



**Attaining the MDGs in India**  
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## **ACCESS TO MEDICINE INITIATIVES IN TAMIL NADU**

Asha Gupta was reviewing once again the report she had in front of her. Asha had been employed as an intern for some time at the National Institute of Immunology in Delhi and was at the moment working on a specific project sponsored by the World Bank. She had been hired to gather documentation for a report on the attainment of Millennium Development Goals (MDG) in India. She had found that the decline in infant mortality relative to the increase in real per capita public spending on health from 1981-99 was largest in the poor, high-mortality states, but that these states did considerably worse than the non-poor states, especially in the south, in terms of targeting government health subsidies to the poor. However, she had received a report prepared by N. Lalitha from the Gujarat Institute of Development Research, about an interesting initiative in Tamil Nadu regarding access to essential drugs. Her own findings indicated that, in the poor states, among many other problems such as the absenteeism of doctors and paramedics, the availability of drugs and medical supplies at public health facilities was typically nonexistent.

At the beginning of the 21st century, the issue of access to essential drugs was becoming increasingly important in the context of patent reforms that were taking place in some developing countries, where health cover was available only to a small section of the population. Essential drugs were those that satisfied the health care needs of a majority of the population. However, a sizeable percentage of the population did not have access to essential drugs. In the case of India, though a national-level essential drugs list existed, its adoption was not uniform across the states, whose governments had the prime responsibility for providing health care. In this context, the experience of Tamil Nadu suggested that public health intervention activities with appropriate planning could be targeted at the section of the population for whom such activities were intended. Lalitha's study focused on the evolution of the process and implementation of a rational drug policy in the government health care systems in Tamil Nadu, including the drug distribution mechanism at the level of primary health centers.

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This case was prepared by N. Lalitha, Gujarat Institute of Development Research, and Prof. J. Ribera, IESE Business School, to serve as a basis for discussion and not to approve or criticize the programs or decisions described. The preparation of this case was sponsored by the World Bank. This case is based on a report entitled "Access to Medicines: Initiatives in Policy Making and Delivery of Drugs – A Case Study of Tamil Nadu" by N. Lalitha.

Identifying and formulating a list of essential drugs, procuring them through appropriate procedures, and distributing them through the Tamil Nadu Medical Services Corporation (TNMSC), specifically set up for this purpose, were the most significant measures taken by the Government of Tamil Nadu. A list of essential drugs, which took into account the needs of different health care levels, had been formulated with the help of a committee set up for this purpose. Different directorates, set up to provide services at different levels of health care, transferred their budget for medicines to TNMSC, which utilized it for drug procurement. TNMSC procured these drugs from units that satisfied the established standards of production and quality criteria. These units arranged to send the supplies to different drug warehouses specifically set up to facilitate access to medicines. From the warehouses, institutions drew their quarterly or monthly quota of drugs, depending on their budget allocation. Streamlining the procurement and distribution procedures had ensured that the available budget was rationally used on essential drugs alone, and quality drugs were available from the government health services for those who needed them. Appropriate government policies in the form of availability of qualified doctors at the primary health centers had also supported this intervention.

## **Excerpts from the Report**

### ***Introduction***

By 2003, the issue of access to medicine had gained a lot of attention in the context of the patent reforms in the pharmaceutical sector in a range of countries in the process of introducing changes in their current patent laws. Hence, there were debates on issues ranging from the welfare loss that arose from providing patent protection for drugs, and the availability of such patented drugs, to the ethical issues of allowing cloning and stem cell research. While activists and others talked passionately about the problems of accessing patented medicines, little light was shed on access to off-patent medicines, which were in abundant supply. Importantly, more than 95 per cent of the drugs classified as “essential drugs<sup>1</sup>” by the World Health Organization, for the type of diseases prevalent in countries like India, belonged to this off-patent segment. Popularly known as essential drugs, they satisfied the health care needs of a majority of the population, and it was therefore important to make them available in adequate quantity and at a price that individuals and the community could afford. Ironically, according to sources from the World Health Organization (WHO), at the beginning of the 21<sup>st</sup> century, one third of the population did not have regular access to essential drugs; this figure was nearly 50 per cent in the poorest parts of Africa and Asia<sup>2</sup>. By the end of 1998, 140 countries had developed their own list of essential drugs based on the WHO guidelines (WHO, 2000). India was on the list, though implementation was not uniform across the states, since health was a responsibility of the states. More than listing the drugs that were required for the countries, the real task was implementing the policy across the country. This was important because the Essential Drug List (EDL) was part of the rational drug therapy, and therefore the list consisted of generic drugs and combination(s) of medicines for effective therapeutic treatment which were already decided. Therefore, the adoption of such a list would curtail the industry’s interest, because they would be forced to supply the drugs generically, and could no longer establish brand supremacy.

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<sup>1</sup> Throughout the report the terms “drugs” and “medicines” are used interchangeably.

<sup>2</sup> Bale Harvey, (2001), *Consumption and Trade in Off-Patented Medicines*, Working Paper No. 65, Indian Council for Research on International Economic Relations, New Delhi.

The 1993 World Development Report<sup>3</sup> observed that public policy in health was successful if it led to increased welfare through better health outcomes, greater equity, more consumer satisfaction and lower total costs than would occur in the absence of public action. Further, according to this report, policies related to the delivery of health services in developing countries should have two main objectives. The first was to improve access to essential clinical services, especially for the poor, and the second was to increase the efficiency with which services, were delivered. Access to off-patented medicines depended purely on the purchasing power of the people, domestic industries' capacity to produce the drugs, domestic pricing, and government policies to make them available in the market and in government health facilities.

As far as India was concerned, thanks to the Indian Patent Act of 1970, there was a reasonably good production set-up<sup>4</sup> and, in terms of production volume, India ranked fifth in the world. However, the issues in India were:

1. Due to the inadequate infrastructure within the government machinery, drugs with irrational combinations that did not represent absolute therapeutic improvements over the existing ones also entered the market, and prices varied even within the same therapeutic group, according to the companies' position in the market.
2. Though price controls did exist on important medicines, the list of such price-controlled medicines had been shrinking over the years, and again with ineffective monitoring at the market level, it would be difficult to implement the price controls significantly<sup>5</sup>.
3. While it was recognized that accessibility also depended on the efficiency of the distribution system, and knowledge and health consciousness of the consumers, who would seek the medicines from the market, nevertheless, availability at the government facilities depended on the procurement policies of the state governments. Health was a state's responsibility and all the state governments made a budgetary allocation for the purchase of medicines. However, due to the different procurement policies adopted by the state governments, there was inadequate supply of drugs at the government facilities.

The applicability of the essential drug concept was not limited to developing countries; drug formularies – detailed lists of essential drugs – were widely used by institutional health providers (public or private) and insurance companies in industrialized countries. The WDR 1993 observed that some countries had achieved savings of 40 to 60 per cent in pharmaceutical expenditure, by improving selection and by competitive purchasing. For example, for several years the Costa Rican social security agency had been able to purchase drugs at approximately half the price of its counterpart institutions in other Central American countries, partly because of its use of centralized purchasing, more open and transparent purchasing procedures, and selection of generic drugs on the basis of its national essential drug list. A similar program was developed in Chile<sup>6</sup>.

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<sup>3</sup> The World Development Report (1993), *Investing in Health*, Oxford University Press.

<sup>4</sup> Lalitha, N. (2002), *Drug Policy 2002: Prescription for Symptoms Economic and Political Weekly*, Vol. 37, No. 30, July 27, 2002, pp. 3102-3104.

<sup>5</sup> Lalitha, N. (2002), *Indian Pharmaceutical Industry in the WTO Regime: A SWOT Analysis*, Economic and Political Weekly, Vol. 37, No. 34, pp. 3542-3555.

<sup>6</sup> Rosenmöller, M., *Challenges of Health Reform*, World Bank & IESE 2000.

The model list of Essential Drugs developed by the WHO suggested a basic list of drugs that the WHO considered important and effective for dealing with health problems in developing countries. First drawn up in 1977, by an expert panel, the original list had been revised and updated seven times, and included about 270 products. It was designed to serve as a template from which countries could develop their own specific lists of essential drugs. Governments had to manage drug selection, procurement and distribution for publicly provided health services. To support the rational use of drugs, governments could develop a national list of essential drugs, and direct public finance to those drugs that supported public health interventions. They could also provide information to public and private health providers and consumers on drug use and cost effectiveness, and establish regulations that discouraged overuse or over-prescription. The WDR also emphasized that there was substantial scope for reduction of waste and inefficiency in government health programs, especially in drug management. Pharmaceuticals, which accounted for 10 to 30 per cent of public spending for health in most countries, were the most promising area for efficiency gains in the short run. Very large savings could be achieved by improving the selection and quantification of drug requirements, in part through the use of essential national drug lists, and by purchasing drugs competitively. Numerous successes had already been recorded. Bulk procurement of drugs enabled a group of church-run African health associations to save 40 per cent of their annual drug bill. Similar efforts by several Caribbean states led to an average reduction of 44 per cent in the price paid for the twenty-five most frequently used drugs. An essential drugs revolving fund for several Central American nations yielded savings of 65 per cent of the costs of pharmaceuticals. For countries like India, the WHO had identified about 450 drug combinations which would suffice to cure the diseases prevalent in the country. However, according to industry sources there were more than 80,000 formulations available on the market, a large percentage of which consisted of irrational combinations.

A study carried out in Satara district in Maharashtra<sup>7</sup>, however, observed that if the financial resources that were currently spent on unnecessary drugs and irrational combinations were rectified, and instead spent on rational drug treatment, there would be adequate resources to take care of all OPD and indoor cases, as well as for preventive care in the district. A rational drug policy had definite implications for the private interests of the pharmaceutical units and lobbying by the industry to prevent such a move had been evident in Bangladesh and Sri Lanka, when a national EDL was formulated<sup>8</sup>. However, Bangladesh's National Drug Policy, adopted in 1982, prohibited the import and sale of non-essential drugs. As a result, about 1,666 products that were judged ineffective or harmful were banned, while about 300 were approved for marketing. The government also oversaw production quality of all manufacturers, and provided training to drug retailers on rational drug use (WDR, 2000).

Weeding out irrational combinations through restricting the domestic production system would be a long-drawn-out process in the context of the large number of pharmaceutical units in the country, and the inadequate technical infrastructure to evaluate the therapeutic contribution of the new drugs that entered the market every day. The impact of irrational combinations was that the cost of treatment for the provider and the consumer was higher, not effective most of the time, and the patient suffered for long periods, affecting her livelihood. Also, since the financial allocation had already been spent irrationally, the government health care system always suffered from inadequate stock of essential drugs, which ultimately led to either the patients being declined treatment, or forced to buy from the market. The obvious implication of this had been that while a few could afford to buy the drugs, others simply forewent the treatment and suffered the disease.

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<sup>7</sup> Phadke Anant (1998), *Drug Supply and Use - Towards a Rational Policy in India*, Sage Publications, New Delhi.

<sup>8</sup> Choudhury Zafarullah (1995), *The Politics of Essential Drugs*, Vistaar Publications, New Delhi.

### *Focus of the Study*

In 1994, the Government of Tamil Nadu introduced the system of an Essential Drug List to be adopted by all the government health care providers, and streamlined the entire procurement and distribution process by setting up a separate corporation called Tamil Nadu Medical Services Corporation. Since such a measure had been adopted entirely due to the state government's initiative, it implied that other governments might learn from it. Hence, a research project was commissioned to study these reform measures, their evolution and development over a period of time and their current level of functioning. The specific focus of the research was to study the process and implementation of a rational drug policy in the government health care systems in Tamil Nadu and understand the replication value of this model. The study was also interested in assessing the availability of medicines to the poor at the primary health centers, and understanding whether such health policy reforms actually reached the lowest layers, and benefited the poor.

### *1.3. Methodology*

To achieve the objective of the project, both primary and secondary data were collected. The methodology used to collect the relevant primary data involved the selection of districts, and within the districts, selection of the blocks for focusing on the primary health centers (PHCs). In order to select the districts, they were ranked according to their contribution to the state's income at constant prices (**Exhibit 1**). In this process, though Chennai ranked first and the district of Nilgiris ranked last, they were not selected, for reasons of demographic specifics. Instead, Coimbatore and Sivaganga districts, which ranked 2nd and 28th respectively in terms of their income contribution, were selected.

After the selection of districts, Anaimalai block in Pollachi *taluka*, in Coimbatore district, and Thiruppathur block in Thirupathur *taluk*, in Sivaganga district were randomly chosen, yielding a sample of eight PHCs. At the PHC level, a structured questionnaire was used with doctors and pharmacists to collect relevant information on the availability of medicine, and an open discussion was also held with the medical officers at the PHCs about the issue of access to drugs. Exit surveys with patients allowed the researchers to get their views on the availability of medicines and doctors, quality of medicines, services etc.

The researchers randomly selected two manufacturers, and discussed with them the tender selection, procurement and supply procedures, and visited their factories. The researcher also visited the drug warehouses at Chennai, Thiruvannamalai, Coimbatore and Sivaganga districts to understand the warehouse practices and procedures adopted in the distribution of drugs to institutions. Besides discussing issues with these people, they also met with several non-governmental organizations providing health care in Tamil Nadu, and had meetings with the executives of the software firm that set up the computer network linking the Tamil Nadu Medical Services Corporation and the various drug warehouses. Appropriate secondary data were also collected wherever they were available.

### *Demographic Profile of the State and the Study Region*

**Exhibit 2** provides the demographic profile of the state and the chosen districts. Coimbatore was an industrially developed district. It was known as the "Manchester of India" and was very well known for its ready made garment units. Sivaganga was an industrially backward district, and also a drought prone region with very low rainfall.

The percentage of urban population was higher in Coimbatore than in Sivaganga. In both, the percentage of SC and ST populations was higher in the rural areas than the urban areas.

### *The Health Care Scenario*

In Tamil Nadu there were several directorates and departments engaged in the provision of health care, with clear areas of demarcation (**Exhibit 3**). The main ones were:

1. Directorate of Medical Education (DME), entrusted with the responsibility for implementing the teaching, training and research programs in the medical field.
2. Directorate of Medical and Rural Health Services (DMRHS), which rendered services through the district headquarters hospitals, *taluka* hospitals, non-*taluk* hospitals, government dispensaries, mobile medical units, women's and children's hospitals, TB hospitals, and leprosy rehabilitation promotion units.
3. Directorate of Public Health and Preventive Medicine (DPH), responsible for the general conditions of the people, with special emphasis on providing maternal and child care for the rural and urban poor.

**Exhibit 4** gives the number of hospitals, doctors and other staff under the different directorates, providing, in a nutshell, an idea of the availability of medical facilities in Tamil Nadu. **Exhibit 5** contains a brief statistical overview of the availability of medical facilities in the chosen districts.

### *Social Spending in Tamil Nadu*

The study included a brief discussion of social spending by the Tamil Nadu Government (TNG). Tamil Nadu had been at the forefront in introducing and implementing social security schemes for the poor and the destitute. These schemes had been both promotional and protectionist in nature. As Dreze and Sen<sup>9</sup> observed, most of the initiatives in social security measures taken in the southern Indian states were in the context of electoral politics. Traditionally, while states with higher growth and higher per capita income spent more on social services such as education, health, nutrition and water supply, as compared to the developing states with less income, some of these states were able to target their social spending to get the desired effects. Particularly the experience of southern states, like Kerala, Tamil Nadu and Andhra Pradesh, in social spending, providing social security measures and targeting public distribution systems, had been discussed in detail by several authors.

In Tamil Nadu, either the Dravida Munnetra Kazhagam or its breakaway group Anna Dravida Munnetra Kazhagam had been in power from 1967. Both these governments had emphasized protective social security measures, i.e. their emphasis had been on human development approaches, on the children, poor, old, infirm and the sick, whose contribution to the production process is minimal. To a large extent, in Tamil Nadu, the successive governments had only introduced more social security programs, besides continuing the earlier programs, which yielded considerable political mileage.

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<sup>9</sup> Dreze Jean and Sen Amartya, (1995), *India, Economic Development and Social Opportunity*, Delhi, Oxford University Press.

**Exhibit 6** shows the social priority areas and the percentage distribution of per-capita social expenditure on these items in Tamil Nadu over a fifteen-year period. Clearly the social priority areas of the state have been education, medical and public health and nutrition, which accounts for a major percentage of per capita social expenditure.

### *The System Before 1995*

In Tamil Nadu, until 1995 responsibility for procuring and supplying drugs to the government health care system lay with a “Centralized Purchasing Committee” (CPC) that functioned under the chairmanship of the Health Secretary, and comprised the three heads of the DMS, DME and DPH directorates. The CPC invited tenders. The requirement in the tender was based on the demand for drugs arrived at by consolidating the requirements of all the institutions mentioned in **Exhibit 4**. In the invitation to tender, preference was first given to the public sector units, and if they failed to meet the demand, then private manufacturers were approached. Under this system, the problem was that the price was not competitive and the supplies did not arrive on time. Hence, the system was changed, and tender was called for from all the manufacturers. While this resulted in competitive prices, supply suffered because tenders were given without regard to the units’ production capacity or quality of the products. Hence, firms were not in a position to supply the required quantity, which meant that to face the demand crisis, drugs were bought from the open market at higher prices. Furthermore, hospitals themselves placed orders directly with the suppliers, which meant different prices prevailed for the same drug. For PHCs and *taluka* hospitals, drug demands were consolidated at the district level and orders were placed. Payments were made once the hospitals acknowledged receipt of drugs.

This system resulted in the buying and stocking of a lot of irrational and unnecessary drugs of poor quality, because procurement was based on the consolidation of requirements of all the hospitals, and was not made with reference to any list. About 1,000 drugs were in use, and no scrutiny was made of the therapeutic use of each drug bought.

Under this regime, brand name medicines were bought in bulk, but in loose packing<sup>10</sup>. Even dealers and stockists could apply for tenders and supply the hospitals. Showing favors to a particular company was not uncommon. All these factors contributed to the government dismantling the old system completely, to start working on improved ways of procuring and distributing drugs. This paved the way for the setting up of the Tamil Nadu Medical Services Corporation.

The Tamil Nadu Medical Services Corporation (TNMSC) was set up in July 1994 under the Companies Act of 1956, for the purpose of supplying essential drugs and services, and it commenced its services of buying, storing and distributing drugs and medicines in January 1995. It had been carefully named the “Tamil Nadu Medical Services Corporation” rather than the “Tamil Nadu Medical Supplies Corporation” so as to indicate the kind of activities undertaken, and those that would be soon added to its list of operations. TNMSC was the brainchild of a group of dedicated bureaucrats and technocrats, who meticulously planned each and every step that TNMSC would handle in the future, and planned the entire scheme of operations over a period of six months, from July 1994 to January 1995. This included the identification and preparation of a list of essential drugs for the state as a whole, planning and preparing the tender document, identification of manufacturers and

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<sup>10</sup> Drugs used to come in plastic or iron jars and pharmacists dispensed the drugs manually.

streamlining their supply to the warehouses. Compared to any government office, which usually had huge manpower resources, TNMSC worked with a skeleton staff (**Exhibit 7**). There were hardly any permanent employees at TNMSC. Except for the company secretary, who functioned as chief accounts officer, all the others were on deputation from other government departments. In 2003, there were 24 drug warehouses in Tamil Nadu. While two warehouses were built with DANIDA's assistance, the World Bank provided loan assistance for building another 11. The rest had been built with state government funds.

### *Selection of Drugs and Quantification*

The first task for the TNMSC was to identify the list of essential drugs. A drug committee, consisting of professors of medicine, pharmacology and therapeutics, a representative from the World Health Organization, the health secretary and the managing director of TNMSC held several meetings, and after detailed discussions, a list of 240 generic drugs was arrived at. A VED analysis ("Vital, Essential, Desired" analysis of drugs, based on the vitality of the drug, essential nature of the drug and the desirability of the drug to physicians) was also carried out in the selection of the drugs. Some of the respondents to the study reported that initially there was resistance from the doctors to accept the EDL, but that they soon began to accept it once there was a government order to the medical officers to stick to the EDL.

Besides selecting the drugs, the drug committee also worked out the cost of each type of medicine, taking into consideration the raw material costs, manufacturing costs, packing costs, excise duty paid, and a certain minimum profit margin. So the drug committee knew exactly what the minimum cost of a medicine was, and this proved to be useful in selecting reliable, quality suppliers.

The committee also decided that while the tablets and capsules would be supplied in aluminum foil and blister packs, syrups would be supplied in 60 ml or 40 ml packs and ointments in small five or ten gram tubes. This was planned to avoid wastage and also to prevent the reduction of drugs' shelf life in storage.

In order to avoid theft, it had been stipulated that all the tablets and capsules carry the logo TG, for Tamil Nadu Government. All tablets, IV fluids and ampoules carried the message that the drug was meant for the supplies of Tamil Nadu Government and not for sale.

Quantifying the demand for drugs proved to be difficult because, under the previous system hospitals kept on buying drugs without any accurate assessment. As one of the interviewees observed, the requirements for sutures given by the teaching medical college hospitals was equivalent to Johnson and Johnson's annual production for the entire Asia region! So in the initial days, the drug advisory committee procured drugs on a rough estimate basis, and over a period of time it was stabilized.

Poornalingam<sup>11</sup> observed that "One of the problems faced by TNMSC was to decide the entitlement of these institutions, which invariably clamor for more funds all the time. There are of course, historical budgetary allocations, which are not however related to

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<sup>11</sup> Poornalingam R (1996), "*Drug Management in the Government Sector: The Tamil Nadu Model*," Essential Drug Monitor, Issue No. 21, World Health Organization, Geneva.

patient volumes. An analysis of the information of the taluk hospitals in a sample district indicated wide variations; the drug consumption varying widely between similarly placed hospitals”. After discussions with the field officers, a norm for drug consumption was adopted, which allowed the identification of hospitals which were wasting drugs.

TNMSC did not have a separate budget allocation. The three directorates passed on 90 per cent of the budget meant for the purchase of drugs to TNMSC. **Exhibit 8** provides these data. TNMSC used this amount to pay the suppliers. The remaining 10 per cent was retained with the directorates to purchase any drug outside the list, but considered essential<sup>12</sup>.

### *Selection of Suppliers*

TNMSC adopted transparent and systematic procedures in drug procurement. The first and foremost condition was that only manufacturers and direct importers of medicines could participate in the tender process. This prevented third party suppliers and stockists from forming a cartel and fixing the price. TNMSC invited tender by advertising in various dailies, pharmaceutical newspapers and on its own Website. Tender documents were issued to interested parties. The prospective suppliers were to satisfy several requirements:

1. The manufacturer should have its own license for the product quoted (loan licensing was not allowed) and should be manufacturing on its own premises,
2. The company should have a minimum turnover of Rs. 35 lakhs<sup>13</sup> and the manufacturer should have market standing for the drug issued for a minimum period of 3 years,
3. The company should have the “Good Manufacturing Practice” certificate issued by the state government authorities and should not have suffered any legal convictions.

A technical team visited the pre-selected units without any prior notice. On the basis of recommendations from the team, samples of chosen drugs were sent for quality checks. Those manufacturers who satisfied all the criteria mentioned were invited for the second phase, which was a meeting where the second part of the tender envelopes, containing the prices, were opened and the prices were made public. This method apparently helped in keeping the system transparent. Obviously, the one who had quoted the lowest price got the tender. But if there were other manufacturers whose prices were close to the lowest rates, and they could match the lowest price, they could also get part of the order (less than 50%). Prices fixed during the tender process held good for the whole year, and could not be changed. Interestingly, suppliers in a given year did not automatically become eligible to supply in the following year<sup>14</sup>. They would have to go through the same procedure again but for the inspection of the factories. This ensured transparency in the operation. Once the order was placed with a supplier, it was to start supplying within 30 days of the contract and

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<sup>12</sup> Some of the drug committee members and the former officials of TNMSC observed that institutions actually found it difficult to utilize the 10 per cent and justify the expenditure since almost all the medicines were covered in the list.

<sup>13</sup> At the time of the case, one US dollar was equivalent to 47 Indian Rupees. One lakh is 100,000 units.

<sup>14</sup> Interestingly, one of the suppliers observed that one of the pharmaceutical units based in Chennai, with considerable political clout, was not selected even though it applied for tender, because of some gaps in the Cover A requirements

complete it within 60 days. A late delivery fee of 1.5 percent of the entire purchase order was levied on the supplier if the supplies were delayed even by a day. The supplier would send the supplies directly to the designated drug warehouses, where a small sample from each shipment was sent to quality control. If negative reports were received on a particular product, then that product was sent for QC to another laboratory. If it failed the second time too, then the entire batch was sent back to the supplier, who would have to supply fresh stocks. If this happened twice, then the supplier was blacklisted.

In discussions with two manufacturers who won the tender in the year 2002, they observed that they did not have to satisfy any rent-seeking official, and the payment for the supply made was prompt. There was no need to show any favors to anybody and they won the contract by normal processes.

### *Storage and Distribution of Drugs*

In order to store the drugs, warehouses were built in 24 districts. All the warehouses were of uniform design and structure. All of them had raised platforms to facilitate easy loading and unloading operations. Electronic trolleys were also available in the warehouses for facilitating the loading of the medicines. The typical staff at the warehouse consisted of two pharmacists, one data entry operator and two helpers to help in loading and unloading operations. None of the employees were regular employees of the corporation.

Taking into account factors like stock in hand, demand from various institutions and the stock still to arrive, TNMSC placed purchase orders for a few months of stock with the suppliers. Suppliers supplied directly to the warehouse. At the warehouse, appropriate entries were made in the computer, which was connected to the TNMSC office in Chennai, and a floppy containing the day-to-day stock position was also sent to the TNMSC office at Chennai every day, to allow an update of the stock position, and also to transfer the drugs from one place to another in case of need. Furthermore, TNMSC undertook quality checks on a random sample from each batch. Pharmacists and the officials informed the researcher that the QC failure rate was almost nil.

### *Additional Activities of TNMSC*

As a result of the appropriate planning and pooled procurement procedures, TNMSC was able to show savings of Rs. 32 crores<sup>15</sup> in the first year of operation itself. **Exhibits 9, 10 and 11** show that,

- The adoption of EDL and proper procurement procedures resulted in enormous reductions in the prices paid for selected medicines compared to the earlier regime,
- With continued vigilance, TNMSC procured medicines at competitive prices, and of good quality,
- There was an impressive price difference between generic and brand name drugs.

All this emphasizes that substantial reductions in government expenditure could be made if only they were made rationally. With such savings, TNMSC had widened its

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<sup>15</sup> One crore is 10 million units.

activities to include equipment purchasing as well. 35 CT scanners had been bought at a total cost of Rs. 25 crores and had been installed in the district headquarter hospitals. Similarly two MRI scanners had also been bought at a cost of Rs. 9.58 crores, and were functioning at Government Hospital Chennai and Government Rajaji Hospital at Madurai. In both cases, charges to patients were substantially lower than the charges at market price. From 2000, TNMSC was also purchasing veterinary drugs for the veterinary colleges and hospitals. TNMSC had recently taken charge of maintaining the Master Health Check-Up Program at the Government General Hospital Chennai and soon TNMSC would be in charge of maintaining the Master Health Check-Up Program at other hospitals too.

Another important activity was the maintenance of the Gastro-Intestinal Bleeding and Hepato-biliary Center (GIBH). This center functioned within the Government Stanley Hospital. This ward remained unutilized for more than 15 years. After the assignment to TNMSC, it got the ISO 9002 award, being the first center of its kind to get such an award for government hospitals in the country. TNMSC itself received the Rajiv Gandhi award for quality control and ISO 9002 for its quality control measures adopted for procurement, storage and distribution of drugs and surgical items.

### *The PHC Scenario*

A huge infrastructure of government health care is available in India to provide health facilities to the poor, ranging from hospitals for specialized treatments and research to preventive health care in rural areas. However, there are differences in the availability of such services to those who require it. Dreze and Sen<sup>16</sup> observed that “India has poor health achievements despite spending a comparatively large part of its GNP on health (if one adds up public and private spending). Much of the mismatch between the resources and achievements is due to the functioning of the public health care system, especially in rural areas. In some states, this system is little more than a collection of deserted primary health centres, filthy dispensaries, unmotivated doctors and chaotic hospitals”. A study on health sub-centers in Tamil Nadu suggested that the medicines were insufficient, there was lack of equipment to transport the drugs, etc. These observations agreed with popular perceptions of the government health facilities.

Lalitha’s study also assessed the availability of medicines at the Primary Health Centers (PHCs) and access for the patients, especially after the setting up of TNMSC. In 2003, there were 1,411 PHCs and 8,682 health sub-centers in Tamil Nadu, 68 PHCs in Coimbatore and 42 in Sivaganga. An important factor that decided the accessibility of rural health services was the location of the PHC.

The morbidity pattern among the PHCs was not very different, as patients who were suffering from colds, fever and coughs approached the PHCs. Doctors observed that the majority of the population suffered from anemia. Diarrhea cases were common during the monsoon and summer. Hypertension, arthritis and bronchitis were particularly evident among the aged in Coimbatore district, while skin diseases were common in Sivaganga district. Insect bites and wild animal attacks were also reported in the forest regions. Dog bites were reported in all the PHCs, and all the PHCs administered the anti rabies vaccine. Besides, PHCs also provided services under antenatal care, hypertension/diabetic care, school health, ophthalmic and ENT care and skin care programs.

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<sup>16</sup> Dreze Jean and Sen Amartya, (1995), “*India: Economic Development and Social Opportunity*” Delhi, Oxford University Press.

In none of the PHCs was the post of doctor or auxiliary nurse midwife (ANM) vacant. In all the PHCs the researchers observed that the doctors had a good rapport with the patients and the support staff also liked the way the doctors motivated them. As far as infrastructure was concerned, though, the majority of the PHCs were housed in their own buildings, and two of the PHCs were in need of complete renovation. Though all the PHCs handled delivery cases, a few of them did not have focus lights or proper beds.

### *Budgets for PHCs*

The total budget allocated for drugs and surgical supplies to PHCs, and the budget allocated under special schemes and other allotments are provided in **Exhibit 8**. Interestingly, as shown in **Exhibit 12**, although DPH accounted for a higher percentage of budget allocation (33 per cent) compared to DMS (20 per cent) or DME (31 per cent), the percentage of funds allotted for medicines was only five per cent of the total budget. Some PHCs reported that if they did not get additional allotments or drugs from special schemes<sup>17</sup>, shortages would occur.

### *Drug Procurement and Distribution*

A total of 54 drugs out of TNMSC's EDL (**Exhibit 13**) were meant for PHCs and to draw these drugs the PHCs did not require the approval of the Deputy Director, Health Services (DDHS).

The PHCs had to travel between 50 and 90 km (one way) to collect their drug stocks from the district drug warehouse. Some PHCs did not have a vehicle of their own and had to depend on the main PHC vehicle to bring their stock. However, in reality, only two or three PHCs' stocks could be collected in one trip because of the space constraints in the vehicle. A few PHCs told the researchers that they did not depend on the main PHC vehicle at all, and hired a private vehicle or used the state transport service.

### *Drug Distribution at the PHC*

Once the patient entered the PHC for treatment, the ANM or others provided the "OP chit" that carried the name, date and details such as whether the patient needed follow-up care or was a new case etc. The patients took this chit to the medical officer. The medical officer made a note of the ailment and the case number in his register and after examining the patient, determined the medicine and dose required. He marked these on the OP chit as well as on a smaller chit, where he mentioned the medicines and the dose or the injection. The patient took these slips to the pharmacist<sup>18</sup>. While the tablet and the capsules slips went to the pharmacist for his records<sup>19</sup>, the ANM handled the injections, and maintained the injection register. While the OP chit was given back to the patients for their records,

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<sup>17</sup> Some of the PHCs reported getting additional allotments from the DDHS. This amount varied from PHC to PHC.

<sup>19</sup> TNMSC, in the early days, provided training to the pharmacists at the warehouse in drug handling, drug storage and distribution. At the PHC level, except for one pharmacist who had been serving for the past 30 years, none of them had attended any training in rational indenting of drugs or distribution of drugs.

<sup>20</sup> All the PHCs invariably complained about the lack of registers at the PHCs, and said they bought their required drugs.

the smaller chit was retained by the pharmacist to dispense the medicine, and was later used to tally the sub-stock register to arrive at the opening and closing stock for the week. This method ensured that all the drugs were dispensed only on the basis of the doctor's prescription, and pilferages were avoided.

While the doctors in general observed that they were not involved in the selection of drugs meant for the PHCs, they maintained that the list of medicines meant for PHCs covered all their needs.

### ***The Patients' Perspective***

The researcher observed that patients, both literate and illiterate, rich and poor, made use of the PHC services. Patients, especially women, paid attention to their illnesses, without dismissing them. She also observed school children, both boys and girls, visiting the PHCs with friends (who served as escorts). Their schools sent them during school hours, and the health awareness among these children was truly amazing. Interestingly, many of the patients with whom the researcher spoke were regular users of the PHC and were able to distinguish between the quality of medicines provided by the PHCs "a few years ago" and "now". Patients also said that the doctors did not ask them to buy the medicines from outside. They were always referred to the nearest GH whenever there was a need. Almost all the patients observed that the doctors were available in the PHCs when they visited, and attended them. They also added that not even once had they gone back without seeing the doctor or getting medicines.

### **The Future**

Asha thought that, while this model was replicable in the public sector, scaling up the operations to extend this system to the private sector or to NGOs could also be considered, but she was concerned about the implementation of some of the elements in the system. For instance, getting a consensus in adopting an essential drug list would be against the interests of the pharmaceutical companies, and this could become a stumbling block. But, given the fact that there were several non-governmental organizations playing an active role in providing health services, TNMSC could extend procurement assistance to them, thus extending rational drug therapy to a wider population.

She was also wondering whether she should propose the replication of the experience of Tamil Nadu in other states, and in that case, which would be the most promising ones. Which state characteristics would facilitate a successful implementation? What were the critical success factors in Tamil Nadu? What could go wrong if the program were replicated in another state? She also wondered whether the experience could be extended to the private sector, and what kind of resistance they should be prepared to face. □

## Exhibit 1

## ACCESS TO MEDICINE INITIATIVES IN TAMIL NADU

**District Income Estimates in Constant Prices**

District	Income (Rs.)	Rank
Chennai	694,698	1
Coimbatore	532,752	2
Cudalore	185,106	15
Dharmapuri	247,08	10
Dindugal	169,105	18
Erode	266,56	9
Kancheepuram	406,343	4
Kanniyakumari	130,906	23
Karur	109,548	26
Madurai	282,421	7
Nagapattinam	131,864	22
Namakkal	184,304	16
Nilgiris	82,46	29
Perambalur	125,229	24
Pudukkottai	109,57	25
Ramanathapuram	96,469	27
Salem	337,352	5
Sivagangai	83,863	28
Thanjavur	197,285	14
Theni	148,712	21
Tiruchi	242,765	12
Tirunelveli	276,757	8
Tiruvallur	492,865	3
Tiruvannamalai	155,616	19
Tiruvarur	154,623	20
Toothukudi	243,273	11
Vellure	322,475	6
Vllupuram	174,752	17
Virudhunagar	208,881	13

Source: Statistical Handbook of Tamil Nadu 2001, Department of Economics and Statistics, Government of Tamil Nadu.

## Exhibit 2

## ACCESS TO MEDICINE INITIATIVES IN TAMIL NADU

**Demographic Profile of the State and the Study Region  
(population figures in *crores*)**

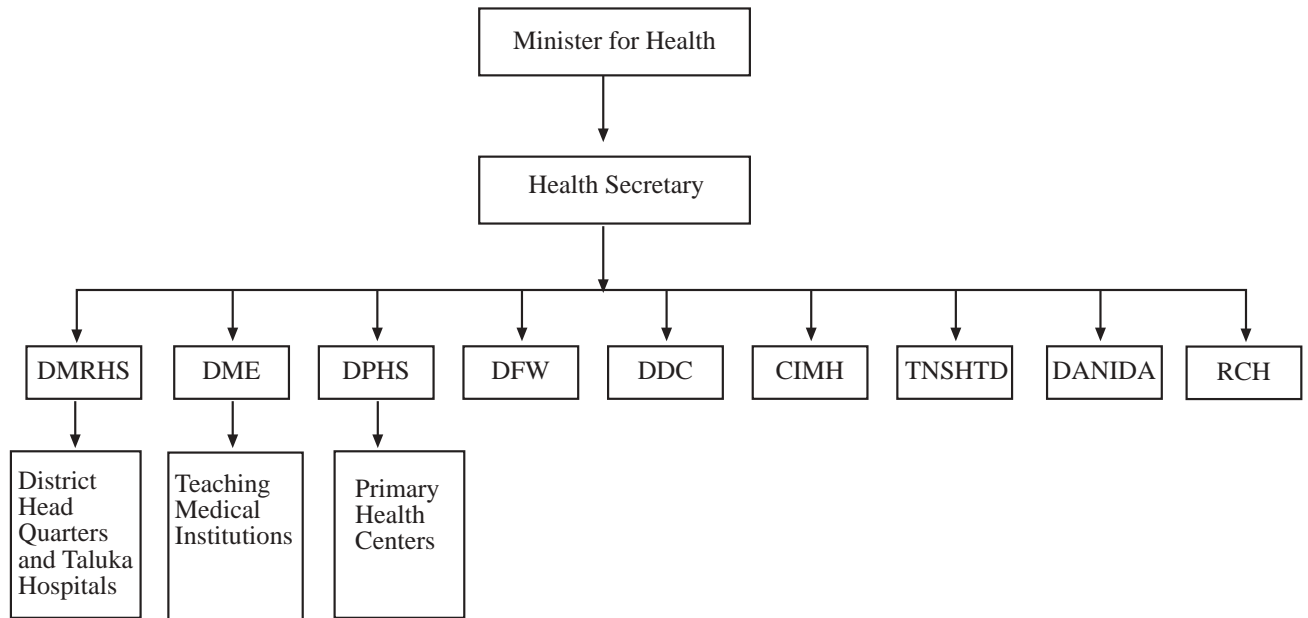
Particulars	Tamil Nadu	Coimbatore	Sivaganga
1. Population	6.21	0.42	0.11
Rural	3.48	0.14	0.08
Urban	2.72	0.28	0.03
2. SC&ST population	1.13	0.06	0.02
Rural	0.89	0.04	0.02
Urban	0.24	0.02	0.002
3. Literates	4.06	0.29	0.07
Rural	2.05	0.08	0.05
Urban	2.01	0.21	0.02
4. Male literates	2.28	0.16	0.04
Rural	1.19	0.05	0.03
Urban	1.09	0.11	0.01
5. Female literates	1.77	0.13	0.03
Rural	0.86	0.03	0.02
Urban	0.92	0.09	0.01
6. Infant deaths (nos.)	15,113	861	106
7. Still births (nos.)	16,228	1,573	195
8. Maternal deaths (nos.)	711	35	12

Note: Population and literacy figures are based on Census 2001. SC&ST population figures are based on Census 1991. Infant, maternal deaths and stillbirths are based on 1999 figures (civil registration system).

Source: Statistical Handbook of Tamil Nadu, 2001, Department of Economics and Statistics, Chennai.

Exhibit 3

ACCESS TO MEDICINE INITIATIVES IN TAMIL NADU



- DMRHS Directorate of Medical and Rural Health Services
- DME Directorate of Medical Education
- DPH Directorate of Public Health and Preventive Medicines
- DFW Directorate of Family Welfare
- DDC Directorate of Drugs Control
- CIMH Commissionate of Indian Medicine and Homeopathy
- TNSHTD Tamil Nadu State Health Transport Department
- DANIDA DANIDA Health Camp Project
- RCH Reproductive and Child Health Project

## Exhibit 4

## ACCESS TO MEDICINE INITIATIVES IN TAMIL NADU

**Availability of Government Medical Facilities in Tamil Nadu**

Classification	DME	DMRHS	DPH	DESI	TOTAL
Hospitals	38	280		8	326
Dispensaries	14	24*		170	208
Primary Health Centers			1,41		1,410**
Health Sub-centers			8,682		8,682
Bed Strength	19,283	21,389	6,028	2,357	49,057
Number of Doctors	3,258	2,279	2,855	654	8,719
Number of Nurses	3,589	3,176		574	7,34
Village Health Nurses			10,594		10,594
Sector Health Nurses			1,52		1,52
Community Health Nurses			381		381

Notes: \* Inclusive of 11 mobile medical units and 1 leprosy unit

\*\* According to sources in DPH, there are 1,411 PHCs due to sanctioning of one more PHC in 2001-02

DME: Director of Medical Education, DMRHS Director of Medical and Rural Health Services, DPH; Director of Primary Health Services, DESI; Director of Employees State Insurance.

Source: Statistical Handbook of Tamil Nadu, 2001, Department of Economics and Statistics, Government of Tamil Nadu, Chennai.

## Exhibit 5

**Population, Beds and Doctors Ratio in Coimbatore and Sivaganga 2000-01**

District	Population	Total beds	Population bed ratio	No. of doctors	Population per doctor
Coimbatore	0.42	3,05	1,385	601	7,028
Sivaganga	0.11	894	1,287	136	8,461
State	6.21	49,057	1,266	8,719	7,123

Note: Population figures are in crores, others are in units. Figures pertain to government facilities only.

Source: Rows 2 and 3 from Statistical Handbook of Tamil Nadu 2001 Row 4 Calculated from Tables 1.2 and 1.3.

## Exhibit 6

## ACCESS TO MEDICINE INITIATIVES IN TAMIL NADU

**Percentage Distribution of Per Capita Social Expenditure  
in Tamil Nadu, 1985-2000**

1	2	3	4	5	6	7
Sector\Year	1985-88	1988-91	1991-94	1994-97	1997-00	GR
PETSS	183.85	212.49	241.54	244.65	236.5	
EDN	47.1	50.7	48.4	48.5	52.8	.0058 (2.462)**
MPH	18.1	15.9	15.2	16.3	22.7	-.0117 (-1.949)
SSW	11.7	7.1	5.2	5.1	7.5	-.0411 (-2.300)**
NUT	7.7	7.4	8.2	8.0	7.1	-7.354 (-.090)
WSS	5.1	6.5	7.7	6.6	3.9	-.0481 (-3.447)
HUD	3.4	3.6	4.4	4.4	2.9	-0.271 (-1.871)
WSCST	2.2	5.7	5.8	6.8	6.9	.0188* -4.616

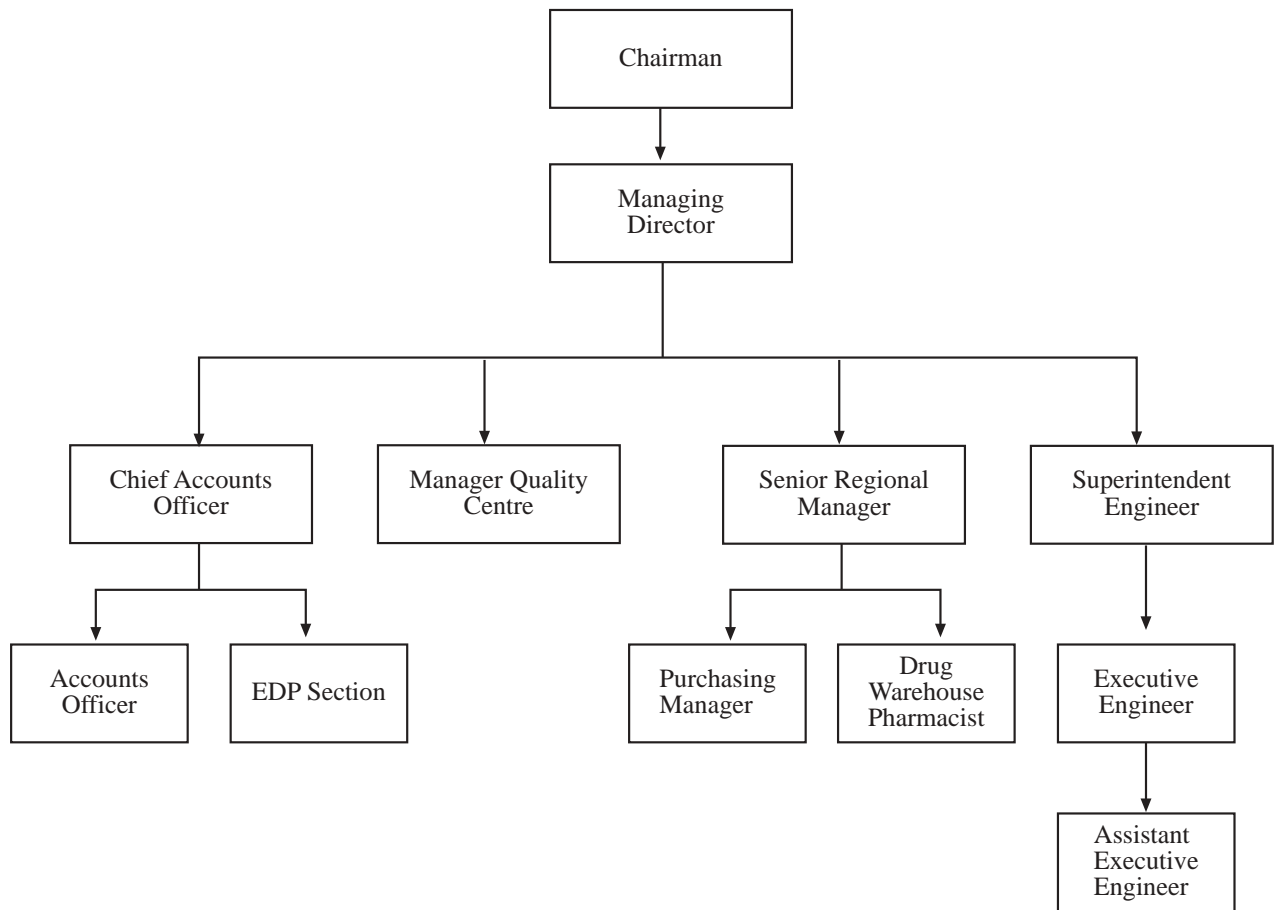
Key: PETSS per capita total expenditure on social services  
EDN education  
MPH medical and public health and family welfare  
SSW social security and welfare  
NUT nutrition  
WSS water supply and sanitation  
HUD housing and urban development  
WSCST welfare of SC and ST respectively.

Source: Calculated from various volumes of Reserve Bank of India Bulletin on State Finance.

Exhibit 7

ACCESS TO MEDICINE INITIATIVES IN TAMIL NADU

**TNMSC Organizational chart**



Source: TNMSC.

## Exhibit 8

## ACCESS TO MEDICINE INITIATIVES IN TAMIL NADU

**Allocation of Budget to TNMSC for the Purchase of Drugs and Surgical Equipment**  
(Rs. in crores)

Year	DME	DMS	DPH*	DPH#	Total
1995-96	26.07	27.74	10.68	10.02	64.49
1996-97	29.47	31.44	13.39	10.02	74.3
1997-98	32.32	33.19	14.28	10.02	79.79
1998-99	33.54	35.52	16.85	10.82	85.91
1999-00	34.76	32.53	18.16	10.82	85.45
2000-01	36.79	35.53	21.62	9.82	93.94
2001-02	37.77	35.73	18.03	9.82	91.53
2002-03	38.02	34.04	21.03	10.31	93.09

Notes: \*includes medicines for PHCs and the Public health schemes

# Medicines for PHCs alone, Rs.10.31 crores have been allocated for the year 2003-04.

Source: Data in columns 2, 3 and 4 provided by TNMSC, data in column 5 provided by DPH.

## Exhibit 9

**Comparison of Prices Before and After TNMSC (In. Rs.)**

Year/drug	Pyrazinamide tablet 10x10	Cloxacillin capsule 10x10	Norfloxacina tablet 10x10	Atenolol tablet 14x10	Ciprofloxacina tablet 10x10
1992-94	135	158.25	290	117.12	525
2002-03	62.80	72.60	51.30	14.68	88.00

Source: TNMSC.

## Exhibit 10

**Prices of Drugs Purchased by TNMSC, 1998-03 (In. Rs.)**

Year/drug	Paracetamol Tablet 10x10	Co. trimaxazole Tablet 10x10	Cephataxime Sodium injection	Ciprofloxacina Injection 100ml ffs	Ciprofloxacina tablets 10x10	Ranitidine Tablets 10x10
1998-99	13.14	31.0	8.31	8	168	31.2
1999-00	11.95	27.85	5.67	7.5	129.6	28
2000-01	11.50	27.3	5.24	7.2	99.9	26
2001-02	11.42	27.82	5.08	6.75	93.03	23.9
2002-03	11.24	27.82	4.94	6.74	88.0	22.34

Source: TNMSC.

## Exhibit 11

## ACCESS TO MEDICINE INITIATIVES IN TAMIL NADU

**Comparison of TNMSC and Market Prices**

Product	Unit of drug	TNMSC Price (Rs.)	Market Price (Rs.)
Aspirin tab I P	10x10 tabs	12.17	44.42 (Ecosprin)
Paracetamol tab IP	10x10 tabs	11.69	68.00 (Fapanil)
Paracetamol syrup I P	60 ml	3.20	19.57 (Calpol)
Co-Trimoxazole oral suspension IP	50 ml	4.06	10.0 (Septran)
Co. Trimoxazole tab I P	10x10	28.37	63.20 (Septran)
Metronidazole tb IP	10x10	13.21	36.50 (Flagyl)
Amoxicillin cap Ip	10x10	78.47	366.66 (Novamax)
Erythromycin state oral suspension	40 ml	8.76	25.27* (60 ml) (Novamax)
Tetanus Toxoid Injection I P	5 ml	6.93	
Anti Rabies Vaccine	3ml	18.00	294.0 (Aventis)
Ciprofloxacin inj. IP	100ml	7.00	46.89 (cifran)
Gentamycin eye and ear drops B P	5 ml	3.56	7.51 (gentic)
Atenolol tab I P	14x10	15.26	310.0 (Tenormin)
Ibuprofen tab I P	10x10	13.10	55.55 (Brufen)

Note: Both TNMSC and market prices are inclusive of taxes.

Source: TNMSC L1 prices for the year 2002-03 provided by TNMSC, and the market prices are the brand prevailing prices collected from a medical shop in Chennai collected during the month of June 2003.

## Exhibit 12

## ACCESS TO MEDICINE INITIATIVES IN TAMIL NADU

**Budget for Health 2002-04 (Rs. '000s)**

Particulars	2002-03 (RE)	2003-04 (BE)
Secretariat	32,443 (0.26)	33,711 (0.24)
DMSRHS	2,542,366 (20.11) 13.40*	2,679,689 (19.41)
DME	3,890,427 (30.77) 10.23*	4,619,945 (33.47)
DPH	4,204,549 (33.26) 5*	5,005,990 (36.26)
Directorate of Family welfare	1,144,514 (9.01)	672,808 (4.87)
Directorate of Drug Control	45,925 (0.36)	51,647 (0.37)
Directorate of Indian Medicine and Homeopathy	466,063 (3.68)	522,937 (3.78)
Directorate of TN State Health Transport	81,733 (0.65)	85,491 (0.62)
DANIDA	63,972 (0.51)	10,696 (0.077)
Reproductive Child Health	168,521 (1.33)	119,975 (0.87)
Total	12,640,513	13,802,889

Note: Figures within parentheses indicate the percentage of the total and \* indicates the percentage of funds allocated for drugs by the directorates. RE and BE refer to the revised and budget estimates respectively.

Source: Demand for grant, Demand No. 18, Health and family welfare department, 2003-04, Tamil Nadu Government, Budget publication No. 18.

## Exhibit 13

ACCESS TO MEDICINE INITIATIVES IN TAMIL NADU

**List of Essential Drugs and Surgical Items Used  
in Public-Health Centers****ANAESTHETICS****Local Anaesthetic**

Atropine Sulphate/Inj 0.6 mg/1ml  
Lignocaine Hcl/Inj I.P. 2% W/V

**ANALGESTICS, ANTIPYRETICS AND ANTI INFLAMMATORY DRUGS**

Aspirine/Tab 300mg  
Ibuprofen/Tab 200mg sugar or film coated tablet  
Ibuprofen/Tab 400mg sugar or film coated tablet  
Paracetamol Tab I.P. 500mg

**ANTI INFECTIVE DRUGS**

Anthelminthics  
Albendazole Tab 400mg

**Anti Bacterials**

Amoxicillin/Cap 250mg  
Chloramphenicol/Cap I.P. 250mg  
Calcium Lactate/Tab I.P. 300mg  
Ciproflaxacin/Tab I.P. 500mg film coated  
Co-Trimoxazole/Tab I.P. 80mg + Trimethoprim + 400mg Sulphamethoxazole  
Co-Trimoxazole Oral Suspension I.P.  
Erythromycin Stearate Oral Suspension  
Phenoxymethyl Penicillin Potassium tablets 125mg  
Phenoxymethyl Penicillin Potassium tablets 250mg

**Antifungal**

Benzoic Acid Ointment Compound

**Anti Amoebic**

Metronidazole Benzoate Oral Suspension 100mg of base/5ml  
Metronidazole/Tab I.P. 200mg Film Coated

**ANTI ALLERGICS & DRUGS USED IN ANAPHYLAXIS**

Betamethasone/Tab  
Chlorpheniramine maleate/Tab I.P. 4mg  
Dexamethasone/Tab I.P. 8mg/2ml  
Hydrocortisone Sodium Succinate/Inj. I.P.100  
Pheniramine Maleate/Inj.  
Phenobarbitone/Tab

## Exhibit 13 (continued)

**ANTI EPILEPTIC DRUGS**

Diazepam/Inj. I.P. 10mg/10ml

**CARDIOVASCULAR DRUGS****Anti Dysrhythmic Drugs**

Atenolol/Tab 50mg

Propranolol/Tab I.P. 30mg

**DISINFECTANTS & ANTISEPTICS**

Cetrimide Tincture Cetrimide I.P. 0.5% w/v

**DRUGS ACTINGS ON RESPIRATORY TRACT**

Aminophylline/Tab 100mg

Theophylline & etofylline/Inj. 2ml.amp

**DIURETICS**

Frusemide/Tab I.P. 40mg

**DERMATOLOGICAL DRUGS**

Liquid Paraffin I.P. 5 Ltr. Can

Gamma Benzene Hexachloride Application 1%

Salbutamol Sulphate/Tab I.P. 4mg

**DRUGS AFFECTING BLOOD****Anti Anaemia Drugs**

Cyanocobalamine/Inj. I.P. 100mcg/ml.

**DERMATOLOGICAL DRUGS**

Silver Sulphadiazine Cream USP 1% w/w

**GASTRO INTESTINAL DRUGS****Antacids and Anti Ulcer**

Aluminium Hydroxide/Tab.If1 120mg

**Anti Spasmodic Drugs**

Dicyclomine HCL/Tab 10mg/Tab

**Drugs Used in Diarrhoea**

ORS Power I.P. (WHO Formula with Citrate Salt)

## Exhibit 13 (continued)

**IMMUNOLOGICALS**

Anti Rabies Vaccine/Inj.  
Snake Venom Anti Serum (Freeze Dried) 10ML  
Tetanus Toxoide I.P.

**MUSCLE RELAXANTS & CHOLINESTRASE INHIBITORS**

Neostigmine/Inj. I.P. 0.5mg/ml

**OPHTHALMOLOGICAL PREPARATIONS**

Gentamycin Eye & Ear Drops B.P. 5ml vial

**SOLUTIONS CORRECTING WATER ELECTROLYTE  
& ACID BASE DISTURBANCES**

Dextrose/Inj. I.P. 10%/540ml  
Sodium Chloride Inj. I.P. 540 ml  
Sodium Chloride & Dextrose/Inj. I.P. 540ml

**VITAMINS & MINERALS**

Ascorbic Acid/Tab 100mg  
Ciproflaxacin/Inj I.P. 200mg/100mg  
Multivitamin/Tab. NFI Formula Sugar Coated  
Vitamin B Complex/Inj. NFI  
Vitamin B Complex/Tab. NFI (Prophylactic)  
Vitamin A/Cap

**MISCELLANEOUS**

Water for Injection

Source: List of Essential Drugs and Surgical Items, TNMSC.