Health status of an indigenous population in India receiving preventive and curative health care services

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Introduction

Indigenous populations are routinely marginalized and deprived of their access to fundamental resources. Inferior health outcomes among indigenous communities can in part be attributed to inadequate access to health care facilities and medical services. Among the scheduled tribes or adivasis of India, mortality, morbidity and malnutrition rates remain particularly high when compared to the Indian population at large [1, 2]. These communities, officially recognized under the fifth schedule of the Indian constitution, comprise a significant 8.2% of the Indian population. Dispensation of health care services to this population, however, by the government and private sector alike, is disproportionately lacking [3]. Remoteness of villages, uncooperative attitudes among medical personnel, limited manpower, and a lack of awareness within tribal communities all pose difficulties in achieving adequate health care delivery [4]. Government initiatives within recent years have highlighted the need to rectify these incongruities and address tribal health care issues. Health care targeted to serve the needs of the adivasi community is critical in maintaining an acceptable and adequate level of health care for all strata of Indian society.

The adivasis of Gudalur Valley, located in the Nilgiris district of Tamil Nadu, number over 25,000 and are comprised of five distinct tribal groups: Paniyas, Bettakurumbas, Kattunaickens, Mullakurumbas, and Irulas. Prior to social and governmental policies that displaced them from their homes and means of livelihood, they were a self-sufficient forest-dwelling people. Changes within the past few decades, however, including deforestation, exploitation as seasonal unskilled workers, and marginalization from mainstream society, led to an overall degradation of their lifestyle. They suffered deterioration in their general health status, demonstrating high rates of maternal mortality, child malnutrition, and morbidity due to preventable causes.

Actions undertaken by a group of social activists and medical care givers have helped restore some aspects of their well-being. In particular, the Association for Health Welfare in the Nilgiris (Ashwini) has developed an accessible and cost-effective system of health care delivery that addresses their community-specific

needs. At the village level, trained adivasi health animators provide basic preventive and curative care through education, child monitoring, family planning and antenatal programs. The Gudalur Adivasi Hospital, a regional hospital catering to the entire adivasi population of Gudalur, provides high quality curative health care at minimal cost, and employs a gynecologist/obstetrician, surgeon, and a team of adivasi nurses and administrators. Furthermore, since the lack of liquid cash is often a deterrent to accessing medical care, adivasis in the region are encouraged to partake in a low-cost insurance scheme.

In order to assess the health status of adivasi individuals in Gudalur receiving curative and preventive health care services, mortality, morbidity, fertility, and child health statistics were examined and compared against various demographic groups in India.

Materials & Methods

Demographic information was obtained from the insurance list maintained by the Gudalur Adivasi Hospital. This list includes every individual from each of the sangam villages in Gudalur (i.e. all villages participating in the health program) and is updated as of May, 2005. All individuals from sangam villages, except those from Masinagudi, receive preventive as well as curative health care services. Masinagudi entries were therefore excluded from all analyses. Tribal and age-sex distributions were subsequently carried out on remaining individuals.

In-patient, out-patient, birth, death, and TB data were obtained from registers maintained at the Gudalur Adivasi Hospital and include all entries from 1/1/05 to 12/31/05 (except in-patient data, which includes entries from 1/1/05 to 6/30/05). Masinagudi area and non-sangam entries were excluded from all data records. Incidence, fertility, and mortality statistics were carried out according to the specifications found in Preventive and Social Medicine [(5)]. Whenever necessary, population data from the insurance list was taken to approximate the study population at mid-year. Women between 15 and 49 years were defined as women of child-bearing age. Primary diagnoses from in-patient records and causes of mortality from death records were coded according to the International Classification of Diseases-10 [(6)] prior to analysis. Indian and Scheduled Tribe age-wise populations, used to standardize mortality rates for comparative purposes, were obtained from the Indian Census 2001 results.

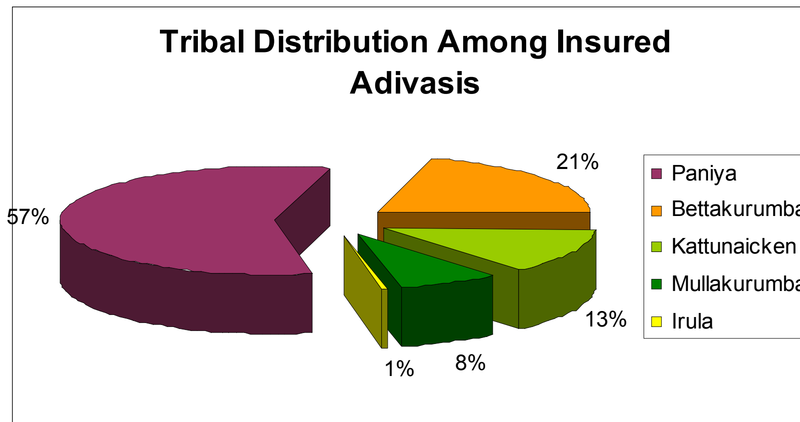
Nutritional status of children under 5 years was determined using a weight-for-age classification system [(7)] and reflects nutritional status as of December, 2005. The children were categorized as normal, grade 1, grade 2, or grade 3 malnourished by trained health animators visiting each of these sangam villages.

Results

Demographics

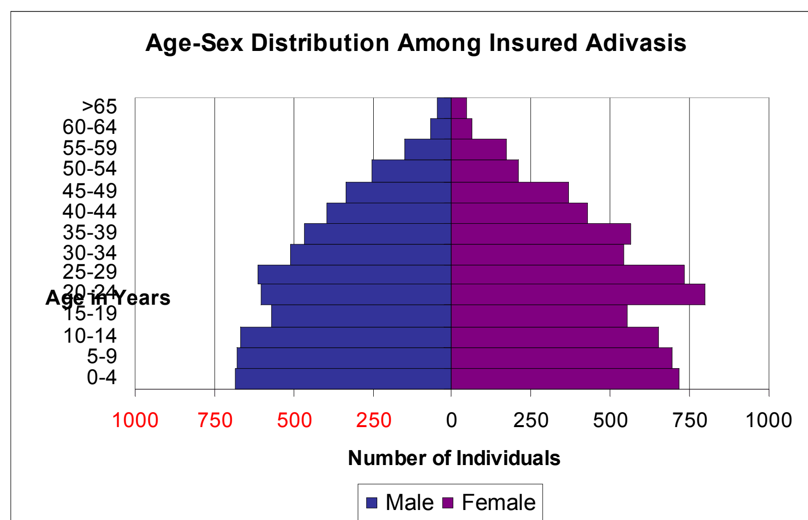
The total study population was 12,606 individuals. Analysis of tribal distribution revealed Paniyas were most numerous (57% of total population), followed by Bettakurumbas (21%), Kattunaickens (13%), Mullakurumbas (8%), and Irulas (1%).

Fig. 1: Tribal distribution



The age-sex distribution revealed a pyramidal shape with a broad base and narrow tip (Fig. 2). The sex ratio was 0.92 males per female. Individuals aged less than 30 years accounted for 63.3% of the total population while individuals aged greater than 50 years accounted for 8.1% of the population. Decline in number of individuals between age groups was noticeably steeper after 29 years of age.

Fig. 2: Age-sex distribution



Major causes of morbidity

Between January 1st and December 31st of 2005, 5921 individuals were seen as out-patients and 623 individuals were admitted to the Gudalur Adivasi Hospital (of which 106 were admitted multiple times). Diseases of the respiratory system were the most common primary causes of all admissions in 2005 (Table 1). These included pneumonia (47), upper respiratory infections (39), and asthma (16). There were 113 admissions for delivery, of which only 5 were by caesarean section. Of all admissions for intestinal infectious diseases, 38 were typhoid cases and the remaining 47 were cases of diarrhea and gastroenteritis of unspecified infectious origin. Significant numbers of admissions were also made for diseases of the genitourinary system, digestive system, circulatory system, trauma and injuries, tuberculosis, and mental disorders.

Table 1: Common Primary Diagnoses for Admitted Patients in 2005

Category	Total Cases
Diseases of the Respiratory System	121
Delivery	113
Intestinal Infectious Diseases	85
Diseases of the Genitourinary System	57
Diseases of the Digestive System	55
Diseases of the Circulatory System	43
Trauma and Injuries	40
Maternal Disorders Related to Pregnancy	32
Tuberculosis	30
Mental Disorders	28

There were 44 new cases of tuberculosis detected in 2005. The incidence of TB within this population was consequently 3.49 per 1000 individuals per year. Of all TB cases, 50% were pulmonary TB, 34% were primary complex, 11.4% were TB of the lymph node, and 4.6% were other forms of TB. 91% of all individuals with TB recovered.

Major causes of mortality

There were 83 deaths in the study population in 2005 over all age groups. Mortality (for individuals aged > 1 year) was primarily due to cardiovascular diseases (34.3%), malignant neoplasms (20.6%), intentional self-harm (8.2%), and chronic renal failure (5.5%) (Table 2). The Crude Mortality Rate (CMR) for this population over all age groups was 6.58 deaths per 1000 individuals per year. When age-standardized to the total Indian population and to the rural Indian population, the CMR was 15.5 and 16.0 deaths per 1000 individuals per year, respectively.

Under-5 deaths were primarily due to bacterial sepsis, broncho-pneumonia, and diarrhea. The Under-5 Mortality Rate (U5MR) was 55.1 deaths per 1000 live births per year. 83.3% of all under-5 deaths occurred in infants, resulting in an Infant Mortality Rate (IMR) of 45.9 deaths per 1000 live births per year.

Table 2: Common Causes of Mortality for Individuals >1

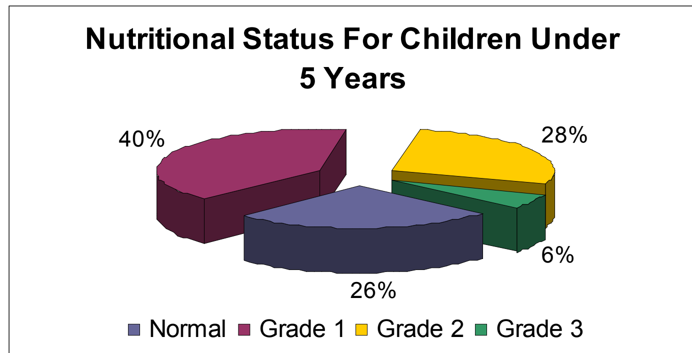
Description	Proportional Mortality Rate (%)
Diseases of the cardiovascular system	34.3
Malignant Neoplasms	20.6
Intentional self-harm	8.2
Chronic renal failure	5.5

Fertility and child health

There were 236 births in 2005, of which 218 were live births. The Crude Birth Rate (CBR) for this population was calculated at 17.3 births per 1000 individuals per year. Fertility rates were highest in women aged 25-29 (0.1 births per woman per year) and lowest in women aged 40-44 (0.005 births per woman per year). There were no births for women aged >44 years. Total Fertility Rate (TFR) for women aged 15-49 in this study population was 1.63 children per woman.

There were 1,175 children actively monitored for growth by health animators in all sangam villages. Of these, nutritional status was known for 1009 children as of December, 2005. Analysis of the distribution of nutritional status records revealed most children were grade 1 malnourished (40%), followed by normal (26%), grade 2 (28%), and grade 3 (6%) malnourished (Fig. 3).

Fig. 3: Nutritional Status for under-5 children monitored for growth



Discussion

In contrast to many of the indigenous communities in India, the adivasis of Gudalur valley have access to a range of curative and preventive health care services. This comprehensive health care scheme works in conjunction with health education and monitoring programs to deliver much needed medical attention to a traditionally vulnerable and marginalized segment of society. Analysis of health data from 2005 suggests that this population demonstrates significantly improved health outcomes when compared to the Indian population as a whole and to other scheduled tribe populations.

Common causes of morbidity within this population were similar to those found among scheduled tribes of Orissa and Maharashtra, and include respiratory infections, gastrointestinal disorders, and tuberculosis[(8, 9)]. Of particular epidemiological interest is the incidence of TB among the Gudalur adivasis, since limitations in disease awareness and utilization of health care services generally leave scheduled tribes particularly vulnerable to the spread of TB infections[(10)]. Interestingly, the incidence of TB in the study population is 3.49 per 1000 individuals per year, higher than the nationwide incidence of 1.68[(11)] (2005). However, while the national treatment success rate is 86%[(11)] (2004), a success rate of 91% was observed for this population. Therefore, though TB incidence may remain high among the adivasis of Gudalur, they experience a high rate of recovery, most probably a result of the targeted health care interventions in place.

The Crude Mortality Rate (CMR) of the study population was age-standardized in order to eliminate the influence of varying age structures between populations[(12)]. The age-standardized CMR of Gudalur adivasis was higher than both the total Indian population (15.5 vs. 9.7) and the rural Indian population (16.0 vs. 10.4) (2). These results are, in fact, in accordance with recent studies that suggest indigenous people generally suffer higher mortality when compared to non-indigenous people, even after accounting for differences in economic standard of living[(13)]. This disparity may be attributed to different cultural practices or means of livelihood between indigenous and non-indigenous communities. Mortality among infants, however, is much lower

in the study population (45.9) when compared to the total Indian (67.6), rural Indian (73.3), and scheduled tribe populations (84.9)[(2)]. Since infancy is a particularly vulnerable developmental period, infant mortality is often an indicator of the quality of health services available within a community[(14)]. These data suggest that mortality levels are not greatly reduced within the study population overall, but significant gains in mortality outcomes have been made for a particularly vulnerable subset of the population.

The common causes of mortality among Gudalur adivasis were also significant contributors to mortality among the Indian population as a whole. For example, cardiovascular diseases and malignant neoplasms, the two biggest contributors to mortality among Gudalur adivasis, have nationwide proportional mortality rates of 27.1 and 7.2, respectively [(11)] (2004). However, while respiratory infections, diarrheal diseases, childhood cluster diseases, maternal conditions, and tuberculosis were significant causes of mortality on a national level, they made minimal or no contribution to deaths in the study population in 2005 [(11)] (2004). It was observed, however, that in past decades, prior to the introduction of targeted health care services, these did in fact contribute greatly to deaths within the Gudalur adivasi community. Efforts at reducing deaths due to these preventable causes through a comprehensive health care, health education, and monitoring system have, it would seem, proven effective.

The Total Fertility Rate (TFR) of the Gudalur adivasi community (1.63) is lower than that of India (2.85), rural India (3.07) and scheduled tribe populations (3.06)[(2)]. It is generally observed that fertility rates are high in developing countries, partly due to lack of access to contraceptives or inadequate female education[(15)]. However, as a result of educating women about family planning and providing easy access to contraceptive methods, total fertility within the Gudalur adivasi community is relatively low.

Proportion of under-5 children that are two or more standard deviations below normal is much lower in the study population (34%) than in India (65%), rural India (69.5%), and scheduled tribe populations (81.9%)[(2)]. Because pre-school children

are a particularly vulnerable segment of society, their nutritional health is indicative of overall health in the community[16]. In many tribal villages, where children live in unhygienic environments without access to proper health care or adequate food, children experience abysmal levels of malnutrition[16]. Consistent growth monitoring by trained health animators in Gudalur has resulted in a drastically reduced level of malnutrition among adivasi under-5 children.

A health care system providing basic preventive and curative services can significantly improve health outcomes within an adivasi community. The impact of such an intervention is felt particularly in the most vulnerable segments of society, infants and under-5 children. Incorporating health education and monitoring programs can, furthermore, greatly reduce preventable deaths and help individuals make better-informed health related decisions. Similar interventions in other adivasi communities can help rectify disparities in health between indigenous and non-indigenous populations.

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