

God's Own Country

Moving Towards Universal Health Coverage in Kerala

Piloting in the Districts of Malappuram and Palakkad



PUBLIC
HEALTH
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OF INDIA



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February 2016

Public Health Foundation of India
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Foreword by Health Secretary

The Planning Commission of India, based on the recommendations of the High Level Expert Group on Universal Health Coverage (UHC), had advocated a move towards Universal Health Coverage by 2022 in the 12th Five Year Plan. The Government of Kerala has been the first state to pilot UHC in the districts of Malappuram and Palakkad since June 2014 with the technical support of the Public Health Foundation of India (PHFI). We have developed a fine analysis of current and anticipated needs and demands of both the health system and the populations concerned, based on which a course for progressive realization of UHC shall be charted and advanced upon.

The objective of this situational assessment of the health systems and services in the districts was to understand the present situation of the facilities, services and support systems present in government health institutions; to identify the top twenty five conditions in the district resulting in mortality, morbidity and high out of pocket expenditure; and to prepare an Essential Health Package (EHP) consisting of care pathways for the aforementioned conditions. The State Health Systems Resource Centre Kerala (SHSRCK), along with the district health departments of Palakkad and Malappuram, has been assisting PHFI in carrying out the baseline.

The product of a strenuous exercise of compiling data from various departments and institutions the report throws light on the different aspects of health infrastructure, human resources, health management information system, resource utilisation, mortality, top twenty five conditions affecting the population, the various schemes and programmes for health care, social determinants, financing, and governance.

The assessment has underscored the need to reposition the vast network of primary health care centres in the state as the bedrock of a comprehensive continuum of care, rather than just centres for maternal and child health services. Kerala is committed to building the commensurate infrastructure, equipment and skills to ensure this as we advance on our UHC path, and has already begun developing care pathways for the top conditions and events identified in this baseline. Further, emphasis is to be placed on building competencies of frontline workers to enhance the care component of health service delivery. Finally, as has emerged in this baseline, there is a need for evidence to be integrated more purposefully in decision-making across the spectrum – from the state headquarters to the community level. Our approach to UHC will now focus on these components, and offers a novel approach not just for Kerala but for other states seeking to operationalise a methodology for implementing UHC.

I take this opportunity to appreciate the effort made by the team members for this report and hope this paves the path leading to Universal Health Coverage in Kerala, while also offering lessons for other states and countries to do the same.

Dr. K. Ellangovan, IAS

Secretary Health and Family Welfare
Government of Kerala

Preface

We are now in the era of the Sustainable Development Goals. This provides a window of opportunity for India to capitalise on strengths and achievements of the Millennium Development Goals in order to address gaps and emerging design our path towards Universal Health Coverage (UHC). In our country, fiscal devolution is now underway, aimed at placing greater flexibility and accountability in the hands of state authorities with respect to the design and delivery of health services. This too provides an opportunity for developing innovative and people- centred models of UHC, to meet the specific needs of each state.

Kerala has shown leadership and commitment by pursuing a mandate of carrying out UHC district pilots, incorporating the goal of UHC in its draft health policy. Over the past year, it has been the privilege of our institution to work closely with state and district officials to understand the needs of various populations in the state, the depth and breadth of coverage they are receiving, the financial implications of this, as well as the institutional mechanisms by which this is being made possible. Attention and support has also been extended by other departments and agencies, demonstrating – as Kerala has a legacy of doing – that health is determined by myriad determinants both within and outside the health sector.

The state is thus well positioned to offer a model for progressive realisation of health equity-promoting UHC, rooted in existing systems and realities, receptive to locally experienced challenges as well as ingenuity and innovation. As this baseline demonstrates, the challenges are large and complex, whether they pertain to quality of services and continuum of care, tailoring the range and depth of services to the existing health burdens, ensuring conditions and management of human resources, and developing decision-support systems using accurate, reliable, and interoperable data and coordination across agencies and departments.

The enlightened public policy of Kerala is best positioned to address these. PHFI will deem it a duty and a privilege to assist in this transformational effort. PHFI looks forward to moving ahead with the Government of Kerala on this path.

Prof K. Srinath Reddy

President

Public Health Foundation of India

Acknowledgements

A district assessment of this nature would not have been possible without the cooperation, assistance, and critical inputs of functionaries across departments of government at the state and district level as well as of functionaries working in private hospitals, organizations and institutions in Malappuram, Palakkad, and Thiruvananthapuram. This assessment is a collaborative initiative undertaken with the Department of Health and Family Welfare, Government of Kerala. We are deeply grateful to the colleagues who provided their support.

This effort has been guided by the vision of Dr. Ellangovan, Health & Family Welfare Secretary, who encouraged us to look deeply and closely at the data, challenging us to look beyond the obvious, to the important. Deep thanks are also due to Dr. Beena M, Secretary, AYUSH for her support and practical reflections, Dr. P. K. Jameela, Former Director of Health Services and Mission Director, NHM for their guidance. The team is thankful to Dr. S A Hafiz, Executive Director, SHSRCK and his staff for his continued support & encouragement to the initiative. The support provided by earlier Executive Director of SHRCK, Dr. Sakeena K and former Deputy Director Dr. Arun Nair is also acknowledged.

We are extremely thankful to Dr. K. Venugopal, District Medical Officer (H) and Dr. Sreehari M., District Programme Manager, National Health Mission from Palakkad, and Dr. V. Ummer Farook, District Medical Officer and Dr. V. Vinod, District Programme Manager, NHM Malappuram and colleagues, who extended extraordinary cooperation, key reflections and critical inputs throughout the duration of the work and supported us by providing the team space in their office.

The team took precious time of the various functionaries who went out of their way to provide information and explain the data in both the districts of Malappuram & Palakkad. We would like to place on record our thanks to the staff of the District Medical Officers (ISM), and Homeopathy, Programme Coordinators under the Health dept., Deputy District Medical Officers, Superintendents and Medical Officers of all health facilities and institutions, Public Relations Officers (PROs) and District & Block Coordinators cum liaison Officers of National Health Mission (NHM), Officials at the District Drug Inspector's office, Coordinators of the Integrated Disease Surveillance Project (IDSP) and Non-Communicable Disease Programme, District Laboratory Technicians, the Statistical Wing of the District Medical office (H), Zila Panchayat, Superintendents and Doctors of the Railway divisional hospital Palakkad, Regional Transport Officer and staff, District Lottery Officer, Karunya District Coordinator & State officials, Kerala Social Security Mission (KSSM) District Coordinator, Executive Director, Comprehensive Health Insurance Agency Kerala (CHIAK), and ADCCHIAK of Malappuram and Palakkad, Manager Kerala Medical Services Cooperation Limited, Director Ex-Servicemen Contributory Health Scheme (ECHS), Cochin, Superintendent, Employees State Insurance Scheme (ESIS) Hospital Palakkad, District Planning Officer and staff and the Directorate of Radiation Safety.

We would like to thank the Kidney Patients' Welfare Society (Malappuram), the Private Allopathic Hospital-Owners association, the Private Doctors Association, Private Dental Doctors Association, the Private Ayurveda Hospital Owners Association, the Private Homoeopathic Doctors Association, and the Private Unani Doctors Association.

We also gained from the cooperation and information given by officials of Assistant Development Commissioner's office, the Suchitwa Mission, the Directorate of Urban Affairs,

the Directorate of Social Justice, Department of Labour&Rehabilitation, Kudumbashree Mission, Department of Statistics and Economics, Information Kerala Mission, Dept. of Scheduled Tribes &Department, and the Scheduled Castes District Offices. We are also grateful for the key insights offered by officials of the State Planning Board and the NHM officials on Bhoomika data.

We specially thank Dr Ramesh- former Principal, Training Centre Department of Health and Family Welfare, State and Regional Head Trivandrum, Dr. Geetha- Director of Medical Education, Director of Panchayats, CGHS- Joint Director, Trivandrum, ESIC- Director, Trivandrum.

We would like to thank Mr. Rajeev Sadanandan, former Health Secretary, Govt. of Kerala and Dr. T R Dilip, Consultant, WHO for reviewing the report and providing valuable inputs, suggestions and comments.

This initiative would not have been taken forward without the stewardship of Dr. Srinath Reddy and Dr. Ramanan Laxminarayan from PHFI who provided us their unstinted encouragement and having faith in us.

Lastly, we would like to thank International Development Research Centre (IDRC) for their financial support.

Glossary of Terms

ANM	Auxiliary Nurse Midwifery
APL	Above Poverty Line
ASHA	Accredited Social Health Activist
AYUSH	Ayurveda, Yoga, Unani, Siddha, Homeopathy
BPL	Below Poverty Line
CHC	Community Health Center
CHIS	Comprehensive Health Insurance Scheme
CHIAK	Comprehensive Health Insurance Agency of Kerala
DH	District Hospital
DMHP	District Mental Health Programme
DMO	District Medical Officer
GH	General Hospital
IDSP	Integrated Disease Surveillance Programme
ISM	Indian System of Medicine
JPHN	Junior Public Health Nurse
JSY	Janani Suraksha Yojana
KBF	Karunya Benevolent Fund
KMSCL	Kerala Medical Service Corporation Limited
LSGD	Local Self Government Department
MLA	Member of Legislative Assembly
MP	Member of Parliament
NRHM	National Rural Health Mission
NHM	National Health Mission
NGO	Non Governmental Organisation
OPD	Out Patient Department
PHC	Primary Health Center
PHN	Public Health Nurse
PIP	Programme Implementation Plan
RCH	Reproductive and Child Health
ROP	Record of Proceedings
RSBY	Rashtriya Swasthya Bhima Yojana
RMP	Rural Medical Practitioner
SC	Scheduled Caste
ST	Scheduled Tribes
THQH	Taluk Head Quarters Hospital
TLGH	Taluk Level Government Hospital
UHC	Universal Health Coverage

Background and Introduction

Universal Health Coverage (UHC) is an idea whose time has arrived. As per the World Health Organization (WHO), the goal of UHC is to ensure that all people obtain the preventive, promotive, curative, rehabilitative and palliative health services they may need without the risk of financial ruin or impoverishment (WHO, 2005). In 2005, all WHO Member States committed towards achieving Universal Health Coverage. The WHO in 2010 published a report: 'Health Systems Financing: The Road to Universal Health Coverage'. This was followed by statements and declarations in Mexico City, Bangkok and Tunis: in 2012, the United Nations adopted a resolution urging all countries to move towards providing access to all their populations to affordable, quality health services. Universal Health Coverage is now a target under the Third Sustainable Development Goal on promoting healthy lives and well being for all ages (United Nations, 2015).

Over the past half-decade, moreover, there has been much debate and discussion over precisely how countries should design their path towards UHC (Kutzin 2012). Concern has been raised over the exaggerated emphasis on financing in many discussions of UHC (Khanna & Nambiar, 2014; Kutzin, 2012), the general ambiguity around the concept (Ottersen et al, 2014), and its implications for health equity (Gwatkin & Ergo 2013). The adoption of UHC is seen as having potential for resurrecting the unfinished agenda of Health for All and of Comprehensive Primary Health Care, a vision launched in 1978 under the aegis of the Alma Ata Declaration, depending on how countries define, design, implement and phase reform on the path towards this goal (O'Connell, Rasanathan, & Chopra, 2014).

In countries like Thailand, the seeds were laid close to two decades ago when the nation underwent a period of democratization, drafting a new constitution in 1997, which defined health as a human right to be protected by the state (Towse, Mills, and Tangcharoensathien, 2004). The newly elected government promised health care for 30 Baht, offering this to those not covered by existing schemes for civil servants and privately employed persons. The approach was to cover the uncovered for a limited package of services that could then be added to, for a nominal premium of 30 baht per visit that was eventually phased out. In Ghana, in 2004 a National Health Insurance Scheme was implemented that combined elements of social health insurance and community-based health insurance to cover both formal and informal workers at premiums based on incomes for all but specific exempt groups (Giedion, Andres, and Diaz, 2013). The package purportedly covers 95% of the problems reported, placing emphasis on maternal and child health. In Bangladesh, an NGO micro-finance health insurance programme targeting the ultra-poor offers those who volunteer support – usually in the order of 50% for a range of services, which are discounted whenever possible and cover a wide range of services, specifically maternal and child health, and communicable diseases (Giedion, Andres, and Diaz, 2013). There is also a wide range of financing models for these services, including the use of tax based revenues, co-payments, and even donations. Thus, various countries have charted their own trajectories of covering their populations, seeking sometimes to cover entire populations or targeted ones, provide a wide range of services, or a circumscribed package, involving co-payment, or eschewing it. Another key area of variation is around the role of the state: in some cases the state internally resources care and provides it, while it is now increasingly common that there is a split such that the state does not provide all care, but rather purchases it from the market, and citizens receive services from private providers. Thus, there is no single path to Universal Health Coverage across countries, or indeed within them, as a recent Going Universal study has also pointed out (Cotlear, Nagpal, Smith, Tandon and Cortez, 2015).

In India, a High Level Expert Group (HLEG) was constituted in October 2010 to prepare a framework for UHC, with its secretariat housed at the Public Health Foundation of India (Planning Commission, 2011). The HLEG report was submitted in November 2011 to the Planning Commission. Subsequently, the 12th Five Year Plan announced the intention of the government to begin towards Universal Health Coverage. Drawing from this, the Planning commission defined UHC 'Ensuring equitable access for all Indian citizens, resident in any part of the country, regardless of income level, social status, gender, caste or religion, to affordable, accountable, appropriate health

services of assured quality (promotive, preventive, curative and rehabilitative) as well as public health services addressing the wider determinants of health delivered to individuals and populations, with the government being the guarantor and enabler, although not necessarily the only provider, of health and related services” (Planning Commission, 2011). The HLEG process and its UHC definition are unique, building on strong and tenacious advocacy for health reform lasting close to a decade and the particular considerations of the diversity and specificities of the Indian context (Nambiar 2013).

Following this, in 2012, the Planning Commission under the National Health Mission Framework for Implementation in turn called for district level pilots in two districts of each state which would involve measuring extent to which populations are covered by health services and interventions, options and models could be tested and adapted in accordance with the needs, systems, and context within individual states and improve coverage in a phased and systematic manner.

Such considerations have been the preoccupation of the Government of Kerala for a long time, and particularly recently, in the efforts to evolve a state health policy. The 2013 Draft Health Policy made reference to prior Expert Committee reports including the HLEG and sets Universal Health Coverage as a target under which the policy is set to guide efforts. The Draft Policy covers a wide range of health issues from financing to health across the life course, communicable and non-communicable diseases as well as the social determinants of health. In its culminating section it proposes that UHC “would involve the state using the essential health care package, either building capacity to provide in government sector or purchasing services from the private sector.”

Following from this, among the first states to advance on this path, in April 2014, the Government of Kerala, issued a Government Order (P15CF/2014/H&FWD) whereby Malappuram and Palakkad were selected as pilot districts for the implementation of UHC with the technical support of Public Health Foundation of India, New Delhi in partnership with the State Health Systems Resource Centre, Kerala.

The team took stock, at the outset, of the impressive achievements of the health sector in providing health, but also in documenting its inputs into the Kerala Health System, as well as the health burdens the system was seeking to address. The team was clear that it would not create processes – of assessing or acting on UHC – that would not be replicable for other districts in the state, or that would create additional, unsustainable burdens of data collection and analysis. The decision was therefore made to collate and analyze existing data, with the aim to determine what it was showing, and in cases where there were gaps or inadequacies, to point these out and allow for the system to incrementally improve its functioning. As such, UHC was seen not as a project requiring the establishment of systems de novo, but rather a path on which the state was already treading, that it could move progressively towards.

It was planned to establish a baseline assessment to understand the extent to which populations are currently covered by free health services (primary, secondary & tertiary) and the resources (finance, human resources, and other) disbursed and available to provide public health service in the district and the institutional mechanisms in place to undertake UHC. Thus began a process of coordination, collation, and analysis of the health situation of these two districts in the state.

Kerala in Context

Kerala, a coastal state in the south-west region of India, was created on 1st November 1956 as per the States Re-organization Act, by combining the princely states of Travancore and Cochin and the Malayalam-speaking Malabar region of the erstwhile Madras Presidency. Prior to this, going back five millennia, Kerala's strategic coastal location placed it squarely on the world's spice route as a cosmopolitan trading power. It has been a hub of great innovation, exchange and diversity, which may have set it on the fast-track for the great gains the state has made in the domain of human development.

Kerala: A snapshot



Formation: 1956

Area: 38,863 km²

Districts: 14

Capital: Thiruvananthapuram

Language: Malayalam

Inhabitants: 33.4 million (52% female, 63.9% working age)

Geography: Narrow with 3 regions –Western Ghats (hilly), lowlands including lagoons, backwaters and coastline (580 km), midlands (10% of total area) eastern border of the state; 44 rivers pass through

Meteorology: SW Monsoon (3,000 mm of rainfall annually) from June–November

Source: State Planning Board (2013). Economic Review: Thiruvananthapuram: State Planning Board

Kerala's population growth has slowed almost uniformly since 1961: in 2001-11 it has grown by just 4.9% which is the lowest rate among Indian states (Planning Commission, 2008). In fact a couple of Kerala districts: Pathanamthitta and Idukki have had negative population growth in the last decade. The fastest growing district, Malappuram grew by 13.4 per cent, which is still a slower growth rate than that of India's over the same period (17.6%)(Planning Commission, 2008). There has been a decline in the child population (aged 0-6 years) by a margin of 8.44%, a declining trend seen in all states but Malappuram. Future projections as per the 2008 Kerala State Development Report suggest that the state's population will peak in 2026 at about 35.9 million, 25 lakh more than the current population (Planning Commission, 2008).

The base for social development in Kerala was laid by the erstwhile princely state of Travancore broadly via land reforms and state provision of education and healthcare. In health, at the turn of the 20th century, Christian Mission hospitals pioneered provision of care to all castes and across genders. By the 1920s, many of the barriers to access in government provisioning of both education and health were lifted. At this time, some key public health reforms were also introduced; spending on health was over 4% of total government spending (Oommen, 2014). In partnership with Rockefeller Foundation, the Travancore monarchy introduced compulsory, universal smallpox vaccination in 1933 as well as a host of treatment campaigns, health education work, and disease surveillance (Kabir, 2003). In contrast to Travancore-Cochin, the northern British-ruled Malabar province saw no land reform before independence. After the formation of the state, the Communist Party of India, which was based in Malabar, ensured land reforms in the entire state and the spread of public health and education institutions, ensuring that Malabar's inherited disadvantages as compared to Travancore decreased to an extent (Dreze and Sen, 1997). Changes ushered in by Communist leaderships transformed the political and social milieu of the state. Kerala is possibly the most successful state in India in devolving power till the Panchayat level: 30-40% of the Plan Funds are to be distributed directly to the Panchayats, a model that has evolved well and been recommended for scale-up elsewhere (Oommen, 2015).

The government rapidly expanded public medical infrastructure till the 1980s after which fiscal strains appeared. Between 1960 and 1976, the state domestic product grew at a Compound Annual Growth Rate (CAGR) rate of 3.9 per cent per annum, lowering to 2.41 per cent per annum in the stagnation phase of 1976-1988. In the post reform phase (1988-2010), the CAGR rate increased to 6.3 per cent per annum, peaking to 8.25 per cent for the period 2000-2010 (beating out national averages) (Oommen, 2014). It bears mentioning however, that disparity ratios (ie the ratio of monthly per capita expenditure comparing the top and bottom decile of the population) in high growth periods have also grown in both rural (from 10.2 in 1993/94 to 18.6 in 2009/10) and urban areas (from 7.7 in 1993/94 to 19.5 in 2009/10) (Oommen, 2014).

Kerala's historical low growth rates have meant that the state has not had great gains in economic wealth, even as it is by far the leader among Indian states on the Human Development Index. Arguably, social reform movements and political mobilization helped in improving the social mobility of oppressed communities to a certain extent. As per the latest estimates by the Rangarajan panel for 2011-12, just 7.3% of Kerala's rural population subsists below the poverty line as against 24.3% of rural Tamil Nadu and 30.9% of India as a whole; 15.3% of Kerala's urban population subsists below the poverty line as against 20.3% of Tamil Nadu's population and 26.4% of India's population (Planning commission, 2014). Kerala does not have the highest per capita income among Indian states, but it has the lowest proportion of population below poverty line.

This seeming paradox of underwhelming economic growth and surpassing growth in human capabilities has been called the 'Kerala Model' (a term coined by the economist K.N. Raj), which has been cited as an alternate model of development by noted economists including Mahbub Haq and Amartya Sen (Dreze and Sen, 2002). The Model theorizes that improvements in quality of life indicators can be achieved with comparatively low per capita incomes if there is mass democratic political participation and activism directing the state to redistribute its wealth and resources for human development. Subsequent efforts by the governments to maintain equality have further resulted in the state having comparatively better health indices even without economic growth. This achievement has been often attributed to the state's progressive policies within and outside the health system, resulting in an accelerated demographic transition rather than the result of a conscious policy effort.

The gains in health infrastructure, for instance, have been marked. At Indian independence, Travancore-Cochin had one allopathic medical institution for 45000 people, Malabar one for 65000. By 1975, the government had started one medical institution for 25000 both in Malabar and Travancore-Cochin regions. The expansion slowed subsequently: by 1990, there was one medical institution for every 20,000 people in the state, following which public infrastructure has not expanded much (Lekshmi, Mohanta, Revikuma and Manna, 2014).

Patterns for health human resources are somewhat more complex: Sadanandan (1993) has observed that the quadrupling of personnel in the health department (from almost 13,000 in 1960 to just under 29,000 in 1985) in the high growth phase of 1960-85 was double the pace of growth in the number of beds in the state (from over 7,000 in 1965 to over 31,000 in 1985). However, productivity declined by almost the same proportion: from 7 major operations performed per employee in 1960 to 3 in 1985; and from 73 in patients per employee in 1960 to 41 in 1985. Thus, there have been challenges of operationalizing growing human resources in this period.

The historical strengths in public health and the huge increase in public investment in the pre 1990 era have had extremely salubrious effects: Kerala's Infant Mortality Rate (IMR), a key public health metric, fell by 44 points from 1976-97, partly because of the high institutional delivery rate and because the government began implementing the Universal Immunization programme a full ten years before the rest of the country. It also has performed well, not just in comparison to other states, but even other countries in terms of reducing Infant Mortality Rates and Maternal Mortality Ratio.

Major Issues of Healthcare

Notwithstanding a recent uptick in communicable diseases, overall, the state has dealt commendably with maternal and child health and communicable diseases. Greater challenges loom in the future, however, linked in part to Kerala's epidemiologic transition.

Kerala has an ageing population; almost three fourths of deaths in Kerala occur after the age of 60, as compared to just over half in India. This ageing population therefore faces a high burden of non-communicable diseases (NCD). Unlike communicable diseases, NCDs require high investment for therapeutic interventions and/or substantial investments for health promotion and risk reduction. At 66.3 deaths per lakh population, Kerala has the highest suicide rate in the country (Patel et.al, 2012); and the growing, hidden burdens of mental illness are an acknowledged challenge (Thresia and Mohindra, 2011).

Over time, moreover, the privatization and medicalization of Kerala's health system has been raised as an issue by many scholars and researchers, (Daivadanam, 2012; Dilip, 2008, 2010; Nithya, 2013) some of whom have emphasized the negative consequences this has had in the provisioning of public health services in remote and hilly areas and in the public sector more generally (Ekbal et.al, 2012).

The latest National Sample Survey reveals that hospitalized spending on males is over 35% higher in rural Kerala (INR 24,060 per hospitalization case) than rural India (INR 17,528 per hospitalization case), although other non-medical expenses in Kerala are lower (INR 1901 per hospitalization case) than the Indian average (INR 2199 per hospitalization case), driving total expenditure up higher than the Indian average (National Sample Survey Organization, 2015). In urban areas, however, for both males and females, both medical and non-medical expenses are a great deal lower in Kerala (across genders, INR 17,117 per hospitalization case) as compared to India (INR 26,455 per hospitalization case).

Notwithstanding this, a major trend has been the rise of the state to the top of the list of per capita payments of health and hospitalisation. A recent study by Ghosh has found that the highest increase in out of pocket payments as a share of household consumption expenditure in the country was observed in Kerala (an increase of 4.7% between 1993-1994 and 2004-2005, with higher proportions being spent by the poorest quintile as compared to the richest in 2004-5) (Ghosh, 2011). Latest Sample Survey data suggest that Kerala has appreciably high financial risk protection coverage in rural areas (19 per 1000 cases of hospitalisation receiving some reimbursement, as compared to 12 per 1000 nationally), although in urban areas, the coverage is similar to national averages (59 per 1000 hospitalisation cases in Kerala reimbursed as against 62 per 1000 cases nationally) - but then again, in relative terms, costs are also lower in Kerala (National Sample Survey Organization, 2015).

The state today requires a comprehensive public health effort that addresses the promotive, preventive, curative, rehabilitative and palliative aspects of care of its population. There is a commensurate need to address multiple populations, taking a life-cycle approach, all the while ensuring that Keralites are able to avoid disease, and if/when they do need to seek care, they are guaranteed accessible, acceptable and quality health services without financial hardship.

The Pilot Districts: Malappuram and Palakkad

The contiguous districts of Malappuram and Palakkad were chosen to be UHC pilot's districts because they are relatively less developed in healthcare as compared to other, better-performing districts in the state. The former happens to be the largest district in Kerala by population, the latter by area.

Formed in 1969 by carving out Ernad and Tirur taluks of Kozhikode District as well as Perinthalmanna and Ponnani taluks of Palakkad district, Malappuram is Kerala's largest district by population. The district has a Muslim majority and a relatively low proportion of Scheduled Caste and Scheduled Tribe populations. Malappuram's economy is centered mainly on agriculture, with other major economy contributors of the district being timber industry, fishery, tourism and spice trading. According to Kerala's 2008 State Development Report, Malappuram had the highest population growth rate of all districts between 1901 and 2001, 88.6% literacy, and yet low work participation rates (Planning Commission, 2008). Unsurprisingly, foreign remittances from migrants (largely in the Middle-East) are a significant source of revenue to the district (46% of the district domestic income) (Planning Commission, 2008). As per the Kerala Migration Survey 2011, Malappuram has the highest proportion of migrants in the state: in the district there is more than one migrant for every two households (Zachariah and Rajan, 2012).

Palakkad district, the largest district by area in Kerala, has about 8.2% of the State's population (making it the sixth most populous district). The district is the gateway to Kerala due to the presence of the Palakkad Gap, in the Western Ghats. This is the only break in that stretch of the Ghats that separates Kerala from neighboring Tamil Nadu; hence Palakkad has had close trade and cultural links with Tamil Nadu. The district has a predominantly agricultural economy and has been named the rice bowl of Kerala. However, in the last decade, increasing numbers of cultivators have moved out from rice cultivation. Besides rice, Palakkad is the only district in the state producing cotton and groundnuts.

Palakkad has the state's largest proportion of tribal population (11% as against 1.45% for the state). In the tribal majority block of Attapady there have been reports of disproportionately high numbers of infant deaths in 2013 (Ekbal 2013; Manikandan, 2014). Palakkad is a high focus district as it contains majority of the state's relatively poor and marginalized tribal populations. In 2006, the Ministry of Panchayati Raj named Palakkad one of the country's 250 most backward districts and it is one of the two districts in Kerala currently receiving funds from the Backward Regions Grant Fund Programme (BRGF).

The World Bank implemented its Population Project (IPP-III) in both districts between 1984 and 1990 with an emphasis on population control and improving maternal and child care services. The final evaluation indicates significant declines in birth rates in Palakkad and Malappuram and some gains in immunization coverage and coverage of institutional delivery (Planning Commission, 2008). Other multilateral projects in the districts, focused on social determinants of health like water and sanitation, have had less encouraging results (Raman 2009).

Each chosen district is distinct and yet, Malappuram and Palakkad have some shared challenges. Both districts have committed officials working hard to improve the functioning of the system notwithstanding a range of constraints. The case is similar in many other parts of the world, where groundwork has commenced in this renewal of efforts to make affordable care universally available. While the WHO has played its normative role in setting the global agenda for UHC, nations with similar health profiles to Kerala (like Thailand and Malaysia) have advanced on the path to provide their populations with universal coverage. The time is ripe for Kerala to pave India's path to UHC, starting with Malappuram and Palakkad.

Methodology

Any evidence-based intervention to ensure Universal Health Coverage (UHC) has to start from a keen understanding of the health system in which it is to operate. It is thus imperative that governments have an understanding of the current status of population and services coverage, i.e., which populations are covered, which not, what gaps exist in services provided, especially to the most vulnerable populations. It is also important to know what services are being provided by which stakeholders (including NGOs, private sector, corporate, other ministries, local government etc.). From such an effort, it will be possible to identify the gaps (in human resources, infrastructure, drugs and logistics, quality etc.), and also appraise capacities at various levels, mindful of the institutional mechanisms that must be infused with evidence to improve functioning.

The premise is that one is not starting afresh; the government has been providing various services and covering the populations through its various programmes and schemes and it is necessary to assess their implementation and coverage, strengths and weaknesses. Further, it is important also to document existing health financing systems & mechanisms, i.e. what services are being financed by various sources, the flow of funds in the public sector, health insurance schemes, purchasing of care, out of pocket expenditure, charging practices, the scope of charitable health schemes and government social assistance schemes, among others. This shall serve as a baseline and assist in evidence-based planning for rolling out the UHC in the selected pilot districts.

Various tools for monitoring the path towards Universal Health Coverage have been devised, by a range of international stakeholders. The World Health Organization has developed an Evaluation Framework and continues its technical work on Service Coverage, drawing upon the Tanahashi framework. (Reeder and Terry, 2013; Tanahashi, 1978). A Joint Learning Network on UHC comprising ten lower and middle income countries in Africa and Asia has been developing indicators to measure progress including population enrolment in schemes, use of services, morbidity and mortality measures, out of pocket spending and quality indicators (Joint Learning Network for UHC, 2015). The World Bank has also carried out landscaping work to identify what indicators may be used to measure UHC (Giedion, Andres, and Diaz, 2013). Bringing these stakeholders together, in 2012, the United States Agency for International Development (USAID) developed a Monitoring and Evaluation Reference Group (MERG) (USAID/Health Systems 2020, 2012). This group created a list of coverage indicators for financial protection (8 indicators), service coverage (24 indicators), and population coverage. However, most if not all of these tools are designed for global or national reporting prospectively, and not all corresponding indicators and systems even exist for India (Devadasan, Ghosh, Nandraj and Sundararaman, 2014).

More critically, none serve the purpose of actually supporting decision-making for UHC at the operational level, which in a country like India, will be at the district level downwards. Further, ongoing efforts have revealed a range of challenges, including the dependence on surveys in prior efforts like the Millennium Development Goals, even as other sources of data (including facility surveys, Management Information Systems and the like) exist. It is acknowledged that monitoring UHC at the sub national level will be distinct from national and global reporting and monitoring. In the former case, rather than indices, simple, operationally linked indicators are likely to be most useful. Engagement with sub national stakeholders is a critical and essential step in these efforts.

It was therefore decided that this UHC baseline exercise would draw directly from stakeholders involved in implementing health policies, schemes and programmes, rely on existing secondary sources and processes of data collection, and evolve a framework that would be of direct operational relevance at the district level, and replicable in other districts eventually.

With the above background an assessment was undertaken in the select districts of Malappuram and Palakkad. The aim of the assessment was

- To systematically document and assess the existing health systems with regard to coverage of populations, facilities, services and schemes, institutional mechanisms and resources available in the selected districts which would form the baseline for undertaking interventions based on evidence.
- To identify the top twenty five conditions / procedures / illness / events in the selected districts resulting in morbidity, mortality resulting in high out of pocket expenditure, and develop an Essential Health Package (EHP) based on evidence and explore options of providing them in an assured manner.
- To identify feasible options and develop a road map for expanding the coverage in a phased manner based on what populations and services can be covered, what will be the method of delivery through facilities (public or private; different systems of medicine) and what systems need to be strengthened. This would enable the creation of a district action plan for implementation of UHC.

A government order was passed in April 2014 selecting Malappuram and Palakkad as pilot districts, with Public Health Foundation of India (PHFI) providing technical support and the State Health Systems Resource Centre Kerala (SHSRCK) serving as the nodal agency for implementation of the project.

The preparatory phase

The project commenced in June 2014 with the appointment of district coordinators in each district and a state programme coordinator.

Meetings with District Medical Officers, District Programme Managers of National Health Mission, Medical officers of the facilities and other functionaries in Malappuram and Palakkad were conducted to introduce them to the concept of UHC and how this linked to their ongoing activities. During the visit, secondary data of public health departments like Annual Administration Report, various reports of NRHM programmes, studies and analysis reports were accessed from the respective offices and a preliminary idea about the infrastructure and utilization indicators was obtained. Efforts were also made to understand the information system in other related departments and to document the schemes and programmes for health in the districts.

To understand the pilot district's geography, economy, social, educational, political, religious background, a district profile of each pilot district was prepared, which included a brief about the population of the district, public and private health infrastructure facilities in various systems of medicines like allopathy, AYUSH health-related schemes and programmes, other health related facilities like dialysis centers, drugs shops, ambulance services, blood banks, labs and diagnostic centers, medical education and training centers, human resource for health and the various channels through which finance is routed for the health sector.

After initial discussions and meetings with state and district officials, a collaborative exercise was carried out for the data collection, preparation of assessment formats and analysis, and an operational plan with framework, tools, formats, systems was developed for the pilot districts in consultation with the district level officials with the emphasis on replication in other districts.

The period of data collection was for FY 2013-2014 or the most recent period for which the data was available.

Methodology of District Level Health Assessment

The assessment was undertaken in partnership with the nodal agency, the SHSRCK. The first step of the assessment involved identification of various data sources. Following this, district UHC coordinators listed the health information systems available in the districts and documented the flow of information for various parameters. This enabled identification of the most reliable and appropriate information source. Mapping of health related schemes and programmes being implemented by health and non-health departments was also undertaken, as this is the primary framework under which plans are delivered to populations – both universally and in targeted fashion

The District and State UHC Project Coordinators undertook secondary data collection by liaising with various departments, through personal interaction. Data collection entailed personal visits to the various offices of the public health departments and collecting various reports studies from the respective offices. We made use of multiple sources of available secondary data and undertook review of- reports, evaluation studies and audits undertaken in last the five years. Interviews with key informants, meetings, group discussions, small surveys, listing etc. were also undertaken to validate some of the key findings. Data collection, preparation of the assessment formats and compilation of the data was done with the support from district staff, which enabled the addition of contextual inputs and ensured association of district teams for work on UHC right from the outset.

Sources of data

In order to understand for what disease condition the population utilizes health services, who are benefitting the services, from which facility, over 60 data sources were accessed, comprising around 500 variables for each of the two districts. Infrastructure, human resources, schemes and service related data were sourced from the District Medical Office and NHM offices, including finance data; data from the Health Management Information Systems, various programmes including the Reproductive, Maternal, Child Health and Adolescents programme, the IDSP, as well as human resources information (at the facility level). Other sources of data include the Comprehensive Health Insurance Agency of Kerala (CHIAK), Karunya Benevolent Fund (KBF), the Labour Department, the Drug Inspectorate, the Social Security Mission, the Department of AYUSH, the Scheduled Tribes Development Department, Information Kerala Mission, the Department of Local Self Government, the Ex Servicemen Contributory Health Scheme, and the Department of Railways, among others. Information was also sought from the Central Government Health Scheme (CGHS) and Employee's State Insurance Corporation (ESIS). Morbidity data on communicable diseases report was culled from the Integrated Disease Surveillance Programme (IDSP), non-communicable diseases report, health related schemes and programmes. Further, diagnosis-wise In-Patient (IP) data collected from all facilities in the public sector and selected facilities in the private sector, while accidents data was obtained from the criminal intelligence gazette. *(Annex 1 details the indicator domains and data sources)*

It needs to be highlighted that certain district level data was compiled for the first time in this project. For example, to understand the top disease conditions, In-patients utilizing inpatient services was sourced from a number of sources and compiled in a completely new exercise. A range of data sources, including Rashtriya Swasthya Bhima Yojana (RSBY), Comprehensive Health Insurance Scheme (CHIS) Plus, Non-Communicable and Communicable Disease data, Karunya Benevolent Fund (KBF) and the Integrated Disease Surveillance Programme (IDSP) reports were used apart from the data of public health care system. Another unique feature of the project was the compilation of data on the private sector; this utilization data was accessed through visits to top private facilities in each district with an emphasis on top 25 primary diagnoses in the medical specialties and top 25 procedures in the surgical specialties. The total number of cases for each top 25 diagnosis was entered by the private hospitals and all the data received was compiled to get the top 25 medical and surgical procedures overall for each district.

Once the data was compiled, it was vetted through a state level dissemination involving senior state level officials, experts and senior academicians. Following this, district level dissemination workshops were carried out; attended by senior officials and personnel from facilities. Preliminary analyses were shared in this process, inputs sought on gaps in knowledge, and feedback was received. Based on this, additional data was sourced and compiled.

All these efforts eventually allowed creation of a unified comprehensive database for each district, which if needed can be updated and used for further district specific planning and action related to other projects. In fact, this database proved very useful in the National Health Mission Common Review Mission process.

The nature of the data compiled is illustrated in the following paragraphs:

Health Infrastructure and Services available in public and private sector in Allopathic and AYUSH systems of medicine. The data for health infrastructure consisted of public & private health facilities across various systems of medicine. The major variables under the service infrastructure of public facilities indicators were the number and types of public facilities like Dispensaries, Mobile Medical Units (MMUs), sub centers, Primary Health Centres (PHCs), Community Health Centres (CHCs), Taluk Head-Quarter Hospitals (THQH), District Hospitals (DH),

General Hospitals (GH), Specialty hospitals and Medical colleges in the districts, their sanctioned and available bed strength, departments available, specialties available and diagnostic facilities available. Data for supportive health related facilities including allopathic drug shops (private, fair price, in-facility, cooperative-based), as well as public and private ambulances, blood banks, dialysis centers, labs and diagnostic centers in public and private sector was collected from various sources.

Human Resources across categories of human resources available in the districts with an emphasis on the public sector were analyzed, including a range of contracts, like permanent, temporary, contractual, adhoc posting, Health Management Committee (HMC) posting, RSBY staff, deputed staff, and staff appointed through National Health Mission. The analysis was disaggregated across categories of staff available like Specialist Doctors, General Doctors, Superintendent Nurses, Staff Nurses, and others, to identify gaps in human resources at the facility level.

Training data was also compiled, including the number of medical education and training centers like Medical College in Allopathy, Ayurveda, Homeopathy, Siddha and Unani. Paramedical training centers likes nursing colleges, schools, Junior Public Health Nursing (JPHN) training centers, physiotherapy training centers and others, were mapped along with their sanctioned seats in both the public and private sector.

We sought also to understand utilization, or how who was using public facilities (i.e. male, female, children), for what disease condition they take the service, from each which facility and, utilization of labs and diagnostics from the public sector facilities. The major variables in the assessment formats were Public sector OP/IP details, Lab utilization, diagnostic details, Immunization vaccination details, maternal health, family planning and sexual health, communicable and Non Communicable diseases. Also the utilization of services using various schemes and programmes of Central and State governments like RSBY/CHIS, CHIS Plus, Karunya Benevolent Fund, Schemes of Social Security Mission like Cancer Suraksha Scheme, Thalolam etc, NRHM Programmes, Blindness Control Programme and other department programmes like ESIS, ECHS, CGHS, Railways etc.

We visited a range of departments to identify over 170 health and health-related schemes and programmes, seeking to understand the eligible population, scope and utilization (in terms of population coverage and financial allocation) of these important instruments of provision of public services. Schemes at the national, state, and district level were identified. The functioning of schemes was also understood in historical perspective. Schemes were mapped as being disease-specific, population specific, and related to the social determinants of health.

To understand the needs of the community, leading ultimately to the design of the 'Essential Health Package,' scheme coverage data was supplemented with diagnosis wise IP data, accident data, along with coverage/claim data from the following financial risk protection schemes: RSBY-CHIS, CHIS Plus and Karunya Benevolent Fund schemes.

The major mortality-related health indicators such as Infant Mortality Rate (IMR), Maternal Mortality Rate (MMR), deaths due to communicable diseases, non communicable diseases, suicides, road traffic and other accidents. The data was assessed from the Panchayat death register for both the districts in terms of age, gender, cause and place of death.

Financial indicators for inflow to the districts through various channels and sources for public health service delivery were compiled, namely District Medical Office Health – Plan and Non Plan fund (across various systems of medicine), Local Self Government Department (LSGD), the National Health Mission, Funds for Health given out by Members of Parliament (MP), Members of Legislative Assembly (MLA), the Prime Minister and Chief Minister Health Relief Funds, RSBY & CHIS Plus, Karunya Benevolent Fund Financial Assistance, the Kerala Social Security Mission Schemes and Special Packages for the Tribal populations.

Based on the broad indicators, the assessment format templates were prepared and standardized for Malappuram, Palakkad in Microsoft Excel Sheets. The data was received in various modes like soft copy (Microsoft word, Excel, PDF) and Hard Copy.

Data was collected across a number of key stratifiers to enable inequality analyses and comparisons, wherever available and applicable. Stratifiers include: district, revenue block, facility level, facility name, urban/rural, sex, age, poverty status (Below Poverty Line/Above Poverty Line). A bespoke format was developed with district, block

and facility name on the left side rows and the other variables like Rural Urban, Age, BPL/Non BPL on the top column expanded towards the right hand side. (Annex 2 Assessment Sample format).

All variables were linked to their referent periods, source, link, person or officer providing data, the date of collection of data, and the person from the UHC team collecting data. A color scheme was used to highlight major variables and figures. Training for data collection and system of quality checks were put in place. Since the set of information needed was vast, to ascertain that nothing is missed and compiled within a short framework of time, a data-tracking sheet was also developed and maintained by the UHC project coordinators.

Challenges and problems encountered, limitations of the data

Data collection had its own share of challenges. We had a mandate from the state authorities and the officials we interacted with were friendly and cooperative. However, in some cases, the process required repeated calls and visits, which resulted in delays. For some data, requests were not honoured even when repeated. Data from the private health sector data was not easily available and required repeated requests and efforts, some of which were in vain.

Another challenge faced during data collection, formatting and cleaning was the wide variation data in terms of format and presentation, involving reconciliation of figures from various sources, lack of data, and lack of disaggregated data. For example, data at the district level was available in various offices in different formats (hard & soft copies, websites, records, reports etc.). As an example, all the data received from District Lab Technician & District Medical Office, Homeopathy (Malappuram) was in hard copy and had to be entered manually.

We also faced some challenges, given that the boundary lines of revenue and health blocks are different. Data obtained from the health department was for health blocks, whereas the population was organized by the Indian Census in revenue blocks, which were discrepant. (See Annex 3, Revenue and Health blocks). For example, Malappuram district has 15 revenue blocks and 7 municipalities but mapping is done for only 14 blocks and 5 municipalities as per the Census of India 2011. This entailed remapping the same into revenue blocks. For instance, the district Chemist Shop details were mapped using health blocks rather than revenue blocks and had to be re-entered anew. Such processes were highly time-intensive

We also found that human resource data for certain categories of staff was not available by facility, requiring us to directly visit each facility and source this information. Starting with data from the District Medical office (i.e. permanent staff sanctioned, in position and vacant), facility-based data was sought for posting categories like staff nominated by Hospital Management Committees (HMC), RSBY, Contractual, Adhoc, Temporary, and Honorary. Once compiled, in some cases, we had trouble reconciling discrepant human resource data across different sources.

This last tendency was found across categories: for certain indicators with multiple sources of data, even though the data was of the same period, facility wise figures did not tally. For example, data for OP/IP was reported through the OP/IP facility-based report. We noted that on the one hand, the process of documentation takes place monthly and is consolidated at the district level for one financial year. Then, for the Annual Administration report, OP/IP data was consolidated from the facility for one financial year and sent in the assigned format from the facility to the district office. On the other hand, in the report of the Health Management Information System (HMIS) OP/IP reporting also takes place, but this is entered by facilities in an online data entry sheet, and then consolidated automatically by the software. Consolidated figures across these three reports did not tally with each other or facility wise totals, and so had to be reconciled post hoc.

Notwithstanding these challenges, it was possible to get the majority of the data in place. The methodology for the assessment and overall analysis was kept simple to allow easy replication by health officials in other districts. Another advantage of this method was that it was neither resource intensive nor demanding by way of time. The appointment of staff, orientation, training, and data collection took around six months. We believe the amount of time could be halved when replicated in other districts as half our time was spent developing formats and the protocol for replication of the exercise (this entailed understanding the health information system, identifying data sources, conducting the meetings, developing formats and systems of data collection, and more). It should be possible for the government to conduct the district level assessment in three to four months.

Health Infrastructure and Services

Healthcare delivery has evolved enormously in Kerala in the last four decades (Department of Economics and Statistics, ND). According to the Department of Economics and Statistics, in 1976, under half the live births were in institutions and almost one fourth of the deliveries (23.6%) were conducted by relatives and untrained attendants. By 2008, more than 95% of the deliveries were in institutions, with almost 36% of births surgically delivered. In 2000, heart attacks caused 22.8% of deaths. By 2008, this percentage had risen to 27%. This demographic change, disease profile change and shift in practices towards more interventions have required a substantial increase in supply and sophistication of infrastructure and services in the state. With the constraints on public health investment, a major part of the investment has come from the private sector, although a great deal of upgradation has also taken place in the public sector. In this chapter, we shall describe the major infrastructure and services provided in both sectors in the districts.

Table 1: Public and Private Health Facilities in the Pilot Districts (as on October, 2014) (Figures in actual numbers)

Category	Malappuram		Palakkad	
	Public Facilities	Private Facilities ⁽⁵⁾	Public Facilities	Private Facilities ⁽⁵⁾
Allopathic (1)	734	107	643	81
Indian System of Medicine (2)	118	450	91	35
Homeopathy (3)	60	7 ⁽⁴⁾	77	Data not available
Total	912	564	811	116

Source: DMO Health, ISM, Homeopathy, NRHM, Private Dental associations, Private Ayurveda Hospital Owners Association. District Medical Office Health, ISM, Homeopathy, Medical Association Ayurveda, Homeopathy, Unani www.arogyakeralam.gov.in, www.ism.kerala.gov.in, www.homeopathy.kerala.gov.in

Note:

1. Sub centers are also included with the allopathic Public Facilities for both the districts
2. Indian System of Medicine Includes Hospitals and Dispensaries NHM Dispensaries of Ayurveda, Siddha and Unani
3. Homeopathy includes the count of Hospitals and Dispensaries
4. Includes only hospitals
5. Does not include private clinics as data was not available

We see that in Malappuram district there are 734 public allopathic facilities providing primary, secondary and tertiary health care services (inclusive of sub centers). In contrast, the 107 facilities denoted in the private sector are all hospitals. In the AYUSH segment, Ayurveda and Unani account for 118 public facilities, including dispensaries, with bed strength of 170, while homeopathy has 60 public facilities with a total bed capacity of 60. In Palakkad district, there are 643 public allopathic facilities including the sub centers providing the primary, secondary and tertiary services to the population, where as in private sector there are 81 hospitals. Indian systems of medicine have 91 public facilities, including dispensaries.

Public Health Facilities Allopathy

The public allopathic facilities in rural Malappuram and Palakkad follow the same three tier structure as the national pattern: sub-centres at the most basic level closest to the community which offer mainly preventive and promotive care, the primary health centres offering mainly preventive and ambulatory curative care and community health centres providing both ambulatory and in patient care. In the urban areas, there are secondary care hospitals at the taluka headquarters and district hospitals and general hospitals in the large towns, which offer a wide spectrum of curative care. The following table presents a facility-wise breakdown in allopathy.

Table 2: Number of Public Allopathy facilities in the Pilot Districts (as on October, 2014) (Figures in actual numbers)

Category	Malappuram	Palakkad
Medical College Hospital ¹	–	–
General Hospital	1	–
District Hospital	3	1
Specialty Hospital ²	–	2
Taluk Hospital	6	6
Community Health Centers	20	19
24X7 Primary Health Centers	20	11
Primary Health Centers ³	66	67
District TB Hospital	–	1
Sub Centers	589	504
Tuberculosis Clinics	2	–
Tuberculosis Units	8	6
Police Hospital/ Dispensary (PD/PH)	4	1
Government Leprosy Control Unit (GLCU)	3	1
Government Fisheries Dispensary (GFD)	2	–
Government Forestry Dispensary	–	1
Mobile Medical Units (NHM and Govt.)	4	6
Government Dispensaries	–	6
Other Department Facilities⁴		
Railway Hospital	–	2
Employees State Insurance Scheme Hospital (ESIS)	–	1
Employees State Insurance Scheme Clinic	5	7
Ex-Servicemen Comprehensive Health Scheme Clinic	1	1
Total	734	643

Source: District Medical Office Health (H), District Statistician DMO, District Statistician District Medical Office and Annual Administration Report 2012-13, www.arogyakeralam.gov.in

Note: 1. Medical College is recently allotted for both the districts and for Malappuram its functioning with GH Manjeri, and for Palakkad with District Hospital

2. Specialty hospitals include Women and Child hospital and Tribal Specialty Hospital

3. PHC includes NUHM PHC for Palakkad District

4. Other Department Hospitals includes police, Railways, ESIS, and ECHS.

The public allopathic infrastructure of Malappuram comprises 1 General Hospital, 3 District Hospitals, 6 Taluka Head Quarters Hospital, 20 Community Health Centers (CHCs), 20 Primary Health Centers (PHC) with 24*7 facility, 66 Mini Primary Health Centers (PHC), 589 Sub centers and 21 dispensaries. In Palakkad district, the system is comprised of 1 District Hospital, 2 Specialty Hospital (Women and Child and Tribal Specialty), 6 Taluk Head Quarters Hospitals, 19 Community Health Centers, and 11 Primary Health Centers with 24*7 facilities, 67 Primary Health Centers and 504 Sub Centers. Also there are 17 dispensaries/ clinics for various targeted population in the district providing primary and secondary care.

Malappuram has almost 1.5 times the population of Palakkad district has almost the same number of primary and secondary level public facilities (i.e. THQH, CHC, PHCs). However, Malappuram has a General Hospital and 3 District Hospitals where as in Palakkad there are no General Hospitals and only 1 District Hospital. Specialty Hospitals are not available in Malappuram district where as in Palakkad there are 2 Specialty Hospitals.

Other department health facilities like Railway Hospitals (in Palakkad), Employees State Insurance Scheme Hospitals (also in Palakkad), Employees State Insurance Scheme Clinics (in both districts), and one Ex –Servicemen Comprehensive Health Scheme Clinic in each district also provide health care services to their target groups.

Private Health Facilities Allopathy

In addition to this, the private health sector consists of various health services provided by Non Government Organisations (NGO's), charitable institutions, missions, trusts, and various types of practitioners and institutions. Cooperative medical institutions are also included in this sector. Licensed practitioners, ranging from General Practitioners (GPs) to super specialists, various types of consultants, nurses and paramedics, licentiates, and Rural Medical Practitioners (RMPs) are all included in this healthcare system. Health care practitioners with no formal qualifications constitute the 'informal' sector, which consists of faith healers, local medicine men / women, traditional birth attendants, priests and a variety of unqualified persons (quacks). The private health subsector institutions are heterogeneous in their size and also variable in terms of the quality and services they provide.

Table 3: Private Allopathy Health Facilities in the Pilot Districts (as on October, 2014) (Figures in actual numbers)

Category	Malappuram	Palakkad
Medical College Hospitals	1	3
Hospitals	107	81
Cooperative Hospitals	6	3
Eye Hospitals/clinics	11	5
Dental Clinics	150*	65

Source: Private dental doctors association, District Medical Office (H)

Note: Figures as per the records from the District Medical Offices.*Data not available for private clinics

Malappuram District has one private medical college, whereas Palakkad District has 3 Private Medical Colleges. WMalappuram district has 125 Private hospitals which include Single Specialty Hospital, Multi Specialty Hospital and a Super Specialty Hospital whereas in Palakkad district 87 facilities constitute the Private Allopathy sector constitute to 87 facilities. The cooperative sector in Malappuram is active with 6 hospitals as against 3 in Palakkad. Private Eye Hospitals and Dental hospitals/ clinics in both the districts are high in number

Health Facilities for non Allopathic Medicine

AYUSH systems of medicines offer ambulatory care through dispensaries and in patient care in hospitals of their respective branch of medicine.

Table 4: Public & Private Institutions under Other Systems of Medicine in the Pilot Districts (as on October, 2014) (Figures in actual)

Category	Malappuram				Palakkad			
	Government			Private	Government			Private
	Department	NHM	Total		Department	NHM	Total	
Ayurveda Hospitals	10		10	50	6	-	6	35
Ayurveda Dispensaries	73	26	99	400	79	5	84	Data Not Available
Homeopathy Hospitals	3	-	3	7	1	-	1	Data Not Available
Homeopathy Dispensaries	45	34	79	Data Not Available	49	27	76	Data Not Available
Siddha Dispensaries	1	2	3	Data Not Available	-	-	-	Data Not Available
Unani Dispensaries	-	6	6	17	1	-	1	Data Not Available
Total	132	68	200	474	136	32	168	35

Source: #District Medical Office (ISM) & National Health Mission, Medical Association Homeopathy and Ayurveda

Note: The total number should be higher if Siddha and Unani hospitals and dispensaries are included. However this data is not available

In the public sector, there are 10 Ayurveda hospitals in Malappuram and 6 in Palakkad. Out of the 99 Ayurveda dispensaries in Malappuram district, 26 are constituted by the National Health Mission; in Palakkad, of the 84 Ayurvedic dispensaries, 5 are constituted by the NHM. The representation of Homeopathy public hospitals in health service is very limited in both the districts. NHM has established a substantial percentage of the homeopathy dispensaries. In Malappuram district there are 17 private Unani dispensaries. There are more AYUSH dispensaries than allopathic PHCs in both the districts.

Location - Revenue Block-wise availability of Public Allopathy Facilities

The basic unit for administration of the public health system is municipalities at the urban level and revenue blocks at the rural level. But even this formulation and its linkage to facilities has a checkered history. The distribution of hospitals follows two administrative lines: the revenue administrations classification of District and Taluk and the Union government's classification of Community Development Blocks and Gram Panchayats. So under the British and Princely state system there were rural dispensaries, taluk and district hospitals. When Union governments classification of PHCs and CHCs came about, the category of rural dispensaries expanded. Since the state had Taluk hospitals, CHCs were not opened in every block. But since CSS allocations under RCH and other programmes started increasing phenomenally Kerala reclassified some Taluk hospitals as CHCs thus blurring the boundary between the two classifications. General Hospitals were located in Municipal corporations. The confusion was confounded further when, for populist reasons, hospitals were renamed without any logic. So district hospitals became General Hospitals even though not located in Corporations. The resultant vacancy of district hospitals was claimed by other hospitals no longer located in hospitals. When the geographical moorings of these designations were taken away, renaming became a free for all activity beyond the comprehension of all without institutional memory. This is an important legacy to contend with when thinking about the state's health infrastructure.

As per the 2011 Census, Malappuram has five municipalities and fourteen blocks, while Palakkad has thirteen blocks and four municipalities. There is some variation in the numbers of public facilities across blocks and municipalities, larger facilities naturally, are present in district or Taluka headquarters. Public facility distribution PHC upwards, across these blocks and municipalities is indicated below:

Table 5: Revenue Block wise availability of Public Allopathy Facilities in Malappuram (as on October, 2014)
(Figures in actual numbers)

Revenue Blocks and Municipalities	General Hospital	District Hospital	THQH	CHC	24X7 PHCs	Mini PHC	Total
Manjeri Municipality	1	-	-	-	-	-	1
Tirur Municipality	-	1	-	-	-	-	1
Ponnani Municipality	-	-	1	-	-	-	1
Perinthalmanna Municipality	-	1	-	-	-	-	1
Malappuram Municipality	-	-	1	-	-	-	1
Nilambur Block	-	1	-	2	4	5	12
Wandoor Block	-	-	1	2	1	5	9
Areekode Block	-	-	1	2	1	6	10
Malappuram Block	-	-	-	1	1	4	6
Perinthalmanna Block	-	-	-	1	2	4	7
Mankada Block	-	-	-	2	1	6	9

Revenue Blocks and Municipalities	General Hospital	District Hospital	THQH	CHC	24X7 PHCs	Mini PHC	Total
Kuttippuram Block	-	-	1	-	2	3	6
Vengara Block	-	-	-	1	-	6	7
Tirurangadi Block	-	-	1	2	2	5	10
Tanur Block	-	-	-	2	1	6	10
Tirur Block	-	-	-	2	1	3	6
Ponannani Block	-	-	-	1	-	4	5
Perumpadappu Block	-	-	-	1	1	5	7
Kondotty Block	-	-	-	1	3	4	8
Total	1	3	6	20	20	66	116

Source: District Medical Office (H) & National Health Mission

Note: Currently Nilambur block is divided in to Nilambur municipality, Nilambur block and Kalikavu block and Kottakkal is upgraded as municipality from Malappuram block. Malappuram population has been projected for 1st October 2013.

Among the total of 116 public allopathic facilities in Malappuram the greatest number of health facilities is at Nilambur Block with 12 facilities and Wandoor, Thirurangadi, Areekode has 10 health facilities each. All the municipalities in the district have one public health facility each, under the category of Hospitals. All revenue blocks except Kuttippuram have CHCs. All revenue blocks except Vengara and Ponnani have 24*7 PHCs.

Table 6: Revenue Block wise availability of Public Allopathy Facilities in Palakkad (as on October, 2014) (Figures in actual)

Revenue Blocks and Municipalities	Specialty Hospital	District Hospital	THQH	CHC	24X7 PHCs	Mini PHC	Total
Palakkad Municipality	1	1	-	-	-	3*	5
Ottappalam Municipality	-	-	1	-	-	-	1
Chittur Municipality	-	-	1	-	-	-	1
Shornur Municipality	-	-	-	1	-	-	1
Thritala Block	-	-	-	2	-	6	8
Pattambi Block	-	-	1	1	1	7	10
Ottappalam Block	-	-	-	2	-	5	7
Sreekrishnapuram Block	-	-	-	1	2	6	9
Mannarcadu Block	-	-	1	1	1	6	9
Attapadi Block	1	-	-	1	2	1	5
Palakkad Block	-	-	-	2	1	5	8
Kuzhalmannam Block	-	-	-	1	1	5	8
Chitoor Block	-	-	1	2	-	4	7
Kollenkode Block	-	-	-	2	1	5	8
Nenmara Block	-	-	-	1	-	6	7
Alathur Block	-	-	1	2	2	3	7
Malampuzha Block	-	-	-	-	-	5	5
Total	2	1	6	19	11	67	106

Source: District Medical Office (H) & National Health Mission

Note: *Includes NUHM PHC (2) numbers in Palakkad Municipality

Services Provided in the Facilities

Health facilities provide various services to diagnose and treat patients: out-patient facilities, inpatient beds, radiology and pathology diagnostics, medications, dialysis centres, labour rooms and operation theatres. The provisioning and inter-dependent utilisation of these various diagnostic and therapeutic units helps in delivering medical care, which increasingly relies on technology to confirm a diagnosis or perform a procedure. There are also entities that are external to the facilities but a part of the health system like ambulances and stand alone pharmacies that play a role, and are thus included in our analysis.

Bed Availability

Bed Availability in Public Allopathic Sector

Beds are a simple and important measure of the adequacy of inpatient care provided; they are one of the two parameters in health infrastructure measured in the annual WHO World Health Statistics report. Bed numbers are also intricately linked to health resources: in many instances, the number of posts sanctioned (for nurses, as an example) is based on a norm proportional to the number of beds in the facility.

Table 7: Total Available Beds in the Pilot Districts (as on October, 2014) (Figures in actual and Percentage)

Facility	Malappuram	Beds Per 10000 Population	Palakkad	Beds Per 10000 Population
Allopathy (Public)	2514	5.9	2474	8.7
Indian System of Medicine (Public)	170	0.4	60	0.2
Homeopathy (Public)	60	0.1	10	0.04
Allopathy (Private)	6937	16.4	4282	14.9
Total	9681	22.8	6826	23.8

Source: District Medical Office (H)& National Health Mission

Note: Population of Malappuram and Palakkad as estimated on 1st October 2013, Beds Per 10,000 figures rounded off

Malappuram has fewer public allopathy beds per 10000 people as compared to Palakkad (5.9 versus 8.7 beds per 10,000), which is partially compensated by higher number of private beds per 10000 people. While we do not have data for private non -allopathy beds, Malappuram has more public non- allopathy beds per 10000 than Palakkad. Given that the number of non-allopathy private facilities outnumber the public, we can expect that some beds will be provided in this sector, although AYUSH facilities tend to focus substantially more on out-patient care, with a few noteworthy exceptions (like the Kottakal Arya Vaidya Sala), as we discuss later. We break down this figure further by looking at sanctioned and available beds across types of facilities, next.

Table 8 Sanctioned & Available Beds in Public Allopathy Facilities in the Pilot Districts (as on October, 2014)

(Figures in actual and Percentage)

District	Malappuram			Palakkad		
	Sanctioned Beds	Available Beds	Bed/10000	Sanctioned Beds	Available Beds	Bed/10000
General Hospital	501	501	1.2	NA	NA	NA
District Hospital	483	483	1.1	462	462	1.6
Specialty Hospital	NA	NA	NA	154	154	0.5
Taluk Hospital	497	497	1.2	668	668	2.3
CHC	453	453	1.1	613	613	2.1
PHC	492	492	1.2	577	567	2.0
Police Hospital	36	36	0.1	10	10	0.03
TB Centers	52	52	0.1	NA	NA	NA
Total	2514	2514	5.9	2484	2474	8.7

Source: District Medical Office (H) & National Health Mission

Note: Population of Malappuram and Palakkad as estimated on 1st October 2013, Beds Per 10,000 figures rounded off

Malappuram has 3.5 beds per 10000 people in secondary and tertiary care facilities where as in Palakkad it is 4.4, which is 26% higher. Out of the eleven 24*7 PHCs in Palakkad only two are functional. Malappuram has fewer public allopathy beds per 10000 people, which is partially compensated by higher number of private beds per 10000 people as compared to Palakkad. We note also the difference between sanctioned and available beds, which arises at the CHC level for Palakkad and does not arise in Malappuram district. There is a further distinction to be made, between the availability and actual functional use of beds, which we look at next.

A substantial proportion of available beds are not used for in-patient admissions. These are termed non-functional beds, i.e. those that exist in facilities that have not admitted in-patients through the year.

Table 9: Availability & Functioning In Patients (IP) Facilities in Public Health Facilities in the Pilot Districts as on

(as on October, 2014) (Figures in actual)

Type of Facility	Malappuram			Palakkad		
	Nos. of Facilities	Facilities with Bed	With Functional IP	Nos. of Facilities	Facilities with Bed	With Functional IP
General Hospital	1	1	1	0	0	0
District Hospital	3	3	3	1	1	1
Speciality Hospital	0	0	0	2	2	2
Taluk Hospitals	6	6	6	6	6	6
Community Health Centres	20	20	16	19	19	19
24*7 Primary Health Centres	20	18	4	11	10	1
Mini Primary Health Centres	66	15	1	65	23	0
Total	116	63	31	103	61	29

Source: District Medical Office (H) & National Health Mission

In Malappuram out of the total facilities 54.3% have beds. Out of these facilities with available beds, only 49.2% are admitting patients. In Palakkad, out of the total facilities 59.22% have beds. Out of these facilities with available beds, only 47.54% are admitting patients. This is mainly because just 22% of 24* 7 PHCs in Malappuram and 10% of such PHCs in Palakkad which have in-patient beds actually admit patients: The proportion of Mini-PHCs with beds that admit patients drops to 17% in Malappuram and 0% in Palakkad. Rationalising the functionality of beds, therefore, is an important area of attention.

Bed availability in Private Allopathic Hospitals

The number of beds is an important parameter for private hospitals: less than 30 bedded hospitals are generally small nursing homes, 30-100 beds are generally multi-doctor ventures, moderately large hospitals with 100 beds or more generally offer wide ranging multispecialty care and large hospitals with 200 beds or more offer comprehensive multispecialty care including a few super specialties.

Table: 10 Available Beds in Private Allopathy Facilities in the Pilot Districts (as on October, 2014) (Figures in actual)

No. of Pvt. Hospitals with	Malappuram	Palakkad
<50 beds	51	46
50-99 Beds	21	12
100-199 Beds	12	6

The striking feature about Malappuram is the high number of large hospitals in the private sector; in fact two non govt. hospitals: EMS Hospital in the Cooperative Sector and MES medical college hospital have 500 or more beds. In contrast, in Palakkad, the larger hospitals are in the public, not private sector.

Bed Availability in AYUSH facilities

Ayurveda has a rich tradition of in-patient care involving Panchakarma, cleansing and rejuvenation that takes place over weeks. However, very few public Ayurveda and Homeopathy facilities offer in-patient care.

Table 11: Availability of Beds in Other System of Medicine Public Facilities in the Pilot Districts (as on October, 2014) (Figures in actual and Percentage)

Category	Malappuram			Palakkad		
	Hospital	Bed Strength	Bed/ 10,000	Hospital	Bed Strength	Bed/ 10,000
Public Ayurveda	10	170	0.40	6	150	0.53
Public Homeopathy	3	60	0.14	1	10	0.03
Total	13	230	0.54	7	160	0.56

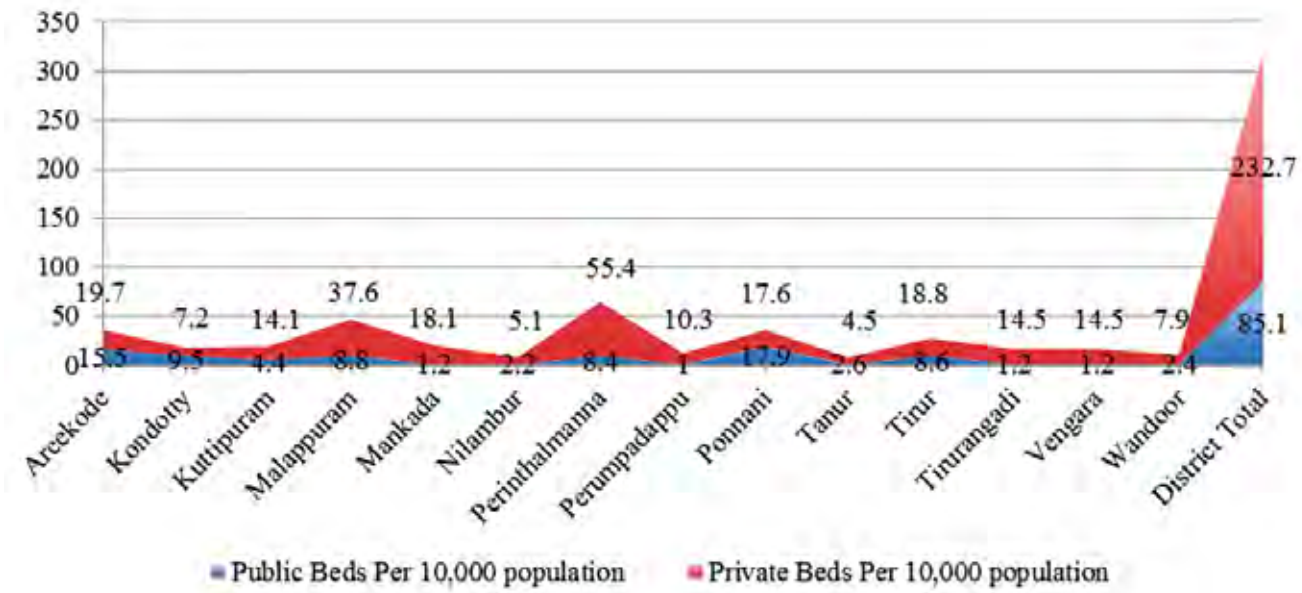
Source: District Medical Office ISM and Homeopathy

According to the DMO, 13 public facilities in Ayurvedic and Homeopathic systems of medicine contribute to 230 beds in Malappuram district while 7 public facilities in Ayurvedic and Homeopathic system of medicine contributes to 160 beds in Palakkad district. There are only 0.4 beds available per ten thousand populations in public Ayurvedic system of medicine in Malappuram district, whereas in Palakkad district it is 0.53. The number of beds per 10,000 available under Homeopathic system of medicine in Malappuram district is 0.14, where as in Palakkad district it is 0.03. Private Ayurveda hospitals in Malappuram account for close to 450 beds for inpatient care, catering proportionately, to almost double the proportion covered by the public sector.

Location of In-Patient Facilities

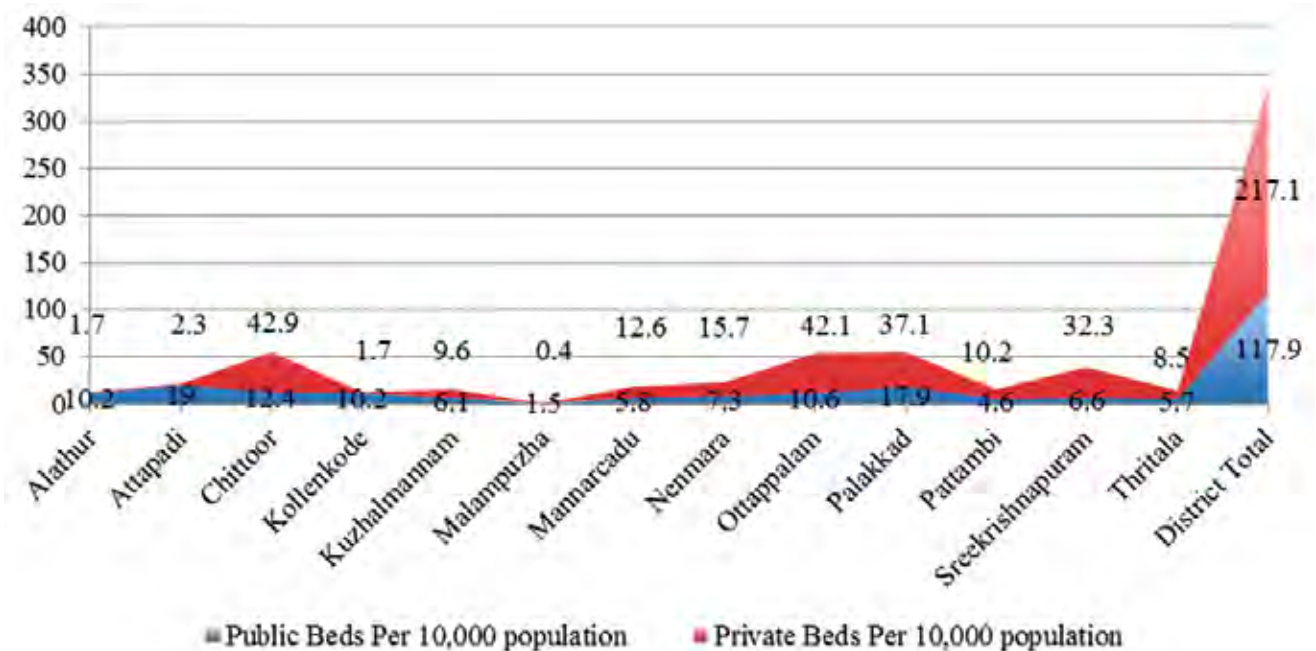
We have previously noted the concentration of public facilities in certain blocks and the relative scarcity of infrastructure in certain other blocks: now with data on location of private beds, public infrastructure and private infrastructure can be compared. If the law of supply and demand holds, blocks which have a low concentration of private beds have either a high number of private beds in neighboring blocks or have low paying capacity.

Figure 1: Revenue Block wise Distribution Public and Private Allopathy Beds in Malappuram



As can be seen from the Malappuram bed distribution chart, four blocks have more than 30 beds per 10,000 population: Malappuram, Areekode Perinthalmanna, and Ponnani. Perinthalmanna has almost three times the number of beds per 10,000 than the district's average. This is mainly due to the high number of private beds in this block. None of the blocks except Ponnani and Areekode have more than 10 public beds per 10,000 people. In fact, 8 of the 14 blocks have less than 5 beds per 10,000 people. In fact Mankada, Tirurangadi and Perumpadappu have more than 10 times public beds per 10,000 than private beds per 10,000 people.

Figure 2: Revenue Block wise Distribution Public and Private Allopathy Beds in Palakkad (2013-14)



In Palakkad, there is only one block, Malampuzha, where the density of public beds is lower than 5 per 10,000 people. As against this Malampuzha, Allathur, Kollenkode, Kuzhalmannam, Mannarkad, Pattambi and Thrithala blocks have less than 20 beds per 10,000 people. Yet, like Malappuram, in Palakkad, the block-wise density of public beds appears to be weakly correlated to that of private beds. There are blocks like Sreekrishnapuram with a below average presence of public beds and above average presence of private beds and the converse is true in Attapadiblock. Palakkad, Ottapalam and Chittoor blocks have more than 50 beds per 10000 people. Further geospatial analysis can provide greater clarity on the nature, correlates and potential causes of these patterns.

Specialties

Allopathic medicine has seen an increased trend towards specialization in recent years. In Kerala, with its high health awareness and comparatively higher willingness to pay for healthcare than the rest of India, the demand for care by highly qualified doctors has increased. It is learned, for instance, that anecdotally, families prefer that deliveries take place only in facilities that have a qualified gynaecologist. As per Indian Public Health Standards (IPHS), a CHC is mandated to have five specialists: in General Surgery, General Medicine, Obstetrics & Gynaecology, Paediatrics and Anaesthesia. At the sub district/Taluka Headquarters level, apart from the five above specialists, ENT surgeon, Ophthalmologist, Orthopedician and Radiologist is mandated. At a District Hospital with 200 beds in addition to the specialists mentioned for the CHCs and Sub District Hospitals, the services of Pathology and Psychiatry specialists are mandated. Specialty availability is indicated below:

Table 12: Specialties Available in Public Allopathy Facilities in the Pilot Districts (as on October, 2014)
(Figures are actual; Figures in parentheses are total numbers of facilities)

Department	Malappuram				Palakkad			
	General Hospital (1)	District Hospital (3)	THQH (6)	CHC (20)	Specialty Hospital (2)	District Hospital (1)	THQH (6)	CHC (19)
General medicine	1	3	3	-	1	1	6	2
General surgery	1	3	2	-	1	1	4	-
ENT	1	3	3	-	1	1	4	-
Obstetrics and Gynecology	1	3	6	2	2	-	1	2
Orthopedics	1	3	4	-	1	1	4	1
Ophthalmology	1	3	4	-	1	1	4	-
Dermatology	1	3	3	-	-	1	2	-
Anesthesia	1	3	4	-	2	1	6	-
Pediatrics	1	3	6	2	2	-	6	2
Chest and TB	1	2	-	-	-	1	-	-
Physical medicine and rehabilitation	1	1	-	-	-	1	-	-
Psychiatry	1	1	-	-	1	1	1	-
Radio diagnosis/ radiotherapy	1	1	-	-	-	1	-	-
Dentistry	1	3	4	-	1	1	4	-
Forensic Medicine	1	-	-	-	-	1	-	-

Source: District Medical Office (H)

General hospitals have availability of specialist doctors in General Medicine, Surgery, ENT, Obstetrics and Gynecology, Orthopedics, Ophthalmology, Dermatology, Anesthesia, Pediatrics, Chest and TB, Physical medicine and Rehabilitation, Psychiatry, Radiology, Forensic Medicine and Dental departments. Forensic medicine doctors are available in General Hospital Manjeri and District hospital Palakkad. Dentists are available in 8 facilities in Malappuram and in 6 facilities in Palakkad. There is non-uniform availability of specialist services in TLHQ and CHCs in both the districts due to specialist vacancies.

Diagnostic Facilities

Diagnostic services include a broad range of tests that are essential to the basic management of patient care, allowing physicians to detect disease earlier, make definitive diagnoses, prescribe therapies, and monitor patient results.

Table 13: Diagnostic Facilities Available in Public Institutions in the Pilot Districts (as on October, 2014)
(Figures in actual)

Facility	Malappuram		Palakkad	
	Public	Private	Public	Private
Cardiac Catheterization (Cath) Lab	-	7	1	4
X Ray	8	250	11	139
CT Scan (Computed Tomography)	1	Data Not Available	1	Data Not Available
Ultra Sonography (USG) Scan	5	47	6	79
MRI	-	8	-	Data Not Available
Laboratory	61	244	58	155

Source: District Medical Office (H)

In Malappuram district, there is no Catheterization lab facility in the public sector; in the private sector there are 7 centers. In comparison, the Palakkad District Hospital had a Catheterization Lab installed in 2014. Data shows that in Malappuram and Palakkad districts, facilities with high-end equipment are more in the private sector as compared to the public sector, and that there is no MRI machine in the public sector in either district. Data on the private sector is generally lacking, and requires greater attention.

Diagnostic Facilities in the Public Sector

Diagnostic facilities are an essential factor in health sector in order to diagnose the exact disease condition and to plan the treatment. The IPHS standards require a basic lab at the PHC level, a lab and x-ray at the CHC level and a lab, X Ray and Sonography at the Taluka Hospital and District Hospital level. According to IPHS, a Computed Tomography (CT) Scan at the District Hospital level is desirable but not essential.

Table 14: Diagnostics Facility in Public Health Institutions in the Pilot Districts (as on October, 2014) (Figures in actual; Figures in parentheses are total number of facilities)

Facility	Malappuram							Palakkad					Total
	General Hospital (1)	District Hospital (3)	THQH (6)	CHC (19)	PHC (86)	Others	Total	District Hospital (1)	Specialty Hospital (2)	THQH (6)	CHC (19)	PHC (78)	
X RAY	1	3	4	0	-	-0	8	1	2	5	4	0	12
CT Scan	1		-	-	-	-	1	1	0	0	0	0	1
USG	1	3	1	-	-	-	1	1	2	3	0	0	6
Cath Lab	-	-	-	-	-	-	0	1	0	0	0	0	1
Laboratory	1	3	6	16	32	3	61	1	2	6	19	30	58

Source: District Medical Office (H)

All the major facilities in Malappuram and Palakkad district have a Laboratory, but two THQs in Malappuram and one THQH in Palakkad do not have an X-ray facility. Taking both the districts together, two thirds of the Taluka Headquarters Hospitals do not have an Ultra Sonography machine (USG). So for even routine Ante Natal Care, sonography scans the THQs shall require referral to higher facilities. Both districts have one CT Scan facility each. District Hospital Palakkad has high-end therapeutic equipment: a newly installed Cardiac Catheterization Lab.

Therapeutic Facilities

Table 15: Availability of Emergency, Surgical, Obstetric and Dental facilities in Public Institutions in the Pilot Districts (as on October, 2014) (Figures are actuals; Figures in parentheses are total number of facilities)

Facility	Malappuram					Palakkad					Total (28)
	General Hospital (1)	District Hospital (3)	THQH (6)	CHC (20)	Total	District Hospital (1)	Specialty Hospital (2)	THQH (6)	CHC (19)		
Operation theatre Minor	1	3	6	4	14	1	2	6	19	28	
Operation Theatre Major	1	3	6	1	11	1	2	3	3	9	
Labor room	1	3	5	2	11	-	2	-	1	3	
Intensive care unit	1	1	1	-	3	1	2	-	-	3	
Casualty	1	3	3	-	7	1	-	-	-	1	
Trauma	-	-	1	-	1	1	-	-	-	1	
Ventilator	1	1	1	-	3	1	2	1	-	4	
Delivery Facility	1	3	4	2	10	-	2	4	1	7	
Functional Referral Unit	1	3	6	-	10	1	2	6	-	8	

Facility	Malappuram					Palakkad				
	General Hospital (1)	District Hospital (3)	THQH (6)	CHC (20)	Total	District Hospital (1)	Specialty Hospital (2)	THQH (6)	CHC (19)	Total (28)
NBCC (New born care corner)	1	3	6	-	10	-	-	2	2	4
NBSU (New born stabilisation unit)	-	3	3	-	6	-	-	2	1	3
SNCU (Special new born care unit)	1	-	-	-	1	-	2	-	-	2
NRC (Nutrition rehabilitation centre)	-	-	-	-	0	-	1	-	2	3
Dental Chairs	1	3	2	1	7	2	2	5	-	9
Dialysis Machines		12	8	-	26*	8	7	3	-	18
Blood Banks	1	2	-	-	3	1	-	-	-	-
Blood Storage Centres	-	1	2	-	3	-	-	-	-	-

Source: District Medical Office (H)

Note: *6 Dialysis Machines are in PHCs in Malappuram District

One out of 20 CHCs in Malappuram and 3 out of 19 in Palakkad have a functional major Operation Theatre, which is necessary for any major procedure. Further, only 4 out of 20 CHCs in Malappuram do not have a minor operation theatre, where minor surgeries like tubal ligation could be carried out. Delivery services are an essential component of public health service, even the most basic unit in the health system: a sub-center is mandated to be equipped with a labour table and a trained ANM to enable delivery care. But the data shows that no PHCs and very few CHCs have delivery facilities. In fact, one Taluka Headquarters Hospital in Malappuram and two in Palakkad do not have delivery facilities, whereas deliveries should surely be a part of minimum services that they offer.

Conditions like prematurity or low birth weight may call for intensive care of the newborn. In Malappuram district these facilities are available at almost all the delivery points, whereas in Palakkad four Taluka hospitals do not have a newborn care corner. Nutrition rehabilitation centers are for providing additional calories of food for the Severe Malnutrition Children. Such children identified are provided nutritious food in these centers. There is incidence of severe malnutrition in the high focus block of Attapadi in Palakkad justifying existence of the NRC in the specialty hospital of Palakkad district. There are only 7 dental chairs in Malappuram and 9 in Palakkad. In Malappuram, there are 6 dialysis machines in PHCs: at a PHC level handling dialysis and its complications is not simple and hence the actual number of dialyses provided by these PHCs should be looked into. In contrast, the largest hospital in Malappuram, the General Hospital, has no dialysis facility. Both districts have innovative mechanisms whereby dialysis is being provided (see Box A). District sources indicate that in Malappuram there are 130 dialysis machines in the private sector: five times the machines in the public sector; in Palakkad there are 36 machines in the private sector which is twice the number of machines in the public sector. The density of dialysis machines per population is higher in Malappuram as compared to Palakkad. We also note that 4 out of 6 Taluka Headquarters Hospitals in Malappuram do not have either a blood bank or blood storage centre, which likely hampers their ability to carry out major surgeries.

Box A: Innovations for Dialysis in UHC Pilot Districts

Kidney Welfare Society (KPWS), Malappuram District

The KPWS is a Charitable Society registered under Charitable Societies Registration Act. The major activity of the society is to support the patients undergoing Hemodialysis. By raising awareness and through discussions and negotiations, many of the private hospitals have reduced the tariff of dialysis significantly, from 800-1000 Rs per dialysis in 2006 to 300-600 Rs in 2014.

The society now provides financial assistance to 580 patients undergoing hemodialysis. Altogether it has supported 1120 patients from 2007 onwards, 438 of them are deceased, 85 underwent renal transplantation, and there are very few drop-outs. Other activities include the provision of immunosuppressant drugs free of cost to kidney transplanted patients (155 patients to date). In addition efforts are underway to start hemodialysis centers in all the major government hospitals of Malappuram District, which can provide free dialysis to poor patients, create public awareness about kidney diseases and their prevention, conduct early detection camps on renal diseases with the support of local organizations, and promote organ donation by creating a data bank of voluntary donors.

Source: (Kidney welfare society, 2015)

Santhi Free & Subsidized Dialysis Unit in Palakkad

Santhi Social Services is a charitable trust functioning in the health sector since 1997, with an aim to provide medical advice, facilities and financial aid to poor patients. Dialysis units linked to a private hospital provide 70% of dialyses free (i.e. 450 free dialyses every month) through community mobilization of financial resources. Separate machines are used for Hepatitis B & C dialysis patients and a continuous emphasis is placed on quality.

Source: (Santhi medical information centre, 2015)

Medicines

Medicines form a key part of patient medical expenses; the availability of medicines at public facilities is key to improving patient satisfaction and health outcomes. To streamline the procurement of medicines and equipment, the state government started Kerala Medical Services Corporation Ltd. (KMSCL), a fully owned government company in December 2007 with the mandate to centralize procurement of all drugs and equipment for the public sector. To enable logistics and distribution of medicines and equipment, KMSCL has established a warehouse in each district (KMSCL, 2015). KMSCL purchases generic medicines via a bidding mechanism and also certain branded drugs as required by hospital authorities. In addition to procuring drugs for public hospitals, KMSCL also sells expensive branded drugs to the public at discounts of up to 60% via a network of Karunya pharmacies, funded by the Department of Lotteries. (Kunnathoor, 2012). Kerala Consumer Federation has started Neethi medical stores to retail both generic and branded drugs for patients at a discount of 13% to 40% to the Maximum Retail Price (MRP) (Consumer Federation, 2015). Our compilation of this data suggests the following:

Table 16: Number of Pharmacies/Chemist Shop in the Pilot Districts (as on October, 2014) (Figures in actual)

Category	Malappuram	Palakkad
	Number of Facilities	Number of Facilities
Government Health Facilities Pharmacy	121	106
Neethi Medicals	22	25
Karunya Medicals	6	2
Cooperative Society Medicals	11	NA
Medicare Medical	-	4
Private	2028	921

Source: District Medical Office (H) and District Drug Inspector

In Malappuram and Palakkad districts, all public allopathic facilities have in-facility pharmacies that are supplemented by government run pharmacies like Neethi and Karunya. However, private pharmacies and chemist shops heavily outnumber these in both districts.

Ambulance Service

In Malappuram and Palakkad, a leading cause of death is cardiovascular disease, and trauma is one of the major causes of morbidity. The need for a responsive ambulance service cannot be understated in reaching affected patients to the facilities within the 'golden hour.' Ambulances with trained personnel can prevent severe neurological deficits in patients with spinal injuries, modern Advanced Life Support (ALS) ambulances, when manned by trained personnel can treat and save extremely critical patients, including defibrillating them to get the heart back into rhythm or intubating them to put them on ventilator support.

Table 17: Ambulances in the Pilot Districts by Ownership (as on October, 2014) (Figures in actual)

Ownership Type	Malappuram	Palakkad
Government	30 ¹	47 ¹
Private	111	91
Total	141	138

Source: District Medical Office (H) and Regional Transport Office

Note: 1. Government includes all state department and Central department Ambulance in the State

In Malappuram, there are 30 ambulances under various government institutions. But only 13 ambulances belong to the Department of Health Services and out of these, only 11 are on road. In Malappuram, six ambulances (General hospital, three district hospital and two Taluka hospital) have Basic Life Support (BLS) facility in public sector and one has Acute Life Support (ALS) at GH Manjeri. In Palakkad district, there are 47 ambulances under various government institutions, with only 15 under the Department of Health Services. Neither Malappuram nor Palakkad district has 108 ambulance services running, even though the same was sanctioned to both the districts. It was reported that the sanctioned 108 ambulances with the Basic Life Support Facility (BLS) were transferred to other districts, as the district was unable to manage the maintenance and human resource cost incurred for providing its service. Advance Life Support ambulance services were extended to both the districts, but were re-allotted to other districts due to various administrative reasons. There is a private network of ambulances in Malappuram, however, that is of note (see Box B).

Box B: Private Ambulance Network in Malappuram

In 2011, a new life-saving, well-equipped ambulance network system called ANGELS (Active Network Group of Emergency Life Savers) in the district was implemented. Angels is a project through which all ambulances in the district will be networked with the help of global positioning system (GPS). This will ensure the availability of an ambulance in case of emergency anywhere in the district. There 61 ambulances were registered under ANGELS network in Malappuram. Unfortunately, the network is no longer functional in the district because the Ambulance drivers failed to pay the monthly rent for GPS connection. Source:(The Hindu, 2011)

Human Resources

Human Resources are a core building block of any health system. The availability of adequate number of health personnel with suitable skills, appropriate deployed at different levels of the health care set-up is essential for providing an effective health care service for the people. Globally, human resources absorb a large part of public expenditure in the health. In low and middle-income countries, cost of human resources for health usually amounts to 60 per cent and 80 per cent of the public expenditure, respectively (Nandan, Nair, and Datta, 2007). Human resources in health (HRH) can be classified as medical personnel, comprising allopathic and non allopathic specialist and general doctors, nurses; allied health personnel comprising physiotherapists, pharmacists and technicians, attendants; and housekeeping and administrative staff like custodial staff, programme managers and clerks. For successful outcomes, different categories, from specialists to janitors, have to function as a team. We begin with an overall picture of HRH in each district.

Table 1: Human Resources Available in Public Health Facilities the Pilot Districts (as on October, 2014)
(Figures in actual)

Sector	Malappuram	Palakkad
Allopathy Public Facilities ¹	4299	3821
Ayurveda, Unani, and Siddha Public Facilities	468	405
Homeopathy Public Facilities	251	147
Total	5018	4373

Source: District Medical Office (H)

Note: 1. This includes permanent, temporary, NRHM, Deputation, Adhoc, RSBY, HMC, Contract Staff in the district of Public Health sector. Data was not available on unregistered practitioners.

Data shows that the total availability of human resources in public facilities put together constitutes 5018 in Malappuram and 4373 in Palakkad District. There are 4,299 personnel currently engaged in public allopathic sector to deliver healthcare services for people of Malappuram while 3,821 are present in Palakkad. The categories of health staff under public sector are several but for the purpose of analysis we have summarized them under certain broad categories, which are listed below with their available positions and vacancies. We also note a 1:10 ratio of Indian Systems of Medicine HRH to allopathic HRH.

Categories of Human Resources Public Allopathic Sector

Broadly, healthcare is delivered by nurses, field staff and doctors, supported by allied health as well as support staff, and overseen by administrative and clerical staff. However, there is some overlap between the administrative categories and doctors, nurses and health field staff. In the case of doctors, there is an official classification of 1) general, 2) administrative, and 3) specialty cadres – but the first and second, and second and third categories often overlap. Quite often, doctors with administrative authority are leading and supervising other HRH.

Table 2: Staff in Public health Facilities by Category in the Pilot Districts (as on October, 2014) (Figures in actual)

Category	Malappuram	Palakkad
Administrative and Clerical Staff	660	323
Doctors	688	503
Nurses	977	961
Health Field Staff	1273	1552
Allied health	448	415
Other Support Staff ¹	972	619
Total	5018	4373

Source: District Medical Office (H)

Note: 1 Other support staff includes cooks, cobblers, drivers, electrician etc. Doctors include both Allopathic and Non allopathic categories. Paramedics include Physiotheraists, technicians etc

Malappuram district has double the population of Palakkad district but the total public health staff in Malappuram is only 12% more when compared to Palakkad district. Palakkad has less than half of Malappuram's administrative and clerical staff and 36% less number of other support staff. But in Palakkad the number of health field staff is 18% higher than in Malappuram.

Vacancies in the Public Sector

Vacancies are a major reason for less than optimum performance of health systems. Studies show that in hospitals with high vacancies, even the staff perceive that they are providing low quality care (Aiken, Clarke and Sloane, 2002). Vacancies are a key challenge for the health system, not just in India but globally.

Table 3: Sanctioned, In Position, Vacancies by Categories in Allopathy health facilities in the Pilot Districts (as on October, 2014) (Figures in actual; Figures in parentheses indicate proportions of sanctioned post by cadre lying vacant)

Category	Malappuram			Palakkad		
	Sanc-tioned	In Position	Vacant	Sanc-tioned	In Position	Vacant
Administrative and Programme Officers	45	29	16 (35.5%)	56	39	17 (30.3%)
Doctors	437	391	46 (10.5%)	357	284	73 (20.4%)
Nurses	562	520	42 (7.47%)	591	515	76 (12.85%)
Health Field Staff	1167	1115	52 (4.45%)	1047	971	76 (7.25%)
Allied health	649	591	58 (8.9%)	633	579	54 (8.4%)
Clerical	362	347	15 (4.1%)	358	354	4 (1.1%)
Other Support Staff ¹	616	446	170 (27.5%)	581	491	90 (15.5%)
Total	3838	3445	399 (10.39%)	3623	3233	390 (10.76%)

Source: District Medical Office (H)

Note: 1 Other support Staff includes cooks, cobblers, drivers, electricians etc

Data shows that in the category of administrative and program officers, 35.5% of posts are vacant in Malappuram district and 30.3% in Palakkad district. In the category of doctors, Malappuram reports 10.5% vacancy and Palakkad, 20.4%. We also note that 7.4% of nursing staff positions are vacant in Malappuram district and 12.85% in Palakkad district. Public health field staff, who play a vital role in epidemic control and family welfare activities, are missing in 4.45% of positions in Malappuram and 7.25% in Palakkad District. In the category of allied health staff 8.9% of positions are vacant in Malappuram and 8.4% in Palakkad, the vacancies for clerical staff are 4.1%

and 1.1% respectively. 27.5% of supportive staff positions are vacant in Malappuram where as in Palakkad the vacancies are 15.5%. With the exception of clerical staff, across categories, addressing vacancies is a key area in need of improvement. Addressing this challenge may be helped by looking at this data in greater depth.

Administrative and Programme Officers Vacancies

Table 4: Permanent Administrative Cadre and Programme Officers in the Pilot Districts (as on October, 2014) (Figures in actual)

Administrative Cadre and Programme Officers	Malappuram			Palakkad		
	Sanc-tioned	In Position	Vacant	Sanc-tioned	In Position	Vacant
District Medical Officer (H)	1	1	0	1	1	0
Deputy District Medical Officer	3	3	0	3	3	0
R.C.H. Officer	1	1	0	1	1	0
District TB Officer	1	0	1	1	1	0
Junior. A.M.O	1	0	1	1	1	0
Superintendent [C/ S]	7	5	2	6	6	0
Superintendent {Dy. DHS}	1	1	0	3	3	0
Dy. Superintendent /DTO	1	1	0			
Dental M.O [A/S]	6	4	2	5	4	1
Dental M.O [C/S]				1	1	0
Administrative Assistant	1	1	0	1	1	0
Asst. Leprosy Officer	2	2	0	1	1	0
Camp coordinator	1	1	0	1	1	0
Course Director				1	1	0
District Edn. Media Officer	1	1	0	2	0	2
District. Malaria Officer	1	1	0	1	0	1
District PH Nurse	2	1	0	2	0	2
District Nursing Officer	1	1	0	1	0	1
District Food Inspector	1	1	0	1	1	0
District Lab Technician	1	1	0	1	0	1
Deputy Edn. Media Officer	2	2	0	1	1	0
Health Inspector-tutor				2	2	0
Nursing Tutor	5	0	5	7	3	4
Nursing Officer	1	0	1	1	0	1
M.C.H. Officer	1	0	1	1	1	0
Principal School of Nursing	1	0	1	1	1	0
Principal J.P.H.N Training. School				1	1	0
Vice Principal School of Nursing	1	1	0	1	1	0
P.H.N.Tutor	1	0	1	6	3	3
Social Work Tutor				1	0	1
Total	45	29	16	56	39	17

Source: District Medical Office (H)

In Malappuram district, positions like Nursing Tutor, Nursing Officer, Maternal and Child Health (MCH) Officer, Principal School of Nursing, Public Health Nursing (PHN) Tutor are vacant. In Palakkad district sanctioned posts for District Education and Media Officer, District Malaria Officer, District Public Health Nurse, District Nursing Officer and District Lab Technician are vacant.

Specialist Doctors Vacancies

Rao et al. report that at an all India level in CHCs, the highest vacancies among specialists are for surgeons and physicians (55%) followed by obstetricians and gynecologists (48%) and pediatricians (47%) (Rao, Gupta, Jain, Bhatnagar, Sundararaman and Kokho, 2010). Malappuram and Palakkad too show a varying pattern of vacancies across the specialties.

Table 5: Permanent Doctors in the Pilot Districts (as on October, 2014) (Figures in actuals; Figures in parentheses indicate proportions of sanctioned post by cadre lying vacant)

Category	Malappuram			Palakkad		
	Sanctioned	In Position	Vacant	Sanctioned	In Position	Vacant
General Medicine	18	12	6 (33%)	14	9	5 (36%)
General Surgery	12	7	5 (42%)	10	2	8 (80%)
Obstetrics& Gynaecology	29	25	4 (14%)	24	18	6 (25%)
Paediatrics	27	25	2 (7%)	17	10	7 (41%)
Orthopaedic Surgery	16	12	4 (25%)	12	10	2 (17%)
ENT	10	9	1 (10%)	7	5	2 (29%)
Ophthalmology	13	10	3 (23%)	9	5	4 (64%)
Anaesthesia	13	9	4 (31%)	11	4	7 (64%)
Dermatology& Venerology	9	8	1 (11%)	4	3	1 (25%)
Psychiatry	4	1	3 (75%)	4	1	3 (75%)
Forensic Medicine	1	1	0 (0%)	1	1	0 (0%)
Physical Medicine & Rehabilitation	2	2	0 (0%)	3	2	1 (33%)
Radio Diagnosis/Radio Therapy	3	3	0 (0%)	1	0	1 (100%)
TB & Chest Respiratory Medicine	5	4	1 (20%)	4	4	0 (0%)
Dental surgeon	7	6	1 (14%)	1	1	0 (0%)
Blood Bank/Clinical Lab/ Public Health Lab	2	0	2 (100%)	1	0	1 (100%)
Total	171	134	37	148	100	48

Source: District Medical Office (H)

The data shows large vacancies across specialties. Malappuram district has vacancies ranging from 100% for blood bank technicians to 10% for ENT. In Palakkad, one in five General Surgeon posts lies vacant; in the case of Anaesthetists doctors, one in three posts is vacant.

Table 6: Facility wise availability of Permanent Doctors in Malappuram (as on October, 2014) (Figures in actual and figures in parenthesis are sanctioned post)

Category	Malappuram						Proportion Vacant across facilities
	General Hospital	District Hospitals	THQs	CHC	PHC	Dispensaries/MMUs	
General Medicine	4(5)	5(7)	3(6)	0	0	0	33.30%
General Surgery	2 (3)	3 (6)	2 (3)	0	0	0	46.20%
Obstetrics& Gynaecology	5(6)	9(10)	9(11)	2(2)	0	0	13.80%
Paediatrics	4(4)	9(9)	11(12)	1(2)	0	0	7.40%
Orthopaedic Surgery	2(3)	6(8)	4(5)	0	0	0	25.00%
ENT	2(2)	4(5)	3(3)	0	0	0	10.00%
Ophthalmology	3(4)	3(5)	4(4)	0	0	0	23.10%
Anaesthesia	1(3)	5(6)	3(4)	0	0	0	30.77%
Dermatology& Venerology	3(3)	3(3)	2(3)	0	0	0	11.10%
Psychiatry	1(2)	0(1)	0(1)	0	0	0	75.00%
Forensic Medicine	1(1)	0	0	0	0	0	0%
Physical Medicine & Rehabilitation	1(1)	1(1)	0	0	0	0	0%
Radio Diagnosis/Radio Therapy	1(1)	2(2)	0	0	0	0	0%
TB & Chest (Resp. Medicine)	2(3)	2(2)	0	0	0	0	20.00%
Dental surgeon	1(0)	3(2)	3(3)	0	0	0	14.30%
Blood Bank/Clinical Lab/ Public Health Lab	0(1)	0(1)	0	0	0	0	100%
Civil Surgeon	0	0	2(2)	13(13)	0(1)	0	6.25%
Casualty medical officer	4(4)	12(12)	4(4)	0	0	0	0%
Asst. Surgeon	8(8)	8(8)	11(12)	67 (69)	122 (126)	1(1)	3.10%
Resident Medical Officer	2(2)	1(2)	2(2)	0	0	0	14.30%
Total	47 (56)	76 (90)	63 (75)	83 (86)	122 (127)	1 (1)	391 (437)
Proportion Vacant within each facility level	16.10%	15.60%	16.00%	3.50%	3.94%	0%	10.50%

Source: District Medical Office (H)

Note: Figures in parentheses shows the number of sanctioned post in the facility

In Malappuram district, out of the 56 doctors sanctioned in the general hospital, only 83.9% are in position. Out of the 90 doctors sanctioned in the district hospitals 84.8% are in position. Only 84% of doctors are in position among the 75 doctors sanctioned for the Taluk hospitals in Malappuram district. In the CHCs and PHCs of Malappuram district, 96% of doctors are in position against the sanctioned posts. So it appears that vacancies are fewer at lower levels of care, but unfortunately, at higher levels, where reliance on and range of specialties is greater and services should be more reliable, vacancies are greater. Data shows that there is shortage of doctors in general medicine (33.3% of posts vacant), general surgery (46.2% of posts vacant), anaesthesia (30.77% of posts vacant), and psychiatry (75% of posts vacant) in Malappuram district. Given these gaps, a key strategy is to identify and address major reasons for not filling up the vacancies. For instance, positions may not be vacant but may appear to be so due to transfer policies like deployment, leave, working arrangements, etc). This may be facilitated through the creation of an Online Human Resource portal linked to the state's existing e-health initiative.

Table 7: Facility wise availability of Permanent Doctors in Palakkad District (as on October, 2014)
(Figures in actual and figures in parenthesis are sanctioned post)

Category	Palakkad						Proportion Vacant across facilities
	General Hospital	District Hospitals	THQs	CHC	PHC	Dispensaries/MMUs	
General Medicine	4 (4)	0 (1)	4 (7)	1 (2)	-	-	35.70%
General Surgery	1(3)	0 (1)	1 (5)	0 (1)	-	-	80.00%
Obstetrics& Gynaecology	-	6 (9)	10(12)	2 (3)	-	-	25.00%
Paediatrics	-	5 (5)	4 (10)	1 (2)	-	-	41.20%
Orthopaedic Surgery	4 (4)	1 (1)	5 (6)	0 (1)	-	-	16.70%
ENT	1 (2)	0 (1)	4 (4)	0	-	-	28.60%
Ophthalmology	2 (4)	0 (1)	3 (4)	0	-	-	44.50%
Anaesthesia	2 (3)	0 (1)	2 (6)	0 (1)	-	-	63.60%
Dermatology& Venerology	2 (2)	0	1 (2)	-	-	-	25.00%
Psychiatry	1(2)	0 (1)	0 (1)	-	-	-	75.00%
Forensic Medicine	1 (1)	-	-	-	-	-	0%
Physical Medicine & Rehabilitation	2(3)	-	-	-	-	-	33.30%
Radio Diagnosis/Radio Therapy	0(1)	-	-	-	-	-	100%
TB & Chest (Resp. Medicine)	1(1)	-	1 (1)	-	-	2 (2)	0%
Dental surgeon	1(1)	-	-	-	-	-	0%
Blood Bank/Clinical Lab/ Public Health Lab	0 (1)	-	-	-	-	-	100%
Civil Surgeon	-	-	-	14 (16)	1 (2)	-	16.70%
Casualty medical officer	4 (4)	6 (8)	8 (8)	2 (4)	0	-	16.70%
Asst. Surgeon	9 (10)	7 (7)	3 (4)	49 (54)	98 (108)	7 (8)	9.40%
Resident Medical Officer	1 (1)	0	0	0	0	0	0%
Total	36 (47)	25 (36)	46 (70)	69 (84)	99 (110)	9 (10)	284 (357)
Proportion Vacant within each facility level	23.40%	32.40%	34.29%	17.90%	10.00%	10.00%	20.45%

Source: District Medical Office(H)

Note: Figures in brackets shows the number of sanctioned post

Out of the total sanctioned posts of doctors in Palakkad's district hospital, only 76.6% of doctors are in position. In specialty hospitals only 69.4% of doctors are in position. Further, only 65.71% of doctors –roughly two out of three – are available across the 6 Taluk hospitals in the district. CHCs have relatively fewer vacancies – with 82.1% of doctors in place, PHCs have 90% of doctors and Dispensaries/MMUs have 90% of doctors in position against the sanctioned post. So while the magnitude of vacancies is greater in Palakkad as compared to Malappuram, the pattern is similar – lower level facilities have fewer vacancies (as likely, there are fewer positions to fill), which cannot be said of higher order facilities, which likely have heavy loads across specialties.

By way of specialties, the shortage of doctors in Palakkad district is in general medicine (35.7% of posts vacant), general surgery (80% of posts vacant), paediatrics (41.2% of posts vacant), ophthalmology (44.5% of posts vacant), anaesthesia (63.6% of posts vacant), psychiatry (75% of posts vacant), radio diagnosis and radio therapy (single post unfilled), blood bank/clinical lab/public health lab (single post unfilled) and physical medicine and

rehabilitation (one out of three posts vacant). This also has to be looked into and aforementioned options are applicable here as well.

Specialists in Public vs. Private Sector in Malappuram

It is seen that most specialists opt for the private sector because of lack of posts, infrastructure, and financial compensation in the public sector. Comparing the number of specialists in the public sector to the specialists in the private sector is demonstrative, given that the sheer number of specialists in the private sector is high, even after one accounts for the higher number of beds in the private sector. If treatments follow doctors, then the private sector provides much more specialized care in the district as compared to the public sector. This follows from our earlier finding that there are high levels of vacancies in the public sector in higher-level facilities. Data were only available for Malappuram:

Table 8: Specialist Doctors in Public and Private Sectors in Malappuram (as on October, 2014)

Specialists	Number in the Public Sector	No. in the Private Sector	Proportion of Total in Public Sector
Cardiologists	0	31	0%
Diabetology	0	21	0%
Endocrinology	0	4	0%
Gastroenterology	0	8	0%
Microbiology	0	1	0%
Nephrology	0	7	0%
Neurosurgery	0	2	0%
Neurology	0	18	0%
Oncology	0	5	0%
Plastic Surgery	0	2	0%
Urology	0	7	0%
Psychiatry	1	23	4%
General Medicine	12	146	8%
General Surgery	7	70	9%
Ear Nose Throat (ENT) Surgery	9	91	9%
Anesthesia	9	91	9%
Orthopedic Surgery	12	103	10%
Radio Diagnosis/Radio Therapy	3	27	10%
Obstetrics& Gynecology	25	174	13%
Pediatrics	25	161	13%
Dermatology & Venerology	8	50	14%
Physical Medicine & Rehabilitation	2	10	17%
TB & Chest Respiratory Medicine	4	19	17%
Ophthalmology	10	42	19%
Forensic Medicine	1	2	33%

Malappuram lacks a super specialty cadre in the public sector, which is partly explained by the lack of a super specialty hospital. Nine tenths or more of psychiatrists, medicine specialists, general surgeons, ENT surgeons, anaesthetists, orthopaedic surgeons and radiologists work in the private sector.

Nursing and Field Staff Vacancies

Table: 9 Permanent Nursing & Field Staff in Allopathy Public Facilities in the Pilot Districts
(as on October, 2014) (Figures in actuals; Figures in parentheses indicate proportions of sanctioned post by cadre lying vacant)

Category	Malappuram [#]			Palakkad [#]		
	Sanctioned	In Position	Vacant	Sanctioned	In Position	Vacant
Field Assistant	5	5	0(0%)	5	2	3
Field Worker	20	20	0(0%)	20	9	11
Filaria Inspector I	1	1	0(0%)	1	1	0(0%)
Filaria Inspector II	1	1	0(0%)	1	1	0(0%)
Food Inspector**	0	0	0(0%)	5	5	0(0%)
Head Nurse	75	73	2(2.67%)	116	108	8(6.9%)
Health Inspector	83	82	1(1.2%)	72	72	0(0%)
Health Supervisor	12	12	0(0%)	12	12	0(0%)
Insect Collector	2	2	0(0%)	2	2	0(0%)
Junior Public Health Nurse Gr. 1	295	291	4 (1.36%)	257	245	12(4.67%)
Junior Public Health Nurse Gr. 11	294	279	15 (5.1%)	258	230	28(10.85%)
Junior Health Inspector Gr I	92	91	1(1.09%)	147	161	14* (9.52%)
Junior Health Inspector Gr II	249	249	0(0%)	156	123	33 (21.15%)
Lady Health Inspector	98	68	3(30.61%)	80	77	3 (3.75%)
Lady Health Supervisor	12	11	1(8.33%)	12	12	
Leprosy Inspector	3	3		19	19	
Nursing Superintendent Grade I	5	3	2 (40%)	3	3	
Nursing Superintendent Grade II	7	5	2 (28.6%)	9	8	1(11.11%)
Staff Nurse Grade I	475**	439**	36(7.58%)	232	200	32 (13.79%)
Staff Nurse Grade II				231	196	35 (15.15%)
Total	1729	1635	94 (5.44%)	1638	1486	152 (9.28%)

Source: District Medical Office(H)

Note:* 14 JHI Grade II are working in the existing vacancy of Junior Health Inspector Grade I

** includes both Grade I and II staff nurse

In Malappuram, out of the 562 sanctioned positions of nursing staff like Head Nurse, Staff Nurse and Nursing Superintendent, 520 (92.52 %) are occupied. Out of the total sanctioned positions of Public Health Field Staff 1167 (95.54%) are in position. In Palakkad, out of the total sanctioned positions for nursing staff, (56.9%) 335 are occupied. Thus, the shortage of medical personnel in Palakkad extends to even the nursing cadre. Out of the total sanctioned positions of Public Health Field Staff, 92.7% are in position in the district.

The key gap in Malappuram is the vacancy of Lady Health Inspectors and Staff Nurses. In Palakkad, Staff Nurses, Junior Health Inspectors and Junior Public Health Nurse are not adequately in place. A short-term strategy could be to have contractually hired health personnel supplementing these categories through National Health Mission or through hospital management committees.

Allied Health Staff Vacancies

Allied health staff play an important role in both the diagnostic and therapeutic components of the healthcare delivery: pharmacists must rationally dispense medicines, trained lab technicians must conduct appropriate tests, physiotherapists play a critical role in rehabilitative care, and X Ray technicians ensure that machines are correctly used and not idling.

Table: 10 Permanent Allied Health Staff in Allopathy Public facilities in the Pilot Districts (as on October, 2014) (Figures in actuals; Figures in parentheses indicate proportions of sanctioned post by cadre lying vacant)

Allied Health Staff	Malappuram [#]			Palakkad [#]		
	Sanctioned	In Position	Vacant	Sanctioned	In Position	Vacant
Biologist	1	1	0%	1	1	0%
Blood Bank Technician	3	1	2 (66.67%)	3	1	2 (66.67%)
Clinical psychologist	1	1	0%	1	0	1 (100%)
Dental Hygienist	4	4	0%	6	6	0%
Dental Mechanic	2	2	0%	1	1	0%
E.C.G. Technician	1	1	0%	2	2	0%
Junior Lab Assistant	0	0	0%	5	5	0%
Junior Scientific Officer	0	0	0%	2	2	0%
Lab Technician	73	60	13 (17.81%)	80	53	27 (33.75%)
Leprosy Physiotherapist	0	0	Not applicable	1	0	1 (100%)
Nursing Assistant	336	304	32 (9.52%)	330	322	8(2.42%)
Ophthalmic Assistant	30	30	0%	25	23	2 (8%)
Pharmacist	153	145	8 (5.23%)	128	123	5 (3.91%)
Pharmacist Storekeeper	8	8	0%	7	7	0%
Physiotherapist	2	1	1 (50%)	1	1	0%
Psychiatrist Social Worker	1	1	0%	1	1	0%
Radiographer	8	8	0%	9	7	2 (22.22%)
Rehabilitation Technician	0	0	Not applicable	5	4	1 (20%)
Senior T.B. Lab Supervisor	6	6	0%	5	4	1 (20%)
Treatment Organizer	8	7	1(12.5%)	7	4	3 (42.86%)
X-Ray attender	9	9	0%	7	7	0%
X-Ray Technician	3	2	1 (33.33%)	2	2	0%
Senior Grade Refractionist	0	0	Not applicable	4	3	1 (25%)
Total	649	591	58(8.93%)	633	579	54(8.53%)

Source: District Medical Office (H)

In Malappuram district, 91.07 % of the allied health staff is in position. The major shortfall of staff under this category in the district is Nursing Assistants and Lab technicians, and one post of Physiotherapist. In Palakkad District 91.47 % of the allied health staff are in position. Here, the shortfall is in the Lab technician category. There were also small magnitudes of vacancy seen for pharmacists that would be prudent to prioritize filling on an urgent basis in both districts.

Clerical Staff Vacancies

Clerical Staff are of importance to the delivery of patient care and patient satisfaction, in that they serve the function of linking up the facilities with the state administrative apparatus. Quality services cannot be provided without their contribution.

Table 11: Permanent Clerical Staff Allopathy Public facilities in the pilot districts (as on October, 2014) (Figures in actual)

Clerical and Administrative	Malappuram			Palakkad		
	Sanctioned	In Position	Vacant	Sanctioned	In Position	Vacant
Clerk/Typist	5	5	0	10	10	0
Compiler LD /UD	3	2	1	2	2	0
Confidential Assistant	0	0	0	1	1	0
Head Clerk	8	8	0	10	10	0
L D /UDC Clerk	198	186	12	177	175	2
L D /UDC Typist	16	16	0	11	11	0
Lay Secretary & Treasurer	7	7	0	6	6	0
Medical Record Librarian	3	3	0	2	2	0
Peon	103	102	1	122	120	2
Senior Superintendent	2	2	0	2	2	0
Junior Superintendent	3	3	0	6	6	0
Statistician & Statistical Asst.	6	5	1	3	3	0
Store Verification Officer	1	1	0	1	1	0
Stores Superintendent	3	3	0	2	2	0
Technical Asst. Gr. I	1	1	0	1	1	0
Technical Asst. Gr. II	2	2	0	2	2	0
Fair copy superintendent	1	1	0	0	0	0
Total	362	347	15	358	354	4

Source: District Medical Office (H)

In both districts there is only a minor shortage of clerical staff; the highest vacancy as per the data is for LD/UD clerk, accounts for a 6.06 % shortfall in Malappuram and a 1.13% shortfall in Palakkad. Minor shortfalls were reported in other categories and could also be rapidly met, particularly if they are in facilities that have high patient loads and need for support.

Vacancies of Other Support Staff

Another critical cadres is that of support staff. They also play an invaluable role in keeping the health system functional, accessible, acceptable, and of quality.

Table 12: Other Support Staff Permanent in Public Allopathy Facilities in the Pilot Districts (as on October 2014) (Figures in actuals; Figures in parentheses indicate proportions of sanctioned post by cadre lying vacant)

Clerical and Administrative	Malappuram			Palakkad		
	Sanctioned	In Position	Vacant	Sanctioned	In Position	Vacant
Hospital Attendant Grade .I	53	43	10 (18.87%)	65	35	30(46.15%)
Hospital Attendant Grade .II	329	215	114 (34.65%)	313	279	34(10.86%)
Cobbler	1	1	0%	3	1	2(66.67%)
Cook	0	0	Not applicable	1	1	0%
Driver	81	74	7(8.64%)	81	80	1(1.23%)
Electrician	1	0	1 (100%)	2	2	0%
Foreman Mechanic	1	1	0%	1	1	0%
Helper	0	0	Not applicable	3	1	2 (66.67%)
House Keeper	2	2	0%	2	2	0%
Mechanic Helper	3	2	1 (33.33%)	1	1	0%
Motor Mechanic	3	2	1 (33.33%)	2	2	0%
Non Medical Supervisor	4	4	0%	4	4	0%
Part Time Sweeper	126	92	34 (26.98%)	100	79	21 (21%)
Plumber	0	0	Not applicable	1	1	0%
Pump Operator	0	0	Not applicable	1	1	0%
Refrigeration Mechanic	1	1	0%	1	1	0%
Lab Attender	4	4	0%	0	0	Not applicable
Packer	2	2	0%	0	0	Not applicable
Painter	1	1	0%	0	0	Not applicable
Record Attender	1	1	0%	0	0	Not applicable
Van Cleaner	1	0	1 (100%)	0	0	Not applicable
Watcher	2	1	1 (50%)	0	0	Not applicable
Total	616	446	170 (27.6%)	581	491	90 (15.49%)

Source: District Medical Office (H)

In Malappuram, overall 27.6% of sanctioned posts are vacant, wherein the hospital attendant grade II accounts for 18.5% of vacant posts and part time sweepers account for 5.5% of vacancies. In Palakkad, out of the 15.5% of posts are lying vacant, the same two posts account for 10.9% and 3.5% of vacancies, respectively. Care should be taken to fill these gaps, especially if they are clustering in facilities where other human resource gaps already exist.

Non Permanent Staff

The central government provides the majority of funds for non-permanent staff through the National Health Mission. Financial support is provided to states to strengthen the health system including contractual engagement of nurses, doctors and specialists based on the appraisal of requirements proposed in annual Programme

Implementation Plans. All posts thus filled are temporary (usually for one year). Support under NHM is also provided by way of additional incentives to serve in remote underserved areas, so that health professionals find it attractive to join public health facilities in such areas. Performance based incentives are also being provided to motivate service providers to give better service delivery. Further, state governments are regularly requested to fill up the vacancies on priority, particularly in remote, rural areas (National Health Mission, 2015). Supplementing these posts are those allocated by Hospital Management Committee with funding from the Local Self Government department, as as posts under various national programmes.

Table 13: Type of Posting of Staff in Allopathy Public Sector in the pilot districts (as on October, 2014) (Figures in actuals; Figures in actuals; parentheses indicate proportions of sanctioned post by cadre lying vacant)

Category	Malappuram			Palakkad		
	Sanctioned	In Position	Vacant	Sanctioned	In Position	Vacant
National Health Mission#	566	527	37	65	35	30(46.15%)
Deputation	-	0	-	-	28	-
Adhoc	-	54	-	-	7	-
Hospital Management Committee	-	70	-	-	7	-
Rashtriya Swasthya Bhima Yojana	-	150	-	-	6	-
Kerala State AIDS Control Society	-	19	-	-	NA	-
Revised National Tuberculosis Control Programme	-	7	-	-	NA	-
Honorary	-	2	-	-	6	-
Other working arrangements	-	93	-	-	56	-
Total	566	922	37 (7.02%)	523	563	45 (8.64%)

Source: District Medical Office(H)

Note: NA stands for Data Not available

The number of sanctioned posts for one cadre, School Health Junior Public Health Nurse was originally 330 in the Revised Operation Plan, but then was reduced to 134.

In Malappuram district (where 89.6% of permanent staff are in position), 69.34% are in position among the category of the National Health Mission Staff. The National Health Mission accounts for 19.8% of the total staff volume in health service delivery. In Malappuram district 11.5% of staff are supplemented to the health service delivery through mechanisms other than NHM, a feature far less common in Palakkad (the proportion is a mere 3.4%). In Palakkad, 89.23% of permanent staff are in position and 91.4% of National Health Mission staff are in position. In Palakkad district NHM contributes 14.43% of staff involved in health service delivery.

Sanctioned Posts and Vacancies in National Health Mission Staff

The National Health Mission provides the budget for the posts sanctioned under it for the year. These numbers of sanctioned posts may change from year to year; notwithstanding, within a year's framework, it is possible to get an idea of vacancies.

Table 14: Medical and Allied Health Staff under National Health Mission in the Pilot Districts (as on October, 2014) (Figures in actual)

Category	Malappuram			Palakkad		
	Sanctioned	In Position	Vacant	Sanctioned	In Position	Vacant
MBBS Doctors including Urban RCH	75	65	10	56	28	28
Specialist Doctors on contract	3	2	1	7	7	0
BDS	2	2	0	2	2	0
Staff Nurse, palliative care nurse	112	101	11	87	82	5
Lab Technician	20	19	1	15	12	3
Pharmacist	25	23	2	4	4	0
Nutritionist counselor /Dietician	0	0	Not applicable	4	4	0
Medical Social Workers/trainees	0	0	Not applicable	13	13	0
School Health Junior Public Health Nurse#	134	134	0	133	133	0
Junior Public Health Nurse Others	20	20	0	34	34	0
X-ray technician/ophthalmic assistant	12	9	3	0	0	Not applicable
Data Manager IDSP	1	0	1	1	1	0
Data Entry Operator-IDSP	1	2	0	1	1	0
Data Entry Operators	0	0	Not applicable	3	3	0
Epidemiologist	1	1	0	0	0	Not applicable
Gender Based Violence Management Coordinators	2	2	0	4	4	0
Public Relation Officer cum Liaison officers	20	16	4	16	16	0
Public Relation Officers	8	5	3	9	9	0
District Programme Management Unit staff	16	16	0	13	13	0
Palliative project staff	3	3	0	11	11	0
Radiographer	0	0	Not applicable	1	1	0
Microbiologist	0	0	Not applicable	1	2	1
Supervisor Urban Immunization	0	0	Not applicable	1	1	0
Mental Health team	14	14	0	5	5	0
District Early Intervention Centre staff	9	9	0	0	0	Not applicable
Revised National Tuberculosis Control Programme Staff	0	0	Not applicable	15	15	0
National Urban Health Mission Staff	15	10	5	42	32	10
DBCS (District Blindness Control Society)	0	0	Not applicable	3	3	0
AYUSH	71	69	2	42	42	0
Total	566	527	37	523	478	45

Source: National Health Mission Office

The number of sanctioned posts was originally 330 in the Revised Operation Plan, but then was reduced to 134.

As per the Revised Operation Plan (ROP) of Malappuram in October 2014 (2013-14), of the 760 positions sanctioned, 527 Staff are in position and 37 are vacant. In Palakkad, as per the ROP, 523 position are sanctioned and 478 Staff are in position, such that there are only 45 vacancies. Thus, given that these posts are filled, contractual hiring, at least as a temporary measure, appears to help bridge gaps in recruitment. It may therefore be relied on to fill human resource gaps in cases where permanent positions have not yet been created. Notwithstanding this, further study is required to see to what extent this affects retention and job performance, particularly for cadres (like specialists) where contractual hiring may need to be scaled up to fill gaps.

ASHAs (Accredited Social Health Activists)

Accredited Social Health Activists (ASHAs) are community health workers instituted by the Government of India's Ministry of Health and Family Welfare (MoHFW) as part of the National Rural Health Mission (NRHM). They are local women trained to educate and promote the community on health aspects and advocate for their linkage to health services. The introduction of ASHAs is one of the core strategies of attaining the goal of improving the availability of and access to quality health care by people, especially for those residing in rural areas, the poor, women and children by NRHM. ASHAs are working in the same village where they are selected and reporting to the JPHN of the concerned sub centre. ASHAs in the municipal areas are working in association with the Taluka hospitals and District hospitals.

Table 15: ASHA workers in the Pilot Districts (as on October, 2015) (Figures in actual)

Malappuram		Palakkad	
Health Block/Institution Facilities	Number of ASHAs	Health Block/ Institution Facilities	Number of ASHAs
MCH Manjeri	59	W&C (PalakkadMunicipality)	54
DH Tirur	42	THQH Alathur	3
DH Nilambur	3	THQH Mannarkkad	3
DH Perinthalmanna	19	THQH Ottapalam	4
THQH Tirurangadi	4	THQH Chittur	24
THQH Malappuram	20		
THQH Ponnani	11		
HEALTH BLOCKS		HEALTH BLOCKS	
Chungathara	264	Agali	100
Edavanna	181	Alanallur	264
Kondotty	183	Ambalappara	120
Kuttippuram	192	Chalavara	100
Vettom	196	Chalissery	182
Wandoor	301	Kadampazhipuram	166
Mankada	246	Koduvayur	231
Maranchery	141	Kongad	213
Melattur	133	Koppam	200
Neduva	239	Kuzhalmannam	218
Omanur	192	Nanniode	146
Pookottur	211	Parali	87
Thrikanapuram	121	Pazhambalacode	169
Valavanur	247	Vadakkanchery	158
Vengara	244	Shornur	34
Total	3249	Total	2506

Source: National Health Mission Office

There are over 3,200 ASHAs in Malappuram and over 2500 in Palakkad. Using October 2013 estimates of population, there is roughly one ASHA for every 1,322 people in Malappuram and one for every 1,142 people in Palakkad.

ASHA training

The ASHA training module primarily aims at enhancing her competencies to develop skills that enable her to have role clarity and carry out her roles/tasks more effectively rather than just having general knowledge on health related topics. The ultimate goal is to enable ASHAs to have greater linkages to the system and confidence to operate as activists in their communities.

Table 16: Details of ASHA training modules in the Pilot Districts

Training Module	Malappuram	Palakkad
	Persons Completed	Persons Completed
Module 1	3805	3348
Module 2	3636	3203
Module 3	3586	3093
Module 4	3575	2997
Module 5	3677	2790
Module 6	3475	2613
Active ASHAs as on October 2015	3249	2506

Source: National Health Mission

As can be seen here, there is high coverage of ASHA training in both districts and a larger number of people have been trained than the number of active ASHAs, suggesting that even those who do not serve as active ASHAs, have the health and health system related knowledge. Care has to be taken to ensure that this helps enable ASHA functioning and health promotion.

Non Allopathy Staff

Non-allopathic systems of medicine do have a strong role to play in the health system. The uptake of these services has been found to be high and Kerala could lead the way in creating a model of a truly integrated health system, which starts with having a vibrant and cooperative health workforce. We were able to source data for Homoeopathy and Ayurveda HRH in both districts (i.e. data on Unani and Siddha were not available).

Table 17: Human Resources in Homeopathy Public Health Institutions in the Pilot Districts (as on October, 2014) (Figures in actuals; Figures in parentheses indicate proportions of sanctioned post by cadre lying vacant)

Category	Malappuram			Palakkad		
	Sanctioned	In Position	Vacant	Sanctioned	In Position	Vacant
District medical officer	1	1	0	1	1	0
Superintendent	3	3	0	1	1	0
NRHM Doctors	34	34	0	25	25	0
Medical Officers	84	80	4 (4.76%)	38	33	5 (13.16%)
Resident Medical Officer	3	3	0	0	0	Not applicable
Clerk	4	4	0	2	2	0
Typist	2	2	0	1	1	0
Office Attendant	15	14	1 (6.67%)	5	5	0
Nurses	15	10	2 (13.33%)	2	2	0
Pharmacist	40	28	12 (30%)	41	20	21 (51.22%)
Attenders	34	29	5 (14.71%)	43	27	16 (37.21%)
Dispenser	8	9	-	0	0	Not applicable
Other Support Staff	52	34	18 (34.62%)	30	30	
Total	295	251	44(16.86%)	189	147	42(22.2%)

Source: District Medical Office Homeopathy

In Malappuram district, 83.1% of the homeopathic staff is in position while 88.02% of staff is in position in Palakkad district. Vacancies appear to be greatest for pharmacists in both districts.

Table 18: Human Resource in Ayurveda Public Health Institutions in the Pilot Districts (as on October, 2014) (Figures in actual)

District/Category	Malappuram	Palakkad
District Medical Officer	1	1
Chief Medical Officer	95	95
NRHM Doctor	26	13
Staff Nurse	26	20
Lab technician	1	0
Therapist	2	0
Pharmacist	85	89
Nursing Assistant	1021	14
Clerical staff	18	0
Lab Attender	0	1
Pharmacy Attender	0	6
Attender	0	81
Other Support Staff	104	85
Total	460	405

Source: District Medical Office (ISM)
Note 1: includes attenders also

In Malappuram District NHM supplements 6.4% of Doctors for the Ayurvedic Public Health Facilities for the service delivery and in Palakkad District NHM supplements 3.31% of doctors for health service delivery. In absolute numbers, the numbers deployed are very similar. There are marginally more support staff in Malappuram as compared to Palakkad. We have no sense of vacancies from this data; this is a key area of further enquiry, along with greater detailing of the focus areas of these HRH, which could be enhanced, in keeping with the needs of the people.

Medical Education and Training

Medical education and training centers create critical health human resources for the state and the country. Till 2000, almost all institutions of medical education were public. Increasingly, there has been a burgeoning of private centres for training the medical and allied health professions. Recently, the Kerala government started one medical college each in both pilot districts. In Malappuram, the Government Medical College is in Manjeri, the sixth government medical college in the State, was inaugurated on 1 September 2013. It is one among four newly sanctioned medical colleges in Kerala. In Palakkad a medical college, the first under the Scheduled Caste-Scheduled Tribes Department in the country will become fully functional within two years. The first batch of MBBS course started in September 2014 and 70 percent of the seats are earmarked to the Scheduled Caste students and rest to the general category. It is to be noted that these medical colleges are functioning in already existing hospitals in both the districts i.e. General hospital in Malappuram and District hospital in Palakkad. Currently, each district also has one government nursing school. Medical education and training centers are more numerous in private sector in Malappuram and Palakkad. Details of medical education and training centers in public and private sectors are given below.

Table 19: Medical Education and Training Institutes in the Pilot Districts

Facility	Malappuram		Palakkad	
	Govt.	Private	Govt.	Private
Allopathy Medical College	1	1	1	3
Dental College	-	3	NA	1
Ayurveda Medical College ¹	-	1	NA	1
Homeopathy Medical College	-	-	NA	NA
Siddha Medical College	-	-	NA	NA
Nursing Colleges	-	6	-	4
Nursing Schools	1	14	1	5
JPHN/ANM Training Center	-	NA	1	NA
Pharmacy Colleges	-	4	NA	NA
B.Sc Lab Technology Colleges	-	2	NA	NA
Optometry Colleges	-	2	NA	NA
Physiotherapy Colleges	-	1	NA	NA
Total	2	34	3	14

Source: Directorate of health service and directorate of medical education.

Note: 1. Government aided medical college

As aforementioned, the private sector shows dominance in medical training institutes when compared to the government sector both districts, especially when it comes to nursing colleges and non-allopathic institutions. In Malappuram, the nursing school is associated with the General Hospital in Manjeri and in Palakkad it is with District Hospital Palakkad. There are no government nursing colleges in Malappuram or Palakkad. There are many private nursing colleges providing GNM, BSc and MSc nursing courses in both districts.

Table 20: Seats Available in Medical and Training Institutes in the Pilot Districts (as on October 2014)
(Figures in actual and in parenthesis are the number of institutions)

Facility	Malappuram		Palakkad	
	Govt. Number of Seats	Private Number of Seats	Govt. Number of Seats	Private Number of Seats
Allopathy Medical College	100 (1)	100 (1)	0	0
Dental College	0	150 (3)	0	0
Ayurveda Medical College	0	50 (1)	0	0
Homeopathy Medical College	0	0	0	0
Siddha Medical College	0	0	0	0
Nursing Colleges	0	330 (6)	0	180 (4)
Nursing Schools	26 (1)	410 (14)	25 (1)	125 (5)
JPHN/ANM Training Center	0	0	45 (1)	0
Pharmacy Colleges (only number, seats not available)	0	4	0	0
B.Sc Lab Technology Colleges (only number, seats not available)	0	3	0	0
Optometry Colleges	0	NA	0	
Physiotherapy Colleges	0	NA	0	0
Total	2	34	3	14

Source: : Directorate of health service and directorate of medical education.
Note: NA stands for data not available

In Malappuram district, the private sector plays a major role in medical education and training with 1,140 seats (89.2% of the total seats) through various training colleges where as the government sector contributes 11.1% of the total seats (there is, therefore, over an 8-fold difference!). In Palakkad district, the private sector also produces four times the number of graduates as compared to the public sector.

Schemes and Programmes

The state of Kerala implements all policies, including those for health, following the framework of development planning adopted nationally. Here, based on a Five Year Plan, Annual Plans are created; “a collection of various programmes/schemes for socio-economic development” (Das, 2007). In addition to these planned expenditures, non-plan expenditures are also incurred to support salaries of new staff, procurements, debt servicing, etc.

Plans are created in order to rationalize and organize the disbursal of financial resources at appropriate levels – central, state, and local (i.e. to Panchayats) – classified as State Plan Schemes (i.e. generated only by the state), Central Plan Schemes (funded entirely by the centre), and Centrally Sponsored Schemes (where funds are jointly given at pre-decided ratios). In addition, for certain disadvantaged groups, Special Component Plans exist, i.e. for Scheduled Castes, Scheduled Tribes, and Women. These component plans are so designated because they fund schemes that ensure direct benefits to the entitled, in proportions commensurate with their population ratios, as non-divertible and non-lapsable allocations.

Typically, a scheme refers to welfare arrangements that address a certain set of issues or a certain population (e.g. Integrated Child Development Scheme); this is relatively less used in the health department. More common in health are programmes, measures or activities with a long term, typically health related aim (e.g. Tuberculosis Control, Leprosy Eradication, etc.). From time to time, policies are implemented in Mission mode, requiring additional resources, financial, human and intellectual, designed to give priority to an area (eg. National Rural Health Mission, Swacch Bharat Abhiyan), under which projects and schemes will be embedded (eg. JananiSurakshaYojana).

In seeking to understand population, service, and financial risk protection coverage, we undertook to map various schemes and programmes of the department of health and other departments relevant to the attainment of Universal Health Coverage. We provide illustrative information on the range of schemes and programmes that exist in the state below.

Table 1: Overview of Schemes

Title	Number
Number of departments/ directorates contacted for schemes	25
Total number of health and related Schemes and programmes identified	177
Total number of Schemes by the Department of Health (DHS/NRHM)	42
Total Number of Health Schemes under Department of Health and other departments	89
• Disease Specific Schemes	26
• Population Specific schemes	63
Total Number of Social Determinants of Health (SDH) Schemes	88

Source: Directorate of health service and directorate of medical education.
Note: NA stands for data not available

Our initial listing yielded over 177 schemes, programmes and projects across over 25 departments, (See annexure 4 for list and details of schemes) although we must at the outset state that this does not mean each of these is of the same size or scope. For example, Kerala spent Rs. 23.18 lakh on the National AIDS Control Programme between 2013-14, Rs. 1.98 crore on the TB Control Programme, whereas the expenditure under NRHM’s School Health Programme was Rs. 1 lakh for the same period. Programmes and schemes have unique designs and coverage: for instance, in 2013-14, the Comprehensive Health Insurance Agency of Kerala on average disbursed just under

Rs. 16,000 per claim in Malapurram and Rs. 7,400 per claim in Palakkad. For the Karunya Benevolent fund scheme of the Ministry of Finance and Lotteries, the expenditure per claim was Rs. 1.28 lakh in Malappuram and Rs. 1.03 lakh in Palakkad in 2013-14. Thus, we are dealing with a great deal of variation – something that must be more deeply understood and harmonized as we advance on the path to UHC.

Evolution of Schemes in Health

A great number of vertical disease programmes were centrally launched, particularly in the 1950s – 1980s, and then again post 1997, implemented through the Directorate of Health Services. Post 2005, we see the entry of the National Rural Health Mission (NRHM), and a host of reconsolidated vertical programmes, more so in the area of non-communicable diseases. There are three exceptions to this: first, Kerala's State Mental Health Programme was introduced before the introduction of National Mental Health Programme and helped shape it. Second, Leptospirosis control has been a unique challenge in the state; pilot programmes have been carried out in the state 2000 onwards. Finally, Kerala also resisted the Polio Eradication programme as it was felt that provisions of the programme were not relevant to the state.

The Indian health system has historically based its structure on provisioning of health services, which was traditionally focused on disease control (eg. leprosy, malaria, sexually transmitted diseases). The shift to family planning happened in the late 1960s, which was expanded to Family Welfare post Emergency. The Universal Immunization Programme brought much-needed attention to child health in the 1980s. Maternal and child health services became a central focus of health as major restructuring of the health system also took place with the launch of NRHM in 2005. We see many of the sub-schemes of NRHM focusing on mothers, children, and by the late 2000s, adolescent and school-going children, as well as survivors of violence. Over time, Kerala developed its own schemes to cover vulnerable groups including persons living with disabilities, tribal communities, the terminally ill as well as the poor (including the elderly poor), mostly post 2005. Local Self Government Institutions have collaborated with the health department to evolve Kerala's unique Palliative Care programme, while the Education department has collaborated to evolve Arogyatharakam, a health education programme for school children.

In the following sections, we illustratively indicate the features of some of the schemes. We note that the trend within the health department historically has been to offer programmes that are universal, and then, more recently, offer more population-targeted schemes with a specific emphasis on financial risk protection (State Planning Board Expert Committee on Health, ND). Outside the health department, there has been some initiative to provide risk protection schemes for particular conditions or populations– like the Karunya Benevolent Fund aforementioned- and in collaboration with the health department, certain schemes for service delivery have also emerged.

Schemes and Programmes within the Department of Health and Family Welfare

We found a little over 50 schemes in the health domain, under the purview of the Department of Health and Family Welfare, the State AIDS Control Society, and the Department of Homeopathy. There were twelve major national programmes administered through the Directorate of Health Services, including the Tuberculosis Control Programme and the Integrated Disease Surveillance Programme. In addition to these vertical schemes with a disease, medical or population-specific focus, we also looked at sub-schemes of the National Rural Health Mission launched 2005 onwards that are aimed at structuring or strengthening the overall health system. We found some 25 schemes under the National Health Mission (roughly half of which were state-specific schemes), while another five were national health programmes implemented through NRHM, like the Vector Borne Disease Control Programme, and the Polio Eradication Programme.

Service Coverage Schemes/Programmes

There are a number of disease control programmes that are longstanding. For instance, the programme for control of Sexually Transmitted Diseases was launched pre-independence. The Leprosy Eradication Programme, launched nationally in 1955, began in Kerala in 1959. Its main aim was effective case detection, treatment and health education. The programme was reviewed and re-launched in the year 1983, with a focus on endemic districts, which includes both Palakkad and Malappuram. For the year 2013-14, 95 cases were detected in Malappuram; data were unavailable for Palakkad.

A more recent programme is the Vector Borne Disease Control Programme, which was launched in 2003-04 by merging the National Malaria, National Filariasis and Kala Azar control programmes, and includes Japanese B Encephalitis and Dengue control. Control involves capacity building through training, development of tools for effective IEC/BCC, early diagnosis and complete treatment, supply chain monitoring, community mobilization, vector control and monitoring and supervision. Almost 6 Lakh residents of Malappuram and 1.29 lakh residents of Palakkad were screened for VBDs in the period 2012-2013, and 2013-14, respectively.

Kerala's Non-Communicable Disease Prevention and Control Programme, initiated 2008 onwards, has three main objectives: 1. Primary prevention-life style modification through health education; 2. Secondary prevention-early detection through screening; and 3. Tertiary prevention through prompt treatment and uninterrupted supply of medicines. The programme is active in Thiruvananthapuram and Wayanad districts currently. In 2013-14, over 3.5 lakh individuals in Malappuram were screened under this programme; data was unavailable for Palakkad.

Kerala has a unique State Mental Health Programme with an emphasis on domiciliary care of stress and secondary prevention of major mental disorders. Kerala's first psychiatry unit was opened in the state in 1970 at Ernakulum District Hospital. Drug de-addiction was incorporated into this programme thereafter and by 2012, a District Mental Health Programme (DMHP) was in place in all the districts. For select districts in 2012-13, the expenditure on existing DMHP programmes was 54.8 Lakhs; 100 Lakhs were additionally spent to set up DMHP in Kollam and Alapuzha districts, with another 5 Lakhs spent on "developing facilities"(Health Information Cell, 2013). District level coverage data was unavailable.

A state-specific scheme to provide medical care for survivors of gender-based violence/social abuse was introduced in 2009 with support from the State Plan Fund. The main objective of the scheme was to strengthen the capacity of health care providers in hospitals and improve the responsiveness of district-level services and functionaries to violence against women. In 2012-13, 346 survivors had received counseling in Malappuram and 563 in Palakkad. Expenditure data was unavailable.

Building on the initiative of doctors and civil society organization in the 1990s, Kerala has developed its own model of a home-based networked Palliative Care Programme to facilitate home care services to the terminally ill. This initiative has received great support from around 400 Local Self Government (LSG) Institutions and comprises processes of identifying the needy, offering guidance for appropriate treatment, providing home care for bed-ridden, and improving the health care system with drug supply. Palliative care is included in the primary health services of health department of Kerala and in 2009; Kerala developed a Pain and Palliative Care Policy, the first of its kind in the country. The state, comprising just 3% of the national population now has more than 90% of palliative care units in the country (Kumar, 2013). The state in 2013-2014 reported an expenditure of 1.83 crore INR on this programme under NRHM.

Another scheme launched in 2013, is called Arogya Kiranam. This scheme provides free medical care for various chronic diseases, including cancer, heart and renal disorders to all children in the state under the age of 18 at government hospitals regardless of their BPL/APL status. Information on coverage of this scheme was unavailable for both districts. In state level reports, this scheme is listed as a financial risk protection scheme.

Financial Risk Protection Schemes (within the Health department)

After the launch of the National Rural Health Mission, a number of schemes were introduced that focused on particular populations and health at particular stages in the life course. The Janani Suraksha Yojana (JSY), launched in 2005, sought to introduce demand-side financing to encourage institutional births, with the aim to avert maternal mortality. Data from 2013-14 suggests that 13,577 mothers availed of JSY in Malappuram, while 3,255 mothers availed of it in Palakkad.

Another scheme building on this is the Janani Shishu Suraksha Karyakram, introduced in 2012 in Kerala, which sought to offer transport, drugs, diagnostics, medical products and food to pregnant women, young mothers and infants. Data for Malappuram shows that 36,279 beneficiaries and Rs 2,880,1841 expenditure for the year 2013-14 was incurred for the JSSK. In Palakkad, uptake of JSSK is higher than JSY, at 8,688 beneficiaries in 2013-14.

In 2014, the National Health Mission released a Free Drugs and Free Diagnostic Services Scheme specifically designed to lower out of pocket expenditure on health attributable to these causes. This is highly desirable given the great and growing burden of OOPE in the state. Coverage data were unavailable, although this is a critical scheme that may be able to address among the main causes of catastrophic expenditure.

Schemes that are Convergent with the Department of Health or outside it

There are also schemes outside the health department, or that involve significant convergence and coordination between the health department and other departments. Just as earlier, some of these schemes offer financial risk protection, while others are focused on specific services and/or populations. Schemes identified were in a range of Departments, from Food and Civil Supplies to the Directorate of Sainik Welfare, from Local Self Government and the Department of Social Justice to the Forests and Wildlife Department. Various institutions like the Kerala State Other Backward Class Development Corporation, the Kerala State Scheduled Caste and Scheduled Tribe Development Corporation, and the Kerala State Handicapped Welfare Fund Board have population specific schemes and programmes, while the State Housing Board, Suchitwa Mission, Kerala Water Authority and other entities provide amenities at the population level, with an emphasis on vulnerable populations.

Service/Population Coverage Schemes/Programmes

The National Rural Health Mission ushered in a number of schemes that involved convergence and cooperation across departments for population coverage. A good example is Kerala's School Health Programme, which involved convergence departments of Health, Education, Sports Council and Local Self Governance Institutions, has high outreach among its beneficiary group, especially in Palakkad where 4.09 lakh students were reportedly involved in 2013-14. In Malappuram, some 1.37 lakh students were reportedly involved with the School Health Programme.

Kerala's telemedicine programme is implemented with the help of the Department of Information Technology. Telemedicine is the use of electronic signals to transfer medical data (photographs, x-ray images, audio, patient records, videoconferences, etc.) from one site to another via the Internet, Intranet, satellites, or videoconferencing telephone equipment in order to improve access to health care. Real time telemedicine could be a simple telephone call, video-conferencing, remote monitoring or consultation using tele-otoscope, a tele-stethoscope, Teleradiology, remote microscope etc. Under NRHM, the state government of Kerala is attempting to revitalise the telemedicine centres existing in Kerala and scaling them to linking to tertiary care institutions. Currently, one Medical College Hospital, Sree Chitra Thirunal Institute of Medical Sciences and Technology, and the Regional Cancer Centre are linked to four district/rural hospitals. The state also has an Oncology Network for treating cancer patients called Cancer Net. In 2012-13, 3,000 individuals living in rural and remote areas statewide were reached by Cancer Net.

Apart from this, Kerala's Department of Social Justice in particular has launched a number of schemes for the welfare of various populations. For instance, the Kishori Shakthi Yojana launched in 2005 has reformulated the Integrated Child Development Scheme and Adolescent Girl programme to provide for the formation of adolescent girls clubs in every Anganwadi. The aim of the programme is to provide adequate nutrition, care and guidance to the adolescent girls and improve their self-esteem and decision making capabilities. In 2013-14, there were 5,193 beneficiaries of this scheme in Palakkad (data was unavailable for Malappuram).

Another scheme of this Department offers support specifically for the education of children of BPL families headed by women, APL families affected by AIDS, social exclusion, as well as families supported by war widows. Across Kerala, 10,430 persons have benefitted from this scheme at a state level expenditure of 2.5 crores; information at the district level was unavailable.

Financial Risk Protection Schemes

Since 2008, Kerala has been implementing its adapted version of the Rashtriya Swasthya Bhima Yojana (RSBY), named the Comprehensive Health Insurance Scheme (CHIS), jointly implemented by the Departments of Labour & Rehabilitation, Health & Family Welfare, Rural Development, and Local Self Government (Kumar, Nair, Nair, Sakeena, Nair, Sankar, 2014). CHIS is managed by an autonomous Comprehensive Health Insurance Agency of Kerala (CHIAK). Under this scheme, up to five members of the family of Below Poverty Line workers (and Above Poverty Line workers paying full premium enrolled before 2011) are entitled to coverage of up to Rs. 30,000 per year for 1,000 in-patient secondary care procedures. CHIS Plus gives chronic disease and tertiary care coverage to those enrolled in CHIS in the amount of up to 70,000 INR in government institutions. In 2014-15, some 57 categories of workers were entitled to CHIS, including rickshaw workers, Accredited Social Health Activists, holders of Widow or Social Security pensions, and more. In Malappuram and Palakkad respectively, over 2 lakh families were covered by RSBY in 2013-2014, representing over 80% of those eligible. Roughly speaking, an RSBY claim was filed in Malappuram for every 6th family enrolled; in Palakkad, a claim was filed for every 8th family enrolled. In the same period 2,694 CHIS Plus claims were filed in Malappuram and 1,979 claims were filed in Palakkad. In Malappuram, 21.6 crores were spent on premia, while in Palakkad 151.2 crore were spent in 2013-14. More detailed information on these schemes is provided in the chapter on Utilisation (see Scheme Utilisation).

The Karunya Benevolent Fund was set in motion in the year 2012 by the finance minister K M Mani. Kerala was in fact the first state to launch lotteries, back in 1967, (Shylaja, Kumari, Nair, Sakeena, Nair, Sankar 2014). The scheme provides financial support of up to 2 lakh INR to poor people suffering from serious ailments, affecting heart, kidney, liver and brain; cancer as well as those needing care for palliation, mental illnesses, thalassemia, and sickle cell anaemia. Moreover, both public sector and empanelled private sector hospitals offer procedures under this programme. In 2013-14, this programme had 2,123 beneficiaries in Malappuram and 2,469 beneficiaries in Palakkad, with sanctioned amounts of Rs. 27.1 crore and Rs. 28.7 crore respectively. The highest number of beneficiaries sought care for cancer treatment in both districts, followed by heart ailments, although in both districts, the highest average per capita disbursement was for kidney disease. More detailed information on KBF is also provided in the chapter on Utilisation of Health Services.

The Thalolam scheme under the Kerala Social Security Mission (KSSM) of the Department of Social Justice provides free treatment to children below the age of 18 who are suffering from kidney diseases, cardiovascular diseases, cerebral palsy, haemophilia, thalassemia, Sickle Cell anemia, orthopedic deformities and other neuro-developmental disabilities, congenital anomalies (including Endosulphan victims) and accident cases requiring surgery. Over 8,276 individuals were given treatment in the year 2013-14 across the state, although district level data were unavailable.

The Cancer Suraksha Scheme under the KSSM provides free treatment to the all children (under 18 years) cancer patients in the selected hospitals. The scheme provides the entire cost of treatment, including the cost of investigations, would be borne by the hospitals through the funds provided by the Mission. The ceiling of expenditure per child would be initially Rs 50,000. However, the hospital can incur additional expenditure, based on the report of the committee comprising of the Oncologist/treating doctor, Head of the Radiology Department

and the Superintendent, subject to ratification by the Mission. There were 3655 beneficiaries for this scheme in the state during 2013-14 with an expenditure of Rs 6.1 crore.

Another scheme called Samashwasam provides financial assistance to Kidney patients belonging to BPL families who are undergoing dialysis at least once in a month. There were 1008 beneficiaries in this scheme till December 2013 in the state. In the same period there were 68 beneficiaries in Palakkad and 101 in Malappuram for the scheme (Kerala Social Security Mission, 2015).

Population-Based Schemes across Departments

Key insights emerge by looking at certain population groups and trying to understand what schemes across departments may cover them. By far the largest number of schemes and programmes were for children – including mothers and children, children with disabilities, poor children, children with particular illnesses, the girl child, and so on. In contrast, there was only one scheme for sexual minorities (for HIV prevention). Therefore, there is scope for both harmonizing and expanding schemes, based on various populations.

Given the sizeable elderly population in Kerala, we were not surprised to find close to twenty different schemes and programmes, from almost ten different institutions. Apart from health, the determinants covered include housing, social security, and food/nutrition.

Since 2010, the Directorate of Health Services has been implementing the National Programme for the Health Care of the Elderly, followed just a year later, in 2011, by the Vayomitram scheme of the Social Security Mission – both of which provide health services to the elderly. While Vayomitram partners with urban local bodies, NPHCE has been implemented across five districts and it remains to be seen to what degree there is linkage, overlap, and exclusion across these two projects. Further, we were unable to see how these schemes relate to earlier projects like the Ayurarogyam Geriatric Health Care Project, launched in 2008/9 under NRHM and the Integrated Programme for Older Persons, which has been underway since 1992 under the Department of Social Justice.

Old age homes receive grants-in-aid from the Directorate of Sainik Welfare as well as the Department for Social Justice (two schemes; one focussing on the elderly handicapped). We were able to get population coverage data for none of the aforementioned, but data was available on all social welfare pension schemes managed by the Department of Local Self Government (referent year unavailable); indicated in the following table. These schemes appear to have fairly high coverage, commensurate with the eligibility criteria of the populations they serve.

Table 2: Social Welfare Pension Schemes of the Departments of Local Government (Figures in actual)

Name of Scheme	Population Covered	
	Malappuram	Palakkad
Agriculture Labour Pension	42,662	57,365
Indira Gandhi National Old Age Pension	1,06,256	1,07,928
Pension for unmarried women above 50 years	4,706	7,292

Source: *Sevana Pension Social Security System (2014). Social Welfare Pensioners District Wise Count.*
Available at <http://www.welfarepension.lsgkerala.gov.in/Districtwiseeng.aspx>

There are also employee-based schemes in the armed forces and railways. The Directorate of Sainik Welfare has a number of schemes ranging medical care grants for TB patients, dialysis, and financial assistance for ex-servicepersons with blindness. Since 2003, the Department of Ex-Service Welfare of the Ministry of Defence has had a Contributory Health Scheme through which service pensioners and their eligible dependents have access to outpatient treatment at over 200 polyclinics all over India, and in-patient hospitalization and treatment through Military Hospitals and empanelled Civil Hospitals & Diagnostic Centres. The Indian Railways Department also has a Retired Employees Liberalised Health Scheme (RELHS) that provides reimbursement of claims for treatment in government or recognised Railway Hospitals, ambulance Services, medical passes, home visits and medical attendance for pregnancies, as well as nutrition and dietary guidance.

The Food and Civil Supplies Department of Kerala, moreover, provides 10kg of food grain to the elderly destitute. In many cases, it is clear that there is no overlap of populations. In the case of some (eg. Vayomitram and NPHCE), it is not clear whether there is overlap and further, should we be able to get coverage information, we can also get an idea of what proportion of the elderly population is not covered by any scheme.

For persons with disabilities, we found that the Social Security Mission plays the role of providing disability certification and also runs schemes on screening for disabilities across the state. In addition a number of schemes are run by the Kerala State Handicapped Development Board (KSHDB) and Directorate of Sainik Welfare as well as in the domains of financial risk protection, and appliance and aids distribution. The KSHDB and the Directorate of Sainik Welfare have schemes for disabled children. Aspects of disability for the elderly are covered in the Integrated Programme for Older Persons of the Department of Social Justice. The Employees State Insurance Corporation, launched back in 1956, also provides support to physically disabled workers in the organised sector, as well as their dependents, for death and disablement attributable to employment injury or occupational illness.

Looking at the tribal population, schemes were in place under the National Rural Health Mission, the Forests and Wildlife Department, the Social Security Mission and the state Scheduled Caste and Kerala State Scheduled Caste and Scheduled Tribe Development Corporation. NRHM has a Tribal Health Programme, largely comprising primary health care outreach through Mobile Medical Units and mobilisation. There is also a component of diagnosis and care of sickle cell disease (in Palakkad). The programme of the Forests and Wildlife Department, in contrast, is for financial risk protection – United India Insurance Company covers at a premium of 6.75 Lakh INR, hospitalisation and personal accident benefits for tribal populations. The Kerala State Development Corporation for Scheduled Caste and Scheduled Tribes offers schemes for marriage assistance, self-employment and subsidies for travel for tribal youth. The Social Security Mission has initiated a programme called Annadayini to address the dire problem of malnourishment among tribal populations. There is definite scope for synergy across all these programmes to ensure continuum of health care for the tribals, and also greater assurance of access to the social determinants of health in a manner that respects and defers to their culture and ways of life.

Overall, we can see that the mid 1970s were a catalyst for the setting up of welfare programmes for various populations (especially, women, children and the elderly); Kerala's Department of Social Justice was set up around this time. In the late 1990s, a watershed event in Kerala was the formulation of the Kudumbashree programme, which represents an ambitious and dramatic programme for convergence under the banner of women's empowerment. A decade after this programme evolved, we see the Department of Social Justice coming up with more refined, specific schemes for women, addressing particular concerns like safety, gender awareness, etc.

Kerala's Social Security Mission has a similarly highly customised set of beneficiaries including care-givers, single mothers, and kidney patients. Meanwhile, Development Boards for the Handicapped have focused on subsidies and Development Corporations for Dalit, Tribal, and Other Backward Class including Minorities have focused mostly on financial empowerment through the provision of grants-in-aid, loans (for housing, education, marriage, etc.). Similarly, the Department of Labour and Rehabilitation provides subsidies and schemes for certain vulnerable categories of workers.

Schemes of departments covering infrastructural determinants like water, sanitation, and housing are largely focused on providing or subsidising infrastructure or in-kind benefits for eligible populations.

Thus we see a combination of approaches, combining both in-kind and cash subsidies to promote the welfare of those living with various vulnerabilities – one time i.e. for Endosulphan survivors, long term, i.e. for minority populations with low income; as well as linked to age, in the support given to children, the elderly, and adolescents. We also see a fair number of schemes that are intersectional in design, e.g. low-income Adivasi women.

Certain schemes are very similar and greater data sharing on beneficiaries could help rationalize scheme coverage and spending. For example, ArogyaKiranam of the health department and Thalolam of the Social Security mission have close to identical eligibility criteria. Coverage data was unavailable for either scheme, and we were thus not able to ascertain whether there is overlap or what is the manner in which these schemes could be harmonized or streamlined. Similarly, NRHM's 2014 Sukrutham scheme appears to overlap with Rashtriya Arogya Nidhi, in place from 1997 onwards and administered through the Department of Finance and Lotteries as Karunya Benevolent Fund.

This would require close attention to the eligibility criteria of various schemes. Pursuing greater financial and programmatic streamlining, efficiency and rationalization will require coordination and information sharing across departments under the stewardship of the Department of Health and Family Welfare. There is also room for better synergy and convergence. The Social Security Mission runs a Hunger-Free City programme for those seeking medical care in cities. This could be linked up to schemes offering treatment in the health department, as well as other departments. Subsidies for employment and transport offered to the differently abled by the State Handicapped Development Board, could be linked or somehow synergised with the schemes offered by the Department of Sainik Welfare, if not in terms of population, but then in terms of design. Similarly, a great deal of schemes for the elderly (pensions, housing, financial assistance) are already converged and managed by Local Self Government Institutions. These could be linked to NHM's Ayurarogyam scheme focused on elderly labourers, as well as the Annapoorna scheme of the Food and Civil Supplies department that focuses on the elderly destitute. Such considerations may guide further a broader initiative on scheme rationalisation and alignment at the state level.

Utilization of Health Services

As early as 1984, Panicker and Soman had observed that the lowering of mortality in Kerala had been accompanied by a high morbidity pattern with more in common with economically developed societies than the rest of India (Gopalakrishna Kumar, 1993). A number of theories and models have been advanced to understand healthcare utilization in these countries/societies. One of the oldest models, the Health Belief Model which was developed by United States public health psychologists more than sixty years ago, an individual's health seeking behavior is activated if the individual perceives herself as susceptible to the disease, perceives the disease as severe, perceives the benefit from getting treated as higher than staying passive and lower than the perceived barriers like cost, side effects of treatment, loss of time etc (Rosenstock 1966). The model has been further extended in the subsequent years: it has been hypothesized that factors like education, skill, motivation, and culture further modify perception. Further, as against barriers in the milieu to seeking healthcare there are triggers too: cues like media reports, family, friends etc.

According to Andersen, individuals have a varied existing predisposition towards seeking care determined by factors like demographics, social hierarchy and belief in benefits of health care. This predisposition is enabled by the family and community resources that the person can access; seeking of care is triggered by the perceived health need which is the person's own view of their general health, experience of the symptoms and their judgment of if these symptoms shall require professional help to resolve. Later additions to the model included health services systems factors and social factors to these above individual and family factors (Andersen, 1995, Bradley et.al, 2002). Bandura (1998) has also viewed health as involving the interplay of self-regulatory and environmental determinants – uptake of health services also follows a similar pattern of having a demand and supply side component.

In understanding utilization patterns in Malappuram and Palakkad, therefore, we are looking at how the supply side aligns with the health needs of the population in the districts by examining uptake and use of services at various locations within the districts at different levels of facilities. Much of our data is limited to public facilities. The first section is on in-patient and outpatient care in 2013-14, followed by a look at the doctors in the facilities, the diseases they treat at each level of the facilities. We also describe trends in 2014-15 OP and IP volumes as compared to 2013-14 volumes. Besides diseases we also studied the major life events: pregnancy and birth followed by immunization. We end by looking at the extent to which major health schemes in the districts, RSBY, Karunya Benevolent Fund and CHIS Plus has been utilized and the utilization through Indian System of Medicine and Ex Serviceman Contributory Health Scheme.

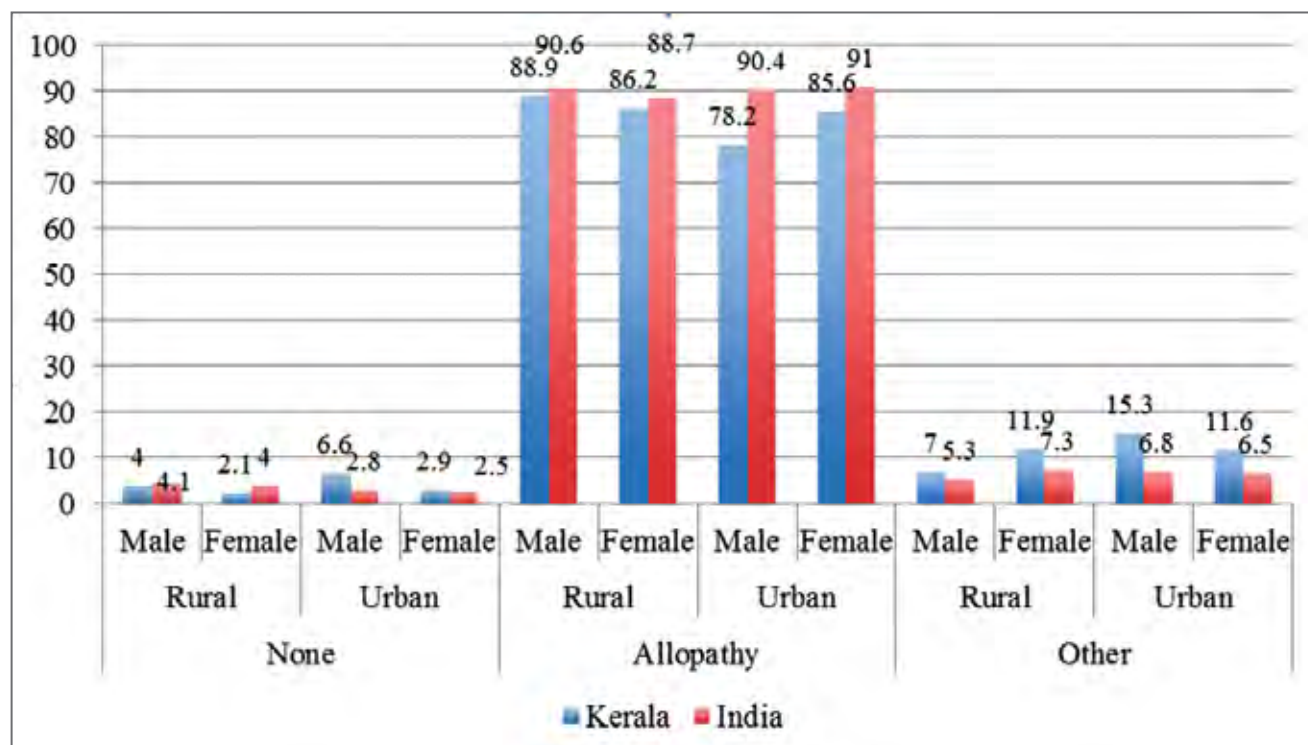
Table 1: Morbidity in Kerala and India by Rural and Urban National Sample Survey 71st Round
(Figures in Actual)

Category	Rural		Urban	
	Kerala	India	Kerala	India
Persons reporting ailment (per 1000)	310	89	306	118

Source: NSSO 71st round

The number of persons reporting an ailment in Kerala is close to three times that reported nationally. Such ailments may be addressed through the provision of non-institutional care, which refers to care that does not require over-night admission of a patient. Unlike institutional care, non-institutional care can be provided in settings like dispensaries by a doctor, nurse and a pharmacist.

Figure 1: Comparison of Percentage Distribution of Spells of Ailment by Nature of Treatment received by Gender in Kerala and India



The above figure shows that allopathy is the most preferred source for treatment by people for ailments (upwards of 78% across genders and place of residence). Notwithstanding this, we see greater reliance on non-allopathic systems of medicine in Kerala – across genders and place of residence – as compared to the national average. This pattern is more pronounced in urban areas: over double the proportion of males and almost double the proportion of females seek non-allopathic care in urban areas, as compared to the average for urban areas nationally. The same pattern holds in rural areas, but is not as pronounced. There is clearly a role for non-allopathic systems of medicine in UHC in this state. Further, in Kerala, treatment is not sought by 4-6% of males and 2-3% of females, meaning that they are possibly using home-based remedies or are unable to seek treatment. In rural areas, this is lower than the national average, suggesting good outreach of care facilities, but in urban areas, the tendency of not seeking treatment in Kerala is higher than national average.

Looking at the dominant trend of care-seeking, further light is shed by examining at what level of care treatment is sought. For one, this gives an indication of how patients perceive the severity of their condition. Further, this has supply side implications, as the higher the level of care, the greater the demands for patient care by way of human resources, infrastructure, etc.

Table 2: Per Thousand Distributions of Spells of Ailment Treated on Medical Advice Over Levels of Care for each Gender

State	Kerala		India	
	Male	Female	Male	Female
HSC/PHC and other*	97	118	79	90
Public hospital	216	242	164	174
Private doctor	360	350	513	497
Private hospital	327	291	243	239
All	1000	1000	1000	1000

Source: NSSo 71st Round

Note: *Others includes ANM/ASHA/AWW/Dispensary/CHC/MMU; Shaded cell indicates highest value in column

In Kerala, as in rest of the country, a third of ailments are handled by private doctors, and two thirds in the private sector in general. However, the proportion of males and females seeking care in public hospitals is higher in Kerala than the national average. Kerala also has roughly one in ten ailments treated at CHC and at lower levels. Compared to India on average, a greater proportion of Kerala males and females seek care from public hospitals.

Kerala's relatively higher utilization of services is explained by Amartya Sen as not being because Keralites are unhealthy than the rest of India but because a Keralite with higher literacy and easy access to healthcare facilities perceives higher illness and seeks remedies more often compared to other Indians. This fits into the models by Rosenstock, Anderson et al., and Bandura described earlier. Gopalkrishna Kumar (1993) notes that, like the morbidity effect observed in Japan, United States and Britain, with increasing life expectancy, morbidity numbers go up. This is because of increased health seeking by longer living people with higher expectations, responding to and able to afford a growing range of niche specialties, spurred by better and earlier detection of long term chronic diseases which require repeated follow-up. Illnesses, which may have caused death earlier, are treated early enough to prevent mortality, but not completely enough to be cured. One thus has large cohorts –and multiple generations - of the population in need of continuous and chronic care. Greater exploration on the nature of health-seeking can help shed more light on this.

Utilization at a Glance: Palakkad and Malappuram

In the next few sections we describe the utilization of the entire public health system broadly in the same order as a patient walking through the system: from out-patient and in-patient volumes, to lab tests, diseases for which patients use the health system including communicable and non communicable diseases and maternal and child events including deliveries and immunization. We follow this up with a detailed discussion on utilization of two major schemes, Karunya Benevolent Fund and Rashtriya Swasthya Bima Yojana. For health care in general, the data we have is limited to broad numbers of outpatients, in- patients and overall lab-tests. As regards maternal and child care, the bed-rock of the public health system, we have data of the entire cycle of care from post-conception to delivery to immunization.

Table 3: Patients Utilizing Health Facilities in the Pilot Districts 2013-14 (Figures in Actual)

Type	Malappuram	Palakkad
Treatment-seeking Behaviour (Public Sector only)		
Number of Outpatients in the Public Sector	1,27,44,628	62,53,784
Number of In-Patients in the Public Sector	1,58,281	1,78,027
Number of Lab Tests in the Public Sector	13,07,170	8,83,232
Reproductive, Maternal and Child Health Coverage (Public and Private Sector)		
Number of Pregnant Women receiving full ANC check-up	92,997	38,761
Number of Deliveries (both Public and Private)	86,458	39,045
Number of Abortions (both Public and Private)	3,464	1,168
Number of Still-Births (both Public and Private)	395	120
Number of cases of Medical Termination of Pregnancy (both Public and Private)	1,649	1,168
Number of Children aged 9-11 with Full Immunization	77,987	43,590
Uptake of Financial Risk Protection (Public and Private Sector)		
Number of RSBY Claims	39,437	23,299
Number of CHIS Plus Claims	2,694	1,979
Number of Karunya Benevolent Scheme Claims	2,123	2,469

Source: District Medical Office, CHIAK, District Lottery Office, HMIS report

We see an overall trend of greater utilization in Malappuram as compared with Palakkad, with the exception of in-patient treatment seeking in the public sector. Palakkad has greater in-patient care coverage in the public sector than Malappuram, which is to be expected, given the penetrance of the private sector in the latter district. Comparing ANC and delivery data, we see greater coverage in Malappuram, indicated by the fact that ANC coverage is greater than the number of deliveries, whereas in Palakkad, ANC completion is lower than the number of deliveries. Full immunization coverage also appears to be fairly satisfactory, although coverage must be triangulated further with analyses of upcoming National Family Health Survey data.

Outpatient and Inpatient Care in Malappuram and Palakkad

As has been shown earlier, in Kerala people utilize both the traditional non-allopathic forms of medicine and modern allopathic medicine. This is found to be the case in both pilot districts, even in the public sector. Among the traditional systems, Ayurveda has historically been popular in Kerala but Homeopathy too has deep roots. Brought to Kerala 125 years ago by missionaries, it had patronage of the Travancore Maharaja and had been included as a recognized system of medicine in the Travancore Medical Practitioners Act, 1943.

Table 4: Patients Attending Government Health Facilities in the Pilot Districts 2013-14

(Figures in Actual) (Figures in brackets are percentages of the respective Column Total)

State	Malappuram		Palakkad	
	Out Patient	In Patient	Out Patient	In Patient
Allopathy	8,158,301 (64%)	1,55,408 (98.2%)	48, 34,763 (77.3%)	175643 (98.8%)
Ayurveda	2,390,280 (18.8%)	1,155 (0.7%)	13, 36,963 (21.4%)	1657 (0.9%)
Homeopathy	2,090,208 (16.4%)	1,718 (1.1%)	78,941 (1.3%)	448 (0.3%)
Unani	90159 (0.7%)	No IP facility	3117 (0.05%)	279 (0.2%)
Siddha	15680 (0.1%)	No IP facility	–	–
Total	1,27,44,628	1,58,281	62,53,784	1,78,027

Source: District Medical Office (H), District Medical Office ISM, District Medical Office Homeopathy

Notes: Figures are rounded off.

More than one third of patients in Malappuram visiting public facilities for out patient treatment approach Ayurveda and Homeopathy institutions. This percentage is lower, but yet a substantial 23% in Palakkad. The other non- allopathic systems, Unani and Siddha have a very low share of patients. When looking at in-patient care however, allopathy is almost exclusively preferred: almost 99% of in-patient admissions in the public sector in both the districts occur in allopathic institutions. Thus, allopathic institutions are the mainstay of in-patient care in the districts.

Outpatient and In-patient Utilization in Allopathy Health Facilities

The public sector has a three-tier referral system. Primary Health Centres (PHCs) are the closest points of access for most of the population above sub-centres, and provide basic treatment for a limited set of conditions. The patients who require more intensive treatment are referred progressively higher up in the system to Community Health Centres (CHC), Taluka Headquarter, Specialty, District and General Hospitals. The referral system is not watertight: a particular patient may choose to directly go to a District Hospital without having been referred by any of the lower centres.

Table 5: Allopathic OP/IP Utilization by Facility Type in the Pilot Districts 2013-14 (Figures in actual. Figures in parenthesis are percentages of the each column total)

Type of Facility	Malappuram		Palakkad	
	OP	IP	OP	IP
General Hospital	6, 56, 346 (8%)	30,159 (1%)	–	–
District Hospital	13, 90,706 (17%)	43,926 (28%)	3,58,725 (7%)	30276 (17%)
Taluka Headquarters Hospital	14,89,897 (18%)	41,264 (27%)	11,41,472 (24%)	84,683 (48%)
Specialty Hospitals	Not applicable	Not applicable	94,304 (2%)	16,404 (9%)
Community Healthcare Centers	19,76,055 (24%)	35,870 (23%)	17,01,015 (35%)	43,862 (25%)
24* 7 PHCs	8, 39,092 (10%)	1,859 (1%)	2,88,097 (6%)	418 (0.2%)
Primary Health Centers	17,72,512 (22%)	620 (0.4%)	12,34,726 (26%)	–
Dispensaries	45,317 (1%)	–	16424 (0.3%)	–
Total	81,69,225	1,55,408	48,34,763	1,75,643

Source: District Medical Office(H)

Notes: 1. Figures in brackets indicate rounded off % ages of the Total OPD/IPD numbers
2. Police Hospital Kallekkad has been considered a dispensary as it has no admissions

Even though PHCs form the bulk of the facilities, less than 1% of admissions take place in PHCs in both districts. It is found that 57% of public allopathic outpatient treatment in Malappuram is in PHCs and CHCs. For Palakkad this figure is 67%. Just 24% of inpatient admissions in Malappuram and 25% of inpatient admissions in Palakkad occur in PHCs and CHCs. Hence in Palakkad more patients proportionately approach the PHCs and CHCs for outpatient treatment than Malappuram: a large portion of Malappuram population prefers higher centres for even out-patient treatment. For in-patient treatment almost the same proportion of patients from both districts get admitted in higher health facilities, namely Taluka Headquarters Hospitals, District and General Hospitals.

OP-IP Variation within Facility Type

Government facilities are supposed to be distributed such that each facility covers roughly a similar number of people, and hence caters to roughly similar number of patients. However, there is a large variance between the number of patients treated in different facilities within the same facility type in both in-patient and out-patient care: this variance matters because broadly, similar facility types are sanctioned similar resources, and yet serve vastly different patient numbers.

Table 6: Daily Average OP Numbers and Range in in the Pilot Districts 2013-14 (Figures in Actual)

Facility Type	Malappuram		Palakkad	
	Avg. OPD/day	Range: Avg. OP/Day	Avg. OPD/day	Range: Avg. OPD/Day
Dispensary	30	0-56	3	0-20
Primary Health Centre	91	6-290	64	12-151
24*7 Primary Health Centre	140	63-239	87	37-162
Community Health Centre	329	116-616	284	114-589
Taluka Headquarters Hospital	828	395-1408	761	519-924
Tribal Specialty Hospital	NA	NA	314	314-314
District Hospital	1545	1376-1671	1196	1196-1196
General Hospital	2188	2188-2188	NA	NA

Source: District Medical Office (H)

Note: NA Stands for Facility not available in the district

There is a remarkably wide range in the patients seen in different CHCs in both Malappuram and Palakkad. On an average, the busiest CHC in Malappuram sees 50% patients more OPD patients per day than the least busy THQH. All the three District Hospitals and the General Hospital in Malappuram see more OPD patients per day on an average than the busiest Palakkad hospital.

Table 7: Daily Average IP Admission Numbers and Range in the Pilot Districts 2013-14 (Figures in Actual)

Facility Type	Malappuram		Palakkad	
	Avg. OPD/day	Range: Avg. OP/Day	Avg. OPD/day	Range: Avg. OPD/Day
Primary Health Centre	26	0.3-52	0	0
24*7 Primary Health Centre	39	11-56	35	35-35
Community Health Centre	187	5-662	215	4-1181
Taluka Headquarters Hospital	573	121-1243	1412	289-2897
Tribal Specialty Hospital	NA	NA	1367	1367-1367
District Hospital	1220	1449	2523	2523-2523
General Hospital	2656	2656-2656	NA	NA

Source: District Medical Office (H)

The busiest CHC in Palakkad admits almost four times the number of patients as the least busy THQH. The busiest CHC in Malappuram admits more than five times the number of patients as the least busy THQH. The busiest Taluka Hospital in Palakkad admits more patients on an average than the District Hospital.

Bed Occupancy Rate in Malappuram and Palakkad District

The Bed Occupancy Rate divides the number of inpatients at midnight on a given day (with a multiplier of 100) by the number of available beds over a given period of time (365 days in our case) (Osborn 2008). It is a proxy for the utilization of the hospital by inpatients. The level of occupancy also varies with the type of facilities available in the hospital. Usually the larger number of beds, the greater the HRH available to serve patients in that facility, providing a wider range of services. Given this, it is normally the case that the bed occupancy rate in secondary and tertiary care facilities is higher than that in CHCs.

Table 8: Bed Occupancy Rate in Malappuram District in 2013-14 (Public Sector only) (Figures in Actual and Percentage)

Facility Type	Number of Facilities	Existing Beds	Midnight IP Count	Bed Occupancy Rate in Percentage
General Hospital	1	501	266814	145.9
District Hospital	3	483	379434	215.2
Taluka Head Quarters Hospital	6	497	260085	143.3
Community Health Centres	20	453	117787	71.2
Primary Health Centres	86	492	83246	46.3

Bed occupancy rate = Inpatient head count at midnight for a given period x 100 / Available beds x Number of days in the period
Source: District Medical Office(H), HMIS Report

As expected, the bed occupancy rate is higher in secondary and tertiary care facilities than the community health and primary health centres in the district. Interestingly, there's a doubling of bed occupancy moving from PHCs to CHCs and from CHCs to THQH and GH. The highest rates are found in the three district hospitals, and not the general hospital (also to be expected as the latter is just one facility, while the district hospital is three).

Table 9: Bed Occupancy Rate in Palakkad District in 2013-14 (Public Sector only) (Figures in Actual and Percentage)

Type of Facility	Number of Facilities	Existing Beds	Inpatient Head Count at midnight	Bed Occupancy Rate in Percentage
District Hospital & Women & Child Specialty Hospital	2	501	266814	145.9
Specialty Hospital	1	54	20545	104.2
Taluka Hospital	6	668	259122	106.3
Community Health Center	19	613	67017	30.0
Primary Health Center	75	577	353	0.2

Source: District Medical Office (H), HMIS Report

Note: In 2013-14 the utilization data of Women and Child Hospital and District Hospital Palakkad was given together

Palakkad follows a similar pattern as Malappuram, although here, there is a tripling in occupancy from PHC to CHC, and from CHC to THQH. The tribal specialty hospital and THQH have on average very similar occupancies; while the district and women and child specialty hospital have higher occupancy. Also, it is noteworthy that the bed occupancy at PHC level in Malappuram is negligibly low, unlike Palakkad.

Utilization of Diagnostic Services

Availability of at least basic lab services has become an almost indispensable aid to diagnosis. We have broad data of volume of tests done at various facilities in the districts.

Table 10: Facility Wise Lab Tests in the pilot districts in 2013-14 (Figures in Actual)

Diagnostic Interventions	Malappuram	Palakkad
Primary Health Center	2,29,560	1,82,038
Community Health Center	3,25,451	3,26,472
Taluka Hospital	2,35,728	2,21,713
District Hospitals	3,05,915	97,029
General Hospital	2,10,516	NA
Specialty Hospital	NA	55,980
Total	13,07,170	8,83,232

Source: District Medical Office Health

In Malappuram the labs are more actively used than Palakkad, following a similar pattern to the numbers of out-patients comparatively in each district. Thus, these numbers are to be expected. It is also noted that the largest number of tests is being carried out at the CHC level in both districts – also to be expected, given the availability of facilities at this level. Malappuram is different from Palakkad in that a lot more tests are being carried out at the district hospital level. Considering the high IP, OP and bed occupancy levels in Palakkad's tribal specialty hospital, the comparatively lower number of laboratory tests should be further looked into.

Maternity and Childcare Events

Among the major services provided by the public system are ante natal care, delivery services and immunization. The number of deliveries in the private sector has steadily increased as the sector has expanded and the purchasing power of the population has grown.

Table 11: Public and Private Hospital Deliveries in in the Pilot Districts 2013-14 (Figures in actual; Figures in Parenthesis are Percentages of total Deliveries in each district)

Sector	Malappuram	Palakkad
Deliveries in Public Institutions	16,214 (18.75%)	9,003 (23.1%)
Deliveries in Private Institutions	70,244 (81.25%)	30,042 (76.9%)
Total	86,458	39,045

Source: HMIS Report

Private facilities are utilized much more than the public ones for delivery and the trend are a bit more pronounced in Malappuram (about four times the number of deliveries in the private sector as compared to the public sector) than Palakkad (about three times the number of deliveries in the private sector as compared to the public sector). There are also over double the number of deliveries overall in Malappuram as compared to Palakkad.

Table 17: Institutional Delivery by Type of Facility in the Pilot Districts 2013-14 (Figures in actual and Percentages)

Category of Facility	Malappuram	Palakkad
Deliveries in Public Institutions	16214	9003
Public deliveries below Taluka Hospitals	762	297
% Public deliveries below Taluka Hospitals	4.7	3.3

Source: HMIS Report

The public health system has built a cadre of Auxiliary Midwife and Nurses and facilities for safe deliveries from the most basic sub-centre level, to enable easy access to delivery care. However, with increased education levels and falling fertility rates, expectant mothers are more inclined to want their deliveries with the assistance of doctors and availability of advanced care.

As seen here, only 3-5% of deliveries in the public sector are at levels below Taluka Hospitals; almost all public deliveries happen at public hospitals with 100 or more beds. The public health system was originally designed mainly for deliveries and family planning with a cadre of ANMs to conduct deliveries even at the sub centre level. In Kerala however, almost no deliveries happen in PHCs and CHCs, possibly because of the public belief that deliveries should take place in larger hospitals. This implies that either more and more people should be persuaded at Ante Natal Care level to have their delivery in PHCs or CHCs or that the role of PHCs and CHCs be redefined with reference to deliveries.

Table 18: Caesarean Section Deliveries in Public & Private Facilities in Pilot Districts 2013-14 (Figures in actuals; Figures in parenthesis are proportions of total deliveries in respective sector)

Sector	Malappuram	Palakkad
Number of Caesarian Deliveries in Public Institutions	4,858 (29.96%)	2,966 (32.94%)
Number of Caesarian Deliveries in Private Institutions	19,952 (28.4%)	8,755 (29.14%)

Source: HMIS Report

Strikingly, Caesarean deliveries reportedly comprise a marginally greater proportion of all deliveries in public hospitals than in private hospitals in both the districts. The rate in Palakkad public institutions is certainly high. This is a consequence as most public deliveries are occurring in higher level facilities. These Caesarean Section rates are much higher than the 10-15% rate the WHO recommends, and 3-4 times the Indian average. Yet, they do reflect a growing trend in the state overall, which approximates what has been seen in China (25.9%) and the United States (30.3%). Overall, public institutions can try and bring their rate down to 15%-20% to reduce the cost on the health system.

Table 19: Obstetric Care in Public Health Facilities in the Pilot Districts 2013-14 (Figures in percentages)

Category	Malappuram	Palakkad
% Discharge within 48 hours in Public facilities	0.03	0.11

Source: HMIS Report

Most pregnancy complications happen with 48 hours of delivery. That a negligible number of women are recorded as having been discharged within 48 hours may mean that the public facilities manage to keep the delivered mothers for a sufficient time to take care of complications. This is a desirable precaution and should be maintained.

Table 20: Medical Termination of Pregnancy in the Pilot Districts 2013-14 (Figures in Actual)

Sector	Malappuram	Palakkad
Public	3	171
Private	1,646	559
Total	1649	730

Source: HMIS Report

Almost all the Medical Terminations of Pregnancy in Malappuram take place in the private sector, whereas in Palakkad almost one fourth of them (23.4%) take place in the public sector. Ensuring access to this critical reproductive health services should be upgraded in public facilities in both districts, and on a priority basis in Malappuram, where possibly the demand may be higher.

Immunization Coverage

As per WHO, immunization is the process of making a person resistant or immune to an infectious disease, usually by administration of a vaccine. WHO recommends vaccinations as one of the most cost-effective health-investments which have a major role in controlling and eliminating life-threatening infectious diseases. Kerala has long had a lead over rest of India in immunization with 84% coverage in early 1990s which has been followed by a decline in subsequent years (Varghese, Raman Kutty, Paina, Adam, 2013). We shall in the following discussion have a look at the immunization indicators in the two districts.

Table 21: Immunization Coverage in the Pilot Districts 2013-14 (Figures are Actual Figures in parenthesis are percentages)

Indicator	Number Covered	
	Malappuram	Palakkad
Full Immunization coverage (9-11 months) in public and private sector		
Males	39,918	22,310
Females	38,069	21,280
Total	77,987	43,590
Full Immunisation coverage (12-23 months) in public and private sector		
Males	8,314	1,682
Females	7,652	1,685
Total	15,966	3,367
Ratio of public to private immunization		
9-11 months	51:1	9.6:1
12-23 months	53.3:1	15.3:1
Ratio of DPT1 to DPT3 coverage	2.8	0.76
Tribal immunization coverage (illustrative, for Nilambur block only)	987	NA

Source: HMIS Report

We found appreciably high rates of full immunization in Malappuram for 9-11 month aged children, with minor gender-related inequality. Further analysis, using life table methods, may help determine the coverage rates of full immunization- allowing triangulation of HMIS data with DLHS-4 data, which shows coverage of full immunization for children aged 12-23 months was passing the 80% mark in both districts.

We also found something in the order of 50 times the number of vaccinations in the public sector as compared to the private sector in this district. Further, almost 3 times the number of children were reportedly receiving DPT1vaccination as compared to the number receiving DPT 3 vaccination, suggesting significant drop-off at follow-up. These concords with the concerns raised recently over the increase in vaccine-preventable diseases in the district. Thus while the public sector has been shouldering the bulk of the responsibility of immunization in the district, greater strengthening of immunization outreach is required, particularly for multi-dose vaccines.

In relation to coverage of tribal populations in particular, it is noted that up to 70% of Malappuram’s Scheduled Tribes population resides in Nilambur block. We found that scheduled tribes represent roughly 21.3% of the under-five population, tribal children under the age of five represent approximately 32.1% of the total under five population receiving primary immunization (987 children, above). Thus, this population is favored for primary immunization coverage, although the same cannot be said of nutrition intervention coverage, in the absence of routine data.

In Palakkad, full immunization coverage in the 9-11 month age group was found to be very high, with negligible differences between males and females. The ratio of public to private immunization in this group was 9:1, suggesting that a relatively greater role is played by the private sector in immunization coverage in this district as compared to Malappuram. Moreover, the ratio of DPT1: DPT3 coverage is 0.76 – somewhat curious, suggesting that more children are getting DPT3 immunization than DPT 1. There is a need for greater examination into the role of the private sector in providing immunisation and in driving up numbers of DPT3 immunization. We were not able to examine immunization coverage in adivasi communities because of lack of data; even though Palakkad has the third largest population of tribals in the state. There is a critical need in this district for disaggregated data on immunization coverage for vulnerable groups like tribal populations, particularly in underserved areas like the Attapady hill area, where child morbidity has been a major health system challenge, and where other child health interventions (like Janani Jatak for growth monitoring) are underway.³

Table: 22 Location Preferences for Immunization (Pentavalent Vaccine) in the Pilot Districts 2013-14

(Figures are percentages)

Sector	Malappuram	Palakkad
Primary Health Center	70%	59%
Community Health Center	17%	24%
Taluka Head Quarters Hospitals	8%	7%
District Hospital	3%	4%
Private Sector Hospital	4%	6%

Source: HMIS Report

Location of Immunization

The public system provides 96% and 94% of vaccinations in Malappuram and Palakkad districts respectively for pentavalent vaccine. PHCs seem to be at the forefront of delivery of vaccinations in Malappuram, whereas in Palakkad comparatively more vaccination takes place at CHC level.

Family Planning

Family Planning is a public run programme for contraception, birth spacing and sterilization. The guarantee of reproductive choice and access is the hallmark of a well-functioning system.

Table 23: Sexual and Reproductive Health and Family Planning Coverage 2013-14
(Figures are Actual Figures in parenthesis are percentages)

Indicator	Number covered (Proportion of eligible population#)	
	Malappuram	Palakkad
Number of eligible couples in public sector receiving sterilization services	4,919 (0.2%)	3,431 (2.3%)
Ratio of deliveries to postpartum sterilizations	16.5:1	15.2:1
Ratio of female to male initiation of RTI/STI treatment	1.58:1	1.49:1

Source: HMIS Report

In Malappuram, it was found that 6% of the overall population has access to HIV testing and that among females, 53% of HIV testing is conducted in ANC settings. VDRL (syphilis) screening occurred in approximately 3% of the overall population. Two out of every 1000 eligible couples received sterilizations in the public sector (data on couple eligibility in private sector was not available). We also found that for every 16 deliveries, there was a post-partum sterilization in 2013. No data was available on other methods of birth control, other than numbers of condoms distributed. As regards treatment for Reproductive Tract and Sexually Transmitted Infections, we found that 58% more women had initiated treatment in 2013 as compared to men in Malappuram.

In Palakkad, we found that 1% of the overall population aged 15 to 65 had sought HIV testing; 59% of the tests among females were conducted in the ANC setting. The uptake of sterilization services in Palakkad was about ten times that in Malappuram, or 2.3% of eligible couples received sterilization services in the public sector. In Palakkad, for every 15 deliveries, one post-partum sterilization was taking place in 2013. Finally, 49% more women initiated RTI/STI treatment in this district. It is difficult to extrapolate further in the absence of data on prevalence of RTIs and STIs in either district.

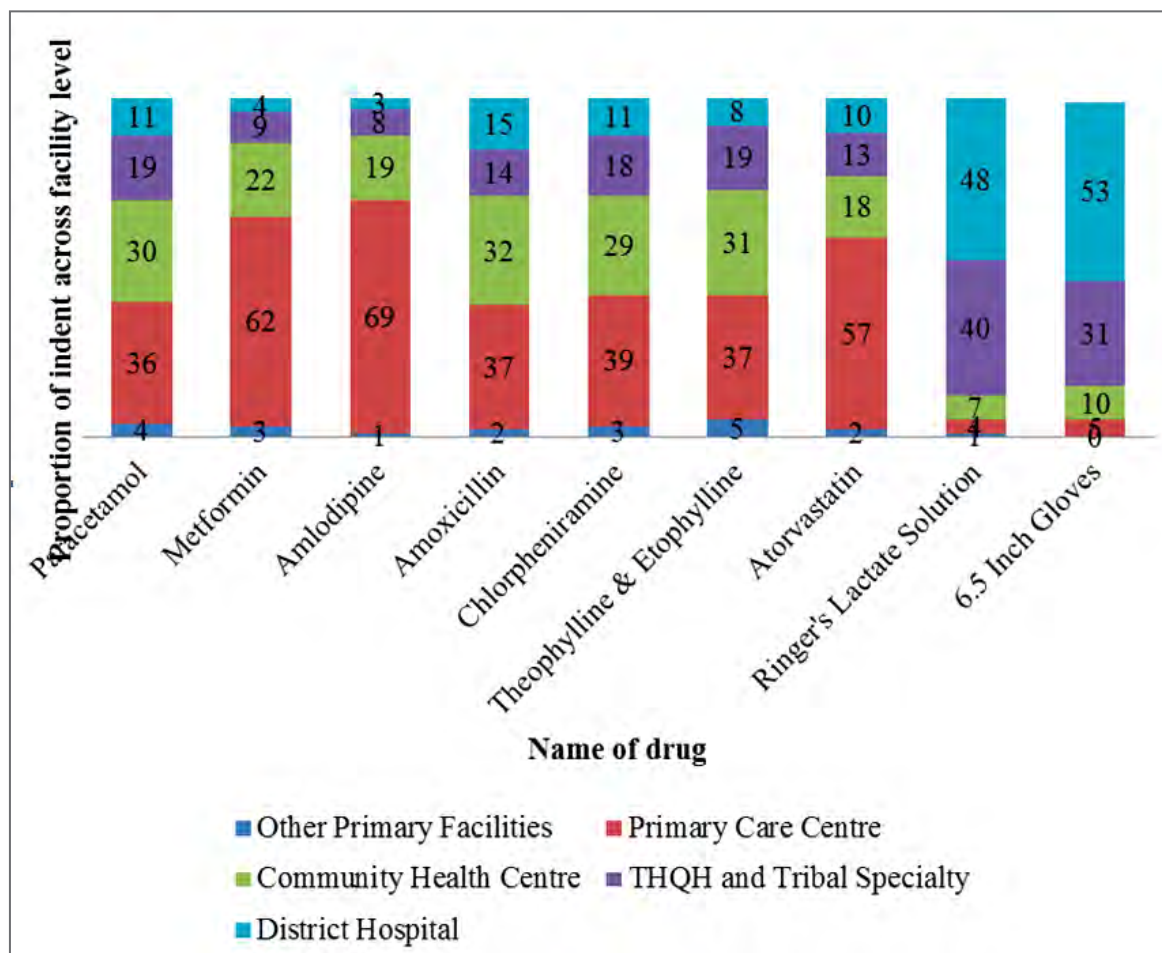
Overall it was found that the data available on the HMIS with respect to reproductive and sexual health did not lend itself to understand population coverage of services. For instance, oral pill cycle and condom distribution does not give an indication of actual population coverage or the exercise of contraceptive choice. Suggested indicators could include number of medical terminations of pregnancy performed, as well as some measures of use of contraceptives/exercise of contraceptive choice through self-report of patients.

Drugs and Medicines in Government Facilities

Our data for drugs and medicines is limited to drugs that have been indented by various facilities only for palakkad. We do not have data for the actual volume of drugs consumed by patients in each facility.

We consider the indents of the leading drugs (by quantity) within each major category in their standard adult doses. Antipyretic Paracetamol (500mg.), Antidiabetic Metformin (500 mg.), Anti hypertensive Amlodepin (5mg.), Antibacterial Amoxicillin (500 mg.), Anti allergic Chlorpheniramine (2 mg.), Antiasthmatic Theophylline and Etophylline (100 mg.), Anti lipid Atorvastatin (10mg.), intravenous fluid (500 ml.) Ringer's Lactate, and sterile 6.5 inch gloves.

Figure: 1 Drugs Indented Palakkad 2014-15



As aforementioned, PHCs account for 32% of all OPD treatments and 0.2% of IPD treatments, CHCs for 35% of the OPD treatments and 25% of IPD treatments, THQH and Specialty Hospitals for 26% of the OPD treatments and 57% of IPD treatments and the DH accounts for 7% of the OPD treatments and 17% of the IPD treatments in the districts. PHCs are the mainstay of primary prevention of non-communicable diseases: more than three fifths of antidiabetic metformin and antihypertensive amlodipine and almost three fifths of antilipid drug Atorvastatin are indented by PHCs.

For all oral medicines in the table, CHCs indent a lower proportion than the PHCs even though CHCs see a higher number of both OPD and IPD patients than PHCs. This suggests under-utilization of CHCs. The mainstay of in patient treatment, intravenous Ringers Lactate solution is disproportionately indented by the District Hospital, though the District Hospital has far fewer admissions than all the Taluka Headquarters Hospitals combined. Similarly, more than half of the main consumable used in procedures, 6.5 Inch gloves are indented by the District Hospital, though the District Hospital has just over one sixth of the total admissions in the district.

Doctor Utilization

Each facility-type is staffed by the same broad norms and is sanctioned similar number of doctors. However, as there is huge variance between the numbers of patients seen in across facilities, and in the number of patients treated by a doctor across facility types and across facilities within the same facility type.

Table 24: Doctors Utilization in in the Pilot Districts for 2013-14

Facility Type	Average No. of Doctors/facility		Average of OPD /Doctor /Day	
	Malappuram	Palakkad	Malappuram	Palakkad
Dispensary	0.8	0.2	22	21
TB Clinic	0	2	0	14
Leprosy Control Unit	Not applicable	0	Not Applicable	0
Primary Health Centre	1.3	1.2	67	60
24*7 Primary Health Centre	2	2.1	79	69
Community Health Centre	5	4.5	72	75
Taluka Headquarters Hospital	12.1	12.8	78	65
Tribal Specialty Hospital	NA	15	NA	22
District Hospital	24.1	42	67	29
General Hospital	41	NA	55	NA

Source: District Medical Office (H)

Notes: Figures rounded off, 52 weeks considered annually

In Malappuram, by sheer patient numbers the Taluka Headquarters Hospital doctors are the busiest with the second highest number of OPD patients and the joint highest number of admissions. In Palakkad too Taluka Headquarters Hospitals seem to be the busiest for the doctors, and are in patient volume much busier than the District Hospital. In fact Palakkad Taluka Hospital doctors seem to have by far the most in-patient admissions in either district.

Though Malappuram's nodal hospital is called General Hospital (GH) in Manjeri and Palakkad's nodal hospital is called District Hospital Palakkad (DH), by size and magnitude DH Palakkad is more aptly compared with GH Manjeri than the other District Hospitals in Malappuram. There are also intra-district variations demonstrating a mis-match between patient volume and human resources. For instance, in Palakkad, THQH Chittur and THQH Ottapalam have 9 and 12 admitting specialists respectively which is comparable to the admitting specialists in THQHs in Mannarkad and Alathur. Alathur THQH and Mannarkad THQH however admit 4-7 times more patients than THQHs in Chittur and Ottapalam.

The CHC and 24*7 PHC averages mask huge intra-group variations, as most 24*7 PHCs and a few CHCs do not admit patients. For example for Malappuram, if we consider just the CHCs that admit patients, the average patients admitted per week by each doctor climbs to 9 from 7.

In a Malappuram PHCs and 24*7 PHCs, a doctor on an average sees more patients than in Palakkad: as against this, in Palakkad CHCs on an average, doctors see slightly more patients than in Malappuram

Palakkad has a functional Tuberculosis Clinic but an unstaffed Leprosy Control Unit with no doctors or patients. In Malappuram there is no Leprosy Control Unit and the Tuberculosis Unit has no doctors or patients.

Scheme Utilization

The government endeavours to improve the health status and reduce the out of pocket expenditure of various target groups through various schemes, as described earlier. Here we present a snapshot of scheme coverage through the proxy of beneficiaries reported by specialised agencies and the District Medical Office.

Table 25: Scheme wise Utilisation by Beneficiaries in the Pilot Districts (2013-14)

(Figures in actual)

Facility Type	Beneficiaries	
	Malappuram	Palakkad
Janani Suraksha Yojana	13577	3255
Janani Shishu Suraksha Kayakram	36279	8688
Palliative Care Programme Nos. of patients seen in Home care, Palliative OP, Secondary care)	27059	7260
District(Community) Mental health Programme (Total patients seen in the Community Mental Health Clinic)	9646	2019
National Programme for Control of Blindness (Cataract Operations)	1097	1153
National Leporasy Eradication Programme (Cases detected)	95	136
Revised National Tuberculosis Eradictiaon Programme (Sputum Examined)	39007	23693

Source: Institute of Mental Health and Neuroscience, District Medical Office (H)

It is difficult to assess coverage without a clearer indication of denominators (or populations eligible) across each of these schemes. Future work in the districts shall have to focus on enumerating this.

Apart from the above schemes, two schemes, Karunya Benevolent Fund and Rashtriya Swasthya Bhima Yojana which are not under the Health Department, have a major role in financing treatment of both routine and major illnesses. We have analysed them in detail.

Karunya Benevolent Fund

The strides made by medical science in the last half a century life mean that life threatening illnesses like Cancer and Chronic Kidney Disease, can now be treated. Survival rates for these ailments have steadily improved with newer treatment modalities which are at the same time expensive. There have been efforts from various governments to make these modern treatments for life threatening illnesses affordable for target population groups. Nationally, the Ministry of Health started the Rashtriya Arogya Nidhi in 1996 and encouraged states to set up their own illness assistance fund. Andhra Pradesh state government pioneered with its state funded insurance scheme: Arogyasri. This model was subsequently taken up by Karnataka and Maharashtra governments.

Karunya Benevolent Fund has a similar purpose of making expensive treatments affordable for many: its innovation is in its funding mechanism. KBF was devised by Kerala State's Finance Ministry in 2011 and rolled out by February 2012 by the State Lottery Department, to enable public funding of high-value catastrophic illnesses through the profits of a Karunya Lottery. The scheme is cashless for members of families with an annual income less than Rs. 3,00,000. The scheme reimburses up to Rs. 2 lakh per patient for empanelled hospitals for performing heart surgery or angioplasty, brain or liver surgery, kidney/liver/heart transplant, maintenance dialysis, cancer treatment including surgery, chemotherapy and radiotherapy and for haemophilia treatment and Rs. 3 lakh for treatment of haemophilia patients. Both public and private hospitals may be empanelled: there are defined package rates for each procedure for private hospitals, public hospitals do not have package rates but utilization of the scheme has been progressively increasing: the amount sanctioned through the scheme for the state increased from Rs. 103 Cr. in 2012-13 to Rs.183 Cr. in 2013-14, to Rs. 241 Cr. in just the first half of 2014-15. In Malappuram the scheme has thirteen government hospitals and six private hospitals and in Palakkad it has twenty two government hospitals and nine private hospitals in its ambit. Four of these thirteen government hospitals and five of the six private hospitals in Malappuram actively treated patients; in Palakkad four of the twenty two empanelled hospitals and six of the nine empanelled hospitals actively treated patients. We shall now have a look at the volumes of patients treated through the scheme, the hospitals and districts they were treated in, the diseases they were treated for and the amount spent by the government on them.

Table 26: Utilization under Karunya Benevolent Fund in the Pilot Districts by Sector 2013-14 (Figures in Actual)

Sector	Malappuram	Palakkad	Grand Total
Government Hospital	1329	1204	2533
Private Hospital	794	1265	2059
Grand Total	2123	2469	4592

Source: District Lottery Office

Though Malappuram has a much larger population than Palakkad, more patients in Palakkad benefitted from KBF than in Malappuram. More than three fifths of beneficiaries in Malappuram (62%) got treatment in government hospitals; in comparison less than half of the patients in Palakkad (48%) got treated in private hospitals.

Table 27: Gender wise Utilization of Karunya Benevolent Fund in the Pilot Districts 2013-14 (Figures in Actual and in Percentages)

District	Malappuram		Palakkad	
	Nos. of Cases	Percentage	Nos. of Cases	Percentage
Female	731	34.43%	922	37.34%
Male	1392	65.57%	1547	62.66%
Total	2123	100%	2469	100%

Source: District Lottery Office

Data shows that both in Malappuram and Palakkad districts males have utilized the benefit of Karunya Benevolent Fund scheme more than the females. This could be tied to disease burden or to gender discrimination – closer examination of this should be a future priority and can shape further design of the programme.

Table 28: District of Utilization through Karunya Benevolent Fund from the Pilot Districts 2013-14 (Figures in Actual and in Parenthesis are Percentages)

District of treatment	Malappuram Patients	Palakkad Patients
Trivandrum	456 (21%)	654 (26%)
Kozhikode	853 (40%)	173 (7%)
Malappuram	607 (29%)	217 (9%)
Thrissur	119 (6%)	642 (26%)
Palakkad	1 (0.05%)	692(28%)
Kannur	68 (3%)	40 (2%)
Kottayam	17 (1%)	37 (1%)
Ernakulam	2 (0.1%)	11 (0.4%)
Alappuzha	-	3 (0.1%)
Total	2123	2469

Source: District Lottery Office

Less than three tenth of patients in Malappuram or Palakkad got treated in their home district perhaps reflecting on the perceived lack of health facilities in these districts to treat tertiary care illnesses. Neighbouring districts have played an important role in both the districts. For Malappuram, almost two out of five Karunya patients was treated in Kozhikode, whereas in Palakkad more than one in four patients wastreated in Thrissur. Comparatively fewer patients from Palakkad got treated in its other neighbouring district, Malappuram, while almost none of Malappuram patients got treated in Palakkad.

More than one in five patients in both the districts traveled the distance to Trivandrum for treatment, reflecting on the importance of institutes like Regional Cancer Centre and Sree Chitra Thirunal Institute in the state's capital. Hopefully the new medical colleges in both the districts will be able to fill the strong need for services within the districts.

Table 29: Top Ten Hospitals by Volume of patients from Malappuram and Palakkad for Karunya Benevolent Fund in 2013-14 (Figures in Actual)

Hospital Name	Malappuram	Palakkad	Total
Medical College Hospital Kozhikkode	738	144	882
Regional Cancer Centre Trivandrum	320	471	791
EMS Memorial Co-operative Hospital Perinthalmanna	267	144	411
Jubilee Mission Medical College Thrissur	49	294	343
Medical College Chest Hospital, Thrissur	36	284	320
SreeChithraThirunal Institute, Trivandrum	126	179	305
Lakshmi Hospital, Palakkad	-	295	295
Valluvanad Hospital Complex Ltd, Ottappalam	1	281	282
MES Medical College Hospital, Perinthalmanna	169	48	217
Malabar Cancer Centre, Kannur	65	33	98
Total	1771	2173	3944

Source: District Lottery Office

The top ten hospitals in the scheme treat more than 85% of the total beneficiaries in the two districts; five of these are government hospitals, five are private hospitals. The four hospitals from the two districts in the top ten: EMS and MES in Malappuram and Lakshmi and Valluvanad in Palakkad are all private hospitals. In fact, just 1.2% of Karunya beneficiaries in Malappuram and 1.6% of Karunya beneficiaries in Palakkad seek treatment in government hospitals within their respective districts.

Table 30: Disease wise Utilization of Beneficiaries through Karunya Benevolent Fund in the Pilot Districts 2013-14 (Figures in Actual and in Parenthesis are Percentages)

Disease	Malappuram	Palakkad
Cancer	842 (40%)	933 (38%)
Heart Ailments	805 (38%)	856 (35%)
Kidney Disease	427 (20%)	626 (25%)
Brain and Liver Ailments	34 (2%)	37 (1%)
Spine and Spinal Cord Injury	3 (0.1%)	11 (0.4%)
Hemophilia	12 (0.6%)	-
Severe Respiratory Disease	-	5 (0.2%)
Palliative Care	-	1 (0.04%)
Grand Total	2123	2469

Source: District Lottery Office

Almost 98% of treatments in both the districts are for Cancer, Heart Ailments and Kidney Disease in both the districts. According to NCD prevalence data from the District Office, Palakkad has roughly four times the number of cancer cases as Malappuram - which explains the number of cases reported for KBF as well. Heart disease in Malappuram is roughly double the prevalence in Palakkad, and yet we see fewer cases in KBF in the former district as compared to the latter. Palakkad has many more cases of renal failure and more cases of Diabetes Type II than Malappuram according to district data, which gives context to the larger number of claims in the district for kidney disease.

Comprehensive Health Insurance Plus (CHIS Plus)

The Comprehensive Health Insurance Scheme Plus (CHIS Plus) was launched by Government of Kerala on 22nd February 2011 as part of their policy to ensure medical treatment to the poor. The Comprehensive Health Insurance Agency Kerala (CHIAK) is implementing the scheme which has turned out to be boon for the economically weaker sections of the society who are suffering from Cancer, Kidney related, Liver related and Heart related diseases to meet the catastrophic health expenses impoverishing their families. The major attraction of the scheme is that, it's implemented through a non-insurance route. The hospital where the beneficiaries seek treatment can directly claim the cost of treatment up to 1 Lakh.

Population covered under the scheme: All the enrolled families under Rashtriya Swasthya Bhima Yojana (RSBY) and Comprehensive Health Insurance Scheme (CHIS) scheme in the State. Size of the family is maximum 5 members. The diseases Covered are Heart, Renal diseases, Cancer, Neurosurgery and Accident Trauma Care. The financial benefit of the scheme offers free treatment up to Rs. 70000/- for a family for tertiary level care, apart from the Rs. 30000/- worth treatment for general illness under Rashtriya Swasthya Bhima Yojana (RSBY) and Comprehensive Health Insurance Scheme (CHIS). The service providers are all government medical colleges, Regional Cancer Center (RCC), Sreechitra Thirunal Institute of Science and Technology, General, District and Taluka hospitals in the State where tertiary care listed under the scheme is provided. The claims processing is that the hospital processes the claims through online system. CHIAK has developed online software with the support of Keltron to manage the claims of the hospitals. Each empanelled hospital is provided with a user id and password. The package rate specific to each procedure is provided in the software.

Table 31: Utilization of CHIS Plus in the Pilot Districts by Gender 2013-14 (Figures in Actual and Percentage)

District	Malappuram		Palakkad	
	Nos. of Claims	Percentage	Nos. of Claims	Percentage
Female	992	36.82%	669	33.80%
Male	1702	63.18%	1310	66.20%
Total	2694	100%	1979	100%

Source: Comprehensive Health Insurance Agency Kerala

We can see that like Karunya Benevolent Fund in CHIS Plus, Males have utilized the scheme more than the females in Malappuram and Palakkad District by a ratio of 2:1.

Table 32: Utilization through CHIS Plus in the Pilot Districts 2013-14 (Figures in Actual and Percentages)

District	Malappuram		Palakkad	
Gender	Nos. of Claims	Percentage	Nos. of Claims	Percentage
Cancer	1079	40.05%	974	49.22%
Nephrology	765	28.40%	855	43.20%
Cardiac/Cardiothoracic	743	27.58%	140	7.07%
Abdomen	86	3.19%	9	0.45%
Palliative Care	4	0.15%	1	0.05%
Breast	1	0.04%	0	0%
Gynecology	1	0.04%	0	0%
Neuro Surgery	12	0.45%	0	0%
Total	2694		1979	

Source: Comprehensive Health Insurance Agency Kerala

In Malappuram district people have utilized the Chis Plus scheme for Cancer diagnosis and treatment 40.05% of total claims, followed by nephrology (which includes chronic kidney disease, dialysis etc) at 28.40%, and Cardiac cases at 27.58% of total claims. Other treatments like abdomen related, palliative care, breast related, gynecology, and neuro surgery account for about 5%. In contrast, Palakkad shows nearly half of the utilization was for cancer, and another 43.2% for nephrology. Cardiac related cases accounted for 7.07% with one claim for palliative care.

Table 33: Hospital wise claims under CHIS Plus in the Pilot Districts 2013-14 (Figures in Actual and Percentages)

District	Malappuram		Palakkad		Total
Gender	Nos. of Claims	Percentage	Nos. of Claims	Percentage	
Kozhikode Medical College	1820	67.56%	165	8.34%	1985
Regional Cancer Centre	522	19.38%	499	25.21%	1021
Thrissur Medical College	101	3.75%	691	34.92%	792
Palakkad District Hospital	0	0%	363	18.34%	363
Thrissur District Hospital	85	3.16%	152	7.68%	237
Sree Chithira Thirunna Hospital	58	2.15%	66	3.34%	124
Malabar Cancer Center	82	3.04%	19	0.96%	101
District Hospital Tirur	21	0.78%	0	0%	21
Kottayam Medical College	0	0%	14	0.71%	14
Trivandrum Medical College	4	0.15%	3	0.15%	7
Ernakulam General Hospital	0	0%	4	0.20%	4
Alappuzha Medical College	0	0%	3	0.15%	3
Pariyaram Medical College	1	0.04%	0	0%	1
Total	2694		1979		4673

Source: Comprehensive Health Insurance Agency Kerala

Data shows that beneficiaries in both districts depended on the nearby medical colleges for tertiary care treatments and the Regional Cancer Center for cancer diagnosis and treatment. In Malappuram, the district hospital was only utilized for 0.78% cases under the scheme, where as in Palakkad, district hospitals were been utilized 18.34% cases.

Rashtriya Swasthya Bhima Yojana

The government of Kerala has actively taken up and expanded the Central Government Social Insurance Scheme: Rashtriya Swasthya Bima Yojana which covers secondary care disease up to an annual limit of Rs. 30000 per household. The Kerala government actively rolled out RSBY in all its 14 districts in 2009: while the central government scheme was for households under the 2002 poverty line, the state government expanded coverage to all under Kerala state's definition of its poverty line which almost doubled the coverage. In addition all SCs and STs were included.

The government also expanded the coverage to treatment of a few tertiary care diseases like Heart Disease and Chronic Kidney Disease to an annual limit of Rs.70000 per household and named this extension of the scheme as RSBY Comprehensive Health Insurance Service-Plus. As RSBY is a foundational scheme for social insurance, we analyse the data of the scheme in detail.

Table 34: Eligible Population, Coverage and Utilization under RSBY-CHIS Scheme in the Pilot Districts 2013-14 (Figures in Actual and Percentages)

District /Category	Eligible	Percentage	Nos. of Claims	Percentage	Total
Malappuram	317871	292323	264526	83%	39437
Palakkad	237167	204870	203147	86%	23299

Source: Comprehensive Health Insurance Agency Kerala

RSBY is supposed to cover 39% of the households in Malappuram and 33% of the Palakkad households. The enrolment was high in both districts but yet 17% and 14% of the eligible households are not covered in Malappuram and Palakkad respectively. In both Palakkad and Malappuram, almost the same proportion of medical cases was treated in public hospitals. However in Malappuram a lot more cases requiring procedures were treated in the private sector than in Palakkad.

Table 35: Utilization through RSBY- CHIS in the Pilot Districts 2013-14 (Figures in Actual and Percentages)

District	Malappuram Nos. of Claims	Palakkad Nos. of Claims
Inside District	24898	16969
	63.1%	72.8%
Outside District	14539	6330
	36.9%	27.2%
Total	39437	23299

Source: Comprehensive Health Insurance Agency Kerala

The above table indicates the total utilisation of RSBY-CHIS and the breakdown of claims that are handled from within and outside the district. In Malappuram district, 63.1% of claims were treated inside the district through the empanelled public and private facilities and 36.9% claims were treated through the hospital outside the district. In Palakkad district 72.8% of claims were treated within the district and 27.2% of claims outside the district.

As can be seen in both districts, a substantial proportion of claims are sought for care outside the district. In a sense, this is a good indication of the portability of financial risk protection. Although we have no reference point to assess whether this is a desirable or undesirable level of portability, our initial analysis suggests that the fact that for almost one in three patients from each of the districts seeking care outside the district (possibly at a more accessible facility), going outside the district does not preclude the receipt of financial risk protection. With qualifications, this is an encouraging finding.

It is noteworthy that trauma/accidents do not show up in these numbers, although that is somewhat to be expected, firstly because these tend to have higher fatalities (and are in fact reflected in our mortality data), and secondly, because the reliance on financial risk protection schemes tends to be for chronic conditions as they involve high expense procedures and care-seeking events.

Table 36: Sector Wise Utilization of RSBY in Malappuram District 2013-14 (Figures in actuals and percentages)

Sector Package	Government		Private		Total Nos. of Claims	Column Percentage
	Nos. of Claims	Row Percentage	Nos. of Claims	Row Percentage		
Medical	20832	84.34%	3868	15.66%	24700	62.63%
Oncology	5355	100%	0	0%	5355	13.58%
Gynecology	1346	50.26%	1332	49.74%	2678	6.79%
General Surgery	1608	77.68%	462	22.32%	2070	5.25%
Orthopedics	1160	74.84%	390	25.16%	1550	3.93%
Other Common Procedures	902	100%	0	0%	902	2.29%
Ophthalmology	293	36.31%	514	63.69%	807	2.05%
Unspecified	458	97.65%	11	2.35%	469	1.19%
Nose	176	96.70%	6	3.30%	182	0.46%
Ear	148	86.55%	23	13.45%	171	0.43%
Urology	145	99.32%	1	0.68%	146	0.37%
Neurosurgery	77	76.24%	24	23.76%	101	0.26%
Throat	92	94.85%	5	5.15%	97	0.25%
Endocrine	71	91.03%	7	8.97%	78	0.20%
Endoscopic Procedures	26	42.62%	35	57.38%	61	0.15%
Pediatrics	39	97.50%	1	2.50%	40	0.10%
Combined Packages	10	58.82%	7	41.18%	17	0.04%
Dental	5	55.56%	4	44.44%	9	0.02%
Hysteroscopy	4	100%	0	0%	4	0.01%
Total	32747	83.04%	6690	16.96%	39437	100%

Source: Comprehensive Health Insurance Agency Kerala

Out of the total claims from Malappuram district, 83.4% were from empanelled public facilities and 16.96% from private empanelled facilities. Of the total claims, 62.63% of utilization was for medical cases in which 84.34% claims were from public facilities and 15.66% through private sector facilities. Another 13.58% of claims were for the treatment of Oncology cases, which was utilized fully through public sector facilities. Other major packages utilized were for Gynecology (6.79%), General Surgery (5.25%), and Orthopedics (3.93%), followed by other common procedures (2.29%), and Ophthalmology (2.05%). Unspecified packages accounted for about one percentage.

Table 37: Sector Wise Utilization of RSBY in Palakkad District 2013-14 (Figures in actual and percentages)

Sector Package	Government		Private		Total Nos. of Claims	Column Percentage
	Nos. of Claims	Row Percentage	Nos. of Claims	Row Percentage		
Medical	13446	85.59%	2263	14.41%	15709	67.42%
Oncology	2887	99.76%	7	0.24%	2894	12.42%
Gynecology	996	78.49%	273	21.51%	1269	5.45%
Other Common Procedures	1262	100%	0	0%	1262	5.42%
General Surgery	551	73.27%	201	26.73%	752	3.23%
Orthopedics	388	69.91%	167	30.09%	555	2.38%
Ophthalmology	314	86.03%	51	13.97%	365	1.57%
Urology	26	21.67%	94	78.33%	120	0.52%
Ear	53	63.10%	31	36.90%	84	0.36%
Nose	44	70.97%	18	29.03%	62	0.27%
Unspecified	45	84.91%	8	15.09%	53	0.23%
Endocrine	38	82.61%	8	17.39%	46	0.20%
Endoscopic Procedures	19	43.18%	25	56.82%	44	0.19%
Neurosurgery	31	100%	0	0%	31	0.13%
Throat	15	75.00%	5	25.00%	20	0.09%
Combined Packages	0	0%	12	100%	12	0.05%
Pediatrics	9	81.82%	2	18.18%	11	0.05%
Dental	0	0%	9	100%	9	0.04%
Hysteroscopy	1	100%	0	0%	1	0%
Total	20125	86.38%	3174	13.62%	23299	100%

Source: Comprehensive Health Insurance Agency Kerala

In Palakkad, out of the total claims from the district 86.38% were from public facilities and 13.62% from private empanelled facilities. Out of the total claims from the district, 67.42% claims were for the medical cases in which 85.59% were utilized through the public facilities and 14.41% from private facilities. 12.42% of claims were for the oncology cases which was utilized 99.76% through public facilities. Other major packages utilized from the district were Gynecology (5.45%), other common procedures (5.42%), General Surgery (3.23%), and Orthopedics (2.38%). Unspecified packages accounted for just 0.23% of claims.

Table 38: Gender wise Utilization of RSBY-CHIS in Malappuram District 2013-14 (Figures in actual and percentages)

Gender Package	Male		Female		Others		Total
	Nos. of Claims	Row Percentage	Nos. of Claims	Row Percentage	Nos. of Claims	Percentage	
Medical	12772	51.71%	11919	48.26%	9	0.04%	24700
Oncology	2664	49.75%	2683	50.10%	8	0.15%	5355
Gynecology	11	0.41%	2660	99.33%	7	0.26%	2678
General Surgery	1132	54.69%	935	45.17%	3	0.14%	2070
Orthopedics	782	50.45%	767	49.48%	1	0.06%	1550
Other Common Procedures	673	74.61%	229	25.39%	0	0%	902
Ophthalmology	350	43.37%	457	56.63%	0	0%	807
Unspecified	325	69.30%	144	30.70%	0	0%	469
Nose	125	68.68%	57	31.32%	0	0%	182
Ear	62	36.26%	109	63.74%		0%	171
Urology	125	85.62%	21	14.38%	0	0%	146
Neurosurgery	45	44.55%	56	55.45%	0	0%	101
Throat	45	46.39%	52	53.61%	0	0%	97
Endocrine	7	8.97%	71	91.03%		0%	78
Endoscopic Procedures	43	70.49%	18	29.51%		0%	61
Pediatrics	23	57.50%	17	42.50%	0	0%	40
Combined Packages	8	47.06%	9	52.94%		0%	17
Dental	5	55.56%	4	44.44%		0%	9
Hysteroscopy	1	25.00%	3	75.00%	0	0%	4
Grand Total	19198	48.68%	20211	51.25%	28	0.07%	39437

Source: Comprehensive Health Insurance Agency Kerala
 Note: Gender as mentioned in the Smart Card

In Malappuram district out of the total claims 51.25% of claims were utilized by females and 48.68% by males. The most utilized packages were medical and oncology for all genders, with Gynaecology coming third for women and other genders.

Table 39: Gender wise Utilization of RSBY-CHIS in Palakkad District 2013-14 (Figures in actual and percentages)

Gender Package	Male		Female		Total
	Nos. of Claims	Percentage	Nos. of Claims	Percentage	
Medical	8082	51.45%	7627	48.55%	15709
Oncology	1547	53.46%	1347	46.54%	2894
Gynecology	9	0.71%	1260	99.29%	1269
Other Common Procedures	1055	83.60%	207	16.40%	1262
General Surgery	449	59.71%	303	40.29%	752
Orthopedics	330	59.46%	225	40.54%	555
Ophthalmology	170	46.58%	195	53.42%	365
Urology	99	82.50%	21	17.50%	120
Ear	30	35.71%	54	64.29%	84
Nose	35	56.45%	27	43.55%	62
Endocrine	6	13.04%	40	86.96%	46
Unspecified	39	73.58%	14	26.42%	53
Endoscopic Procedures	27	61.36%	17	38.64%	44
Neurosurgery	19	61.29%	12	38.71%	31
Throat	10	50.00%	10	50.00%	20
Combined Packages	2	16.67%	10	83.33%	12
Pediatrics	9	81.82%	2	18.18%	11
Dental	1	11.11%	8	88.89%	9
Hysteroscopy	0	0%	1	100%	1
Total	11919	51.16%	11380	48.84%	23299

Source: Comprehensive Health Insurance Agency Kerala

In Palakkad, out of the total claims 51.16% of claims were utilized by males and 48.84% by the females. In the top utilized packages like medical 51.45% were males and 48.55% were females, Oncology 53.46% males and 46.54% females, gynecology 99.29% females and other common procedures 83.60% males and 16.40% females. Data on other genders was not available.

Under RSBY-CHIS in Malappuram district more females are utilizing the scheme where as in Palakkad district more males are utilizing the schemes. This could be further looked into.

Utilization of Other Systems of Medicine

Table 40: Disease wise OP utilization in Public Health Facilities under Indian Systems of Medicine in Malappuram 2013-14 (Figures in Actual and in Parenthesis are Percentages)

Name of the Disease	Ayurveda			Siddha
	No. of Patients Visited			No. of Patients Visited
	Hospitals	Dispensaries	Total	Dispensaries
Arthritis	46533	314380	360913 (18.8%)	0
Respiratory disease	15486	131742	147228 (7.7%)	139 (8.9%)
Fever	8678	75795	84473 (4.4%)	1645 (10.5%)
Gastro-Intestinal	6715	82291	89006 (4.6%)	1979 (12.6%)
Gynecological disease	6148	69084	75232 (3.9%)	813 (5.2%)
Skin diseases	5784	77612	83396 (4.3%)	528 (3.4%)
Genitourinary disorders	2642	11284	13926 (0.7%)	0
Loco motor Disease	0	0	0	6202 (39.6%)
Cancer	0	0	0	1 (.006%)
Others	280592	786564	1067156 (55.5%)	3118 (19.9%)
Total	372578 (19.4%)	1548752 (80.6)	1921330	15680

Source: District Medical Office ISM

In Malappuram district of the total OPD cases in the public sector, 19.4% of visits were to Ayurveda hospitals and 80.6% was to dispensaries. Of the total cases reported in the OPD, 55.5% were unclassified, with arthritis accounting for 18.8% and respiratory disease 7.7% of visits. Under the Siddha system of medicine, of the total OPD cases, 39.6% utilized services for Loco-motor diseases and 12.6% for Gastro-Intestinal diseases.

Table 41: Disease wise OP utilization in Public Health Facilities under Indian System of Medicine in Palakkad District 2013-14 (Figures in Actual and in Parenthesis are Percentages)

Name of the Disease	Ayurveda			Unani
	No. of Patients Visited			Patients Visited
	Hospitals	Dispensaries	Total	Dispensaries
Arthritis	41354	280325	321679 (12.2%)	15 (0.5%)
Respiratory disease	9576	152312	161888 (6.1%)	5 (0.2%)
Fever	18279	98236	116515 (4.4%)	2326 (74.6%)
Gastro-Intestinal	5736	61298	67034 (2.5%)	78 (2.5%)
Gynecological disease	8246	72318	80564 (3.1%)	0
Skin diseases	7238	90195	97433 (3.7%)	125 (4%)
Genitourinary disorders	3218	15438	18656 (0.7%)	10 (0.3%)
Others	511689	1263218	1774907 (67.3%)	558 (17.9%)
Total	605336 (22.9%)	2033340 (77.1%)	2638676	3117

Source: District Medical Office ISM

In Palakkad district, of the total OPD cases in the public sector, Ayurvedic dispensaries accounted for 77.1% and hospitals, 22.9% of cases. Arthritis is the top condition, with 12.2% of the total OPD, while 67.3% of the diseases were not classified. In the Unani system, 74.6% of the OPD cases consulted in the dispensaries are Fever cases, while 17.9% of cases were unclassified.

Table 42: Disease wise IP utilization in Public Health Facilities under Indian System of Medicine in the pilot districts 2013-14 (Figures in Actual and in Parenthesis are Percentages)

Name of the Disease	Malappuram	Palakkad
	Ayurveda Nos. of Patients Visited	Ayurveda Nos. of Patients Visited
Low Back ache	382 (33.81%)	282 (27.25%)
Arthritis	266 (23.54%)	215 (20.77%)
Hemiplegia	123 (10.88%)	54 (5.21%)
Respiratory disease	17 (1.50%)	10 (0.9%)
Fever	12 (1.06%)	59 (5.70%)
Others	330 (29.20%)	415 (40.09)
Total	1130	1035

Source: District Medical Office ISM

In Malappuram and Palakkad the highest inpatient utilization of Ayurveda is for low backache, followed by arthritis.

Utilization of health services of other department schemes

Table 43: Utilization under Ex Serviceman Contributory Health Scheme in the Pilot Districts 2013-14 (Figures in Actual by number of cases and in parenthesis are percentage)

Districts	Primary members	Spouse	Parents	Children	Total
Malappuram	1734 (54.26%)	1328 (41.55%)	86 (2.69%)	48 (1.50%)	3196
Palakkad	1822 (42.31%)	1728 (40.13%)	481 (11.17%)	275 (6.38%)	4306

Source: ECHS Regional Office

Data shows that ECHS covers the primary member and dependents. In Malappuram district, 54.26% of scheme beneficiaries were primary members, 41.55% were spouses, and 4.19% were dependents. In Palakkad district 42.31% the total beneficiaries were primary members utilized the benefits, 40.13% were spouses and 17.55% were dependents.

Table 44: Disease wise Utilization under Ex Serviceman Contributory Health Scheme in the Pilot Districts 2013-14 (Figures in Actual by number of cases and in parenthesis are percentage)

Disease	Malappuram		Palakkad		Total
	No of cases	Percentage	No of cases	Percentage	
Hypertension	795	24.87%	1120	26.01%	1915
Diabetes mellitus	720	22.53%	1025	23.80%	1745
Cardiac	362	11.33%	484	11.24%	846
Dental	233	7.29%	281	6.53%	514
Orthopedics	96	3.00%	238	5.53%	334
Renal	89	2.78%	52	1.21%	141
Cancer	30	0.94%	78	1.81%	108
Gynecology	31	0.97%	70	1.63%	101
Psychological Disorder	35	1.10%	2	0.05%	37
Others	805	25.19%	956	22.20%	1761
Total	3196	42.60%	4306	57.40%	7502

Source: ECHS Regional Office

The Needs of the People: Towards an Essential Health Care Package

Public resources for health are limited. Demand for public healthcare can outstrip supply even in well-developed health systems in prosperous countries. All public health systems must prioritize what the essential or minimum package of care and services it can deliver, seeking to progressively increase coverage over time. The government of Kerala was keen on understanding the needs of its populations in order to design its essential package.

To this end, in this chapter, we undertake to identify the top diseases/conditions/events in each district on the basis of morbidity. We have made an effort to integrate data from various sources and try build a picture, recognizing that this is an approximation, and that caveats will apply. Notwithstanding this, based on available information, this can nonetheless serve as a basis for the development of care pathways for each disease/condition/event that can ultimately come together to comprise an Essential Healthcare Package for people in the district and state level.

To begin with, we were looking for information on diseases, conditions, procedures and events faced by the population, in particular more vulnerable populations at greatest risk of catastrophic health expenditure. We recognize that this ignores large swathes of the population that do not even access care and are possibly facing shared or possibly even distinct morbidities and mortality patterns. Given our mandate to rely on existing data, however, this has not been possible: we recommend that such on a priority basis, population-based data on burdens of disease be collected in a feasible manner. It is also learned that state-wise data following the Global Burden of Disease is being proposed to be gathered, which may well help fill this gap in our knowledge.

In this exercise, our team collected utilization data from the following financial risk protection schemes: RSBY-CHIS, CHIS Plus and Karunya Benevolent Fund schemes, all of which seek to provide financial risk protection. We also compiled routinely reported data from public facilities, i.e. reporting of communicable diseases through the communicable and non-communicable diseases from the District Statistician. Finally, data on mortality was collected from Panchayats (and is presented in a separate chapter).

This chapter presents the Top 25 Conditions as indicated by claims made under RSBY-CHIS, CHIS-Plus and Karunya Benevolent Fund(KBF) social health insurance schemes, volumes of persons/patients by each disease reported by the IDSP and Non Communicable data.

We were constrained by lack of data on out-patient care and hence have focused on in-patient health-seeking. It must be acknowledged that neither RSBY, CHIS-Plus, KBF IDSP nor NCD samples are representative of district populations as a whole, the results of top-25 conditions ranking cannot be extrapolated accurately for the population. They are a limited proxy that can be used to begin priority-setting.

We first consider results for just the population covered by RSBY CHIS. As per the eligibility criteria of RSBY, beneficiaries are populations defined as Below Poverty Line by the centre or the state and can be said to be the most in need of state support for health. For each claim made, RSBY-CHIS gives data for the "package" under which funds were allocated as well as one or more diagnoses at discharge. A package refers to a procedure name or a diagnosis.

We have used the packages in the scheme and the diagnosis at discharge to get the numbers for each disease/procedure/event. The top 25 conditions which have the maximum number of claims have been listed followed by all the other conditions clubbed together as other diseases/procedure/events. The top 25 conditions account for 55% and 62% of all claims in Malappuram and Palakkad respectively.

Top 25 Diseases/Procedures/Events under RSBY CHIS

In Malappuram, the top 25 conditions account for about 55% of the claims made under RSBY-CHIS that we were able to analyze. In the top 10 of this list are NCDs like COPD, CAD, cancer of the lung and breast, cerebrovascular accidents, chronic renal disease and diabetes and communicable diseases like enteric fever and acute respiratory illness. The burden of typhoid is also noteworthy, representing 5.3% of all claims in the year 2013-14 and ranking second.

Table 1: Top 25 Diseases/Procedures/Events under RSBY CHIS in Malappuram 2013-14 (Figures in actual by number of cases and in percentages)

S. No.	Diseases/Procedures/Events	Claims	Percentage
1	Chronic Obstructive Pulmonary Disorder	2406	6.10%
2	Enteric Fever	2103	5.33%
3	Coronary Artery Disease	1863	4.72%
4	Diabetes Mellitus Type 2	1523	3.86%
5	Acute Respiratory Infection	1447	3.67%
6	Normal Delivery	1188	3.01%
7	Cerebro Vascular Accident	1007	2.55%
8	Cancer Breast	985	2.50%
9	Chronic Kidney Disease	882	2.24%
10	Cancer Lung	878	2.23%
11	Urinary Tract Infection	859	2.18%
12	Caesarian Delivery	675	1.71%
13	Asthma	608	1.54%
14	Appendicitis	591	1.50%
15	Hernia Repair	579	1.47%
16	Cancer Stomach	545	1.38%
17	Inter Vertebral Disc Prolapse	486	1.23%
18	Cataract	457	1.16%
19	Acute Gastro Enteritis	446	1.13%
20	Hypertension	444	1.13%
21	Dialysis	419	1.06%
22	Dengue Fever	383	0.97%
23	Viral Hepatitis	352	0.89%
24	Acute Diarrheal Disease	349	0.88%
25	Bronchial Pneumonia	343	0.87%
	Total	21818	55.32%
26	Other Diseases/ Procedures/Events	17619	44.68%
	Grand Total	39437	100%

Source: Comprehensive Health Insurance Agency Kerala

Among the respiratory diseases, along with COPD and respiratory infections, bronchial Asthma (608) and pneumonia (343) are also among the top 25 in Malappuram, accounting for over one in ten of the claims made in 2013-14. Heart conditions, stroke, and hypertension account for another 9% of the claims made in the same year; a similar proportion of claims were made for diabetes mellitus, chronic renal disease, dialysis and cataract, while deliveries (normal and Caesarian) accounted for another 5% or so of claims. Surgical conditions like appendicitis and hernia have many beneficiaries (well over 1,000).

Table 2: Top 25 Diseases/Procedures/Events under RSBY CHIS in Palakkad 2013-14 (Figures in actual by number of claims in percentages)

S. No.	Disease/Procedures/Events	Claims	Percentage
1	Chronic Obstructive Pulmonary Disease	1824	7.83%
2	Fever	1521	6.53%
3	Respiratory Tract Infection	1186	5.09%
4	Chronic Kidney Disease	747	3.21%
5	Hemodialysis	741	3.18%
6	Urinary Tract Infection	717	3.08%
7	Diabetes Mellitus Type 1 and 2	621	2.67%
8	Cerebro Vascular Accident	596	2.56%
9	Coronary Artery Disease	593	2.55%
10	Enteric Fever/Typhoid	575	2.47%
11	Dengue Fever	553	2.37%
12	Normal Delivery	484	2.08%
12	Acute Gastro Enteritis	474	2.03%
13	Cancer Lung	465	2.00%
14	Cancer Stomach	446	1.91%
15	Caesarian Delivery	440	1.89%
16	Cancer Breast	439	1.88%
17	Acute Diarrheal Disease	423	1.82%
18	Cataract	323	1.39%
19	Cancer Cervix	310	1.33%
20	Hypertension	186	0.80%
21	Cancer Esophagus	164	0.70%
22	Appendicitis	183	0.79%
23	Inter-Vertebral Disc Prolapse	179	0.77%
24	Acute Gastritis	176	0.76%
25	Hernia Repair	148	0.64%
	Total	14514	62.29%
26	Other Diseases/Procedures/Events	8785	37.71%
	Grand Total	23299	100%

Source: Comprehensive Health Insurance Agency Kerala

In Palakkad, the top 25 conditions account for a little over 62% of the claims made under RSBY-CHIS that we were able to analyse; this comprises NCDs like chronic obstructive pulmonary disease, chronic kidney disease and haemodialysis, diabetes mellitus, coronary artery disease, as well as CDs like respiratory infections, unspecified fever and urinary tract infections.

Respiratory diseases have been the major health problem affecting the beneficiaries who have claimed RSBY in 2013-14, COPD affecting 7.83% and respiratory infections affecting 5.09% taking the top 1st and 3rd positions. Unspecified fever, affecting 1521 of the 14514 beneficiaries is another major condition, which includes viral fever, pyrexia of unknown origin and all febrile illness.

There were a high number of beneficiaries for chronic renal diseases and hemodialysis, which form around 6.3% of the total number, and needs to be borne in mind while planning strategies for better service. These, along with diabetes mellitus and cataract care accounts for over 10% of the claims made under RSBY-CHIS and are a substantial area where essential services and continuum of care are needed.

Urinary tract infection has shown quite a number of beneficiaries (717) accessing RSBY card and is now an important medical condition to reckon in all age groups. A clear pathway is needed for prevention, management and treatment of this condition, which may have myriad causes and co-morbidities. Typhoid (575) and dengue fever (553) account for 5% of the claims made in Palakkad population with acute gastroenteritis following closely. These conditions, along with acute gastritis and acute diarrheal disease account for another 10% of claims made in the district

Another major area of burdens is cancer: of the lung, stomach, breast, cervix and oesophagus. RSBY-CHIS claims are also being made for normal and Caesarian delivery.

Utilization through CHIS Pluss

Table 3: Utilization through CHIS Plus in the Pilot Districts 2013-14 (Figures in Actual)

Package	Malappuram Number of Claims	Palakkad Number of Claims
Cancer	1035	954
Nephrology	765	855
Cardiac/Cardiothoracic	743	140
Brachy therapy for cancer	46	20
Gastro intestinal	86	9
Palliative Care	4	1
Neuro Surgery	12	0
Total	2694	1979

Source: Comprehensive Health Insurance Agency Kerala

CHIS Plus shows 2694 cases in Malappuram and 1979 cases in Palakkad mainly accessing this schemes for cancer treatment and investigations as the main condition, as brachy therapy, palliative care are all for cancer treatment. Renal diseases under nephrology and cardiac medical and surgical conditions follow cancer. It is also noted that the volume of cases in Malappuram in the last year has been higher than in Palakkad. This can be examined a little more closely, as is done in the following tables.

Table 4: Top 21 Disease Condition/Procedure under CHIS Plus in Malappuram District 2013-14
(Figures in Actual)

SI. No.	Disease/Procedures/Diagnostics	Malappuram Number of Claims
1	Coronary Artery Disease	670
2	Hemodialysis	659
3	Cancer Investigation And Treatment	517
4	Chemotherapy And Investigation	321
5	Radiation	159
6	Continuous Ambulatory Peritoneal Dialysis	88
7	Intracavitary	46
8	Gastrojejunostomy (Duodenojejunostomy)/ Gastrectomy/ Oesophago Gastrectomy	23
9	Valve Replacement	46
10	Diagnostics (CT Scan, X Ray, MRI, USS)	18
11	Cancer Surgery	15
12	Nephrology Surgery	13
13	Neurology cases	12
14	Cardiac Investigation	11
15	Cardiac Valve Disease	9
16	Cerebrovascular Accident	8
17	Pacemaker	7
18	Cancer Head	6
19	Lung Surgery	6
20	Kidney Stone	5
21	Other Cases	55
Total		2694

Source: Comprehensive Health Insurance Agency Kerala

Note : Other cases includes Palliative, Achd, Cancer Kidney Investigation, Cholecystectomy, Jejunostomy, Abdominal Perineal Excision Of Rectum, Angioplasty, Atrial Fibrillation-Medical Management, Exploratory Laparotomy, Partial/Subtotal Gastrectomy. Hypothyroidism, Aneurysm-P-Coiling, Anterior Resection Of Rectum, Atrial Tachycardia, Mod LvDys-Eps+Rfa Done, Basilar Top Aneurysm.- Procedure: Coil Embolisation, Bav,Sev Cal As, Gdlv,Sr,Nc-Procedure: Avr, Block Dissection Of Inguinal Nodes etc

The beneficiaries of CHIS Plus in Malappuram have accessed the scheme for 21 conditions in 2013-14; the most claims have been for cardiac conditions as well as cancer investigation and treatments. A considerable number have also been affected by renal disease for which hemodialysis and surgery was done, while some have sought reimbursement for gastro intestinal and lung surgery. Cancer investigation and treatment under the various heads in CHIS plus accounts for around 37% of all the beneficiaries. Coronary artery disease accounts for 670 of the 2694 cases, which is one – fourth of the total cases. Similar is the case with hemodialysis, which also accounts for close to one fourth of all the cases. As expected, these cases involve considerable (possibly catastrophic) expenditure: cancer treatment, surgeries, cardiac illnesses, chronic neurological conditions and chronic renal conditions.

Table 5: Top 22 Disease Condition/Procedure under CHIS Plus in Palakkad District 2013-14 (Figures in Actual)

SI. No.	Disease/Procedures/Diagnostics/Drugs	Palakkad Number of Claims
1	Hemodialysis	831
2	Chemotherapy	447
3	Cancer- Investigation	417
4	Coronary Artery Disease	87
5	Radical Treatment	31
6	Valve Disease	25
7	Cancer Treatment	20
8	Intracavitary procedures	20
9	Continuous Ambulatory Peritoneal Dialysis	16
10	Radiation	13
11	Diagnostics (CT Scan, X Ray, MRI, USS)	12
12	Cancer	10
13	Neuro-Surgery	5
14	Aneurysm	4
15	Plasmapheresis	4
16	Cancer Surgery	3
17	Injection Goserelin (Zolodex)10.8mg	3
18	Cancer Head	2
19	Cardiac Pacemaker	2
20	Lung Surgery	2
21	Urology Surgery	2
22	Other Cases	23
	Total	1979

Source: Comprehensive Health Insurance Agency Kerala

Note Other Cases includes: Excision Of Filarial Scrotum, Freys Procedure, Gastrojejunostomy (Duodenojejunostomy), Gil-Verners, Extended Pyelolithotomy, Git Surgery, Head Surgery, Internal Urethrotomy, Left Hemi Colectomy, Nephrology, Palliative Treatment, Psyudo Aneurism, Skeletal Fluorosis, Spinal Coad , Terminal Colostomy, Total Colectomy, Total Gastrectomy, Urology Investigation etc

In Palakkad too, about half of the CHIS Plus claims are for hemodialysis, which can be expected, as this is a recurrent treatment that can add up cost-wise. The next most common number of claims are for chemotherapy, again, to be expected, as recurrent costs are involved for a single patient. Overall, moreover, a large number of claims are for cancer treatment and investigation, accounting for 48% of all claims, followed by renal disease for which hemodialysis is needed. Similar to Malappuram the remaining cases are for cardiac illness and various surgeries. The largest numbers of claims under CHIS PLUS in both Malappuram and Palakkad are for CAD, hemodialysis and cancers, followed by gastrointestinal surgeries, investigations and cardiac valve replacement procedures.

Top conditions under Karunya Benevolent Fund

Like RSBY, Karunya Benevolent Fund provides financial support as packages under certain specific heads (even as charging procedures vary across public and private hospitals).¹ Each of these heads has a list of conditions, but unlike RSBY, these more specific diagnoses are not mentioned, although they are noted and are started at the KBF office. Thus, the data we have is not on the diagnosis of the patients, but rather the broad disease category: Heart Ailments, Cancer, Kidney Disease, Brain and Liver Ailments etc.

Table 6: Beneficiaries under Karunya Benevolent Fund in the Pilot Districts 2013-14 (Figures in Actual)

SI. No.	Package	Malappuram (No of Patients)	Palakkad (No of Patients)
1	Cancer	842	933
2	Cardiology	805	856
3	Nephrology	427	626
4	Neurology	34	37
5	Palliative Treatment	0	1
6	Severe Respiratory Disease	0	5
7	Spine and Spinal Cord Injury	3	11
8	Hemophilia	12	0
	Grand Total	2123	2469

Source: District Lottery Office

More than nine tenths of the Karunya patients have been treated for Heart Ailments, Cancer and Kidney Disease. The greatest numbers of claims - 40% in Malappuram and 38% in Palakkad - have been for cancer treatment, although we are unable to determine which cancer. Cardiac conditions are a close second, followed by renal diseases.

Top Disease condition under Integrated Disease Surveillance Programme

Apart from risk protection schemes, another key source of data is the Integrated Disease Surveillance Programme, which reports both communicable and non-communicable diseases.

Table 7: Disease Condition Reported as per IDSP in the Pilot Districts 2013-14 (Figures in Actual)

SI. No.	Disease	Malappuram (No of Cases)	Palakkad (No of Cases)
1	Fever	389055	269669
2	Acute Diarrheal Disease	85984	49066
3	Typhoid	536	531
4	Dengue Fever	520	154
5	Hepatitis A	167	115
6	Malaria	123	74
7	Leptospirosis	15	20
8	Hepatitis B	9	33
9	Hand Foot Mouth Disease	4	17
	Total	476413	319679

Source: IDSP Cell

¹For private hospitals, KBF applies package rates for any procedure done. So, even though KBF does not report the actual procedure performed/treatment given, it is possible in some cases to decipher the procedure performed by examining the amount charged. For instance, under Heart Ailments, the only package charged at Rs.42,000 is Angioplasty with a single bare metal stent. Yet, since this is not the case uniformly across procedures, and not in public facilities either, making disaggregated analysis difficult, if not impossible at this stage.

Infectious diseases are mainly reported by the IDSP. Unspecified fever tops the list with maximum number of cases in both the districts around 83% of total cases followed by acute diarrheal disease (17% of all cases) while all the other infectious diseases including typhoid, dengue, hepatitis A&B, malaria, Leptospirosis and hand foot mouth disease are very few in numbers compared to the first two conditions.

Top conditions under Non Communicable Diseases

There are 20 conditions stated in the NCD report from the District Statistician. Hypertension 28% and Diabetes 24.5% are the two main non-communicable diseases across both districts – accounting for more than half the NCDs reported. Respiratory illness like bronchitis and Asthma follow closely in both districts.

Table 8: Non Communicable Diseases in the Pilot Districts -report from District Statistician (2013-14)

(Figures in Actual)

SI. No.	Disease	Malappuram (No of Cases)	Palakkad (No of Cases)
1	Hypertension	123480	75602
2	Diabetes Mellitus Type 2	106024	59830
3	Accidental Injuries	32304	50685
4	Bronchitis	79679	41676
5	Asthma	54862	30092
6	Common Mental Disorders	8076	4602
7	Cancer	1080	4131
8	Road Traffic Accidents	382	3916
9	Ischemic Heart diseases	5782	3399
10	Cerebro Vascular Accident	2459	1810
11	Snake Bite	361	1682
12	Diabetes Mellitus Type 1	12239	1108
13	Emphysemas	2945	1018
14	Obesity	32	651
15	Chronic Kidney Disease	48	611
16	Other Neurological Disorders	3646	567
17	Severe Mental Disorders	1517	86
18	Rheumatic Fever	48	0
19	Congenital Heart Disease	57	0
20	Other Cardio Vascular Disease	143	0
	Total	435164	282009

Source: District Medical Office

Malappuram shows a marked difference from Palakkad in having more than 10 times the number of diabetes type 1 cases (Malappuram - 12239 & Palakkad - 1108) and double the number in diabetes Type 2 (Malappuram - 106024 & Palakkad - 59830). Malappuram also has a higher burden of bronchitis (18% of cases) as compared to Palakkad (15% of cases), the third highest NCD burden in the district. In Palakkad, by contrast, the third highest burden is of accidental injuries (19% of cases, while only 15% of cases reported are Bronchitis). Mental disorders also show a considerable number in both the districts and adequate attention needs to be given to this condition now with appropriate preventive and supportive measures.

Ten times the number of road traffic accidents are seen in Palakkad as compared to Malappuram, probably as it is a border district is to be noted for future interventions. Snakebite cases are five times more in Palakkad (1682) compared to Malappuram (361). The NCD data also shows that chronic kidney disease and obesity are almost twenty times more in Palakkad when compared to Malappuram.

Top conditions reported under Communicable Disease

Table 9: Communicable Disease reported by District Statistician in the Pilot Districts (Figures in Actual)

SI. No.	Disease	Malappuram (No of Cases)	Palakkad (No of Cases)
1	Acute Respiratory Infection	651980	475001
2	Acute Diarrheal Disease	83149	59066
3	Dog Bite	1307	20990
4	Pulmonary TB	1249	2125
5	Dengue Fever	7938	1905
6	Pneumonia	3778	1273
7	Enteric Fever	1121	725
8	Chicken Pox	2224	722
9	Other STD	0	640
10	Viral Hepatitis A	2336	197
11	AIDS	0	173
12	Measles	282	80
13	Leptospirosis	814	47
14	Syphilis	0	33
15	Cholera	10	0
16	Rabies	9	0
17	Viral Hepatitis B	29	31
18	Meningitis	0	8
19	Viral Hepatitis CDE	4	3
20	Gonorrhoeal Infection	5	3
21	Whooping Cough	1	1
22	Japanese Encephalitis	0	1
23	All Other CD	3088141	806123
	Total	3834386	1369147

Source: District Medical Office

In both districts, acute respiratory illness affects maximum number of people accounting for 17% in Malappuram and 35% in Palakkad districts. Acute diarrhoeal diseases have also affected the population in both districts (Malappuram - 83149 & Palakkad - 59066 cases) and are similar to the data seen in IDSP above in Table. Dog bites have affected a considerable number of people in Palakkad (20990) as compared to Malappuram (1307) around sixteen times more, although no cases of rabies are reported in the former district, whereas in the latter, nine were. Palakkad also has over one and a half times the number of pulmonary tuberculosis cases as Malappuram. Dengue and Viral Hepatitis A also need attention in both the districts, though Malappuram shows a much higher number. Vaccine preventable diseases like measles, hepatitis B, whooping cough, and chicken pox have also

featured as top conditions in both the districts showing that immunization needs to be strengthened to cover all children in the routine immunization.

Comparing CD data from the statistician and IDSP data, we see some issues of classification (as in, fever is not a reportable outcome in CD data, but is in IDSP). Further, that Diarrheal Disease is a major burden in both datasets, and to a lesser extent, typhoid, dengue, hepatitis A and B, malaria, and leptospirosis – all of which were seen in both datasets.

Top 20 conditions in Palakkad district based from different data sources

Based on the top 20-25 conditions derived from the different data shown above, we have developed a top 20 list of conditions/ illnesses/ disease/ events/ procedure for the two districts. This is based on the limited data that we have received and may not be representative of the whole population. The top 25 conditions affecting the population of Palakkad and Malappuram are the following.

Table 10: Top 20 conditions in Palakkad district from various data sources (Figures in Actual)

SI. No.	Top Condition/ Procedure/Events	Palakkad					
		NCD	CD	RSBY	CHIS PLUS	Karunya	Total
	Total Utilization	282009	1369147	23299	1979	2469	1678903
1	Acute Respiratory Infection		475001	1186		5	476192
2	Hypertension	75602		186			75788
3	Diabetes Mellitus Type 2	59830		621			60451
4	Acute Diarrheal Disease		59066	423			59489
5	Accidental Injuries/RTA	54601				11	54612
6	Chronic obstructive pulmonary disease	42694	0	1824	0	0	44518
7	Asthma	30092					30092
8	Cancer	4131		2917	946	934	8928
9	Ischemic Heart diseases	3399		593	87	856	4935
10	Mental Disorders	4688					4688
11	Chronic Kidney Disease	611		1488	831	626	3556
12	Dengue Fever		1905	553			2458
13	Cerebro Vascular Accident	1810		596			2406
14	Pulmonary TB		2125				2125
15	Snakebite		1682				1682
16	Enteric Fever/typhoid		725	575			1300
17	Pneumonia		1273				1273
18	Delivery (Caesarian & normal)			924			924
19	Urinary tract infection			717			717
20	Acute gastroenteritis			474			474

The top conditions in Palakkad districts as per the data received from the Communicable diseases, non communicable diseases data from district statistical officer, RSBY CHIS, CHIS Plus and Karunya data suggest that while there is a substantial greater burden of communicable diseases as compared to non-communicable diseases (conservative estimates would suggest four cases of CD for every NCD), CDs are not what is causing catastrophic expenditure (as indicated by claims made by the three financial risk protection schemes). We also note a high burden of acute respiratory infection, reflecting around 28% of all the conditions reported in the data. NCDs like diabetes and hypertension are seen in considerable numbers followed by acute diarrhoeal disease. Putting together datasets allows us to see the burden of accidental injuries and road traffic accidents – which are not necessarily what claims are being made for, but are nonetheless a substantial burden in the district (in fact, much higher in Palakkad when compared to Malappuram).

Respiratory diseases like chronic obstructive pulmonary diseases, emphysema and bronchitis included along with bronchial Asthma, pneumonia and Pulmonary TB also feature in the top 20. Investigation and treatment of cancers of different parts of the body are also high. Ischemic heart diseases are the main cardiac illness affecting the people with a significant number affected by mental illness. Chronic renal diseases leading to haemodialysis are also prevalent in the population. Stroke or Cerebrovascular accidents affect many in the elderly population.

Among the communicable diseases, apart from diarrhea are dengue and typhoid. Snakebite is a condition seen in large numbers in Palakkad compared to Malappuram. Among the numbers who avail of schemes, one of the main events for women is delivery, which incurs a considerable expense. We also note the substantial number of claims made for urinary tract infections, a common condition especially among females but also seen in males.

Table 11: Top 20 conditions in Malappuram district based from various data sources (Figures in Actual)

SI. No.	Top Condition/ Procedure/Events	Malappuram					Total
		NCD	CD	RSBY/CHIS	CHIS Plus	Karunya	
	Total Utilization	435164	3834386	39437	2694	2123	4313804
1.	Acute Respiratory Infection		651980	1447			653427
2	Hypertension	123480		444			123924
3	Diabetes Mellitus Type 2	106024		1523			107547
4	Chronic obstructive pulmonary disease	82624		2406			85030
5	Acute Diarrheal Disease		83149	349			83498
6	Asthma	54862					54862
7	Accidental Injuries/RTA	32686				3	32689
8	Mental Disorders	9593					9593
9	Ischemic Heart diseases	5782		1863	670	805	9120
10	Cancer	1080		5531	1012	842	8465
11	Dengue Fever		7938	383			8321
12	Pneumonia		3778				3778
13	Cerebro Vascular Accident	2459		1007	8		3474
14	Enteric Fever/typhoid		1121	2103			3224
15	Viral Hepatitis A		2336	352			2688
16	Delivery (CS & normal)			1863			1863
17	Chronic Kidney Disease	48		1301	659	427	1357
18	Pulmonary TB		1249				1249
19	Urinary tract infection			859			859
20	Leptospirosis		814				814

The first few conditions which affect the population in huge numbers in Malappuram are almost similar to Palakkad like acute respiratory infection, hypertension, diabetes, acute diarrhoeal disease which feature among the top 5. Other similarities include the presence of accidental injuries and road traffic accidents, cancer, dengue, typhoid, as well as deliveries in the top 20.

Putting all the data together, we see a trend similar to Palakkad in Malappuram: conservative estimates put the likely burden of CDs to be almost eightfold what the burden of NCDs is, although the latter is what risk protection schemes are used to avail of. In the case of ARIs (ranked first), ADDs (ranked fifth), dengue (ranked 11th), typhoid (ranked 14th), and hepatitis A (ranked 15th), we see the burden being so substantial and the progression of the disease so acute that even RSBY-CHIS funds are being used for these communicable conditions. Apart from this; the bulk of the burden is of NCDs aforementioned, as well as accidents and injuries. A unique feature in Malappuram, furthermore, is the burden of mental illness – over 9,500 cases reported in a one-year period. This is important to consider, therefore, in the care pathways for this district.

Overall, there are some clear indications of what conditions or clusters of conditions comprehensive care pathways need to cover. For one, respiratory diseases – including ARIs, COPD and asthma, are a key area for development of the essential health package. Another key area is in the area of nephrological conditions including diabetes, renal failure and related conditions. These conditions are linked - Diabetes mellitus Type 2 for example, includes those diagnosed with diabetes on medication to all the complications of diabetes among the people like hyperglycemia, hypoglycemia, diabetic foot, diabetic retinopathy (cataracts), diabetic coma, amputation of foot etc. Another cluster is hypertension, stroke, and ischemic heart disease that contribute independently to great burdens and expenditure, but are also linked. The prevention and management of communicable diseases – especially diarrheal disease, dengue, and typhoid is another obvious area where there is also the need for greater synergy and collaboration with LSGIs, other departments and other stakeholders on the social determinants of health (things like water and sanitation, waste management, and so on). Cancers (especially lung and breast, but also stomach, cervix, and esophagus) should also be addressed through care pathways. Continued emphasis and strengthening of delivery should also be included, along with management of fevers, urinary tract infections, gastroenteritis, inter-vertebral disc prolapse, and such conditions that can severely hamper quality of life and are often co-morbid with other conditions. Finally, attention must also be paid to road traffic accidents and critically, to mental health, especially depression, which is reported in Malappuram and is likely linked to the high suicide burden in Palakkad (see Mortality chapter).

Top 25 conditions based on UHC assessment and key informants

The below table shows the list of conditions among the top 25 affecting the population. The final table of 25 top conditions was derived from the top 20 diseases compiled from different data sources in Palakkad and Malappuram and from the information collected from Key informants on the conditions mainly treated at the government health facilities, especially at primary and secondary levels of care.

Acute Respiratory infections are found to be major problem as seen in the CD, RSBY CHIS and Karunya data. This has affected huge number of people. It has been seen that respiratory conditions have affected the major chunk of the population, be it chronic obstructive pulmonary disease, asthma, emphysema or ARI. Diabetes mellitus Type 2 is seen in large numbers both in the NCD data as well as in the RSBY CHIS data. Diabetes Type 2 includes those diagnosed with diabetes on medication to all the complications of diabetes among the people like hyperglycemia, hypoglycemia, diabetic foot, diabetic retinopathy, diabetic coma, amputation of foot etc. Another main condition affecting large numbers is essential hypertension as seen in the NCD and RSBY CHIS data. One of the conditions which features in almost all the data collected on NCDs is the Ischemic heart diseases or coronary heart diseases which have affected people in huge numbers with Malappuram showing the bulk of it. Cerebro vascular accidents has affected many a number as seen in NCD, RSBY CHIS and CHIS Plus data. Though the numbers are less than that of diabetes or Hypertension, it needs to be borne in mind because hypertension when uncontrolled can lead to more Cerebrovascular accidents. This condition could lead to bedridden and long period of continuous treatment. COPD is another condition for which RSBY CHIS schemes have been availed by

Table 12: Top 25 conditions based on UHC assessment and key informants

SI No.	Conditions/ illness/ procedure/ event/ diseases
1	Acute Respiratory Infections
2	Essential Hypertension
3	Diabetes mellitus & complications- retinopathy/ foot/ coma/
4	Chronic Obstructive Pulmonary Diseases (COPD)
5	Acute Diarrheal Disease
6	Asthma
7	Accidents/injuries- Trauma care- Fracture- Open and closed reduction
8	Mental Disorder- Depression
9	Coronary artery Disease
10	Lung cancer
11	Breast Cancer
12	Dengue
13	Cerebro vascular accidents including hemiparesis
14	Hepatitis
15	Caesarean delivery
16	Urinary Tract Infection
17	Chronic Pelvic Inflammatory disease
18	Dental Caries
19	Hypothyroidism
20	Allergic skin disorders Atopic dermatitis
21	Osteo arthritis
22	Acute gastroenteritis (Viral/Bacterial/Amebic dysentery/Bacillary dysentery)
23	Polycystic ovarian Disease (PCOD)
24	Glaucoma
25	Non-operative management of Disc Prolapse

many. Asthma cases are also high in number in the CD data of both the districts. A fair number of beneficiaries have availed RSBY CHIS for Urinary tract infection treatment. Common mental disorders and severe mental disorders form a major chunk in the NCD data of which Depression is a major illness affecting the population. According to the data Malappuram shows a considerable number which is almost double the number in Palakkad in common mental disorders and almost 10 times more in severe mental disorders. Hypothyroidism is another condition seen in the RSBY CHIS data. Osteoarthritis is a condition mainly seen in the Malappuram data on RSBY CHIS. The CD data shows a number of persons affected by hepatitis A. Similarly Dengue fever is also featured in the CD data as well as in the RSBY CHIS of both the districts. Acute diarrheal disease has the largest number of cases in both RSBY CHIS and CD data of both the districts. This is a food and water borne infection, which accounts for loss of lives especially in children and can be very well controlled with appropriate preventive measures. Similarly acute gastroenteritis is also added as it is commonly seen in adults. Accidental injuries and road traffic accidents lead to morbidity and mortality in a considerable number of people, therefore bringing out the importance of state of the art trauma care, which can save a number of lives. Caesarian delivery is one of the conditions in RMNCH+A for which RSBY CHIS has been availed since surgery involves more expenditure and in Kerala every baby being precious. Pelvic Inflammatory diseases and polycystic ovarian disease are the two other conditions added based on the key informant from Government facilities. Cancer investigation and treatment under a broad head has shown the huge number affected in all the NCD data. It is mainly in the RSBY CHIS data that the cancers have been specified and here the Lung and breast cancer show the maximum numbers similar to that seen in the cancer registry. Most of the medical ophthalmic cases treatable at the PHC/CHC as informed by the key informants is Glaucoma.

Box A: Definitions

Medical condition: A medical condition is a broad term that includes all diseases, lesions and disorders. While the term medical condition generally includes mental illnesses, in some contexts the term is used specifically to denote any illness, injury, or disease except for mental illnesses. (Dorland, 2007) The Diagnostic and Statistical Manual of Mental Disorders (DSM), the widely used psychiatric manual that defines all mental disorders, uses the term general medical condition to refer to all diseases, illnesses, and injuries except for mental disorders. This usage is also commonly seen in the psychiatric literature (American Psychiatric Association, 2000). Some health insurance policies also define a medical condition as any illness, injury, or disease except for psychiatric illnesses.

We have classified the conditions observed into five distinct categories: 'Communicable Disease', 'Non Communicable Disease', 'Reproductive Event', 'Interventional Procedure' and 'Accident & Injury'

Communicable Disease is defined as an illness caused by an infectious agent or its toxins that occurs through the direct or indirect transmission of the infectious agent or its products from an infected individual or via an animal, vector or the inanimate environment to a susceptible animal or human host (Centres for Disease Control, 2010).

Non Communicable Disease is defined as a chronic condition that does not result from an (acute) infectious process and has a prolonged course, does not resolve spontaneously, and for which a complete cure is rarely achieved (McKenna, Taylor, Marks and Koplan, 1998)

Reproductive event is a set of outcomes relating to menstruation, conception, gestation and labour.

An Interventional Procedure is defined as a series of steps performed for a diagnosis or treatment that involves an incision, puncture, entry into a body cavity, or the use of ionising, electromagnetic or acoustic energy. (National Institute for Health and Clinical Excellence, 2009)

An **Accident** is defined as any unexpected or unplanned event that may result in death, injury, property damage, or a combination of serious effects (Mosby, 2009). Injury: as wound or trauma; harm or hurt; usually applied to damage inflicted on the body by an external force. (Dorland, 2007). In the classification when a condition falls within two categories, we have given primacy to the category of the underlying causative condition (if the causative condition is apparent): for instance 'Caesarean Section Delivery' is classified under 'Reproductive Health' though it also is an 'Interventional Procedure', 'Open Reduction Internal fixation of Fracture' is classified under 'Accident and Injury' though it too is an 'Interventional procedure'.

Illness and **sickness** are generally used as synonyms for disease (Dorland, 2007) Illness is defined as an abnormal process in which aspects of the social, physical, emotional, or intellectual condition and function of a person are diminished or impaired compared with that person's previous condition. In a sense, the illness definition is derived from the definition for condition: illness is an unwell condition (Mosby, 2009).

The term **disease** broadly refers to any condition that impairs the normal functioning of the body. For this reason, diseases are associated with dysfunctioning of the body's normal homeostatic process (Dorland, 2007) Commonly, the term disease is used to refer specifically to infectious diseases, which are clinically evident diseases that result from the presence of pathogenic microbial agents, including viruses, bacteria, fungi, protozoa, multicellular organisms, and aberrant proteins known as prions. An infection that does not and will not produce clinically evident impairment of normal functioning, such as the presence of the normal bacteria and yeasts in the gut, or of a passenger virus, is not considered a disease. By contrast, an infection that is asymptomatic during its incubation period, but expected to produce symptoms later, is usually considered a disease. Non-infectious diseases are all other diseases, including most forms of cancer, heart disease, and genetic disease.

Acute disease is a short-lived disease, like the common cold.

A **Chronic disease** is one that lasts for a long time, usually at least six months. During that time, it may be constantly present, or it may go into remission and periodically relapse. A chronic disease may be stable (does not get any worse) or it may be progressive (gets worse over time). Some chronic diseases can be permanently cured. Most chronic diseases can be beneficially treated, even if they cannot be permanently cured.

A **Procedure** is defined as the sequence of steps to be followed in establishing some course of action (Mosby, 2009). Operation: is defined as a surgical procedure, usually using instruments, for remedying an injury, ailment, defect, or dysfunction (The American Heritage Medical Dictionary, 2007)

An **Event** is a change in your life that can involve good or bad health and has implications for your and your family's future health. Childbirth is an event, as is death, or onset of a disease. In the US, an event is viewed in the context of health insurance, as it can affect one's eligibility and the terms of coverage (Healthcare.gov, ND).

Mortality

Mortality is one of the basic components of population change and related data is essential for demographic studies and public health administration. (SRS, 2012) Kerala has a population of just under 33.4 million people and a life expectancy at birth of 74.2 years (Kerala Population Census data 2011). Life expectancy at birth in Kerala is around 71.5 years for males and 76.9 years for females as against 64.6 years for males and 67.7 years for females in India. CBHI, 2013) Female life expectancy in Kerala exceeds that of the male, just as it does in the developed world. (McKibben, 1996) Kerala's maternal mortality ratio 0.66 deaths/1,000 live births (2010-12), is lowest in India. Sample Registration System, 2013)

Kerala happens to have appreciable data from Panchayat death registration records² compiled at the SEVANA Kendra of Information Kerala Mission. We were able to look at death disaggregated by age-groups, location and cause of death allowing combinations of analyses that shed light on the district and state level burden (eg. we disaggregated data to compare the number of deaths in public versus private facilities and to compare causes of death across age groups).

Prior research and Sample registration data (see Table 1) suggest that while Kerala's crude death rate is comparable to the national average, the burden of child and maternal death is far lower. In fact, it is well shown that most of the deaths in Kerala occur as a result of non-communicable diseases (NCDs). According to a recent population-based survey, 20% of all deaths in Kerala are caused by coronary heart disease (CHD/CAD). The age-adjusted CAD (coronary artery disease) mortality rates per 100,000 population are 382 for men and 128 for women in Kerala. These CAD rates in Kerala are higher than those of industrialized countries. (Soman, Kutty, Safraj Vijayakumar, Rajamohanam and Ajayan, 2010)

Table 1: Mortality Indicators in Kerala and India for 2013 (Figures in Percentages)

Mortality indicators	Kerala	India
Crude death rate	6.9	7
Percentage of infant death to total death	2.5	13
Infant mortality rate per 1000 live births	12	42
a) Neo-natal mortality rate	7	29
b) Early neo- natal mortality rate	4	23
c) Late neo- natal mortality rate	3	5
d) Post neo- natal mortality rate	5	13
e) Peri neo- natal mortality rate	10	28
Still birth rate	6	5
Maternal Mortality Ratio	66	178

Source: Sample Registration System

²ForThe Civil Registration System is a continuous, permanent and compulsory recording of the occurrence and characteristics of vital events. The main objective of the Civil Registration System is to record the annual change of population at national and state level in between two successive decennial Censuses. The registration of births and deaths has been made statutory through Registration of Births and Deaths Act 1969. The act came into force on 1st April 1970 in Kerala. The registering authorities at the local bodies are Secretaries of Gram Panchayats, Health Inspectors of Municipalities, Health Officers of Corporations and the Executive Officer of Kannur Cantonment.

We have been able to source data for January through December of 2013 (where for other sources, data has been from April 2013 through March 2014). Table 2 presents the total number of deaths in Malappuram and Palakkad for the year 2013, disaggregated by gender and age-group.

Deaths by age group

For one, we note that the total number of deaths and their sex distribution is almost the same in both Palakkad and Malappuram. In both the districts the number of deaths among the males is slightly more than among the females.

Table 2: Number of Deaths by Age Group in the Pilot Districts 2013 (Figures in Actual and in Parenthesis are Percentage)

Age group (SRS)	Malappuram			Palakkad		
	Male	Female	Total	Male	Female	Total
Under 5	244 (2.2%)	168 (1.8%)	412 (2.0%)	104 (1.1%)	78 (1.0%)	182 (1.0%)
5-14	68 (0.6%)	55 (0.6%)	123 (0.6%)	44 (0.4%)	29 (0.4%)	73 (0.4%)
15-59	2822 (25.6%)	1358 (14.9%)	4180 (20.7%)	2773 (28.1%)	1127 (13.8%)	3900 (21.6%)
>=60	7884 (71.6%)	7513 (82.6%)	15398 (76.6%)	6957 (70.4%)	6959 (84.9%)	13916 (77.0%)
Total	11018	9094	20112	9878	8193	18071

Source: Civil Registration System Kerala

Note: for 357 cases age has not been mentioned

When looking at the age distribution of deaths, we find that the number of deaths in the under-5 age group is almost 2.26 times more in Malappuram as compared to that in the same age-group for Palakkad (deaths are also more prevalent among male children). In the districts as well as the state, many more men are dying in the productive age group (15-59 years) than women: of all male deaths in Malappuram, 25.6% occur in this age group as against 14.9% for females: similarly in Palakkad 28.1% male deaths occur in this age group as against 13.8% for females. Thus, males are at greater risk of mortality in their economically productive years as compared to females.

Deaths by place of death

Based on the data available, we were able to categorize deaths as having taken place in a hospital, at home, other custodial institutions (like mental and rehabilitation centres, old age homes, and palliative care centres), or other places.

Table 3: Deaths in Malappuram and Palakkad by Place of Death and Gender 2013 (Figures in Actual and in Parenthesis are Percentage)

Place of death	Malappuram			Palakkad		
	Male	Female	Total	Male	Female	Total
Hospital	4331 (38.9%)	3048 (33.5%)	7379 (36.7%)	2468 (25%)	1577 (19.2%)	4045(22%)
Home	6238 (57%)	5911 (65%)	12149 (60.4%)	6720 (68%)	6428 (78.5%)	13148 (73.2%)
Institution	10 (0.1%)	18 (0.2%)	28 (0.1%)	27 (0.3%)	36 (0.4%)	63 (0.3%)
Others	439 (4%)	116 (1.3%)	555 (2.8%)	660 (6.7%)	152 (1.9%)	812 (4.5%)
Null	0	1	1	3	0	3
Total	11018	9094	20112	9878	8193	18071

Source: Civil Registration System Kerala

Among the total deaths maximum number of deaths has taken place at home (73% in Palakkad and 60% in Malappuram) followed by hospital (22% in Palakkad and 37% in Malappuram). Most of the others have died in other places like, place of work, railway stations, on the way to the hospitals, etc. Less than 10% of the death in the whole state is registered in Palakkad and Malappuram districts each. Institutional deaths have been recorded to be minimal (Palakkad 0.3% and Malappuram 0.1%)

After segregating based on gender it is found that males are 4-5 times more likely to die in other places than females. Other places of death include vacant plots, during travel, at bus stands and railway station, in the train, suicides in public places, rubber plantations, in the sea/streams/rivers, in the roadside, in shops, on the way to hospital, etc. Though by a small margin, more females are seen dying at institutions than males in both the districts (this reflects what is seen at the state level). It is also seen that the total number of women who die at home is almost twice the number at the hospital and even more in Palakkad. It is quite possible that this reflects the nature of both morbidity and poor health seeking among the women.

We were also interested in seeing the type of facility in which hospital deaths were taking place. In both the district irrespective of the gender, death is mainly in the private hospitals indirectly showing that more people seek health care at the private institutions.

Table 3: Deaths in Hospital by Gender in the Pilot Districts by type of Hospital, 2013 Figures in Actual and in Parenthesis are Percentage)

Sector	Malappuram			Palakkad		
	Male	Female	Total	Male	Female	Total
Government	638 (15%)	422 (14%)	1060 (14%)	919 (37%)	492 (31%)	1411 (35%)
Private	3004 (69%)	2205 (72%)	5209 (71%)	1430 (58%)	1001 (63%)	2431 (60%)
Cooperative	577 (13%)	358 (12%)	935 (13%)	89 (4%)	67 (4%)	156 (4%)
Null	112 (3%)	63 (2%)	175 (2%)	30 (1%)	17 (1%)	47 (1%)
Total	4331	3048	7379	2468	1577	4045

Source: Civil Registration System Kerala

Around one in five deaths is taking place in government hospitals in Malappuram while about one in three takes places in the same type of facility in Palakkad. The bulk of deaths are reported in private facilities in both districts (71% in Malappuram and 60% in Palakkad), far greater than what is seen in the state overall. In Malappuram, the cooperative hospitals play a substantial role in providing terminal health care – one in ten deaths, roughly is reported here. These trends do not vary substantially by gender, although we see a slightly greater proportion of women than men reporting deaths in private facilities.

Causes of Death

Though in the top 25 conditions among the population a mixture of both communicable and non communicable diseases is seen, here in the mortality data it is clearly seen that the majority of death is caused by non communicable diseases in both the pilot districts and the state as a whole. We also note a fairly high number of deaths (especially in Palakkad) that are from ill-defined causes.

Table 4: Cause of Death in the Pilot Districts 2013 (Figures in Actual and in Parenthesis are Percentage)

Cause of death	Malappuram	Palakkad
Non Communicable Diseases	15304 (76.1%)	10741 (59.4%)
Communicable Diseases	254 (1.3%)	500 (2.8%)
Injuries/ Accidents/ Suicides/	747 (3.7%)	1188 (6.6%)
Ill defined Causes including Senility and blanks	3807 (18.9%)	5642 (31.2%)
Total	20112	18071

Source: Civil Registration System Kerala

The total deaths has been differentiated by the top 23 causes of death as given in the death registration records. Non-communicable diseases cause majority of the deaths- cardiac, respiratory, cancer, CVA, hypertension and diabetes.

Table 5: Deaths by Disease in the Pilot Districts 2013 (Figures in Actual and in Parenthesis are Percentage)

Cause of death	Malappuram	Palakkad
Cardiac arrest	7293 (36.3%)	4959 (27.44%)
Asthma/bronchitis/Respiratory distress/COPD	3572 (17.76%)	2125 (11.76%)
Old age/ natural causes	1996 (9.92%)	4753 (26.30%)
Others- causes not clear, post mortem pending, not recorded, un categorized , cause not mentioned	1766 (8.78%)	877 (4.85%)
Cancer	1712 (8.51%)	1344 (7.44%)
CVA-stroke, paralysis	769 (3.82%)	672 (3.72%)
Hypertension	582 (2.89%)	309 (1.71%)
Renal Failure	351 (1.75%)	321 (1.78%)
Diabetes	316 (1.57%)	224 (1.24%)
Liver disease	296 (1.47%)	352 (1.95%)
RTA	282 (1.40%)	213 (1.18%)
Suicides	219 (1.08%)	571 (3.16%)
Drowning	119 (0.6%)	194 (1.1%)
Arthritis	93 (0.5%)	117 (0.6%)
Gastro related diseases	90 (0.4%)	102 (1.3%)
Fever	85 (0.4%)	237 (0.9%)
Accidents-rail accidents, electric shock, other non classified accidents	80 (0.4%)	154 (0.5%)
Pneumonia, aspiration pneumonia	78 (0.4%)	106 (0.5%)
TB	43 (0.2%)	82 (0.2%)
Jaundice	39 (0.2%)	35 (0.1%)
Fits/ epilepsy	36 (0.2%)	15 (0.1%)
Premature baby/ delivery	33 (0.2%)	26 (0.1%)
Others	222 (1.1%)	283 (1.6%)
Total	20112	18071

Source: Civil Registration System Kerala

As seen in the above table the most important cause of death in both the districts is due to cardiac problems like- congenital heart disease, cardiac arrest, CAD etc. This is to be expected as these conditions do appear in unexpected and acute forms. In Malappuram the second most important cause of death is asthma or bronchitis, mainly respiratory problems while in Palakkad it is natural death or as a result of ageing followed by Asthma/ bronchitis. This echoes the trend seen in other data. The next cause of death in both districts is Cancer followed by cerebrovascular accidents, stroke, cerebral hemorrhage and cerebral thrombosis. Other major causes of death in Malappuram include hypertension (582) while Palakkad has almost an equal number of deaths due to suicides (571). Suicide rates are much higher in Palakkad when compared to Malappuram. Diseases like renal failure, liver diseases and diabetes complications are responsible for a number of deaths. Road traffic accidents, fever and accidents (including drowning, electric shock and other non specified accidents) have also claimed lives in both districts. Other causes of death include measles, homicide, septicemia, pregnancy complications, snakebite, psychiatric illness, malaria, syphilis, metabolic encephalopathy, alcoholism, etc. There are a considerable number of deaths that have no reasons recorded or are pending postmortem reports.

Table 6: Cause of death among the 15-59 yrs age group (Preventable Deaths) in the Pilot Districts 2013 (Figures in Percentage)

Cause of death among 15-59 yrs	Mallapuram N=4175 (%)	Cause of Death among 15-59 yrs	Palakkad N=3901 (%)
Cardiac arrest, sudden death, myocardial infarction, Heart disease and heart attack, CAD	43.2	Cardiac arrest, sudden death, myocardial infarction, Heart disease and heart attack, CAD	35.6
Cancer	13.5	Cancer	11.5
Others- causes not clear, post mortem pending, not recorded, un categorized etc	8.6	Suicides	11.3
Asthma/bronchitis/ Resp distress/ Pneumonia/ aspiration/ COPD	6.6	Asthma/bronchitis/ Resp distress/ Pneumonia/ aspiration/ COPD	7.2
Road Traffic Accidents	5.0	Others- causes not clear, post mortem pending, not recorded, un categorized etc	5.7
Suicides	4.1	Road Traffic Accidents	4.1
Renal Failure	2.7	Liver disease	3.3
CVA-stroke, paralysis	2.3	Drowning	2.8
Hypertension	2.0	Other Accidents	2.7
Drowning	1.8	Renal Failure	2.6
Liver disease	1.8	CVAstroke, paralysis	2.1
Other Accidents	1.6	Old age/ natural causes	1.9
Diabetes	1.3	Hypertension	1.4
Respiratory distress/COPD	1.2	TB	1.3
Others	4.3	Others	6.3

Source: Civil Registration System Kerala

The pattern of deaths among those aged 15-49 largely mirrors those seen in the overall population. In both Palakkad and Malappuram, majority of the population in this age group is dying of cardiac diseases. In this population, deaths due to suicides and road traffic accidents move up higher in the list, while things like hypertension, COPD and such move further down.

The case is thus reinforced for an emphasis on non-communicable diseases, while also paying attention to mental health issues, which may be driving suicides in Palakkad district in particular.

Financing

This section includes findings on financial resources available through the public sector for healthcare in UHC pilot districts of Malappuram and Palakkad. The aim here is to understand financing sources for healthcare available within the government; the specific contribution of several government departments in ensuring availability of health services; and the broad utilization patterns of finances in both the districts for key health programmes. This is important from the point of view to understand how much finances are available presently at the district level. A separate exercise for costing to provide additional services under the Universal health coverage in the districts is being undertaken in the next phase.

As per 2011 Annual Report to the People on Health by Ministry of Health and Family Welfare, Kerala has the highest per capita public health expenditure on health at Rs2950/person/year, in comparison to other southern non-high focus states. The National Sample Survey estimates that on average, the last hospitalization case in Kerala cost about 16,775 INR, lower than the Indian average of 18,268, albeit with substantial gender disparities: 21,496 INR spent on males and 12,340 INR spent on females. (Ministry of Statistics and Programme Implementation, 2015). It was also found that while rural expenditures in Kerala were higher than the national average (17,642 INR as compared to 14,935 INR), in urban areas, the spending was far lower (15,465 INR in Kerala as compared to 24,436 INR for the nation). The degree to which these payments are made out of pocket, prepaid, subsidized or recompensed in some fashion is dependent on the sources of funding available to the state for health.

The following table indicates the expenditure for medicine and public health in the state, as reported by:

Table A 42: **Medical and Public Health-Detailed Break-up of Expenditure (₹ crore)

Item	2012-13 Accounts	2013-14 Accounts	2014-15 Revised Estimate	2015-16 Budget Estimate
1	2	3	4	5
(a) Medical Establishment	55.76	78.26	88.05	93.88
(b) Hospitals and Dispensaries	1205.72	1347.17	1540.25	1845.07
(c) Ayurveda	199.53	251.32	303.37	359.17
(d) Homoeo	176.57	114.42	147.71	158.31
(e) Medical Colleges and Schools	520.04	684.10	765.41	836.05
(f) Employees State Insurance Scheme	98.89	109.16	130.16	149.01
(g) Others	287.28	272.23	338.06	374.19
(h) Loans	0.00	0.00	0.00	0.00
Sub Total-I	2543.79	2856.66	3313.01	3815.68
2. Public Health				
(a) Public Health Establishment	1.28	14.41	10.05	9.20
(b) Prevention of food adulteration	11.42	12.92	16.64	19.55
(c) Drug Control	18.54	14.39	15.18	20.20
(d) Prevention and Control of Diseases	114.67	141.19	652.42	723.22
(e) Public Health Education and Training	76.40	93.13	111.35	128.02
(f) Public Health Laboratories	32.80	33.43	38.57	42.95
(g) Other Programmes	2.02	0.85	27.17	0.83
Sub Total-II	257.13	310.32	871.38	943.97
3. Family Welfare	323.75	354.73	545.04	579.16
4. Capital Outlay*	130.65	130.32	315.26	262.02
Grand Total (1+2+3+4)	3255.32	3652.03	5044.69	5600.83

* Includes Capital Outlay on Medical, Public Health and Family Welfare ** Excluding Water Supply and Sanitation

Sources of Funds for Public Health Institutions

Public Health Institutions in the state of Kerala at the district level have five major sources of funds: State Plan and Non-Plan Funds, Grants from Local Government Institutions, National Rural Health Mission Funds, Hospital Management Committee Funds, premium and reimbursements by RSBY and Donations from Individuals and Organizations. The sources of Hospital Management Committee Fund include fees paid by patient at the time of Out Patient/In Patient registration, donations from the public, and specific funds received from the governments such as under the National Rural Health Mission.

Table 1: Sources of Funds Available in the Pilot Districts 2013-14 (Figures are in Lakhs)

Source of Fund	Malappuram	% Total	Palakkad	% Total
District Medical Office (H) Non Plan Fund	11,601.54	48.32%	11,498.70	32.24%
District Medical Office (H) Plan	201.45	0.84%	187.3	0.53%
Homeopathic System of Medicine	645.97	2.69%	376.6	1.06%
Indian System of Medicine Non Plan	1,365.38	5.69%	1,261.10	3.54%
Indian System of Medicine Plan	35.14	0.15%	Not Available	0%
Local Self Government Department	2,498.91	10.41%	2,187.00	6.13%
National Health Mission	2,779.39	11.58%	2,096.10	5.88%
National Urban Health Mission	8.51	0.04%	12.6	0.04%
MP /MLA Funds	Not available	0%	58.1	0.16%
RSBY (Premium)	2157.34	8.99%	15119.406	42.39%
Karunya Benevolent Fund Expenditure	2714.7	11.31%	2868.2	8.04%
Total	24,008.33	100%	35,665.11	100%

Source: Comprehensive Health Insurance Agency Kerala

Note: CHIS Plus is implemented only through the government health facilities in the State

DMO Non Plan funds are the highest sub component in the entire district fund flow. Plan Funds comprise less than 1% of the total funds in both Malappuram and Palakkad. Substantial funds are disbursed via Local Bodies: Local Body funds represent a little over one ninth of the total funds expended in the district. Non-Allopathy expenditure is 9.4% of Malappuram's total expenditure and 8.5% of Palakkad's total health expenditure.

Based on this data, the per capita health spend for Malappuram is Rs.498 and for Palakkad is Rs.672. Kerala's public per capita health spend for FY 13, the last year for which data is available, is INR 1102 (INR 987 from State and INR 113 from the Centre's share of NRHM expenditure). For FY 14 the corresponding figure is estimated to be at least 15% higher: INR 1267. Hence, per capita expenditure for Malappuram is 39% and for Palakkad is 53% of the average per-capita public expenditure by the state's health and medical education ministries. Part of the reason could be that in FY 14 Malappuram and Palakkad had no tertiary care institutes, and a part of the public health expenditure of its population happened outside the districts (in Calicut Medical College Hospital, Thrissur Medical College Hospital, Shree Chitra Tirunal Institute of Medical Sciences and Technology etc.). Further, the cost of Kerala state's overall health administration is not included in the districts' health funding. Nonetheless, there is an appreciable difference between Malappuram's, Palakkad's and Kerala's per capita public health expenditure.

Table 2: DMO Plan Funds in the Pilot Districts (2013- 14) (Figures are in Lakhs)

Head of Account	Malappuram	Palakkad
Surveillance and Control of Communicable Diseases	126.74	71.87
Non communicable diseases	22.63	20.64
Control of Water borne diseases	4.44	4.26
Strengthening of Physical Medicine, Rehabilitation and Limb Fitting Centres	1.00	5.00
Purchase items to Nursing School	2.91	5.00
Nutrition Bureau	0.55	0.25
Pain and Palliative care	3.96	4.00
Dental care	1.82	1.86
Cancer Care Programme	11.05	13.50
National Iodine deficiency disorder control programme	1.50	1.47
Tele health & Medical education project	0.49	2.25
National Leprosy eradication programme	2.35	2.06
National TB control Program	5.46	9.97
De Addition Centre Purchase of various Items	4.81	0.00
Pain & Palliative care and elderly care	11.80	11.50
Total DMO Plan	201.45	151.34

Source: District Medical Office

Even as Malappuram's population is almost 1.5 that of Palakkad, its DMO Plan Fund is just 1.33 times that of Palakkad. As most of the above programs are universal (i.e. for the entire population) and preventive, even the proportionally smaller curative public infrastructure in Malappuram as compared to Palakkad (eg. fewer Public hospital beds per 1000 population) cannot fully account for this proportion of DMO Plan funds for Malappuram. Except for Communicable Diseases, Palakkad funds for each of the other heads almost equals or surpasses Malappuram's. Even though Non Communicable Diseases are the major cause of mortality in the two districts, the public spend on NCDs Malappuram is just 53 paise and in Palakkad is just 72 paise per person per year.

Although the tele-health and medical education project is not yet active, expenses are being reported under this item. There are two different heads for Pain and Palliative care expenditure in both the districts, although the second, more substantial amount appears to be focused on the elderly. The funds under ' Nutrition Bureau' seem to be too meager for any substantial purpose – it is not entirely clear how this dovetails, moreover, with expenses in other departments or other nutrition components.

Indian Systems of Medicine Expenditure

Table 3: Non Plan Expenditure in the Pilot Districts in 2013-14 (Figures in Lakhs)

Particulars	Malappuram	Palakkad
Hospitals and Dispensaries (Non-Siddha)	1220.80	1173.01
SidhaVaidya Hospitals and Dispensaries	11.86	11.94
District Ayurveda Store	0	9.07
District Medical Office expense	61.47	67.05
Expenditure for medicines	71.23	Not available
Total	1365.37	35.14

Source: District Medical Office ISM

Notes: Expenditure for Medicines is included in Hospitals and Dispensaries in Malappuram. In Palakkad on the other hand, even the District Ayurveda Store Expenditure does not mention expenses on Medicines.

Figures are Rounded off to 2 decimal places.

Malappuram and Palakkad have similar non-plan expenditure in all heads in ISM, with the exception of Ayurveda stores, which have no disbursement in Malappuram, and medicines expenditure, which was not available for Palakkad. A major area of expenditure is likely in these areas and greater availability of data is needed here, as well as clarity on the overlap between the two.

Table 4: Plan Expenditure in ISM in Malappuram District in 2013-14 (Figures in Lakhs)

Particulars	Amount in Lakhs
O.C (Purchase of Medicine) in Rural Dispensaries	5.50
Balamukulam "Ritu" (School Health Program)	19.79
M & S (purchase of Medicine) in District and taluk Hospitals	3.00
Training Programme in DMO office	1.40
AMC Photostat Machine in DMO office	0.06
Purchase of Furniture & Equipment in Siddha Hospitals	1.90
Medicine in Siddha hospitals	3.00
Medical Camp and etc.	0.50
Total	35.14

Source: District Medical Office ISM
 Figures are Rounded off to 2 decimal places.

Whereas more than half of the Plan expenditure in ISM is for a school health program, medicine purchase is almost one third of the Total Plan expenditure (32.7%). As the AYUSH sector advances, there is a need for greater rationalization of the plan expenditures, and perhaps focus on primary care beyond just the parameters of school health, and across AYUSH systems.

Local self-government expenditure

Table 5: Local Self Government Department Funds in the Pilot Districts in 2013-14 (Figures in Lakhs)

Tiers of Panchayat	Malappuram			Palakkad		
	Service	Infrastructure	Total	Service	Infrastructure	Total
District Panchayat	338.48	0	338.48	493.69	0	493.69
Block Panchayat	336.73	12.31	349.04	268.16	14.31	282.46
Municipality	290.89	1.47	292.36	137.42	1.9	139.32
GramPanchayat	1482.01	37.1	1519.11	1240.02	31.49	1271.49
Total	2448.11	50.88	2498.99	2139.29	47.7	2186.96

Source: District Planning Office

The allocation of LSGD funds is only about 14.4% higher in Malappuram as compared to Palakkad, even as there is a sizeable population difference. Substantially larger fund expenditures are occurring at the Gram Panchayat level in both districts as compared to other levels, with the most meager expenditure occurring at the municipality level. There may be other causes competing for municipality funds, but this is also the level at which emphasis on services could be increased, particularly if urban health services are to be improved. Expenditure on infrastructure from LSGD funds is 2% for Malappuram and 2.2% for Palakkad, and is the highest at the gram and block levels. This suggests that some kind of a gap may be being filled by LSGD that perhaps could be filled by plan funds, or has to be more deeply understood.

MP & MLA Funds for Health

In Malappuram the Member of Parliament (MP) and Member of Legislative Assembly (MLAs) planned a few projects but they were still at the stage of being estimated, and were thus not included; there was therefore, no expenditure on health from the MP and MLA funds for Malappuram in FY 14.

Table 6: MP & MLA Funds for Health in Palakkad District in 2013-14

(Figures in Lakh INR)

Particulars	Fund	Amount in Lakh INR
Construction of Homeopathy Dispensary building Valluvakundu	MLA	20.00
Purchase of 2 Haemo Dialysis machines & Crash cart to CHC Chalisseri	MLA	11.53
Ambulance for Cooperative Hospital Cherupalaserry	MP	7.40
Purchase of Bolero SLE 2WD 7 Seater to Pain & Palliative Care Clinic Mannarkkad	MLA	6.91
Utilization of funds for the purchase of 10 fogging machines to ChitturThathamangalamMunicipality	MLA	6.00
Purchase of Ambulance for the handicapped and old agehome at Koduvayur	MP	3.34
Purchase of Ambulance (Maruthi Omni) for Kottathara Tribal Speciality Hospital in Attapady	MP	2.95
Total		58.12

Source: District Planning Office

Notes: Figures are Rounded off to 2 decimal places.

In Palakkad on the other hand, the MPs and MLA expended a substantial 58 Lakh INR on mainly infrastructure and equipment, comparable to the expenditure made by LSGDs on infrastructure. There is a need for review of these expenses and to what extent they are rationalized and could be redistributed across sources of funding.

National Rural Health Mission Expenditure

Under the NRHM we find that the expenditure in Malappuram is 32.6% higher than Palakkad, though its population is 48% higher. Unless economies of scale have been achieved, one would expect a higher rate of spending. Further, we see a greater allocation in Malappuram under the flexi-pool as compared to Palakkad, which hopefully indicates use for shifting burdens of disease towards NCDs.

Table 7: NRHM Expenditure in the Pilot Districts in 2013-14

(Figures in Lakh INR and Parenthesis are Percentage)

Head of Account	Malappuram	Palakkad
RCH - Technical Strategies and Activities (RCH Flexible Pool)	1367.88 (49.22%)	1143.01 (54.53%)
Additionalities under NRHM (Mission Flexible Pool)	1068.01 (38.43%)	771.36 (36.80%)
Immunization	183.68 (6.61%)	97.81 (4.67%)
Others	159.79 (5.75%)	83.91 (4.00%)
Total	2779.38	2096.10

Source: National Health Mission

Notes: Figures are Rounded off to 4 decimal places.

It is also noted that immunization expenditure is 87.7% higher in Malappuram as compared to Palakkad as against 121% more births in Malappuram than Palakkad. A case could be made for greater emphasis on immunization coverage in Malappuram, relatively speaking, though here again, if economies of scale are being achieved, the allocation need not be higher. Still, given what is known about uptake of the private sector in delivery, strengthening immunization and delivery services is an important area of continued allocation in both districts.

Table 8: NRHM Expenditure under RCH - (RCH Flexible Pool) in the Pilot Districts 2013-14

(in Lakhs and Parenthesis are Percentage)

Head of Account	Malappuram	Palakkad
Maternal Health	443.69 (32.44%)	252.78 (22.12%)
Child Health	9.55 (0.70%)	56.41 (4.94%)
Family Planning	31.6 (2.31%)	25.31 (2.21%)
Adolescent Reproductive and Sexual Health	26.6 (1.94%)	22.81 (2.00%)
Urban RCH	45.74 (3.34%)	22.19 (1.94%)
Tribal RCH	9.24 (0.68%)	30.64 (2.68%)
Contractual Human Resources	672.67 (49.18%)	613.71 (53.69%)
Training	23.47 (1.72%)	17.72 (1.55%)
Programme Management Costs	105.33 (7.70%)	101.39 (8.87%)
Total	1367.89	1143.01

Source: National Health Mission

Notes: Figures are Rounded off to 4 decimal places.

Palakkad has higher expenditure than Malappuram on Child Health though Malappuram has more than twice the number of births: this is mainly because Palakkad has used NRHM funds for Facility Based Newborn Care, which Malappuram has not. Palakkad has as almost as much funding for Human Resources, a key determinant of service delivery; which raises the concern over Malappuram, which also handles a greater number of deliveries in the public sector than Palakkad (it seems, with not a commensurably larger HR allocation).

Malappuram spends just under 25% more NRHM funds on Family Planning though it has more than double the births. Neither districts has utilized NRHM budget for minor civil works, IMNCI, Infant Death Audits, accreditation of private providers for Family Planning, PNDT cell, or Geriatric Care, which could be key areas of NHM spending going forward.

Table 9: NRHM Expenditure under Additionalities (Mission Flexible Pool) in the Pilot Districts 2013-14
(Figures in Lakhs and Parenthesis are Percentage)

Particulars	Malappuram		Palakkad	
	Expenditure in Rs.	Percentage	Expenditure in Rs.	Percentage
ASHA	111.42	10.30%	76.36	9.90%
Untied Funds	351.25	32.47%	232.42	30.13%
Annual Maintenance Funds	102.44	9.47%	65.96	8.55%
Hospital Upgradation and Strengthening	4.77	0.44%	30.52	3.96%
New Constructions/Renovations	4.36	0.40%	3.18	0.41%
Corpus Grants to RogiKalyanSamiti	132.44	12.24%	106.78	13.84%
District Actions Plans	4.19	0.39%	2.14	0.28%
Panchayati Raj Initiative (orientation of local leaders, workshops etc.)	0.28	0.03%	0.45	0.06%
Mainstreaming of AYUSH	197.06	18.22%	111.16	14.41%
IEC	10.08	0.93%	9.41	1.22%
Mobile Medical Units	19.75	1.83%	26.91	3.49%
Referral Transport	0	0%	1.75	0.23%
PPP/NGOs	0	0%	0	0%
Innovations (Palliative Care, Dialysis Unit, Gender Violence, Mental Health etc.)	97.97	9.06%	59.24	7.68%
Planning, Implementation, Monitoring	32.01	2.96%	31.2	4.04%
Procurement of equipment and drugs	4.15	0.38%	13.87	1.80%
Regional Drug Warehouses	0	0%	0	0%
New Initiatives (Telemedicine, Palliative Care, NCDs)	9.54	0.88%	0	0%
Menstrual Hygiene Training	0	0%	0	0%
Health Insurance Scheme	0	0%	0	0%
Research, Studies, Analysis	0	0%	0	0%
State Level Health Resource Centre	0	0%	0	0%
Support Services	0	0%	0	0%
Total	1081.7	100%	771.37	100%

Source: National Health Mission

Notes: There is a difference of 13.69 Lakh in the total in this table and the Total Mission Flexible Expenditure sheet prepared by the DPM, as the sheet provided by the DPM does not add the expenditure on Procurement of drugs (4.15 Lakh) and on New Initiatives (of Rs. 9.54 Lakh)
Figures are Rounded off to 2 decimal places.

Malappuram expenditure is 40% higher than Palakkad, which is almost in line with its greater population as compared to Palakkad. Mainstreaming of AYUSH has been a major activity in Malappuram, where 77% higher spending took place. Both districts have spent money on innovations, although greater spending on support services, research and IEC could be considered in the future, particularly given the role this could play in improved planning, design and uptake of services.

Table 10: Immunization Expenditure from NRHM funds in the Pilot Districts 2013-14

(Figures in Lakhs and Parenthesis are Percentage)

Particulars	Malappuram	Palakkad
Immunization strengthening project (Review meeting, Mobility support, Outreach services etc)	84.7 (46.11%)	33.7 (34.45%)
Salary of Contractual Staff	0.98 (0.53%)	0.89 (0.91%)
Training under Immunisation	0.94 (0.51%)	2.05 (2.10%)
Cold chain maintenance	0.4 (0.22%)	0.35 (0.36%)
ASHA Incentive	56.38 (30.69%)	28.16 (28.79%)
Pulse Polio operating costs	40.28 (21.93%)	32.66 (33.39%)
Total	183.69	97.81

Source: Comprehensive Health Insurance Agency Kerala

Note: CHIS Plus is implemented only through the government health facilities in the State

Overall, the relative distribution of funds across budget items is comparable across both districts, with Palakkad spending slightly more on pulse polio and less on immunization strengthening activities. Allocations, in absolute terms, however, are different. As stated earlier, Malappuram has 120% more overall births than Palakkad in the private and 80% more births than Palakkad in the public system. However, in absolute terms, its project review and outreach expenditure is 151% more than Palakkad. The ASHA incentive is about double that in Palakkad, as can also be expected. However its Pulse Polio operating costs are much lower relatively: just 23% higher than Palakkad, whereas pulse polio immunization is addressing almost the same target group of children as the rest of the immunization program (in Palakkad this appears to be the case, as the proportionate amounts are also similar; in the order of 30 lakhs or so). The 2:1 ratio of spending on immunization versus pulse polio in Malappuram warrants further examination.

CHIS Plus

Table 12: Amount claimed by public health facilities for treating beneficiaries in the Pilot Districts through CHIS Plus by procedure 2013-14 (Amount in actuals and Column Percentages)

Procedure	Malappuram		Palakkad	
	Amount Claimed in Rs	Percentage	Amount Claimed in Rs	Percentage
Cancer Treatment and Diagnosis	1,39,72,854	32.46%	8,5,25,491	57.99%
Cardiac/Cardiothoracic	2,59,08,336	60.19%	4,7,38,362	32.23%
Nephrology	2,4,29,140	5.64%	1,1,74,135	7.99%
Abdomen	5,08,800	1.18%	1,53,100	1.04%
Neurology	1,54,256	0.36%	0	0%
Palliative Care	40,400	0.09%	70,000	0.48%
Cardio Respiratory	0	0%	39,800	0.27%
Gynecology	18,600	0.04%	0	0%
Breast	9,900	0.02%	0	0%
Grand Total	4,30,42,286	100%	1,47,00,888	100%

Source: Comprehensive Health Insurance Agency Kerala

Note: CHIS Plus is implemented only through the government health facilities in the State

Almost 90% of the claimed amount in CHIS plus is by cancer and cardiac patients in both the districts. In Malappuram district, cardiac patients claimed more than 60% of the total claimed amount whereas in Palakkad district, roughly the same proportion was made by cancer patients.

RSBY – CHIS

Table 13: RSBY Expenditure in the Pilot Districts 2013-14 (Figures in Lakhs)

Particulars	Malappuram	Palakkad
Premium Paid*	2157.34	15119.40

Source: Comprehensive Health Insurance Agency Kerala

Note: *Premium paid is calculated on the basis of total enrolled families in the districts multiplied by Rs.738/-

A part of the RSBY expenditure on insuring the eligible families is recovered when patients in public hospitals in the district utilize RSBY for their treatment. The approximate net cost to the district for RSBY can hence be calculated (approximate) because not all of the patients treated in say a public hospital in Malappuram belong to Malappuram district. So a person residing in Palakkad shall have his premium paid noted under Palakkad district but if she gets treated in a Malappuram public hospital, the claim reimbursement shall accrue to this hospital. It needs to be noted that the tables are generated from primary source of RSBY CHIS transaction database as the figures are claimed amount by the hospitals. So these figures will not match with the amount reimbursed to the hospitals because the Insurer rejects claims

Table 14: Amount Claimed by Public and Private Hospitals in the Pilot Districts under RSBY-CHIS 2013-14 (Figure in Lakh and Percentage)

District	Public	Private	Total
Malappuram	1146.94	294.64	1441.58
	79.56%	20.44%	
Palakkad	594.92	126.51	721.43
	82.46%	17.54%	

Source: Comprehensive Health Insurance Agency Kerala

Overall it is found that roughly one in five claims is made from private hospitals, with the remaining from public hospitals under RSBY-CHIS (the proportion in public being slightly greater in Palakkad). This can be explained by the fact that while public facilities are automatically empanelled, only empanelled private hospitals may be used to avail of care and that is a limiting factor in their entry/consideration for RSBY/CHIS. In absolute terms, however, the amount claimed by private and public hospitals in Malappuram is double the amount claimed in Palakkad district.

Table 15: Package wise Claimed amount from Public and Private Empanelled Facilities in the Pilot Districts 2013-14 (Figure in Lakhs and Row Percentages)

Package	Public		Private		Total Claimed Amount in Rs.	Percentage (Column)
	Claimed Amount in Rs.	Percentage of Total Claims	Claimed Amount in Rs.	Percentage of total claims		
Medical	563.82	86.69%	86.58	13.31%	650.40	45.12%
Gynecology	82.32	48.42%	87.71	51.58%	170.03	11.79%
Orthopedic	115.97	73.70%	41.38	26.30%	157.35	10.91%
General Surgery	116.92	75.99%	36.94	24.01%	153.85	10.67%
Unspecified	97.04	97.21%	2.79	2.79%	99.83	6.93%
Oncology	74.89	100%	0.00	0%	74.89	5.19%
Ophthalmology	12.64	33.99%	24.54	66.01%	37.17	2.58%
Urology	15.85	96.63%	0.55	3.37%	16.40	1.14%
Ear	13.65	84.76%	2.46	15.24%	16.11	1.12%
Neurosurgery	11.99	79.59%	3.08	20.41%	15.07	1.05%
Nose	12.89	95.43%	0.62	4.57%	13.51	0.94%
Endocrine	8.23	85.37%	1.41	14.63%	9.64	0.67%
Endoscopic Procedures	2.19	30.97%	4.87	69.03%	7.06	0.49%
Other Common Procedures	6.93	100%	0.00	0%	6.93	0.48%
Throat	6.48	95.01%	0.34	4.99%	6.82	0.47%
Pediatric	3.49	93.06%	0.26	6.94%	3.75	0.26%
Combined Packages	1.03	52.82%	0.92	47.18%	1.95	0.14%
Dental	0.35	62.39%	0.21	37.61%	0.56	0.04%
Hysteroscopy	0.28	100%	0.00	0%	0.28	0.02%
Grand Total	1146.94	79.56%	294.64	20.44%	1441.58	100%

Source: Comprehensive Health Insurance Agency Kerala

In Malappuram district, the majority of cases claimed are under the medical(45%) category followed by gynecology (11.7%), orthopedics (10.9%) and general surgery (10.6%). We note also that certain areas like ophthalmology, gynecology, and endoscopy have a greater proportion of claims coming from the private sector, whereas all oncology and hysteroscopy claims, as well as more than 90% of the claims under urology, nose, throat and pediatric are from the public sector.

Table 16: Package wise amount claimed by Public and Private Empanelled Facilities in for treating beneficiaries from Palakkad District 2013-14 (Figure in Lakhs and Row Percentages)

Package	Public		Private		Total Claimed Amount in Rs.	Percentage (Column)
	Claimed Amount in Rs.	Percentage of Total Claims	Claimed Amount in Rs.	Percentage of Total Claims		
Medical	346.98	88.94%	43.15	11.06%	390.13	54.08%
Gynecology	65.34	75.68%	20.99	24.32%	86.33	11.97%
Oncology	55.34	99.55%	0.25	0.45%	55.59	7.71%
General Surgery	38.27	70.37%	16.12	29.63%	54.39	7.54%
Orthopedic	29.01	62.27%	17.58	37.73%	46.59	6.46%
Ophthalmology	14.03	66.33%	7.12	33.67%	21.15	2.93%
Urology	2.93	21.96%	10.41	78.04%	13.34	1.85%
Unspecified	10.63	93.64%	0.72	6.36%	11.35	1.57%
Ear	6.55	66.51%	3.30	33.49%	9.84	1.36%
Other Common Procedures	9.42	100%	0.00	0%	9.42	1.31%
Endocrine	4.61	79.90%	1.16	20.10%	5.77	0.80%
Nose	3.42	68.13%	1.60	31.87%	5.02	0.70%
Neurosurgery	4.20	100%	0.00	0%	4.20	0.58%
Endoscopic Procedures	1.94	62.06%	1.19	37.94%	3.13	0.43%
Combined Packages	0.00	0%	2.41	100%	2.41	0.33%
Throat	1.39	79.37%	0.36	20.63%	1.75	0.24%
Pediatric	0.82	85.42%	0.14	14.58%	0.96	0.13%
Hysteroscopy	0.05	100%	0.00	0%	0.05	0.01%
Dental	0.00	0%	0.01	100%	0.01	0%
Grand Total	594.92	82.46%	126.51	17.54%	721.44	100%

Source: Comprehensive Health Insurance Agency Kerala

The trend in the claims from Palakkad district is similar to the Malappuram district. But the total claims under neurosurgery are in the public sector, whereas for urology almost four out of five claims and for dental care all claims are from private sector. In Palakkad, 75% of the claims under gynecology are from the public sector where as it is only 50% in Malappuram district.

Karunya Benevolent Fund

Table 17: Financial Assistance Provided to the Beneficiaries through Karunya Benevolent Fund in the Pilot Districts 2013-14 (Amount in Lakh Rs. Figures in parenthesis are percentages of column totals)

Disease	Malappuram	Palakkad	Total Amount
Financial Reimbursement to Govt. hospitals	1709.7 (63%)	1334.1 (47%)	3043.8 (55%)
Financial Reimbursement to Private Hospital	1005.1 (37%)	1534.1 (53%)	2539.1 (45%)
Total Amount	2714.7	2868.2	5582.9

Source: District Lottery Office

The total amount distributed through the Karunya is almost similar in both the district. In line with patient volumes, financial assistance to government hospitals for Karunya beneficiaries is more than three fifths of total assistance for Malappuram district whereas for Palakkad beneficiaries, more than half of the financial assistance is to private hospitals. This trend, in Palakkad, is distinct from what is seen in other schemes, suggesting there is something about the empanellment of facilities and services sought in KBF that is rather unique as compared to RSBY-CHIS. We examine this further, next.

Table 18: Disease wise Financial Assistance through Karunya Benevolent Fund for Beneficiaries in the Pilot Districts 2013-14 (Amount in Lakh Rs. Figures in parenthesis is percentages of column totals)

Disease	Malappuram	Palakkad	Total (Column)
Cancer	1024 (38%)	959 (33%)	1982 (36%)
Kidney Disease	807 (30%)	1167 (41%)	1974 (35%)
Heart Ailments	831 (31%)	700 (24%)	1531 (27%)
Brain and Liver Ailments	27 (1%)	32 (1%)	59 (1%)
Hemophilia	23 (1%)	0 (0%)	23 (0.4%)
Spine and Spinal Cord Injury	2 (0.1%)	7 (0.2%)	9 (0.2%)
Severe Respiratory Disease	0	3 (0.1%)	3 (0.05%)
Palliative Care	0	1 (0.03%)	1 (0.02%)
Total Amount	2715	2868	5583

Source: District Lottery Office

KBF claims are spent the most on cancer treatment in Malappuram and kidney disease treatment in Palakkad (although a sizeable proportion is also spent on cancer care. We may note that kidney patients are lower in volumes than patients with heart ailments but have a higher amount spent on them than heart ailment patients. Also, despite the problem of kidney disease being highlighted more in Malappuram, spending under KBF on this condition is higher in Palakkad. This may have in part to do with the fact that dialysis services are more accessible in the private sector in this district, and should be further examined. Moreover, heart ailments form a comparatively much larger piece of the total pie spent in Malappuram district than in Palakkad district, although in absolute terms, the amounts spent are similar. We also see a wider range of claims in Palakkad – albeit for very few people- than in Malappuram, with the exception of hemophilia, for which only Malappuram patients have sought care.

Table 19: Disease wise amount reimbursed to Public and Private facilities through Karunya Benevolent Fund for Providing Treatment to Beneficiaries in Malappuram District 2013-14

Disease	Public		Private		Total Amount Reimbursed in Rs.	Percentage (Column)
	Amount Reimbursed in Rs.	Percentage	Amount Reimbursed in Rs.	Percentage		
Cancer	883.69	86.31%	140.16	13.69%	1023.85	37.71%
Heart Ailments	586.31	70.53%	245.01	29.47%	831.32	30.62%
Kidney Disease	195.29	24.20%	611.79	75.80%	807.08	29.73%
Brain and Liver Ailments	19.95	73.62%	7.15	26.38%	27.10	1.00%
Hemophilia	23.42	100%	0.00	0%	23.42	0.86%
Spine and Spinal Cord Injury	1.00	51.28%	0.95	48.72%	1.95	0.07%
Grand Total	1709.66	62.98%	1005.05	37.02%	2714.71	100%

Source: District Lottery Office

In Malappuram district, more than 60% of the total amount is going to the public hospitals. For cancer, heart ailments, and brain and liver ailments more than 70% of the fund is going to the public sector. But in case of kidney disease less than 25% of the amount is reimbursed to the public sector.

Table 20: Disease wise amount reimbursed to Public and Private Sectors facilities through Karunya Benevolent Fund for Providing Treatment to Beneficiaries in Palakkad District 2013-14 (Amount in Lakhs and Percentage)

Disease	Public		Private		Total Amount Reim-bursed in Rs.	Percentage (Column)
	Amount Reim-bursed in Rs.	Percentage Of Total Reim-bursed	Amount Reim-bursed in Rs.	Percentage Of Total Reim-bursed		
Kidney Disease	113.46	9.72%	1053.81	90.28%	1167.27	40.70%
Cancer	870.14	90.78%	88.39	9.22%	958.53	33.42%
Heart Ailments	320.92	45.86%	378.92	54.14%	699.84	24.40%
Brain and Liver Ailments	22.49	70.97%	9.20	29.03%	31.69	1.10%
Spine and Spinal Cord Injury	3.26	48.61%	3.45	51.39%	6.71	0.23%
Severe Respiratory Disease	3.18	91.38%	0.30	8.62%	3.48	0.12%
Palliative Care	0.64	100%	0.00	0%	0.64	0.02%
Grand Total	1334.10	46.51%	1534.07	53.49%	2868.17	100%

In Palakkad district, out of the total amount, more than 50% is reimbursed by the private sector. More than 90% of the amount to the cancer treatment is reimbursed by the public sector where as for kidney disease it is less than 10% only. This confirms our earlier statement that kidney disease treatment appears to be more accessible in the private sector

Governance and Information Systems

According to the World Health Organisation, governance in the health sector refers to a wide range of steering and rule-making related functions carried out by governments/decisions makers as they seek to achieve national health policy objectives that are conducive to universal health coverage (WHO, 2015). It is a political process that involves balancing competing influences and demands, maintaining the strategic direction of policy development and implementation, detecting and correcting undesirable trends and distortion, articulating the case for health in national development, regulating the behavior of a wide range of actors - from health care financiers to health care providers and establishing transparent and effective accountability mechanisms. Beyond the formal health system, governance requires collaborating with other sectors, including the private sector and civil society, to promote and maintain population health in a participatory and inclusive manner.

In Kerala, there exist a series of interconnected and nested governance structures in service of health. These include the State Health and Family Welfare Department, nested within which is the Directorate of Health Services, as well as the National Health Mission. Each of these elements have components and architectures extending district level downwards, as we explain in this chapter. Another key governance stakeholder is the institution of Local Self Government Institutions (which are under the purview of an eponymous Department of Local Self Government).

A key component of governance is management, which involves the monitoring of the health status of populations and the provision of services, drugs, equipment, finances, and personnel on a regular and need basis. This requires timely and accurate information from various sources. Accurate, relevant and up-to date information is essential to health managers if they are to recognize weaknesses in health service provision and take action to improve service delivery. Accordingly, the development of an effective Health Information System (HIS) is necessary precursor to managerial improvement. Kerala has an intricate set of information systems related to health, which we also characterize in this chapter.

Structure of Kerala State Health and Family Welfare Department

The government of Kerala is run through a secretariat, the highest level of state administration, which offers a locus for the exercise of authority, and is comprised of departments. Health is overseen by the Department of Health and Family Welfare; political leadership is given by an appointed health minister while administrative leadership is provided by the Secretary to the Government.

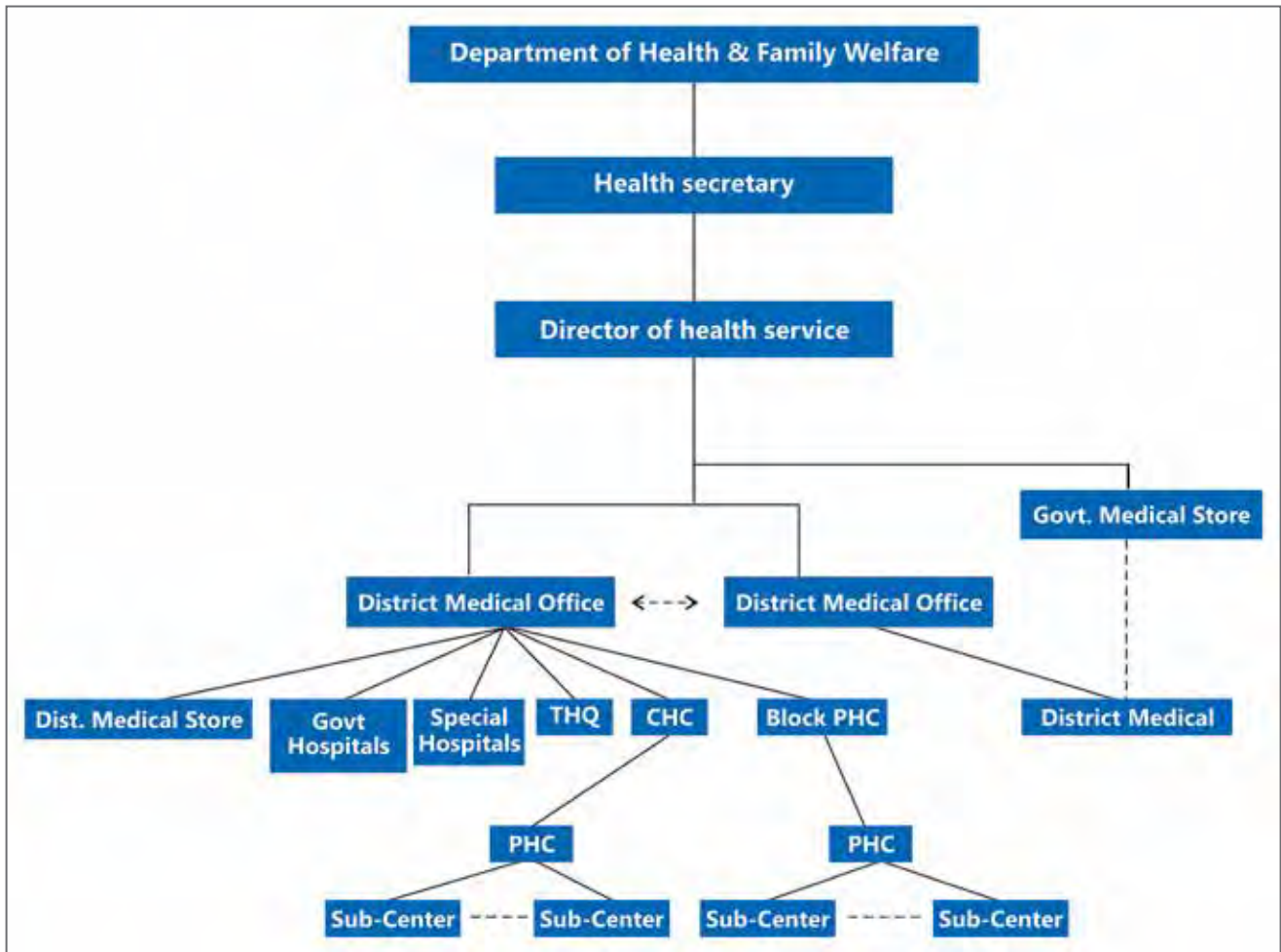
Objectives and Activities: The main objective of the Department is to assure preventive, promotive, curative, and rehabilitative health care, along with the implementation of the Family Welfare programme through a five-tier health delivery system (described later).

Directorate of Health Services

Under the Directorate of Health & Family Welfare, a technical wing that establishes and maintains medical institutions with necessary infrastructure, controls communicable diseases, renders family welfare services including Maternal and Child Health Services, and implements national control/eradication programme and administration of various divisions of the Directorate. The Analytical Laboratories and Public Health Laboratory function as single purpose units under the department with an independent controlling officer for each.

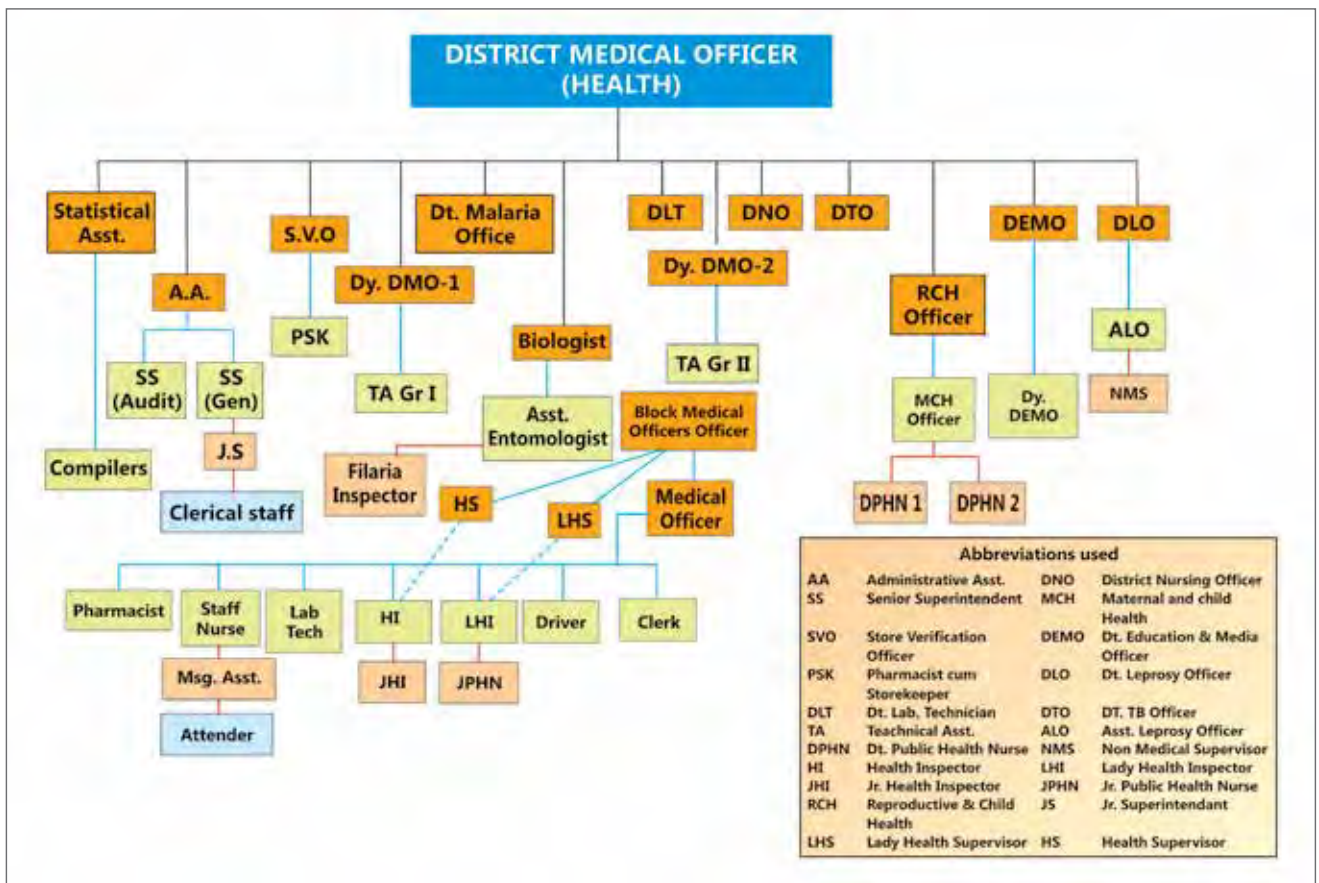
The activities of the Director of Health Services are designed for the preservation and improvement of preventive, promotional, curative and rehabilitative health; the Director of Homeopathy, Director of Indian System of Medicine, Analytical Laboratory, Public Health Laboratory and Hospitals ranging from Medical College Hospitals to Community Health Centers fall under his/her purview, as depicted in Figure 1, below.

Figure: 1 Drugs Indented Palakkad 2014-15



District Medical Offices oversee the provision of services based out of facilities from the community level upwards, with varying staff and administrative configurations (see Box A). The most grass roots level institution and first facility level contact for the community is the Sub Centre. The activities and services in the Sub Centre are provided by the Junior Public Health Nurse (JPHN) and Junior Health Inspector (JHI), serving a population of 3000 to 8000 depending on the density of population, geographic terrain and other special characteristic of the area in question.

Figure 2. Organogram of the District Medical Office



The next level up is the Primary Health Centre (PHC), which provides promotive, preventive and curative services for 30,000 persons (20000 persons in hilly, tribal and backward areas). The PHC is headed by a Medical Officer, and comprises clerical staff, pharmacist, laboratory technicians, Lady Health Inspector, Health Inspector etc. Each GramPanchayat will have one PHC; where there is more than one institution in any GramPanachayat, one will be the designated PHC for Public Health and Primary Health care activities and the others will focus on curative services.

The Community Health Centre (CHC) / Block PHC- provides clinical care with in-patient (IP) services in addition to services provided by PHCs, catering to a population of 80,000 to 1,20,000. CHCs are serving as the referral institution for four PHC's under the Block Panchayat; they are headed by the Superintendent, and staffed by Medical officers, clerical staff, a Health Supervisor, a Lady Health Supervisor, Pharmacist, Lab Technician, Staff Nurse etc.

Going up (in terms of specialization and curative focus) is the Taluka Head Quarter Hospital (THQH), another category that may provide the entire basic specialty services. They are to be equipped to provide all types of secondary level services. THQH provide curative services with essential specialty care including RCH services (up through post-partum care units), essential diagnostic services including ElectroCardioGram (ECG), X-Ray, Ultrasound (USG) and laboratory services, Trauma care & Emergency medical services, Ambulance Service and Post-mortem.

District Hospitals provide all types of tertiary level care, including super specialty services like Cardiology, Neurology, Plastic Surgery, Urology and Paediatric Surgery. Specialty dental services- Maxillo facial surgery, conservative and Orthodontic- are also provided at this level.

General Hospitals-provide a greater quantum of all the services provided at the District Hospitals level and are also expected to provide the super specialty services like Cardiology, Neurology, Plastic Surgery, Urology and Paediatric Surgery. Specialty dental services such as Maxillo-facial surgery, conservative and Orthodontic- are to be provided at this level.

Specialty Hospitals provide specialized treatment by population of disease condition – examples include Women and Child Hospitals, Tribal Specialty Hospitals, and Sanatoria/Hospitals or District Centres for Tuberculosis, Leprosy, and Mental Health.

Medical colleges play a pivotal role in developing medical and paramedical human resources to cater the health needs of the state. They also function as premier referral and research centres.

Box A. Administration of Public Health Facilities

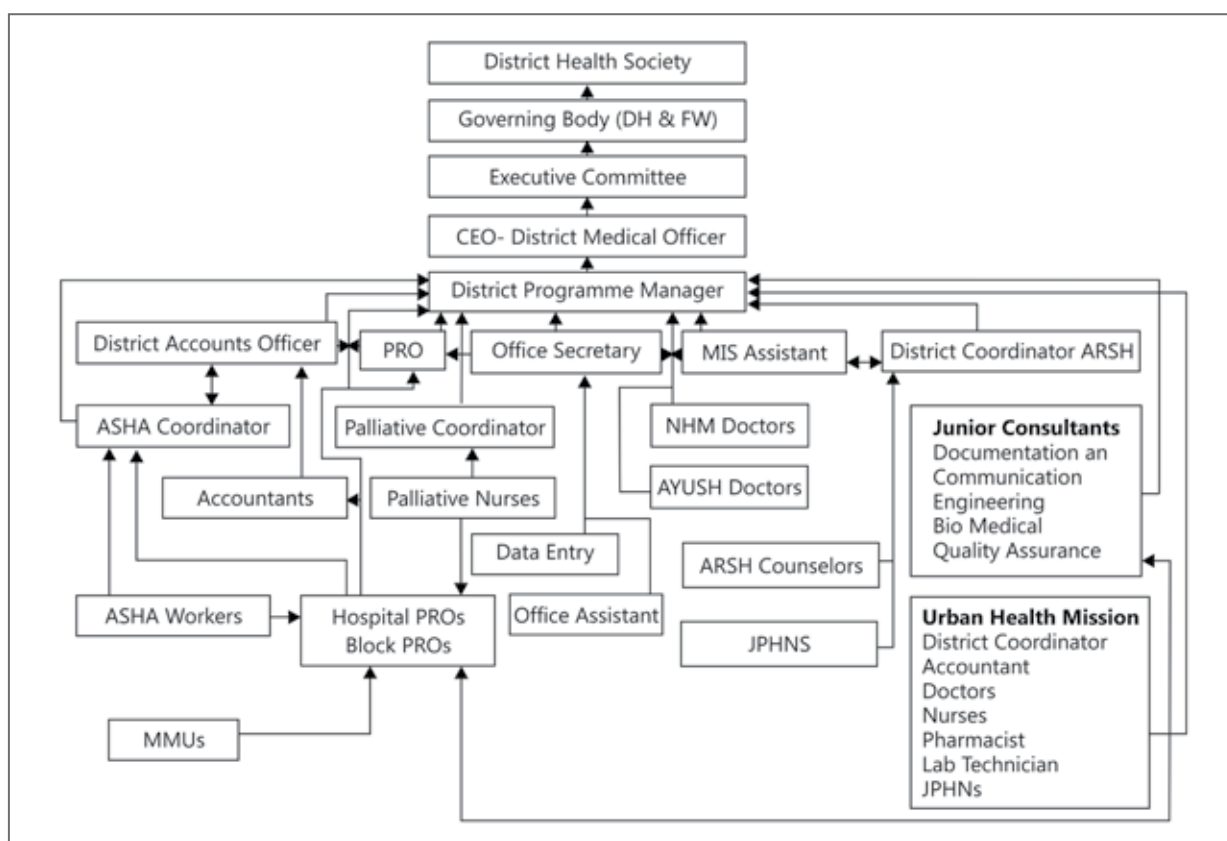
At the sub-centre level, nursing cadres provide leadership and service delivery. Upwards of this, medical doctors are relied on for facility administration, and are classified under three cadres based on their choice and qualification as General, Specialty and Administrative cadres. Doctors in the general cadre function as administrative heads in PHCs and CHCs where as at the Secondary and Tertiary care facilities, doctors from administrative cadre carry out administration. More specifically, the Medical Superintendent (MS) is the head of the Taluk, Specialty and District level institution under the overall administrative control and guidance of District Medical Officer. The MS has both administrative (Planning and development, staff management, HMIS monitoring) and functional responsibilities (management of preventive, promotive and curative programmes, medico-legal responsibilities and financial management). In addition to this, the Hospital Management Committee (HMC) is the decision making body of Taluka Hospital. Members of HMC include MS, Block Panchayat President or Chairperson of the Municipality, elected representatives of the local body and civil society members. The meeting of the HMC is carried out every three months to discuss the needs of the hospital. HMC collects funds through service charges for OP tickets, diagnostics, lab charge etc. 50 percent of the funds of HMC is to be utilized for hospital development and 50 percent as staff salary. Once a decision is made in the HMC meeting, Superintendent of the hospital is the implementing authority.

Structure of National Health Mission (NHM)

The National Health Mission (NHM) is an initiative undertaken by the government of India to address the health needs of underserved rural areas. Founded in April 2005, the NHM was initially tasked with addressing the health needs of 18 states that had been identified as having weak public health indicators.

The mission was initiated with the goal to improve the availability of and access to quality health by the people. In Kerala, as elsewhere, there is a State Mission Office headed by the state Mission Director; each district has District Programme Management Support Unit (DPMSU, see Figure 3). The District Medical Officer is the Chief Executive Officer of NHM at this level while programme management is carried out by the district programme manager (DPM). The activities of the NHM include the management and implementation of several programmes to reduce the infant and maternal mortality, assurance of access to public health services such as women's health, child health, water, sanitation and hygiene, immunization and nutrition, and prevention of communicable and non communicable disease.

Figure 3. Organogram of the National Health Mission at District Level



The District Programme Management Support Unit (DPMSU) is populated from the field to district levels by consultants appointed under the DPM on a contract basis, who are responsible for the implementation, monitoring and data management at the assigned levels.

As per the 12th Plan document of the Planning Commission, the flagship programme of NRHM will be strengthened under the umbrella of National Health Mission. The focus on covering rural areas and rural population will continue along with up scaling of NRHM to include non-communicable diseases and expanding health coverage to urban areas. Accordingly, the Union Cabinet, in May 2013, has approved the launch of National Urban Health Mission (NUHM) as a sub-mission of an overarching National Health Mission (NHM). The major Initiatives under NHM are

- National Urban Health Mission
- National Ambulance Services
- JananiSurakshaYojana (JSY)
- JananiShishuSurakshaKaryakarm (JSSK)
- RashtriyaBalSwasthyaKaryakram (RBSK)
- Mother and Child Health Wings (MCH Wings)
- Free Drugs and Free Diagnostic Service
- District Hospital and Knowledge Center (DHKC)
- National Iron+ Initiative
- Palliative Care Programme
- School Health program

- Adolescent Reproductive and Sexual Health (ARSH)
- Multi Stakeholder Participation
- Tribal Health Programmes
- Accredited Social Health Activist (ASHAs)

Under National Urban Health Mission Programme (NUHM), Primary Health Centers are setup in the urban areas of the district with the support of Local Administration, envisaged to meet the health care needs of the urban population with the focus on urban poor, by making available to them essential primary health care services and reducing their out of pocket expenses for treatment

The central mechanism for decision-making and implementation of the NHM is the state Programme Implementation Plan (PIP), a document prepared annually that aims to indicate targets and rationalize budgetary requirements for programme implementation in the upcoming year. A bottom up approach is followed for preparing the State PIP wherein the inputs are taken from block, CHC/PHC and Village level to prepare a District Health Action Plan (DHAP). These DHAPs are then consolidated to prepare a State PIP. From the state level, PIPs are finalized in the NPCC (National Programme Coordination Committee) meeting for Administrative approval; Resource envelope is created and accordingly conveyed to the state. On finalization of the budget in the NPCC Meeting, it becomes an Official document available in the Ministry's site for general viewing.

Financial support is provided by NHM for infrastructure development, procurement of diagnostics and drugs, ward health, sanitation and for maternal and child related services. NHM also supplements various categories of technically qualified professionals like Staff Nurses, Lab Technicians, Pharmacists and Doctors on a contractual basis to improve the outcome of services provided through these facilities. NHM funds include untied fund, Annual Maintenance Grant, and the RogiKalyanSamiti fund. Other funds to the hospital are provided from various schemes like RSBY, JSY, and JSSK.

Role of Local Self Governments in Public Health

Kerala is one among the states where the implementation of the Panchayati Raj Act (the 73rd Constitutional Amendment) for people's participation in governance has been successfully undertaken. Kerala has highly active Gram, Block and District Panchayats. Subsequent to the enactment of the Panchayati Raj Act in 1996, various Public Health Institutions were transferred across these three tiers: Gram Panchayats were given Dispensaries, Primary Health Centers and Sub Centers, Maternity and Child Welfare Centers, Immunization and other preventive measures, as well as the Family welfare and Sanitation programme; Block Panchayat and Municipalities were given charge of Community Health Centre and Taluk Hospitals; and District Panchayat were awarded control over Management of District Hospitals, setting up of Centers for care of special categories of persons with disabilities, and co-ordination of central and state sponsored programmes at district level.

PRI's share responsibility with the National Health Mission for supplementing health services delivery. For example, nearly 10-15 percent of their budget is used for infrastructural development and maintenance of public health institutions. Any proposal submitted by the Superintendent of Hospital is reviewed and processed by the Health Working Group and Health Standing Committee of the relevant PRI for approval. Local body also provides the solid waste collection services in the hospital along with other obligatory functions. Finally, a Medical Superintendent may approach MP/MLA of the area for financial support to meet the infrastructural needs of the hospital (John, 2012).

Panchayati Raj Institutions are given limited level of control over health human resources (like doctors and nurses). Panchayati Raj Institutions do not have any role in recruitment, placement and promotion of health personnel these activities. However, Government of Kerala has given managerial and part disciplinary control over staff of public institutions to relevant Panchayati Raj Institutions, often serving with them in management related committees. This serves as a kind of feedback loop for accountability.

A typical example of this is the Hospital Management Committee which exists for each public facility across Allopathic, Ayurvedic and Homeopathic systems. The HMC is headed by the elected head of the concerned local government and also includes other medical staff from the facility as well as other members of the community. Through the mechanisms of the HMC, Panchayati Raj Institutions carry out overall management of public health institutions, including allocations for maintenance of existing infrastructure including building and equipment, building up new infrastructure, purchase of certain medicines, equipment, as well as grievance redressal for patients and the public.

Health Information System

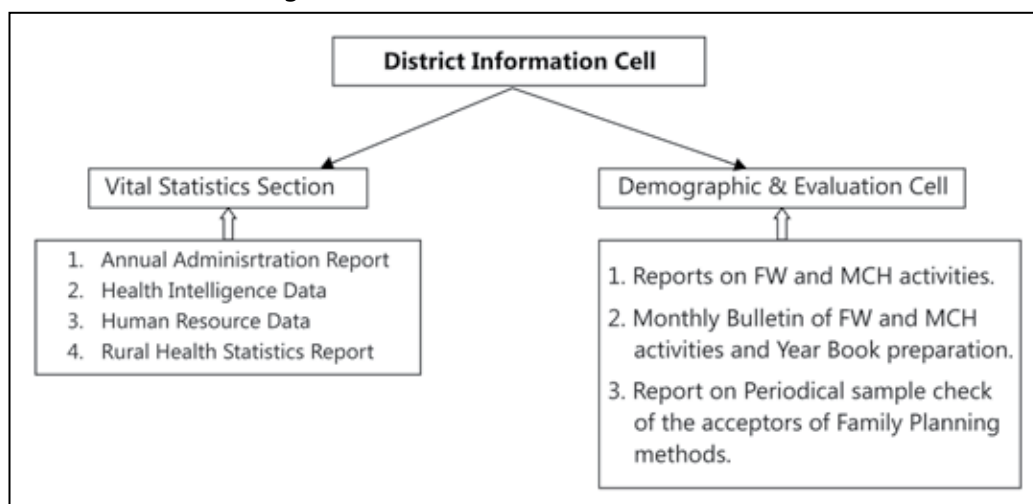
A health information system is a set of organized processes and mechanisms whereby health data (inputs) are recorded, stored, retrieved and processed for decision making (outputs). Decision making broadly includes managerial aspects such as the planning, organizing and control of health care facilities at the national, state and institutional levels and include: 1) providing optimal patient care; 2) training of medical personnel to generate appropriate human resources; and 3) facilitating research and development activity in various fields of medicine

The Health Management Information System (HMIS) includes the sub systems for surveillance, service reporting, programme reporting, administration, and finance and is may often dovetail with other information systems like Vital registration (documentation of births, deaths, marriages, migration, etc.). Each sub-system is fairly complex and nuanced; for example epidemiological surveillance includes identification/notification of diseases and risk factors, investigation follow up and control measures. Routine service reporting pulls hospital/ health center based indicators on their coverage and performance. Specific programme also takes place for coverage of various programs like, RCH, AIDS, Malaria, Leprosy, NHM, RSBY. The Administrative System Account and financial systems includes drug management (procurement, storage and delivery), personnel management and asset management (Equipment/Building etc) and is another critical component of the HMIS (Bodavala, 1998). It is important to note further that the HMIS spans, like facilities, from the grassroots up to the state and national health departments (and other agencies and departments like the State Planning Board), requiring mechanisms for coordination and transfer of knowledge across these levels.

At the district level, health related data is collected through Offline/ Manual and Online Modes. Daily, weekly and monthly data is collected, compiled and reports are generated at the District Medical office and National Health Mission Office. In online systems, software automatically compiles the data for PHC, CHC and for the district levels and in offline mode. Figure 5 shows the existing data collection (manual) and reporting process illustrating where consolidation takes place.

The District Health Information Cell operates out of the District Medical Office for collection and compilation of Health Intelligence data and other vital statistics, as indicated in Figure 4.

Figure 4. District Information Cell Data Flow



Basically two types of reports are sent from the grass root level to upper levels. They are action plans, and monthly reports. Action plans are prepared once in a year, reporting services related to Health and Family Planning that are required to be provided during the year. In compliance with these plans, monthly reports are generated indicating service coverage and utilization of schemes and programmes.

Primary health care institutions have field staff that collect data manually under the supervision. Junior Public Health Nurses (JPHN) and Junior Health Inspector (JHI) collect data for their sub-centre area under the supervision of the Lady Health Inspector (LHI) and Health Inspector (HI) at the PHC level. At the Block level the report is routed through the Health Supervisors (HS) and Lady Health Supervisor (LHS). This data is consolidated and sent to the District Medical Officer, where it is compiled across facilities and sent to the Directorate of Health Services, and the passed onward to the Department of Health and Family Welfare at state and central levels. Area reports are compiled for institutional delivery as well as maternal and child health, family welfare, communicable diseases and stock positions, sometimes using manual forms (Form 6) and other times using a computerized format known as Community Need Assessment (CNA) report. Paper reports are also sent compiling data on family welfare, communicable diseases, palliative care, the school health programme, Vitamin-A supplementation programme, supply of iron & folic acid, vector survey and the Integrated Child Development Scheme (ICDS). All paper reports are aggregated or collected by the supervisors at the PHC and CHC levels, typically by nursing staff, for transmission to the district level. (See Annexure 5 for transmission of data at various levels)

The Annual Administration Report consists of reports related to expenditure and revenue details under different heads, urban/rural break up of Government Allopathic Medical Institutions, details of Grant-in-aid Institutions, the number of Sexually Transmitted Diseases (STD) cases treated, district wise Medical Termination of Pregnancy (MTP), coverage indicators for each health programme during the year, Information Education and Communication activity details, disease burdens, in-patient loads and procedures.

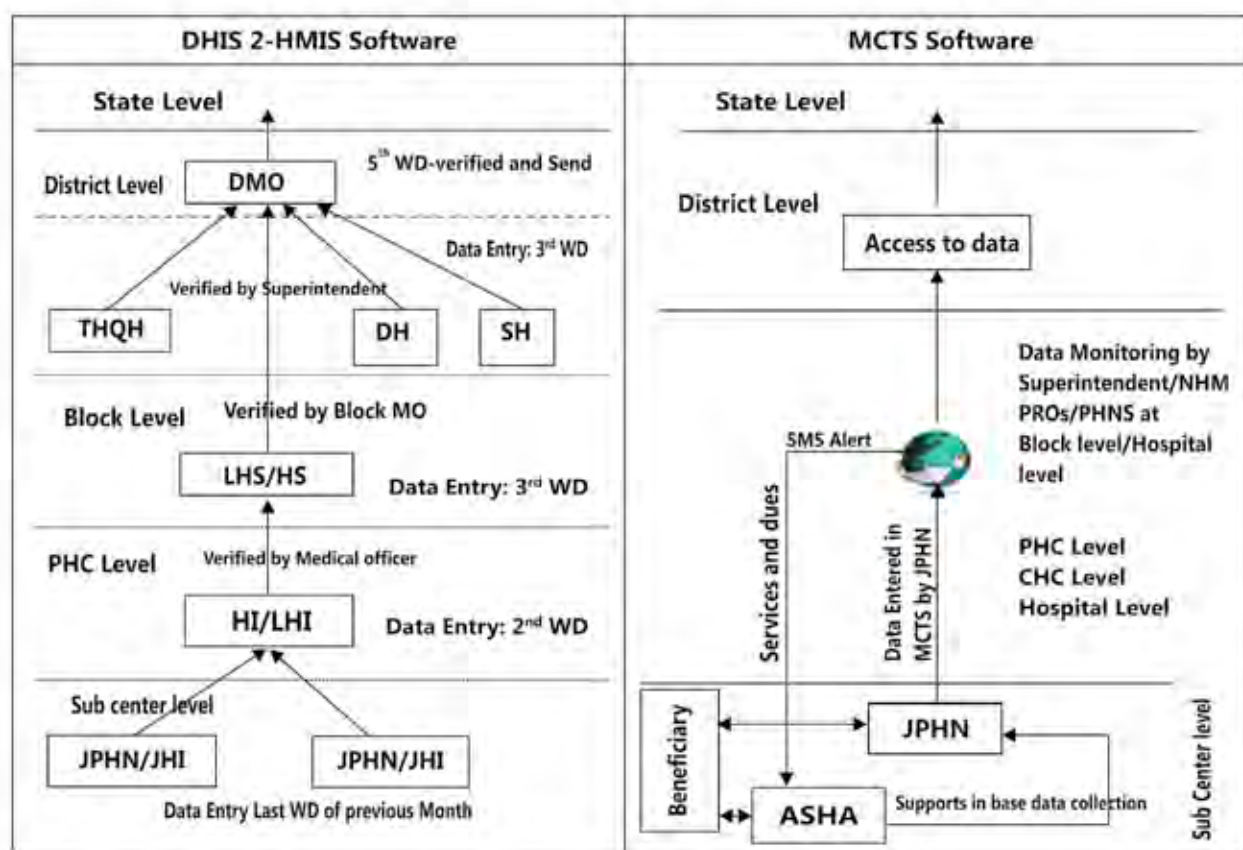
Health Intelligence data is collected on a monthly basis from each district. It mainly consists of information on activities carried out under different health programmes. When appropriate, i.e. during epidemic outbreaks, the frequency of health intelligence data reporting increases to daily or weekly reports.

The reporting load at the grassroots level is significant, as different programmes have a vertical structure with little integration between them. The Junior Health Inspectors at present sends in several reports including monthly target and achievement report, vector survey report, reports related to malaria control programme, non-communicable disease control programmes and migrant survey reports. At present the JPHN collects and transmits information under several sections as listed below.

DHIS 2 which is commonly referred to as HMIS: It collects information regarding service delivery related to maternal health and immunization activities on a monthly basis which is entered into the online DHIS software sub center wise and the data is consolidated by the software at PHC/CHC level and gets approved by the Medical officer which is consolidated at the Block level cross checked by the Block Medical Office. The data received from various health blocks of the district is again consolidated at the district level and finally aggregated at the state level. It is based on service given at individual institutions. Data from private institutions are also collected by the JPHN and entered separately.

MCTS (Mother and Child Tracking System): This is an initiative of the national government and is basically a replica of the Maternal and Child Health register used by the JPHN. All the information collected by the JPHN is entered into the online platform and transmitted to the national level. It is supposed to be updated on a continuous basis. User names and passwords are assigned for the PHCs, CHCs and Hospitals. Sub centers are assigned to the parent organization in the online software with the name, phone number and address of the health provider (JPHN) and ASHA worker of that area (this data is changed when required) There are two servers for the data entry procedure and one server for generating the report. In MCTS, consolidated data and individual line listing data is available where by one can track what service is given to the target group, to whom services are due etc. The software also sends automated SMSes to beneficiaries, health providers and frontline workers on the date when the service has to be taken, also reminds the health worker in case when a service is due.

Figure 5. Flow of data in HMIS



National Health Mission (NHM)-Reports Offline

Statement of Expenditure (SOE) - The expenditure statements of utilization of NHM funds given to the PHCs and Hospitals are collected by the Public Relations Officers (PROs) and Block Liaison Officers through the Clerks. They are then forwarded to the District Programme Management Supporting Unit (DPMSU) for further consolidation.

School Health Report- Junior Public Health Nurses are assigned to all the aided schools in the districts for providing screening, health care and referrals. They report to the District Coordinator School Health and Adolescent Health monthly on the UTIs, URIs, deficiencies, disabilities, drug abuse and sexual health issues. It is consolidated at the district level and then to the state level.

RashtriyaBalSwasthyaKaryakram (RBSK) Expenditure Report- Expenditure reports are collected from the hospitals by the PROs through the clerks and it is send to the district for consolidation

Ward Health Sanitation Committee Report- Number of Committees and Nutrition days observed in each of the wards institution wise is send monthly to the DPMSU by the PROs and BLOs.

JSY/JSK reports – Number of eligible beneficiaries for JSY/JSSK urban and rural

Adolescent Friendly Health School Clinic – Client load in the counseling sessions at the schools is reported by the counselor

Human Resources report – Sanctioned and in position status of staffs under NHM facility wise is reported by the PROs and BLOs to the district office

Menstrual Hygiene Report– PROs and BLOs collected the stock and issue of free days MH pads from the LHIs facility and report to the District office.

Palliative Care Programme Report- the Palliative care nurses appointed at the Panchayat level send the monthly report on the Primary and Secondary services provided under the scheme to the Palliative District Coordinator at DPMSU.

Box: B Janani and Jatak Software – in Attapady

Jatak is a system for Growth monitoring of every child (under-5 yrs.) on real time basis, through mobile telephony (voice file, picture and location along with vital statistics) and server based programme (with a GIS backbone). The system automatically sends early warnings to the mobile phones of JPHNs (as alert notification) about each child whose growth is found to be alarming, declining or faltering. The principal purpose of Jatak is to bring notice to a child as soon as she/he enters into the arena of 'malnutrition'. Jatak brings focus on all three indicators viz. underweight, wasting and stunting in Attapady, where concern has been raised on these very issues.

For focusing on mothers during pregnancy and the post-natal period and ensuring appropriate neo-natal care of children, the health department launched 'Janani' in mid-April 2014 at Attappady. Janani is a system similar to Jatak to capture, transmit and process real time data related to expecting/lactating mother and the children covering all the aspects of maternal and child healthcare for populations living in this tribal dominated district.

Reports under NHM – online

Central Plan Scheme Monitoring System (PFMS/CPSMS) - funds received by the DPMSU is transferred/ allocated to the beneficiary facility/ the beneficiaries through the central monitoring system which linked to all nationalized banks in order to ensure the fund has been received by the real eligible beneficiary facility/beneficiary. E.g. JSY payment is initiated through this software; the eligible beneficiaries are imported to this software from MCTS.

EcMan software-This software is used to manage the ASHA details and Performance. The monthly incentive paid to the ASHAs is based on the reports generated from this software. The performance details in this software are entered by the JPHNs

School Health Information System- This software contains the basic demographic and infrastructural details of schools in the district. Data is updated as required by the school health JPHNs

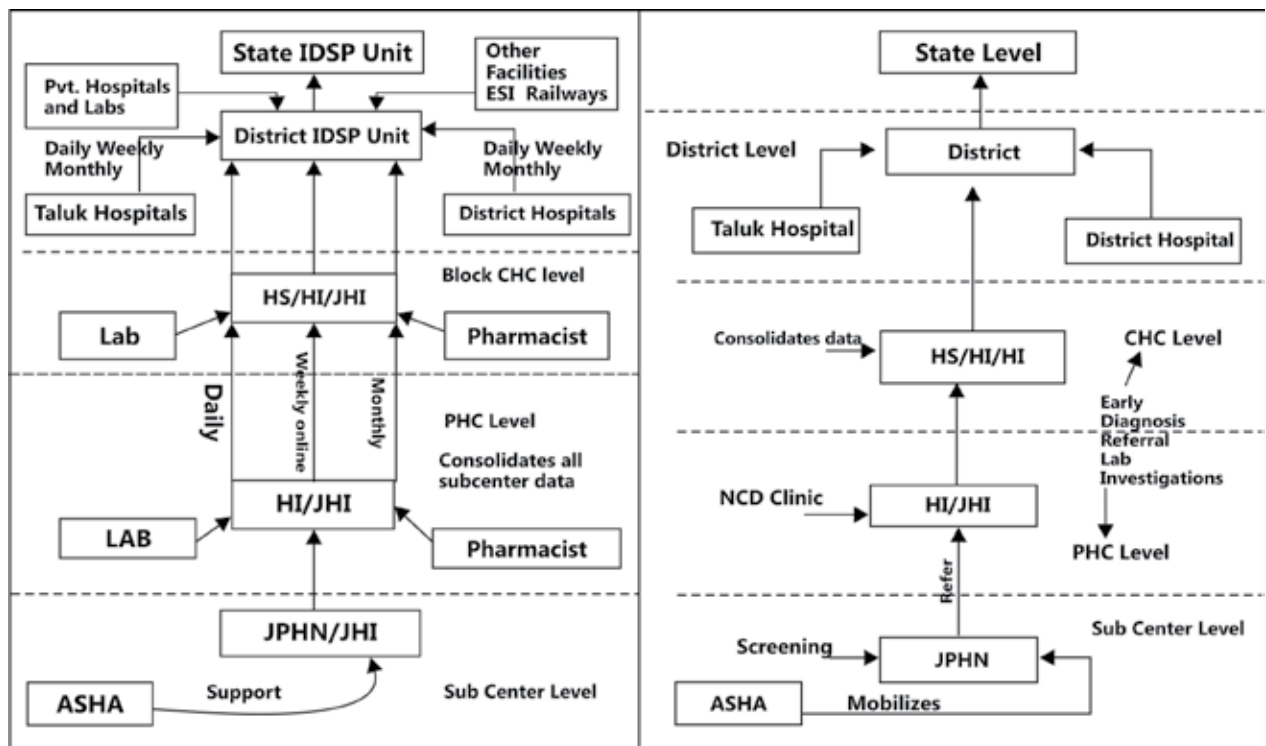
NRHM HR Apps (<http://nrhmhrapps.kerala.gov.in/>) - This software contains the line listing details of the NHM Employees and the Mobile Medical Units services and Utilization is updated through this application.

MCTS and HMIS- NHM district office has the access to the MCTS and HMIS software for monitoring the data quality and for using the data for Programme Planning

Under the Integrated Disease Surveillance Programme (IDSP) disease surveillance data is collected on daily and weekly (Monday–Sunday) basis and immediate (SOS) on imminent outbreaks. Daily data is reported from the public health facility to the District Surveillance Unit over Telephone by the JHI/JPHN or the in charge official for Viral fever, OP/IP statistics of Acute Diarrheal Disease (ADD) and other major communicable diseases. The data received is compiled at the district level and send to state IDSP cell on daily basis. The weekly data gives the time trends and silent outbreaks. The IDSP has a web portal through which information can be directly uploaded at district and is accessible at www.idsp.nic.in.

Non-communicable disease control programmes: Programmes have been initiated under the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Disease and Stroke (NPCDCS) with monthly reporting formats. Early diagnosis of chronic non communicable diseases through opportunistic screening of persons above the age of 30 years at the point of primary contact with any health care facility. Opportunistic screening is built on components of mass awareness creation, self-screening and trained health care providers. For the screening and treatment of the NCDs; NCD clinics are set up on specified days at the PHC, CHC and Hospital levels where comprehensive examination of the patients referred by the lower health facility/ health worker as well as of those reporting directly will be conducted for ruling out complications or advanced stage of common NCDs. Screening, diagnosis and management like diet counseling, lifestyle management and home based care are the key functions. Regular monitoring and review of the scheme is conducted at the District level through monitoring and periodic visits and review meetings. Figure 6 indicates the data flow for these two components.

Figure 6. Information System Flow in IDSP and NCD



Schemes and Programmes information system at the District Level

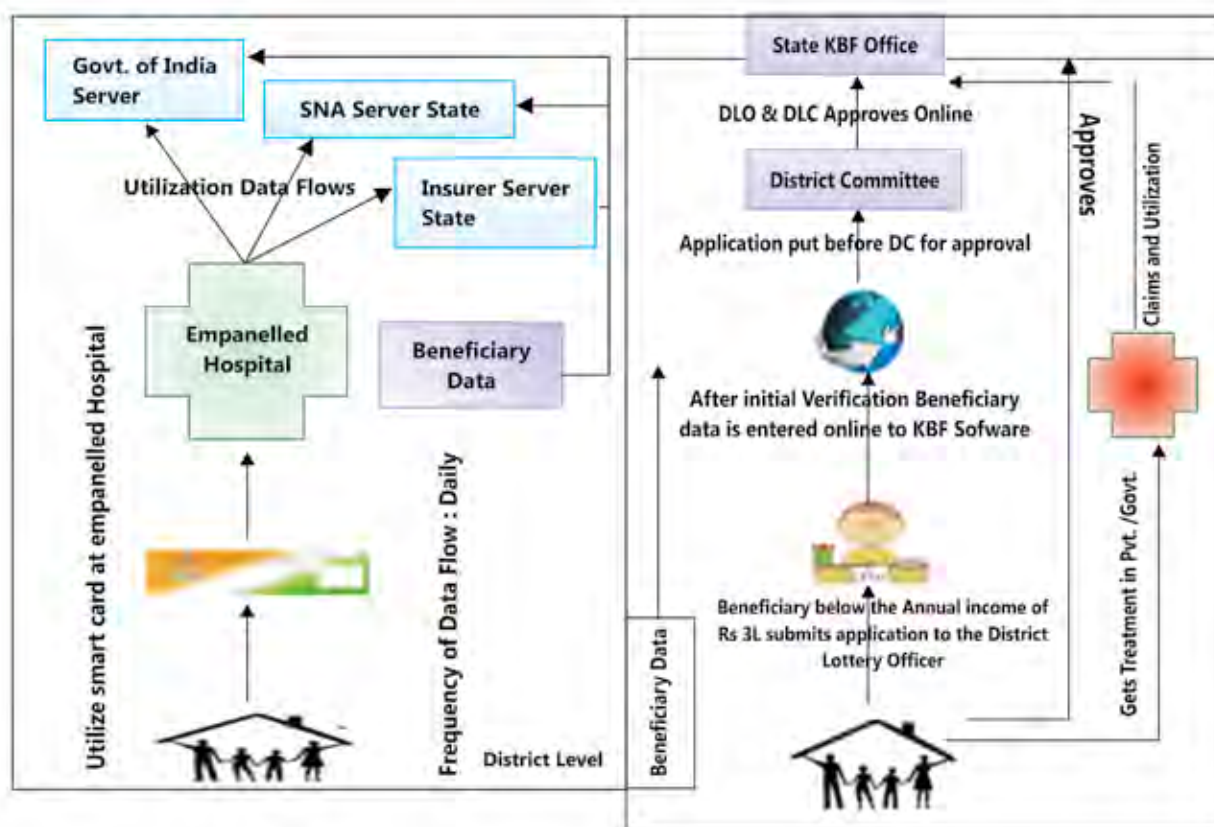
Apart from the National Programmes and Family Welfare Programmes, there are social security and financial security schemes sponsored by the State and Central governments utilized through the selected hospitals. These schemes are implemented by various departments, which provide secondary and tertiary care to the beneficiaries. The information flow of the major schemes and programmes is given below

Rashtriya Swasthya BimaYojana

Under RSBY, data is available on coverage and utilization updated once a year, and flowing from empanelled hospitals through an online system to State, Central and the Insurance Providers Servers (see Figure 7). On the front end, apart from registration and blocking of amounts for treatment, Public Relations Officers (PROs) in empanelled hospitals upload data daily on the Unique Registration Number (URN) of patient, age, gender, provisional diagnosis, confirmed diagnosis and amount claimed for treatment and the balance available.

CHIS Plus: Utilization data for CHIS Plus flows to the State Nodal Agencies (SNA) server through an online web portal similar to that of RSBY. The RSBY URN (Unique Relationship number) is used on a different software platform, allowing quick verification of eligibility. Once the treatment is completed, the PRO of the concerned hospital uploads the data to the SNA Server linked to URN, providing claim details, diagnosis/ treatment, as well as variables for age and gender.

Figure 7. Information Flow in RSBY and Karunya Benevolent Fund Schemes



Karunya Benevolent Fund

Data entry and compilation process of the KarunyaBenevolentFund disbursement takes place in the district lottery office on an online software platform. The basic details of the patient, disease details, estimation of the amount required for the treatment and other scheme details available for the patients are collected from the application given by the patient. After the district level committee approval, the claimed amount details are also uploaded online and can be made available in summary form.

Other System of Medicines and Private Hospitals Data

Like the public Allopathy system, AYUSH systems in the public sector have their own District Medical Offices to which infrastructure, service coverage, utilization, and finance data flows from the grass root level and is further reported up to the state level. Data on utilization and disease profile of the beneficiaries utilized is not shared with other departments of medicines. Further, data on the number of or services provided by private AYUSH facilities in the district is unavailable with the AYUSH department.

With regard to the private Allopathy hospitals/ Clinics, data on the number of facilities in the district, their bed strength, and facilities is reportable under the Prevention of Prenatal Diagnosis and Testing Act and is thus provided routinely to the District Medical office. Also, private hospitals accredited with Janani Suraksha Yojana share their monthly achievement of antenatal care, deliveries and immunization with the department.

Gaps in the HIS

The extensive nature of the HIS notwithstanding, there is no single source of data at the district level as there are numerous institutions and departments which work along their own hierarchies posing problems for integration and coordination. Some of the below noted points may justify these issue.

Multiplicity of Institutions and fragmented data:The number of institutions dealing with collection and storage and transmission of health related information is large. Their size, complexity and requirement is quite specific, making the work of coordination at district, state and central level very challenging. Various departments, programmes and institutions within the health sector tend to develop their own data collection system without consulting each other. For instance, vertical programmes for malaria control, TB control, leprosy control, and vector borne disease control in the district operate their information systems independently in the absence of a single institution responsible for HIS. Further, since the sources, timing and channels are different, the comparability and inter-operability of data is inconsistent, particularly in the absence of systematic, periodic reconciliation of data across various departments. In some cases, different types of data flow to different places and are thus difficult to reconcile.

Exhaustive Information Collected but Often Inappropriate for Use: The information requested and collected from staff and facilities every month is exhaustive (see Annexure), heavily fragmented, and not always use-able or necessarily following a broader rationale or framework for reporting. Excessive information collection creates a load on the system and may also result in carelessness due to lack of understanding and investment in the broader use of data. A very large number of registers are to be maintained, very often separately with vastly different parameters. (add reference) Further, the number of health programmes has increased over the years and the people who implement them at the grass root level often feel over burdened with the collection and recording data. To boot, currently, health information systems generate large amounts of data which is often are incomplete or inaccurate and therefore are little used by planners. Input and process data is often included, but outcome and impact data is not, and even the units for reporting sometimes vary across and within districts, hampering the ability to make comparisons and rationalize decision-making.

Combination of reporting methods cumbersome for Staff Compiling Reports:There is a large number of registers, records and reports – some of which are online and others offline-that have to be maintained and sent, requiring specific skills and additional effort. From the field level upwards, this places high demands on staff, which at times they may not even be equipped to handle. This increases the possibility of error and inaccuracy in reporting.

Lack of longitudinal information storage and processing creates additional burden: Absent a system of storing, managing, and updating data over time, for every report, data is reported afresh on a monthly basis. This can allow for wide margins of error and extra effort for each reporting cycle. General information of the public allopathic facilities in the district is entered in the DHIS2 software from the sub center level, which is updated annually, but the software does not generate routine reports, a functionality that is necessary and could easily be added.

Inconsistent units and scope of indicators: In reporting, some indicators are aggregates while others are not, creating challenges in compiling and comparing data. This is particularly the case for IDSP and MCTS data where uniform standards are not followed in reporting, making the data unstable for decision-making and use. In other cases, data are not available or not consistently reported (for example, with mental health burdens).

Conclusions and Way Forward

As detailed in prior sections, there is extensive data available on district specific health resources, facilities, utilization, morbidity, mortality, schemes, social determinants and financing mechanisms. While it was a challenge to bring all this together, we are now able to take a more comprehensive view of the structure and functioning of district level health systems in Malappuram and Palakkad, and appraise the situation in terms of strengths and gaps.

From Primary Health Centre upwards, over 800 public facilities (allopathic and AYUSH) exist in both districts, of various sizes, with coverage of 22-23 beds per 10,000 population. This appears quite substantial, although closer analysis suggests that utilisation of beds and functionalization of in-patient care has to be upgraded. For instance, we found that particularly at the CHC level, many public health institutions existed where not a single patient had been admitted in the past year. It can be argued that this is the case as patients are utilising beds in the private sector. In the case of Malappuram, this may be true. Malappuram has a high number of large hospitals in the private sector, accounting for over 1000 beds. In contrast, in Palakkad, the larger hospitals are in the public, not private sector.

A more detailed comparison of public versus private provisioning of services compiling data across sources, is presented below:

Table 1. Public and Private Health Facilities in the Pilot Districts 2013-14

Type of Facility/Service	Malappuram		Palakkad	
	Public	Private	Public	Private
Allopathic System of Medicine				
Medical College	1*	1	1*	3
Hospital (public includes General, District Specialty and Taluk Hospitals)	10	113	9	79
Community Health Center	20	Not Applicable	19	Not Applicable
Primary Health Center	88	Not Applicable	78	Not Applicable
Dispensaries	19	Not Applicable	14	Not Applicable
Sub Center	589	Not Applicable	504	Not Applicable
Mobile Medical Units	4	Not Applicable	6	Not Applicable
Other Department Hospitals and Dispensaries	4	Not Applicable	11	Not Applicable
Eye Hospitals	0	11	0	5
Dental Clinics	0	150	0	65
Other Systems of Medicine				
Ayurveda Hospital	10	50	6	35
Ayurveda Dispensaries	68	400	84	Na
Homeopathy Hospital	3	7	1	Data not available
Homeopathy Dispensaries	79	Data not available	76	Data not available
Siddha Dispensaries	3	Data not available	0	Data not available
Unani Dispensaries	6	17	1	1
Available Beds				
Allopathy	2514	6937	2474	4282
Other Systems	230	Data not available	70	810
Diagnostics				
Cath Lab	0	7	1	4

Type of Facility/Service	Malappuram		Palakkad	
	Public	Private	Public	Private
Allopathic System of Medicine				
X-Ray	8	250	11	139
CT- Scan	1	Not Applicable	1	Na
USG scan	5	47	6	79
MRI	0	8	0	0
Laboratory	61	244	58	155
Other Services				
Ambulance	30	111	47	91
Medical Shops	166	2028	134	921
Dialysis Machines	26	130	18	37
Utilization				
Deliveries	16214	70244	9003	30042
Caesarian Deliveries	4858	19952	2966	8755
Full immunization coverage (9-11 months)	76486	1501	39492	4098
Utilization of Schemes and Programmes				
Karunya Benevolent Fund (Nos. of Cases)	1329	794	1204	1265
RSBY Conservative Management (Nos. of Cases)	15248	3011	11762	2180
RSBY Procedure Based Management (Nos. of Cases)	3738	2062	3006	843
<i>Note: * Newly sanctioned medical colleges DNA- Data not available Note: NAppl – Not Applicable</i>				

As can be seen above, the private sector dominates in almost all sectors and realms of service delivery, with some noteworthy exceptions (like immunization, financial risk protection schemes).

Our baseline assessment revealed that there is a mismatch between services provided and sought, between human resources present and needed (especially specialists). For instance, the busiest CHC in Palakkad admits almost four times the number of patients as the least busy THQH. The busiest CHC in Malappuram admits more than five times the number of patients as the least busy THQH. And the busiest THQH in Palakkad admits more patients on an average than the District Hospital. And yet, we also found that there are relatively fewer deliveries in PHCs or CHCs as compared to the private sector and public sector hospitals. In facilities that face large crowds, challenges of quality are likely prevalent. These findings suggest that rationalization of care should be brought in, with clear referrals. Further, there is a lack of uniformity in services in THQH, due in part to vacancies but also lack of facilities (especially diagnostic equipment). All the major facilities in Malappuram and Palakkad district have a laboratory but X-ray and sonography facilities are not uniformly available. Although high-end therapeutic equipment is being introduced in some facilities and both have a CT Scan machine, this is an important area of further improvement. Upgrading the diagnostic and care services starting with THQH would therefore go a long way to enabling these high load facilities to more comprehensively address patient needs.

It was also noted that a great proportion of outpatient care (close to a third in Malappuram and a fifth in Palakkad) was being sought from facilities in the Ayurveda, Yoga/Naturopathy, Unani, Siddha, Sowa Rigpa, and Homeopathy sectors – a strong base for primary health care. This has to be included in the referral chain, while giving consideration to the role these systems can play for particular populations (eg. arthritis among the elderly, lower back pain among working populations, etc.). On a related note, greater attention also needs to be paid to the role of health promotion and wellness practices that may be propagated by these systems, ensuring that these are serving to improve population health and can eventually allow for democratic medical pluralism in the health system.

We further learned that over a third of patients availing of RSBY-CHIS schemes in Malappuram are from outside the district, while in the case of Palakkad, a little over a fourth are. The schemes are therefore catering to a wide population outside the state, which the department may wish to take a position on.

The baseline also revealed challenges of recruitment and retention in both districts of the state, with attention to improve performance and management across human resource categories. Total human resources (comprising field staff, paramedicals, nurses, doctors, administrative staff, and other support staff) in the public sector in each district hovers around 4000-5000 across categories of contract (i.e. permanent, temporary, National Health Mission contracts, those deputed, ad hoc, under RSBY and contracted by Hospital Management Committees). This comes to a little over one practitioner per 1,000 population. Considering doctors and nurses alone, the coverage is far lower, and thus lower than WHO recommended norms. Even as numbers of practitioners may be close to adequate, ensuring productivity across levels of care has been a challenge since the 1980s (Sadanandan 1993). The challenges continue till date: we found that in PHCs in Malappuram, doctors are seeing a high volume of patients, while less so at other levels. This is the case for doctors in CHCs in Palakkad. Rationalisation of human resources based on patient and disease loads is therefore essential.

There is the additional challenge of vacancies in the public sector, particularly in the case of specialists. Adequate permanent posts have not been created. For instance, in Malappuram, we found that at most one in five specialists overall was to be found in the public sector. Further, there were no cardiologists, neurosurgeons, oncologists, or plastic surgeons in the public sector, and over ten times the number of general medicine, orthopaedic specialists, 4-5 times the number of obstetrician/gynaecologists and paediatricians, and twenty times the number of psychiatrists in the private sector. Further, there is a need to supplement nursing staff and field staff cadres in both districts and vacancies for even National Health Mission posts are high in Malappuram. Overall, if posts could be rationalised and filled across levels, starting with an anchor point at the THQH level (where patient loads are high), the system can begin to more adequately address the needs and burdens of patients. We can see from our Malappuram data there are a great number of specialists in the private sector – improved human resource policies, that incentivise recruitment and retention can serve to pull in practitioners to these posts. Further, with the medical colleges coming up, gaps can be filled through recruitment policies designed for these new cadres, who will enter the workforce in 2018. For non-physician cadres, emphasis must be placed on quality training, adequate deployment, on the job support, adequate recompense and perquisites, as well as career opportunities. It is interesting to note the very few vacancies in the clerical categories – they appear to have all they need to function. For more technical posts, adequate infrastructure and equipment can help with this, as can ensuring that teams are created across levels of care with clear care pathways and role clarity.

Our analysis of the top conditions in each of the districts revealed the continuing burden of non-communicable diseases (over 150,000 cases of acute diarrheal disease, over 1000 cases of typhoid over 600 cases of dengue, almost 150 cases of malaria). Across both districts, moreover, non-communicable diseases were a considerable burden (Chronic Obstructive Pulmonary Disorder, Acute Respiratory Infection, Haemodialysis and Cancer – seen across schemes, and Coronary Artery Disease, Diabetes and Hypertension). The toll of injuries, particularly in Palakkad, is also considerable (almost 4,000 road traffic accidents, over 20,000 dog bites, over 1600 snake bites, and over 50,000 accidental injuries). Mental disorders also appear to exist in large measure, particularly in Malappuram, though are likely to be under-reported in both districts. A lot of conditions were shared across districts and genders (like COPD, cancer, diabetes) although some appeared to be more salient by district (eg. dengue seen in both surveillance and in-patient care in Palakkad, inter vertebral disc prolapse in top ten of RSBY/CHIS claims in Malappuram) and by gender (breast cancer). Moving forward with care pathways, such commonalities and specificities have to be borne in mind.

It was found that various schemes covering a range of services and a range of populations exist in both districts, within and beyond the health department. There also have emerged, particularly over the past decade, a number of financial risk protection schemes designed to provide financial cover for particularly expensive procedures and conditions. There is a need for a consolidated and customisable view of which populations are covered by what services, provided by whom, and at what cost. Using this information as a starting point, it is proposed that a larger inventory of this information be created and purposed for decision-making at the state and possibly district levels. At this point, summary information on beneficiaries is provided, but a comprehensive understanding of population coverage is still not possible, in the absence of more precise information about the number of eligible beneficiaries for each scheme or programme and the referent periods for information reported. It is suggested through uptake of financial risk protection schemes that males are more likely to be beneficiaries than females, which is suggestive either of differential morbidity, or the gendering of health-seeking. The latter explanation appears more likely, but will also have to be examined further.

Further, it is not clear what the periodicity is of data that is collected, and if/how this data is used by decision-makers at the state and district levels. Given the goal of planning for UHC, moreover, we are limited in that we lack information on the degree to which schemes are alleviating out of pocket costs. Thus, a more robust understanding of the impact of government schemes in Kerala would be gleaned from extensive analysis of financial allocations over time for various schemes and components of schemes. Through such an analysis, we may be able to conclude what is the population coverage, of what services specifically, and at what cost to the state and to the citizen.

A great deal of data is generated on a routine basis, usually for reporting as per norms of vertical programmes and routine systems. However, consolidation and use of this information, facilitated by improving inter-operability of these systems, could be considerably improved and serve as a major resource for decision-making within the department. A logical next step to this exercise is to organise and compile this information to enable analysis and decision-making regarding what schemes may be linked, what populations can be prioritised and how departments may converge towards attainment of universal health coverage and improved development of the people of Kerala. Longer term, further study can shed light on how system inputs, resources, schemes and programmes link to utilization and ultimately affect health outcomes in the population overall and in priority populations in particular in order to ensure greater knowledge-based decision-making in the state.

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| <p>A. Comprehensive care pathways for Kerala's top 20 conditions at the district level, which entails developing an essential health package using an entitlements framework (looking at specific health issues and developing interventions all the way from the community non-clinical level, through to specialized, tertiary level care)</p> |
| <p>B. Re-engineering the health system with norms for appropriate services at appropriate levels of care. This involves repositioning PHCs and CHCs and greater focus on the Taluk Hospital as nodal institution with autonomy at taluka level. This includes Human Resource Management policies and distribution, responsibilities of various cadres (doctors, nurses, specialists, etc.) – ensuring that the HR is fine tuned to treat the specific major diseases in the community, and training</p> |
| <p>C. Harmonization and financial streamlining of schemes to identify duplication, understand exclusions, financial streamlining, design/implementation gaps (Population-based convergence, Issue-based convergence)</p> |
| <p>D. Consolidation of baseline data and health information systems to create an information system which captures data at point of service provision and generates analyses to guide decision making</p> |

As our work on this agenda advances, a first step will be to develop care pathways for the priority conditions, all the while ensuring financial risk protection for those already in the system. Consultations have been held with state and district officials for their concurrence on top 25 conditions (component A) and selection of 2-3 THQH per district to focus on re-engineering (component B), which will ultimately be linked, so as to have the re-engineering of the system so as to deliver the care pathways in a coordinated, efficient, and equitable fashion.

This requires the creation of a methodology for development of care pathways from PHC level upwards (so the process is replicable), drawing on experts and specialists in Kerala as well as district level implementers who will give inputs, refinements, and final approval. We have as a frame of reference, the National Accreditation Board of Hospitals and Health care providers (NABH) from the Quality Council of India, as well as the Kerala Accreditation Standards for Hospitals (KASH) for quality of health care at the government health care facilities, which will be a starting point, but require considerable expansion as we create the care pathways.

Further, re-engineering will entail a mapping of existing status, utilisation, and gaps in infrastructure, diagnostics, drugs, Human Resources, supportive services, and related components for each selected THQH and linked PHCs and CHCs. PHFI is providing this support and seeking, once top 20 pathways are determined, to give additional technical support by way of strategies to fill gaps and also to improve THQH/CHC/PHC that align with the top 20 conditions as well as strategies that will be required irrespective.

Complementing this set of activities, are sets of activities linked to components C and D, which involve desk review of financial risk protection scheme coverage triangulated with field observations to arrive at a strategy to address duplication and streamlining of schemes as is proposed under Sampoorna Arogya Keralam and other

provisos for rationalization. As the fieldwork at THQH is underway, moreover, consultations will be held in order to ensure that these facilities are accessible to vulnerable populations and those with special needs, such as the elderly, disabled, pregnant women, children, and those Below the Poverty Line. Recommendations will feed into the technical support for re-engineering. The goals of this component will be to assure first, ease of administration by district and state level government functionaries; second, point of service accessibility for patients (i.e. standardization of service delivery from the modes that exist currently, to care received at facilities or during diagnosis, including vulnerable sub-populations); and finally, generation of data on financial risk protection and population coverage that may be shared across departments under the stewardship of the Department of Health and Family Welfare.

Drawing upon the extensive work of the baseline assessment, we have already created booklets for public consumption that describe in detail the services available in the public sector so as to inform the public of their entitlements and improve citizen awareness of the functioning of the health system. This is expected to be updated and re-circulated as re-engineering components are introduced and help with demand generation for public services.

In addition to this, it is proposed that further mapping of information flow and content from district to state (to national level) will take place, followed by consultation with district officials on how to make this information decision-ready for their use, and what additional information needs to be introduced in reporting to monitor re-engineering and health system performance. The first goal, therefore, is to ensure that all the data needed is being generated and that data generated can be used for decision-making. As Kerala's e-health initiative also advances, we seek to dovetail enhancements and improvements in the digitization of data collection to be introduced by e-health. Enhancements and support to the District Health Information Cell, which compiles data that is reported weekly, monthly, and yearly, is also proposed so that existing efforts and vertical reporting chains are not duplicated, but rather coordinated, harmonized, and made inter-operable. The second goal, then is to reduce the effort required to carry out reporting, remove duplication in procedures, and allow longitudinal reporting of data. As this is carried out, care will be taken to ensure quality checks and feedback through the reporting chain, ensuring that the process is empowering and has the required human resource backstopping.

Kerala's Draft Health Policy (2013) views UHC as a "future development," giving it particular mention and consideration. The Policy is also realistic in pointing out the essential need for financial allocation for this kind of broad based reform to occur. The Policy, on behalf of the people of Kerala, demonstrates particularly bold political will by stating right after the constraints of funding, quite simply, "But Kerala will prepare a template for Universal Health Coverage." In the past few years, the state has led the way in doing precisely this. Kerala has demonstrated not just political commitment, but the use of a grounded methodology – indeed a template_ for reform, understanding UHC not as some new or monumental shift, but rather a globally linked framework for advancement along a path it is already treading. It has been our privilege to support and witness the development to date, and it will be our honour to see them through to their impactful conclusion as we move forward.

References

1. Aiken, L. H., Clarke, S. P., & Sloane, D. M. (2002). Hospital staffing, organization, and quality of care: cross-national findings. *International Journal for quality in Health care*, 14(1), 5-14.
2. American Psychiatric Association. Task Force on DSM-IV (2000). *Diagnostic and statistical manual of mental disorders (4th ed.)*. Washington, DC: American Psychiatric Association.
3. Andersen, R. M. (1995). Revisiting the behavioral model and access to medical care: does it matter?. *Journal of Health and Social Behavior*, 1-10
4. Bandura A. (1998). Health promotion from the perspective of social cognitive theory. *Psychology and Health* 13(4): 623-649.
5. Bradley, E. H., McGraw, S. A., Curry, L., Buckser, A., King, K. L., Kasl, S. V., & Andersen, R. (2002). Expanding the Andersen Model: The Role of Psychosocial Factors in Long-Term Care Use. *Health services research*, 37(5), 1221-1242.
6. Centers for Disease Control and Prevention (2010). *Menu of Suggested Provisions For State Tuberculosis Prevention and Control Laws*. Retrieved from <http://www.cdc.gov/tb/programs/laws/menu/definitions.htm>. Accessed 12 November 2015
7. Central Bureau Of Health Intelligence (2013). *National Health Profile for of India-2013*. Retrieved from <http://cbhidghs.nic.in/writereaddata/mainlinkFile/Demographic%20Indicators-2013.pdf>. Accessed 22 November 2015.
8. Consumer Federation (2015). Neethi medical store. Retrieved from <http://www.consumerfed.net/networks/neethi-medical-store>. Accessed 12 December 2015.
9. Cotlear, D., Nagpal, S., Smith, O., Tandon, A., & Cortez, R. (2015). *Going Universal: How 24 Developing Countries are Implementing Universal Health Coverage from the Bottom Up*. World Bank Publications.
10. Daivadanam, M. (2012). Pathways to catastrophic health expenditure for acute coronary syndrome in Kerala: 'Good health at low cost'?. *BMC public health*, 12(1), 306.
11. Das S (2007) *Let's Talk about Budget*. New Delhi: Centre for Budget and Governance Accountability. Retrieved from <http://www.internationalbudget.org/wp-content/uploads/Lets-Talk-About-Budget.pdf>. Accessed 12 June 2014
12. Department of Economics and Statistics (ND). *Vital statistics-A trend analysis*. Retrieved from http://www.ecostat.kerala.gov.in/docs/pdf/reports/vs/trend_2.pdf. Accessed 12 November 2015.
13. Devadasan, N., Ghosh, S., Nandraj, S., & Sundararaman, T. *Full Case Study: Monitoring and evaluating progress towards Universal Health Coverage in India*. *PLOS Medicine*. Retrieved from <http://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1001697>.
14. *The American Heritage Medical Dictionary*. (2007). "Chronic Disease." 2nd Edition. New York: Houghton Mifflin Harcourt Publishing Company.
15. Dilip, T.R. (2008) *Role of private hospitals in Kerala : an exploration*. CDS working papers, no.400. Trivandrum: Centre for Development Studies.
16. Dilip, T. R. (2010). Utilization of inpatient care from private hospitals: trends emerging from Kerala, India. *Health Policy and Planning*, 25(5), 437-446.
17. Directorate of Health Services (2013). *Projected population for Oct 2013. Health at a glance 2013*. Health Information Cell. Thiruvananthapuram: Directorate of Health Services.
18. *Documentation of Best Practices of State Health Systems in Kerala: Comprehensive Health Insurance Scheme Plus (CHIS PLUS)*. Thiruvananthapuram: Population Research Centre/State Health Systems Resource Centre Kerala.
19. Dorland (2007). "Illness" *Dorland's Medical Dictionary for Health Consumers*. New York: Elsevier.
20. Dreze, J., & Sen, A. (1997). *Indian development: Selected regional perspectives*. Oxford University Press.
21. Dreze, J., & Sen, A. K. (2002). *India: Development and participation*. Oxford University Press.
22. Ekbal, B., Narayana, D., Thankappan, K. R., Aravindan, K., Praveen, P., Sadanandan, R., Harikumar, S., K, S., Ravindran, S., Mishra, U.S. (2012). *Social Determinants of Health in Kerala*. Health Science.

23. Ghosh, S. (2010). *Catastrophic payments and Impoverishment due to Out-of-Pocket health spending: The effects of recent health sector reforms in India*. Asia Health Policy Program Working Paper, (15).
24. Giedion, U., Andrés Alfonso, E., & Díaz, Y. (2013). *The impact of universal coverage schemes in the developing world: a review of the existing evidence*.
25. Gopalakrishna Kumar G. (1993). *Low mortality and high morbidity in Kerala reconsidered*. Population and Development Review Vol. 19, No. 1 (Mar, 1993), pp. 103-121.
26. Gwatkin DR, Ergo A. (2011). *Universal health coverage: friend or foe of health equity?* Lancet 2011; 377: 2160–61.
27. Health Information Cell (2013). *Health at a Glance 2013*. Thiruvananthapuram: Health Information Cell, Directorate of Health Services, Government of Kerala. P 86-90.
28. Healthcare.gov. (ND). Retrieved from <https://www.healthcare.gov/glossary/qualifying-life-even>. Accessed 12 November 2015.
29. John, J. (2012). *A Study on Effectiveness of Panchayati Raj Institutions in Health Care System in the State of Kerala*. Planning Commission, Government of India. Retrieved. http://planningcommission.nic.in/reports/sereport/ser/ser_kds1803.pdf Accessed on 20 November 2015.
30. Joint Learning Network for UHC (2015). "Resources" Retrieved from <http://www.jointlearningnetwork.org/resources>. Accessed 23 November 2015.
31. Kabir, M. (2003). *Beyond philanthropy: the Rockefeller Foundation's public health intervention in Thiruvithamkoor, 1929-1939*.
32. Kerala Medical Services Corporation Ltd (2015). *Kerala Medical Services Corporation*. Retrieved from <http://www.kmscl.kerala.gov.in>. Accessed on 12 November 2015.
33. Kerala Social Security Mission (2015). *Samashwasam*. Retrieved from <http://www.socialsecuritymission.gov.in/index.php/samashwasam1>. Accessed 22 May 2015.
34. Khanna R, Nambiar D. (2014). *Universal Health Coverage and the Role of Civil Society Organisations*. Working Paper. New Delhi: Public Health Foundation of India.
35. *Kidney patient's welfare society* (2015). Retrieved from <http://www.malappuramdistrictpanchayath.kerala.gov.in/core/specialProjects.htm?id=99>. Accessed 22 December 2015.
36. Kumar S, Nair RJ, Nair SB, Sakeena K, Nair AB, Hari Sankar D. (2014). *Comprehensive Health Insurance Scheme Plus (CHIS PLUS). Documentation of Best Practices of State Health Systems in Kerala*. Thiruvananthapuram: Population Research Centre/State Health Systems Resource Centre Kerala.
37. Kumar.S (2013). *Models of delivering palliative and end-of-life care in India Supportive and Palliative care*. 7(2): 216-222.
38. Kunnathoor.P (2012). *Kerala government launches Karunya Community Pharmacy to sell medicine at 40 to 60% discount*. Retrieved from <http://pharmabiz.com/NewsDetails.aspx?aid=67617&sid=1>. Accessed 18 December 2015.
39. Kutzin J. (2012). *Anything goes on the path to universal health coverage? No*. Bulletin of the World Health Organisation. 90:867-8.
40. Lekshmi, S., Mohanta, G. P., Revikumar, K. G., & Manna, P. K. (2014). *Developments And emerging issues in public and private health care systems of kerala*. Int J Pharm PharmSci, 6, 92-8.
41. Manikandan, A. D. (2014). *A Tragedy Unfolding*. Economic and Political Weekly. 49(2).Web Exclusive.
42. McKenna, M. T., Taylor, W. R., Marks, J. S., & Koplun, J. P. (1998). *Current issues and challenges in chronic disease control*. Chronic disease epidemiology and control, 2, 1-26.
43. McKibben, B. (1996). *What is true development? The Kerala model*. Retrieved from <http://www.ashanet.org/library/articles/kerala.199803.html> Accessed on 9 November 2015.
44. Ministry of Statistics and Programme Implementation (2015). *Key Indicators of Social Consumption in India*. National Sample Survey 71st Round (January – June 2014). New Delhi
45. Mosby (2009). "Illness" *Mosby's Medical Dictionary*. St. Louis, Mo, Mosby/Elsevier. Retrieved from <http://medical-dictionary.thefreedictionary.com/illness>. Accessed 8 December 2015.

46. Nambiar D. (2013). India's "tryst" with universal health coverage: Reflections on ethnography in Indian health policymaking, *Social Science & Medicine*.99:135-142.
47. Nandan, D., Nair, K. S., &Datta, U. (2007). *Human Resources for Public Health in India–Issues and Challenges*. *Health and Population: Perspectives and Issues*, 30(4), 230-242.
48. National Health Mission (NHM) (2015).Human resources. Retrieved from <http://nrhm.gov.in/nrhm-components/health-systems-strengthening/human-resource.html>. Accessed 30 January 2015
49. National Institute for Health and Clinical Excellence (2009). *Interventional Procedures Programme*. Retrieved from <http://www.nice.org.uk/media/default/about/what-we-do/nice-guidance/nice-interventional-procedures/interventional-procedures-programme-process-guide.pdf>. Accessed 14 November 2015
50. National Sample Survey Organisation (2015). *Key Indicators of Social Consumption in India – Health (January – June 2014)*. Government of India. Retrieved from http://mospi.nic.in/Mospi_New/upload/nss_71st_ki_health_30june15.pdf accessed on 15 November 2015
51. Nithya, N. R. (2008). 'Kerala Model of Health': Crisis in the Neo-liberal Era. *International Journal of Science and Research*. 2(8): 201-3.
52. O'Connell T, Rasanathan K, Chopra M. What does universal health coverage mean? *The Lancet* 2014; 383: 277–79.
53. Oommen, M. A. (2014). Growth, Inequality and Well-being Revisiting Fifty Years of Kerala's Development Trajectory. *Journal of South Asian Development*, 9(2), 173-205.
54. Oommen, M. A. (2015). Fourteenth Finance Commission. Implications for Local Governments. *Economic and Political Weekly*, L(21), 44-46
55. Osborn C. E. (2008). *Basic Statistics for Health Information Management Technology*. Sudbury, MA: Jones and Bartlett Publishers.
56. Oswego City School District Regents Exam Prep Center (ND). "Regents Prep: Living Environment: Homeostasis".
57. Ottersen et al. (2014). *Making fair choices on the path to universal health coverage.Final report of the WHO Consultative Group on Equity and Universal Health Coverage*. Geneva: World Health Organisation.
58. Patel, V., Ramasundarahettige, C., Vijayakumar, L., Thakur, J. S., Gajalakshmi, V., Gururaj, G., ... & Million Death Study Collaborators. (2012). Suicide mortality in India: a nationally representative survey. *The lancet*,379(9834), 2343-2351.
59. Planning Commission (2008). *Kerala State Development Report*. Government of India. Retrieved from http://planningcommission.nic.in/plans/stateplan/sdr/sdr_kerala.pdf Accessed 15 July 2014
60. Planning Commission (2013). *Twelfth Five Year Plan (2012-2017). Social Sectors. Volume III*. Retrieved from http://planningcommission.gov.in/plans/planrel/12thplan/pdf/12fyp_vol3.pdf Accessed 10 July 2014
61. Planning Commission (2014). *Report of the Expert Group to Review the Methodology for Measurement of Poverty*. Government of India. Retrieved from http://planningcommission.nic.in/reports/genrep/pov_rep0707.pdf Accessed 10 July 2015
62. Planning Commission. (2011). *High Level Expert Group Report On Universal Health Coverage for India*. New Delhi: Public Health Foundation of India/Planning Commission.
63. Raman KR. (2009) *Asian Development Bank, policy conditionalities andthe social democratic governance: Kerala Model under pressure?*, *Review of International Political Economy*, 16:2, 284-308.
64. Rao, K. D., Gupta, G., Jain, K., Bhatnagar, A., Sundararaman, T., & Kokho, P. (2010). *Which doctor for primary health care. An Assessment of Primary Health Care Providers in Chattisgarh, India*. New Delhi: PHFI.
65. Reeder, J. C., & Terry, R. F. (2013). *Research for universal health coverage*. Geneva: World Health Organization.
66. Rosenstock, I.M. (1966). *Why people use health services*. *Milbank Mem Fund Q*. 44:94-127.
67. Sadanandan, R (1993). *The Role of Government in the Development of the Health Care System in Kerala (Masters thesis)*. Thiruvananthapuram: Centre for Development Studies.
68. *Sample Registration System (2012). SRS statistical report 2012*. Government of India.

69. Sample Registration System (2013). *Special bulletin on maternal mortality in India 2010-12*. Retrieved http://www.censusindia.gov.in/vital_statistics/SRS_Bulletins/MMR_Bulletin-2010-12.pdf. Accessed 24 November 2015
70. Santhi medical information centre (2015). Retrieved from <http://santhimedicalinfo.org/dialysisunits.aspx>. Accessed 31 January 2015
71. Shylaja L, AnithaKumari KR, Nair SB, Sakeena K, Nair AB, HariSankar D. (2014). *Documentation of Best Practices of State Health Systems in Kerala: Karunya Benevolent Fund Scheme*. Thiruvananthapuram: Population Research Centre/State Health Systems Resource Centre Kerala.
72. Shylaja L, Kumar AKR, Nair SB, Sakeena K, Soman, C. R., Kutty, V. R., Safraj, S., Vijayakumar, K., Rajamohanan, K., & Ajayan, K. (2010). All-cause mortality and cardiovascular mortality in Kerala State of India: results from a 5-year follow-up of 161 942 rural community dwelling adults. *Asia-Pacific Journal of Public Health*. 23(6):896-903
73. State Planning Board Expert Committee on Health. (ND). *Draft Final Report of the 12th Plan Kerala State Planning Board Expert Committee on Health*. Thiruvananthapuram: State Planning Board.
74. Tanahashi, T. (1978). Health service coverage and its evaluation. *Bulletin of the World Health Organization*, 56(2), 295.
75. *The Hindu* (2011). Angels to operate from Malappuram from July 1. Retrieved from <http://www.thehindu.com/todays-paper/tp-national/tp-kerala/angels-to-operate-in-malappuram-from-july-1/article2108660.ece>. Accessed 14 November 2015.
76. Thresia, C. U., & Mohindra, K. S. (2011). Public Health Challenges in Kerala and Sri Lanka. *Economic & Political Weekly*, 46(31), 99.
77. Towse, A., Mills, A., & Tangcharoensathien, V. (2004). Learning from Thailand's health reforms. *BMJ: British Medical Journal*, 328(7431), 103.
78. United Nations (2015). *Ensure healthy lives and promote well-being for all at all ages: Sustainable Development Goals-3*. Retrieved from <http://www.un.org/sustainabledevelopment/health/> Accessed 16 July 2015
79. USAID/Health Systems 2020 (2012). *Measuring and Monitoring Country Progress Towards UHC: Concepts, Indicators, and Experiences. Meeting Summary July 20, 2012*. Retrieved from <http://www.social-protection.org/gimi/gess/RessourcePDF.action?sessionId=8584653cfb33136784c0328eed2cb2864b4ac72547ce14be6fcd4a77dbd4817c.e3aTbhuLbNmSe34MchaRahaKch90?ressource.ressourceId=32908>. Accessed 21 November 2015.
80. World Health Organisation. (2015). *Governance*. Retrieved from <http://www.who.int/healthsystems/topics/stewardship/en/> accessed 24 November 2015.
81. World Health Organization (2005). *Sustainable health financing, universal coverage and social health insurance*. Assembly resolution 58.33. Retrieved from http://apps.who.int/iris/bitstream/10665/20383/1/WHA58_33-en.pdf?ua=1 Accessed 5 July 2014
82. Zachariah, K. C., & Rajan, S. I. (2012). *Inflexion in Kerala's Gulf connection: report on Kerala Migration Survey 2011*. Thiruvananthapuram: Centre for Development Studies.

Annexure – 1

Indicators and Sources of Secondary Data

Population and Profile

Indicator	Source
Demographic Indicators	
Total Population, Population Density, Population Size, Slum Population, Sex Ratio(at birth, 0-6 years, child sex ratio), Migrant Population, BPL Population, Age Group (0-4 years to >80 years), Urban Population, Rural Population, Total Census House Holds, Occupied and Vacant House Hold, Size of House Hold, Homeless Persons Per Lakh	www.censusindia.gov.in, http://www.ecostat.kerala.gov.in
Religion and Caste	
Hindu, Muslim, Christians, Sikhs, Buddhist, Jains, Other religion, Scheduled Caste (Male, Female and Sex Ratio), Scheduled Tribes (Male, Female and Sex Ratio)	www.censusindia.gov.in
Health Indicators	
Total Fertility Rate, Birth Rate, Death Rate, Life Expectancy at Birth (Male and Female), Infant Mortality Rate, Maternal Mortality Rate, Effective Couple Protection Rate, Prevalence of Under Weight Children under 5 years	Sample Registration System (SRS)
Estimated Disabled Population	
Total Disability, Mental Disability, Physical Disability, Visual Disability, Hearing Disability, Speech Disability, Locomotors Disability	www.censusindia.gov.in
Socio Economic	
Literacy Rate 7+ Years(Total person, Male and Female), Literates 7+ Years (Total person, Male and Female), Labour and Employment (Non worker, Marginal Workers), Industrial Category (Plantation, Livestock etc), Occupational Classification (Cultivator, Agricultural Labourers etc), Median income, Unemployment Rate(Rural and Urban Male, Female), Employment in Organized Sector,	www.censusindia.gov.in
Public Order and Safety	
Incidence of Crime Per Lakh Population, Rape Against Women, Sexual Harrassment, Suicide, Accident Per Lakh Population, Road Traffic Accident	1. http://www.ksmha.org 2. http://www.keralapolice.org/ 3. http://www.keralapolice.org/

Health Services and Infrastructure

Indicator	Source
Health Infrastructure - Public and Private	
Public Sector Hospital Facilities, bed strength - sanctioned and in position beds facility wise, Allotment of beds for various department, Institutions having IP/OP facilities, Institutions with in facility pharmacies, labs, operation theatres, diagnostic facilities, delivery facilities etc.	District Medical office (H)
AYUSH Hospital and Dispensaries , bed strength	District Medical office (ISM)
Homeo Hospitals and Dispensaries , bed strength	District Medical office (Homeo)
Private Allopathy Hospitals, Bed Strength	District Medical office (H)
Private Homeo Hospitals and Dispensaries	Indian Medical Association (Other Systems)
Private AYUSH Facilities (Local Vaidayas etc)	Indian Medical Association (Other Systems)
Labs and Diagnostic Centers Infrastructure Public and Private	
Lab Investigations and Diagnostics Public	District Medical office (H)
Lab Investigations and Diagnostics Private	Private Lab Owners Association
Other Health Related Facilities Infrastructure Public and Private Sector	
Blood Banks	National Health Mission Office
Ambulance in the District Public and Private Sector	Regional Transport Office
Private Drug Shops	District Drug Inspector Office
Dialysis Centers Public and Private	1. District Kidney Welfare Association 2. Dialysis Technician District Hospital
RSBY /CHIS Empanelled Hospitals Block wise	District Labour Office
Human Resources in Public Sector	
Human Resource under DMO- which includes different types of postings like Permanent staffs sanctioned, in position and vacant , Temporary, Adhoc, HMC, Contractual, RSBY etc.	District Medical Office, National Health Mission Office
Human Resource under National Health Mission	National Health Mission Office
Human Resource Homeo	District Medical office (Homeo)
Human Resource at AYUSH	District Medical office (ISM)
Training Institutes Public and Private	
Number of Allopathic medical colleges, Ayurvedic medical colleges, Homeopathic medical colleges nursing colleges, nursing schools, JPHN training centers	Directorate of Medical Education Trivandrum

Health Service Utilization and Mortality

Indicator	Source
Public Services & Utilization	
Public Sector OP/IP, lab details,	District Medical Office (H)
Immunization -BCG DPT1 Pentavalent1 DPT2 DPT3 Pentavalent 2, Pentavalent 3, OPV 0, OPV1, OPV2, OPV3 etc	HMIS report, District Medical Office (H)
Vaccination - Primary vaccination, Anti-Typhoid inoculation, Anti-Diphtheria inoculation, Anti-Tetanus inoculation, Anti-whooping cough inoculation, Anti-Polio inoculation, Anti-Rabies inoculation	Annual Administration Report, District Medical Office(H)
Maternal Health - Total registration for ANC, registration within first trimester, ANC under 19 year, new registration under JSY, TT1,TT2 or booster 100 IFA tab 200 IFA tab BP>140/90 new cases eclampsia managed Hb <11 Hb <7 treated, normal delivery, C-section, complications in pregnancy etc	HMIS report, District Medical Office(H)
Family Planning and Sexual Health - Laparoscopic sterilizations, Mini-lap sterilizations, Post-Partum sterilizations, IUD Insertions, Quality in sterilization services, complications, failures following sterilization, deaths following sterilization , new RTI/STI, HIV tests, VDRL tests.	HMIS report, District Medical Office(H)
Drug Supply to Public Health Facilities	Kerala Medical Service Cooperation Ltd
Road Traffic Accidents - Injured, Grievously injured	Criminal Intelligence Gazette
Surgical procedures - Major Operations, minor operations	District Medical Office (H)
Public Services & Utilization	
Private Sector OP/IP, Top disease condition treated for- Medical, surgical and procedural, Maternal Health - Normal, C- section , Immunization- BCG DPT1 Pentavalent1 DPT2 DPT3 Pentavalent 2, Pentavalent 3, OPV 0, OPV1, OPV2, OPV3 etc , Family Planning -New RTI/STI, HIV tests, VDRL tests.	1. Directly from the facility 2. HMIS report, District Medical Office (H)
Schemes and Programmes Utilization	
RSBY -CHIS - Facility wise IP data, male, female, medical, surgical and procedural data	Comprehensive Health Insurance Agency Kerala, Trivandrum Office
CHIS Plus - State wise Surgical and Procedural data	Comprehensive Health Insurance Agency Kerala, Trivandrum Office
Communicable diseases - Whooping Cough, Measles , Acute Respiratory Infection including influenza Pneumonia, Enteric Fever (Typhoid), Dengue Fever , Viral Hepatitis – A, Viral Hepatitis - B Viral Hepatitis - C,D,E, Weils Diseases (Leptospirosis), Meningococcal meningitis Japanese Encephalitis, Dog bite, AIDS(As reported to NACO), Acute Diarrheal Diseases Syphilis, Gonococcal Infection, Other STD Diseases, Pulmonary Tuberculosis Chicken Pox etc	1. IDSP Project Coordinator, District Medical Office (H) 2. Statistical Assistant, District Medical Office (H)
Non Communicable Disease - Cardio Vascular Diseases, Neurological Disorders, Diabetes Mellitus, Lungs Diseases, Psychiatric Disorder, Accidental Injuries, Cancer, Snake Bite, Renal Failure, Obesity, Road Traffic Accidents etc	1. NCD Project Coordinator, District Medical Office (H) 2. Statistical Assistant, District Medical Office (H)
Ex- Servicemen Comprehensive Health Insurance Scheme- District wise medical and surgical data department wise	ECHS regional Office Cochin.
Railway Hospital - Facility wise OP/IP, Medical and Surgical Procedures	Railway Divisional Hospital - Palakkad

Indicator	Source
Karunaya Benevolent Fund	District Lottery Office
National Health Mission Programmes	
Palliative Care ,School Health ,JSY & JSSK, Tribal Health, IEC/ BCC, National Urban Health Mission, ASHA, Infrastructure Development, Gender Based Violence etc	District Programme Managers Unit (DPMSU), National Health Mission
Blindness Control Programme, Revised National Tuberculosis Control Programme	District Medical Office (H)
Mortality - District wise Number of deaths, cause of death, gender, place of death, age	http://www.cr.lsgkerala.gov.in

Schemes and Programmes

Health Related Schemes and Programmes	Source
Directorate of Health Services	http://www.dhs.kerala.gov.in
Ministry of Health and Family Welfare	http://www.unicef.org
Immunization Programmes	http://www.india-seminar.com
National Vector Borne Disease Control Programme	http://nvbdcp.gov.in
National Programme for Prevention & Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS)	http://www.mohfw.nic.in
National programme for Health care of the Elderly (NPHCE)	http://www.mohfw.nic.in
National Iron Plus Initiative	http://ecurrentaffairs.in/
National Rural Health Mission Programmes	http://www.arogyakeralam.gov.in/
Mobile Medical Units	http://arogyakeralam.gov.in
Menstrual Hygiene	http://www.sctimst.ac.in
Rashtriya Bal Swasthya Karyakram	http://nrhm.gov.in
Kerala AIDS Control Society	http://ksacs.kerala.gov.in
Karunaya Benevolent Fund	http://karunya.kerala.gov.in
Insurance Medical Services Kerala	http://www.ims.kerala.gov.in
Ministry of Labour and Employment	http://labour.gov.in
Directorate of Sainik Welfare, Kerala	http://www.sainikwelfarekerala.org
Indian Railways	http://indianrailwayemployee.com/content/medical-and-health-care
Indian Railways	http://indianrailwayemployee.com
Kerala Forests and Wildlife Department	http://www.forest.kerala.gov.in
Kerala Forests and Wildlife Department	http://forest.kerala.gov.in
Regional Cancer Centre Thiruvananthapuram	http://rcctvm.gov.in/patient-welfare.php
Kudumbashree Empowerment Programmes	http://www.kudumbashree.org
Social Justice Department, Government of Kerala	http://sjd.kerala.gov.in
Kerala Social Security Mission	http://www.socialsecuritymission.gov.in
Kerala State Handicapped Persons Welfare Corporation	http://www.hpwc.kerala.gov.in
Kerala State Development Corporation for Scheduled Castes and Scheduled Tribes	http://www.scstkerala.org
Kerala State Backward Classes Development Corporation	http://ksbcddc.com
Kerala State Backward Classes Development Corporation	http://ksbcddc.com
Kerala State Backward Classes Development Corporation	http://ksbcddc.com

Health Related Schemes and Programmes	Source
Government of Kerala, Department of Fisheries	http://fisheries.kerala.gov.in
Government of Kerala, Department of Fisheries	http://fisheries.kerala.gov.in
Labour and Rehabilitation Department	http://www.labour.kerala.gov.in
Civil Supplies Department	http://www.civilsupplieskerala.gov.in
Suchitwa Mission.	http://www.sanitation.kerala.gov.in
Kerala Water Authority	https://kwa.kerala.gov.in
Schemes and Programmes Beneficiaries and Utilization Data	
RSBY /CHIS	Comprehensive Health Insurance Agency Kerala, Trivandrum Office
CHIS Plus	Comprehensive Health Insurance Agency Kerala, Trivandrum Office
Karunya Benevelont Fund (KBF)	District Lottery Office
Social Security Mission	District Coordinator KSSM
National Health Mission Programmes	
Palliative Care, School Health, JSY & JSSK, Tribal Health, IEC/BCC, National Urban Health Mission, ASHA, Infrastructure Development, Gender Based Violence	District Programme Managers Unit (DPMSU), National Health Mission
Blindness Control Programme, Revised National Tuberculosis Control Programme	District Medical Office (H)
Other Department Schemes and Programmes	
Employees Comprehensive Health Scheme (ECHS)	ECHS regional office Cochi
ASHRAYA project	Kudumbasree, District Mission Office
Railways	Railway Divisional Hospital
Employees State Insurance Scheme (ESIS)	ESIS Regional Office, Thrissur
Central Government Health Scheme	CGHS Regional Office Cochin

Financing

Type of Funds	Source
Plan fund, Non Plan Fund, DMO (H)	District Medical Office (H)
Plan fund, Non Plan Fund DMO (ISM)	District Medical Officer (ISM)
Plan fund, Non Plan Fund DMO (Homeo)	District Medical Officer (Homeo)
National Health Mission Finance	District Programme Managers Unit (DPMSU), National Health Mission
Local Self Government Fund For Health	District Planning Office
MP Fund	District Planning Officer
MLA Fund	Assistant Development Commissioner Office
RSBY/CHIS	Comprehensive Health Insurance Agency Kerala, Trivandrum Office
Karunya Benevelont Fund	District Lottery Office

Annexure 3

Health Blocks and Revenue Blocks in Malappuram and Palakkad District

SI No.	Malappuram District			Palakkad District		
	Health blocks	Revenue blocks	Municipalities	Health Blocks	Revenue Blocks	Municipalities
1	Chungathara	Nilambur	Malappuram	Agali	Attappadi	Palakkad
2	Wandoor	Wandoor	Perinthalmanna	Alanallur	Thrithala	Ottappalam
3	Kondotty	Kondotty	Ponnani	Ambalappara	Ottappalam	Shornur
4	Pookkottur	Malappuram	Tirur	Chalavara	Sreekrishnapuram	Chittoor
5	Omanur	Areekode	Manjeri	Chalissery	Mannarkkad	
6	Melattur	Perinthalmanna		uzhalmannam	Kuzhalmannam	
7	Mankada	Mankada		Katampazhipuram	Chittoor	
8	Kuttippuram	Kuttippuram		Koduvayur	Kollenkode	
9	Vengara	Vengara		Kongad	Nenmara	
10	Neduva	Tirurangadi		Koppam	Alathur	
11	Valavannoor	Tanur		Nanniode	Malampuzha	
12	Vettom	Tirur		Parali	Palakkad	
13	Thavanur	Ponnani		Pazhampalacode	Pattambi	
14	Marrancheri	Marrancheri		Vadakkancherry		
15	Edavanna					

In Malappuram district as per 2011 Census there are only 14 revenue blocks and 5 municipalities but now there are 15 revenue blocks (New: Kalikavu) and 7 municipalities (new: Nilambur and Kottakkal). Also for adhering to the norms of standardization and for the ease of administration, the public health system has been divided into Health Blocks. Each Health block is headed by a block Community Health Center (CHC). In Malappuram district the Public allopathic facilities are restructured under 15 Health blocks but there are only 14 revenue blocks.

In Palakkad district there are 14 Health blocks and 13 Revenue blocks

Annexure 4

Details of Health Schemes and Programmes

Health Schemes and Programmes - Health Department

Scheme Name	Responsible/ Administering Authority	Description
National Leprosy Eradication Programme (NLEP)	Central/ Directorate of Health Services (DHS)/ National Rural Health Mission (NRHM)	The programme was first launched as National Leprosy Control Programme in 1955 with the aim of effective case detection, treatment and health education. Later in 1983, the programme was reviewed to launch NLEP. The aim was to wipe out leprosy by 2000 AD. The programme was later included in the 20 point programme with 100% central assistance. In Kerala, the services are provided mostly in the endemic districts of Alappuzha, Thrissur, Palakkad, Kollam, Thiruvananthapuram, Ernakulam, Kannur, Kasaragod, Malappuram and Kozhikode. In the year 2013-14, in Malappuram district 95 cases were detected. The number of detected cases for Palakkad is unavailable
National Filariasis Control Programme	Central/DHS	Launched in 1955, the aim of this programme is to control filariasis in the endemic areas of 17 states in the country and to train personnel to man the programme. In Kerala, Filariasis is prevalent along the entire coastal belt. There are 16 NCFP units and 2 Filariasis survey units with the main unit located at Thiruvananthapuram. The main activities of the programme in the state include mosquito control and entomological and parasitological assessment. According to the DHS website, 6.3 million people were found to be risk prone and 2.8 million people were protected with NCFP, although the referent year was not indicated. The data is not available for Malappuram and Palakkad
National Malaria Eradication Programme (NMEP)	Central/DHS	Kerala entered maintenance phase in 1965 and remained malaria-free till 1968. Imported cases led to a disease outbreak in Kannur district, which were effectively controlled by 1977. The programme is spread across all the 14 districts in the state with the help of 50% central assistance.
National TB Control Programme (NTCP)/ Revised National TB Control Programme (RNTCP)	Central/DHS	The aim of the scheme was to detect the TB patients and provide effective treatment. The Revised National TB control programme, launched in 1997, aimed to achieve and maintain a TB cure rate of 85 % and 70 % detection rate. In Kerala, the programme was first introduced in Pathanamthitta district in 1994 and is spread across 8 districts currently. In Malappuram district in the year 2013-14, sputum examination was conducted for 39007 people. In Palakkad sputum examination was done for 17283 people out of which 1054 positive cases detected.

Scheme Name	Responsible/ Administering Authority	Description
State Mental Health Programme	State/NRHM/DHS	The state has a unique mental health programme with an emphasis on the domiciliary care of stress and secondary prevention of major mental disorders. Kerala's first psychiatry unit was opened in the state in 1970 at Ernakulum District Hospital. Drug de-addiction was incorporated into this programme. There are 3 mental health centres, 5 psychiatric units and district psychiatric units currently in the state. By 2012 District Mental Health Programme (DMHP) was in place in all the districts.
National Programme for Control of Blindness (NPCB)	Central/ DHS	In Kerala, the programme envisages comprehensive eye health services to both urban and rural populations. The activities are based on an eye camp approach. The activities under this programme include screening, conducting cataract surgery and provision of spectacles. The details of the state as a whole is unknown. In Malappuram district out of the 13311 people who were examined, 3179 people has been identified for cataract surgery out of which 1097 patients got operated. The number of school children screened include 71203 out of which 4144 students were identified with refractive errors. 1945 children are provided with spectacles. The number of beneficiaries of the scheme in Palakkad
Expanded National Programme on Immunization (EPI)/ Universal Immunization Programme (UIP)	Central/ DHS	The EPI was launched centrally in India following WHO directives following the success of smallpox eradication, placing emphasis on child immunization in the first year of life. Gradually, more vaccines were included, such as oral polio, tetanus toxoid. The programme was renamed and expanded in 1985, given status as a National Technology Mission in 1986, and by 1990 phased throughout the country, ultimately integrated into the Child Survival and Safe Motherhood Programme in 1992.
National Polio Eradication Programme	Central/ DHS/ NRHM	This has been a highly contested programme in the state since its introduction in 1999 under the Intensified Pulse Polio Immunization programme with National Immunisation Days. Concern was raised over vested interests in this campaign and the need for it, even as in the district of Malappuram, two cases were detected in 2000.
National Iodine Deficiency Disease Control Programme (NIDDCP)	Central/DHS	The NIDDCP was launched in 1962 with 100% central assistance. Kerala has a fully functional Goiter cell since 1990. The programme encompasses health education and awareness regarding the use of iodised salt instead of common salt. Between 1989-94, the Goiter cell conducted 30 Goiter prevalence surveys in 14 districts and found out that the prevalence rate was 4.7 to 20 percent. Subsequent surveys were not readily available at time of writing.

Scheme Name	Responsible/ Administering Authority	Description
Leptospirosis Surveillance	National Institute of Communicable Disease/ DHS	Following an epidemiological record published by WHO in 1999, Kottayam, Allepey and Calicut were found to have between 7-9% prevalence of Leptospirosis. In the absence of a national programme, pilot projects are being implemented in partnership with medical colleges.
National Vector Borne disease Control Programme(NVBDCP)	Central/DHS and DHFW/ NRHM	Launched in 2003-04 by merging the National Malaria, National Filariasis and Kala Azar control programmes, Japanese B Encephalitis and Dengue have also been included in this programme. Control involves capacity building through training, development of tools for effective IEC/BCC, Early diagnosis and complete treatment, supply chain monitoring, community mobilization, vector control and monitoring and supervision. Blood smear examination has been conducted for 5993305 people in Malappuram district and 128798 people in Palakkad District in the year 2013
Integrated Disease Surveillance project (IDSP)	Central/DHS and DHFW/ NRHM	Government of India initiated IDSP in the year 2004 with the help of World Bank. It was introduced in Kerala as a five year project. Under the programme the state organises weekly and monthly review. However, priority lab support is available only in two districts.
National Programme for Prevention and Control of Deafness (NPPCD)	Central/DHS	The pilot phase of the programme was launched in 2006-8 in 10 states of the country. The objectives of the programme include prevention of avoidable hearing loss, early identification and diagnosis, institutional capacity-building of ear care services, medical rehabilitation persons of all age groups suffering from deafness. In Kerala, the programme prioritises the early detection of hearing problems in infants.
Non-Communicable Disease Prevention and Control Programme(NCDCP)	Central/DHS/NRHM	This programme was initiated by the Department of Health and the National Rural Health Mission (NRHM) in the state in 2008-09. Three main objectives of the programme are 1. Primary prevention-life style modification through health education, 2. Secondary prevention-early detection through screening and 3. Tertiary prevention through prompt treatment and uninterrupted supply of medicines. The programme is active in Thiruvananthapuram and Wayanad districts currently. In Malappuram district under this scheme 356085 people were screened for NCD for Cancer, Diabetes, Cardio vascular disease, and hypertension in 2013.
National Programme for the Health Care of the Elderly (NPHCE)	Central/DHS	Initiated by the national government in 2010, the basic objective of the programme is to provide preventive, curative and rehabilitative services to the elderly. The districts chosen for implementation in Kerala include Pathanamthitta, Idukki, Alappuzha, Thrissur and Kozhikode.

Scheme Name	Responsible/ Administering Authority	Description
National Programme of Prevention and Control of Cancer, Diabetes, Cardio Vascular disease, and Stroke Programme (NPCDCS) Error! Bookmark not defined.	Central/DHS/NRHM	Launched in 2010-11, the focus of NPCPCS is on the promotion of healthy lifestyle, early diagnosis and management of diabetes, hypertension, cardio vascular disease and common cancers. NPCDCS has been implemented in the districts of Pathanamthitta, Alappuzha, Idukki, Trissur, and Kozhikode as of 2012.
National Iron Plus Initiative(NIPI)	Central/NRHM	Launched by the national government, this is a comprehensive programme to prevent anaemia. It comprises of vitamin A supplementation to children till age of 5 and Iron and Folic Acid Supplementation to the children from 6 to 60 months. ASHA's are entrusted with the supply of nutrients.

Schemes of National Health Mission (Arogya Keralam)

Intended Beneficiary	Schemes	Description
Below Poverty Line and SC-ST Pregnant Women	Janani Suraksha Yojana (JSY)	JSY aims to reduce maternal mortality among pregnant women by encouraging them to deliver in government health facilities. Under the scheme, cash assistance is provided to the eligible pregnant women for giving birth in a government health facility. Stipends are also offered to Accredited Social Health Activists who motivate mothers to demand institutional care. The number of beneficiaries under this scheme for the year 2013-14 was 13577 for Malappuram and 3255 for Palakkad.
Universal	Mobile Medical Units	There are 15 ophthalmic mobile units to provide eye care services to people of both rural and urban Kerala by adopting eye camp approach. By the year 2014 there were 34 Mobile Medical units in the state, out of which 22 were NRHM funded and the rest constituted from the State Fund. In the year 2013, 2, 60,000 people attended medical care from the MMU. Malappuram and Palakkad have 4 & 2 Mobile Medical Units, respectively. In 2013-14, Malappuram district had 14644 beneficiaries of MMUs. In Palakkad district, on average 22 camps were conducted per month. The total number of people screened in the year 2013-14 was 1300.
Mothers and Children	Mother and Child Tracking System	Kerala state in 2009 launched the Name Based Information Tracking system for Pregnant Mothers and Child Immunisation (NBITS) project as per directions from MOHFW, Government of India. The aim of NBITS is to monitor ante natal care check-ups of pregnant women, institutional deliveries and post natal care in order to reduce maternal mortality. Children are tracked to assess immunization coverage and to prevent drop out cases thus ensuring 100% immunization. Beneficiaries of this scheme are both mother and child registrants. In Malappuram district there were 86925 child registrants and 95698 mother registrants in 2013-14. In Palakkad, total child registrants were 28,816 and mother registrants were 30127 in the year 2013-14.

Intended Beneficiary	Schemes	Description
Adolescents (aged 10-19)	Adolescent and Reproductive Sexual Health (ARSH)	The programme was initiated in the state during 2008-09. It is currently implemented in 5 Taluk Hospitals, 62 PHCs and 24 CHCs. The programme comprises of interventions to build life skills through experimental learning. The state invests in ARSH with a view to reduce teenage pregnancy, STDs and HIV along with a positive influence on MMR and IMR. In the year 2013-14, registered clients under this programme in Malappuram district was 216 and Palakkad district is 405. In Palakkad, 5 of the registered members were married while 400 of them were unmarried.
School students	School Health Programme	Rolled out in the state in 2009 as a joint venture of departments of Health, Education, Sports Council and Local Self Governance Institutions, the SHP focuses on effective integration of health concerns through decentralized management at district with determinants of health like sanitation, hygiene, nutrition, safe drinking water, gender as well as awareness of social and civic issues. Medical and personal details which have a bearing on children are recorded in the health record named "minus 2, plus 2". The main components of school health programme in the state include clinical services, preventive services, counselling and documentation. The state has also recently included Lifestyle Disease Education and Awareness Programme (LEAP) in school health programme. Under this scheme, some activities have also been launched by the AYUSH department, with a focus on promoting mental development of school-going children. In Malappuram 137005 children and in Palakkad 409382 students have been screened in the year 2013-14
Survivors of Gender-based Violence(Medical Care for Survivors of Gender-based Violence/Social Abuse	The programme was introduced in select institutions of all the 14 districts with the help of State Plan Fund. The programme was an intervention by the state government along with the NRHM. The main objective of the programme was to provide counselling to victims of gender-based violence and strengthen the capacity of health care providers in the hospital and also district to respond to survivors of violence against women. Under this scheme in Malappuram district 346 and in Palakkad 563 cases were identified by 2013-14
Adolescent girls aged 10-19 years	Scheme for Promotion of Menstrual Hygiene among Adolescent Girls	This programme is aimed at ensuring that adolescent girls (10-19 yrs) in rural areas have adequate knowledge and information about menstrual hygiene and the use of sanitary napkins. Sanitary napkins are provided through central supply in districts of Kasaragod, Kannur, Wayanad, Malappuram, Idukki, Kottayam and Palakkad, Information is disseminated through the social marketing by ASHA.

Intended Beneficiary	Schemes	Description
Adolescent girls (12-19yrs)	Weekly Folic Acid Supplementation Programme (WIFS)	The Ministry of Health and Family Welfare, Government of India launched the Weekly Iron and Folic Acid Supplementation (WIFS) Programme to reduce the prevalence and severity of nutritional anaemia in adolescent population (10-19 years). IFA supplements are to be distributed free of cost on a weekly basis to the target groups in the schools and outside the schools. In addition to IFA supplements, Albendazole tablets for de-worming are to be administered twice a year to the same target groups.
Pregnant women and infants up to 30 days of age	Janani Shishu Suraksha Kayakram (JSSK)	JSSK was introduced in Kerala in 2012 to provide free to and fro transport, free drugs, free diagnostic, free blood, and free diet to pregnant women who come for delivery in the public health institutions and sick infants' upto one year. In Palakkad district under this scheme 8688 deliveries have been conducted in the year 2013-14
Mothers and Children	Mother and Child Health Wings (MCH Wings)	With a focus to reduce maternal and child mortality, dedicated Mother and Child Health Wings with 100/50/30 bed capacity have been sanctioned in high case load district hospitals and CHCs since 2013. This is to ensure there are adequate beds for mothers and children.
Children up to 18 years of age	Rashtriya Bal Swasthya Karyakram (RBSK)	This programme under NHM envisages a comprehensive health package for children upto 18 years. The programme aims at detection of defects in children. The defects include 4 Ds- defect at birth, diseases in children, deficiency conditions and developmental conditions including disabilities. There will be two levels of screening. First one at the delivery points and the next at the outreach level. Once the child is screened and referred treatment is provided free of cost to the family. District early intervention centres are established across the state to provide referral support to children detected with health conditions during health screening, primarily for children up to 6 years of age group.
Children	ArogyaKiranam	Arogyakiranam is a welfare oriented health care programme for all children from birth to 18 years. The programme is based on the platform of RBSK. Govt of Kerala has targeted many illnesses in the specified age group and try to incorporate investigation, management, complex surgeries and free medical services to all beneficiaries irrespective of APL/BPL status. "One of the notable additions to the RBSK list is Juvenile Diabetes, which a significant number of children in Kerala also suffer from"
School going Children	DISHA(Direct Intervention System for Health Awareness)	DISHA is a 24 hour helpline programme for school going children to deal with exam related stress. In the second phase the programme will be scaled up to every districts and other social issues like violence, physical ailments, social isolation, and victims of abuse, through the call centre based in Techno park.

Intended Beneficiary	Schemes	Description
Universal/ Persons in emergency situations	Kerala Emergency Medical Services Project	Kerala has 108 ambulance services extended to all the districts under NRHM. The government will extend the 108 emergency ambulance service to all districts, in accordance with the National Ambulance Service guidelines and code. According to a newspaper, new ambulances with Basic Life Support (BLS) will provide emergency services in all districts while the 43 ambulances with Advanced Life Support (ALS), currently providing 108 emergency ambulance service, will be redistributed among major government hospitals for inter-hospital patient transfers.
Universal	Free Drugs and Free Diagnostic Services	A new initiative has been launched under the National Health Mission to provide Free Drugs Service and Free Diagnostic Service with a motive to lower the out of pocket expenditure on health.
Cancer Patients	Sukrutham	This is an anti-cancer treatment scheme for patients diagnosed as suffering from cancer either histologically or radiologically. The eligible people include the BPL card holders, RSBY card holders and person with a certificate from secretary of Panchayat, Municipality and Municipal Corporation.
Tribal populations vulnerable to sickle cell anaemia	Tribal Health Programme with a focus on sickle cell anaemia	This scheme envisages comprehensive primary health care services for tribal communities living in remote areas (they comprise more than 1% of the state's population and are geographically and ethnologically distinct). Mobile medical units, medical camps, health education are major part of the programme. There are 13 Mobile Medical Units for tribal health at present in the state. These units conduct 20 medical camps in the state per month on an average under the leadership of medical officer with the help of supporting staff. Community mobilisation is done by the field workers. One of the major projects under this programme is to contain sickle cell anaemia. Four components of the project is in the tribal areas of Wayanad and Palakkad district and comprises a comprehensive health care facility for sickle cell disease; diagnosis, early recognition of complications and treatment of complications to reduce mortality; and prevention of new cases through genetic counseling and prenatal diagnosis
Isolated island communities	Floating Dispensary	This has been an innovation of NRHM Kerala to provide health services to the people of Island Panchayats of Ernakulum and Alappuzha districts. It covers a population of 70,000 people from both the districts. The floating dispensary has a medical team comprising of a Medical Officer, a staff nurse, and a pharmacist visiting the boat jetties every day as per predefined schedule.
Patients with terminal illness	Palliative Care Programme	Kerala has developed its own palliative care programme to facilitate home care services to the needy in the state, an initiative spearheaded by its Local Self Government Institutions. The programme is run with the help of Community Based Organizations. The initiative aims at identifying the needy, offering guidance for appropriate treatment, provide home care for bed-ridden, and improve the health care system with drug supply. Palliative care is included in the primary health services of health department of Kerala. Around 400 Gram Panchayats have developed palliative care programme across the state.

Intended Beneficiary	Schemes	Description
Disadvantaged/ vulnerable elderly	Ayurarogyam Geriatric Health Care Project	Named "Ayurarogyam," the scheme was initiated in Kollam District, and is aimed at improving health status and quality of services to the elderly who are daily labourers from cashew, rubber plantations, coir factories and retired employees from Government and Private. The Lifestyle disease Education and Awareness Programme (LEAP) will begin in schools from next academic year sector. The main activities are improving the participation of society in improving the health of elderly, protect senior citizens from exploitation of private health care institutions, ensure balanced health care services for people from different socio-economic groups, and create awareness towards different needs of ageing to the society.
School children	ArogyaTharakam	With the aim of sensitizing school children, the health department started an innovative programme in 2012 called "Arogyatharakam". In the programme health quiz competition is organised by NRHM in schools to be telecast through Doordarshan, Kerala and VICTERS channel of department of education.

Schemes of the Ayurveda, Unani, Siddha, Sowa Rigpa and Homoeopathy (AYUSH) Department

Intended Beneficiary	Schemes	Description
All	Rapid Action Epidemic Control Cell- Homoeopathy (RAECH)	This scheme comprises Epidemic Control Measures initiated under the supervision of RAECH by distributing preventive medicines, conducting medical camps, health awareness programmes and seminars throughout the State, wherever epidemics break out. It functions by bringing together homeopathic educational institutions, professional organisations, and health care delivery institutions under the Dept. of Homoeopathy. There is also a component of continuing education for Homoeopathic Doctors that places emphasis on combating new epidemics.
Women with depression and suicide ideation and their family members	Seethalayam	This project (launch date not available) aims to provide homeopathic care for women facing mental distress and suicidal tendencies, with an emphasis on reducing side effects and financial burden. It comprises consultation with a lady Homoeopathic Physician with out-patient or in-patient (depending on severity) treatment and counselling (with the help of an allopathic psychologist). If needed, support is also extended to family members. The scheme also has a training component offered by the allopathic doctors to Homoeopathic doctors.
School-going children (Government)	Jyothirgamaya	This programme, run in tandem with the School Health Programme of the state, seeks to identify and address "intellectual and mental aberrations" among children in government schools in the state.

Health-Related Schemes of Other Departments

Sponsoring Level/ Steering Authority	Intended Beneficiary	Scheme Name	Description
Kerala Social Security Mission	Children under the age of 18 with cancer	Cancer Suraksha Scheme	The scheme provides free treatment for children below 18 years who suffer from cancer. The scheme is implemented through empanelled hospitals and the children are assessed through their socio-economic status. No ceiling is fixed for expenditure. The cash transfer is not direct. The beneficiary will get the benefit on reaching the hospital. There were 3655 beneficiaries under this scheme in the year 2013-14.
Kerala Social Security Mission	Children under the age of 18 with life threatening illnesses	Thalolam	The scheme, initiated in 2010 provides free treatment to children below 18 years suffering from life threatening diseases. The disease categories include congenital heart diseases, kidney diseases, haemophilia, gillianbarrie, cerebral palsy, thalassemia, sickle cell anaemia, and surgeries in accident cases. No ceiling is fixed for expenditure. The Benefit will arrive on arrival at the hospital. There were 8276 beneficiaries under this scheme in the year 2013-14.
Kerala Social Security Mission	Survivors of Endosulfan poisoning	Snehasantwanam	The scheme is envisaged to support those exposed to endosulfan poisoning in Kasaragod district. The victims are provided with monthly assistance as per the rates 1700/- for bedridden victims who are getting pension, Rs. 2000/- for victims who do not receive disability pension and Rs 1000/- for other endosulfan patients. 4468 beneficiaries were reported to benefit from scheme in 2013-14,
Kerala Social Security Mission	Children below the age of five in need of cochlear implants	Sruthitharangam	This is a free cochlear implantation scheme which also provides for two yearlong auditory verbal rehabilitation below five years. It works under the PPP mode for the welfare of deaf and dumb children. The children are selected after clinical evaluation and investigation by a cochlear implant team consisting of an implant surgeon, audiologist and speech language pathologist. Eligibility limit is annual income of 2lakh maximum for the parents. There were 401 beneficiaries in the year 2013-14
Kerala Social Security Mission	Elderly	Vayomitram	The scheme is a joint venture along with urban local governments to provide free services like mobile clinic, residence in palliative care homes, and help desks at medical facilities for elderly citizens. Currently there 25 projects under the scheme spanning over 5 corporations and 20 municipalities. In the year 2013-14, the number of beneficiaries were 103344.

Sponsoring Level/ Steering Authority	Intended Beneficiary	Scheme Name	Description
Department of Social Justice	Hearing impaired	Free distribution of aids and appliances	This scheme aims at helping the hearing impaired people have access to aids and appliances for a better living. The programme envisages "to assist the needy disabled persons in procuring durable sophisticated and scientifically manufactured, modern, standard aids and appliances that can promote their physical, social and psychological rehabilitation, by reducing the effects of disabilities and enhance their economic potential".
Kerala State Handicapped Welfare Development Board	Various Handicapped	Free distribution of aids and appliances	Beneficiaries are selected during the medical camps in the districts and appliances are provided every year. Some aid like artificial limbs, tricycles, wheel chairs, callipers, crutches, hearing aids, white canes, colostomy bags etc. are provided every three years. The number of beneficiaries of the scheme is not available.
Kerala State AIDS Control Society	All	Sexually Transmitted Disease (STD) Control Programme	The STD control programme was started by the Government in 1942. Currently it is under the purview of National AIDS Control Organisation. STD in Kerala mainly concentrates on the reduction of syphilis and control of congenital syphilis. STD clinics are attached to all district and Taluk Hospitals. Treatment is offered and monitored through the HMIS.
Kerala State AIDS Control Society	People living with HIV	USHUS ART Centres	'Ushus' are the Anti-Retroviral Treatment (ART) centers set up in all the Government Medical Colleges in Kerala, functioning under the department of medicine. ARV treatment, drugs for opportunistic infections and the CD4 testing are all provided free of cost to HIV positives. Kerala is the first state in India to start ART for HIV positive people in 2004, by meeting funds from its exchequer. Since 2006, the ART centers are supported by National AIDS Control Organization. By the year 2012, there were 16485 registrants for HIV care in the Ushus ART centres in Kerala. Out of them 1567 people are reported to have expired and 6686 people are on ART.
Kerala State AIDS Control Society	People with Sexually Transmitted Infections (STI)	Pulari	'Pulari' - or STI clinics are centers for the treatment of Sexually Transmitted Infections free of cost to anyone who walks into the clinics. In both Malappuram and Palakkad the STI clinics are located in District Hospitals. The number of beneficiaries in these clinics are currently unavailable.

Sponsoring Level/ Steering Authority	Intended Beneficiary	Scheme Name	Description
Kerala State AIDS Control Society	People in need of counselling	Jothis	The programme is also referred to as Integrated Counselling and Testing Centres (ICTC). Centres provide HIV counselling and testing and treatment referrals free of cost. There are 163 centres across the state located at all Medical Colleges, District Hospitals, General Hospitals, Taluk Hospitals as well as at some ESI hospitals and Private hospitals. Counselling and HIV testing is provided to anyone who walks in at the centres in addition to individuals who are referred by doctors on the basis of their symptoms. The total number of persons tested for HIV in the year 2011 is 255,495. Seropositive males are 1314, pregnant woman tested and diagnosed seropositive are 795, and number of HIV positive deliveries is 69 respectively in Kerala. In Malappuram and Palakkad there are 8 and 9 ICTC clinics currently.
Kerala State AIDS Control Society		Prathyasha	Though this scheme had been mentioned in the site, no information is currently available on the activities.
Kerala State AIDS Control Society	Sexual Minorities	Suraksha	Suraksha is a targeted intervention programme under the main component under NCAP III. This focuses on Sexual Minorities who practice risky sexual behavior, to prevent and control the spread of HIV/AIDS among them and preventing the spread of HIV/AIDS through high risk groups to bridge population and general community. The program deals with the Core Group viz. Female Sex Workers (FSWs), Men having Sex with Men (MSMs) and Injecting Drug Users (IDUs) & Bridge populations like migrants and truckers. The Suraksha programme is being implemented through the Community Based Organizations (CBO) and Non-Governmental Organizations (NGO). Currently there are 20 projects targeting Female Sex workers, 14 Projects targeting MSM, 8 projects for Injecting Drug Users, 8 Projects for Migrants and 2 projects targeting truck drivers in the state.
Ministry of Finance & Department of Lotteries	People in need of cancer, cardiac, urological treatment or palliative care	Karunya Benevolent Fund	Karunya Benevolent Fund has been initiated in the year 2012 by the finance minister K M Mani. The scheme provides financial support to people suffering from cancer, heart and kidney ailments, and haemophilia along with palliative care. Both public sector and private sector hospitals are part of this programme.

Sponsoring Level/ Steering Authority	Intended Beneficiary	Scheme Name	Description
Ministry of Labour and Employment	Workers in formal employment	Employees State Insurance Scheme	Four years after its launch in Kanpur and Delhi, Kerala implemented ESIS, forming in 1985 a separate Department of Insurance Medical Services under the Labour Department. This scheme provides "comprehensive medical care services to the worker population and their dependents and protecting against certain eventualities that result in loss of wages or earning capacity. The scheme also takes care of physically disabled workers and their dependents with monetary support, where death or disablement has occurred due to employment injury or occupational disease." Three super specialty hospitals and four dispensary is empanelled in Malappuram under this scheme. In the district of Palakkad however there is no empanelled super specialty hospitals but just two dispensaries.
Ministry of Labour and Employment	Unorganised workers Below the Poverty Line	Rashtriya swasthya Bima Yojana (RSBY)/ Comprehensive health insurance scheme (CHIS)	RSBY is a programme by the GoI under Unorganised Workers Security Act, 2008. The state government started the CHIS in the same line. RSBY and CHIS is implemented in all the 14 districts of the state.
Ministry of Labour and Employment/ Comprehensive Health Insurance Agency Kerala (CHIAK)	Unorganised Workers Below the Poverty Line	Comprehensive Health Insurance Scheme PlusError! Bookmark not defined.	Apart from the Rs.30000/- coverage for the normal diseases under RSBY Govt of Kerala provides and additional coverage of Rs. 70000/- to these families for major disease conditions like Heart, Kidney, Liver, Brain, trauma Care through the Govt. Medical Colleges and selected district hospitals .
Indian Navy	Ex-naval personnel	Purchase of Special Medical Equipment for Handicapped Children/ (Indian Navy)	This is an Ex-Naval personnel grant which gives a sum of Rs.4500 for purchase of special medical equipment on recommendation of medical authority.
Indian Railways	Indian Railways employees	Medical and Health Care	Treatment at the Railways network of hospitals and clinics for primary through tertiary level care

Sponsoring Level/ Steering Authority	Intended Beneficiary	Scheme Name	Description
Indian Railways	Railway pensioners and/or family members	Fixed Medical Allowance	Launched in 1999, this central scheme provides fixed medical allowance to meet the day today medical requirement of Railway Pensioner/ Family of Pensioners who are residing beyond 2.5 km from the nearest railway hospital. The beneficiaries are not entitled to have outdoor treatment from Health Unit/Railway Hospital etc. except in case of chronic diseases like Arthritis, Cardio vascular disease, cancer, diabetes, epilepsy, obesity, TB, AIDS, Oral health problem and chronic skin disorders. Card holders of RELHS (Retired Employees Liberalised Health Scheme) are not entitled to avail Fixed Medical Allowance.
Kerala Forests and Wildlife Department	Victims of Wildlife Attack	Compensation for Victims of Wildlife attack	On submission of an application to the Divisional Forest Officer, the victims of wildlife attack are provided with compensation.
Kerala Forests and Wildlife Department	Tribal populations residing in forest areas	Hospitalization Benefits and Personal Accident Benefits for the Scheduled Tribes & Scheduled Castes in the Forest Area	Under this scheme, tribal populations residing within the forest area are covered at a total premium of Rs.6.75 lakhs. It is learned that "this is implemented through United India Insurance Company. The application for the claims has to be preferred by the claimants before the Divisional Manager of the United India Insurance with specific recommendation of the Range Officer having jurisdiction of the area."
Prime Minister's Office	Patients of low socio-economic Status	Prime Minister's National Relief Fund	This scheme provides up to 2 Lakh of financial aid for treatment before it is undertaken.
Ministry of Finance and Department of Lotteries	Cancer patients requiring funding for surgery, chemotherapy, radiology scans and in-patient care	Rashtriya Arogya Nidhi (RAN) Error! Bookmark not defined.	This scheme provides financial aid for specific investigations and treatments related to cancer not exceeding 1 Lakh to poor patients. The grant is released as one time grant to Medical Superintendent of the hospital.
Non-Resident Keralite Affairs Department (NORKA)	NRK returnees	Santhwanam	Non Resident Keralites who has a minimum period of two years' service abroad receive financial assistance through NORKA.

Sponsoring Level/ Steering Authority	Intended Beneficiary	Scheme Name	Description
Kerala State Insurance Department	State Employees	Group Insurance Scheme	The Kerala State Employees' Group Insurance Scheme is intended to provide support for the state employees, at a low cost and on a wholly contributory and self-financing basis. The support is provided to help their nominees in the event of death while in service and a lumpsum payment to augment their resources on retirement. The beneficiaries of the scheme include all the all the permanent government staff, teaching sand non-teaching staff of all private schools and colleges under direct payment scheme, and others who may be extended according to the government order.
Kerala State Insurance department	Government Employees	Kerala State Life Insurance Scheme	All State Government employees holding permanent or officiating appointments under the Government of Kerala who are below the age of 50 years on the date of 1st remittance of premium is eligible for this insurance. The insured shall have to pay a monthly premium as fixed by the government. The sum assured under the policy plus eligible bonus declared by Government from time to time shall be payable to the insured on his completing 55 years of age or at his death whichever is earlier.
Chief Ministers office	Needy individuals	Chief Minister's Distress Relief fund	This scheme provides financial assistance to people affected by natural calamities and to the needy individuals for their treatment of major diseases like cancer, cardiac surgery, kidney transplant, brain tumour, Liver and Multi organ failure etc.

Schemes of the Department of Social Justice

Intended Beneficiary	Schemes	Description
Women, Children, and Adolescents	Integrated Child Development Services	This scheme was initiated in the Malappuram district of Kerala and thereafter extended to the entire state under 258 ICDS projects with central support from the Ministry of Women and Child Development. The programme aims at improving the nutrition of children below six years and reducing IMR, malnutrition, school dropout etc. It also aims at improving the capacity of women in delivering comprehensive health protection of children. There are many programmes under the ICDS scheme in Kerala. They include : education through Anganwadis; immunization programmes; school counsellingprogramme for adolescent girls; comprehensive nutrition programme; take home ration strategy; medicine kits for Anganwadis; conditional maternity benefit scheme; and the Karyakarthuru BimaYojana

Intended Beneficiary	Schemes	Description
Children	Integrated Child Protection Scheme	This is a flagship, comprehensive programme towards child protection started by the Ministry of Women and Child development. It aims at building a protective environment for children in difficult circumstances as well as other vulnerable children through government, civil society partnership. Activities of ICP include institutionalizing essential services and strengthening structures, enhance implementers capacity at all levels and create database and knowledge base for child protection services. The scheme basically targets children up to 18 years of age. The state of Kerala has 692 beneficiaries under all the categories (Child Health, Occupational Health and, Special Health) for the year 2013-14.
Adolescent girls	Kishori Shakthi Yojana (KSY)	This programme seeks to empower adolescent girls. It is a redesigned ICDS and Anganwadi programme that includes formation of adolescent girls clubs in every Anganwadi. The aim of the programme is to provide adequate nutrition, care and guidance to the adolescent girls and improve their self-esteem and decision making capabilities. Currently in the state there are 174 projects under this scheme in 10 districts. Districts which do not have this scheme are Kollam, Idukki, Malappuram and Palakkad. The Number of beneficiaries under this scheme in Palakkad for the year 2013 was 5139. In Malappuram this scheme is implemented as psychosocial services where a range of counselling services is provided to adolescents, mothers, fathers, grandparents etc. The scheme is implemented through 46 schools.
Adolescent Girls	Rajiv Gandhi Scheme for the Empowerment of adolescent girls (RGSEAG-SABLA)	The scheme aims at empowering adolescent girls (age group 11-18 years) along with improvement in their nutritional and health status and upgrading their skills. The Scheme is being launched 2000 districts across the country. In the state of Kerala, the scheme is functional in 4 districts of Kollam, Idukki, Malappuram and Palakkad. The scheme is implemented through anganwadi centres. The components of scheme include IFA supplements, health check-up and referrals, counselling and guidance on nutrition and health education and ARSH, Life skill education, guidance for accessing public services and vocational training. Currently there are 84 projects in the given districts.

Schemes of the Kerala Social Security Mission

Intended Beneficiary	Schemes	Description
Unwed mothers	Snehasparasham	The scheme provides monthly assistance to sexually exploited unwed mothers belonging to the state at Rs.1000 per month. The application is forwarded through District Social Justice Officer or anganwadi worker/ICDS supervisor/ child development project officer. In 2013-14 there were 16699 beneficiaries under this scheme in the state.
Caregivers	Ashwasakiranam	This scheme provides financial assistance to the caretakers of bedridden patients, Mentally challenged including Mentally Retarded, Autism and Cerebral Palsy, 100% blind patients, bed ridden patients suffering from cancer and old aged diseases. Since the productivity of the caregivers is reduced while giving care, a monthly pension of Rs. 525 is given to the care giver. In the year 2013-14, the scheme had 57570 beneficiaries in the state. In district Malappuram the scheme had 8837 beneficiaries in the year 2013-14.
People in need who seek medical care in the cities	Hunger free city programme	This free lunch scheme is run by the state for individuals who come to cities for medical treatment. This is a scaled up programme which was initiated in the Kozhikode medical college. The programme has been extended to Malappuram, Kollam, and Thiruvananthapuram urban areas. There were 1441242 beneficiaries under this scheme in the year 2013-14 in the state.
Disabled/ differentially abled	Disability certification camp	The camp is conducted at the panchayat and block level to identify the disabled population in the state and provide medical certificate for disability. The card is issued to 13027 persons by 2013-14.
Disabled/ differentially abled	State initiative on disabilities	Scheme is envisaged for disabled population to carry out early detection, early intervention, education, employment and rehabilitation. Government has mooted for four early intervention centres in Kollam, Ernakulam, Thrissur and Calicut districts.
Kidney patients	Samaswasam	The scheme was initiated in 2013 to provide financial assistance to kidney patients belonging to BPL families. The assistance is 900/ month. Under this scheme there were 1895 beneficiaries in the state for the year 2013-14. In district Malappuram there were 243 beneficiaries in the year 2013-14.
Patients who underwent Kidney and liver transplant surgeries.	Samaswasam-2	This scheme provides a pension of Rs.1000/- for the people who have undergone kidney and liver transplantation surgeries. The time period for the scheme is from the date of surgery to the next five years. The beneficiaries of the scheme should have the annual income of less than 1 lakh. Under this scheme there were 27 beneficiaries in the state in the year 2013-14

Annexure 5

Table showing transmission of data at various levels

From – To	Reporting Functionary	Mode	Periodicity	Content
ASHA to JPHN	ASHA	Offline	Monthly	Immunization, Nutrition days, family welfare, cataract surgery, TB, Antenatal, Maternal Health, MCTS base data
Sub Center to PHC	JPHN/JHI	Offline	Daily & Weekly	IDSP Form S- Syndrome Surveillance
			Monthly	Performance report– report on all aspects of performance, Family planning, Immunization, Diarrheal diseases, Malaria, Leprosy, Blindness, Deaths of all types Inventory report – Malaria drugs, Family planning aids, Vaccines, ORS, Basic drugs and others
		Online	Monthly	DHIS2- Consolidate Antenatal, Delivery, Immunization, infant deaths, maternal deaths
				ECMAN- Basic details of ASHAs and their incentives
			As and when required –Daily	MCTS- Case wise Antenatal, Delivery and Immunization, postnatal care
	LHI/HI/ Pharmacist/ HS/NHM PROs	Offline		Consolidated information collected from Sub-Centre level
PHC/CHC/ Hospital to the District	HS /HI	Offline	Daily and Weekly	IDSP- Communicable disease report daily over telephone to the district IDSP unit
			Monthly	Family Welfare achievement report, active blood smear report, IEC/public health activities report, demographic profile of the family welfare acceptance report, institutional case and deaths due to principal communicable diseases, OP/IP new and Old, cases and deaths due to NCD, Control of ADD, blood smear collection report, NVBDCP ,Vacancy position
		Online	Weekly	Nikshay – RNTCP IDSP weekly report in DHIS2 software
	LHI	Offline	Monthly	JSY, DHIS2, Family Planning, Immunization, NCD and CD
	Clerk	Offline	Monthly	Expenditure from DMO funds and NHM funds and Salary of staffs
	Lab Technician	Offline	Daily & weekly, Monthly	IDSP- Form L, NVBDCP data
	Pharmacist	Offline	Daily & weekly, Monthly	IDSP- Form P, Medicine stock position of RNTCP

From – To	Reporting Functionary	Mode	Periodicity	Content
	NHM PROs	Offline	Monthly	Statement of Expenditure , School health report, RBSK expenditure report, Ward health sanitation report, JSY/JSSK, Adolescent friendly health clinic , Human Resource report
		Online	As and when required	CPSMS- JSY beneficiary payment
				School Health Information System- school details in the block
District to DHS	Statistical Department / Concerned Programme Officers	Consolidated report of all information collected from lower level institutions under the DMOMonthly summary of program statistics for each program - Malaria, TB, Leprosy, Blindness etc.,Summary statistics for Family Welfare Services (presently RCH)Inventory report – Malaria drugs, Family planning, Vaccines, ORS, Basic drugs and others. Vacancy PositionIEC reports on contacts, group activities, T.B., MALARIA, LEPROSY monthly reports.		



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