

Traditional Medicine in Health System Development:

A Case Study of Kerala State, India

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1. Introduction

In most countries traditional medicines (TRM)¹⁾ coexist with mainstream conventional medicine and health seeking remains pluralistic though their presence may not be obvious and officially recognized. Estimates suggest that TRM continues to be an integral part of health care for around eighty percent of the world population (WHO 2002). While there is emergent research and policy interest on various areas of TRM, studies on their contribution to health system development are limited. Studies on relevance of such knowledge in public health are also inadequate. Despite the fact that the literature on medical pluralism is fairly large, there are limited materials on reorientation of health systems to respond to pluralistic health seeking behaviour especially in developing countries.

India has taken a pluralistic and inclusive view towards TRM although health system integration is still in an ambiguous situation. However, within the country Kerala State represents a special model for such integration. The State has a high level of medical pluralism consisting of both formal and informal traditional medical systems, with several unique characteristics. Kerala has a high social and political patronage for TRM. The high health status achieved by Kerala is unique even in the international healthcare development context. Whereas studies on high health status of the state suggest a relation between the health status and cultural traditions in the state, this relation has not been studied adequately. The relationship between various medical systems and inter-cultural issues related to medical pluralism in Kerala also remain unexplored.

In this context, this article describes the historical path of health system, traditional medicine development, and their contemporary status both in India and Kerala. The paper attempts to illustrate the evolution of medical pluralism in Kerala and by identifying specific areas of traditional medical culture in the State, it explores the contribution of such practices to the high health status in the State. In doing so, it seeks to highlight how an integrated approach to healthcare can be a factor in achieving public health objectives. It also points to the role of and priority areas in strengthening TRM in order to develop strategies for replicating this experience appropriately in areas of need especially in developing countries.

2. Health Sector Development in India and the Status of Traditional Medicine

2.1 Pre-Independent India Health System Development

Upto the 19th century traditional medicine was the major source of healthcare in India. Western medicine came

1) The terms traditional medicine (used with acronym TRM), indigenous medicine, folk medicine, native medicine, complementary and alternative medicine are used in the article interchangeably unless specified. In India such systems together are under the national government, department of AYUSH (Ayurveda, Yoga and Naturopathy, Siddha, Homeopathy and Tibetan medicine). The terms modern medicine, western medicine, biomedicine, allopathy are used in various contexts to denote conventional medicine.

to the country after the Portuguese arrived, who started a hospital (in 1498) and a medical school (in 1607) in Goa (Vinayachandran 2001: 21). By around 1600 AD Western medical ideas and practices made inroads with the arrival and establishment of the East India Company. As the company's trade influence in the country grew, their medical influence too increased. This resulted in various presidency medical services (in Bombay, Calcutta and Madras which got merged and became Indian medical service in 1896) and establishment of boards in the 1770s (Harrison 1994: 7). In the initial periods medical facilities were established to cover mainly the colonizers and the military. At the same time enquiries related to tropical disease patterns and the coping mechanisms emerged. In 1822 Western medical education was started in Calcutta with combined classes of Ayurveda and Unani medicine. In 1835, Calcutta medical college was established. In the 1830s western medical care started becoming available to Indians through introduction of charitable dispensaries supported by native philanthropists as well as in some cases, by the government, which were planned to be a combination of curative clinics with some public health focus. Apart from this missionary societies initiated medical service from 1830s (Arnold 1993: 244). From the late 1850s, public health programs were started, when the administration was taken over by British government. The clinics became delivery points for vaccination against conditions such as small pox, and they undertook sanitation and hygiene works in the areas. In the 1860s there were attempts to train traditional birth attendants by some missionary societies. Soon, Western medicine became popular among Indian aristocracy as a symbol of social status (Arnold 1993: 12). The medical registration act in 1912 by Medical Council of Bombay further strengthened the process. Medical education also progressed well with some private medical schools also in the field and by 1938 the country had 27 medical schools, of which nine were private. The major developments in medical education were between 1860–1880 as well as 1920–1935 (Jeffrey 1979: 303). Despite this expansion, some researchers like Ramasubban and McKim Marriot have argued that western medicine had never any influence on and ignored the requirements of the native people (Arnold 1993: 13, Harrison 1994).

2. 2 Developments of Health System Post Independence

After the independence of the country from British rule in 1947, the Constitution of India decreed that the health of the population, including aspects related to planning and financing, became primarily responsibility of individual States. Though following this India took a then popular welfare state approach²⁾ with universality and equity as basic tenets, “the health care system evolved from a political structure of market-orientated socialism with the coexistence of private and public sectors” (Dummer and Cook 2008). The report of the Bhore Committee (1946) was central to shaping the current health system in the country by affirming development of basic primary health services with referral systems. It also stressed the importance of indigenous production of modern medicines to avoid dependence on multinational companies and also recommended 15 percentage spending by the States in health sector. The first and second five year plans from 1951 to 1961 focused on developing basic infrastructure and manpower³⁾. The Indian Medical Council Act (1956) was legislated for recognizing medical qualifications as well as for maintaining registers of practitioners in State Medical Councils. This also laid down standards of medical education, and ethical codes for medical practitioners. Though there were several shifts in focus such as family planning, introduction of multipurpose workers at the grass root level and so on, the Alma Ata declaration of 1978 (to which India is a signatory) laid down the idea of a comprehensive primary health care approach. In 1983, the National health policy tried to integrate all these perspectives and focused on a

2) See Nundy 2005. Primary Health Care in India: Review of Policy, Plan and Committee Reports, *Financing and Delivery of Health Care Services in India*, National Commission on Macroeconomics and Health, Ministry of Health and Family Welfare, Government of India — http://www.whoindia.org/en/Section102/Section201_887.htm, accessed on 18th March 2010.

3) *Ibid.* page 2.

Table 1 Health Care Infrastructure in India

Area	Institution	Population	Function
Village	Accredited Social Health Activist (ASHA)/Link worker	1,000 approx.	Create awareness on health and its social determinants, mobilizing community for local health planning and increased utilization and accountability of the existing health services, providing basic curative services
Panchayat Around 5 villages (25 sq. kms)	Sub-centre (Staffed with one male and female health worker)	3,000–5,000	Basic health care, including nutritional advice, family welfare, immunisation, diarrhoea control and control of basic infectious diseases, provision of basic drugs
Panchayat cluster Around 25 villages (125 sq. kms)	Primary health centre (A trained doctor and other health care staff with 6 beds)	20,000–30,000	Referral centre for 6 subcentres, Preventive and curative programs, national programs/ family welfare programs
Block level Around 200 villages (1000 sq. kms)	Community Health Centre ⁷⁾ (4 medical specialists (surgeon, physician, gynaecologist, paediatrician) and medical support staff)	80,000–120,000	Referral centre for 4 PHCs and secondary care With 30 beds, operating facilities, X-ray and laboratory services
Tertiary medical care			
District	District hospital/General hospitals	Urban	Referral centre, specialist care for urban and rural patients
Region	Medical college hospitals	Urban	Tertiary care, research, teaching

Source: Annual Report of Ministry of Health and Family Welfare, 2009–2010⁸⁾.

decentralized system with a participatory approach including involvement of civil society organizations and the private sector. But the implementation was partial and the program suffered from low attendance of medical staff, inadequate supplies, lack of community involvement and lack of proper monitoring mechanisms and the vertical programs were reintroduced. The situation worsened with the introduction of concepts of globalization, liberalization and privatization in 1990s (Jan Swasthya Abhiyan 2006). With varying focuses in subsequent years, health remained a complex issue in the country and the National Health Policy (2002) again stressed the need for reintroduction of 'primary health care for all' approach through an integration of vertical programs and decentralizing health care delivery system through Panchayati raj (local governments) and other autonomous institutions. While stressing the need to regulate private health care, it advocates inclusion of private infrastructure in the referral system⁴⁾. The National Rural Health Mission⁵⁾ established recently is a new initiative in this direction. The program was targeting to train around 250,000 women to become Accredited Social Health Activists (ASHA) to improve access to healthcare. However as per 2010 data 749,440 ASHA are already been selected and trained. Today there is a network of 146,036 Sub-centres, 23,458 Primary Health Centres (PHC) and 4,276 Community Health Centres (CHC) in the country as part of the primary health care program of the country⁶⁾.

4) *Ibid.* page 3.

5) Main strategies of National Rural Health Mission (NRHM) are decentralized village and district level health planning and management, appointment of Accredited Social Health Activist (ASHA) to facilitate access to health services, strengthening the public health service delivery infrastructure, particularly at village, primary and secondary levels, mainstreaming AYUSH, improved management capacity to organize health systems and services in public health, emphasizing evidence based planning and implementation through improved capacity. See http://jknrmh.com/Guideline/Frequently_Asked_Question.pdf, accessed on 18th March 2010.

6) See Annual Report of Ministry of Health and Family Welfare, 2009–2010.

7) Community health centre is top most rural health service structure. Rural structure is based on population count. The urban centres are called health posts which have a doctor, nurse, midwife and other support staff.

8) See <http://health.nic.in/Annual%20Report%20Health%20Eng%202009-10.pdf>, accessed on 21st May 2010.

2.3 Public Financing

Even with such extensive infrastructure and proactive policies, private sector has been in the forefront of healthcare delivery with around 80% of the population using it. The National Government spends only 0.9% of GDP towards health sector, which is one of the lowest government spending in the world while other developing countries on an average spend 2.8%. Health care public expenditure is less than 100 rupees per person per year. More than 80% of government spending is on salaries, and administrative costs with meager amount for drugs and other consumables (Jan Swasthya Abhiyan 2006, Levesque et al. 2007, Duggal 2008). There are some vertical programs such as national disease control programs, family planning and welfare and immunization etc. that are supported directly by the national government.

Health insurance in India covers as low as 3% of the population mostly restricted to government employees, though private, insurance companies are growing at a fast pace. Ninety seven per cent of the population meet their private spending on health through out of pocket spending. National expenditure on health is 4.8% of GDP of which 80% (3.9% of GDP) is through private expenditure (Dummer and Cook 2008).

2.4 Traditional Medicine Development in India

From the Vedic period and through the vast medical literature of Ayurveda over last three millennia, there are various documented traditional medical knowledge streams in Indian subcontinent. Similarly there are other systems such as Siddha, Unani⁹⁾ which are popular and have a long history. From the vast literature both in local languages and Sanskrit, Tamil or Persian, one can learn that these systems have been updated on a continuous basis until recently. Apart from such codified medical systems there are also very diverse, eco-system and ethnic community specific folk medical knowledge in the country dispersed among over 4,600 varied communities. There are also medical systems of recent origin like homeopathy which have become popular and have high patronage in the country.

During the British colonial period the rulers' views on TRM was ambiguous as they never recognized them nor tried to assess its medical value. In the early days neither indigenous medicine nor western medicine could exert a monopoly influence on the society. Researchers note that even in 1920s and 1930s TRMs such as Ayurveda and Unani were more popular than western medicine¹⁰⁾. Western medicine took almost three centuries to establish and it had a long interaction and epistemological struggle with traditional knowledge systems due to their political and economic power and not due to clinical merits (Arnold 1993). The western medicine which spread in India too had a clear 'orientalist' form with greater focus on the local climatic conditions, geographical peculiarities, regions, vegetation and individual constitution. Since the 1912 Medical Registration Act of Bombay, there were confrontations between western medical practitioners and the indigenous practitioners. But as the number of Indians joining the official Indian medical service increased, the upper hand held by the indigenous medicine started decreasing. Often medicine became a "tool of empire" for expanding western power (Arnold, 1993: 14, Abraham 2005: 188). In this situation of neglect the All India Ayurveda Congress was formed in 1907.

9) Siddha is popular mainly in Tamil nadu state of South India and the literature is mostly in Tamil language. Unani is the Greek-Arabic medicine which became popular and patronized in India from the period of Mughal rule. See Subbarayappa 2001 for details.

10) Some of the principal explanatory reasons include the failure of Western medicine to spread into large portion of rural areas, dependence on family system of medicine for understanding health and disease, cost effectiveness. In spite of foreign origin Homeopathy was closer to people due to its subjective and personal care compared to the impersonal style of western medicine. See Arnold 1993.

In the early days of colonization, the indigenous practitioners were extensively consulted and their medicines were widely used by the British administrators in their quest for adapting to tropical climate (Harrison 1994: 40, Arnold 1993: 11, Jeffrey 1979: 302). Though in due course this interest subsided as they adapted better, the interest was revived again in the early 19th century following the curiosity in Oriental texts and their scholarship. There was a major shift in the position of western and indigenous medicine in the country and western medicine acquired considerable authority. Simultaneously by following developments in the western medicine sector, indigenous medicine was also on a path of revival after a long stint of degeneration (Arnold 1993: 12).

In 1822 a medical school for native physicians was started in Calcutta with a combination of indigenous and western medicine, but such an integrated system of education could not survive for long and by 1835 the course was abolished. After this there was no formal institutional education for TRM for a long time until the early 20th century when the first Ayurveda and Unani college was established in Delhi, followed by one in Chennai and Calcutta (Shankar 1992: 143). However, institutional manufacture of traditional medicines was started much earlier.

Due to the increasing influence of modern medical knowledge on TRM an ideological debate stemmed in the professionalization and institutionalization of traditional medicine. The two major positions were 1. Ayurveda should be taught and practiced in a 'pure' (*suddh*) form without mixing up with modern knowledge, 2. allopathic elements should be integrated into TRM to make it complete. Liberal progressive groups thought the first group was conservative which influenced policy process on TRM considerably.

2.5 Development of Policies on Traditional Medicine

Today India is considered a proactive nation with respect to state supported medical pluralism. There were several regional government committees¹¹⁾ before the independence which nurtured such a development. The Bombay Medical Practitioners' Act of 1938 was instrumental in forming the first register for Ayurveda and Unani Practitioners in the country. There were also several regional acts which regulated qualification and registration of practitioners¹²⁾. Though the Bore committee (1946) recommendations were instrumental in evolving the present primary health centre (with integrated curative and preventive health close to the population), it completely neglected traditional medical systems and even considered it a matter of history. It ardently suggested that only a biomedical model should be promoted in the country.

Through gradual expansion of education, manufacturing, clinical service and strong advocacy, the importance of TRM grew in the next two decades. Presently there is a Central Council for Indian Medicine and there are national institutes for each of the six systems of Indian medicine viz. Ayurveda, Siddha, Unani, Yoga, Naturopathy and Homeopathy. Today Tibetan medical centres are also popular in the country though they are partly supported by the government. The education system is well developed with TRM under-Graduate Colleges and post graduate programs across the country.

There is a central research authority with research and development programs on several aspects related to Indian

11) Usman Committee in Madras (1923), Ayurveda and Tibbi committee in Bengal (1925), United Provinces (1926), Central provinces and Berar (1939), Punjab (1941), Mysore (1942), Bombay (1947), Assam (1947) and Orissa (1947), and during the post independence period, the Chopra committee (1948), Pandit committee (1951), Dave report (1956), Udupa committee (1959), Vyas report (1963), Ramalingaswamy report (1981) are the important ones. The last one of 1981 was not a government report but by a major nongovernmental organization in the country (Wujastyk 2008: 44).

12) The Madras Registration of Practitioners of Integrated Medicine Act (1956), The Mysore Homeopathic Practitioners' Act (1961), The Mysore Ayurvedic and Unani Practitioners' Registration Act (1962), The Indian Medicine Central Council Act (1970) are the major acts (Wujastyk 2008: 45).

Table 2 Traditional Medicine Infrastructure in India (2007)

System of medicine	Registered practitioner	Pharma Industry	UG colleges (Admission)	PG Colleges (Admission)	Hospitals	Beds	Dispensaries
Ayurveda	4,53,661	7,900	240(11,225)	62(991)	2402	43,751	13,913
Homeopathy	2,17,860	685	183(13,425)	33(1,084)	234	10,933	5,910
Unani	46,558	322	39(1,750)	7(67)	262	4,671	1,019
Siddha	6,601	290	7(350)	3(110)	277	2,596	488
Naturopathy	888	ND	10(385)	Nil	171	5,677	238
Yoga	ND	ND	ND	Nil	12	495	70
Tibetan medicine	ND	ND	ND	Nil	2	32	131
Total	7,25,568	9197	479(27,135)	105(2,252)	3,360	68,155	21,769

Source: AYUSH Department, Government of India, 2007¹³⁾.

medicine, and education and practice are regulated under the Indian Medicine Central Council Act 1970. A national regulating body was established for overseeing education, registration and professional standards of TRM. There are central research councils and national institutes for each of the systems of medicine and number of scientific journals in each field. In 1995, a separate department for Indian Systems of Medicine and Homeopathy (ISM&H), which is now known as the department of AYUSH (Ayurveda, Yoga, Unani, Siddha, Homeopathy) was established. In 2002 a National Indian Systems of Medicine policy was also drafted which gave further momentum for a vision plan for TRM. In the 11th Five Year Plan (year) the sector has received better support¹⁴⁾ and attempts are being made for health system integration through the National Rural Health Mission.

Parallel to this, an informal tradition not regulated by the government consisting of village healers, also functions in the county. It is estimated that within this system there are birth attendants (600,000) bone-setters (60,000) herbal healers (100,000) healers who treat poisons (60,000), veterinary practitioners (60,000). In official policy, the fact and presence of the folk stream goes unnoticed indicating an alienation from ground realities (Shankar and Unnikrishnan 2004). However, recently a National Working Group on Local Health Practices and healers has been set up for better understanding and promotion of this informal sector.

2. 6 Health System Integration

During the colonial period attempts for integration were often politically motivated, selective and name sake. The native doctors always had a subordinate role. In 1977 India devised a system similar to barefoot doctors in China for training village volunteers as community health workers in order to improve access to basic health care. But the local healers were never integrated into the plan and it was poorly implemented¹⁵⁾. Even in the National Rural Health Mission local healers have not found a legitimate status.

Traditional medical systems have had impressive growth in last 50 years, and there have been efforts for health system integration, it still seems to be an uncertain subject for a host of reasons. To date there is also no clear estimation of the health system contribution or potentials of TRM in the country.

This gives the overall context of health system development in India and the status of TRM in the country. Within

13) AYUSH department, Government of India—<http://indianmedicine.nic.in/Section%201.pdf>, accessed on 27th March 2010.

14) See Duggal, R., Economic and Political Weekly, August 15, 2009, vol. xlv, no. 33, pp. 14–17.

15) See Leslie 1985.

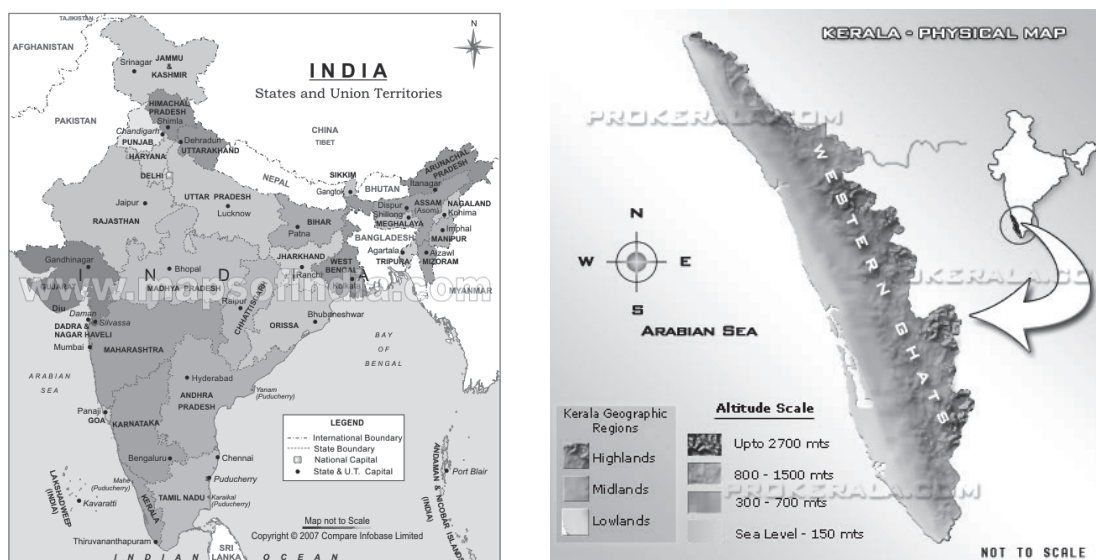


Figure 1

this broad development, Kerala state presents a very different and unique case in point.

3. Health System Development and High Health Status in Kerala

3.1 Kerala State and the Development Enigma

Kerala state was formed in 1956 by merging two regions in southern India called Malabar (part of former Madras state) and Travancore-Cochin. The present land area of Kerala is 38,863 km² which forms 1.18% of India and has a population of 31.8 million (Govt. of India, 2001 census). It is one of the most densely populated states in the country. In last 3–4 decades Kerala has caught repeated attention of social scientists due to its paradoxical high human development at a per capita GDP that is far below the national average, which is often cited as Kerala phenomenon or Kerala Model development. Kerala's GDP has improved after 1990 and it stands above the national average today. The State has a literacy rate of 96.9% and it is one of the least corrupt states in India as per the reports of the Transparency International (2005). Kerala's has typically alternated its government every 5 years between two major political parties—the Communist (Left Democratic Front) and the Congress (United Democratic Front).

By 19th century different regions of Kerala progressed in social sector development and by mid 20th century it was on a development trajectory. The State is often praised for its good public distribution system, high political awareness, social engagement, extensive primary health care facilities, high literacy, successful land reforms, high public participation in political process, strong labour unions and gender equity. These have also been indicated as the reasons for high health status in the state by several researchers (Ramachandran 1997).

Kerala's culture is mainly Dravidian in origin, deriving from a greater Tamil-heritage state known as Tamil nadu. Later, the dominant culture underwent some changes through centuries of contact with overseas cultures. Malayalam became a distinct local language by around 11th century. The coast runs 580 km, bound by the Arabian Sea to the west. Historically from the BCE period, Kerala having many developed ports in the region, has had trade relationships with Middle East countries, Europe, China and East Asian countries. Interactions with foreign cultures resulted in the development of an eclectic culture since historical times in the region.

3.2 Health System Development in Kerala

Kerala has a long history of a well nurtured health system. Kerala coast has been known as a land of medicines and spices for many centuries. The stone inscriptions of Asoka (a famous emperor in the Indian subcontinent) had references to human and veterinary hospitals in Kerala region during BCE period¹⁶⁾. A British traveler to India between 1672–1681 John Fryer mentions about the veterinary hospitals in Tanur, South of Kozhikode highlighting the then system of public physicians (Wujastyk 2005).

The dawn of modern medicine in Kerala began in Travancore region (one of the three regions of present Kerala) with the patronage of the royal family in early 19th century. Though the services remained available only to the elite sections in the beginning, soon the region progressed in an enviable way compared to other regions in India. By 1813 small pox vaccination was introduced in the region and a separate department of public health was formed in 1865 (Vinayachandran 2001: 23). Yet it was actively promoted among the public only in 1879 when a public proclamation was made making vaccination compulsory for public servants, prisoners and students (Kutty 2000). In 1837 a charitable clinic with a resident physician was started which was subsequently developed into the general hospital (which is today 150 years old). Around the same period a missionary clinic was also started in Neyyur. In 1888 a separate hospital was started for women. In 1885 there were 31 medical centres in the region which slowly grew and by 1939 became 32 government hospitals and 55 clinics in addition to 21 private hospitals¹⁷⁾. In the same period a public health laboratory was also set up. Health awareness programs focused on conditions such as hook worm infestation, malaria, cholera, small pox, tuberculosis, leprosy, plague, filariasis, venereal diseases, hygiene, nutrition and mother and child health. By the 1880s sanitation works were also initiated in the region. The cholera and small pox epidemics in the region in 1890 gave further impetus to the public health programs and also became the basis for certain legislations. Civil registration system was also started shortly (Vinayachandran 2001).

In Cochin (Kochi) region too a charitable clinic was started in 1818 but did not continue for long¹⁸⁾. By the 1880s dispensaries were started in many places of present Kerala¹⁹⁾. By 1890 sanitation works were also initiated in Kochi. Though vaccination had started in 1803 in Kochi, the program became active only after 1893 following a series of epidemics. In Malabar the health facilities were under-developed and the first government hospital was started in 1845. From 1800 there were quarantine measures in the port areas for preventing plague and other epidemics. By 1920 many small towns in the region had hospitals run by the government.

In 1944 The Travancore Medical Practitioners Act was passed which regulated qualifications to practice medicine, which was later merged as Travancore-Cochin Act in 1953. Medical associations in Malabar (1934), Cochin (1938) and Travancore (1940) also came into existence all of which got merged in 1957. Following the formation of Kerala state, a health service department came into existence. Super specialty hospitals like Sri Chitra medical centre, Regional Cancer

16) See Panikkasseri, V., *Kerala Charithram*, Kottayam: D. C. Books, 2006, p. 19.

17) In 1928, parasite surveys were conducted in Travancore which led to measures to control hookworm and filariasis patronized by the Travancore government and supported by the Rockefeller foundation. A health unit incorporating many of the concepts of primary health care was also started with both preventive and curative focus. Another major development was the introduction of mission hospitals promoted by Christian churches. Young Christian girls increasingly took up nursing career (Kutty 2000).

18) In 1728, a hospice in Pallippuram for treating patients with major illnesses was started. Even prior to this there was also one in Castella, Kochi. But when the region was transferred to the British by the Dutch these did not get sufficient support.

19) According to Vinayachandran (2001) in Kochi region hospitals were started in Nenmara (1882), Chittoor (1885), Irinjalakkuda and Kunnamkulam (1888), Vadakkancheri (1891), Chalakkudy (1893), Nelliampathy (1893), Njarakkal (1907), Payyannur (1908), and Mattanchery (1909). In Malabar Calicut, Kannanur, Ponnani, Manjeri, Mananthavadi were some of the towns with hospitals. There were special centres for women, children, leprosy or mental patients and so on.

Table 3 Medical Institutions, Beds and Patients Treated under Three Systems of Medicine in Kerala's Public Sector during 2006 and 2007

Sl. No	System of Medicine	Institutions		Beds		Patients treated in 2006 (in hundred thousands)		Patients treated in 2007 (in hundred thousands)	
		2006	2007	2006	2007	In patients	Out patients	In patients	Out patients
1	Allopathy*	1,279	1,279	45,405	45,553	23.3	461.77	20.27	468.11
2	Ayurveda	871	871	3,940	4,020	0.57	209.9	0.50	222.47
3	Homeopathy	561	561	1,170	1,170	0.21	127.6	0.25	135.33
	Total	2,711	2,711	50,515	50,743	23.78	799.27	21.02	825.91

* Excluding sub-centres. Source: Economic Review 2007, Government of Kerala.

Table 4 Private Sector Institutions and Beds²⁰⁾

System of Medicine	Institutions	Beds
Allopathy	4,825	57,071
Ayurveda	4,332	5,502
Homeopathy	3,226	813
Total	15,094	114,129

Source: Economic Review 2007 (as on 2004), Govt. of Kerala.

Centre were started in the 1970s.

In 1956 when the Kerala state was formed, a well developed health care infrastructure was already in place and in 1957 there were 277 hospitals and 9,473 beds in the state. With a steady progress the State achieved the target of 1 bed for 1,000 people in 1971. From 1960 to 1990 period the government health infrastructure further grew and reached 36,000 beds in 1986 (Kutty 2000). In a survey conducted in 1948 considerable advance was found to have been made in reducing malaria and filariasis and Kerala became the first state in India to eradicate malaria by 1965. While the health service progressed well, Kerala was lagging behind in the field of medical education as the first medical college was opened only in 1950 till which period the students were educated in other states.

Although the governments alternated between two major political parties, both consistently supported health sector in a major way and in 1980s health care expenditure formed around 13% of the fiscal spending. It is noteworthy that the presence of health insurance in Kerala is marginal.

Today Kerala has extensive, functional healthcare facilities both of Allopathic medicine and TRM. By 2004, the infrastructural development in the state corresponded with the United States and other developed regions with around 33 beds per 10,000 population. Japan, Germany, and UK are some of the countries which have a higher bed-population ratio. Even though there was a marginal reduction of number of modern medicine hospitals between 1986 and 2004 the bed-population ratio improved due to several new inpatient care units under the traditional medical systems, especially Ayurveda (Dilip 2008: 13).

The above Table 4 shows the government data on private sector. However a different study of private medical

20) This table is based on the Government of Kerala, Economic Review of 2007 based on 2004 statistics. However the Economic review 2008 and 2009 quotes data from 1995 and mentions that Allopathy has 4,288 institutions and 67,517 beds, Ayurveda has 4,922 institutions and 2,595 beds and Homoeopathy has 3,118 institutions and 394 beds. This indicates major difference in number of beds for TRM.

Table 5 Number of Medical Colleges and Intake of Students for Undergraduate Courses per Year

System of Medicine	Number	Intake of Students
Allopathy	13	1,600
Dental course	9	460
Ayurveda	14	680
Homeopathy	5	250
Total	41	2,990

Source: Economic Review 2007, Govt. of Kerala

Table 6 Health Indicators

Indicators	Kerala	India	USA	Japan
Per capita GDP (US\$)*	930	740	46,716	34,099
Human Development Index	.773	.612	.956	.960
Crude Death Rate	6.8	7.4	8.3	9.26
Infant Mortality Rate	13	53	7	2.8
Maternal mortality rate	110	254	8	7.3
Crude Birth Rate	14.7	22.8	14	7.87
Life expectancy	74.6	63.9	79.1	82.7
Life Expectancy –Male	71.3	62	76.7	79
Life Expectancy —Female	76.3	64.9	81.3	86.2

Source: Economic Review of India–Kerala (2008), UNDP Report 2007.

*GDP: World Bank, 2008 (USA, Japan), Ministry of Health and Family Welfare, Government of India (India, Kerala) 2010.

institutions (both inpatient and outpatient together) in Kerala shows that they constituted 34% Allopathy, 39% Ayurveda and 24.7% Homeopathy institutions. The presence of other systems such as Unani and Siddha are marginal. However the inpatient facilities of modern medicine far outnumber other systems as Ayurveda and homeopathy institutions are mostly dispensaries and clinics (Sankar 2001). Also in terms of the number of staff, the TRM hospitals are much smaller compared to allopathic medicine.

3.3 An Overview of the Health Status in Kerala

Over the years health status of Kerala's population has seen considerable improvement and now it is at par with some developed countries despite slow economic growth and low per capita income. Kerala State accomplished social development with a per capita gross national product of US\$275/person/year (in 1996). For the same period, the national average was US\$350 for India, and US\$23,090 in developed countries in 1996 which was the period when health indicators reached the current phase of achievements²¹⁾. Some of the prominent indicators of its development include high life expectancy, low infant mortality and low maternal mortality rate. Table 6 shows health indicators of Kerala along with figures for India, USA and Japan.

The life expectancy has consistently improved from 1910–20 as per records when it was 25.5 for male and 27.4

21) See Unnikrishnan Payyappallimana, Decentralization in Kerala state, India and its Impact on Healthcare, 2009. <http://www2.igss.ynu.ac.jp/cseg/doc/pro7h20a.pdf>.

for female (Ramachandran 1997: 225) to reach 71.3 (male) and 76.3 years (female) within the last century. Infant mortality has also declined drastically over the period. Despite these indicators, Kerala has high morbidity as well as health care spending. Researchers have argued that this is a statistical artifact. Others argue that morbidity perception is high (Kumar 1993). It remains a matter of ongoing inquiry.

3.4 Reasons Stated for High Health Status

Large number of studies on Kerala's health status have indicated that a highly developed health care infrastructure, access and affordability, increased health awareness among population and hygienic practices, control of many infectious conditions, decentralization of health services with good efficiency are some of the direct reasons and an efficient public distribution system, high literacy and education, land reforms, gender equity (with matrilineal traditions), increased purchase power due to overseas remittances are cited as indirect reasons for high health status (Krishnan 1976 & 1989, Ratcliffe 1978, Panikkar & Soman 1984, Nag 1985, Halstead et al. 1985, Caldwell 1986, Kannan et al. 1991, Kabir & Krishnan 1992, Dreze & Sen 1995, Panikkar 1999, Kunhikannan & Aravindan 2000, Nabae 2003). Several studies remark on the amazing achievements of the state in the past and attribute it to social sector development that happened in 1940s and 50s (Ramachandran 1997). According to Amartya Sen (1998) a prioritized planning in social services like health and education has contributed immensely to Kerala health status. Some studies have compared similar societies across the world and compared the reasons. Caldwell (1986) compared Sri Lanka, Costa Rica and Kerala where achievements have been made at low cost with respect of low mortality. He indicates how social and political will have transformed the Kerala state. He also mentions several peculiarities in these regions such as female autonomy, high inputs to health and education, accessibility and efficiency, nutrition, universal immunization, antenatal and post natal care etc. Gunatilleke compared five countries/regions such as Kerala state (India), Jamaica, Norway, Sri Lanka and Thailand and points to the intersectoral factors that have influenced developments. He also indicates the role of rich cultural traditions in such development.

Except for few (Gunatilleke 1984, Abraham 1989, Shankar 2001) most studies have not critically looked at the role of a rich traditional medical culture and pluralistic health system in the state in achieving high health status.

4. Traditional Medical Culture and Historical Developments

4.1 Historical Developments

Historically the development of medical traditions in Kerala can be classified into three periods. 1. A period prior to the arrival of classical Sanskrit Ayurvedic literature and tradition in Kerala²²⁾ 2. After their arrival 3. Modern period (Varier 2002²³⁾). While many peculiarities can be observed in the local traditions relating to such a period, there are not sufficient historical studies about the first period. Historians speculate that the mainstream literature made prominent influences between 5th and 7th century AD. It is also opined that much before this, Buddhists and Jain travelers and monks brought classical Ayurveda to Kerala who constructed nursing homes in the region adjacent to their monasteries. The present institutionalized Ayurveda tradition in Kerala owes its foundation to Vagbhata's *Ashtanga hridaya*, a renowned text on Ayurveda. While it may seem perfunctory to attribute Ayurveda in Kerala merely to the *ashta vaidya*

22) Caraka samhita and Susruta samhita are the two prominent Sanskrit texts of Ayurveda from around 300 BC and 200 BC on medicine and surgery respectively. The medical tradition in Kerala has many unique aspects such as several local medicinal formulations, treatment of poisons, psychiatric traditions, martial arts and vital points (*marma*), oil treatments, elephant treatments, a rich folk tradition etc., not found in such classical Ayurveda literature.

23) Varier, N. V. K., *Ayurveda Charithram*, Kottakkal: Arya Vaidya Sala, 2002.

tradition²⁴⁾ or any other community tradition, the *Ashta vaidya* and the *Ezhava*²⁵⁾ family traditions have had enormous influence in shaping its current form. Several texts and commentaries have been written on diverse aspects of medicine between 7th and 18th century in Kerala²⁶⁾.

Several anecdotes and documentations are available on the rich medical tradition in the State. Maro Polo, a world traveler who visited Kerala in 1300 AD describes about the rich medical tradition, healers, and medicinal materials on the coast. The first modern medico botanical documentation of the region was by Henric Van Rheede who codified the native traditions into a famous text in Latin called *Hortus Malabaricus*²⁷⁾ which was compiled and published between 1674–1703 AD.

4.2 Developments in Modern Period

In 19th and 20th century indigenous medicine especially Ayurveda, was financially supported by the State even when Kerala was divided into three royal kingdoms. Due to its large presence and acceptability among masses, Travancore State supported Ayurveda. This was the first impetus to development and increase in access to traditional medicine in Kerala inline with other socio economic development processes. During this period there was a general decline of indigenous knowledge traditions and mass industrial production and the state support gave thrust to its development (Panikkar 1994). Prior to this period, Ayurveda medicines were produced by vaidyas and dispensed to their patients. But around late 19th century, ideas of industrial production came into the field as the institutionalization of education and health care service of indigenous medicine began. The students who were trained in traditional methods were brought into this fold of new thinking. The first school of Ayurveda was started in Thiruvananthapuram in 1886 which was taken over by the government. Subsequently a department of indigenous medicine was opened. A grant in aid program was started in 1895 by the Travancore government for appointing successful practitioners trained in this college at Taluka level clinics under strict scrutiny (Harilal 2008). These physicians were also mandated to keep all the records related to the clinical and administrative matters. In 1868 an Ayurveda physician was appointed in the civil hospital mainly to investigate efficacy of Ayurveda drugs and for incorporating them in efficacious drugs list (Vinayachandran 2001). The state support for Ayurveda was comparable to or was better than European medicine during this period. Civil society groups and professional associations were also active in promoting TRM, since the early 20th century.

In the Malabar area, Arya Vaidya Samajam was a consortium of prominent physicians. P. S. Varier who was a prominent member of this consortium started Kottakkal Arya Vaidya Sala, a renowned pharmaceutical industry in the country, in 1902. This was the harbinger of pharmaceutical production of medicines and more importantly the foundation of current popular version of Ayurveda in Kerala. He also started at the same time, an Ayurveda college with an integrated curriculum. A journal and regular conferences were also initiated by P.S. Varier who was amply supported by the local

24) *Ashta vaidyas* are several healer *namboodiri* families in Kerala who have had training in eight branches or Ayurveda. Few of the prominent today are *Pulamanthole*, *Alathiyoor*, *Kuttanchery*, *Thaikkattu* (both *Thrissur* and *Elayidathu*), *Chirattaman*, *Vayaskara*, *Vallode*, *Alathiyoor* and *Vaidyamadhom*.

25) A Hindu community group in Kerala with several healer families. <http://en.wikipedia.org/wiki/Ezhavas>.

26) See Varier, N. V. K., *Ayurveda Charithram*, Kottakkal: Arya Vaidya Sala, 2002.

27) *Hortus Malabaricus* (meaning Garden of Malabar) is a comprehensive treatise that deals with the medicinal properties of the flora in the Indian state of Kerala in 1676. The book was conceived by Hendrik Van Rheede, who was the Governor of the Dutch administration in Kochi (formerly Cochin) at the time. Van Rheede was also assisted by the King of Cochin and the ruling Zamorin of Calicut. Prominent among the Indian contributors were Itty Achudan, Ranga Bhat, Vinayak Bhat and Appu Bhat. The ethnomedical information was extracted from palm leaf manuscripts by a famous healer named Itty Achudan. See also: http://en.wikipedia.org/wiki/Hortus_Malabaricus, accessed on 21 May 2010.

rulers. Two strategies were used by Varier for popularizing medicines, one introducing the agency concept in many towns, and secondly, bringing new formulations during epidemics (Harilal 2008). Kerala Ayurveda Samajam was also a similar initiative in middle part of Kerala which started a school in 1946. There was no state support for indigenous medicines in this region. At the same time several dispensaries were started by the physicians who came out of this school as well as by the *ashtavaidyas* mainly in Cochin and Malabar region with small home level medicine production facilities. As there was a general improvement in the Ayurveda medicine production sector several *ezhava* and *velan* (two ethnic communities) healers also became widely known for their practice around the same time. Though some studies suggest that this created a situation of cultural hegemony of Ayurveda in Kerala (Panikkar 1994) over the folk traditions, the overall development of the sector seems to have nurtured other TRM systems and cultural knowledge as well. During the early period owing to strong caste practices in the state, Ayurveda remained as an elitist system accessible only to certain sections of the society. It may be presupposed that this necessitated other health support systems for a large section of population. This might have been a reason that the diversity of other cultural medical knowledge streams remained intact in the state.

From the period of formation, the State has consistently had supportive policies for TRM. Several Ayurveda schools initially with diploma programs and subsequently with bachelor and masters programs were started. Industrial production of medicines was also introduced. The increased production facilities made Ayurvedic medicines easily available, accessible in Kerala which also resulted in increased awareness and demand of the system. It was also cheaper compared to western medicine. At the same time regular epidemics, lack of enough western doctors and medicines also gave an impetus for increased use of TRMs.

Thus the development of traditional medical cultures in the State has been steady while incorporating most of the native cultural aspects in the last century. It should also be noted that though there are small incidences of confrontation between western medicine and native medical traditions, largely the development has been pluralistic with both state as well as civil society support. In such a process TRM in the State has been able to retain a significant part of its holistic philosophy in health care.

4.3 Salient Features of a Unique Health Culture

There are several bio-geo-cultural factors that have nurtured traditional medical knowledge and contributed to the present health situation in the State. Kerala has four major physio-geographic zones and the land area is classified into four zones such as coastal, plains, midland and highland. There are 40 rivers (Ramachandran 1997: 208, 209) with each having rich cultural traditions along its course. A study conducted about healthy regions in India by an East India company surgeon John Clerk found Malabar (in present Kerala) to be temperate and healthy. Similarly several other colonial administrators have opined that the region is pleasant and fertile with air conducive to health even in summer months. The region's population was also praised for having immunity to many endemic diseases (Harrison 1994: 38)

Cleanliness – Marco Polo, a world traveler who visited Kerala in the 13th century was amazed by the cleanliness and bathing habits of even the poorest in the state. The hygienic practice was reiterated to be the best in a comparative national study (Aiyappan 1965). Gunatilleke (1984) indicated that the high standard of cleanliness maintained in a Kerala household even when housing conditions are poor is worth mentioning.

Biodiversity – The Western Ghats which covers the entire eastern region of Kerala is one of the world's biodiversity hot spots. Forested land covers 10,292 sq. km, including 1887 sq. km of private forests (Forest Survey of India, 1993)²⁸⁾ and houses a rich medicinal flora (around 1800 species) and fauna thus providing a highly conducive environment for

28) The forests in Kerala are classified as southern tropical wet evergreen and semi-evergreen, southern tropical moist deciduous, southern tropical dry deciduous, montane sub tropical, and forest plantations.

TRMs. High presence of sacred groves and related healing traditions also make the region unique.

Home Gardens – Homestead gardens in Kerala is a well documented topic. A 14th century traveler Shaikh Ibn Batuta says “we came to the country of Malabar which is the country of black pepper. Its length is a journey of two months along the shore from Sindapur to Kawlām. The whole of the way by land lies under the shade of trees...and in all this space of two months’ journey there is not a span free from cultivation. For everybody has there a garden and his house is placed in the middle of it; and around the whole of this there is a fence of wood, upto which the ground of each inhabitant comes”²⁹⁾. A study conducted in a central district of Kerala found that home gardens house upto around 153 species with an average number of 36 plants in such gardens³⁰⁾. Home herbal gardens in South India have demonstrated that many simple primary health care problems like fever, upper respiratory tract infections, gastro-intestinal problems such diarrhea, dysentery, worm infestations, hepatitis, anaemia, arthritic conditions, and certain gynecological conditions can be managed at household level through simple herbal home remedies and early identification and interventions. Reproductive health and nutrition forms two important aspects of household care. Considerable health cost saving has been found through this program apart from health and nutrition benefits (Hariramamurthi et al. 2007).

Physical Characteristics – Certain unique physical characteristics of Kerala population are also worth mentioning. The calorie and nutritional intake in Kerala is less than the national average with the exception of calcium. Even with a low calorie diet the State has been prominent in athletics, martial arts, and other physical sport. While this quite perplexing in comparison with other states where intake is more than recommended and scientists suggests that the nutrients may be better utilized in the state (Soman 1992). This necessitates a serious study about the food culture of Kerala.

Highly Evolved Folk Tradition – From the period even prior to the arrival of classical medical literature, Kerala has highly evolved folk medical systems (Rajagopalan 2009, Unnikrishnan 2009³¹⁾). In the folk traditions, each community group is specialized in a particular form of healing viz. *Velan*, *Ganakan* or *Kaniyan* in peadiatric care, *Mannan*, *Kuruppu*³²⁾ in massage techniques, vital points and so on. There are several health related rituals, customs that have been documented and still followed by Kerala communities. There are several temples such as Thiruvizha, Thakazhi, Chottanikkara that offer ritual medicines or oils to patients especially with psychiatric conditions or other physical ailments³³⁾. Diverse tribal health practices belonging to around 36 tribal communities in the state have been studied (Nair 2008). The Government of Kerala has set up the Kerala Institute for Research, Training and Development Studies of Tribals which is doing laudable work in reviving the tribal healing practices of the state. Through this work a significant part of tribal medicine is still alive. In terms of utilization, in a comparison of data on usage of indigenous health practices between 1987 and 1997, a 10 percentage reduction in utilization of such practices was observed (Kunhikannan and Aravindan 2000: 31). This reduction may be owing to the strong influence that institutionalized systems such as Ayurveda or modern medicine may be exerting on the folk medicine.

Gender Dimension – Traditionally a large section of Kerala society was matriarchial which has been stated as a major reason for development of women and low infant mortality rate. At the same time one can presuppose that this has also had a high positive impact on traditional knowledge of various sectors including health, nutrition, agriculture

29) William Logan, *Malabar Manual*, Vol.1, Thiruvananthapuram: Chitra Publications 1981.

30) Mohan, S., J. R. R. Alavalapati, and P. K. R. Nair 2006 Financial Analysis of Home Gardens: A Case Study from Kerala State, India in B. M. Kumar and P. K. R. Nair (eds.), *Tropical Home Gardens: A Time-Tested Example of Sustainable Agroforestry*, 283–296. *Netherlands: Springer*.

31) Unnikrishnan, E., Ayurvedathinu Ayussundo, in *Mathrubhumi*, March 22, 2009.

32) These are various ethnic communities in Kerala.

33) Menon, S. 2009, *Kerala Charitram*, Kottayam: DC Books, p. 101.

See also Rajagopalan, C. R., Keralam Srishtichathu Parasuramanalla, in *Mathrubhumi*, 9th Aug. 2009.

which is mostly preserved by women. This knowledge thrives parallel to the institutionalized tradition.

Intersectoral Linkages of such development are also a point worth mentioning. Gunatilleke in his study (1984) says that in Kerala modernity and tradition are interacting in very complex ways. An important point is that the state has been pluralistic in most areas be it religion, political ideologies or health care. Sen (1999) also points out that such a progressive and dialectic situation in most sectors has been conducive to the State's development. The influence of a vibrant traditional culture which influences seasonal health care practices, nutritional practices has also not been adequately studied. Conversely, literature generally tends to portray such knowledge systems as an impediment to progress.

5. Specific Aspects of TRM and Cultural Knowledge and Contributions to High Health Status

A World Health Organization supported study on Inter-sectoral Linkages and Health Development (Gunatilleke 1984) has compared five countries such as Kerala state (India), Jamaica, Norway, Sri Lanka and Thailand. The study says: "The interaction of tradition and modernity in the field of health in developing countries manifests itself in very diverse forms as is shown in the five case studies. It is, therefore, dangerous to form generalised conclusions. Nevertheless, those responsible for health policies have to be fully sensitive to this type of problem." By citing Kerala, he says, "perhaps more than any other society included in the study, Kerala state provides an illuminating example of the complex way in which modernity can interact in the case of health. A highly developed system of indigenous medicine remains popular to this day and has acquired a reputation in certain branches of medicine, which extends throughout India and to countries abroad. Such a system although it may in some respects have run counter to the western medical system, promoted attitudes to healthcare, diet, personal hygiene, and sanitation conducive to the acceptance of more modern approaches. Other cultural elements such as the practice of yoga, which perceives health as a total system – physical, emotional, mental, and spiritual – and prescribes elaborate procedures for achieving total well being, influenced the concerns for health."

Gunatilleke points that, "The elements of traditional culture have therefore combined in Kerala state, in a manner quite different from the ways in which similar elements have interacted in most other traditional communities of India. Again as in Kerala state, traditional knowledge, and attitudes and practices regarding health, derived from indigenous system of healthcare, promoted an intelligent awareness and concern in regard to health, and in many ways created a receptive environment for the acceptance of the modern healthcare system. This is illustrated by the fact that both the indigenous and the western systems of healthcare continue in parallel, and a large part of the population makes use of both systems selectively for different ailments and diseases" .

Based on this argument, using a descriptive approach, the following section of the paper attempts to highlight specific contributions of TRMs to high health status. The representative examples cover areas related to public health, preventive, curative and promotive health care. Apart from this, the section also looks at how the health care infrastructure has enabled equal access to different systems of medicine. One of the major challenges in establishing a relationship between traditional medical systems and high health status is the inadequacy quantitative data in TRM sector on such aspects.

5.1 Traditional Medical Health Services

A large portion of Health infrastructure in the state is contributed by traditional medical systems viz. number of hospitals, dispensaries, physicians, colleges, industries, products and so on. However most developments in TRM has taken place in the private sector.

5.1.1 Institutions (clinical services) in Government Sector

There is wide presence of traditional medical hospitals and dispensaries in the state (Table 3). Traditional government hospitals were under utilized due to poor infrastructure, lack of medicines and competent health personnel

and such TRM centres had low image. But today with increasing public financing and integration of such centres in the national rural health mission programs they are better utilized. With such huge numbers the **contribution to high health** status by such machinery has completely been ignored in current scientific literature.

5. 1. 2 Institutions (clinical services) in Private Sector

A high percentage of TRM hospitals are in private sector (See Table 4). Most of these hospitals are *panchakarma*³⁴⁾ centres which attract patients both from within the state and outside. Today these centres form major part of tourism promotion in the state and is a big revenue generator. There are comprehensive accreditation systems for these centres based on the facilities available.

5. 1. 3 Education

There are 14 Ayurveda colleges in the state of which three are directly managed by government, two are aided by the government and nine are in private sector. An annual intake of students for undergraduate courses is 680 (see Table 5). There are also today masters programs in four colleges. Pharmacy courses and *panchakarma* therapists/nurses courses are also becoming popular and available in most of these institutions. Following the training most physicians undertake their internship with any of the above centres or traditionally qualified physicians and thus there is a harnessing of institutional education along with traditional orientation which make them unique practitioners in the country. There are 5 homeopathy colleges with intake of 250 undergraduate and 18 post graduate students. There is also one Siddha college.

5. 1. 4 Research Centres

Though there are only few dedicated research facilities for TRM such as the *Panchakarma* Institute, Shornur and the Regional Research Institute, Thiruvananthapuram, there are many research centres conducting studies on TRMs. Tropical Botanical Garden and Research Institute, Regional research laboratory, Regional Cancer Centre, Rajiv Gandhi Centre for Biotechnology, (all four in Thiruvananthapuram), Aromatic and Medicinal Plants Research Institute, Kochi, Kerala Institute for Research Training and Development Studies of Tribals, Kozhikkode, Kerala Forest Research Institute, Amala Cancer Research Centre, Kerala Agriculture University (all in Thrissur), Centre for Medicinal Plant Research, Kottakkal, Pappinisseri Poison Treatment Centre are some of the institutes studying Ayurveda, Homeopathy, medicinal plants and other natural medicines. Some of the above centres are also doing specific research studies on Homeopathy.

There are some academic and clinical research programs attached to the Ayurveda colleges. Some research programs carried out by pharmaceutical industries mostly in private sector are mainly focused on drug development. New initiatives like the Indian Institute of Diabetes (IID) and Ayurveda Sports medicine research initiative bring hope for new programs in the field of TRM research. However such research programs are not centrally coordinated or guided for state's priorities. Research and documentation remains a less focused area in TRM development in the state.

5. 1. 5 Pharmaceutical Industries

There are around 750 licensed Ayurveda pharmaceutical units in the State. The following data shows the growth of a large government owned Ayurveda pharmaceutical company in India. Available data also indicates that Ayurveda and homeopathy industries have grown at a compound growth rate of 12 percentage and 26 percentage respectively.

34) Panchakarma is a major treatment method in Ayurveda and the word literally means five actions or techniques viz. *vamana* (induced vomiting/emesis), *virechana* (purgation), *kashaya vasti* and *sneha vasti* (two kinds of medicated enemas with decoction and unctuous material), *nasya* (nasal medication) and *raktamoksha* (blood letting). A major therapeutic use of panchakarma is purification (*sodhana*) of the body, though it is also widely used for pacifying and rejuvenating purposes (Unnikrishnan, P. M., *Amruth Supplement*, Bangalore: FRLHT, 2000).

Table 7 Medicine Sales of OUSHADHI³⁵⁾, Government of Kerala (In million rupees)

Year	Total Sales and Growth Percentage	For Government Hospitals, clinics	Private Outlet Sales
2000–01	108.28	27.19	81.09
2001–02	104.59 (-3.40)	24.38	80.21
2002–03	117.57 (12.41)	29.45	88.12
2003–04	130.46 (10.96)	39.36	91.1
2004–05	142.53 (9.25)	45.80	96.73
2005–06	193.38 (35.68)	72.01	121.37
2006–07	220.00 (13.77)	70.15	149.85
2007–08	253.73 (15.33)	72.81	180.92
2008–09	323.41 (27.46)	68.29	255.12

Source: Economic Review 2009, Govt. of Kerala (adapted).

Table 8 Production of Homeopathic Medicines (Govt. of Kerala) in Value (in millions rupees)

	Year	Production Value and Growth Rate (%)
1	2003–04	16.70
2	2004–05	27.10 (62)
3	2005–06	24.00 (-11)
4	2006–07	34.50 (43.75)
5	2007–08	57.30 (66.1)
6	2008–09	66.10 (15.35)

Source: Kerala State Homeopathy Co-operative Pharmacy Ltd., Economic Review 2009.

It can be understood that even though the number of major industries are low, the industry has a steady growth. More than 200 Ayurvedic drug firms in Kerala have GMP certification and many have ISO 9001: 2000 quality certification. Most Ayurveda industries follow an approach of agencies in small towns for distribution of their medicines and it is estimated that there are over 50,000 such outlets across the state (Suneetha 1998).

5.1.6 Budget Support

Kerala is the major supporter of TRM among Indian states. However the proportion of support within the health budget of around 9.4% does not justify the high development that has taken place in the TRM sector.

5.1.7 Cost of Medicine-System Wise

According to this study Ayurveda and homeopathy continues to be far cheaper compared to modern medicine³⁶⁾.

35) See Economic Review 2009 (Govt. of Kerala)—The institution originally established as Sree Kerala Varma Ayurvedic Pharmacy in 1941 by His Highness the Maharaja of Cochin was for taking care of the Royal family, and for supplying medicines to Govt. Ayurvedic Hospitals. In 1959, this unit was converted and registered as Co-operative Pharmacy and Stores Limited, Thrissur. On 8th September 1975, this was incorporated under the Companies Act, 1956 and was renamed as The Pharmaceutical Corporation (Indian Medicines) Kerala Limited, Thrissur. Now OUSHADHI is a large manufacturer of Ayurvedic medicines in Government sector functioning especially as a profit making public sector undertaking.

36) Though in the recent past there has been high increase of cost of Ayurvedic medicines.

Table 9 Annual Plan Outlay and Expenditure on Medical and Public Health During Eleventh Five Year Plan (In millions rupees)

Sl. No.		Sector Outlay (2007–2012)	Yearly Outlay 2007–08
1	Allopathy – Health Services	5,768.7	574.6
2	Medical Education	2175	469.2
3	Ayurveda	165	14.9
4	Ayurveda Medical Education	460	40.4
5	Homeopathy	88.2	25.8
6	Homeo Medical Education	160	27.5

Source: Eleventh Five Year Plan, Economic Review, 2008, Govt. of Kerala (Adapted).

Table 10 Medical Expenses per Person per Episode by System 1987 and 1996

System	1987	1996	% increase
Modern Medicine (Allopathy)	20.72	197.19	852
Ayurveda	10.80	98.97	816
Homeopathy	7.47	66.44	789
Other	Not available	45.57	—

Source: Kunhikannan and Aravindan, 2000: 35.

However the percentage of increase in price across the years is almost comparable among systems. This indicates that TRM continues to be cost effective.

5. 2 Disease Based Health Seeking Behaviour

Health seeking behaviour in Kerala is peculiar, given a highly pluralistic health system. Unlike other regions or countries, TRM in the State is sought for its inherent strengths and not due to inaccessibility or high cost of modern medicine. Disease based health seeking behaviour indicates a clear understanding of strengths and weaknesses of each of the systems of medicines such as Allopathy, Ayurveda or Homeopathy among the population. Though there are occasional conflicts among systems, cross referrals across physicians of various medical systems is a unique feature unlike in many other societies.

There are a number of estimations on the extent of services provided by traditional medical systems. According to a *Kerala Sashtra Sahitya Parishat*³⁷⁾ study (Kunhikannan and Aravindan 2000: 26), 21% of the population seek healthcare through alternative forms of medicines. In the same study around 9% of the population surveyed is reported to have resorted to self treatment which may not have been reflected in the extent of population seeking alternative therapies. It is worth mentioning that self care through home remedies is still popular in the State. Cost of care, emergence of new diseases such as congestive heart disorder, diabetes, cancer may be prompting people to seek alternatives given that TRM has better management in such conditions. Thus Ayurveda and Homeopathy enjoy high level of confidence among people for specific illnesses. Based on a Government of Kerala survey around 40% of health care is serviced

37) Kerala Science and Literary Society (KSSP) is an organization which has been highly influential in many environmental movements, science popularization and awareness creation in Kerala.

by traditional medical systems such as Ayurveda and Homeopathy (Government of Kerala 1996). Yet another study indicates that 30% service is rendered by TRMs (Sankar 2001).

Utilization of TRMs for chronic ailments is significantly higher compared to acute treatment, where the preference is for allopathy. Health seeking behaviour is also specific to age groups. For instance, in paediatric conditions homeopathy is highly preferred compared to other systems while the elderly use much more of ayurveda care. It is also noted that patients with pains and aches approach more traditional systems in comparison (Sankar 2001).

Sankar also notes that the chance of using TRM increase with improved access and short distance for travel. Education has a positive correlation for usage of homeopathy and ayurveda in respective order. The study clearly indicates the preference for Ayurveda both in rural and urban areas. A study by Pillai et al. says that there is rural-urban and gender difference in preferred choice of systems (Pillai et al. 2003: 788). The study considers utilization of health services as an indicator of TRMs contribution to health system. Since there is no whole state wise data, regional study data of pluralist health seeking is taken here to highlight the issue. One important feature noted in this health seeking is that the choice is not made in a hierarchical way but at the same level and TRM is used not as an alternative. Disease, service quality, age and gender, cost or accessibility have relatively less impact on system preference.

5.3 Traditional Pharmacopoeia

TRM approach to health care is based on the premise that for a person living in a particular place, local medicinal, dietary resources and healthcare approaches are most useful. It also says that even if one is living outside one's native place home grown materials will be most suited³⁸⁾. Such a philosophy is literally integrated into the TRM development in Kerala. The usage of a unique local resource based pharmacopoeia based on a vast textual literature in vernacular from 1500 AD and distinctive treatment approaches among the physicians of Kerala are living testimony to this³⁹⁾. The native traditions of poison treatment, paediatrics, martial art related therapeutics, temple related traditions of psychiatric treatments and so on also reveal that even before arrival of organized Ayurveda there was a well evolved local health system in Kerala (Varier 2002: 482)⁴⁰⁾.

Several locally available medicinal plants, diverse formulations (*ilaneer kuzhambu*, other *ilaneer* preparations etc.), various classical texts, diverse treatment methods (such as *dhara*, *thalam*, *thalapothichil*, and *navarakizhi*) all make the local pharmacopoeia quite unique. The majority of formulations produced by the industries across the state are based on this pharmacopoeia and using local resources. The relationship between morbidity patterns in the state and this pharmacopoeia is yet to be studied well.

5.4 Drinking Water and Hygienic Practices

Water related diseases form upto 80 percentage of public health problems in India. Despite the formulation of a

38) A famous verse on this philosophy in Ayurveda goes like this "*Uchito yasya yo deshastajjam tasyoushadham hitam, desenyatrapa vasato tattullya guna janma ca*" —Ashtanga Samgraha, Sutra Sthana, 23rd Chapter, 35th Verse.

39) *Sahasrayoga*, *chikitsamanjari*, *Chikitsanool*, *Vaidyamanorama*, *Dhara kalpam*, *Chikitsakramam*, *Sindooramanjari*, *Alathiyoor Manipravalam*, *Yogaratanprakasika*, *Vaidyamanjari*, *Sannipata cikitsa*, *Netrarogacikitsa*, *Yogamritam*, *Yogasaram*, *Vaidyamanjari*; poison treatment literature such as *Jyotsnika*, *Prayogasamuccayam*, *Sarvagarala pramocana*; paediatric treatment literature such as *Arogyaraksakalpadrumanam*, *Arogyacintamani*, *Garbharaksakrama*, *Vaidyajivana*; eye treatment literature such as *Netra cikitsa*; orthopedic texts like *Marma darpanam*; veterinary texts like *Matangalila* are some of the most prominent vernacular texts of Ayurveda.

40) Several formulations used today in Kerala are not found in the classical literature of Ayurveda, a typical example is the category of several coconut based formulations (Varier 2002).

National Water Policy (1987) focused on improving drinking water access, the situation has not changed substantially⁴¹⁾. According to an all-India survey on conditions of drinking water, sanitation and hygiene prevailing (carried out as part of the 54th round of the National Sample Survey Organization, 1999, Government of India)⁴²⁾, Kerala is one of the states which has the lowest access to potable drinking water viz. rural –12 percentage and urban –40.4 percentage. In 2001, the figures were 16.9 percentage (rural) and 42.8 percentage (urban) respectively (Economic survey of Government of India (2008–2009). A large percentage of households use drinking water from own water source such as open wells (Kunhikannan and Aravindan 2000: 11). **Such water sources are considered susceptible to contamination**⁴³⁾ as the state has latrines that are made with septic tanks (26 percentage rural, 48 percentage urban) and pour flush pit 29.3 percentage (rural), 25.5 percentage (urban) which is the highest in India.

Diseases like dengue fever, malaria, chikun gunya are prevalent due to urbanization and deteriorating environmental conditions. Perception of increase in mosquito population is reported high in Kerala in the National Sample Survey. However, the state has substantially controlled diseases such as cholera, diarrhoeal diseases, hepatitis and other waterborne diseases (Kunhikannan & Aravindan 2000: 14, Ekbal 2006). **This indicates that though there is contamination of water there are some interventions that make water potable.**

Kerala has developed certain natural adaptations to an environment filled with water bodies and high prevalence of water borne diseases. It is reported that the state has highest percentage of households boiling drinking water with rural –49.3 percentage and urban –65.3 percentage. The hygienic handling of water is also high in the state (NSSO 1999). This practice is highly related to the historical culture of consuming medicated boiled water in the State. This cultural knowledge has continued as a popular social practice even today. Nag Moni (1989) in a comparative study of Kerala and Bengal remarks that “Kerala tradition of drinking water that has been boiled with cumin seeds (*jeerampani*) and the water remaining after rice has been boiled (*kanji*) may have contributed toward lower morbidity and mortality”⁴⁴⁾.

Such prescriptions have several references in classical as well as vernacular Ayurvedic literature especially in sections on seasonal routines to be followed for maintaining health. This tradition can trace its roots in the regional Ayurvedic text books like Sahasrayoga, Chikitsa manjari which recommends enhancing water quality by boiling it with medicinal plants such as ginger, cumin seeds, Acacia catechu, coriander, Caesalpinia, Vetiveria among several others. According to the ayurvedic understanding most systemic diseases are caused by faulty metabolic processes and drinking water has a strong effect on mitigating such effects both in states of health and illness. Based on this, specific medicated preparations are made for specific illnesses. There are two likely benefits of this practice. One is the obvious and well studied benefit of boiled water which is microbial free. Second being the physiological and clinical benefits through medicinal substances used for treating water.

There are several herbal products for water treatment available today in the market and the sales of such products are showing increasing trends⁴⁵⁾. Though they are widely available in the markets today, most households also continue to use home made medicinal materials for boiling water. Several studies have been carried out on the physiological and therapeutic benefits of using green tea today in East Asian countries. Similarly research on the culture of medicated drinking water needs to also be pursued.

41) See—National Sample Survey Organisation (NSSO), ‘Drinking Water, Sanitation and Hygiene in India, 54th Round’ January–June 1998, Department of Statistics, Government of India, New Delhi, 1999.

42) See, http://www.mospi.gov.in/mospi_nssorept_pubn.htm, accessed on 30th March 2010.

43) However this view that susceptibility of water contamination is high in the state may be contested.

44) See Moni Nag, The Kerala Formula in *World Health Forum*, Vol. 9, 1988.

45) Based on data SNA Pharmacy (2006–2010) on sale of water medicines—<http://www.thaikatmooss.com/>.

5.5 Daily and Seasonal Preventive Care

There are several cultural practices in the state which are assumed to have direct implication on health though they have not been studied systematically. Few of them are *Karkitaka kanji* (a medicated porridge consumed in June-July month), *karkitaka chikitsa*⁴⁶⁾ (special health treatments in this season), daily oil application on the body and head, seasonal foods, various fermented, probiotic foods, health related rituals, etc⁴⁷⁾. While there are cogent explanations for such practices from Ayurveda, they may not be well explained from a modern approach owing to epistemological differences as well as due to lack of appropriate methods for studying such holistic approaches.

Recently there are considerable decline in such practices and their consequent effects, which need to be studied. It needs to also be checked if the high morbidity is related to such changes. In a similar case Todoriki et al. (2004) point out how life expectancy was reduced among Japanese population in Okinawa due to increased fat intake during the American occupation period between year 1945 and 1972. However the counter argument in Kerala may be that the State has had high morbidity since last few decades and may not be coinciding with the recent changing lifestyles.

5.6 Care of Chronic Disorders

Today Kerala is going through a demographic transition and about 4.48 million persons in Kerala are reported to have one or more of the eight chronic diseases such as diabetes, cardio-vascular conditions, arthritis, cholesterol, hypertension, asthma and bronchitis, cancer and kidney diseases, apart from 1.78 million suffering from non-specified chronic diseases (Zachariah et al. 2003). High incidence of chronic diseases is generally observed in elderly and within them, women. At present there is a concern if the public health system can service the needs of an ageing population in the state (Sureshkumar & Rajagopal 1996, Bollini et al. 2004).

According to Sankar (2001), Ayurveda is most sought after for treatment of chronic disorders. Ayurveda has unique methods such as *panchakarma* which have proven to be beneficial for such chronic conditions. While there is inadequate data on their clinical efficacy, such treatments are being utilized increasingly by the population in the state.

6. Emerging Challenges

6.1 General Health Sector Challenges

Though the state has accomplished a high health status, high morbidity, increase in healthcare costs, ineffective health support systems for poor population, neglect and under-utilization of primary health centres, deteriorating quality of health services; health conditions such as anaemia, low birth weight, occupational diseases, ageing related problems,

46) The Malayalam month of *Karkitaka* (June-July month) is time for preventive therapies as per Ayurveda as during this month there is disease proneness and the immunity is low. Historically this period is utilized for preventive treatments and rejuvenation therapies.

47) S. Parvez, K. A. Malik, S. Ah Kang and H.-Y. Kim, Probiotics and their Fermented Food Products are Beneficial for Health, *Journal of Applied Microbiology*, Vol. 100, Issue. 6, 2006, pp. 1171-1185 — "Most probiotics fall into the group of organisms' known as lactic acid-producing bacteria and are normally consumed in the form of yogurt, fermented milks or other fermented foods. Some of the beneficial effect of lactic acid bacteria consumption include: (i) improving intestinal tract health; (ii) enhancing the immune system, synthesizing and enhancing the bioavailability of nutrients; (iii) reducing symptoms of lactose intolerance, decreasing the prevalence of allergy in susceptible individuals; and (iv) reducing risk of certain cancers. The mechanisms by which probiotics exert their effects are largely unknown, but may involve modifying gut pH, antagonizing pathogens through production of antimicrobial compounds, competing for pathogen binding and receptor sites as well as for available nutrients and growth factors, stimulating immunomodulatory cells, and producing lactase. Recent scientific investigation has supported the important role of probiotics as a part of a healthy diet for human as well as for animals and may be an avenue to provide a safe, cost effective, and 'natural' approach that adds a barrier against microbial infection."

vector borne diseases such as chikungunya, dengue; issues of environmental sanitation, inadequacy of drinking water, traffic accidents (trauma care), increasing suicides, high alcohol consumption are some of the partially addressed challenges in health sector (Ekbal 2006).

Kerala has the highest public and private out-of-pocket expenditure for health of all Indian states (World Bank 2001). Privatization of health care is an important issue (Kutty 2000, Levesque et al. 2005) with around 60% of population approaching private hospitals for inpatient treatments (Varatharajan et al. 2002). Among outpatient care seekers, 77% depend on private facilities due to reasons such as choice, dissatisfaction with public facilities and problems of access and higher availability and better quality care by private providers. Non-availability of drugs and equipments are also reasons for under utilization of public services (Narayana 2001). Another area that merits a closer study is the trend in increasing marketization and rising cost of medicine in Kerala.

One of the paradoxes about health in the State is that despite the high health indices, there is high morbidity. Often it is mentioned that this is due to high health awareness and resultant morbidity reporting. Earlier morbidity patterns were similar to less developed states in India and it was attributed to low nutritional intake in the State. But today some of the common conditions reported are a mix of affluence and poverty and an ageing population⁴⁸⁾ (Kunhikannan & Aravindan 2000, Michael & Singh, 2003) The Human Development Report of NCEAR (India: Human Development Report, NCEAR, 2000) shows that Kerala is second in the country followed by Andhra Pradesh in the prevalence of major diseases. A comparison of morbidity load indicates that high morbidity rates of major diseases in Kerala require interventions from secondary level institutes (Kunhikannan and Aravindan 2000: 12, 19). The capacity of the public health infrastructure to cope with the emerging needs of the population is a matter of concern (Sureshkumar & Rajagopal 1996, Bollini et al. 2004, Levesque et al. 2007, Narayana 2008).

6.2 Challenges of TRM Sector

In such a situation, TRM has an increasing role to play as some of the modern sector challenges also contribute to increasing care seeking through TRM. However this sector is also facing several challenges today. Increasing production and commercialization have led to questions about availability of raw drugs and quality of medicines. Since a large portion of medicinal plants are still collected from wild forest areas, there is serious concern of environmental sustainability. At the same time though the industry has grown manifold over the years, production efficiency is low and technological innovations have been low.

A related issue is the limited existence of research programs in the sector. Pharmaceutical research is mostly confined to drug research while neglecting other aspects such as production efficiency, conservation, agrotechnology and so on. Sociological as well as clinical studies on specific health issues are also sparse. Recently a new medical university that brings various medical faculties under the same umbrella has been established, which fosters hope that there will be more prioritization and coordination for research.

Inadequate clinical documentation and research subsumes most public health success stories in the State by TRM. For example during the chikungunya epidemic of 2007–2009 Ayurveda and Homeopathy were frequently sought by patients although such experiences have not been compiled and studied rigorously, and are largely confined to anecdotes.

While there are no sufficient studies on health seeking behaviour through Ayurveda or Homeopathy primary health centres, the ayurveda centres continue to be known as 'decoction hospital' approached by elderly population for buying oils for aches and other degenerative problems, thus attaching their image to a section of population. This has resulted

48) Emerging needs of aging population in Kerala, UN Report 1992.

in neglect of such public facilities by other sections.

A macro perception about such public health issues and strategies to respond to increasing population demands is lacking in the field of TRM. For instance there is no comprehensive vision on how to service the needs of an ageing population in the state when Ayurveda is the most sought after system by such users. Changing cultural traditions and dietary habits, increasing alcoholism are also few other challenges where Ayurveda needs to be alert. Gunatilleke (1984) says "...new health problems associated with the lifestyles of affluent societies are emerging in both Kerala state and Sri Lanka as a result of the cultural dislocations and the changes in lifestyles and values." This is corroborated by findings from other studies that identified that the per capita expenditure on health reduced with traditional lifestyle (Suneetha 1998).

There is a growing discord between different TRM streams. As Panikkar (1994) notes growth of Ayurveda has created a cultural hegemony in TRM field in Kerala and many cultural traditions have got subsumed into such a development. This has created unwarranted debates between non-institutionally trained physicians who continue to practice, with the institutionally qualified physicians in the state, given the dynamic interactions that the different classical and folk systems have had historically. Sustaining the folk practices therefore also needs to be given high priority.

7. Conclusion

From the early 19th century there have been certain socio-political changes that have contributed to Kerala's development. The contention of the article has been that these developments also gave a strong impetus to the revival of traditional medical knowledge in the State. Through this process the inequities that existed in access to traditional medical knowledge diminished and traditional knowledge and products became widely available across population through institutionalization. This in turn has had a strong impact on the health system development in the state. The objective of this paper was not to show that TRM has been the sole contributor, but to showcase how development of a pluralistic health culture widened the choice and in turn influenced health seeking and improved health status.

While there are arguments that TRM is generally accessed when there is lack of availability of modern health care, increase in cost etc., health seeking and choice of systems in Kerala is with clear identification of strength and weaknesses of medical systems by the population and not as alternative or complementary options. Several studies have shown that both in chronic diseases and elderly care the preferred choice of care is traditional medical systems. Given the rapid demographic change in Kerala and related morbidity, much more support should be provided for TRM especially ayurveda in the area.

The specific contributions made by traditional medical systems and their volume may be contested and is a matter of detailed study. Also the nuances of how such a pluralistic health culture has been in place in Kerala require further in-depth enquiry. Research inputs to the sector needs to be improved and there is a need to establish a coordinated vision with both public and private sector as partners for responding to the newly emerging needs of the population. However Kerala provides a good case for developing countries to learn from for a sustainable health system development as well as improving health status at low cost.

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