5

Health and Nutrition

Good health and access to healthcare, as shown in Figure 5.1, are facilitated by factors from within and outside health sector, from private and public sector, and are shaped by intra-national and global institutions.

In India, although several major national programmes financed by the Government of India (GoI) (such as national blindness control programme, national malaria control programme, national HIV/AIDS control programme), have played and continue to play a significant role in building healthcare systems across States, State governments have a greater role and responsibility in building a sustainable delivery system in the long run. Over the years, Tamil Nadu has acquired the distinction of having implemented various national and State-level health programmes more effectively than most other States (Muraleedharan *et al*., 2011). The people of Tamil Nadu also enjoy a far better health status than those in most parts of India. Yet, there are several challenges that persist. This chapter will highlight both the achievements and challenges, and indicate the steps that the government can take to build an affordable and effective healthcare system and to improve health status of the people of Tamil Nadu.

This chapter is organised as follows:

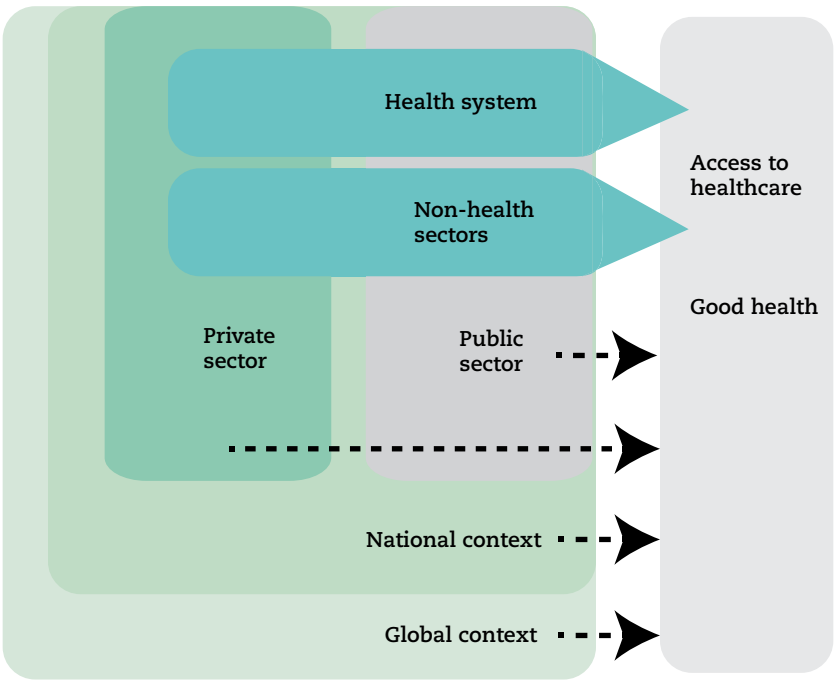
Section II presents major policy and programmatic initiatives in the State in the last decade, since early 2000s. Section III provides available evidence on access to health services and cost of care, and progress in overall health status of the State over the past decade. Section IV addresses attainments and gaps in nutrition and sanitation facilities in the State that are critical for improving health status. Comparison with other States and inter-district comparisons are provided wherever possible. The present chapter concludes by highlighting some of the major prevailing challenges, and suggests ways forward to strengthen the healthcare system, including the State's private health sector.

Programmatic Initiatives

Tamil Nadu's performance in health sector has improved significantly over the past decade. The State has witnessed dramatic improvements in primary care and secondary care facilities through the establishment of several professional medical teaching institutions and significant improvements made in the higher secondary and tertiary care facilities. The effective implementation of National Rural Health

Figure 5.1

Conceptual Framework: Good Health at Low Cost



Source: Balabanova *et al*., 2011.

Mission (NRHM), a national level flagship programme of the GoI, and the State Health System Project (SHSP) with the support of World Bank and State government, since 2005, have contributed significantly in improving the quality and quantum of services delivered through public healthcare facilities in the State. The major developments since early 2000 are highlighted here.

Public Financing

The budgetary provisions for public healthcare delivery system has steadily increased over the decades. It has grown from ₹410 crore in 1991-92 to about ₹8,245.41 crore in 2015-16 (Health and Family Welfare (HFW), Policy Note, 2015). This is partly due to "The conditions[1] for receiving funds under NRHM" and partly for launching newer schemes, such as the State insurance scheme for tertiary care, and huge increase in maternity benefits scheme. Another interesting feature of the State budget for health is the fact that nearly 40 per cent of this budget is spent on primary healthcare, which is observed to be higher than the amount spent by most Indian States. The share of tertiary care in the budget has fallen from 33 per cent in 1990 to 25 per cent in 2012 with the secondary sector's share rising correspondingly, possibly due to the increased flow of funds from SHSP (Muraleedharan *et al*., 2011: 169). The consistent commitment of resources to the health sector by successive governments has made it possible for the State to make the best use of Central schemes, which often require matching resources and funding for staff from the State government. The State also has the distinction of having spent a larger share of the budget on drugs and other non-staff items compared to that of other States (Kumar *et al*., 2011). The State budget during 2005-2012 had been on a rise on an average at 19 per cent per annum, while the contribution of NRHM had been growing at about 16 per cent per annum during the same period. It is important to note here that the State's capacity to absorb and utilise central funding has remained on average above 95 per cent over the past decade, reflecting overall systematic efforts being made to strengthen the public delivery system. In the year 2013-14, the State has received about ₹1,300 crore under NRHM budget, which is one of the highest amount received and utilised among all States.

While such positive features reflect State's commitment to strengthen public health delivery system, we should also flag the fact that the government's spending for health sector is about 1 per cent of the State GDP (Gross Domestic Product). Estimates show that government spending on healthcare per capita was about ₹223, while the total health spending (including private spending) per capita was about ₹1,256 (which works out to 3.99% of SGDP) (MoHFW, National Health Accounts, 2004-05; 2009). Although NRHM has brought considerable additional resources, the overall public spending has not been able to keep pace with the increased private spending. Over the years, government spending on health accounts for about 4.2 per cent of the total State budget.

Service Delivery

Strengthening PHCs/HSCs: Since mid-1980s and through 1990s, the State witnessed a massive expansion in the primary healthcare delivery system. A fairly robust network of Primary Health Centres (PHCs) and Health Sub Centres (SHCs or sub-health centres) across the State (as per population norms) along with a huge deployment of field functionaries and sustained bureaucratic and political commitment, helped effective implementation of NRHM in the following decade. But for the existence of a fairly effective primary healthcare delivery system, already in place by early 2000, the benefits of NRHM may not have been appropriately realised. During 2005-2015, about 200 new PHCs were built using NRHM funds; but one must note here that a significant portion of NRHM funds was systematically utilised to upgrade a large number of PHCs (close to 300, with additional buildings, beds, staff and equipment) during this same period (Interview with a former Secretary, HFW, GoTN, 10 July 2014).

It should be noted here that (as of 2015) out of 1,750 PHCs, 1,564 are functioning in government buildings (HFW, Policy Note, 2015), compared to 1,360 in 2004-05, and a mere 660 in 1999-2000.

As of 2015,748 PHCs have been awarded ISO certification. There has been a concerted effort to upgrade at least 2 PHCs from each district to ISO 9000 standards over next few years.

The State has been upgrading 1 PHC in each block with 30 beds and providing them with additional facilities (such as operation theatre, x-ray machine, an ambulance) and manpower (5 additional doctors in each upgraded PHC). As of 2013, 398 upgraded PHCs have been functioning in 365 blocks.

Mobile Medical Units: In addition, Tamil Nadu has also been at the forefront in deploying Mobile Medical Units

1. A main condition imposed by the Central Government being that the state health budget should increase annually by 15 per cent to receive NRHM funds.

(MMUs) at block level, to improve access in remote and underserved areas. Each MMU consists of a dedicated team, including a doctor, a nurse and an attendant, provides family welfare services and treatment for minor ailments. At present, there are about 396 MMUs; one in each block in the State, funded by NRHM. On an average, each MMU conducts 40 camps per month, and covers about 50-80 patients per camp.

Mobile Units in Tribal Areas: Twenty mobile units (in 13 districts) have been deployed exclusively in tribal areas. Women tribal counsellors have been appointed in about 42 PHCs/hospitals in tribal regions, with additional funding to augment bed availability in some regions. Special efforts have been made in tribal regions to survey the prevalence of sickle cell Anaemia, and for treatment and counselling. Birth waiting rooms (for 2 weeks prior to delivery date) in PHCs in tribal areas, initiated with NRHM funds, are increasingly being utilised.

Anecdotal impression is that MMUs have improved access to primary care in remote areas, but their impact on access to care and outcomes are yet to be systematically assessed. 396 MMUs are being deployed across the State, utilising considerable amount of resources from NRHM. It is therefore important to rationalise their use in order to maximise their reach and utility among the target population.

Hospitals and Comprehensive Emergency and Obstetric and Neonatal Care (CEmONC) Centres

The State has 30 district-level hospitals (providing up to higher secondary care), besides 160 Taluk and 80 non-Taluk hospitals providing a link between primary care and secondary care services.

The facilities at higher levels of care have also been substantially augmented. Under SHS project, about 700 buildings were newly built/renovated. Several of these are located at taluk headquarters. Tamil Nadu was the first State to establish 24-hour functioning CEmONC by early 2000. At present, there are 125 CEmONC centres with additional permanent staff. These along with several other initiatives, as a result, have substantially reduced maternal deaths over the past decade. The number of complicated deliveries made in CEmONC centres has increased from about 1.07 lakh in 2007-08 to about 1.85 lakh in 2013-14. Their capacity to handle complicated neonatal admissions has also been doubled over the last six years.

Neonatal Intensive Care Units (NICUs): There are 42 Neonatal Intensive Care Units (NICUs) attached to CEmONC centres, all with additional staff nurses and physicians. All staff members in NICUs receive special 14-day training in NICU management. The overall quality of these NICUs is so high that private providers see them as competitors, and as a result, many private providers have substantially reduced the charges for neonatal services to attract and retain their patients (interviews with private physicians in Thoothukudi and Ramnad Districts, July 2014)

108-Ambulance Service: As of February 2014, 638 vans have been deployed to provide 108-emergency management services (EMRI scheme). Each van does 3 to 4 trips per day, travelling on average 50 to 60 km per trip. Recent estimates shows that on average it takes about 16 minutes to reach the patient from the time of call, about 11 minutes at the "incident location" and about an hour to reach a hospital from the time of call.

Non-Communicable Diseases: The State has also been a forerunner in providing primary care services to those suffering from NCDs (non-communicable diseases). NCD clinics have been established in all district, taluk and non-taluk hospitals, and upgraded PHCs in the State. PHCs in the State have a staff nurse (funded by SHSP) exclusively for screening patients for NCDs. All PHCs provide free drugs to patients with diabetes and blood pressure, which is important given that a study conducted in Tamil Nadu (ICMR–INDIAB study), reported that the prevalence of diabetes was 10.4 per cent (Anjana *et al.*, 2011). All government hospitals regularly carry out screening for breast and cervical cancer for women above 30 years of age. Besides that, the Department of Education, Labour and Education are also involved in addressing NCDs at schools and work-related sites. Funds from centrally-funded National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS), and District Mental Health Programme (DMHP) have substantially strengthened efforts to address NCDs in the recent past. The DMHP assumes importance in the context of relatively high suicide rates in Tamil Nadu. National Crime Records Bureau's report on accidental deaths and suicides in India (National Crime Records Bureau, 2014) indicate that the States with the highest suicide rates (number of suicides per one lakh population) in 2013 were Sikkim (29.3), Tripura (25.9), Kerala (24.6) and Tamil Nadu (24.3).

Quality of Care: As part of efforts to improve quality of care and services provided in public hospitals, SHS project has developed a set of 14 quality of care indicators, and 12 parameters to be fulfilled for International Association for Business and Health

(IABH) accreditation. So far, 3 government hospitals and 25 private hospitals have been accredited. Besides, the State (with in-house expertise) has brought out a Standard Treatment Guidelines (in 2010). Several other States have adopted this manual.

Also, steps are underway to accredit 12 secondary hospitals under the National Accreditation Board for Hospitals and Health Care (NABH) under the Tamil Nadu Health Systems Project (TNHSP). What is needed at this point seems to be a major policy thrust to incorporate the principles of quality management into the functioning of the entire public health system.

Under National Health Mission (NHM), the State has made a special effort to improve healthcare in urban areas. All towns/cities with a population of more than 50,000 will have their existing urban health post upgraded and new centres added.

Besides that, special initiatives have been launched (though at pilot stage) with regard to Palliative care, Early Intervention Centres, Poison Management Centres, and Upgraded Dental Care Scheme across the State.

State-Sponsored Insurance for Tertiary Care: In an effort to further reduce financial burden arising from catastrophic expenses in tertiary care, a State-sponsored insurance scheme was introduced in 2009.

This scheme, which was further improved with more comprehensive features and increased coverage of up to ₹1 lakh per year per household in 2011, covers nearly 1.36 crore families, i.e., nearly 40 per cent of the population having an income of less than ₹72,000 per annum (HFW, Policy Note 2012: 104). The government pays the entire premium for the scheme and the scheme is implemented through public and private providers at a cost of more than ₹700 crore. The revised scheme has been successful in involving the public sector hospitals, which receive nearly 30 per cent of the claim amount, since certain basic surgical procedures have been reserved for these hospitals. However, the scheme is yet to be evaluated for its effect on out-of-pocket expenses. The scheme does not receive any funding from NRHM and the State has also opted out of participating in the Rashtriya Swasthya Bima Yojna (RSBY). About 2.2 lakh and 3.3 lakh claims have been made in 2010-11 and 2012-13 respectively (Interviews with offices, CMCHIS, October 2014).

Dr Muthulakshmi Reddy Maternity Benefit Scheme: In the year 2006-07, the government launched a maternity benefit scheme in the name of Dr Muthulakshmi Reddy Maternity Benefit Scheme (MRMBS). Until 2011, all poor pregnant women were given a financial assistance of ₹6,000 so as to protect them adequately from wage losses during the pregnancy period, and from experiencing lack of nutrition, in turn reducing the incidence of low birth deliveries. Within a year since its launch, the proportion of women using government institutions for deliveries increased substantially, from 6.22 lakh in 2006-07 to 6.83 lakh beneficiaries in 2007-08. Thereafter, every year, nearly 6 lakh women/mothers benefit from this scheme. Since 2011, this amount has been increased to ₹12,000 per delivery, provided it is made in public facilities. It is important to note that this scheme also covers pregnant women of Sri Lankan Refugees. There are certain salient features of this scheme, unique across the entire country. The amount is distributed in three equal instalments: the first is given during the 7th month of pregnancy to those who have availed prescribed health services (antenatal care services); the second instalment is given to those who deliver in government institutions; and the third instalment is given to mothers on completion of 3rd dose of DPT and other post-delivery services to the child. All disbursements are now made electronically from the treasury to beneficiary bank accounts. A sum of ₹652 crore was disbursed (for 6.63 lakh beneficiaries in 2013-14), compared to ₹100 crore for 2.41 lakh beneficiaries in 2006-07.

National Disease Control Programmes: All national programmes are being implemented in Tamil Nadu. The following specific programmatic efforts deserve a special mention. Vector borne diseases (VBDs), particularly Malaria, Dengue, Chikungunya, Filarias, are common in several districts in the State, with Filaria being regionally more widespread (Table 5.1). Tamil Nadu is one of the States in India to have reported Japanese Encephalitis, and it is being reported from newer regions in the State. VBDs continue to remain as a major public health problem in the State.

The State has established 1 Apple Laboratory, besides 30 sentinel surveillance hospitals, and has more than 70 entomologists in place. The number of confirmed cases has steadily gone up, reflecting the system's capacity to detect follow-up action. The trend during 2009-2011 is given in Table 5.1 (SHS, PIP, 2012-13).

Leprosy programme was integrated with the general healthcare system (as part of primary healthcare) in mid-1990s and has made remarkable progress in containing the incidence of leprosy in the State. The number of new cases detected has come down from 8.1 (in 2006-07) to 6.7 (in 2015-16) per 1 lakh population.

Table 5.1

Cases and Deaths Due to Vector Borne Diseases in Tamil Nadu, 2012-2015

Year	*Malaria Cases*	*Malaria Deaths*	*Dengue Cases*	*Dengue Deaths*	*Chikungunya Cases*	*AES Cases*	*AES Deaths*	*JE Cases*	*JE Deaths*	*Microfilaria Rate*
2012	18869	0	13204	66	514	954	72	33	5	0.14
2013	15081	0	6122	0	859	77	8	33	0	0.07
2014	8729	0	2804	3	543	346	4	36	3	0.07
2015	5653	0	4535	12	329	847	0	53	0	—

Source: State Health Society SHS, PIP, 2012-13.

The State's remarkable achievement over the years in controlling HIV/AIDS is well recognised. The overall control strategy of Tamil Nadu State Aids Control Society (TNSACS) and NGOs (non-governmental organisations) in particular has played a significant role in this regard (Muraleedharan *et al*., 2011).

HIV-TB intensified package is being implemented in the State. Close to 80 per cent of TB (tuberculosis) patients were tested for HIV in 2012. Both cure rate and success rate under the Revised National Tuberculosis Control Program (RNTCP) have been around 84 per cent since early 2000.

Indian System of Medicine (ISM): Historically, Tamil Nadu is known for promoting ISM. About 1000 PHCs, 30 district hospitals and nearly 230 government hospitals (taluk and non-taluk) have incorporated ISM. Nearly 450 ISM facilities were established with additional funding from NRHM. One must note here that drugs prescribed under ISM are produced by Tamil Nadu Medicinal Plant Farms and Herbal Medicines Corportion Ltd (TAMPCOL), established by the Tamil Nadu government, since 1983.

Human Resources

Here we focus on both the efforts being made to establish a large number of educational institutions leading to creation of medical and paramedical professionals, and to create employment opportunities for these professionals.

Medical Education: A notable development has been the decision to institute a large number of publicly-financed medical colleges across the State. As of 2013, there are 18 government medical colleges, with total intake of about 2,400 seats for undergraduate programme in medicine. This has been a substantial growth over the last 20 years: by mid-1990s, there were 9 government medical colleges with capacity of about 1,100 seats for undergraduate programme. Of these, 3 were and are in Chennai. The additional 9 government colleges over the past 20 years have been established systematically in other regions/districts of the State, resulting in substantial improvement in hospitals attached to these medical colleges. As a result, public hospitals are now in a position to exert pressure on the large private facilities to reduce costs of care for comparable services. Besides these medical colleges, there are 23 government nursing schools (offering Diploma in Nursing), and 4 government nursing colleges (offering BSc/MSc courses in nursing). Also, there has been a proliferation of private educational institutions offering training in basic medical and super speciality services and in allied paramedical subjects. There are 11 private medical colleges and 166 private nursing colleges. Nearly 10 private medical colleges have been established since mid-1990s. As a result, over the past two decades, 19 new medical colleges have been established, thereby increasing the total number of medical colleges in the State to 29, and the overall capacity of producing health professionals.

Besides these schools, there are a large number of private institutions offering two year training in Auxiliary Nursing and Midwifery (ANM) courses and a large number of health-based NGOs who employ female field workers to implement their own out-reach services. How much of these professionally trained manpower get absorbed in the State health system, how much is absorbed by the private health system, and of which how many remain as stand-alone practitioners? We have little knowledge of the career paths of those not entering the government system.

The Department of Health and Family Welfare has about one lakh employees, of which nearly 42 per cent is employed under the Directorate of Public Health and Preventive Medicine. About 33 per cent comes under the Medical Education Department and about 25 per

cent comes under Directorate of Medical and Rural Services (*Source*: DPH office). Evidently, primary care services, both in terms of total manpower deployed and its overall share in the State health budget, have received much attention.

With the creation of Medical Recruitment Board (MRB), direct recruitment of physicians and paramedical professionals (including nurses and radiographers) on contract basis has become possible. MRB has already made a large number of direct recruitment and has filled vacancies on a fast track mode. Over the past three years, more than 2000 doctors have been recruited directly into services through MRB.

Over last 8 years, since 2007-08, about 10,000 assistant surgeons have been recruited through Tamil Nadu Public Service Commission. About 1,000 male (health inspectors) and about 200 village health nurses (VHNs) were appointed over the same period. Evidently, while there has been a significant increase in the employment of physicians; contrarily, the rise in the number of paramedical staff has been too low.

However, every wave of recruitment faces legal hurdles that delay the process of deployment of human resources, thereby limiting access to effective care. In higher level facilities, particularly at taluk and district level public hospitals, there has mostly been an acute shortage of nurses and other paramedical staff, in particular.

Drugs Supply and Diagnostic Services

The role of Tamil Nadu Medical Services Corporation (TNMSC) deserves special attention. Over the years, since its creation in mid-1990s, TNMSC has strengthened substantially the public drug delivery system in the State and its contributions are widely recognised, nationally and internationally. Its role has expanded from procurement and distribution of essential drugs to public facilities, to include investing substantially on diagnostic equipment in these facilities. Across the State, TNMSC now provides the following diagnostic services on payment basis: 61 CT scan centres (with at least one in each district), 15 MRI scan centres, 2 Lithotripsy centre, and a sales counter (at Chennai Kilpauk Hospital) where life-saving drugs are sold to the public at a rate much less than market prices. The essential drug list is updated once every two years, based on drug utilisation and inclusion of new drugs for maternal and child health and safe abortion (SHS, PIP, TN 2012-13).

The overall budgetary provisions have gone up from about ₹175 crore in 2008-09 to about ₹350 crore in 2013-14. The Corporation with about 650 employees has managed most effectively the drugs supply system in the State. All warehouses (located in district headquarters) maintain five months' physical stocks to prevent any shortage of drugs.

Health Management Information System

Health Information Management System: Health Management Information System (HIMS) in the State has been bolstered with support from SHSP. Tata Consultancy Services (TCS) and ELCOT have been involved in building the HIMS. At present, each hospital maintains patient records but they are not fully networked and integrated. But to an extent, these hospitals that are involved in CM's Insurance Scheme, are also integrated. The State, with the help of Indian Council of Medical Research (ICMR), has recently set up a State Health Data Resource Centre (SHDRC). It is yet to get stabilised, but its mandate is clear and has the potential to contribute to effective monitoring and policy formulation in the future.

Integrated Disease Surveillance Project (IDSP): IDSP in Tamil Nadu was launched in 2005 in order to establish a decentralised system of surveillance of the communicable and non-communicable diseases with a view to provide timely and effective public health interventions. More specifically, IDSP will address a few specific diseases and risk factors, integrate surveillance activities at district and State level, improve laboratories for disease surveillance, deploy human resources development for surveillance and establish a system of data collection, reporting, analysis and feedback using IT (information technology) (SHS, PIP, TN 2012-13).

Owing to strengthening of District Surveillance Units (DSUs)—there are 32 DSUs—a drastic improvement in the laboratory confirmation of outbreaks has been noticed over the years. It went up from 2008—19 per cent, 2009—31 per cent, 2010—29 per cent, 2011—82 per cent, 2012—93 per cent, 2013—93 per cent, 2014—84 per cent, 2015—89 per cent. Also over the years, there has been a significant improvement in the reporting of outbreaks of communicable diseases: 2008—81, 2015—153. Yet, it should be noted that several Health Unit Districts (HUDs) do not have DSUs in place and in that case, these regions are yet to benefit from IDSP.

Outcomes

How do we assess the combined and cumulative effects of several of these initiatives? Intuitively, one

could expect positive impact of these initiatives in terms of: (a) increased utilisation of services provided in public facilities; (b) reduction in the out-of-pocket expenditure by patients, in particular among the poor; and (c) improvements in the overall health status of people. This section provides an overview of changes that the State has witnessed over the past decade or so, in these contexts.

Quite evidently, we cannot directly relate the impact of these measures on overall improvements in the health status of populations, for the simple fact that health status (survival chances and quality of life after treatment) is significantly determined by factors, such as nutrition, housing, overall economic status, pollution and lifestyle.

Utilisation of Public Healthcare Services

Data from the National Sample Survey Organization (NSSO, 2006) 60th Round study on Morbidity and Health Care, shows that self-reported ailments in Tamil Nadu are comparable to that of rest of the country, whereas the rate of hospitalisation is distinctly higher. The percentage of those not seeking care is relatively low at 13 per cent, the major reasons given being unavailability of healthcare and its high cost. Further, considering the all-India figures, it is seen that 75 per cent of outpatient care and 60 per cent of inpatient care in the State are availed in the private sector. The share of the private sector in both these cases are higher in urban than in rural areas. Another interesting fact is that as on 1 January 2002, it was estimated that 78 per cent of hospital beds in Tamil Nadu are in the public sector (CBHI, 2003). Although the public healthcare infrastructure in the State is comparatively better than rest of the country, it does not seem to have resulted in an increased proportion of utilisation of public inpatient or outpatient care, except in the case of child birth. This indicates a preference of the population for availing healthcare from the private sector, raising questions about the quality of services provided by the public health facilities. With a largely unregulated private sector and rising healthcare costs, there is an urgent need to improve utilisation of the public healthcare system so as to avoid wastage of precious government resources and to ensure that the poor and underprivileged are not denied access to healthcare for economic reasons.

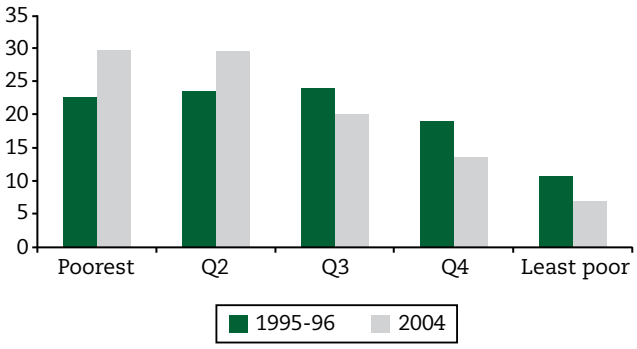
The data presented here on utilisation of healthcare is based on the NSSO study done in 2004 and it can merely serve as a base line for studying the impact of NRHM on this parameter, which is a good proxy for access to healthcare. State health department data show that the average figures for outpatient attendance in the PHCs has increased from 123 per day in 2005-06 to above 142 in 2011-12. This indicates a possible shift towards better utilisation of the public sector in the State for outpatient care. As stated above, utilisation of public health services is very closely aligned with the public perception of quality of services rendered by the public health facilities.

Equity in Utilisation of Healthcare

Equity is an important dimension of provision of health services to the population. Equity studies help to reveal whether or not the public funds invested in healthcare services have reached the poorest, the target population. Studies by Mahal *et al.* (2000) done on the utilisation of public healthcare services in the State, using the 52nd Round of NSSO on Morbidity and Treatment of Ailments, have clearly shown that public immunisation and maternity services were pro-poor in the State; that is, the poorest quintile used more than its proportionate share of these services, even in 1995-96. At this time, the rural inpatient services and urban outpatient services were pro-rich. Further research using the 60th Round of NSSO reveals that over this period, utilisation of all forms of public healthcare services, which include inpatient, outpatient, maternity and immunisation, has become more equitable in the State, with all the services becoming pro-poor (Acharya *et al.*, 2011: 19-29). Figure 5.2 illustrates the-poor utilisation of public facilities for maternal deliveries. The figure also shows that over a period (1995-96 to 2004), greater proportions of those utilising public facilities belonged to bottom-most quintiles. Further studies on how equity and utilisation of public healthcare in the State have fared owing to NRHM, can only be carried out after results of the 71st Round of NSSO on Morbidity and Health Care become available.

Figure 5.2

Distribution of Maternal Deliveries in Public Facilities in Tamil Nadu, 1995-96, and 2004, by Socio-economic Groups



Source: Acharya *et al.* (2011).

Maternal and Child Health: Coverage and Outcome Indicators

Many inputs provided under the Reproductive and Child Health (RCH) component of NRHM, including provision of 24x7 delivery services, ensuring availability of emergency obstetric care and setting up of NICUs, have been designed to improve Maternal and Child Health (MCH). The coverage and outcome parameters of MCH services are relatively easy to measure and can be used as a proxy to study performance of the overall health system in terms of access and effectiveness.

MCH coverage indicators show that Tamil Nadu had met most of the benchmarks set by NRHM by 2005 itself. The proportion of institutional deliveries in the State, which was only 64 per cent in 1992-93, had gone up to nearly 98 per cent by 2005 (Muraleedharan *et al.*, 2011: 178-80). In fact, data from the District Level Household and Facility Survey in 2007-08 (DLHS 3) shows that institutional delivery was near universal in both rural and urban areas of Tamil Nadu (Table 5.2). The one significant change noted since 2005 is the increase in proportion of deliveries conducted in the PHCs, their share of total deliveries going up from 7.9 per cent to more than 25 per cent between 2005-06 and 2009-10. This has been accompanied by a corresponding fall in the share of deliveries conducted by the private institutions over the same period. The shift in utilisation from private to the public sector can be taken as a positive indicator of improved health service delivery for maternity care, resulting from the additional inputs provided under NRHM. However, the payment of ₹6,000 (and later ₹12,000) as a maternity benefit for all poor women under the State-funded Muthulakshmi Reddy Maternity Benefit Scheme (HFW, Policy Note, 2013: 42) also had some role to play in the improved utilisation of PHCs for maternal deliveries. Similarly, the proportion of women who received at least three antenatal visits increased dramatically from about 20 per cent in the early 1990s to 95 per cent by 2005 (HFW, Policy Note, 2013: 178-80). Information from Table 5.2 shows that the proportion of mothers who received three or more antenatal visit was the highest in Tamil Nadu (95.6%) and those with full antenatal coverage was much higher than the national average in Tamil Nadu (51.8%), except Kerala and Karnataka. However, there were rural-urban disparities, with full ANC (antenatal care) coverage being relatively higher in urban than rural Tamil Nadu. Latest information from the United Nations Children's Fund's (UNICEF) Coverage Evaluation Survey (CES) 2009[2] shows a decline in full antenatal coverage in Tamil Nadu to 44.1 per cent (UNICEF, 2010). During the same period, full antenatal care coverage improved in the country as a whole and also in Andhra Pradesh (united), Kerala, Maharashtra and Gujarat, while declining in Karnataka and Maharashtra. Tamil Nadu has a higher proportion of mothers who received postnatal care within two weeks of delivery (89.2%) than the other States under comparison, except Kerala. Moreover, the proportion was higher in rural than urban areas in Tamil Nadu. Information from UNICEF's CES 2009 reveals that 98.4 per cent of the deliveries took place in institutions in Tamil Nadu, which reflects an increase since 2007-08.

Another example of Tamil Nadu's nearly universal coverage of services for women and children is its successful immunisation programme. Tamil Nadu has always been a pioneer in immunisation services and had ranked first among all the States in India in terms of coverage by the early 1990s. By the late 1990s, 99 per cent of rural and 100 per cent of urban children in the State had received at least one dose of immunisation, while more than 80 per cent children received full vaccination—a level of performance that has been maintained over the past 15 years (DPH Office 2014). Data from DLHS 3 for 2007-08, however, show a fall in the full vaccination coverage (to about 81.8%) compared to 91.4 per cent in DLHS 2 in 2002-2004[3] (International Institute for Population Sciences (IIPS), 2010). This declining trend in full immunisation coverage in Tamil Nadu is also corroborated by UNICEF's CES 2009, which indicate that 77.3 per cent of the children aged 12-23 months were fully immunised in Tamil Nadu (UNICEF, 2010a). There was a higher utilisation of private health facilities for immunisation in Kerala (21%) and Tamil Nadu (20%), which affected full immunisation of children (UNICEF, 2010a). In Tamil Nadu, according to CES 2009 (UNICEF, 2010b), full immunisation shows variation across caste, where children belonging to STs (Scheduled Tribes) (54.3%), SCs (Scheduled Castes) (74.5%) and OBCs (Other Backward Classes) (77.7%) have lower levels of immunisation than those from other castes (90.3%). While immunisation improves among children belonging to higher wealth quintiles, there

2. UNICEF's CES used questionnaires similar to National Family Health Survey (NFHS) and DLHS. The data on antenatal care pertains to women who delivered 12 months preceding the survey.

3. It is important to note that DLHS 2 administered the questionnaire only to currently married women, whereas DLHS 3 administered the questionnaire to every married woman.

Table 5.2

Maternal (Married Women Aged 15-49 Years) and Child Health Coverage in Tamil Nadu, Andhra Pradesh (United), Karnataka, Kerala and Maharashtra 2007-08 (as %)

S. No.	State	Place of residence	Mothers who had 3 or more antenatal check-up	Mothers who had full antenatal check-up	Institutional delivery	Mothers who received post-natal care within two weeks of delivery	Children age 12-23 months fully immunised
1	Tamil Nadu	Rural	94.8	47.7	91.8	86.9	82.9
		Urban	97.0	58.3	97.5	92.7	80.0
		Total	95.6	51.8	94.0	89.2	81.8
2	Andhra Pradesh (united)	Rural	87.2	37.6	65.7	76.4	65.0
		Urban	96.3	49.7	90.9	89.0	73.2
		Total	89.4	40.5	71.8	79.4	67.1
4	Karnataka	Rural	78.5	48.7	59.7	64.8	76.5
		Urban	88.6	57.3	79.8	81.5	77.3
		Total	81.2	51.0	65.1	69.3	76.7
5	Kerala	Rural	95.2	72.4	99.2	99.3	80.3
		Urban	95.5	71.4	99.9	99.9	77.0
		Total	95.2	72.2	99.4	99.4	79.6
6	Maharashtra	Rural	70.5	32.6	54.1	76.0	67.6
		Urban	84.3	37.1	87.2	89.1	72.6
		Total	74.4	33.9	63.5	79.7	69.0
7	Gujarat	Rural	48.0	16.0	48.0	52.8	51.3
		Urban	77.3	32.7	83.7	81.1	66.8
		Total	54.8	19.9	56.4	59.4	54.8
	All India	Rural	42.8	14.7	37.8	41.7	50.0
		Urban	67.5	29.5	70.4	69.7	62.5
		Total	49.7	18.8	46.9	49.5	53.5

Source: District Level Household and Facility Survey 3, 2007-08.

is surprisingly a decline among children belonging to the highest wealth quintile. They may have most likely used private health facilities. CES 2009 points out that Goa, Sikkim and Punjab have the highest proportion of children aged 12-23 fully immunised in India. As Pentavalent vaccines have been introduced in select States, beginning with Tamil Nadu and Kerala in 2011, results from NFHS 4 will provide an idea of coverage under the new Universal Immunisation Programme (UIP).

Considering the aggregate outcome indicators on maternal and child health, Tamil Nadu has already achieved the NRHM goal of Maternal Mortality Rate (MMR) below 100, reaching a value of 97 per one lakh live births, based on the Sample Registration Survey (SRS) data of 2007-09 (RGI, 2011). The MMR figures for the year 2010-11 based on State programme data (maternal death line listing) show a value of 79, which has reflected a further fall to 71 in the year 2011-12 (SHS, 2012: 10). However, the SRS figures for MMR in 2010-12 show that it has declined to only 90 (Table 5.3). This discrepancy needs to be reconciled and the early momentum in reduction of MMR has to be regained.

On the child health front, the Infant Mortality Rate (IMR) has fallen to 21 in 2013, well below the NRHM target of 30 per thousand live births (RGI, 2013a). The rate of fall of the IMR has also been faster in the years following NRHM than those preceding it. In the period between 2005 and 2013, the State recorded one of the largest falls in IMR in the country (Table 5.4).

Table 5.3

MMR for Tamil Nadu and Other Southern States (2011-12, 2007-2009, and 2004-2006)

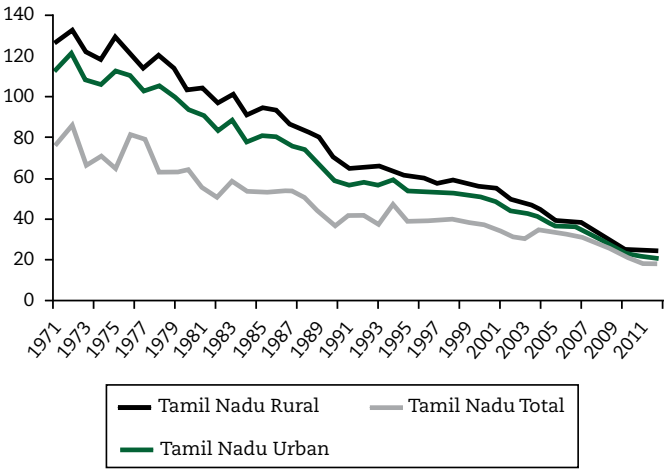
India and Southern States	*Sample Female Population*	*Live Births*	*MMR 2010-2012*	*MMR 2007-2009*	*MMR 2004-2006*
India	6169091	430170	178	212	254
Andhra Pradesh	357699	22427	110	134	154
Karnataka	390941	21909	144	178	213
Kerala	305268	15351	66	81	95
Tamil Nadu	410769	22622	90	97	111
Subtotal	1464677	82309	105	127	149

Source: Registrar General of India (RGI, 2013b).

However, the State has witnessed a certain degree of deceleration in the improvement of IMR over the last two years—the causes for which need to be examined in detail and addressed. Figure 5.3 shows changes in IMR for rural and urban TN from early 1970s and Figure 5.4 shows IMR in major states of India, as of 2012. Table 5.4 shows that the State fares better across all health indicators compared to the all-India averages in many respects. TN CDR has however remained stagnant over the period 2005-2012 at 7.4, while all-India average has fallen to 7 by 2012.

Figure 5.3

IMR for Tamil Nadu by Place of Residence



Source: RGI, 2013a.

Table 5.4

Tamil Nadu's Health Status in Comparison with All-India Status: Key Indicators

Health Indicators	*2005*		*2012*	
	TN	*All India*	*TN*	*All India*
CBR	16.5	23.8	15.6	21.4
CDR	7.4	7.5	7.3	7.0
TFR	1.7	2.9	1.7	2.3
IMR	37	58	21.0	40.0
MMR	111	254	79	167
U5M	36	69 (2008)	23	49
LE at Birth	66.7 (1997)	63.8 (m) 66.1 ((f) 2001-2005	68.6 (m) 71.8 (f)	67.3 (m) 69.6 (f)

Note: Crude Birth Rate (CBR), Crude Death Rate (CDR), Total Fertility Rate (TFR), Infant Mortality Rate (IMR), Maternal Mortality Ratio (MMR), Under 5 mortality (U5M) and Life Expectancy at Birth (LE).

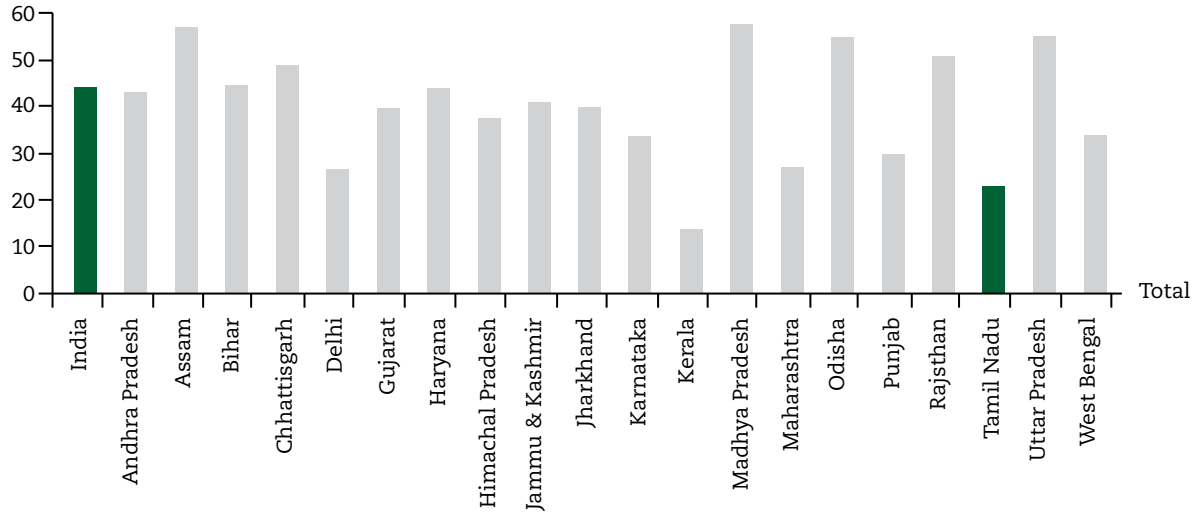
Source: SRS 2011-2013 (RGI).

While the State can be justifiably proud of these achievements, it is well documented that there are inequities in health outcomes across districts as measured by the departmental MMR figures. Similar variation is seen in the IMR figures as measured by the Vital Events Survey in 2008 (SHS, 2011). Studies based on the NFHS-3 also show inequities in mortality and morbidity indicators across income and caste (Krishnamurthy, 2008). The State cannot afford to ignore these differences, even though the reasons for their existence may not lie within the health system alone.

The State has always been a star performer in family welfare, with the Total Fertility Rate (TFR) falling to 2 by 1997, reaching the national goal of 2.1 well before

Figure 5.4

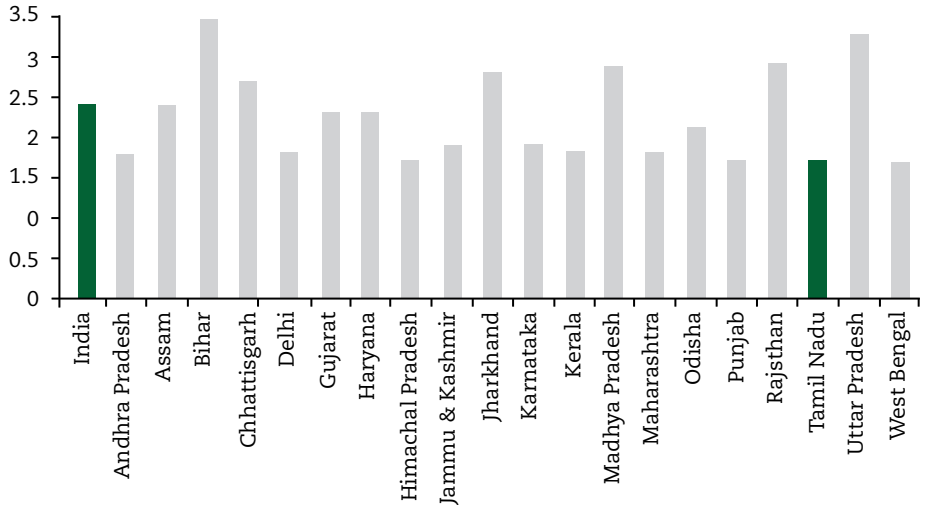
IMR in Tamil Nadu and Other Major States of India



Source: RGI, 2013a.

Figure 5.5

Total Fertility Rate, Tamil Nadu and Other Major States of India, 2011



Source: SRS Statistical Report 2012.

the introduction of NRHM. As of 2013, Tamil Nadu's TFR stands at 1.7 (see Figure 5.5).

However, there is excessive dependence on female sterilisation, with 53.8 per cent of women reporting it as a method of family planning in comparison with 0.2 per cent of men (International Institute of Population Sciences, 2010). DLHS 3 had revealed that nearly three-fourth (73.6%) of the terminal methods of family planning were practiced in a government health facility, whereas only 24 per cent accessed a spacing method from government health facilities in Tamil Nadu. Further, in 2013-14, 25 per cent (81,554) of all the sterilisations were conducted in PHCs and 41 per cent in government hospitals (Government of Tamil Nadu, 2014). There is very low priority given to provision of accessible, safe abortion services in the public sector.

Cost of Care: Out-of-pocket Expenditure on Healthcare

Unlike most other States, Tamil Nadu has the distinction of having the lowest out-of-pocket

Table 5.5

Availability of Drinking Water, Toilet Facilities and Prevalence of Open Defecation Tamil Nadu, Andhra Pradesh (United), Karnataka, Kerala, Maharashtra, Gujarat and All-India, 2011 (as %)

S. No.	State	Place of residence	Drinking water –Tap water from treated source	Location of drinking water source within premises	Households having latrine facility within premises	Households having bathroom within premises	Open defecation
1	Tamil Nadu	Rural	46.1	17.0	23.2	26.1	73.3
		Urban	66.3	54.0	75.1	75.5	16.2
		Total	55.8	34.9	48.3	49.9	45.7
2	Andhra Pradesh (united)	Rural	36.4	31.5	32.2	33.9	65.1
		Urban	75.5	67.9	86.1	85.6	11.9
		Total	49.0	43.2	49.6	50.6	48
3	Karnataka	Rural	22.9	26.6	28.4	63.4	68.1
		Urban	68.4	70.9	84.9	91.7	10.7
		Total	41.2	44.5	51.2	74.8	45.0
4	Kerala	Rural	17.2	72.9	93.2	74.5	5.6
		Urban	30.4	83.3	97.4	88.8	1.7
		Total	23.4	77.7	95.2	81.2	3.8
5	Maharashtra	Rural	32.0	42.9	38.0	46.2	55.8
		Urban	85.7	79.3	71.3	86.0	7.7
		Total	56.3	59.4	53.1	64.3	34.0
6	Gujarat	Rural	16.7	48.3	33	33.6	65.8
		Urban	68.8	83.7	87.7	85.0	8.7
		Total	39.8	64.0	57.3	56.5	40.4
	All-India	Rural	17.9	35.0	30.7	25.4	67.3
		Urban	62.0	71.2	81.4	77.5	12.6
		Total	32.0	46.6	46.9	42.0	49.8

Source: Census of India (2011).

expenditure amongst those utilising public facilities. The out-of-pocket expenditure for hospitalisation in rural Tamil Nadu was only ₹637 as against ₹3,238 in the rest of India (NSSO, 2006: 29-35). However, the corresponding out-of-pocket expenditure in a private facility summed up to ₹8,360, and was higher than the all-India average value of ₹7,408 (NSSO, 2006: 42). The out-of-pocket cost for hospitalisation in public facilities for the poorest quintile was only ₹152, which was around 6 per cent of the all-India figure of ₹2,469, thereby proving that even before the advent of NRHM, the poorest were able to get inpatient care at very low cost in the State. In this context, it is significant to note that Tamil Nadu was the only State where the Patient Welfare Societies (PWS) were not authorised to collect user fees as a method of raising resources, regardless of being part of the NRHM mandate.

Water, Sanitation and Nutrition

No discussion on health is complete without a reference to access to water, sanitation and nutrition status of a population. Proportion of households having access to improved water[4] has increased from 94.7 per cent in 2007-08 to 97.4 per cent in 2012-13 (IIPS, 2014). Similarly, those with access to improved toilet facility increased from 38.8 per cent to 52.5 per cent during the same period. However, when compared to other southern States, Census of India (2011) shows that although a larger proportion of households in Tamil Nadu used tap water from treated source as drinking water, a lower proportion of households did have a proper drinking water source,

4. Improved source of water includes pipe water into dwelling, piped to yard/plot, public tap/standpipe/hand pump/tube well/bore well/well covered/protected spring, tanker/truck, cart with small tank/drum and packaged/bottled water

Table 5.6

Availability of Drinking Water, Toilet Facilities and Prevalence of Open Defecation in Districts of Tamil Nadu, 2011 (as %)

S. No.	Name of the district	Drinking water–Tap water from treated source	Location of drinking water source within premises	Households having latrine facility within the premises	Households having bathroom within the premises	Open defecation
1	Ariyalur	44.1	16.6	18.1	14.7	80.1
2	Chennai	79.0	76.3	95.6	95.6	0.6
3	Coimbatore	87.6	59.2	66.7	73.6	22.2
4	Cuddalore	49.5	33.4	36.1	32.6	61.8
5	Dharmapuri	27.6	9.9	19	24.2	79.0
6	Dindigul	50.9	25.0	33.3	43.7	58.7
7	Erode	63.8	35.6	49	52.5	41.9
8	Kancheepuram	56.7	43.8	65.5	67.6	32.5
9	Kanyakumari	45.5	38.8	87.5	51.7	7.1
10	Karur	58.5	36.9	41.2	43.4	53.2
11	Krishnagiri	47.3	18.9	33.0	44.2	64.3
12	Madurai	65.5	37.4	59.2	60.8	35.5
13	Nagapattinam	40.9	25.3	39.5	29.1	57.8
14	Namakkal	57.9	29.4	40.7	48.5	43.8
15	The Nilgiris	60.1	21.4	51.9	63.7	36.7
16	Perambalur	27.9	19.2	22.2	26.6	73.5
17	Pudukkottai	44.6	14.6	28.0	22.5	69.7
18	Ramanathapuram	29.1	10.5	36.6	30.7	60.0
19	Salem	62.1	24.7	35.0	43.2	53.9
20	Sivagangai	40.1	24.7	40.7	36.3	55.6
21	Thanjavur	30.2	34.7	45.1	35.6	50.9
22	Theni	76.0	39.3	39.3	62.7	40.1
23	Tiruchirappalli	66.6	41.0	48.5	48.3	43.1
24	Thiruvallur	46.0	36.6	67.9	69.6	29.9
25	Thiruvarur	23.0	25.0	39.7	27.3	56.8
26	Tirunelveli	72.5	36.2	47.6	45.3	43.1
27	Tiruppur	75.4	46.5	57.2	62.6	35.4
28	Tiruvannamalai	44.0	26.6	22.8	26.8	75.8
29	Thoothukudi	63.0	30.4	50.0	49.8	46.1
30	Vellore	49.9	35.0	41.1	48.8	56.5
31	Villupuram	41.5	16.7	21.1	22.6	77.2
32	Virudhunagar	45.0	21.5	30.9	46.9	52.4
	Tamil Nadu	55.8	34.9	48.3	49.9	45.7

Source: Census of India (2011).

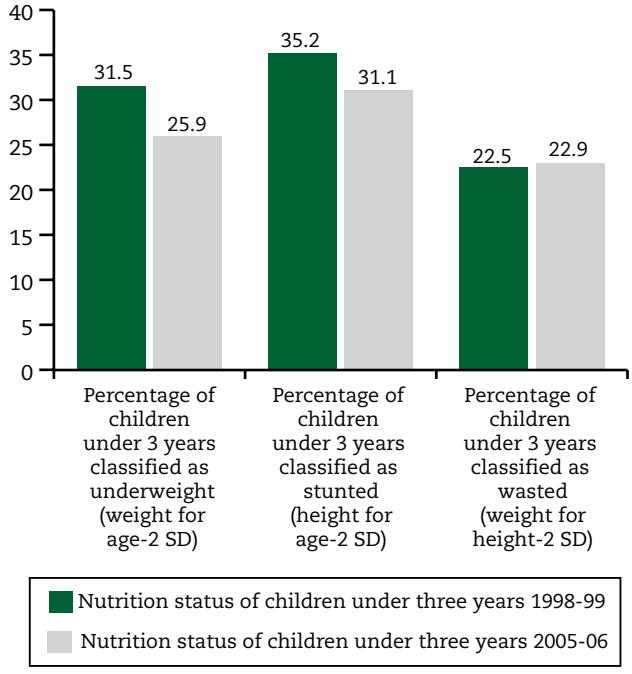
latrine and bathroom within their homes (Table 5.6). Further, a larger proportion of households in Tamil Nadu defecate in the open than in Kerala, Karnataka, Maharashtra and Gujarat. Although Kerala has a lower proportion of households that use treated tap water for drinking, the State performs better than the States under comparison in terms of having drinking water source, bathroom and latrine within premises and very low proportion of households that report open defecation.

The district-wise pattern on sanitation show that Chennai and Coimbatore perform better than all the other districts (Table 5.6). While Chennai and Coimbatore have the highest proportion of households using tap water from a treated source for drinking, Chennai, Coimbatore, Kanyakumari and Thiruvallur have the lowest proportion of households defecating in the open.

Malnutrition (both under and over nutrition) among children and adults has the potential to depress human capability, increase vulnerability and reduce resilience of a population; or in other words, it has potential to reverse human development. If left unaddressed, undernutrition causes poor health among children, leaving them susceptible to illness and mortality. It also causes cognitive impairments leading to sub-optimal educational completion, which by reducing opportunities reinforces poverty and multiple deprivations. The consequences of obesity are no less, as it is a risk factor for NCDs. Access to food and dietary composition is no doubt a critical determinant of child undernutrition, but not the only one; the others being women's autonomy, maternal education, maternal nutritional status, utilisation of maternal healthcare services, caste, early marriage and early child bearing, birth order, child care and feeding practices, sanitation and hygiene, income group, traditional beliefs/taboos about food and living arrangements. It has been argued that the main factor that explains high level of stunting among Indian children is the practice of open defecation (Coffey *et al.*, 2013). India's shocking record in under-five child undernutrition up to 2005-06 has received considerable attention prompting the Supreme Court to order that the Integrated Child Development Scheme (ICDS) and Midday Meal Scheme (MDMS) be universalised, which is the world's largest child feeding programme. Information gathered from the NFHS (population-based survey) conducted in 2005-06 revealed that in India, 42.5 per cent of children under the age of five were underweight, 48 per cent were stunted and 19.8 per cent were wasted. Child underweight (weight for age minus 2 standard deviation [SD]) is a comprehensive indicator of nutritional status, as it reflects chronic and acute malnutrition; stunting (height for age minus 2 SD) reflects linear growth retardation and indicates chronic undernutrition; and wasting (weight for height minus 2 SD) is an indicator of acute malnutrition as a result of recent illness. When compared to the national average, in 2005-06, the situation in Tamil Nadu was better with lower percentage of underweight children (29.8%) and stunted children (30.9%), although the State had a higher percentage of children who were wasted (22.2%). It is evident that Tamil Nadu's long history in implementing social security schemes (described in the chapter on social security) for nutrition, education and health, particularly the public distribution system, MDMS, ICDS and those focussing on girl's education, has played a role in enabling such a situation. In fact, the State performs comparatively well in maintaining lower rates of chronic malnutrition (stunting) among children, exhibiting the third lowest rate after Kerala (24.5%) and Goa (25.6%), although the prevalence of malnutrition was fairly high even among these better performing States. The earlier discussion on sanitation has highlighted that Tamil Nadu had relatively higher proportion of households defecating in the open, which could be one of the reasons for 30 per cent of the under-five children to be stunted in 2005-06.

Figure 5.6

Nutrition Status of Children Below Three Years in Tamil Nadu, Between 1998-99 and 2005-06



Source: International Institute of Population Sciences (IIPS) and Macro International (2008).

On the nutrition front, both positive and negative trends are observed over time in Tamil Nadu, when data on undernutrition for children under three years is compared between NFHS 2 and NFHS 3[5] (Figure 5.6): Firstly, the proportion of underweight children (below age 3) has decreased from 31.5 per cent in

5. As NFHS 2 collected information on children under three years, for comparison, NFHS 3 data on the same has been used. All indicators of malnutrition are expressed in SD units from the median of the 2006 WHO International Reference Population.

Table 5.7

Nutritional Status of Children Below Five Years and Pregnant Women in Tamil Nadu, Andhra Pradesh, Karnataka, Kerala, Maharashtra and Gujarat, 2005-06 (as %)

S No	State	Place of residence	Percentage of children under 5 years classified as underweight (weight for age-2 SD)	Percentage of children under 5 years classified as stunted (height for age-2 SD)	Percentage of children under 5 years classified as wasted (weight for height-2 SD)	Percentage of children (6-59 months) with anaemia	Percentage of adult women (age 15-49 years) with anaemia
		Rural	32.1	31.3	22.6	63.4	54.2
1	Tamil Nadu	Urban	27.1	30.5	21.6	65.1	52.0
		Total	29.8	30.9	22.2	64.2	53.2
		Rural	34.8	45.8	13.0	72.7	64.6
2	Andhra Pradesh	Urban	28.0	36.7	10.7	66.8	59.7
		Total	32.5	42.7	12.2	70.8	62.9
		Rural	41.1	47.7	18.2	72.0	53.5
3	Karnataka	Urban	30.7	36.0	16.5	67.1	48.3
		Total	37.6	43.7	17.6	70.4	51.5
		Rural	26.4	25.6	18.2	44.6	32.2
4	Kerala	Urban	15.4	22.2	10.9	44.4	34.1
		Total	22.9	24.5	15.9	44.5	32.8
		Rural	41.6	49.1	18.2	66.8	50.6
5	Maharashtra	Urban	30.7	42.3	14.1	58.7	46.0
		Total	37.0	46.3	16.5	63.4	48.4
		Rural	47.9	54.8	19.9	74.6	58.7
6	Gujarat	Urban	39.2	46.6	16.7	61.9	50.9
		Total	44.6	51.7	18.7	69.7	55.3
		Rural	45.6	50.7	20.7	71.5	57.4
	All India	Urban	32.7	39.6	16.9	63.0	50.9
		Total	42.5	48.0	19.8	69.5	55.3

Source: National Family Health Survey 3, 2005-06.

1998-99 to 25.9 per cent in 2005-06; secondly, stunting among under-3 children has declined from 35.2 per cent to 31.1 per cent over the same period; but lastly, wasting (weight for height) among under-3 children has worsened from 22.5 per cent in 1998-99 to 22.9 per cent by 2005-06.

Anaemia among children under five years was high at 69 per cent in 2005-06. Furthermore, anaemia among children under three years increased from 69 per cent in 1998-99 to 72.7 per cent in 2005-06. Under-five anaemia was higher among male children, children of mothers without education, those with anaemic mothers, Hindus, SCs, and children living with both parents instead of one and in urban areas (IIPS, 2008). This observation has to be read with the fact that 53.2 per cent of adult women in Tamil Nadu had anaemia.

Among the States under comparison, Kerala had the lowest proportion of children under five years who were underweight and stunted, Andhra Pradesh had the lowest prevalence of wasting and Gujarat had the highest proportion of children who were underweight and stunted.

A higher percentage of children who were small at birth (38.8%) were underweight than those who were normal or average size at birth (24.9%) in Tamil Nadu (IIPS, 2008). In 2005-06, Tamil Nadu has a lower proportion of infants (less than 6 months) being exclusively breastfed (34.1%) than Kerala (56.2%). A larger proportion of boys than girls were underweight, stunted and wasted (Table 5.7). The need to focus attention on birth spacing is brought out by the fact that under five, underweight and stunting rates decline

Table 5.8

Nutritional Status of Children Below Five Years in Tamil Nadu by Background Characteristics, 2005-06 (as %)

Background characteristics		*Percentage of children under 5 years classified as underweight (weight for age -2 SD)*	*Percentage of children under 5 years classified as stunted (height for age -2 SD)*	*Percentage of children under 5 years classified as wasted (weight for height -2 SD)*
Gender	Male	31.5	32.7	31.5
	Female	28.0	29.0	28.0
Birth interval in months	First birth	28.3	27.0	21.4
	<24	34.7	42.7	19.9
	24-47	32.4	34.8	24.9
	48+	23.8	25.4	16.7
Birth order	1	28.2	26.9	21.5
	2-3	29.6	33.2	19.5
	4-5	40.6	45.6	33.9
Mother's education	No education	41.6	44.4	27.4
	<5 years complete	35.4	37.0	20.9
	5-9 years complete	33.5	34.0	25.6
	10 or more years complete	17.7	19.1	14.1
Religion	Hindu	31.8	32.7	22.9
	Muslim	15.0	13.6	26.8
	Christian	13.4	19.1	7.9
Caste/tribe	SC	40.2	39.7	26.7
	ST	NA	NA	NA
	OBC	26.3	28.2	20.8
	Others	15.9	10.6	15.4
Mother's nutritional status	Underweight (BMI<18.5)	37.7	37.6	26.7
	Normal (BMI 18.5-24.9)	29.7	30.9	21.8
	Overweight (BMI>25.0)	18.8	22.4	14.8
Child's living arrangements	Living with both parents	31.0	31.8	22.0
	Living with one or neither parent	24.4	26.6	22.8
Wealth index	Lowest	43.1	40.1	27.7
	Second	38.0	37.7	31.4
	Middle	34.1	35.4	22.0
	Fourth	26.7	28.3	20.4
	Highest	9.2	13.2	13.4

Source: IIPS, National Family Health Survey 3, 2005-06.

with increase in birth interval. Wasting is lowest when the birth interval is more than four years. Similarly, underweight and stunting prevalence increases with birth order. Maternal education has an important role in child development. In Tamil Nadu, underweight and stunting was higher among children whose mothers had no education (41.6% and 44.4% respectively) than those whose mothers had 10 or more years of education (33.5% and 34% respectively), thereby indicating the important role that education plays in improving capabilities (Table 5.8). The proportion of underweight and stunted children was highest among Hindus and least among Muslims, whereas wasting was highest among Muslims and least among Christians. The SC

children exhibited a higher prevalence of underweight, stunting and wasting. The proportion of children who were underweight, stunted and wasted was greater among those whose mothers were underweight, underscoring the important role that maternal health plays in determining child undernutrition. Under-five stunting and underweight were lower among children who lived with single parents or no parent than those living with both parents, which could be because single parents are more independent in taking decisions about their child's health. Economic background of the household also plays a role in influencing children's undernutrition, with prevalence of underweight and stunting declining with increasing wealth quintile.

Information from NFHS 3 on child care practices will offer some insights about determinants of undernutrition. Incorrect feeding practices among children were higher in Tamil Nadu than in Kerala, with 20.6 per cent of the children being given a pre-lacteal feeding when compared to 10.8 per cent in Kerala (IIPS, 2007). In addition, in Tamil Nadu, only 34.1 per cent of infants less than 6 months were exclusively breastfed (24-hour recall period). Further, 28.9 per cent of all children (6-23 months) were fed with recommended Infant and Young Child Feeding (IYCF) practices in Tamil Nadu, whereas it was 61 per cent of the children (6-23 months)in Kerala. In addition, only 12 per cent of the children (age 6-59 months) in Tamil Nadu were given deworming medication six months preceding the survey, compared to 44.7 per cent in Kerala (IIPS, 2007). The relatively higher proportion of under-five wasting in Tamil Nadu can be associated with poor knowledge and practice about management of diarrhoea, apart from poor sanitation and management of other illnesses. Information from NFHS 3 had shown that in Tamil Nadu, only 9.6 per cent of the children suffering from diarrhoea were given more fluids as per UNICEF guidelines, compared to 44.1 per cent in Kerala (IIPS, 2007). Besides management of diarrhoea, another factor that can cut down wasting is safe disposal of children's excrement, which prevents spreading of infections. Only 22.1 per cent of children's excrement was disposed safely in Tamil Nadu, in comparison with 73.7 per cent in Kerala and 73.5 per cent in Sikkim (IIPS, 2007).

As discussed earlier, maternal undernutrition (low BMI or body mass index) is a risk factor for child undernutrition. A BMI of less than 18.5 indicates Chronic Energy Deficiency (CED). Information from NFHS 3 highlights that a relatively low percentage of adult men and women in Tamil Nadu and Kerala had CED compared to the other southern States, Maharashtra and Gujarat (Table 5.9). CED was higher among women than men in all the States under comparison, except Kerala. Tamil Nadu and Kerala also had the highest proportion of adult men and women who were obese and obesity was considerably higher among adult women than men, implying that these two States face a higher risk of NCDs among women

Table 5.9

Chronic Energy Deficiency and Obesity according to BMI Grades among Adults (18 Years and Above) in Tamil Nadu, Andhra Pradesh, Karnataka, Kerala, Maharashtra and Gujarat, 2005-06 (as %)

S. No.	*State*	*Chronic energy deficiency (<18.5)*		*Obesity (>30)*	
		Male	*Female*	*Male*	*Female*
1	Tamil Nadu	27.1	28.4	2.0	5.1
2	Andhra Pradesh	30.8	33.5	1.9	4.1
3	Karnataka	33.9	35.5	1.7	3.7
4	Kerala	21.5	18.0	2.1	5.0
5	Maharashtra	33.5	36.2	1.6	3.6
6	Gujarat	36.1	36.3	2.0	4.6
	All India	34.2	35.6	1.3	2.8

Source: IIPS, National Family Health Survey 3, 2005-06.

Way Forward

Several challenges persist even in the present day. But it is important to address a few key issues in the immediate future as they are likely to have long-term implications.

1. There are considerable variations within and across district in IMR, MMR, and neonatal deaths. Most districts have blocks that are suffering from the lack of access to primary and secondary care services; this is so, even in most developed districts such as Coimbatore, where children continue to suffer from highly preventable conditions such as dysentery and diarrhoea. While efforts are being made to reduce such inequities in health status, significant improvements in the overall health status can be addressed, only if such inequities are reduced systematically as the primary objective of public health policy of the State.

2. While it is obvious that government spending in absolute amount has gone up significantly over the past five years, its share in the overall State budget has remained the same around four per cent; in terms of State domestic product, it is just about 1 per cent. The share

of health and family welfare in the total State budget should be much more than it is now.

3. Despite the recent spurt in recruitment of medical and paramedical persons both in primary and secondary delivery system, there is a huge shortage of manpower at various levels in the delivery system. Not only specialists, but even field functionaries at primary care level are in short supply. Every round of recruitment faces unexpected legal and other barriers, but it is important to address this bottleneck and strengthen the manpower required to improve access to effective care. Several secondary level facilities, particularly district hospitals, require careful and immediate attention to strengthen paramedical staff specifically. There is a clear case for strengthening human resources at the sub-centre level across the State. There is an urgent need to (re)open training institutions for VHNs and other functionaries and also continue training for enhancing quality of services delivered by them. The State is now in the process of re-establishing training institutions and in augmenting the strength of VHNs at HSC level. This needs immediate attention.

4. Tamil Nadu's primary healthcare delivery system has received considerable attention over the years and is being viewed as a model system for rest of the country. Yet, it is true that HSCs (Health Sub Centres) over the years have not received as much attention as PHCs. Both building infrastructure and additional staff (VHNs) at HSC level require immediate attention. This will have visible and immediate positive impact on overall functioning of the public primary healthcare system and the extent to which this can reduce the financial burden of people.

5. Private health sector has grown passively over the year. The presence of private providers in the tertiary sector is noteworthy. Yet, a concern is noticed from various quarters with regard to the overall quality and cost of care obtained through private providers. The State must implement the Private Clinical Establishment Act, which was introduced more than 15 years ago, but is yet to be implemented. This will go a long way in facilitating improved governance of private health sector and ensure accountability.

6. The State should formulate and implement specific policy measures, with a view to achieve Universal Health Coverage (UHC) before the end of the current decade.

7. Despite improvements in overall health parameters, the state needs to address the issue of malnutrition among pregnant women and children. Importantly, the state's relatively poor performance in terms of provisioning sanitation facilities despite good economic development emerges as a policy issue that requires urgent attention.

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