Mamre Community Health Project —
demographic, social and environmental profile
of Mamre at baseline

J. M. KATZENELLENBOGEN, G. JOUBERT, M. HOFFMAN, T. THOMAS

Summary

Demographic, social and environmental information was collected from 4,623 residents in 870 Mamre households: 34.3% of the population were under 15 years and 4.4% over 65 years of age, while 2.7% of adults had had no education, 42.1% had only primary school education, 51.1% secondary school education and 4.1% had had some tertiary education. Education and age were inversely related. Of employable adults 64.7% were working. Community, social and personal services and manufacturing accounted for 76% of the male and 92% of the female jobs. Cape Town or Atlantis was the workplace for 78% of male and 87.2% of female workers. Of the labour supply 17.2% were unemployed; 75% of employed people were semi-skilled and unskilled workers.

There were a mean of 5.5 persons per household. Of the houses 18.4% were older than 80 years; 38% of households had inside taps and 98% had outside tap(s). Sewage disposal by the bucket system was used in 86% of households while 13% used flush toilets. The mean amount of money spent on fuel was R10.92 per person per month.

The Mamre community is well past the initial phase of rural-urban transition in terms of its sociodemographic profile. At present, critical environmental infrastructural changes are being introduced.

The promotion of health in a community demands a full assessment of the health status of the population and its subgroups. Health promotion activities are always interventions to the complex societal and environmental systems resulting from historical, economic, socioeconomic and biological processes. Knowledge of this complex network and constant monitoring of any changes are essential if health improvements are to be achieved. This is especially the case when a community is undergoing rapid rural-urban transition.

The distribution of events of epidemiological interest according to certain demographic, social and environmental variables can aid in identification of susceptible population subgroups and can lead to the identification of risk factors for certain conditions. Such knowledge, in turn, generates preventive and/or curative interventions.

The Mamre Community Health Project has as its long-term goal the improvement of the health of the residents of Mamre. The initial phase of this collaborative project aimed to assess the health status of the population, and as such collected baseline information for future studies and interventions. In this article the demographic, social and environmental profile of the community at baseline are described.

Methods

Eight hundred and seventy households, representing over 98% of the total, were visited and information was obtained on 4,623 residents by 10 trained interviewers who were selected from the community. The demographic, social and environmental data collected formed the basis for a number of analytic studies and for an ongoing longitudinal study in Mamre.

Results

Demographic data

Age and sex composition

Of the 4,623 residents for whom information was obtained, 2,291 (49.6%) were male and 2,332 female. The age distribution is set out in Fig. 1; 34.3% of the population were less than 15 years of age while 4.4% were aged 65 years or over. The shape of the population pyramid is similar to that of a transitional
community, with a narrowing of the base. The male/female ratio remains about 1.0 for all ages until the 45-54-year group after which it drops drastically, reflecting the higher life expectancy of women.

**Birth rate and parity**

In the survey for 1986 127 births were reported, implying a crude birth rate of 27/1000 population. Parity increases with age — women 21-24 years of age had a median of 1 child compared with 4 in women aged 45-54 years and 7 in women aged over 55 years. Ten per cent of females between 14 and 19 years of age had had children. Of the 33 teenage mothers, 30 were single.

**Migration**

The proportion of people who had spent their first year of life in Mamre decreases with age for both sexes, showing a slight increase in the over-75-year group. A greater proportion of men than women of all ages had been born in Mamre. Cape Town was the largest source of newcomers in all age groups except the over-75-year group (Table I).

**Education level**

There were 1160 children (25% of the total population) aged between 7 and 15 years or still attending school. Only 5 children in this group did not attend school. Each school standard between Sub A and Standard 6 has approximately 10% of the schoolgoing population. However, from Standard 7 there is a drop in the percentage, with only 3.8% of schoolchildren being in Standard 9 and 2% in Standard 10.

The age distribution and level of education of individuals over 15 years of age and no longer attending school are set out in Table II: 27% had had no formal education; 42% had only primary school education; 51% had had secondary school education; and 41% had had some form of tertiary education. The level of education was related to age, with the younger age categories having a higher level of education than the older age categories.

With increasing age, the proportion of individuals who had no schooling similarly increased, 17.5% of respondents aged 65 years or older having had no formal education.
Employment

The 2501 respondents aged between 15 and 65 years and no longer attending school (54% of the total population) were considered to be employable and constituted the figure for manpower. Of these, 15.9% were housewives, 64.7% were employed, 16.2% were unemployed (including people on disability grants), 1.5% were students and 1.6% fell into none of these categories (e.g. were in prison).

Thirty-five per cent of the total population and 53.3% of the population aged over 15 years were economically active. Of the employed men, 42% worked in the community, social and personal services sector which includes central, provincial and local government. Of these men 55% worked for the Regional Services Council (Divisional Council of the Cape at the time of the survey), 14% for the central government and 10% for the local government. Another 34% of the employed men worked in the manufacturing sector, predominantly the motor and electrical divisions (Table III).

The major employment sector for the employed women was manufacturing — 71% of the employed women worked in this sector and 55% of these worked in the clothing manufacturing division. The second most important employment sector was community, social and personal services, in which 21% of the employed women worked (Table III).

Of the employed men, 45.7% worked in Cape Town, followed by 32.3% in Atlantis and 10.2% in Mamre. The proportion of employed men in each age group working in Mamre increased with age, with 6.9% of those in the 15-24-year group and 27.5% of those in the 55-64-year group working in the village itself. The majority of employed women (58.3%) worked in Atlantis, followed by 28.9% in Cape Town and 8.4% in Mamre. The 35-44-year group of working women had a higher proportion working in Mamre (15.8%) than the other age groups. A greater proportion of younger men and women worked in Atlantis than in Cape Town.

Unemployment

Calculation of the unemployment rate using those available for work (excluding housewives, disabled people on grants and students) as the denominator gives a figure of 17.2%.

Among males, the proportion of unemployed was highest (22.8%) in the 15-24-year age group; it was constant (14-18%) for the other age categories until 55 years, when it increased to 37.0%. Among females, the rate in the youngest age group (25.6%) compared with males. However, the unemployment rate decreased substantially by age to between 1% and 2% in the over-45-year groups, probably indicating the absorption of women into the role of housewife. Two people reported current unemployment benefits.

Social class

Those employed were classified into social classes according to their occupation as set out by the Centre for Applied Social Sciences (CASS) (Table IV). Table IV gives the distribution of education and household environmental factors for the different occupational groups, the unemployed (excluding disabled on grants), the aged and housewives; 75% of all employed people fell into the semi-skilled and unskilled categories.

Household data

Household size and room occupancy

For the 870 households visited, there was a mean of 5.3 persons per household (range 1-17).

The median number of rooms per house (excluding bathroom, kitchen and storeroom) was 3. Room occupancy ranged...
### TABLE III. SECTOR OF EMPLOYMENT, MALES AND FEMALES

<table>
<thead>
<tr>
<th>Sector</th>
<th>Males</th>
<th>Females</th>
<th>Males</th>
<th>Females</th>
<th>Males</th>
<th>Females</th>
<th>All coloured / Asian</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. %</td>
<td>No. %</td>
<td>No. %</td>
<td>No. %</td>
<td>No. %</td>
<td>No. %</td>
<td>(%).</td>
</tr>
<tr>
<td>Agriculture</td>
<td>25 3,3</td>
<td></td>
<td>7 4,2</td>
<td></td>
<td>32 3,5</td>
<td></td>
<td>32 2,0</td>
</tr>
<tr>
<td>Mining</td>
<td>2 0,3</td>
<td></td>
<td>0,6</td>
<td></td>
<td>3 0,3</td>
<td></td>
<td>3 0,2</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>286 37,5</td>
<td>450 75,3</td>
<td>33 19,9</td>
<td>34 41,0</td>
<td>319 34,4</td>
<td>484 71,1</td>
<td>803 49,9</td>
</tr>
<tr>
<td>Electricity, water, gas</td>
<td>25 3,3</td>
<td></td>
<td>1 0,2</td>
<td></td>
<td>28 3,0</td>
<td></td>
<td>28 1,7</td>
</tr>
<tr>
<td>Construction</td>
<td>53 6,9</td>
<td>4 0,7</td>
<td>16 9,6</td>
<td>0 0,0</td>
<td>68 7,4</td>
<td>4 0,6</td>
<td>73 4,5</td>
</tr>
<tr>
<td>Wholesale, retail</td>
<td>47 6,2</td>
<td>33 5,5</td>
<td>12 7,2</td>
<td>8 9,6</td>
<td>59 6,4</td>
<td>41 6,0</td>
<td>100 6,2</td>
</tr>
<tr>
<td>Transport, communication</td>
<td>16 2,1</td>
<td>1 0,2</td>
<td>5 3,0</td>
<td>2 2,4</td>
<td>21 2,3</td>
<td>3 0,5</td>
<td>24 1,5</td>
</tr>
<tr>
<td>Financing, insurance</td>
<td>41 1,0</td>
<td>5 0,8</td>
<td>0 0,0</td>
<td></td>
<td>4 0,6</td>
<td>5 0,7</td>
<td>14 0,9</td>
</tr>
<tr>
<td>Community, social, personal</td>
<td>300 39,4</td>
<td>105 17,6</td>
<td>88 13,0</td>
<td>39 47,0</td>
<td>388 41,8</td>
<td>144 21,1</td>
<td>533 33,1</td>
</tr>
<tr>
<td>Total</td>
<td>762 100</td>
<td>598 100</td>
<td>166 100</td>
<td>83 100</td>
<td>928 100</td>
<td>681 100</td>
<td>1609 100</td>
</tr>
</tbody>
</table>

### TABLE IV. DISTRIBUTION OF SOCIAL CLASS AND EDUCATION AND ENVIRONMENTAL FACTORS IN MAMRE

<table>
<thead>
<tr>
<th>Education (adults)</th>
<th>Household environment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of people/room</td>
</tr>
<tr>
<td>Social class</td>
<td>Tertiary education (%)</td>
</tr>
<tr>
<td></td>
<td>Household (%)</td>
</tr>
<tr>
<td>Professional</td>
<td>81 3,6</td>
</tr>
<tr>
<td>White-collar</td>
<td>117 5,2</td>
</tr>
<tr>
<td>Skilled artisans</td>
<td>196 8,7</td>
</tr>
<tr>
<td>Semi-skilled workers</td>
<td>734 32,5</td>
</tr>
<tr>
<td>Unskilled workers</td>
<td>491 21,7</td>
</tr>
<tr>
<td>Unemployed</td>
<td>345 15,3</td>
</tr>
<tr>
<td>Aged</td>
<td>200 8,8</td>
</tr>
<tr>
<td>Housewives</td>
<td>367 17,6</td>
</tr>
</tbody>
</table>

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*According to social class of individual, excluding 140 people on disability grants, students, etc.

†According to social class of head of household for which environmental information could be linked (815 households).
The profile family 'bulge' in the age group 15 - 24-years reflects the easy access to schooling in the 44- and 45-year age groups. The size is substantially larger than that of the national pyramid for the coloured population. The pyramid is very similar to the national pyramid for the coloured population based on the 1985 census for all ages except the 35 - 44- and 45 - 54-year age groups.

The proportions of the population under the age of 15 years (34%) and over the age of 65 years (4,4%) are in keeping with the pattern normally seen in developing communities. The birth rate of 27/1 000 and the crude death rate of 6,7/1 000 are similar to those of the coloured population of Cape Town, which are 28,6/1 000 and 6,0/1 000 respectively. The increase in parity with age suggests a secular effect on family size. Assuming that women aged 45 - 54 years are close to completing their families, their completed family size is substantially less than that of older women.

Water and sanitation

Filtered and treated water was piped to all households; 338 households (38%) had taps inside and 96% of all households had an outside tap. A water source other than the reticulated water supply was used by 116 households (13%); 8% made use of water from the local fresh water spring ("die oog"). The bucket system was used for sewage disposal by 86% of households, while flush sanitation was available in only 13%; 8% of houses had both facilities.

Fuel

For cooking purposes, 42% of households used wood and gas or paraffin, 29% used only wood and 28% used only gas; 55% of households used candles as well as paraffin for lighting, 29% used paraffin only and 6,5% used candles only. No fuel was used for heating in 67% of households.

Seventeen per cent of households spent less than R20 per month on fuel, 48% spent between R20 and R50, and 6% spent more than R100. The mean amount of money spent on fuel per household member per month was R10,92, while the median was R8.67.

A quarter of the 251 households which used only wood for cooking spent no money on buying wood.

Telephones

Forty-four per cent of the households in Mamre had telephones.

Animals

Eighty per cent of households (692) reported that the family had animals in the yard. In Mamre there were 993 dogs, 499 cats, 945 chickens, 657 pigeons, 30 pigs, 18 cows, 42 donkeys, 10 horses and 4 goats. In 678 cases (78% of households) there was a fence that enclosed the yard completely; 729 households (84%) considered that stray animals were a problem.

Discussion

Demographic structure of Mamre

The population pyramid (Fig. 1) resembles that of a developing community, while there is an interesting narrowing of the base of the pyramid suggesting a fall-off in the proportion of the very young. The 'bulge' in the age group 15 - 24-years may reflect declining child mortality in the 1960s. The pyramid is very similar to the national pyramid for the coloured population based on the 1985 census for all ages except the 35 - 44- and 45 - 54-year age groups.

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Migration

The cross-sectional design of the study makes it difficult to answer detailed questions concerning migration into and out of Mamre. It is possible to give information on migration into Mamre over the last few decades. The fact that a greater proportion of men than of women have remained in Mamre reflects the tendency of women to move to their spouse's place of residence. The proportion of all age groups who were not born in Mamre indicates that Mamre is not a totally stable community. There is a tendency for people to move back to Mamre after retirement.

Education level

With only 2,7% of adults (mostly the elderly) having had no formal education, and with all but 5 children of school-going age attending school, the Mamre community can be considered as having good basic educational exposure; 39,7% of the whole community have achieved at least Standard 6. This lies near to the national figure for coloureds in the Cape Peninsula (40,9%) and is somewhat higher than the national figure for coloureds (31%). This educational profile reflects the easy access to schooling made available in Mamre by the Moravian Church, despite the absence of a high school in the village. The proximity to Cape Town (and recently to Atlantis) facilitates access to high school. There is, however, evidence of a marked decrease in school attendance after Standard 6, but the sex ratio of school attendees does not show any clear trend.

The tendency of the younger people to have significantly higher levels of education than the older people reflects the changing educational profile of the South African population in general, and of coloured people in particular. The marked increase in the proportion with Standard 9 or 10 education in the 15 - 24-year group (17%) compared with the 25 - 34-year group (8%) and the older group (± 3%) suggests that improvements are very recent and substantial.

Information about education is important in health, particularly since the level of female education has been shown to relate to the extent and quality of child survival.

Employment

The proportion of economically active people in the Mamre population during 1986 (35,7%) is lower than the figure for coloureds in the Cape Peninsula in 1985 (42,3%). With 90,5% of employed people working outside Mamre, the village economy can be considered to be dependent on the greater Cape Town and Atlantis economies. While Atlantis provided the greatest number of jobs (43,2%), the majority of these were for women working in the light manufacturing sector. A further 38,7% were based in Cape Town, which accounted for almost half of the male and 28,9% of the female jobs. The percentage of females employed in Atlantis decreased with age, while the percentage of those employed in Cape

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Town jobs has the reverse trend. Among men employment rates in Atlantis decrease with age, but employment rates in Mamre increase with age. For both males and females, jobs were mainly in the manufacturing and community, social and personal sectors. When compared with the distribution by sector of the employed coloured/Asian residents of Cape Town, a substantially greater proportion of Mamre employed worked in the manufacturing and services sectors. Smaller proportions of the Mamre employed worked in agriculture/fishing, construction, wholesale/retail and finance. Finer analyses of the specific work sectors and, in particular, the nature of occupational exposures that impact on health, will assist in occupationally related studies in the future.

Unemployment

The unemployment rate in Mamre is comparable to such estimates for coloureds in 1985 in the Greater Cape Town area (17.2% v. 18% using extended labour supply as the denominator). The corresponding figures for Cape Town whites are 6.25% and 8.6% and for Cape Town blacks 18% and 24%. A 1982 unemployment estimate of active work seekers in Atlantis was 11%. The unemployment figures for young men and women reflect the lack of employment opportunities for school leavers. Of concern is the high proportion of unemployed among men in the 55-64-year age group (37%). This will have to be investigated in future studies. It seems probable that older men who are retrenched are never reabsorbed into the economy. Health and social consequences of this finding will also be investigated.

Social class

There is no single adequate measure of social class available. Instead a variety of variables are used as indicators. While the CASS classification used in this study is useful, it merely incorporates the occupational dimension of social class. In a community which is predominantly working class, this classification is fairly crude. Other variables such as income, educational and environmental factors increase the heterogeneity of the population, and may provide finer indications of social class and prove to be more useful in future studies that investigate the relationship between social class and health outcomes. Table IV shows the distribution of occupational social class categories and certain household environmental variables. The median number of rooms per household, and the percentages with indoor taps and flush toilets, appear to be related to occupational level.

Religious affiliation

The fact that 90% of the community identify themselves as Moravians reflects the historical roots of the community. The church remains an important influence in the village, and plays a central role in the everyday life in Mamre. Other studies have shown that strong social and community ties (e.g. church membership) are associated with a decreased risk of mortality.

Environmental information

Housing

The effects of housing on health have been documented extensively. Many household accidents and communicable and non-communicable conditions (e.g. lead poisoning) are associated with housing. Similarly, mental health and psycho-social well-being, while difficult to define and quantify, can be linked to home environment. In this study, baseline information on the quality of housing as well as crowding indices were collected for use in future studies aimed at looking at the health effects of housing. The average number of people per habitable room, a frequently used crowding index (although the median would be a statistically more meaningful figure), was found to be 2.03 in Mamre. The 1980 averages for various coloured suburbs in Cape Town range from 0.82 to 2.73 (median 1.81), while those for the white suburbs range from 0.44 to 1.15 (median 0.63). When grouped with Cape Town coloured townships, Mamre falls within the 25% of areas with the highest level of overcrowding. A study investigating the relationship between overcrowding and tuberculosis in Mamre has provided more in-depth information concerning housing in Mamre.

Water supply

In 1973 a sand filtration plant and piped water were introduced into Mamre. In 1979 the reticulation system was linked to the Pella reservoir. Despite this, many homes still use the natural spring which used to be the main village water source and was responsible for the 1976 outbreak of typhoid fever (Medical Officer of Health, Cape Divisional Council — personal communication). Personal preference and water costs explain most of the continued use of this water source, which was officially closed after the typhoid outbreak.

Domestic fuel utilisation

The lack of access to electricity in Mamre — uncommon in planned townships in urban areas — is reflected in the profile of domestic fuel utilisation. Wood and/or gas were used for cooking in 98% of households. Candles and/or paraffin were the most common fuel used for lighting. The 4.9% of households using petrol for lighting probably have access to household generators.

Careful study of fuel utilisation may well provide researchers with fairly sensitive socio-economic indicators. Household expenditure on fuel, whether gross or per capita, may be one such indicator. For example, those households which spend no money on buying wood (8% fetch wood in the forest) and spend less than R20 per month on fuel (17%) probably have the least favourable socio-economic situations. The other extreme would be the 4.9% of households with their own generators.

The relationship between domestic fuel consumption and respiratory diseases will be investigated in the future.

Conclusion

At the time of the baseline household interview survey, many demographic changes had already started to occur in Mamre. The Mamre community can be considered to be well past the initial phase of rural-urban transition in terms of its socio-demographic profile. The population pyramid, as alluded to previously, is one of a transitional community. The educational profile points to recent and substantial changes in the level of education in the community. Migration into and out of Mamre has been occurring on a fairly substantial scale for over a century, with increased movement of non-Moravians into the village in the post-war era. The growth and development of Atlantis, 5 km away, has accelerated this trend. The employment profile reveals almost no agricultural activity of note, with
most employment being offered within the Cape Town-Atlantis economies in the semi-skilled and unskilled employment categories. Mamre can thus be considered a dormitory town to Cape Town/Atlantis, with its inhabitants dependent on these centres for their employment. However, the village has maintained its unique social character, with the church remaining an important social influence.

The collection of baseline information has, however, occurred at a critical time in the development of Mamre. Until 1986, despite exposure to modern services in nearby (newly) developed areas, the majority of Mamre residents did not have access to basic modern bulk services. Structural changes and repairs were neglected, and inhibited the development of a modern lifestyle more in keeping with the sociodemographic profile of the village. Major environmental infrastructural changes are now being introduced which could have significant effects on the lifestyle and health of the residents. In many developing communities, such changes have been accompanied by dramatic improvements in crude health outcomes. The continued monitoring of these factors will deepen the understanding of the process of urbanisation in general, and its relationship to health specifically.

As Mamre changes, such information should allow critical questions concerning health and development to be addressed. Only when the beneficial and adverse effects of such changes are clarified can effective strategies be planned to ensure that social and environmental improvements are accompanied by improved health and quality of life.

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REFERENCES