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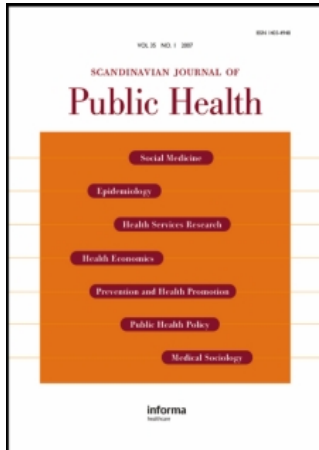
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Patterns of local migration and their consequences in a rural Ethiopian population

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Aims: In the context of the Butajira Rural Health Programme (BRHP) in Ethiopia, which has maintained demographic surveillance in selected communities since 1987, this paper investigates patterns of migration and their consequences within that population over a ten year period 1987–1996. *Methods & Results:* Based on observations of over 336,000 person-years in nine rural villages and one small town, 48% of individuals migrated in or out of the study area at some stage, as recorded in monthly household visits. There was a net incidence of migration into the urban area, particularly among young adults. Mortality was higher among residents compared with in-migrants, with rates of 10.5 (95% CI 7.5 to 14.9) and 8.2 (95% CI 5.8 to 11.7) per 1,000 person-years respectively after adjustment for age, sex and area of residence, a rate ratio of 1.3. Fertility among in-migrant and resident women was similar, at rates of 0.26 and 0.28 births per reproductive year respectively. *Conclusions:* The causes of the observed differences in mortality are not clear, though they may be partly due to self-selection effects among migrants, and may have important implications for future health policy and planning in Ethiopia and other similar settings.

Key words: Africa, demography, Ethiopia, fertility, health transition, migration, mortality, rural, urban.

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INTRODUCTION

Rural Ethiopia remains one of the world's most traditional societies, in which many features of rural life have remained unchanged for centuries. However, the effects of external influences are beginning to be seen, not least of which are trends to greater mobility and small-scale urbanization. A demographic surveillance system has been implemented in one rural area, Butajira, some 130 km south west of Addis Ababa (1, 2) and this paper presents patterns of migration and consequences for mortality based on a decade of observation from 1987 to 1996.

At the global level, increasing rural to urban migration has been noted as a general concomitant to development. In recent decades population growth in urban areas of Africa, Asia, and Latin America has outstripped both that of corresponding rural areas and that of urban areas in North America and Europe, with up to 40% of developing country urban growth being attributed to rural–urban migration (3). It has further been suggested that rural to urban migrants in many developing

countries may enhance their children's survival as a result of migration (4). Urbanization in general has been associated with reduced mortality (5), while urban in-migrants as a subgroup may thrive compared with their neighbours of urban origin, as reported from Thailand (6) and Nigeria (7). Migrant women in a range of African countries have also been observed to experience a postmigration decline in fertility (8), as was also found in China (9). However, as for many population-based issues in developing countries, detailed longitudinal data on patterns of in-country migration and its consequences are scarce.

Irrespective of migration, gender-specific crude mortality rates in the three ecological zones within the Butajira Rural Health Project between 1987 and 1996 were 9.3 and 6.7 per 1,000 person years for men and women respectively in Butajira town, 16.0 and 13.7 in the surrounding rural highlands and 20.9 and 18.3 in the rural lowlands (1). Thus residence in this relatively small town seems to be associated with significant benefits in terms of survival, compared with the rural surroundings.

Within this overall picture, therefore, this paper seeks to explore patterns of migration in and out of the surveyed communities, examining the consequences for those who move and those who stay behind.

Neither the chief editor, Stig Wall, nor the managing editor, Maria Emmelin, has had any part in the review and decision process of this paper.

METHODS

While in some countries the registration of all vital events has been an established practice for centuries, a substantial proportion of today's births, deaths, and migrations pass unrecorded (10). Thus any detailed analysis of demographic patterns requires implementation of a system to capture individual data on a longitudinal basis as a starting point. The basic design and methodology of the Butajira Rural Health Programme reflects this need, and has been described in detail elsewhere (1). During the ten-year period 1987–96, monthly visits were made by field workers to households in the Butajira area to elicit details of vital events. As part of this monthly surveillance system for vital events, people who moved into the study communities were recorded as doing so together with the date of moving, as were those who moved out. These data were collected and entered into a database of personal records, which has been used as the basis for these analyses.

The system as originally implemented did not permit the detailed recording of repeated in- or out-migration events for the same individual, a methodological limitation which has subsequently been revised. Thus, for the present analysis, consideration is limited to grouping individuals as ever or never moving in or out. Also origins of in-migrants and destinations of out-migrants are not known, although it is reasonable to assume that most migration is reasonably local, including in some cases to or from the city of Addis Ababa, approximately 130 km from Butajira.

Data were handled using dBase and Epi-Info software, with person-time analyses undertaken using the Cohort program (Umeå University).

RESULTS

Of the total of 60,446 individuals observed at any time during the 10-year period of surveillance, 13,036 in-migrated, 11,292 out-migrated, 4,948 did both and 31,170 never moved. Table I shows these figures by area and the associated person-years of observation.

Age-specific analyses have used the age groups 0–14 (since children are considered mainly to migrate as a result of their caretakers moving), 15–24, 25–44, 45–64, and 65+. Table II shows age- and gender-specific incidence of in- and out-migration in the three ecological areas over the 10-year period. Figure 1 shows the net incidence of migration on a similar basis.

Mortality analysis for out-migrants in this setting is not possible since there is no mechanism for postmigration follow-up. However, comparisons of mortality patterns between in-migrants and permanent residents can be made, the crude results of which are given in Table III. Since age–sex population structures differ between areas (1) and between in-migrants and residents, standardization of mortality rates is required in order to make meaningful comparisons. Table IV shows standardized mortality rates for in-migrants and permanent residents by area and gender (age standardization groups: infants, 1–4; five-year groups to 79; 80+, with reference to female in-migrants to the urban area).

A cross-sectional retrospective fertility survey among 4,818 adult women from the same population in 1995 found a lower crude fertility rate of 3.8 births/woman among in-migrants compared with 6.5 among permanent residents. However, this apparent difference largely reflects the younger age spectrum of migrant women, with actual rates of 0.26 and 0.28 births per reproductive year recalled for in-migrants and residents respectively.

DISCUSSION

Migration was a common phenomenon in the population during the decade of observation, with 48% of ever-registered people migrating and 34% of the total person-years observed being associated with migrants. The net migration into the urban area in all age groups except for the elderly might be explained by economic and social trends away from the traditional rural lifestyle and towards education, trade, and employment. At the same time a retirement phenomenon may be

Table I. Individuals and person-time observed in the Butajira Rural Health Programme by migration status and area from 1987 to 1996

		Rural highlands	Rural lowlands	Butajira town	Overall
Never moved	<i>n</i>	14,794	11,918	4,458	31,170
	person-years	108,116	80,876	32,846	221,838
In-migrated only	<i>n</i>	4,492	4,004	2,796	11,292
	person-years	21,430	17,957	11,872	51,259
Out-migrated only	<i>n</i>	6,172	4,542	2,322	13,036
	person-years	23,666	17,488	9,774	50,928
Multiple migration	<i>n</i>	1,500	1,480	1,968	4,948
	person-years	4,007	3,350	4,689	12,046

Table II. Incidence per 1,000 person-years of in- and out-migration observed in the Butajira Rural Health Programme by gender, age group, and area from 1987 to 1996

Age group	Rural highlands				Rural lowlands				Butajira town			
	In-migration		Out-migration		In-migration		Out-migration		In-migration		Out-migration	
	M	F	M	F	M	F	M	F	M	F	M	F
0-14	43	46	47	48	44	48	46	50	87	104	59	71
15-24	61	103	71	95	89	131	64	90	149	211	101	111
25-44	41	30	38	31	56	38	43	35	191	118	74	69
45-64	17	22	22	29	33	46	24	42	72	46	54	34
65+	22	49	29	49	38	100	30	56	27	50	43	60
All	42	48	47	51	53	59	47	54	109	115	69	75

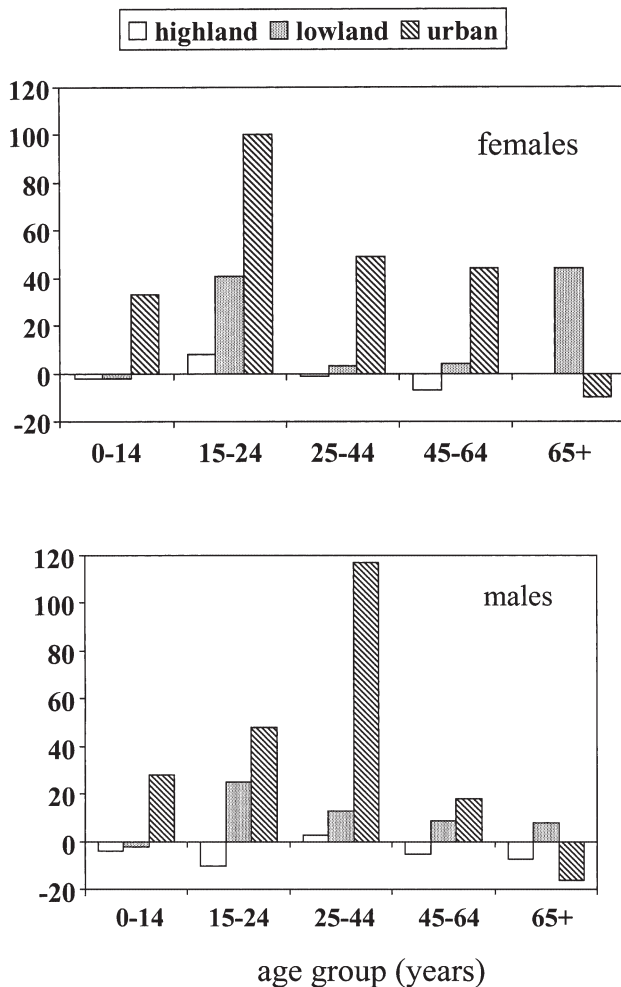


Fig. 1. Net incidence of migration per 1,000 person-years observed in the Butajira Rural Health Programme by gender, age group, and area from 1987 to 1996.

taking place whereby there is a net out-migration from the urban area amongst the elderly, though detailed data to support these hypotheses are not available. The extensive net migration of women aged 15-24 and men aged 25-44 into the urban area probably also reflects

a customary disparity in age between married men and women, as reported elsewhere (11).

Mortality rates were generally lower among in-migrants compared with the resident population, across different age groups, genders and areas, and particularly among children. It is unfortunate that it is impossible to draw any conclusions about the relative mortality of out-migrants, but the lack of any national death registration system in Ethiopia (as in many developing countries) obviously precludes this. Although standardization reduces the magnitude of mortality differences between in-migrants and residents, the overall standardized rates of 8.2 and 10.5 deaths per 1,000 person-years respectively reflects a difference that is approximately consistent over various subgroups. It therefore seems that in-migrants generally experience lower mortality than residents, even after standardizing for their different age profile, gender, and area of residence. Whilst from these data our findings do not demonstrate statistical significance, they nevertheless raise interesting issues about possible characteristics of migrants. Even in the relatively low overall mortality of the urban setting, in-migrants are still considerably advantaged. The causes behind all this are unclear, but there could be a "healthy migrant" effect whereby in-migrants tend to be self-selected for advantageous factors, analogous to the healthy worker effect sometimes observed in occupational settings.

There is very little similar material from developing communities with which to make comparisons, particularly stretching over a sufficient period of time to avoid any short-term fluctuations. No difference in fertility among in-migrant women was found, although a longer term follow-up after migration could be necessary to detect any such change, as observed elsewhere (8, 9). The available data did not allow any detailed analysis of why individuals chose to move or remain in one location, and a more detailed qualitative approach to these issues in the future might help in understanding the mortality patterns observed. It may

Table III. *Crude mortality rates per 1,000 person-years for original residents and in-migrants observed in the Butajira Rural Health Programme by gender, age group, and area from 1987 to 1996*

Age group	Rural highlands				Rural lowlands				Butajira town			
	Males		Females		Males		Females		Males		Females	
	Residents	In-migrants	Residents	In-migrants	Residents	In-migrants	Residents	In-migrants	Residents	In-migrants	Residents	In-migrants
0–14	21.0	9.4	18.0	7.8	32.1	15.3	27.0	12.4	10.4	4.1	8.2	3.7
15–24	5.5	5.7	5.5	5.2	9.1	3.3	8.0	5.0	3.3	3.7	4.2	1.1
25–44	8.0	6.3	7.5	7.2	9.0	6.5	8.3	4.8	9.5	3.4	3.1	2.0
45–64	18.4	22.9	17.9	19.3	19.8	8.7	25.7	24.9	18.7	12.0	7.9	12.2
65+	61.1	80.5	59.0	57.0	62.0	20.1	56.6	66.8	44.7	38.0	30.9	27.6
All	17.1	10.2	14.7	9.0	23.3	9.2	20.0	10.9	10.9	4.8	7.9	3.6

Table IV. Standardized mortality rates per 1,000 person-years for original residents and in-migrants observed in the Butajira Rural Health Programme by gender, age group, and area from 1987 to 1996, standardized to female in-migrants in the urban area

Group	Adjusted for	Residents	95% CI	In-migrants	95% CI	Ratio residents: in-migrants
Highland	Males	10.4	7.3–14.8	10.3	6.9–15.2	1.0
	Females	9.9	6.9–14.1	8.6	5.8–12.7	1.2
Lowland	Males	14.3	10.0–20.3	9.0	6.0–13.5	1.6
	Females	12.4	8.7–17.7	10.7	7.2–15.8	1.2
Urban	Males	6.9	4.7–10.3	5.8	3.3–10.3	1.2
	Females	5.0	3.4–7.5	3.6	ref	1.4
Highland	Age and sex	10.2	7.1–14.4	9.4	6.5–13.6	1.1
Lowland		13.4	9.4–18.9	10.1	6.9–14.6	1.3
Urban		5.8	4.0–8.3	4.2	2.8–6.4	1.4
All	Age, sex and area	10.5	7.5–14.9	8.2	5.8–11.7	1.3

also be possible and instructive in future to undertake comparative analyses of migration patterns between different demographic surveillance systems, for example within the framework of the Indepth network (12).

As yet it is not possible to evaluate the medium- to long-term effects of the observed net migration to the urban area. The relatively rapid development and expansion of even modest urban centres like Butajira is evident throughout Ethiopia, and indeed in many developing countries. The suggestion from these data that such migrants are a self-selected advantaged group is likely, over a longer period, to have consequences for the traditional rural communities that are left behind. Since much of Ethiopia's traditional lifestyle and agricultural production is located in the rural milieu, the phenomenon of younger adults leaving for the towns may have important socioeconomic implications. As is being observed elsewhere, this may well be accompanied by a shift from infectious to non-communicable disease and mortality (13), in addition to much higher rates of HIV infection and AIDS currently observed in Ethiopian towns and cities compared with rural communities (14). Whilst much more detailed sociological and anthropological studies may be needed to explore these phenomena further, both of these issues should be causes for concern to health planners and policy makers in Ethiopia and similar environments.

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