Mapping The Health Landscape Through a Family Health Survey: A Community Diagnosis af a Village in Chengalpattu District, Tamil Nadu

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ABSTRACT

INTRODUCTION: *Health of a community is intricately linked to its social, economic, cultural, and environmental determinants. Conducting a community diagnosis through a family health survey will help identify local health problems, assess service utilization, and understand social determinants of health at household level. The objectives are to analyze the demographic and environmental profile, to assess morbidity and maternal-child health needs, and evaluate health-seeking behavior and healthcare utilization in a village of Chengalpattu District.*

METHODS: *A community-based cross-sectional study was conducted in Pulipakkam village, Tamil Nadu, from January to March 2024. A total of 412 individuals from 100 systematically selected households were surveyed using a pre-tested semi-structured questionnaire, with sample size based on NNMS 2022 data. The collected data were analyzed using SPSS version 21. Ethical approval and informed consent were obtained.*

RESULTS: *Of the 412 participants surveyed, majority 88(21.3%) were aged 30–39 years and 229(55.7%) were female. Most households used LPG 288(70%) and had pucca houses 268 (65%) with adequate ventilation 272(66%). Drinking water was mainly from Panchayat supply 56(56%), and 25(25%) used no purification method. Dumping was the common method for solid waste disposal 74(74%), and 75(75%) used Indian-style toilets. Government and PHC facilities were preferred for healthcare, mainly due to affordability. The prevalence of Diabetes Mellitus was considerably high (50.39%).*

CONCLUSION: *The study highlighted key socio-demographic and health patterns, with more females, nuclear families, and middle-class households. Most lived in pucca houses, though overcrowding and mosquito breeding were concerns. Safe water access was good, but food storage practices were often poor. Government and PHC services were commonly used due to affordability and a high prevalence of diabetes mellitus was observed.*

KEY WORDS: *Community diagnosis, Environmental conditions, Family health survey, Morbidity pattern*

INTRODUCTION

Health of a community is intricately linked to its social, economic, cultural, and environmental determinants. In rural settings, especially in developing countries like India, these determinants often vary widely across regions, necessitating localized health assessments for effective interventions. Community diagnosis serves as a critical tool for understanding the existing health status, identifying prevailing health problems, and evaluating the needs and resources of a population at the grassroots level. It is a comprehensive assessment of the community's health status in relation to its social, physical, and biological environment. The primary purpose of community diagnosis is to define existing problems, determine available resources, and set priorities for planning, implementing, and evaluating health actions by and for the community [1].

National Family Health Survey (NFHS-5, 2019–21) states that rural India continues to grapple with challenges such as undernutrition (35.5% of children under five are stunted), anemia (57% of women aged 15–49 are anemic), limited access to safe sanitation (only 65.5% of rural households have access to

improved sanitation), and suboptimal maternal health indicators (only 58.1% of mothers received full antenatal care) [2].

Tamil Nadu, while considered a better-performing state in terms of overall health indices, still exhibits intra-district disparities, especially in its newly reorganized districts. Chengalpattu District, carved out in 2019 from Kancheepuram, has seen rapid urbanization on one side and stagnation of basic health indicators in its rural pockets on the other. As per the District Level Household and Facility Survey (DLHS-4) and the State Health Society of Tamil Nadu (2022), rural areas in Chengalpattu continue to report high prevalence of anemia (above 55%), suboptimal immunization coverage (below 80%), and a growing burden of non-communicable diseases such as hypertension and diabetes, often undiagnosed or untreated due to limited access to primary care [3].

In such contexts, community diagnosis emerges as a valuable strategy for bridging the information gap. According to WHO definition, it is "A quantitative and qualitative description of the health of citizens and the factors which influence their health. It identifies problems, proposes areas for improvement and stimulates action". The process involves identifying prevailing health conditions, understanding the social determinants influencing those conditions, and evaluating the available health resources. The primary objective of community diagnosis is to define existing problems, set priorities, and guide health action plans by and for the community thereby fostering local participation and ownership of health outcomes [4].

One of the most effective tools in conducting community diagnosis is the Family Health Survey, which provides household-level data on demographic details, morbidity patterns, maternal and child health, sanitation, nutrition, health-seeking behavior, and awareness levels. Such micro-level surveys are critical in rural and semi-urban settings where aggregated national or state-level data often mask local variations. Moreover, family-level health assessments facilitate identification of at-risk populations and under-utilized resources, helping in the formulation of tailored, need-based interventions [5].

Despite considerable improvements in public health indicators at the national and state levels, rural areas like those in Chengalpattu District continue to face significant health disparities due to socio-economic, environmental, and infrastructural challenges. Large-scale surveys provide valuable data but often overlook granular, village-level health dynamics essential for targeted intervention. Chengalpattu, a newly formed district in Tamil Nadu, lacks disaggregated data on critical health indicators, especially in its underserved rural pockets. Conducting a community diagnosis through a family health survey will help identify local health problems, assess service utilization, and understand social determinants of health at the household level.

Objectives:
1. To analyze the demographic and environmental profile.
2. To assess morbidity and maternal-child health needs.
3. To evaluate health-seeking behavior and healthcare utilization in a village of Chengalpattu District.

MATERIALS AND METHODS:
Study design: Community-based Descriptive Cross sectional study
Study area: Pulipakkam village (Rural field practice area of a medical college in Chengalpattu District, Tamil Nadu.)
Study population: Households residing in the village.
Study period: January 2024 – March 2024
Sample size and Sampling: Pulipakkam village comprises 23 streets with a total of 1,506 households. The sample size for the study was determined based on the prevalence of key non-communicable disease (NCD) risk factors in rural Tamil Nadu. According to the National Non-communicable Disease Monitoring Survey (NNMS) 2022, the prevalence of overweight and obesity (BMI ≥25 kg/m²) among rural adults in Tamil Nadu was reported to be 41.3%.[6] This figure was used as the reference prevalence (P) for calculating the minimum required sample size for the present study.
Using the standard formula for estimating sample size for a proportion:

$$n = \frac{Z^2 \times P \times (1-P)}{d^2}$$

where Z = 1.96 (for 95% confidence level), P = 0.413, and d = 0.05 (absolute precision), the estimated minimum sample size was approximately 369 participants. After adjusting for an anticipated 10% non-response rate, the final sample size was calculated to be around 412.

In this study, a total of 412 individuals from 100 systematically selected households were surveyed, which exceeds the calculated requirement and ensures adequate statistical power to estimate NCD risk factors and other health indicators in the rural population. A complete household list (sampling frame) was obtained from the local health authorities. The sampling interval was calculated as:

$$k= \frac{\text{Total number of households}}{\text{Sample size}} = \frac{1506}{100} = 15.06 \approx 15$$

A random number between 1 and 15 was chosen as the starting point, and every 15th household thereafter was selected for the survey and all the members were interviewed. If a selected household was locked or refused to participate, the next adjacent household was approached. This approach ensured that the sample was both statistically representative and operationally feasible. Using a recent, large-scale national survey as the basis for prevalence added validity to the sample size justification and enhanced the generalizability of the findings.

Inclusion criteria:
• All permanent residents of Pulipakkam village who had been living in the household for at least 6 months.
• Individuals of all age groups, including children, adults, and the elderly.
• Individuals who were present at the time of the survey and gave informed consent (or assent in the case of minors with guardian consent).
• Both males and females were included in the study.

Exclusion criteria:
• Individuals who were seriously ill, hospitalized, or unable to participate in the interview due to physical or cognitive impairment at the time of data collection.
• Locked households after two consecutive revisit attempts.

Study tools:
1. Community survey questionnaire which included socio demographic details, vital events, economic status, personal hygiene and environmental conditions, sanitation, KAP regarding diseases, nutrition, MCH, health seeking behavior and health care utilization.
2. Measuring tape and weighing machine to measure anthropometry.

Data collection:
The data collection was carried out by a total of 40 second-year undergraduate medical students from two academic batches (20 students each) participated in the household survey. They were assisted by a postgraduate student, a medical intern, and a medico-social worker. The fieldwork was conducted under the overall supervision of faculty members. Each pair of undergraduate students was assigned 25 households. Following a structured schedule, they visited 5 households per day, thereby completing their assigned 25 households.

Data were collected using a pre-tested semi-structured, interviewer-administered questionnaire designed to capture information on socio demographic details, vital events, economic status, personal hygiene and environmental conditions sanitation, KAP regarding diseases, nutrition, MCH, health seeking behavior and health care utilization. The questionnaire was initially prepared in English and translated into Tamil to ensure better comprehension by the local population. Informed consent was obtained from each participant or from guardians in the case of minors. If a selected household was locked during the first visit, two additional visits were made before considering it non-respondent. Daily review of completed forms was done by the supervisors to ensure consistency, accuracy, and completeness of data across all survey teams.

Data analysis:
The collected data were entered and analyzed using IBM SPSS Statistics version 21. Descriptive statistics were used to summarize the data. Categorical variables such as gender, marital status, education level,

occupation, housing type, and morbidity patterns were expressed as frequencies and percentages. Continuous variables such as age were presented using means and standard deviations. Cross-tabulations were used to explore associations between socio-demographic variables and selected health indicators. Chi-square tests were applied to determine statistical significance for associations between categorical variables. A p-value of less than 0.05 was considered statistically significant. Graphs and tables were used to present key findings clearly and concisely.

Ethical issues:
The study was approved by the Institutional Ethics Committee of the medical college. Permission was obtained from local health and village authorities. Informed consent was taken from all participants; for those under 18, assent and parental consent were obtained. Confidentiality was maintained, and participation was voluntary with the option to withdraw at any time.

RESULTS:
Of the total 412 participants surveyed in Pulipakkam village, majority 88 (21.3%) were in the age group of 30-39 years (Table 1). The young age and old age dependency ratio was computed to be 132 (31.96%) and 40 (9.62%) respectively. The total dependency ratio was calculated as 41.5%. It was seen that 229 (55.71%) were females while 199 (48.29%) were males, 309 (75%) were married and 260 (63%) were educated upto primary level. Further, 260(63%) belonged to Hindu religion, 204 (49.50%) were living as nuclear family and 239 (58%) participants were belonging to middle class according to modified BG Prasad classification.
The environment around the houses in (56.6%) had fly/mosquito breeding places followed by stagnant water collection (22.2%), stray dog menace (12.10%), heaps of refuse (7.10%) and animal excreta (2%). Majority (65%) of the houses were of pucca type followed by (31%) which was semi – pucca and kutcha (4%). It was observed that (51%) of the households had adequate lighting and (66%) had adequate ventilation. It was found that (59%) had cross ventilation whereas (41%) had no cross ventilation. It was observed that overcrowding was present in (51%) of the households.

Table 1: Distribution of age and occupation of the study participants (n=412)

Variable	Frequency (%)
Age group	
0-9 years	51 (12.3)
10-19 years	67 (16.3)
20-24 years	45 (10.9)
30-39 years	88 (21.3)
40-49 years	44 (10.6)
50-60 years	56 (13.5)
60-64 years	34 (8.31)
>65 years	28 (6.79)
Occupation	
Unemployed	24 (5.8)
Unskilled	85 (20.7)
Semiskilled	99 (24.1)
Skilled	42 (10.2)
Clerical/shop owner/ farmer	46 (11.1)
Semi professional	30 (7.3)
Professional	5 (1.2)
Retired	18 (4.3)
Student	63 (15.3)

The type of fuel used by majority of the families (70%) was LPG (Figure 1). It was also observed that (47%) of the houses had kitchen with adequate smoke outlet, (69%) had washing area in kitchen and (71.7%) with cooking platform. It was found that (73%) of the families stored raw food properly while

it was improper in (27%). Also, the storage of cooked food was proper in (55%) whereas (45%) were improper.

Figure 1: Type of fuel used in the houses (n=100)
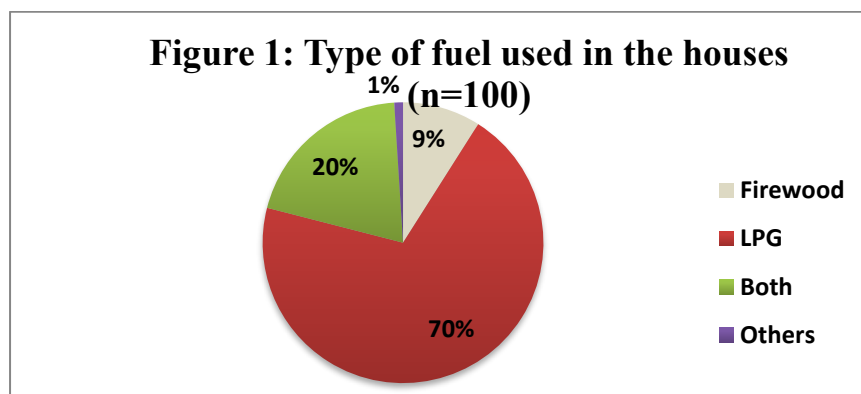
Source of drinking water and water for domestic purposes in 56% and 44% of the houses was from Panchayat water supply (Figure 2) respectively. It was noted that 34% of the families used mineral water can and the method of household purification of drinking water used was boiling in 25%, filtration (14%) and reverse osmosis (2%). It was revealed that 25% of them practiced no purification methods. Further, 78.40% houses had sufficient bathroom facilities and 84% houses had sufficient latrine facilities.

Figure 2: Source of drinking water (n=100)
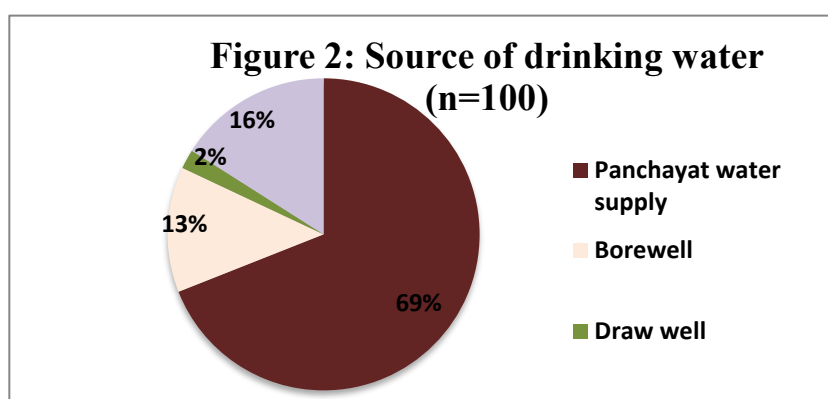
It was revealed that 74% households practiced dumping for disposal of solid wastes (Figure 3), sullage disposal through open drain is practiced in 79% houses, 75.8% households had Indian type of latrine while 4% of the families practiced open air defecation.

Figure 3: Method of solid waste disposal (n=100)
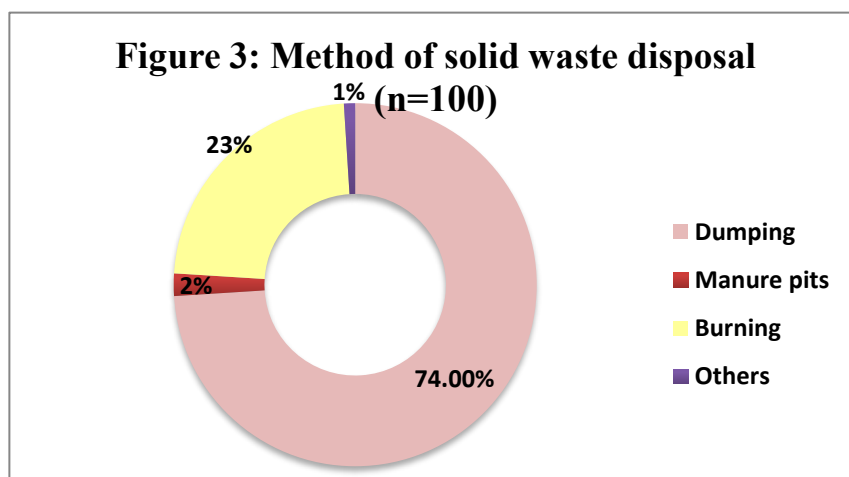
It was found that the type of diet in 72% of the families was mixed, rice (71%) was the staple food of the families, caloric intake was inadequate in 157 (38%) of the people while protein intake was inadequate in 91 (22%) of the people.

Table 3: Distribution of study participants based on prevalence of acute morbid condition (n=48), chronic morbid conditions (n=210) and disability profile (n=6)

Morbid condition/ Disability	Frequency (%)
Acute morbid conditions (n=48)	
Fever	4 (8.3%)
Cough/cold	3 (6.3%)
Loose stools	2 (4%)
Headache	6 (12.5)
Abdominal pain	5 (10.41%)
Injury	1 (2.1%)
Giddiness	6 (12.5%)
Myalgia	11 (22.9%)
Fatigue	9 (18.9%)
Others	1 (2.2%)
Chronic morbid conditions (n=254)	
Diabetes mellitus	128 (50.39%)
Hypertension	78 (30.70%)
Asthma	37 (14.56%)
Others	11 (4.33%)
Disability profile (n=6)	
Mental retardation	1 (16.7%)
Hearing disability	3 (50%)
Visual disability	2 (33.3%)
Speech disability	0

It was observed that 7 women (1.7%) were currently pregnant. All had registered their pregnancies at the local Primary Health Centre and had received at least one antenatal check-up. A total of 17 children under five years (4.1%) were identified, of whom 16 (94.1%) were fully immunized as per the national schedule. Further, 3 recent deliveries (0.7%) were reported, all of which were institutional deliveries in government health facilities.

Moreover, 190 (46%) of participants sought healthcare from government hospitals, closely followed by 177 (43%) who preferred Primary Health Centres (PHCs), while 41 (10%) each opted for private hospitals and other sources (Figure 4). For under-five children, 8 (47%) of caregivers utilized government hospitals, 4 (24.6%) preferred private hospitals, 3 (18%) visited PHCs, and 2 (10%) relied on other systems, including indigenous medicine. Affordability emerged as the primary reason for choosing a healthcare facility among 214 (52%) of respondents, followed by accessibility 99 (24%), quality of patient care 95 (23%), and other factors such as reduced waiting time 4 (1%). Similarly, for under-five children, affordability was the most cited reason 9 (55.7%), followed by good patient care 5 (29.5%), accessibility 2 (9.8%), and less waiting time 1 (4.9%).

Figure 4: Health seeking behaviour (n=412)

- PHC — 43%
- Government hospital — 46%
- Private hospital — 10%
- Others — 10%
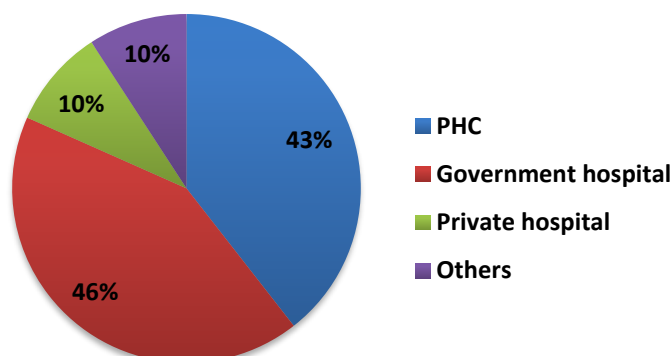
DISCUSSION:

In the current study, males comprised 48.29% of the population, while females accounted for 51.71%. This distribution is comparable to findings by Gandhi et al. [7], who reported 54.7% males and 45.3% females. Conversely, Pachori et al. [8] reported a slightly higher female proportion (51.3%) compared to males (48.7%), while Ahmed et al. [9] found the female population at 50.6%, marginally surpassing the male population (49.4%). The sex ratio calculated for the present study was 1071 females per 1,000 males, which is higher than the national average of 943 (Census 2011, National Health Profile 2018) [10] and above Tamil Nadu's urban sex ratio of 996, as reported in the NFHS-5 State Fact Sheet (2020–2021) [11].

Adults aged 30–39 years constituted the most represented age group, accounting for 21.3% of the population, which closely aligns with Pachori et al. [8], who observed 53% of individuals between 20–40 years. Older adults aged above 60 years made up 15.1% of the study population, which is also reflected in Gandhi et al. [7], who reported 5% of the surveyed population being above 60 years.

The literacy rate in the current study was 71.2%, slightly below the urban literacy rate of Tamil Nadu (87.0%) as per Census 2011 but comparable to that of Gandhi et al.[7], who reported a literacy rate of 76.4%. Regarding immunization, 94.1% of under-five children were fully immunized according to the national schedule, 4.5% were partially immunized, and 1.4% were unimmunized. This pattern mirrors the findings of Punith et al.[12], who reported 92.1% full immunization, 6.58% partial immunization, and 1.31% unimmunized children.

With respect to occupation, skilled workers accounted for 10.1% of participants, closely resembling the 7.3% reported by Ahmed et al. [9]. Nuclear families predominated at 49.5%, followed by joint families (39.7%) and three-generation families (10.8%). These distributions are consistent with Gandhi et al. [7], who reported 74% nuclear and 26% joint families, and Shukla et al. [13], who noted a nuclear-to-joint family ratio of 79.2% to 20.8%. Socio-economic classification using the modified BG Prasad scale showed 58% in Class III, 27% in Class IV, and 9% in Class II. These findings contrast with Ahmed et al.[9], where 40% belonged to Class II, and Pachori et al. [8], who reported 30% in Class I and 18.7% in Class V.

Housing assessments revealed that 65% resided in pucca houses, 31% in semi-pucca, and 4% in kutcha houses. This closely resembles data from Shukla et al.[13], who found 69.5% in pucca, 29.6% in semi-pucca, and 0.7% in kutcha homes. A separate kitchen was available in 87% of households, consistent with Ahmed et al.[9], who noted 93% coverage. Overcrowding was observed in 51% of homes, higher than the 28% reported by Ahmed et al. [9]. Regarding water sources, 69% of households relied on panchayat supply and 15% on borewells. Gandhi et al. [7] reported similar findings with 74.3% using tap water and 14.3% using borewells. In terms of sanitation, 75.8% had latrine facilities, which is below the 97.1% reported by Gandhi et al. [7] and the 94% by Gelaw et al. [14]. Solid waste disposal was primarily through open dumping in 74% of households, unlike Gandhi et al.[7], where 54.3% used waste pits. For

cooking, 70% of households used LPG, 20% used kerosene, and 9% used coal. This pattern is similar to Gandhi et al. [7], who reported 63% using LPG, 20% using firewood, and 17% using a mix.

Diabetes mellitus was the most common morbidity, affecting a significant proportion of the population, which aligns with Gladius et al. [15], who found a 33.3% prevalence. Hypertension affected approximately one-third of the population, consistent with Das et al.[16], who reported 36.4% among urban residents in 2003. These figures underscore the increasing burden of non-communicable diseases and the need for robust preventive and management strategies at the community level.

The study had certain limitations. Data were collected using the interview method, which may have introduced interviewer or response bias. Additionally, some information such as dietary intake, morbidity status, and health-seeking behavior relied on participant recall, which could be prone to recall bias. Observations regarding housing and environmental conditions may also have involved subjective interpretation.

CONCLUSION:

The community-based study in Pulipakkam village provided valuable insights into the sociodemographic and health profile of the population. A higher proportion of females were observed, with most participants belonging to the middle socioeconomic class and living in nuclear families. While housing conditions were predominantly pucca, issues such as overcrowding, inadequate ventilation, and mosquito breeding sites were common. Although access to safe water and sanitation was satisfactory in most households, improper food storage practices persisted. Health-seeking behavior favored government and primary health centers, primarily due to affordability and accessibility. Maternal and child health indicators were encouraging, with high rates of antenatal registration and immunization. Notably, a high prevalence of diabetes emphasized the rising burden of non-communicable diseases in rural areas, suggesting a need for strengthened community-level screening and management strategies.

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