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## Kerala Medical Services Corporation – An Analytical Study on Its Working during the First Three Years of Its Establishment.

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### ABSTRACT

The Kerala Medical Services Corporation Ltd. (KMSCL) is a Govt. Company started functioning in the state of Kerala in January, 2008 replacing the 'Central Purchase Committee' (CPC) system working since 1984 in Kerala. KMSCL was established primarily to look after the procurement and supply of medicines and other hospital requisites for the government health care facilities in the state. The working of KMSCL during the first 3 years of its existence was studied and critically analyzed in the study. The situation prior to the establishment of KMSCL for a period of ten years was also studied and evaluated. The study finds that KMSCL could improve access to medicines in the state during the study period. The quality and availability of medicines in government hospitals also increased considerably. KMSCL could introduce many innovations in its functioning and make the procurement scientific and transparent. The establishment of professionally managed community pharmacy services under the Karunya Community Pharmacy scheme is a unique feature of Kerala's drug policy. Preparation of Essential drug list, modernization of warehouses and on-line payments to suppliers are other progressive steps of KMSCL. The utilization of information technology in a unique manner helped to bring transparency in functioning and reduce unethical practices remarkably. It also helped to make its services fast in many aspects. The Corporation deserves more support and encouragement from the State and Central Governments and other organizations like WHO. If KMSCL can establish a research wing attached to it for conducting studies and evaluate its functioning, programmes, policies and other related activities, that will further strengthen its functioning. The manner in which KMSCL is improving its functioning in the three years of its origin shows that the Kerala model of Drug Policy is one of the best policies among all Indian states.

**Keywords:** Kerala Drug Policy, Drug procurement in Government of Kerala, Kerala Medical Services Corporation Ltd, KMSCL.

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## INTRODUCTION

As per the World Bank list of economies in April 2012, India is a lower middle income country, that is, a country having gross national per capita income in the range of \$ 1006-3975. The country has acquired all round socio-economic progress during its post-independence period and became one of the top industrialized countries in the world [1]. With its 3,287,590 sq.km area extending from the snow covered Himalayan heights to the tropical rain forests of the south, India is the 7th largest country in the world and accounts for 2.4 percent of world's surface of 135.79 million sq. kms.

According to the 2011 census, India's population clock stands at a colossal 121 crore (1.21 billion) plus level. Population wise India is second in the world, China being the most populous country with 134 crore people. India supports and sustains 17.50 percent of the world population which is almost equal to the combined population of USA, Japan, Indonesia, Brazil, Bangladesh and Pakistan (1.214 billion).

According to the National Health Profile 2006, Government of India, the per capita health expenditure was rupees 1201 in 2005. The total health expenditure measured by central and state governments was rupees 2, 84, 540 million out of which 73.53% was the share of the states. As a share of total state expenditure, public expenditure varied within a range of 3- 4% for all major states except Maharashtra where it was 2.88%. In terms of spending, 67.12% was for medical public health and 14.38% for family welfare purposes. About 70 % of the population spend their out- of- pocket (OPP) income on medicines and health care services which is much higher than the Asian countries average of 30-40%. The OPP pay for health care is a growing problem in India and about 39 million Indians are shifted to poverty due to illness each year. About 47% of hospital admissions in rural India ( 31% in urban centers) are financed by loans and sale of assets and the states have reduced their spending on purchase of drugs in recent years.

Kerala is a comparatively small Indian state having an area of 38,863 sq.km (15005 sq. miles) which accounts for only 1 percent of the total area of India. As per the 2011 census Kerala has a total population of 3, 33, 87,677 (about 3 percent of the country's population) with 160, 21290 males and 173, 66387 females. The state has a population density of 859 which is third in Indian states [2]. Kerala with its 14 districts, has many credits to claim in the areas of education and literacy and health care and family welfare among the Indian states. Being a state with the highest literacy among the Indian states, the awareness of the people about health and hygiene is very high. Kerala has very good health care facilities and can boast of a large number of hospitals, dispensaries and nursing homes spread across the state.

The poor standards in industrialisation, agricultural production or in per capita income did not affect the development of social sectors in Kerala. Most health indices of the state rank favourably with those of the high-income developed countries. The World Health Organisation ( WHO) and the UNICEF had designated Kerala as the world's first 'baby friendly state' for its effective promotion of breast feeding. The life expectancy of the people of Kerala is not only highest among Indian states, but is almost similar to that of the developed nations in the world [3, 4].

Kerala has a long tradition of organised health care, even before the introduction of modern medicine. Practitioners of indigenous systems like Ayurveda handed their traditions over generations and the people of Kerala became very much accustomed to approaching the healers when they are sick. Today there are five directorates under health services department- Health services, Medical education, Indian systems of medicine, Ayurveda and Homeopathy. Modern medicine, ayurveda and homeopathy are well accepted in Kerala. The three systems together have 2711 institutions in the government sector with 50515 beds as on 2005. There are 115 ayurveda hospitals and 747 ayurveda dispensaries. Under the homeopathy there are 5 medical colleges, 31 hospitals and 525 dispensaries. All the three systems together have 12918 medical institutions in private sector. There are 1316 health care institutions under the Director of Health Services (DHS) and 16 institutions (affiliated to government medical colleges) under the Director of Medical Education (DME) in the state. Out of the 23 allopathic medical colleges in Kerala, 16 are in private, five in government and two in co-operative sectors. The proportion of Kerala people seeking care from private rather than government hospitals increased from 55 percent in 1987 to 65 percent in 2005 [5].

Kerala's birth rate of 18.3, death rate of 6.4 and infant mortality rate of 12 are the lowest in the country. The maternal mortality ratio is also the lowest at 32 per lakhs. The institutional delivery rate is almost 100 percent. Kerala's sex ratio is unique among Indian states. It is the only state which has a female population in excess of the male population with 1058 females for 1000 males as per 2001 census and 1084 females for 1000 males as per 2011 census. It is the first state in India that could attain the health and demographic goals of National Rural Health Mission (NRHM) years before the scheme was launched[6].The dramatic decline in fertility and child mortality during the last four decades has given Kerala the reputation of the healthiest state in India.

The important challenges of contemporary health scenario in Kerala include decreasing allocation to public sector, degenerating public health system, greying population, high rate anaemia among children, unregulated private sector leading to inequality and increase in cost of health care, escalation of health care cost and marginalisation of poor, re-emerging of epidemics like malaria, dengue fever, chikungunia, leptospirosis and increasing incidence of non-communicable diseases like heart diseases, cancer and diabetes[7,8].

An insurance scheme known as 'Rajiv Arogyasri comprehensive medical insurance' is introduced in the state of Kerala making treatment up to rupees two lakhs free in government and private hospitals. About 32 lakh families below the poverty line and 20 lakhs families of above poverty line with annual income of less than Rs. 2.50 lakhs need not pay any premium to join the scheme [9].

The usage of medicine, both modern medicine and herbal items, is very high in the state. It is estimated that 3 percent of the Indian population living in the state of Kerala is consuming about 11- 13 % of the modern medicines marketed in the country. The numbers of modern medicine manufacturing units are insignificantly less in Kerala, that too only in

small scale sector. Kerala is considered as a good market for the pharmaceutical manufacturers of India.

The state of Kerala owned pharmaceutical firm Kerala State Drugs and Pharmaceuticals Ltd. (KSDP) was started in 1974 at Kaloor in Alleppey. KSDP was started because of the success story of Indian Drugs and Pharmaceuticals Ltd (IDPL) started in 1961 by the then Prime Minister Jawaharlal Nehru, the visionary responsible for the growth and development of Pharmaceutical Industry in India. The KSDP was started with the objective of functioning as the 'kitchen of the state health department' and thereby cater the requirement of the sick and poor population of the state of Kerala approaching the government hospitals [10].

Till 1984, The Director of Health Services (DHS) was purchasing the medicines directly from KSDP at the price fixed by them and supplied to the government institutions in the state. Later the prices were fixed jointly by the KSDP and the officials of the DHS through negotiations. Government Orders like G.O. (MS) 235/82/ID dated 16.07.1982, G.O (MS) 246/82/HD dated 07.08.1982 and G.O (Rt) 26/83/SPD dated 07.10.1983 specify the system followed in this regard.

In 1984 the State Government modified the system and introduced the Central Purchase Committee (CPC) scheme for direct purchase of medicines from Government of India and state public sector undertakings. (G.O (MS) 179/84/HD dated 02.07.1984 of Health (J) Department). As per that system, indents for drugs were collected and the total quantity for items was determined by the CPC. The rates for various items obtained from the CPC firms were then finalised and published by the CPC. The hospital superintendents, medical college principals and the district medical offices (DMOs) have to procure the medicines from the CPC approved lists. In cases where medicines were not obtained from the CPC firms or medicines were not available with them, other means like open tenders, local purchases or other similar methods were adopted by the heads of institutions for such items.

However non supply, delayed supply and irregular supply of medicines by CPC firms became a major issue and were adversely affecting the availability of life saving medicines in government hospitals. In certain cases, the CPC rates of medicines were much higher than the open market rates of reputed manufacturers or their brands. The professional organisations like the Indian Pharmaceutical Association and Indian Medical Association along with Kerala State Pharmacy Council and the department of Hospital and Clinical Pharmacy of Medical College, Trivandrum took active steps in educating the state government and authorities. They conducted workshops, discussions, conferences and seminars on issues related to the drug procurement and the non-availability of essential medicines in government hospitals[10].A series of workshops and seminars involving state ministers, politicians, health care professionals and government officials were conducted in the state during 1992-94 period. Such programmes along with the news paper reports and the public reactions compelled the government to take certain serious steps to ensure the continuous availability of life saving medicines in hospitals in Kerala and to re-structure the existing CPC system.

The state government was finally forced to modify the drug procurement system in the state and to reconstitute the CPC set up by providing a provision for private reputed manufacturers to take part in the open tender scheme (G.O. (MS) No 323/94/ H&FWD dated 19.10.1994). The criteria for including more firms in the CPC list were also specified in the order which included conditions like a minimum of five years market standing / manufacturing experience, annual turnover of rupees five crores, supply of medicines to health services of other states, quality standard certificates like GMP/ ISO etc. and DGS&D rate contract. It is to be noted that it was during the same period that Delhi and Tamil Nadu introduced their state drug policies [11].

Government of Kerala sanctioned a Hospital Formulary for Medical Colleges in the state of Kerala in 1994 containing 236 drugs ( G.O (Rt) No 3108/94/H&FWD -K) The formulary was made applicable to all the then five government medical colleges in the state. Items that are not included in the Hospital Formulary could be purchased only with the prior permission of the Principal of the respective medical college. Based on the above government order, the first hospital formulary for a government medical college in the country was published in 1997 under the auspicious of the department of hospital and clinical pharmacy, Govt. Medical College Hospital, Trivandrum.

In May 1995 the state government took a bold revolutionary step to start community pharmacies (Paying counters) in all major hospitals in Kerala jointly by the hospital development committees (HDCs) and hospital pharmacies of the respective institutions with the objective of providing opportunities to the patients to purchase the medicines which are not available in the hospitals through free supply scheme, at a reasonable price on round the clock basis. The first community pharmacy was established in Trivandrum Medical College under the department of Hospital and Clinical Pharmacy in December 1995. This Community Pharmacy became a great success and grown to a role model for starting other such counters in the state. Today there are about 600 such community pharmacies in the state supplying medicines to the patients and public at reduced prices [12].

In the beginning (1980s) there were only three members in the CPC to monitor its activities, all were officers of the state health department. By 1994 more members were incorporated in the CPC management committee. Officers like Health Secretary , Director of Health Services, Director of Medical Education (DME), Store Purchase Department Secretary , Additional Secretary of Finance department, Director of Employees State Insurance (ESI), State Drugs Controller, Govt. Analyst of the state drugs control department, and the Professor and Head College of Pharmacy became the members of the CPC governing committee. The Director of Medical Education and the Director of Health Services acted as Chairman of the CPC every alternate year on rotation basis. The CPC office remained at the office of the DHS.

The annual single order system followed by the CPC till 1994 was replaced by half-yearly order system and later by 2000 the quarterly order system was introduced. This was done with the objectives of avoiding the wastage due to date expiry of procured items, providing adequate storage facilities and to re-evaluate the need of the indented items. However complaints regarding malpractices, corruption, low quality medicines and non-

supply of ordered items were common. Quite often the orders for one year were given through a single supply order with the direction to supply in four instalments with a gap of three months period which was not obeyed by the suppliers.

When the new drug policies were introduced in Delhi and Tamil Nadu in 1994, serious discussions were initiated in Kerala for revamping its policy also. It was K.G.Revikumar the head of the Hospital and Clinical Pharmacy Services, Medical College, Trivandrum who initiated the campaign for introducing the TNMSC model of procurement of medicines in Kerala. He has utilised the forums Indian Pharmaceutical Association (IPA) , and the Pharmaceutical Society of Kerala to advocate for the same. News papers were carrying reports in this regard almost regularly. However a section of the government hospital pharmacists were strongly critical of introducing the Tamil Nadu Medical Services Corporation (TNMSC) model in Kerala, fearing their promotion opportunities.

In 2001 the IPA Kerala State Branch submitted certain proposals for the improvement of the medicine related scenario in the state. The major request was for restructuring and revamping the Central Purchase Committee system in the state incorporating certain aspects of the TNMSC and the Delhi drug policy. It was also requested to appoint a full time Indian Administrative Service (IAS) officer in the CPC taking TNMSC as a model and make the CPC corruption free and efficient. They have also suggested making CPC an independent and transparent establishment having its own office and administrative set up for the procurement and distribution of medicines in Kerala [13]. Serious discussions were held and some major changes were introduced in the CPC system taking from TNMSC model. However the basic structure of the CPC was retained and continued to work in the DHS office as an ad-hoc arrangement [14].

In 2005, Kerala spent rupees 20 crores more for the procurement of medicines than Tamil Nadu. Still Kerala faced more drug related problems than Tamil Nadu during the period. An important reason pointed out by experts for the medicine shortage in Kerala government hospitals was the special interest or importance given for certain costly medicines compared to the low priced essential items[15].The notorious issue related to the purchase of anti-rabies vaccine from a manufacturer after freezing the supply of the CPC firm by the DHS during 2002-2003 became a hot subject of discussion among the media and the public in Kerala. All such incidents and developments forced the state government to accelerate the process of starting an independent full time agency to procure and distribute medicines in government hospitals in Kerala.

#### **Kerala Medical Services Corporation Ltd.**

The Kerala Medical Services Corporation Ltd (KMSCL) was established in November 2007 as a Govt. Company under The Companies Act 1956 with three IAS officers of the state Health Department as first Directors (Dr. Vishwas Mehta, Dr..Usha Titus and Dr. Dinesh Arora). The Government of Kerala constituted KMSCL with the primary objective of making available quality medicines, surgical items and other hospital requisites to the poor patients through the public health care networks and for that purpose procure the medicines at most economical rates. The fully Government owned company had initially an authorised



share capital of rupees ten crores. It has its head quarters at the state capital city Thiruvananthapuram.

### **Objectives of KMSCL**

The KMSCL was floated with the following objectives-

1. To purchase, set up, manufacture or otherwise procure and to sell, supply, distribute or deliver all kinds and varieties of generic and patent medicines of allopathic, ayurvedic, homeopathic, veterinary and other systems of medicines, medical supplies, surgical accessories, hospital equipment, machineries, furniture, vehicles or other facilities to various medical colleges, district and taluk hospitals, health centers or other such institutions under the health department of Government of Kerala or other state or central government departments/ institutions or institutions under private sector and to general public or to outsource or act as agent for outsourcing such supplies, equipment, instruments or other facilities on behalf of such institutions.
2. To implement a system for purchase and distribution of drugs in the department of health and other institution under government and other to meet the qualitative and quantitative needs of the end users alleviating scarcity and losses.
3. To establish warehouses, storage rooms, go-downs and cold storage facilities in various districts in Kerala and other places in India or elsewhere for safe and convenient storage of medicines, surgical products and other medical and para-medical products of all kinds and description for the purpose of attainment of the main objectives of the Company.
4. To provide quality assured atmosphere both in material management and in system operation up to the end user.
5. To buy, sell, supply, distribute, store, stock, maintain and otherwise handle, deal in and carry on business in all kinds of varieties of patent and non patent veterinary medicines, drugs, mixtures, formulation, capsules, tablets, pills, powder, pharmaceutical, chemical, medical and medicinal products, preparations and materials, sterilized injections, vaccines, immunogens, and surgical dressings relating to all kinds of animal husbandry, domestic or otherwise.
6. To economise expenditure on drugs through pooled procurement system and to optimise accountability at all levels.



**Fig 1: Office of KMSCL at Thycadu, Trivandrum**

### **AIM AND OBJECTIVES**

The aim of the study is to conduct a critical analysis of the working of KMSCL during the first three years of its functioning with the following objectives:

1. To study and evaluate the medicine policy of the state of Kerala.
2. To study the genesis and the process of establishment of KMSCL.
3. To study the medicine procurement system of the state of Kerala before and after the establishment of KMSCL.
4. To study the medicine storage and distribution system of the KMSCL and compare with the situation prior to its establishment.
5. To conduct SWOT analysis of KMSCL.

### **METHODOLOGY**

It was a prospective analytical study extending over a period of period of 40 months from April 2008 as a part of a major study leading to the award of Doctor of Philosophy of a public University.

The collection of data process was conducted utilising all the available resources, including, official communications like orders, circulars and notifications, published literature both in scientific and non-scientific publications like news papers, journals, magazines etc. and by conducting interviews and discussions with the various stake holders and the public and patients.

The data were also collected from the officers and professionals associated with drug management, and the professionals including journalists and writers. The stake holders were selected to cover various aspects like policy framing, implementing, analysing and evaluating activities. Experts and professionals were interviewed to collect their opinions, observations and viewpoints. Representatives of various professional organisations, political parties, journalists and other media persons were also included for the interview. Apart from the organised interviews, a number of pharmacists, pharmacy store keepers/store officers/store superintendents were also consulted for the study. The people were identified based on their works, writings, expressed opinion and willingness to share their views.

The persons interviewed belonged to the following groups:

- Persons supporting the policy/ policies based on their findings and viewpoints.
- Critics opposing the policies for specific reasons.
- Persons who have studied the policies scientifically at micro levels with professional/ academic or research interests.

Over forty hospitals covering primary health centers (PHCs) to tertiary care hospitals were visited to study the outcomes of the policies, actual medicine situations and obtaining the view points of patients and their care takers. It also helped to test certain findings and observations related to the drug policies gathered from the published documents and other sources.

## RESULTS AND DISCUSSION

The KMSCL floated the first tender for the procurement of medicines on 30.1.2008 and 173 firms including reputed firms with long market standing took part in the tender. They have initiated the activities of distribution of medicines and other hospital supplies including surgical items from April 2008 by establishing District Drug Warehouses in all the 14 districts of the state.

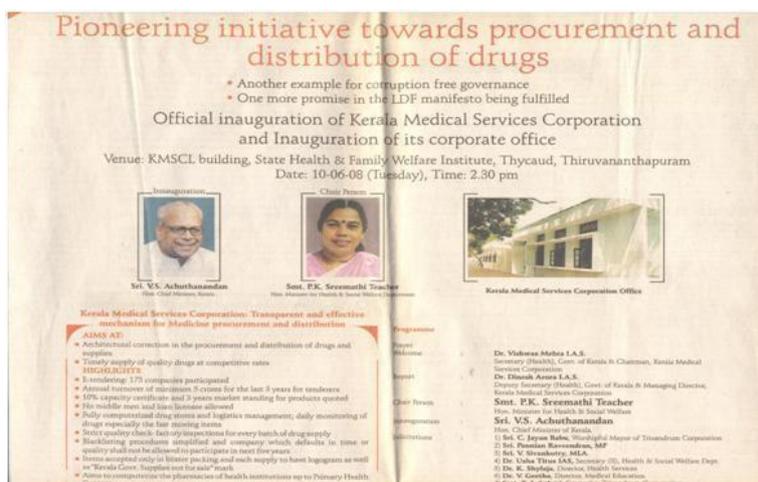


Fig.2. Kerala Govt. Notification regarding formal inauguration of KMSCL.

Like the Tamil Nadu Medical Services Corporation Ltd, the KMSCL also incorporated certain objectives aimed at providing the infrastructure facilities and amenities in government hospital set ups. The following objectives noted in the Memorandum of Association of KMSCL are examples

1. 'To construct, set up, run and maintain all kinds of modern medical and paramedical or medical based ancillary facilities such as hospitals, pathology labs, diagnostic centers, x-ray/ scanning facilities, medical shops, canteen facilities, pay wards and such other facilities adjacent to aforesaid institutions or elsewhere so as to provide facilities of excellence, expertise and quality required by patients and others visiting or using the facilities of the aforesaid institutions.'

2. 'To undertake civil, mechanical, electrical and other construction works for setting up of hospitals, health centers, pay wards and other ancillary facilities on behalf of institutions under the health department of government of Kerala or other state and central government departments/ institutions and others and to undertake civil and other general repairs, maintenance and improvement of hospital buildings, equipment, machineries and all such facilities for the purpose of attainment of the main objectives of the company.'
3. To purchase, take on lease or otherwise acquire any land, sites, buildings or other moveable or immovable properties necessary for the purpose of the company.
4. To establish modern warehouse and engineering workshops to manufacture, assemble, repair or otherwise maintain various medical equipment, surgical instruments, diagnostic equipment, fire- fighting equipment, furniture and fittings including hospital furniture and undertake civil works for that purposes.

The Corporation was established with a Board of Directors having the following eight members-

Secretary to Government (Health and Family Welfare).	Chairman
Additional Secretary to Government (Finance).	Member
State Mission Director (NRHM)	Member
Director of Health Services	Member
Director of Medical Education	Member
Drugs Controller of the State	Member
Expert from Pharmaceutical Sciences	Member
Managing Director KMSCL	Member

Dr Vishwas Mehta IAS was the first chairman and Dr. Dinesh Arora IAS first Managing Director of KMSCL. In the beginning the Corporation has to face many odds from various corners including the professionals from health care sector. When Mr Biju Prabhakar, an IAS officer with will power, dynamism and corruption free track record took over the charge as Managing Director of KMSCL in 2010, it was not difficult for him to identify the centers and points where corrupt practice can originate as in other government set ups. He managed to study and understand all major issues and problems of the KMSCL. Even though he is from engineering background, he managed to understand each and every drug purchased by KMSCL with the skills of an intelligent pharmaceutical professional. He managed to introduce strong steps and precautionary measures to make KMSCL more transparent even compared to all other similar organisations in the country including TNMSC within two years of his working in KMSCL.



Fig 3: Logo of KMSCL

Biju Prabhakar was responsible for introducing and popularising the concepts of scientific warehousing and storage of medicines not only in KMSCL but also in government hospitals. Earlier medicines were stored in major government hospitals ignoring the principles of good storage practices, adopting the practice of storage of food grains in the ware houses of Food Corporation of India. Antibiotics and other medicines having the label instructions to “keep in a cool place” were stored as engineering goods were stored. Items of medicines like vaccines and biological preparations requiring “Cold Place” storage also were kept in room temperature in many places. Today some of the KMSCL warehouses are having state of arts facilities for storage of medicines. Medicines are kept on areas specified as ‘cool place’ and ‘cold place’ complying fully with the requirements/ specifications of Indian Pharmacopoeia, the Rules under the Drugs and Cosmetics Act 1940 and the label specifications of individual items of medicines.

It was BijuPrabhakar who managed to start the Karunya Community Pharmacy Scheme in Kerala under the KMSCL. The Community Pharmacies were started with the objective of providing medicines which are not available for free supply in Government hospitals at low prices to the patients. The design, structure and management of the Community Pharmacies are in par with those in developed countries like USA and UK, both in functioning and services.

Compared to the policies of Delhi and Tamil Nadu (TNMSC) started during 1994-95, and all other Indian states having an established Medicine policy, the involvement of pharmaceutical expertise is significantly high in KMSCL and the same is reflecting in the service qualities of KMSCL. Two senior pharmacy professionals – one from the Drugs Control department and another from the Medical Education Department are members of the Board of Directors of the KMSCL and highly qualifies and experienced pharmaceutical scientist are associated with various policy aspects of KMSCL. In fact it is this unique feature of KMSCL that helped it to overshoot TNMSC (started in 1994) in a number of functional activities and services. It was during the year 2011 that KMSCL started to attract highly qualified experts from Pharmacy fields to it and its Chairman Rajeev Sadanandan IAS (Principal Secretary Health and Family Welfare, Kerala) and Managing Director, Biju Prabhakar IAS were very much responsible for that initiative.

The participation of standard reputed firms in the KMSCL tender process is good and shows its acceptance among pharmaceutical manufacturers. The system of transparency is the main inspiration for this. In 2008 a record number of 173 reputed firms from all over India participated in the tender process of KMSCL which became 154 in 2009. Again in 2010 KMSCL got massive response from the pharmaceutical manufacturers and the number of firms participating in the bidding has gone up to 177.

The Kerala Medical Supplies Corporation managed to introduce certain bold and professionally adoptable sincere initiatives within the first three years of its functioning. Since KMSCL was started because of the success story of TNMSC, it is quite natural that certain components of the Tamil Nadu model were adopted either as such or with necessary modifications. The media, both printed and visual, which carried a number of critical reports and discussions at regular intervals regarding the working and related

activities of the corporation could contribute positively for making the KMSCL strong, active and committed. Such reports also helped to make the functioning of the corporation more transparent and professional. Today one can obtain details regarding almost all activities of the tender process of KMSCL on the web site [www.arogyakeralam.gov.in](http://www.arogyakeralam.gov.in). It also helps to avoid the chances of complaints and court cases from the side of bidders.

Like TNMSC, the KMSCL also introduced the two bid system consisting of separate technical and financial envelopes and the KMSCL has taken sincere steps to avoid the middlemen and brokers out of the tender process. Only authorized representatives of the manufacturers could attend the tender process. The certificate to prove their market presence, a non-conviction certificate, issued by the respective drug control department and the certificate from Sales Tax Department have been made compulsory for the drug manufacturers to participate in the bidding.

Right from the beginning KMSCL introduced the system of inspecting the factory facilities of new firms participating in the tender process prior to the opening of the financial bids. It helps to weed out fake firms and assess the capacity and capability of manufacturing units to execute bulk orders in time. The KMSCL adopted the pass book system of TNMSC as such to monitor the budget allocation and medicine consumption.



**Fig. 4 a, b. KMSCL Team Inspects Factories**

The warehousing and material transport system planned and adopted by KMSCL is much better and more scientific compared to TNMSC. Medicines from the manufacturers are received and stored in the District warehouses for delivery to the hospitals. Medicines are issued to the medical college hospitals thrice in a month and to the general hospitals and district hospitals twice in a month. Taluk hospitals receive medicines once in a month and primary health centers once in two months. Emergency supplies are affected as per the need. For each hospital the budget allotment is notified by the KMSCL and recorded in the pass books. All the district warehouses and head office are connected through online network for monitoring stock position and details regarding quality control and quality assurance process.

The new warehouses under construction are very much modern, scientific and technically designed. The KMSCL initiated serious steps for improving infrastructure of warehouses and material transport system by the beginning of 2011. They have also planned to modernise their warehouses which were made available to them by the state government in all the 14 districts of Kerala in 2008. These warehouses were originally the offices of the District Medical Stores (DMS) under the control of District Medical Officers (DMOs). It is a herculean task for the KMSCL to modernise the old traditional stores to modern scientific warehouses.

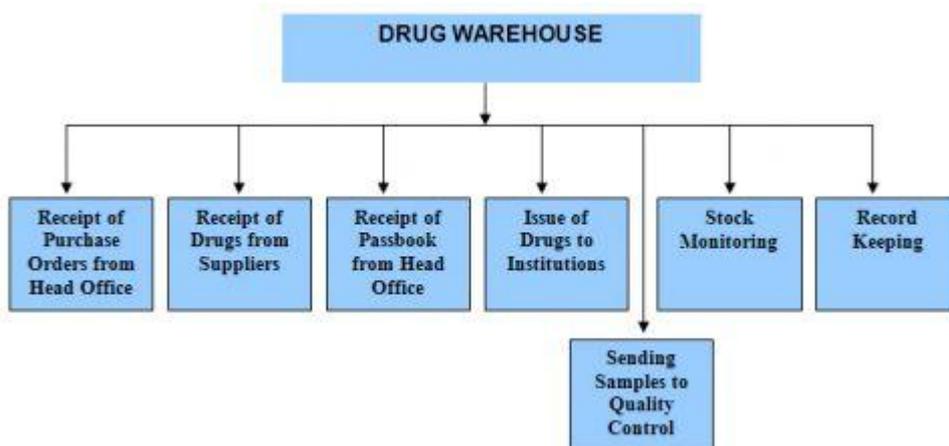


Fig.5. Warehouse Activities of KMSCL

Modernization of drug warehouses is taken up on a war footing to plan, design, build and operate scientifically designed warehouses catering to the growing future demands of storage management, inventory management and fleet management by utilizing modern racking and stack mechanisms, modern packaging techniques, bar code readers and Global Positioning System (GPS) enabled transportation vehicles. The new warehouse design captures all the elements required for the efficient storage of drugs by considering all the climatic factors of the state.

In the process of modernising the warehouses, on 16<sup>th</sup> February, 2011, the KMSCL opened their first modernised warehouse in Trivandrum district attached to the Medical College hospital, with facilities for ‘cool’ and ‘cold’ place storages, quarantine for received items waiting for quality control test reports, computerised racking facility, humidity control room, bar coding for inventory control and expiry management and advanced fire fighting utensils. They have started the works for well designed warehouses in a planned manner in other centers. The construction of the warehouse of Kannoor District at Mangattuparambu was started on 6<sup>th</sup> September 2010 and the foundation stone was laid by the then Chief Minister of Kerala, Sri V.S. Achuthanandan. The warehouse is designed to have the modern architectural design and facilities.

The company is procuring drugs worth about Rs 170 crores by 2011. They are also buying medical equipment worth 45 crores. It has also been entrusted with the setting up and running other health care services like hospitals, pathological labs, diagnostic centers, x-ray/scanning facilities etc. In 2011 KMSCL procured 50 Advance Life Support Ambulances (ALSA) for the Kerala Emergency Medical Services Project (KEMP) through a National

Competitive Bid process. It is associated with National Rural Health Mission (NRHM), Kerala on this ambitious Ambulance Solutions project.

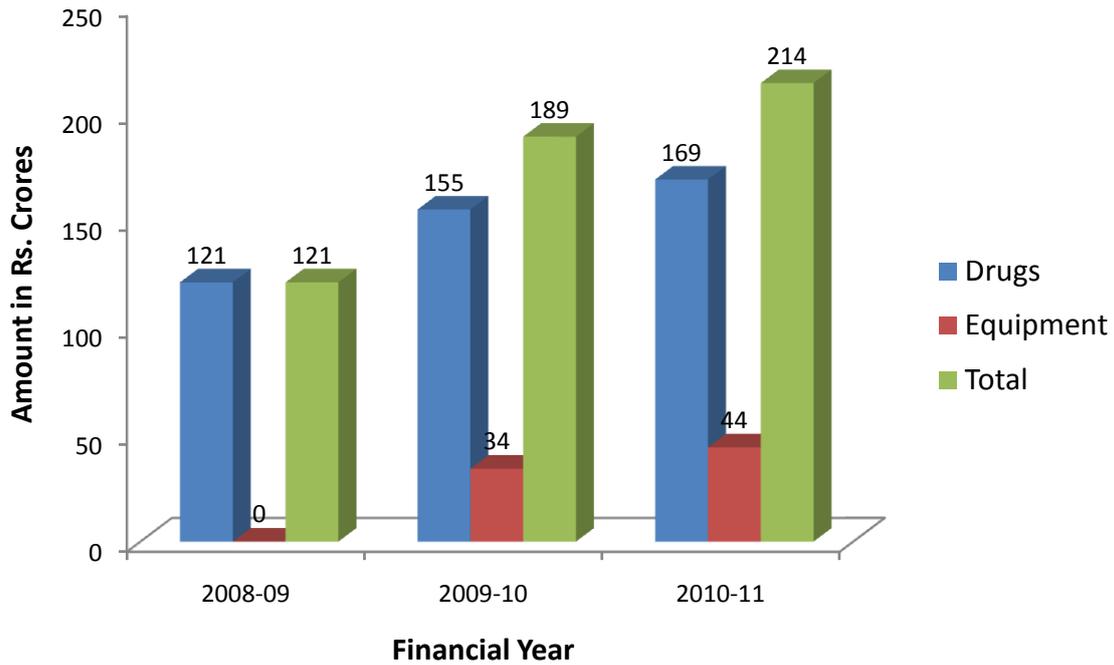
Each and every batch of drug procured by the Corporation is tested through empanelled approved drug testing laboratories from all over India before being released for issue. The Government Drug Testing Laboratory, Trivandrum is the appellate authority in the case of dispute regarding quality tests. A new department called Quality Assurance (QA) with a mandate to conduct surprise inspections at the warehouses and to collect samples randomly for testing purposes has been introduced in the corporation. Dual coding system has been introduced in the QA module of the system software which will ensure the secrecy in respect of batch number, manufacturer and empanelled labs. The number of samples subjected to quality analysis has risen from 8000 samples/year in 2008 to 15,000 samples/year by 2010. The extensive and diligent quality control tasks are achieved through a suite of empanelled drug testing laboratories.

The KMSCL finalises the Essential Drug List (EDL) every year. The first EDL was published in 2008 containing 527 items of medicines, sutures, surgical and other hospital items including detergents and chemicals. The annual indents are prepared by the DHS and DME and the Corporation does the tender process based on the estimated requirements. However during the first three years, the KMSCL could not give much attention and care activities like publication of EDL in booklet form every year and make it available to all health care centers as done by TNMSC. The KMSCL is yet to take up issues like publication of Formulary, Standard Treatment Guidelines (STG) etc as done by Delhi and Tamil Nadu. The sixteen year old TNMSC and Delhi policies are presently more effective in the case of publication of hand books, reference materials,, Essential Drug Lists, Formularies and other publications aimed at promoting rational and scientific use of medicines.



Fig 6: An inside view of KMSCL warehouse

**Fig. 7. KMSCL -Procurement of Drugs and Equipment-expenditure**



The research activities of KMSCL are also limited as in the case of TNMSC. It is to be noted that in the beginning the Delhi policy was studied critically every alternate year by an external agency with the objective of taking corrective measures and introducing innovations.

**Table.1.Comparative Statement of Price**

Sl. No	Name of the Drug	KMSCLRate*	MarketRate*
1	IsosorbideDinitrate Tab	6.82	89.00
2	Nifedipine Tab	6.19	40.00
3	Atenalol Tab	12.70	40.00
4	Ciprofloxacin Tab	70.62	120.00
5	Amoxycillin Dispersible Tab	34.45	60.00
6	Amoxycillin Cap	69.64	120.00
7	Ampicillin Cap	70.62	122.00
8	Ranitide Tab	21.90	32.00
9	Insulin Human Rapid Acting	54.90	120.00
10	Anti-Snake Venom	299.00	333.00
11	Anti-Rabies Vaccine	191.36	316.00
12	Paracetamol Tab	17.17	24.00

Source: <http://aogyakeralam.gov.in/index.php/stateinitiatives/kmscl> - Accessed on 15th July 2011

**Table.2. Price comparison of medicines purchased by Kerala. 2000- 2010**

1	Aspirin Tab IP 300 mg	10x10	10.05	11.13	16.6
2	Adrenaline Inj 1mg/ml	1ml Amp	1.27	1.4	1.45
3	Atropine sulphate Inj 0.6mg/ml	2ml Amp	0.75	0.75	0.77
6	Ketamine Inj IP 50 mg/ml	10 ml vial	24.97	17.6	15.85
7	Thiopentone sodium Inj IP 500mg	20 ml vial	15	17.5	17.44
8	Folic acid Tab IP 5mg	10 x 10	5	5.78	4.66
9	Diethyl carbamazine citrate Tab 50 mg	10x 10	5.4	10.5	18.50 (100mg)
10	Chloroquine phosphate Tab 25 0 mg	10 x 10	29.83	28.35	33.55
12	Phenobarbitone Tab 30 mg	10 x 10	7.5	9	7.9
13	ORS powder IP 27.9 gm	Pouch		1.55	1.77
14	Hydrocortisone Inj 100mg/vial	100mg via	11.25	9.2	8.28
15	Frusemide Tab 40 mg	10 x 10	14	15.59	10.69
16	FrusemideInj 10mg/ml	2ml Amp	0.95	0.97	0.89
17	MetoclopramideInj 10mg/2ml	2ml Amp	1.12	1	0.95
18	Ranitidine Tab 150 mg	10 x 10	26.9	23	21.65
19	Ranitidine Inj 50 mg /2 ml	2ml Amp	1	1	0.95
20	Metronidazole Inj 100 ml bot	100 ml	6.45	6.45	4.1
22	Paracetamol Tab 500mg	10 x 10	12.5	12.13	17.17
23	Diazepam Tab 5mg	10 x 10	3.88	5.35	8.55
24	DexamethazoneInj 2 ml	2ml vial	2.63	2.35	4.93
25	PentazocineInj 30mg/ml	1ml Amp	3.75	2.9	
26	Chlorpheniramine maleate Tab 4mg	10 x 10	3.36	4.72	3.12 (2 mg)
27	Ibuprofen Tab 400mg	10 x 10	13.95	22.5	15.09
28	ParacetamolInj 150mg/ml	2ml Amp	1.18	1.02	1.4
29	DiclofenacInj 25mg/ml	3ml Amp	0.95	1.02	1.2
30	Glybenclamide Tab 5mg	10 x 10	6.8	5.98	4.39
31	NeostigmineInj 0.5mg/ml	1ml Amp	1.47	1.1	3.3
32	Metformin Tab 500mg	10 x 10	18.5	17.3	14.38
33	Imipramine Tab 25mg	10 x 10	13.7	16	13.65
34	Haloperidol Tab 5 mg	10 x 10	11.2	12.08	8.34
35	Lignocaine HClInj 30 ml	vial	4.22	3.5	5.25
36	MannitolInj 350ml	Bot	26	25	8.77 (100ml)
37	Ciprofloxacin Eye drops	5ml Via		2.7	2.6
38	Carbamazepine Tab 200mg	10 x 10	57.8	48.38	40.9
39	Ciprofloxacin Tab 500 mg	10 x 10	107	97.65	84
40	Erythromycin stearate Tab 250 mg	10 x 10	112.9	116	103.95
41	Amoxycillin Cap 250 mg	10 x 10	71.5	70.95	61.7
42	Ampicillin Cap 250 mg	10 x 10	65.5	71.22	63.35
43	Antisnake venom Poly.Lyophilised	vial	310	310	341
44	Ringer Lactate Inj 500ml	Bot	10	9.68	7.06
45	Dextrose Inj 5% 500ml	Bot	9.9	8.7	7.25
46	Insulin Human Inj40U/ml	10 ml vial	151	140	54.59

The decision of KMSCL to go for e-tendering and e-procurement of certain items is a revolutionary step aimed at promoting transparency. They are also planning to work as the purchasing agency for other States. The move to introduce online tendering also comes in the wake of criticism and allegations made in the press when certain firms were blacklisted in the recent past. The e-tendering is expected to curb corruption and make the process transparent. It will also keep the bogus companies out of the process and bring down the expected time for clearance. Besides, it will also avoid the troubles faced by manufacturers to be present in person for bidding as per the present practice [16].

Over the 3 years of its operation, the company today procures around 530 types of drugs and over 250 types of medical equipment at an annual procurement spend which has risen from 120 crores to 220 crores. The KMSCL is in the process of securing ISO certification in a bid to expand its operations out of the State also. It is also approaching the World Bank for empanelling for drug procurement and if that happens, the agency can take up the drug purchasing for other interested States also [17].

The vast difference in the prices of drugs procured by the KMSCL and the maximum retail price (MRP) of the same drugs when sold through the retail medical stores in Kerala exposes the huge profiteering indulged by intermediaries and agents in the field. The huge difference in procurement price of KMSCL and MRP was revealed through an Right to Information (RTI) Act provision by Janapaksham, an NGO in Kerala. The cancer drug Amifostinjection is procured by KMSCL at Rs 430.00 per vial while the same injection is available at private medical stores at Rs 4225.00. Inj. Paclitaxel with codanset 16.70 ml is procured by the KMSCL at Rs 575.00 while its MRP is Rs 5500.00. Again Inj. Streptokinase is procured by KMSCL at Rs 538.00 while its MRP is Rs 2500.00[18].

The KMSCL has taken up a novel and innovative program by entering into the open market trading of medicines of manufacturers of brand leader products. The scheme aims to start a number of Community Pharmacies throughout the state to make medicines available to the patients at reduced or subsidised rates, taking the Paying Counter system started in Medical College Trivandrum in 1995 as a model[19]. The Chief Minister of Kerala Sri Oommen Chandy himself has taken initiatives to launch the system of Community Pharmacies under KMSCL.

### CONCLUSION

Compared to the earlier CPC system, the KMSCL could make wonderful changes in the drug situation in Kerala within three years of its existence both in making the medicines available in government hospitals and ensuring their quality. KMSCL could introduce and popularize the concepts of good ware housing and storage practices in drug store management in Kerala. The starting of community pharmacies for open market sales of medicines is a unique feature of Kerala's drug policy. The manner in which the community pharmacies are designed and established is worth emulating. The community pharmacies and their working are very much professional and scientific both in structure, appearance and functioning. The Karunya Community Pharmacy could develop as an ideal role model for other Indian states, professional organisations and associations to adopt. With the expertise and the professional competence, it will be easier for KMSCL to take the community pharmacy set up to higher and better levels in the country in general and the



state of Kerala in particular in the near future. KMSCL can with the support of the State Pharmacy Council can initiate the Accreditation of Hospital and Community Pharmacies in the state. KMSCL initiative of the Community Pharmacy can contribute positively for elevating the Indian medical stores to the level of professional community pharmacies as in developed countries.

KMSCL has succeeded in promoting access to medicines in the state and to popularise the concept of quality assurance in medicines. Through Karunya Community Pharmacies, KMSCL managed to provide medicines that are not available for free distribution in the state at a reasonable cost to the society. The corporation is also promoting the growth and development of the domestic pharmaceutical industry. It has made possible the procurement of cost effective medicines in right quantities at right time in the right manner. KMSCL tries to extend maximum possible benefit to the poor sections of the society in health care with the available budget. It also helps to eradicate the issue of counterfeit and substandard medicines in government hospitals to a certain extent.

The KMSCL is purchasing most of the medicines at an economic rate incorporating the concepts of cost minimisation principles of pharmacoeconomics. There is considerable difference between the open market price and rate fixed by KMSCL. The prices of a number of medicines are competitive even when compared with TNMSC rates. The Corporation needs mode support and assistance from the State and the Central Governments to initiate activities like research studies and other innovations in the field.

### **Competing interests**

No conflict of interest.

### **Authors' contributions**

VR researched data and wrote the manuscript. KGRK, LS, PKM, GPM contributed to the discussion and reviewed/edited the manuscript. KGRK and VR are taking responsibility for the contents of the article. All authors read and approved the final manuscript.

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