Expected frequency*	2.96	3.58	30.83	67.75	93.87	199

\*Expected frequency of women making the appropriate number of correct combinations.

One of the interview questions tried to assess whether the mother actually perceived the drawings as was intended. Seventy-one mothers did so for all four drawings, while a further 86 mothers grasped the message of three of the drawings. Twenty-eight and 10 mothers respectively were able to identify the message of two and one of the drawings. Four mothers were unable to understand any of the drawings. The right-hand column of Table 1 thus represents the number of mothers eligible for assessing their ability to combine drawings with growth charts. Consequently, for each of the corresponding rows we have a theoretical distribution of probabilities for correct guessing.

From the theoretical probabilities we can easily calculate the expected frequencies of correct combinations under the null hypothesis of no knowledge above that of chance. Thus, we can expect that  $71 \cdot 1/24 = 2.96$  mothers identify correctly all four combinations and that  $71 \cdot 6/24 + 86 \cdot 3/24 + 28 \cdot 2/24 = 30.83$  randomly select two combinations correctly. The bottom row of Table 1 thus represents the reference values with which the observed frequencies will be compared using a chi-squared test.

**Results**

Almost all mothers were still retaining their charts at the time of the study. The ability to hold the chart in a correct position was observed during the interview;



92% of the mothers did so. Only 4% did not know any purpose of using the chart. All others mentioned the promotion of child health and/or growth. Ninety-six per cent of the mothers recognised the value of the growth chart as being good for the control and promotion of their children's health and/or growth. Only two mothers saw no practical value and one mother stated that the only consequence of the weighing procedure was that her child was frightened. Almost all mothers (98%) recommended that weighing and growth charts be introduced in other Somali villages.

Table 2. The mothers' ability to correctly combine weight curve with corresponding picture. Results are given for the entire group of mothers and for those mothers who interpreted the pictures without difficulties.

Curve	Mothers who understood pictures (%)	All mothers (%)
A. Early growth retardation, later catch-up	42.4 (182)	39.6 (199)
B. Progressive growth retardation	39.2 (119)	37.1 (199)
C. Normal growth	60.7 (168)	53.3 (199)
D. Weight loss during the second year, later catch-up	41.9 (139)	43.3 (199)

Figures within brackets denote number of mothers.

The maternal ability to combine curves and corresponding pictures is summarised in Table 2. The normal growth curve was most easily recognised. The misinterpretations consisted mainly of difficulties in distinguishing differences between charts A and D as to the timing of growth retardation. However, some mothers had difficulties in correctly interpreting the pictures and had for that reason not the same chances of combining chart and picture. Taking this into consideration, the observed and expected number of correctly combined charts and pictures are summarised in Table 3. The maternal ability to interpret the charts differed statistically significantly ( $P < 0.001$ ) from that expected by chance.

The age, number of children and literacy of mothers who correctly and incorrectly identified different growth charts are given in Figure 2. The overall impression is that these characteristics did not differ much between the two groups. Possible exceptions to this were a lower maternal age and a smaller number of children being related to the correct interpretation of chart B, and literacy being positively associated with the understanding of chart D.

Table 3. Observed and expected number of correctly combined charts and pictures stratified for misinterpretations of the pictures of children (see text)

Possible number of correct combinations	Number of correct combinations					Total number of mothers
	4	3	2	1	0	
4	22	0	23	17	9	71
3	0	9	41	21	1	86
2	0	0	11	10	7	28
1	0	0	2	2	5	10
0	0	0	1	3	0	4
Observed	22	9	78	53	35	199
Expected	2.96	3.58	30.83	67.75	93.87	199

$\chi^2 = 203.8; P < 0.001$ .

The mothers were asked to suggest appropriate actions for each of the four growth curves (Figure 3). Most mothers (84%) suggested 'no action' to the normal growth curve. To the other curves the responses were more diversified, including 'Western' or traditional medical therapy or various combined treatments. 'Food' was not a major suggestion in response to any of the growth curves and 'Western' therapy was more frequently suggested than traditional therapy. Thus, the mothers related the pathological growth patterns to diseases, for which they saw the need for health services and medical treatment.

### Discussions and conclusions

In the Somali national health care system, primary child care including growth monitoring is only offered to a minority of the children so far. There are indications of widespread growth faltering and malnutrition among young children. Growth monitoring and the use of growth charts as a health education tool therefore could be advocated, when primary health care is developed.

In this study, a group of predominantly illiterate mothers has been asked to combine four growth histories with each of four pictorial illustrations of the corresponding child appearances. Thus, the mothers have been exposed to the difficult task of selecting the correct combination out of a possible number of 24. The results show that they managed significantly better than could be expected by chance alone. Most mothers recognised and matched the normal growth curve with the corresponding picture. The other growth patterns were more difficult to identify, and especially the temporal aspect of growth retardation. Many of the misclassifications were made regarding charts A and D - both showing temporary growth retardations but in different age intervals. In contrast to other studies,<sup>8,9</sup> this evaluation focused on the understanding of growth pattern over time, which is more relevant in growth monitoring, but still more difficult to comprehend than single attained weight levels.



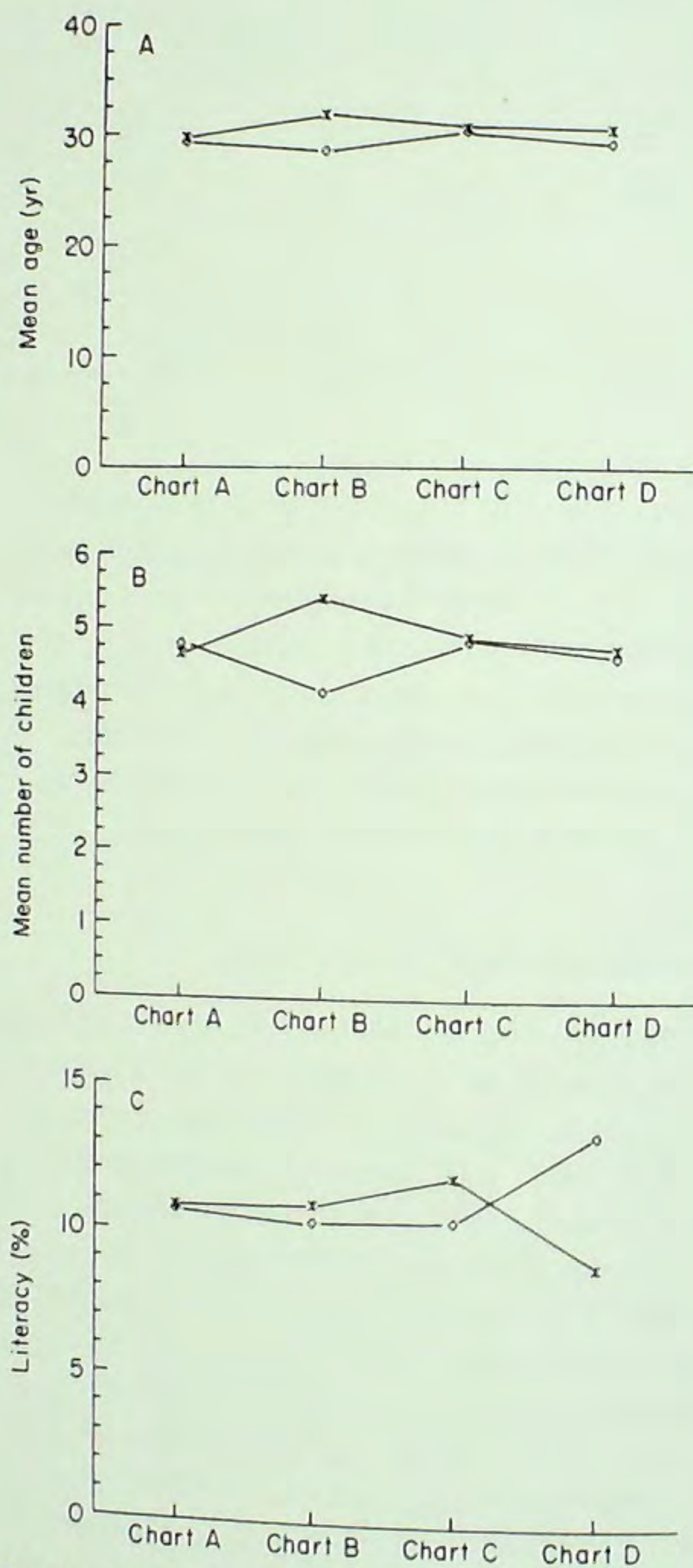


Figure 2. Demographic characteristics of mothers, who correctly identified different growth charts with the corresponding pictures. ✖ = incorrect; ◇ = correct.

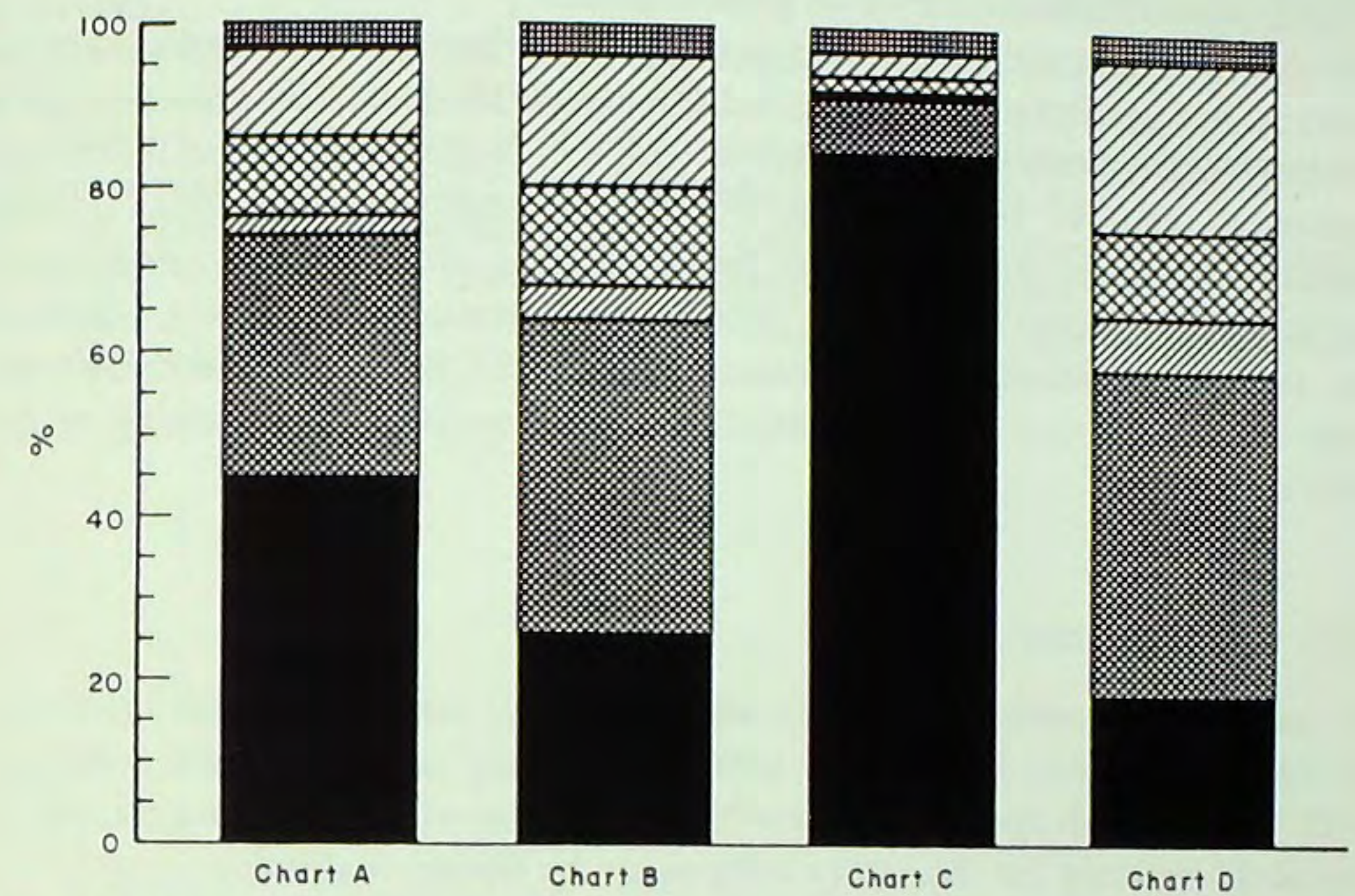


Figure 3. Mothers' suggestions regarding health actions in response to the four growth charts. Chart A = early growth retardation with later catch-up; chart B = progressive growth retardation; chart C = normal growth; and chart D = weight fall during the second year of life followed by later catch-up. ■ = no answer; ▨ = combined action; ▩ = food; ▧ = traditional treatment; ▤ = Western treatment; ■ = no action.

Out of the five originally-stated reasons for growth monitoring using growth charts<sup>7</sup> (i.e. for early detection of malnutrition, as advice on the timing of supplementary feeding, for selection of high-risk children, for health education and as a tool for the epidemiology of malnutrition), this study has addressed mainly the health education aspect. The appropriateness of the growth chart in this respect has been questioned, especially when it is used in illiterate populations.<sup>5,6,7,10</sup> Our study cannot support this. Even the abstract representation on the chart of the dynamic growth of a child over time may be understood very well by an illiterate mother, and appreciated by her as a component in the care of her child.

A majority of mothers related the pathological growth patterns to diseases, and suggested the use of health services and medical treatment to master these problems. Usually they did not relate the growth problem to lack of food or inappropriate foods. This may illustrate the necessity for an appropriate and efficient health service, including health workers able to give advice as well as to treat common disorders.<sup>11</sup>

This study has analysed one aspect of growth monitoring activities, that of the mothers' comprehension of the growth chart message. We do not claim to have



evaluated the appropriateness of the total procedure or its impact on health, but rather to have addressed one of its prerequisites.

A mother's comprehension of a growth chart does not necessarily have an impact on her health behaviour. The continued assessment of the growth chart in this study will therefore, in connection with the feedback of the results to the community, address this problem by use of qualitative methods. Growth monitoring increases the demand on health services, and should not be initiated on a large scale, unless appropriate health care is available and staff are trained. Thus, further evaluation should focus not only on the ability of the recipient, but rather the general context of the health support, including the training of the health staff.<sup>12-15</sup>

### Acknowledgements

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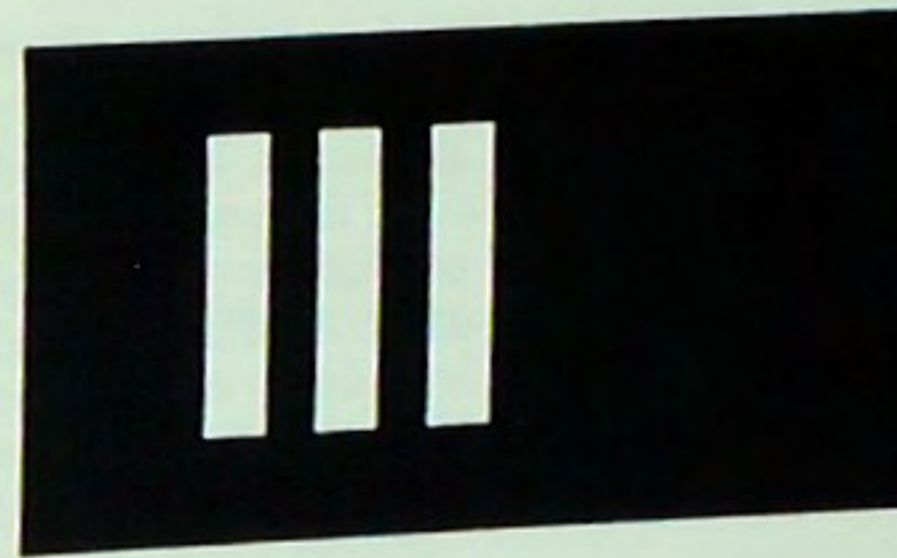
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# Diarrhoea among children in rural Somalia. Maternal perceptions, management and mortality

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Diarrhoea was the second most common disease symptom in a longitudinal study of 431 children under five years of age in rural Somalia. Most mothers perceived child diarrhoea as a condition, where oral rehydration therapy (ORT) and feeding were logical parts of its management. During one year of observation ORT was used in the household in one third of the diarrhoea episodes. There were tendencies that non-farming, young and literate mothers used oral rehydration therapy more frequently. Infants were more often treated than older children as well as children in smaller households. In a three-year demographic surveillance in the same area (1219 person-years) the under-five diarrhoea mortality of children of literate mothers was 43 per 1000 (95% CL 0-84) as compared to 93 per 1000 (95% CL 60-101) if illiterate. The findings may illustrate that mothers' ability to allocate time to health care and her general position in the household are associated to the use of ORT.

## BACKGROUND

Diarrhoeal diseases have been reported as a major cause of morbidity and mortality in Somali children <sup>1,2</sup>. Therefore it was logical, that diarrhoeal diseases were given high priority in the 1989-91 national health plan <sup>3</sup>. The use of oral rehydration therapy (ORT) was advocated as a major tool in the household management of these diseases.

In the household the mother is the major provider of health care, particularly to children <sup>4,5</sup>. Her education and social position have been shown to be associated to the survival chances of the child in many different geographical areas <sup>4,6,7</sup>. In studies in Kenya and elsewhere the education of mothers was positively associated with the use of oral rehydration therapy <sup>8,9</sup>. How mothers perceive, experience and cope with diseases like diarrhoea, is based on their explanation of these illnesses and to the social position they occupy <sup>10</sup>.

In the present study ORT had been promoted for household use by the village health services in a rural area between the two Somali rivers. A cohort of under-five children was surveilled



during one year as to morbidity and home management of health problems. In the same area a three-year demographic surveillance allows for an analysis of under-five mortality and under-five diarrhoea mortality. The mothers' perceptions of diarrhoea in childhood and its treatment was asked for through separate interviews.

The aims of this study are to describe the maternal perceptions and household management of diarrhoea in childhood, to analyse possible determinants of oral rehydration use and to discuss its impact on diarrhoeal mortality.

## MATERIAL AND METHODS

**Study area.** The study was performed in two villages, situated some 10 kms from the Shabeelle River and 40 kms from the Somali capital, Mogadishu. In these villages, chosen as being representative of the semi-arid agricultural area between the two Somali rivers, a Somali-Swedish collaborative research project has been in progress with the aim of using epidemiological methods for the planning of public health. A field study base was established, where socio-anthropological and demographic data formed the background to a series of specific studies 11,12,13. The inhabitants in this dry-land area are subsistence farmers. A minor proportion of the population practises nomadic pastoralism part of the year and quite a number breed cattle and make a certain surplus from milk production.

Research activities were integrated with the training of medical students in these communities. At the community health posts approximately twenty simple therapies were available for common diseases and symptoms, e.g. oral rehydration salt for diarrhoeal diseases, a few antibiotics (tablets or capsules), chloroquine, cough syrup, skin ointments etc. Community health workers were trained to diagnose and treat common childhood diseases like diarrhoea, acute respiratory infections, skin infections etc. Treatments were offered free of charge, but the villagers contributed by maintenance of the health centre. UNICEF oral rehydration solution packets were available free of charge all through the study period. Thus, the access to ORT may be judged as equal for the entire study population. Before and during the study period no specific campaign regarding diarrhoea management had taken place. A relatively poorly equipped district hospital was available in Afgooye, around 10 km away from the villages.

Religious healers (*wadaad*), magicians, healers practising burning, tooth extraction, scarification and other minor surgical procedures as well as herbalists offered their services to the population. The traditional medical practices have been described in detail previously 14.

**Perceptions of diarrhoea.** There were 252 mothers or other female substitutes caring for these children. Of these women 220 were also interviewed by members of the Community Health department regarding their perceptions of child health and disease in 1988. The missing 32 mothers were absent from the village during the field work. The interviewees were answering open-ended questions regarding beliefs and practices in relation to child health and child health problems. In this paper the maternal perceptions regarding causes and management of diarrhoea are discussed.

**Morbidity and household management.** All children under 5 years of age (431 children) - constituting one fifth of the total village population - were included in a prospective cohort study. Thus, 210 boys and 221 girls were followed between April 1987 and April 1988. Out of those 89 were born into the study during the year. The households were visited every 14 days for interviews and measurements performed by members of the Community Health department. The interviewees (mother, mother surrogate or father) were absent or otherwise not available for interview on 10 per cent of the possible occasions. These 10 % were evenly distributed over age groups and seasons. The median number of observation periods was 23 out of possible 26 2-week periods. Thus, a total of 8914 visits were included in the study.

The definition of diarrhoea used in this study was the mother's own perception of diarrhoea, using the Somali word *shuban*, meaning the pouring liquid. This diarrhoea concept includes the liquid quality of the stool and the rapid motion of the bowels. Even one episode of loose stools may therefore be considered as *shuban*. Oral rehydration therapy, ORT, both includes the use of the UNICEF oral rehydration solution packets and home-made sugar and salt solutions.

Literacy was defined as ability to read and write in the Somali language, irrespectively of formal education. In this society formal education had been offered women only to a very limited extent. However, a literacy campaign in the seventies reached a segment of the female population. Occupation is classified as "farmer" if the main source of income, according to the interviewee, is farming with or without animal husbandry. "Not farming" mainly includes commerce, craftsmanship and similar sources of income - a rather homogenous group, considered to be economically better off. The head of household was in most cases a man, usually the husband of the mother concerned. For some children (maximum 21 children) information on background factors was missing or not applicable (eg when the child was cared for by other than the biological mother).



Repeated fortnightly interviews were performed in the households. All health problems of children under five years of age during the past 14 days according to the interviewee and any subsequent actions taken in the household due to the health problem were registered. Treatments were classified into traditional or modern medical treatments and notes were taken specifying the treatment. Usually the mother was the interviewee, but on a few occasions another female caretaker was answering the questions.

**Demographic surveillance.** A demographic surveillance system was running from January 1987 to December 1989. After an initial census (2456 inhabitants) all births, deaths, in- and outmigration were registered through an intensive collaboration with village leaders, village health workers and traditional birth attendants. The size of the study base was planned to enable estimations on infant and under-five mortality with sufficient precision.

Demographic data and symptoms prior to death were registered by community health workers and traditional midwives in the villages, and cross-checked by one of the researchers (O.H.M) on regular weekly or fortnightly visits. In all 1219 person-years under the age of five years form the study base for the estimations of under-five mortality. Causes of death were registered through a "verbal autopsy" procedure, ie a structured interview with mothers or other close relatives identifying symptoms prior to death 15. Registered symptoms prior to death were discussed within the research team in order to assess the diagnosis.

**Statistical methods.** Differences between means were tested by a non-parametric test (Kruskal-Wallis H, equivalent to Chi square). Differences between proportions were tested by Chi square test. Under-five mortality was calculated by use of the Quest epidemiological and statistical program, the density method 16.

## RESULTS

### Maternal perceptions of diarrhoea and its management

According to the open-ended interviews with these Somali mothers the diet of the lactating mother may influence the occurrence of diarrhoea in her child. Thus, if she had eaten bad food, which was left over from the previous day, she herself and her child may get diarrhoea. Diarrhoea could also be provoked if the lactating mother eats hot chili sauce, fatty meat (especially from sheep), mango fruits or traditional plants in order to clean her bowels.

Sometimes diarrhoea was attributed to fatigue of the lactating mother, especially after being exposed to the environment away from home. If the mother breast feeds her child immediately after returning back home from the work, the breast milk may cause diarrhoea in the child. Thus, the mother has to take a bath and clean her breasts before feeding her child.

The lactating mother should also avoid eating foods, which she had not used the first weeks after delivery. Such foods were considered foreign to the child later on and might cause illness and diarrhoea if eaten by the mother.

When the mother gets pregnant while still breast feeding her breast milk turns into the quality of the first milk (colostrum). This may cause diarrhoea in the breast fed child and therefore she abruptly stops breast feeding.

According to these mothers teething causes diarrhoea in all children, as a natural phenomenon.

One third of the mothers underlined the importance of giving all foods and fluids the child could eat during an episode of diarrhoea, while the rest were putting up certain restrictions or giving special dietary advices for the treatment of the diarrhoea episode. Only two mothers were suggesting that no foods or fluids should be given in the treatment of the diarrhoea.

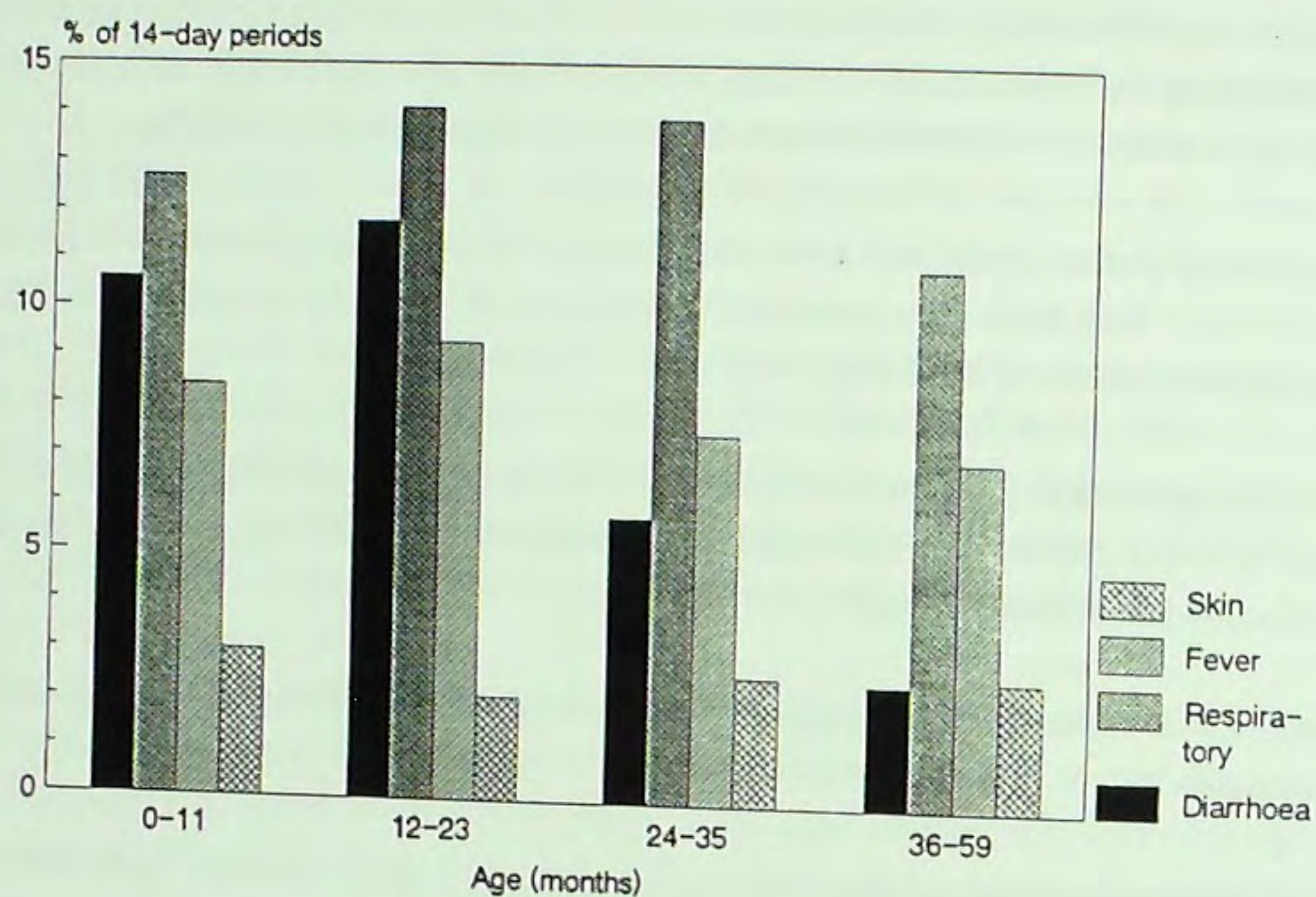
Sour milk, boiled rice, water with sugar and lemon and tea with lemon were considered as good foods for children with diarrhoea. On the other hand foods thought to be harmful were meat, tomato sauce, beans and fresh milk. The mothers emphasized that the children's wishes were important and that they could even eat the restricted food if they preferred to do so.

The reason behind the advices by the mothers, was the belief that if these foods and fluids were not given, the abdomen of the child becomes dry, the child cries, the condition becomes worse and he might die. A major part of the mothers also expressed that foods and fluids *reduces* diarrhoea.

### The occurrence of diarrhoea and its management

Diarrhoea was the second most common symptom during the first two years of life. During an average of one tenth of the observed 2-week periods the children were suffering from diarrhoea. Symptoms from the respiratory tract were most prevalent over all ages, followed by fever, diarrhoea and skin conditions (Figure 1).





**Figure 1.** Proportion of 14-day recall periods with disease symptoms in rural Somali children 0-4 years of age in a one-year prospective study 1987-88 (431 children, 8914 recall periods).

Oral rehydration therapy was ever given to 54% of the 235 children with any registered episode of diarrhoea. In all, ORT was used in 34% of the diarrhoeal disease episodes, in 29% by preparing the UNICEF oral rehydration solution and in 5% by use of home made sugar and salt solutions. Oral rehydration was sometimes combined with other therapies. Over all, traditional treatments were given in 15% of the diarrhoea disease episodes, while antibiotics were used in 10% and other pharmaceuticals in 20% of the episodes. Thirty-five per cent of the episodes were not given any treatment.

A number of different traditional therapies were used to cure and prevent further diarrhoea. Usually these therapies included Qur'an reading, use of herbs, fumigation etc. It should be noted, that surgical procedures like uvulectomy, extraction of tooth germs and burning was performed - sometimes combined - in five per cent of the diarrhoea episodes. Tooth germ extraction was performed to treat and prevent a number of conditions, diarrhoea being one of the most important. It was usually performed in infants, sometimes as early as at 3 months of age. The mean age for this procedure was 10 months.

### Variation in diarrhoea occurrence, management and outcome

The mean proportion of perceived periods with diarrhoea was 5.2%. Significantly higher mean proportions of diarrhoea were reported from households consisting of only one building, where the mother had given birth to fewer children or when the child was below 12 months of age at start of study (Table I).

Children in households with 1-2 children were more frequently treated with ORT than in larger households (Table I). Non-farming mothers were also more frequently using ORT and infants (<12 months) were more often receiving this treatment. There were also non-significant tendencies that young mothers and literate mothers were more prone to use ORT. However, there was an interaction between occupation and literacy in relation to ORT use. Among farming mothers there was no difference in ORT use between literate and illiterate (mean proportion treated 28 and 29% respectively,  $p=0.99$ ). Among non farming mothers the corresponding figures were 76 and 41% respectively,  $p=0.02$ .



**Table I.** Occurrence of diarrhoea and use of oral rehydration therapy (ORT) in relation to a number of background factors among 419 children under the age of 5 years studied for 26 consecutive 14-day periods.

Background factor	No of children	Median number of observed 14-day periods	% of children with any diarrhoea	Mean proportion of periods with diarrhoea	Mean proportion of ORT treated diarrhoea	<i>p</i> ORT treatment
<i>Household</i>						
Adults	1-2	269	24	51	5.3	0.10
	3-	143	24	46	4.9	
Children	1-2	133	23	53	6.2	0.03
	3-	279	24	47	4.7	
Houses	1	210	24	54	5.8	0.27
	2-	202	24	44*	4.5*	
Literacy of head of household	Yes	230	24	54	4.7	0.18
	No	167	24	52	5.4	
<i>Mother</i> Age	<25	146	23	52	5.8	0.08
	25-	264	24	48	4.8	
Parity	1-2	96	23	55	7.2	0.20
	3-	315	24	48	4.6*	
Occupation	Farmer	308	24	51	5.2	0.01
	Not farmer	103	24	46	5.2	
Literacy	Yes	31	20	55	8.1	0.07
	No	380	24	49	4.9	
<i>Child</i>						
Age (months)	0-11	163	23	67	8.2	0.01
	12-59	256	24	37*	3.1*	
Sex	Male	206	24	50	5.0	0.53
	Female	213	24	47	5.1	

\* *p* < 0.05 between groups

Literate mothers more frequently used some treatment - either ORT or traditional therapy - than illiterate. The use of antibiotics or other pharmaceutical drugs in the treatment of diarrhoea was, however, not positively associated with maternal literacy.

The under-five cumulative mortality due to diarrhoea was 76 per 1000 (95% CL 56-96) while the over all under five mortality was 295 per 1000 (95% CL 261-329). (Table II). There was a tendency of lower diarrhoea mortality if the mother or the head of household was literate, although with overlapping confidence limits. The over all cumulative mortality under five was lower when there were more children in the household, when the mother was older or when the head of household was literate.

**Table II.** Cumulative diarrhoea mortality and total cumulative mortality under five years of age in two Somali villages in relation to a number of background factors. Total number of person year included in the analysis 1219. Data collected 1987-1989.

Background factor	Under-five cumulative diarrhoea mortality (per 1000)	95% C.I.	Under-five cumulative mortality (per 1000)	95% C.I.
Children in household	1-2	70	303	209-397
	3-	28	143	104-182
Age of mother	<25	66	312	235-389
	25-	30	131	98-164
Mother's occupation	Farmer	49	300	262-338
	Not farmer	46	259	191-327
Mother's literacy	Yes	39	273	169-377
	No	81	300	264-336
Literacy of head of household	Yes	43	207	156-258
	No	93	324	281-367

## DISCUSSION

A majority of rural Somali mothers perceived childhood diarrhoea as a condition, where oral fluid therapy and feeding was a logical part of its management. In reality, ORT was used in one third of the episodes and literate mothers were more active in the general treatment of diarrhoea episodes as well as in the use of ORT. The under-five diarrhoea mortality was lower in the children of literate mothers.

In this study the mothers' own definition of diarrhoea was used. This may be an advantage, when the aim is to study the occurrence and management of this common disease symptom,



as perceived by the mothers. However, the recognition of diarrhoea in the child – as well as the management of the condition – may be influenced by a number of factors, including child and maternal characteristics such as maternal age, education, number of children and the sex of the child 17,18. The proportion of diarrhoea episodes treated with ORT is sensitive to the diarrhoea definition used and reference period for the question asked, as shown in a study in Bangladesh 19. In this study the same proportion of diarrhoea episodes (14-day recalls) were treated as in a WHO review, where on average 35% of diarrhoea episodes in 47 countries were treated by use of ORT 20.

As has been pointed out by Kroeger 21 the dichotomy between magical-supernatural and physical empirical diseases has been shown to be related to different strategies of treatment. In the Somali tradition all "disease and health are sent by Allah" 12. The mothers revealed a number of physical and other environmental reasons for a child to acquire diarrhoea in addition to that first level of explanation. In our experience from the field work mothers do not always consider diarrhoea as harmful. Adults often take some herbs in order to "clean the bowel". Mothers may also consider one day of loose stools in the child as a positive event, in order to cure or prevent intestinal parasitosis and a variety of general discomfort, the later called *qaras* or *dacar*. However, if the symptoms continue for more than one day or are appearing in a small infant, it may be considered as harmful.

In this area, as well as in other reports 22, some disease symptoms were considered as more suitable for traditional therapies, but traditional and modern medicine were generally not competing and often preferably combined 14. Some of the traditional managements were – like ORT – a sort of symptomatic curative approach, while others, like the extraction of teeth germs and uvulectomy, aimed at healing the reasons behind the symptoms.

The list of perceived causes of diarrhoea shows similarities with results from other cultures 23,24,25. Many of these explanations are empirical, eg the relation between bad, contaminated food and diarrhoea. Others are more complex, but may be based on observations, eg the recommendation to avoid breast feeding immediate after heavy physical work away from home. Most of the presented explanations are not contradicting an oral rehydration management.

From late infancy and onwards the male sex was associated with a higher chance of getting ORT. This may be part of a general gender inequity in health in this society 4,13. Literacy of the mother was one of the strongest promoting factors for ORT use. Similar findings were reported from Kenya 8 and India 23. The results paints a picture of an ORT using mother as young, married, literate, primipara living within a household with another mother and

children: a picture of improved social power of the mother. It should be noted, that the literate mothers did not choose ORT instead of traditional therapies – they were generally more active in treating this condition in their children – however not in using antibiotics more often than others.

Mothers with few children reported more diarrhoea episodes. Not farming mothers in households with fewer children were more active in using oral rehydration therapy. There was also a tendency, however not significant, that young and literate mothers were more active in use ORT. This may indicate that mothers with better possibilities to allocate time to child care were more prone to use ORT. In a society like this literacy may also imply an improved social power of the mother – the primary health manager in the household. Thus, combatting illiteracy may contribute to a better treatment of child diseases, e g in the household management of childhood diarrhoea.

A household with few children was associated with more active use of ORT. This group had a significantly higher under-five mortality. The under-five diarrhoea mortality showed the same tendency, although not significant. Households with more children are often economically better off in this rural community and a number of hygienic, nutritional or other factors may be causative.

Although not statistically significant, there was an indication of lower diarrhoea mortality when the head of household or the mother were literate. The over all under-five cumulative mortality was significantly associated to literacy of head of household, but not to maternal literacy. This tendency of lower diarrhoea mortality may of course be due to confounding, eg the nutritional status of the child. Anthropometric data were not available for analysis for the entire period of demographic surveillance.

ORT is an appropriate technology, which may or may not agree with traditional concepts of diarrhoea management. A relatively high proportion of diarrhoea episodes were treated with ORT. Our results indicate that the mothers' ability to allocate time to health care and her general position in the household (non-farming, literate) may be important factors for the use of ORT. Health professionals and managers should investigate mothers' situation as care providers as well as their perceptions of disease and its management and design interventions accordingly.



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