Kerala's Innovative Efforts at Health Systems Strengthening: (2016- 2020)- A Report

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Introduction:

This report is an independent assessment of the health sector in Kerala with a focus on recent initiatives taken by the current government at health systems strengthening. The Department of Health and Family Welfare and Planning Commission of the Government of Kerala commissioned this study.

This report is presented in four sections:

I. An Overview of Kerala, its Health performance and its health care system
II. Initiatives at Health Systems Strengthening since 2016.
III. An Assessment of the government initiatives- Strengths and Challenges
IV. A summary and implications for action

This study is based both on an analysis of secondary data and on the basis of a team visit made to Kerala from the 15th to the 18th of January, to understand the current efforts of the state government to strengthen health services in the state. As part of this visit- the team visited two districts of Wayanad and Kannur, and within them interacted with community health workers (ASHAs), healthcare providers, mid level managers and patient at over 9 healthcare facilities as also a number of community interactions. The team also interacted with the leadership of local self-governments (village, block and district panchayat) and the district administration. (see annexure 1 for facilities and sites visted)

Section I: An Overview of Kerala and its Health performance:

Demography: Kerala, India's southern most state has a population of 33.4 lakhs and a population density of 860/sq. km, giving it one of India's highest population densities among India states. The state has relatively a high degree of urbanization- over 48%. The state also has and a relatively low proportion of scheduled caste population (9.1%) and scheduled tribes (1.45%). It has much more religious diversity than most states with Hindu population of about 55%, Muslim population of 26 % and Christian population of 18%.

Kerala has also a rapidly aging population. In 2011 over 12.6% of the population were over 60 years of age and this could reach 20% by 2025. 15 % of this elderly group is over 80 years old.

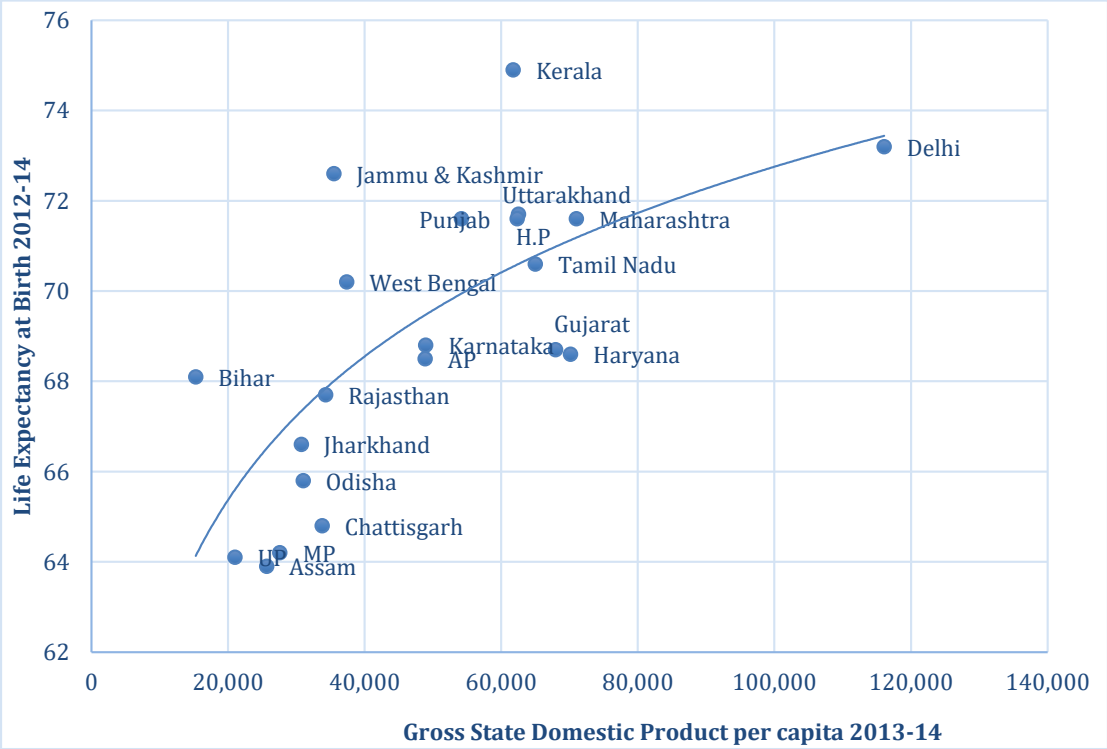
Kerala was a state dominated by out-migration- but this is changing now. Currently in-migrants are estimated at 2.5million or about 7.5 % of the population. All of this brings along its own health challenges.

Overall Health Performance: Kerala's health performance has been an object of considerable positive comment and it figures in a series called "Good Health at Low

Cost" where the case is made that this state has health indicators compared to many developed nations, even though its per capita income is similar to most developing nations.

Within India when compared to other states using the Preston Curve which is an expression of the wealth of the state measured as GDP per capita plotted against the health of the state, measured as Life Expectancy at birth, Kerala punches far above its weight.

Figure 1: The Preston Curve for the large Indian States:



This punching above its weight on the Preston curve persists whether we look at mortality in the 0 to 5, or 0 to 14 populations or in the adult population (15 to 70). It also persists whether we look at mortality due to reproductive and child health, to communicable disease or to non-communicable disease.

It must be recognized that much of the good performance of a nation/state in terms of health outcomes is dependent on social determinants (probably over 70%) , and only less than 30% of the performance can be attributed to performance of health systems performance.

The Social Determinants of Health In Kerala: Some social determinants are well known. Kerala's high level of literacy (over 84%) and schooling, especially female literacy (> 87.9%) is the most often cited. Access to safe drinking water is estimated at 94.3% and access to sanitation at 99.2 % with open defecation rates lower than 1. These are among the best among states.

Historically the introduction of land reform movements in the first three decades after Independence, the establishment of a robust public distribution system which made essential food items available at subsidized costs,

Kerala has relatively lower levels of poverty and malnutrition- though there are significant levels. Income and wealth inequity is however not low- and Kerala's Gini Co-efficient shows higher inequity- but the bottom is higher set.

Over a century, Kerala has a stronger commitment to both public education and healthcare.

The Political Contexts Kerala is one of the States where for about half its post independence period has been governed by a coalition of left parties- and the other half by a centrist coalition of parties (led by the Congress) – both pursuing what could be called a liberal economic policy with a commitment to a welfare state. Right wing forces- both in economics and in social mobilization, are relatively marginal in this State. The pressure for privatization of public services has therefore been relatively less.

This State has the highest degree of decentralization among all States. Almost 40% of the state budget is spent through elected local self-government bodies. Considerable parts of public services are placed under the supervision, even ownership of local self-governments. All primary health care is devolved to the local elected self-governments (called panchayats) and the block and district hospitals are under district panchayats.

Helped by a high level of debating of public policy in civil society and media, there is a higher level of citizen engagement in policy making. An important role in civil society consciousness is played by the Kerala Sastra Sahitya Parishad, an important constituent of India's peoples science movement and peoples health movements. This could have contributed to keeping both health and health related public services as a greater priority in Kerala's polity.

Kerala has also evolved a small, progressive pro-active public health academic community, which has had a focus on health rights. This has a modest influence on the Directorates of health services. In comparison to other states, the directorates of the department are relatively more empowered and with greater technical capacity. This enables the state government to be able to take greater state level initiatives. This could be one reason why this state is able to have launched such innovative initiatives. Which means it does not have to rely only on the technical design of central programs or on external donor/funding agencies. In fact Kerala may have been helped by the fact that it has never had to undertake a World Bank aided Health Systems Development Program.

Kerala's Health Profile and Challenges:

Kerala's life expectancy is 74.9- the highest among Indian states and comparable to many developed nations. (men 72.5 years, women 77.8 years). It would have a higher death rate due to a more elderly population, but if one compares age-standardized death rates than at 703 per lakh it is the lowest in India. This lower death rate is largely contributed by much lower child 5 mortality rates and also very low mortality due to pregnancy and due to communicable disease. Age standardized mortality rates due maternal, neonatal and communicable diseases are only 81 per lakh population- in comparison to NCDs that account for 554 per lakh populations. Almost half of NCDs mortality (43.95%) happens before 70 years of age- as compared to less than 20% in a developed nation- and this is considered as preventable mortalities.

Age standardized mortality due to injuries at 67 per lakh is high as a proportion of all deaths, but this is still the lowest rate for the Indian states. (Reference: computed by authors from India: Health of the Nation's States — The India State-Level Disease Burden Initiative. New Delhi: ICMR)

The leading causes of mortality in Kerala (in descending orders *measured in terms of years of life lost* (YLL) are ischemic heart disease, stroke, suicide, chronic kidney disease, chronic respiratory disease, road injuries, diabetes, Lower respiratory infections, congenital birth defects, falls, diarrheal diseases and then cancers, and premature birth complication. This is shown in figure 2. We need to note that of the top 6, four are directly related to the main NCDs of cardio-vascular disease, diabetes and respiratory disease and one to mental health and then injuries. (Reference: India: Health of the Nation's States — The India State-Level Disease Burden Initiative. New Delhi: ICMR, PHFI, and IHME; 2017. ISBN 978-0-9976462-pg2.)

In terms of morbidity measured in terms of years lived with disability (YLD)- there is a completely different pattern. This is shown in the figure 3. W Though most of the diseases on this list are not killers, they are contributory to the huge and rising costs of care that we see in - and these too need urgent public health measures. (Reference: India: Health of the Nation's States — The India State-Level Disease Burden Initiative. New Delhi: ICMR, PHFI, and IHME; 2017. ISBN 978-0-9976462-pg 2.)

We also note that both in terms of mortality and morbidity those on the top 5 to 10 currently (2016) like sense organ diseases, chronic respiratory disease, stroke, diabetes, chronic kidney disease were largely at the bottom of the list in 1990, and those in the bottom of the list now (like neonatal complications, lower respiratory infection and diarrheal disease), were among the 5 to 10 leading causes of mortality and morbidity in 2015. Reference: India: Health of the Nation's States — The India State-Level Disease Burden Initiative. New Delhi: ICMR, PHFI, and IHME; 2017. ISBN 978-0-9976462-pg 3.) However the public health system in Kerala is still largely geared to the disease priorities of the nineties, in part because this is the focus of central funding and guidelines. For the center whose first priority is to address the health inequities of the northern states, this makes sense, but Kerala needed to move on.

The most important risk factors that public health needs to address now are high blood pressure (hypertension), dietary risks, high fasting plasma blood glucose(diabetes), high body mass index(overweight and obesity), high total cholesterol, tobacco use and air pollution. (see figure 4) (Reference: India: Health of the Nation's States — The India State-Level Disease Burden Initiative. New Delhi: ICMR, PHFI, and IHME; 2017. ISBN 978-0-9976462-pg3.).

Though mortality due to infectious disease in Kerala is low, the state is plagued by repeated outbreaks of either altogether new infectious diseases like swine flu, Nipah virus and now Corona virus or re-emergent diseases like dengue, chikungunya, scrub-typhus, diphtheria, leptospirosis etc. Kerala has shown great skill and determination in management of these outbreaks. The most impressive among this was the timely containment of the Nipah virus outbreak. Containment of these recurrent epidemics can draw away the entire efforts and resources of public health systems leaving less for addressing the high mortality and disability due to NCDs.

All of this has major implications for the design of healthcare systems. It informs us of the risk factors that preventive and promotive public health measures must address

and the specific health services for which access and financial protection has to be universalized.

Kerala's Healthcare system:

Kerala's better health indicators owe a lot, not only to its better social determinants but also to one of the better organized public health systems in the country.

Public Health Infrastructure: Kerala has currently 9 government medical college hospitals, 18 general and district hospitals, 79 taluk hospitals that make up its investment in secondary and tertiary care. It has 234 CHCs, 849 PHCs and 5403 sub-centers and a large number of ASHAs (CHWs) which constitute its investment in primary level care. (CHCs are meant to be secondary care, but the current package is more like that of primary healthcare). This primary level infrastructure is less than norms, but not seriously so, especially considering that these norms are for rural areas, and about 48% or more of Kerala's population is urban. One could however show that there is a serious gap between required facilities and available facilities for primary level care in the urban areas of Kerala

Kerala's total bed strength in the public sector is 37,843. This is about 1 bed per 1000 population, which is less than the recommended 2 per 1000 norm, but if we include private sector this could be considered adequate. Of these beds 22,063 are in urban areas and 15,780 is in rural areas, which is not necessarily iniquitous since Kerala has almost half its population residing in urban areas. Further because of dispersed urbanization and good transport systems, urban hospitals are readily accessible to most rural areas. http://dhs.kerala.gov.in/pdf2018/list_10052019.pdf

The interpretation however changes if we remove from this calculation all the government beds at primary care level- defined for this purpose as beds in CHCs, PHCs, and leprosy hospital. These beds account for 15748 beds or 41.6% of the total beds. About 92% of these 'primary care beds' are in rural areas. At the secondary and tertiary level, public hospital beds are only 24863 beds and of these only 3787 or about 15% are in rural areas. Since very limited hospitalization happens below the taluk hospital level, even for normal deliveries, the actual public-bed-to-hospitalization ratio should be only about 0.73 beds per 1000 population.

At the community level, the state has 26,475 ASHAs of which only 2396 are in urban areas. In In Kerala ASHA workers were redistributed as 'One ASHA per Ward' and ASHA is the Coordinator of Ward Health Sanitation & Nutrition Committee (WHSNC) . These committee are functional and include anganwadi workers and kudumbashree (self-help group) members.

Urban Health Infrastructure : Kerala has 6 municipal corporations and 87 municipalities where 1.59 crore urban population reside. This is 48% of total population of Kerala. The National Urban Health Mission, Kerala caters to an urban population of only 51.9 lakhs residing in 44 urban local bodies, i.e., around 33 percent of urban population in Kerala. The rest are under the National Health Mission (implicitly the main, rural health mission) The population in slums is estimated 2.02 lakhs in 2011 census- which is a relatively small proportion. Since the inception of NUHM, there has been some expansion of primary health care services for urban areas. There are 83 fully functional urban primary health centres across the districts

including the upcoming 2 new UPHCs in Kannur and Thiruvananthapuram and 1 new UCHC in Ernakulum. Going strictly by norms with urban PHC catering to 50,000 population, this is adequate- but in practice, for the expanded package of care, 50,000 is far too high a number.

Selective Primary Healthcare: Though Kerala never subscribed to a World Bank funded health sector reform project of the nineties, it had fully bought into the structural adjustment discourse of selective primary healthcare. Selective healthcare enters as a politically neutral technical discourse, and has the credibility of the central government's backing. So though Kerala's political consciousness never allowed privatization of its healthcare system, its primary care system remained limited to a declining proportion of morbidities, leaving response to the increasing burden of chronic illness to the private sector. In effect this was a form of privatization- but justified and disguised by the technical discourse. This can be seen most clearly in the sub-center and ASHA services which till just about one year back remained strictly limited to the same disease profiles as would characterize a pre-epidemiological transition state. The state is now seized of this problem- but it is going to be a challenge, to change a mind-set of over 20 years.

Ke*rala's Private Sector in Healthcare:* Kerala has a large private sector in health care. In year 2014, 66.0 % of all outpatient visits and 66.2% of all in-patient visits went to the private sector. By 2017 this had declined to 52.5 % of out patient visits and 61.7% of all in-patient visits. In the 2014 survey, the proportion of those utilizing private care was higher in every social sub-group except for SC and ST where utilization of public sector is more. In the 2017 survey utilization of public sector was more not only in SC and ST, but also in OBC sub-group, and in the poorest three quintiles of rural areas and the poorest two quintiles of urban areas. Overall, rural population utilizes public sector more than private sector, and the reverse is true for urban areas- but both are close to the 50% mark. (see tables 1 and 2). The data in this paragraph and in the subsequent paragraphs is all by an as yet unpublished paper of Alok Ranjan, Sundararaman, Muraleedharan et al which is entirely based on analysis of the NSSO survey – 71st round of 2014, and the 75th round of 2017-18.)

An interesting fact is that as compared to all India figures, the proportion of people going to public sector for outpatient care is more in Kerala than the all India average- both in 2014 and in 2017. Whereas when it comes to in-patient care, the proportion of population going to public sector in Kerala is less than the all India average.

Financial Hardship due to costs of health care: Higher utilization of private sector is well known to be associated with higher catastrophic health expenditures. The average out-of-pocket expenditure on OP care in 2014 in Kerala was Rs 221 in the public sector and Rs 564 in the private sector, and four years later it remained stagnant (or declined after adjusting for inflation) to Rs 236 in the public sector and rose to Rs 789 (2017-18). Kerala's per episode out of pocket expenditure on both public and private sector is much less than the all India average, though because of more OP visits per year per capita, annual per capita expenditure could be more.

The average out-of-pocket expenditure in IP care in Kerala was (in year 2014) Rs 3250 per hospitalization episode in public sector and Rs 23, 274 in the private sector. Both rose in 2017-18, becoming Rs 4239 in the public sector and Rs 26081 in the private sector. Again these expenses are less than the all India average (though Kerala is a wealthier state than most other states). One feature is that in this period average

public hospitalization expenditure in all India level had declined considerably, whereas in Kerala it had risen.

Public Funded Insurance Programmes: Kerala has implemented a state level publicly funded health insurance program (PFHI) - known as the Karunya Arogya Suraksha Padhati (KASP) to provide financial risk protection for those below the poverty line and a set of additional beneficiaries. This was broadly based on the RSBY model with special features. With the coming of Ayushman Bharat - Pradhan Mantri Jan Arogya Yojana (AB-PMJAY), Kerala has had to adopt some of the latter features. Insurance based care covers 41 lakh families for in-patient care- of which premium for 19.5 lakh families is partly supported through AB-PMJAY and for 20.5 lakh families is through Comprehensive Health Insurance Scheme of Kerala. The sum assured is Rs. 5 lakhs per family. There is in addition a Karunya Benevolent Fund which provides an additional 3 lakhs benefit for critical illnesses. There is also a state funded health insurance for state government employees and pensioners.

NSSO 's 71st round (2014) and its 75th round show that coverage with PFHI is 34.6% and 32.8% of the population. This is a more modest figure than can be expected from government data- but it is still a higher coverage than most states. However insurance coverage does not seem to lead to cashless services- and the costliest care in public sector without insurance is still cheaper than the lowest rates with insurance in the private sector.

An earlier report, the State Health Accounts of September 2016, had concluded that though the density of public health facilities is relatively more in Kerala as compared to higher states, the experience with catastrophic health expenditure is worse and as many as 5.7% of the population could get pushed below the poverty line due to healthcare costs. (State Health Accounts - Kerala, India Technical Report · September 2016 DOI: 10.13140/RG.2.2.33757.61923)

In Conclusion:

This section has presented the context and baseline in Kerala's health systems as it was available when the current LDF government comes to power. It is against this baseline that we would examine the achievement and challenges of the current government.

Kerala has now completed an epidemiological and demographic transition. Its social determinants and risk factors as related to reproductive and child health and the old communicable disease are well in control and the health systems are also adequately geared to addressing these problems. However Kerala faces a high burden of preventable, premature mortality due to non-communicable diseases including mental health and due to injuries. These too have social determinants- but the state was yet to engage with them at the level of intensity required. Kerala has also been facing repeated outbreaks of either altogether new infectious diseases or sporadic re-emergence of old ones- and though these do not contribute significantly to mortality, their containment can suck away the states resources and distract from the problems that are the leading contributors to death and disability.

The other crisis in Kerala's health sector is that the public health systems were not designed or expanded as required to address the new epidemiological and demographic situation. As a result, there has been an active growth of an unregulated

private health sector, where health outcomes are uncertain- but there is a high exposure to financial hardship and impoverishment.

What accounts for such a large proportion of persons, even in the poorest quintile going to private sector? Why does Kerala have such a high burden of preventable mortalities due to non-communicable disease, injuries and mental health, even though it has done well in reduction of maternal and child mortality and mortality due to under-nutrition and communicable disease?

The easiest answer (and the laziest) is to attribute it to lack of quality of care in public hospitals. There is little evidence to support this contention and further the word "quality" is subject to different interpretations.

More likely answers that one must consider are:

1. The services available in the public primary health care level are very selective. Most primary health care needs were not being addressed by these centers-.
2. The government infrastructure capacity at secondary and tertiary level is seriously deficient- and hence there is gross over-crowding that pushes out many needy patients. These are informal forms of rationing.
3. Out-patient care relevant to peoples needs are not available at primary level and the nearest public facility where they are available are too far away.
4. Most out-patient care needs are related to chronic illness, and the organization of services with regard to timings, case follow up, continuity of care between specialist and primary level are all not geared to chronic illness.
5. Engagement with the private sector through insurance is not likely to contribute to health outcomes- which are far more dependent on universal coverage with primary healthcare measures addressing chronic illness and containment of emergent communicable disease. They are also not leading to financial protection in secondary and tertiary care.

It is worth noting that most or all of these issues, are what the LDF government has been addressing in its state level initiatives since it came to power in May 2016.

Section II_ Initiatives under the Current Left Front Government:

The current government came to power in May 2016. Soon after. as part of fulfillment of expectations and promises, the government announced a major initiative in the social sector called the "*Navakerala Karma Padhadhi*"constituted by four missions . This was launched by the Chief Minister on 10th Novemeber 2016.

These 4 missions were the Aadram Mission for the Health Sector, Livelihood Inclusion and Financial Empowerment mission for creation of livelihoods, the Hari-th-keralam Mission for environmental issues and the Comprehensive Public Education Rejuvenation Mission. These missions were also meant to align Kerala with progress towards the Sustainable Development Goals for 2020 and 2030. With the help of large number of expert groups on various aspects, targets for each of these missions were developed an these plans were incorporated into the state's thirteenth five year plan. The health groups were all unanimous that the state is responsible for the health of the people and that the way to deliver this is to focus on providing comprehensive primary health care while in parallel strengthening public provisioning of secondary and tertiary care centers.

Aardram Mission:

The objectives: The Mission in Health was named as "*Aardram"* a word which means compassion in Malayalam,

The initial focus of Aardram was creating people friendly healthcare delivery systems in the state from primary health centers to medical colleges, and treating every patient with dignity based on their needs.

This Aardram Mission has five objectives:

1. Transforming Out Patient (OP) services to become people-friendly.
2. Re-engineering Primary Health Centres to Family Health Centres.
3. Ensuring specialty services in one hospital each in every district and taluk.
4. Introducing super specialty services in district hospitals
5. Transforming Medical colleges to centres of excellence.

1. Transforming Out Patient (OP) services to become people-friendly.

Much of the initial emphasis was on the first of these objectives- and even now in every facility taken up under the Aardhan Mission, this is what has clearly happened. This was meant to address perceived quality as related to patient experience in seeking out-patient care. The various elements that together contributed to enhancing the patient experience were comfortable waiting areas with good seating arrangements and facilities like drinking water reading material and radio or television, token systems at registration, pharmacy and labs so as to obviate the need to stand in queues, e-records with patient identification systems to enable follow up, consultation rooms with adequate privacy, better waste managerment, and elderly as well as disability and women friendly in both access and in toilets, and better signages and an overall aesthetic ambience that includes better design and décor within as well as gardens and access outside.

This was in the first two years. As the mission proceeds, and the difference becomes visible to both community, to local self governments and to the department there was

increasing pressure to improve such patient experience enhancement or what is termed people-friendliness of the hospital to all its departments. The in-patient departments were next to be prioritized, but it moved on to such things as crèches and playgrounds for accompanying children, or better maintained mortuaries or better patient transport systems- especially to drop the sick and disabled back home or at the bus stand. Much of these latter innovations were driven by local self governments- as the visible gains of improving patient experience sunk in.

Quality of Care Improvements: One particular dimension of such transformation that has since evolved and is making a huge positive impact is what is being termed " the standardization of" district hospitals, Taluk Hospitals, Family Health centres, Health Subcenters etc. These imply a minimum set of services that should be available in them, plus minimum standards in infrastructure and human resources and an attractive common set of design and décor and signages that is similar across facilities. Another is the decision to go in for NQAS (National Quality Accreditation Standards) and do a good job of it. At the level of policy there is still articulation of entry level NABH and KASH as alternative standards- but clearly on the ground most are going with the wiser, more helpful and feasible choice of NQAS.

2. Re-engineering Primary Health Centres to Family Health Centres.

State has upgraded 170 PHCs to FHCs in 2017-18 and another 500 PHCs in 2018-19. In current year, target is to cover all the remaining PHCs. Under Sampoorna Yoga Keralam, aim is to empower Yoga Volunteers to train public, school children, etc through six sessions/month, extending within one-two years to cover the entire ward, school and public (covering all 941 panchayats).

Features of Family Health Centers: Family Health Centres are primary health centers have all the features of transformation of patient experience as defined under the Aardram Mission. But in addition these are defined by an expansion in human resources and a much larger set of assured services. This expanded basket of services includes all national health programs plus a new crop of state level health programs. It also includes well-standardized curative protocols for a wider range of diseases as well as enhanced availability of drugs and diagnostics and of palliative and rehabilitative care. Outreach services – to schools, homes and other welfare institutions are also included.

Timings: One important criterion defining a FHC was that its out patient timings extend from 9 am to 6 pm instead of closing at 2 am as most PHCs have it.

National Health Programs- on antenatal care, immunization, family planning, TB, HIV, Leprosy, National vector borne disease control program, Blindness are well known and are part of the FHCs mandate- like any other PHC. Though this list is long in Keralas context the disease load of these programs is very limited and they probably account for less than 10% of community's health needs.

Expansion of services : Amurtham Arogyam: One major expansion of this list- covered under the health and wellness component of Ayushman Bharat is screening and care for hypertension, and diabetes. Though AB-HWCs mandates coverage for many other illnesses, in most states the expansion of the services is limited to these two. In kerala this aspect has been named the Amrutham Arogyam program: This program addresses hypertension and diabetes through interventions at 4 levels, viz.,

(i) primordial prevention through reduction of risk factors in the population, (ii) primary level prevention through health education for the population on healthy diet, exercise and ill effects of addiction,(iii) secondary level prevention through screening for the population above 30 years of age for NCDs and free drugs for all those detected with NCDs and (iv) Tertiary level prevention for early management and treatment of complications. Amrutham Arogyam programme is expected to cover the entire state spreading across all 14 districts and the services are rendered through all district and sub-district health facilities includeing PHCs and the 5404 subcentres. Kerala is the only large state where screening of the entire population of state for NCDs is being rolled out.

Expansion of Services: State Level Schemes: What is even more amazing is the set of state level schemes that are introduced for delivery through the FHCs as part of going comprehensive:

These could be listed below- but discussed in the next section at some length:

1. ***Palliative Care:***

   This is an unique primary care program, not only in India, but across nations. It provides for community based palliative care, led by local self governments and professionally supported by health system. A revised Palliative Care Policy 2019 for the state guides action. This reaches out to cancer patients who are terminally ill or on care, to chronic kidney disease patients on conservative care or on dialysis or asfter transplantation, those who are recovering from stroke or other paralysis and those who are bed ridden and immobile due to old age (most often) or some illness.

   Action is at three levels.

   1 Primary level: This is implemented by all the 1064 Panchayath Raj Institutions(PRI) in Kerala. Structured home visits are organised by a trained community nurse paid by PRI with other team members being trained ASHA workers, field staff of PHC and volunteers. This happens under the supervision of the PHC Medical Officer. Each PRI is spending about 5 lakhs rupees per year under decentralized planning scheme for palliative care activities.

   2. Secondary level Palliative Care: This happens through public hospitals of district . Patients referred from Primary level palliative care programmes like patients with end stage cancer, colostomy, tracheotomy, end stage systemic diseases etc. who need more skilled care are catered to. The home Care is done under the leadership of trained Staff Nurse appointed through NRHM and also by doctors trained in Palliative Care. A Medical Officer trained in Palliative Care gives morphine, and other palliative care medicines to the needy patients through secondary OP. The secondary units are also co-coordinating and monitoring the activities of primary palliative care units in their area through training and quality improvement programmes. The secondary services are being provided through 102 hospitals and more recently 232 Community Health Centres- each of which are provided with one staff nurse trained in Palliative Care and one Physiotherapist. Much of geriatric care is subsumed into this palliative care

   3. Tertiary level Palliative Care focuses on various trainings for professionals (doctors and nurses) as well as students and volunteers and acts as a referral site.

The scheme also provides for Preparation of a participatory plan, Strengthening Neighbourhood Network of Palliative Care and partnership with NGOs and Community Based Organizations.

2. ***Swaas:*** The Kerala COPD Prevention and Control Program. This is the first on scale effort at addressing India's huge burden of COPD. A low cost spirometer is used to screen an ddiagnose cases at the FHC and those who are positive are followed up with necessary referrals, and medication compliance and home care
3. ***Aaswasam***- Program to screen, diagnoise and manage depression at primary care level. ASHAs and ANMs use a 9 point questionnaire to screen those at risk for symptoms of depression. Those who score above a threshold are sent up for consultation to a trained medical officer or consultant. If found to be depressive and put on treatment, they would be followed up at the village level. This scheme is meant to address the high level of depression.
4. ***Mental health – Sampoorna Manasika Aarogyam*** ; Other than depression there are many forms of psychoses and serious mental illness that are either undiagnosed as such, or are unable to continue with optimal medication and care. The program aims to identify such patients, refer for care and then assist in continued medication and support to the individual and family.
5. ***Amma Manas'*** (Mother's Heart) : improve the capacity of field level functionaries and providers to to identify mothers/expectant mothers at high risk of depression, so that early intervention can prevent maternal suicides.
6. ***Nayanamritham*** - Diabetic Retinopathy Screening : This is done using a hand held camera which can take fundus photograph and transmit the image to a state retinopathy centre located in the Regional Institute of Ophthalmology. Here trained optometrists would evaluate the picture and send back the diagnosis along with advice on management.for the diagnosis and staging of diabetic retinopathy. Training is imparted to staff nurses, for the photography, referral and follow up. At present this has started in all DHs and some FHCs but should soon expand to all. Similar initiatives are planned for diabetic foot, and for management of chronic kidney disease..
7. ***Screening of Oral Pathologies*****:** There are 159 dental units in the state- 18 in GH, 18 in DH, 80 at the Taluk leel and 40 in CHCs. Mass screening of school children is also envisaged under the scheme. FHCs would all have dental units.
8. ***Sampoorna Yoga Keralam,*** which envisages the propagation of yoga. disseminate yoga training to the public by empowering ASHA, school volunteers and community volunteers through continuous yoga trainings.

One interesting element of the FHC program is the team building trainings that provides training to all health staff in the FHC (including doctors and field staff) as well as the people's representatives- for working as a team to improve quality and access to services.

Other than the above district level services are envisaged for cancer management, stroke management and specialist consultation for diabetes.

3. Ensuring specialty services in one hospital each in every district and taluk and introduction of super specialty services in district hospitals:

1. All taluk hospitals have to be upgraded to have the following 8 assured specialities - Medicine, Surgery, ENT, O&G, Anaesthesia, Ophthalmology, Paediatrics, Dental. There would also be a Dialysis units in all taluk hospitals run by trained MOs (3 months training). In addition there would be what is called a "Secondary Palliative care unit" for specialist IP care that patients registered for palliative care need. Audiology & speech therapy services are also envisaged at Taluk level
2. District Hospitals are being upgraded to include all of the above plus the following services:
    a. 3 assured superspeciality disciplines - Cardiology, Neurology, Nephrology
    b. Functional Cath lab with CCU
    c. Stroke Stabilisation Unit with thrombolysis facility
    d. Day care Chemotherapy Centre at DH level
    e. Palliative Care Training Resource Centre
    f. 360 degree metabolic centre - for comprehensive NCD management

4. **Transforming Medical colleges to centres of excellence.** (This study was unable to cover medical colleges)

In addition to the programs that come under Aadram, there are other notable intiatives in public service delivery.

One notable initiative is to improve quality in maternal and neonatal care as part of the LaQshya scheme and in partnership with professional organisations like Kerala Federation of Obstetrics and Gynaecology and Indian Academy of Paediatrics.

The other has been strengthening disease surveillance and response to outbreaks of communicable disease. The double burden of natural disasters including floods & landslides and ensuing communicable diseases over the past two years have tested the state's surveillance and response system. Even then, Kerala is making good inroads into elimination of malaria and filariasis and control of dengue and chikungunya. Its intervention in the containment of Nipah virus outbreak has won wide appreciation.

Another strength of the Kerala health system is its ability for involvement of local self government and community in planning, development, and ownership of health action and health services. Local Self Governments compete with each other on health outcomes and the quality of service delivery of their health centres. A substantial part of the funding for primaryhealthcare flows through panchayats and munciplaities and they also raise moneys to close gaps.

Inter-state migrants are an important population group whose health needs are to be addressed. There are initiatives to extent health care and even insurance cover to these sections.

Kerala is expanding the concept of wellness to cities through its 'Healthy City' project in partnership with development agencies like UNICEF to address various determinants of health including water, sanitation and hygiene, pre-monsoon preparedness and trauma care.

Kerala has been also able to rationalise its essential drug list. This combined with streamlining of drug procurement and logistics through Kerala Medical Services Corporation Ltd. has ensured adequate availability of drugs in all public health institutions and has prevented drug stock-outs. It has also established a government owned drug manufacturing firm for production of essential medicines.

Kerala, through its Aardram Mission, has transformed primary health centres into Family Health Centres with provision for preventive, promotive, curative, rehabilitative and palliative care services to the local community. Family Health Centres perform the function of health and wellness centres which act as the nodal centre for community based service delivery including screening for NCDs, community palliative care and workplace interventions for diagnosis and management of NCDs. Upgradation of sub centres as health and wellness centres is currently under process, and will result in greater gains to the state in the field of non-communicable diseases and palliative care.

Kerala is also moving towards a e-Health framework that would enable information flow across levels of care. Provision of services that are not available in the public sector are ensured through strategic purchasing from the private sector through Ayushman Bharat - Pradhan Mantri Jan Arogya Yojana (AB-PMJAY).

Kerala recognises the need for concerted efforts from all sectors to address determinants of good health. It is to address this that the state is implementing "Aardram Janakeeya Campaign", a people-led, people-centric campaign to address various determinants of health. The campaign gives priority to de-addiction, health promotion and wellness activities, exercise and physical activity promotion, healthy food, and cleanliness and waste disposal. The campaign seeks to promote behaviour change among the population of Kerala through specific social behaviour change communication strategies.

Section III: A Field Assessment of the Strengths of the Public Health Services in Kerala.

This study is based on a limited visit to two districts in Kerala, Wayanad and Kannur undertaken over three days. The places visited are given in annexure 1. In the part A we list the strengths, and in part B, the weaknesses and challenges.

Part A - The Strengths and challenges

Strengths:

1. **Major increase in availability of services**: This has lead to much greater outpatient attendance at all levels. Increase in the range of services available at the FHC is the main factors behind this, but other factors listed below contribute. Consequent to this increase in Primary Care, patients attending Taluk and District level Hospitals have also increased. OP transformation with introduction of services of Cardiologist, Nephrologist and Neurologist, and facilities of Cathlab and Dialysis are being implemented in district level hospitals. At Taluk level hospitals also specialty services have also improved. Since all these transformation are in the developing phase, it may not be reflected in all the institutions in Kerala in a similar fashion.
   At the FHC level we now have about 40 patients per doctor per day, or about 200 outpatients per day.

   The main factors that contribute to this increase are:
   a. Increased "range of services". Earlier the focus was on Ante-natal care and immunization and some vertical disease control programs. But now the services include many non-communicable and communicable diseases. Diabetes and hypertension care is a major contributor to OP attendance.
      Increased range of services is also operationalized through a number of special clinics are organized each week- and this also contributes to increased out-patient attendance. The usual set of special clinics are- a) Clinic for reproductive age women, (b) immunization clinic, (c)Adolescent clinic, (d)NCD clinic, (e)geriatric care clinic and in some facilities the f) Swaas clinics for chronic respiratory illness and the g) Aswasam clinic for depression and mental illness.
   b. Change of timings at the FHCs ,with OPDs going up to 6 pm and a second shift for one doctor being operational has also helped considerably.
   c. More doctors and nurses appointed in the PHCs. This was essential to cope with increased case load due to more services.

   One important lesson is the importance of moving from selective primary healthcare to the comprehensive primary healthcare approach. The image of poor quality and effectiveness of government primary healthcare services largely relates to the restriction of services to a very narrow and

minimalist set of services. The government move to expand this package rapidly as part of upgrading PHCs to become Family Health Centers (FHCs) is thus most welcome and has had a very positive impact.

At the district hospital level also there is a much needed expansion of services. The district hospital has all the basic 11 specialities- but is now going on to start a cardiology, a neurology and a nephrology unit. Further the specialists in these hospitals feel encouraged to offer a range of services. For example- a gynecologists in a DH often remains limited to sterilizations and C-section. But at Mananthavadi DH the gynecologist does the entire range except for cancer surgeries. This same expansion may not be a feature of all specialities or in hospitals outside those taken up under Aadram. The pathologist for example remains limited to blood bank work, the ENT surgeon does not undertake cochlear implantation and the eye specialist does not go beyond cataract. This problem is much more in the facilities that have not yet been taken up by Aadram.

The increase in sub-centres, CHCs and the general hospitals is less. Work on improving these facilities is at an early stage.

2. **Implementation of NQAS- (National Quality Accreditation Scheme).**

Implementation of NQAS has taken place following the Aardram Mission activities. When PHCs where transformed to FHCs, the Government encouraged the panchayath and the FHC team to go for NQAS after addressing the gaps as per NQAS criteria. The team training involving the Panchayath authorities and Heath team under Aardram Mission was a big success and created a motivation for implementation of Aardram Mission as well as NQAS. Only very few PHCs in the state have gone for NQAS before transformation to FHC.

We list some of these NQAS components below:

i. Patient Flow: This involves an easy registration, comfortable waiting space with amenities, an initial pre-check up done by trained nurses, an electronic board where ones token number and turn to go in is announced. But further to it also NQAS certification also helps patient flow to the pharmacy, for diagnostics, for discharge etc.
ii. Adequate standards of bio-waste management.
iii. High standards of cleanliness.
iv. A very good level of drug safety assurance that reduces prescription and dispensing errors.
v. Considerable effort at standard treatment guidelines. A training program introduced 54 clinical guidelines for most frequently seen clinical conditions. In addition for the four or five common NCDs the STGs are available as desk calendars or desk side displays- as also e-aids.
vi. Signages are everywhere and well designed.

vii. Printed patient information materials and notices are available at appropriate sites.
viii. There is also an effort at aesthetic color and décor standardization that provides both a brand image and aesthetic appeal.
ix. Effort has also gone into team building around the development of vision, mission and quality control statements – all of which are typical of the TQM approach.
x. A three-day team building training organized by SHRC. The trainees were all the key staff of the facility as well as the panchayat heads- and the focus was on implementation of quality measures.
xi. Many of the facilities are winning awards for such standards- and this has also enhanced the impact of NQAS.
xii. But perhaps the single most important transformation that NQAS in its entirely has brought around is professional pride in providing quality services- and a very positive work environment that facilitates and motivates the service providers.

What is impressive is that all of the above processes have been re-engineered /optimized at every facility which is under the Aadram program. However facilities, which are not under the program, like the Kalpetta GH may have few such features. Clearly NQAS makes a difference to quality of public health services.

3. **Great role of panchayats**.
    a. Another major positive finding is the major role played by gram panchayats/ local self government (LSG) bodies. There is a clear alignment of facility to LSG- and this helps. Thus there is one ASHA per ward and one PHC/FHC per GP (sometimes two for large GPs) . The CHC, the taluk hospital comes under the block panchayat and the district hospital under the district panchayat.
    b. Gram panchayats are spending anywhere from 25 lakhs to upwards of a crore of rupees on ensuring adequate functioning of the healthcare facilities under their governance- and even higher sums are spent by block and district panchayat.
    c. These funds are spent on the following items:
        i. Supplemental staff – at least one medical officer and a paramedical worker- but often more
        ii. Supplemental medicines- especially to cover gaps in suply
        iii. Investment in infrastructure: This is the main head of expenditure. This could be for core infrastructure, or it could be for gardens and playgrounds outside and other amenities.
        iv. Project: palliative care- at least Rs 6 lakhs is earmarked for this- discussed in detail later.
        v. Other projects like tribal health- NCDs, etc.
    d. The panchayat project is an interesting concept. Panchayats can propose projects of their choice for state funding. A fair number of

such proposals relate to health services- and can be locale specific and innovative. Examples are- projects around NCD prevention with focus on developing gyms and promoting exercise, tribal health and tribal nutrition projects, teaching cycling to adolescent girls, supplying cots to tribal households, geriatric care etc. A few projects like the palliative care project are mandatory.

e. The rest is upto the panchayat. This gives a major scope for panchayat level planning and innovation, and addresses the problems of matching public financing with local planning- which most states have little success in addressing.

4. The Palliative Care Progam:

a. This is one of the most innovative primary healthcare programs in both national and international context. The definition of palliative is flexible, but within a framework understanding. This flexibility has been used to address local needs more effectively.
b. To give an example- Edavada GP and its PHC take care of 236 persons registered under it for palliative care. The GP has a population of 23,500- so this is about 1%. This includes 147 cancer patients and about 100 bed-ridden patients many of whom are hemiplegia, or paraplegia, and 71 chronic kidney disease (CKD)patients. Of the 71 CKD patients, 9 have had kidney transplantation, 15 are on chronic dialysis and the remaining 47 are on conservative management. (there is an overlap in diagnosis). COPD , heart failures also contribute.
c. A nurse hired and paid for by the panchayat visits the registered palliative care patients periodically once or twice a month. Medicines are also paid for by panchayat , and sometimes there is an assistant as well. Patients with a higher level of complications and care requirements are called secondary care palliative patients and registered with the block panchayat. – one panchayat nurse- the primary level care under GP and the secondary level care under

5. Improvements in infrastructure:

a. One of the main features of the Aardam program is the improvement in infrastructure. Initially the focus was only on “OP transformation improvements”. But gradually the demand built up for major improvements in in-patient wards, operation theatres, paying wards, special newborn care units and so on. This required the preparation of a “master plan”. Many facilities under the Aardam program have gone to this stage.
b. We saw this at work in the matanchavady district hospital. The entire hospital which is a relatively old structure is being transformed, section by section and will eventually become a modern state of the art hospital- despite many constraints of space. A new radiology, intensive cardiac care, advanced nephrology and neurology units are coming up. The entire

maternity wards are being re-built but already they are over-crowded. This is really a massive transformation.

c. Even in PHCs that are not yet taken up for Ardam, there is a spillover effect- and GPs are coming forward to fund improvements and medical staff are introducing a limited range of NCD services- mainly diabetes and hypertension. Therefore even PHCs which are not FHCs have good infrastructure- though FHCs are much better placed.
d. UPHCs are constrained for land-space- but within this limitation their infrastructure also has increased.
e. On the whole the state has adequate number of PHCs and sub-centers in rural areas- but there are significant gaps in urban areas. One explanation is the neighboring rural PHCs are looking after urban populations also- but this is not very clear.

6. Improvements in drug logistics:

a. Drugs logistics and quality assurance systems are vastly improved. There are few stock-outs. Thresholds and buffer stocks are not quite clear to facility pharmacists, but mid level managers ensure uninterrupted supply using the computerized inventory system.
b. Essential medicine lists are universal and prominently displayed along with situation in current availability.
c. A process of monthly tele-meetings is helping to identify gaps and issues and address them.
d. There is a good awareness about preventing wastage and rational use of medicines. Outside prescriptions are the exception- and since these are largely attended to by the Karunya pharmacies- there is no visible problem of kick-backs, commissions and other conflicts of interest that affect prescription.
e. All medicines supply is free- and that along with the above points is a huge achievement.
f. As visible from the field, the KMSC seems to be performing this task adequately.
g. Supply to sub-centers is a problem- but that we will discuss with weaknesses.

7. Better diagnostic availability:

a. Overall there is a vast improvement in availability of diagnostics.
b. The list of essential diagnostics at each facility type is clear to all providers and prominently displayed. There are 54 essential diagnostics at FHC; and even more at CHC ,taluk hospital/GH and and DH.
c. There are two laboratory technicians in each facility, but some have only one.
d. High end Imaging services are managed by the KMSC- and this seems to be functioning optimally. In both districts there is a CT Scan in the district hospital.
e. All diagnostics have modest levels of user fees. Many categories of patients (upto 18 years age, pregnant women, tribals, BPL etc) are

exempted-but we could not assess the implementation of this. Other than the fee for diagnostic, the only other charges are the charges for registration (Rs 5 or Rs 10).

f. There is no hub and spoke model of distributed collection and centralized analysis at work. So access to higher end diagnostics in the periphery is limited.

8. Better HR policies:

a. The vacancy situation is not much. There are no problems with availability for recruitment- for all cadre, and even for most specialists. However sanction of the posts is far less than required as per case loads, and often even less than the standard norms. This is despite a reported 5000+ posts having been sanctioned since this government came to power. Which is quite a big achievement- and reflects a commitment to invest again in improved public services.

b. Private practice is allowed – but is to be limited to the providers home and cannot be in private nursing homes. Surprisingly in rural Kerala, in the districts visited, the providers are not maximizing private patients and cross-referring in any major way. Seems to be doing little damage to public provisioning unlike the experience in many states. This is remarkable, since in areas visited the private practice of the public provider is the only available private provider within the Gram Panchayat. (One is told that in cities it is different- but that is untested). Many doctors and staff seen are enthusiastic, motivated, proud of their public service and seem to have consciously opted for public service- not a choice forced on them.

c. Overall HR policies are also sound, except for the lack of required posts- but there are concerns about contractual appointments.

9. The ASHA Program:

a. The state has a good ASHA program. The standardization of one ASHA per ward has worked. However about 10% of ASHAs are not residents in their wards- and that is weakness.

b. The ASHA earning is good relative to most states with take home being in the range of Rs 7000 to Rs 8500 per months.

c. The ASHA diary is well designed, and well maintained and plays a very valuable role.

d. The ASHA plays a supportive role for pregnant women and immunization. Health seeking behavior for this is well established except perhaps in very vulnerable sections- one of which is the urban poor.

e. The ASHAs are playing a role in NCDs – but this is very sub-critical. Though they are aware of the number of persons registered for treatment, they do not see it as their role to ensure that everyone, especially the vulnerable access to services.

10. The SWAAS program:

a. This is a primary healthcare program for chronic respiratory disease. Perhaps the only place in India that this has been rolled out. Even though COPD is an important component of NCDs- most states fail to initiate any intervention in this regard. It is very good that Kerala has pioneered this. This program provides a spirometer to measure lung function, and ensures ready availability of anti-asthmatic and broncho-dilator drugs as well as antibiotics and nebulisers to treat exacerbations. STGs are in place.
b. In addition to the diagnosis and management of COPD and Asthma, the programme is linked to smoking cessation and Pulmonary Physiotherapy extending up to the subcentre level.
c. Roll out of this program has started with 100 FHCs . There is a case for scaling up much faster.
d. Documentation and Concurrent studies would be useful to learn and improve the effectiveness of this initiative.

11. Tribal Health:

a. In the tribal areas of Wayanad, a special tribal health program is being implemented. The program has three components. One is a hamlet level ASHA called the "ooramitra". The other is tribal area coordinators who ensure access to different programs. And the third is the tribal mobile unit. These efforts are largely under the panchayats as special projects.
b. Special sensitization of mainstream providers- especially of ASHAs to reach these sections may still be required.

12. **E-health** –

a. Only two FHCs visited had this in place. One of the FHCs- Cheruytayam was completely paper-less. The registration clerk enters the name and provides a token number, the pre-check nurses takes vitals and does some counseling and then the patient presents to the doctor. The doctor makes notes on the computer directly. The system is user-friendly enough for the doctor to make their own templates making it easier for them to prescribe care. By integrating data entry into work-flow they reduce the doctors burden of record keeping.
b. However the system does not currently produce the monthly report to be submitted to mid level public health managers nor does it enable population based analysis – even of outcomes in their own patients. The gaps should be easy to close.
c. The data entry is going into a record situated in the state level server. But as it stands now it cannot be used to establish continuity of care between levels. This needs to be studied further.

13. The Karunya Pharmacy:

a. This is a state run pharmacy present in all public hospitals that provides commercial pharmaceuticals at reasonable rates. It largely caters to private sector prescriptions, but can also be used

for government facility patients who were prescribed to buy medicines outside.

b. This needs to be documented and studied further, but potentially it is a major measure to reduce costs of care.

14. **Well functioning Patient Transport and Emergency response systems**: KMSC managed 108 services plus the 104 – drop back home services. Thus ambulance sources are not outsourced to a private agency- but despite that it functions well. This could be studied further. the drop back service has also been started up and is popular.

15. **Iron sucrose for correcting severe anemia in pregnant women**- The state has considerable seriousness in anemia correction in pregnant women, especially women from tribal areas. Iron-sucrose injections are frequently used for this purpose- with both moderate and severe anemic patients receiving this injection.

16. **Functioning District Early Intervention Centres (DEICs)**- These centers that provide referral services to children who have any defects, deficiencies, disability or disease. This was reported as functional in both districts visited. That is an important development and it needs to be documented and studied further.

Part B: Concerns and Challenges:

1. **Lack of Continuity of Care between primary care providers and the secondary/tertiary levels**:
    a. One of the major problems is the lack of continuity of care between the primary care providers and the secondary/tertiary levels.Primary health care providers are referring cases of NCDs for consultation with specialists- but there is no feedback on what is diagnosed or advised in these consultations. They are unaware of who (by name or even facility) they are referring to.
    b. Secondary and tertiary care providers when they see NCD cases are not referring back/ providing feedback instructions to primary care providers to enable follow up. They may even be unaware of which PHC area the patient comes from, and what medicines and facilities are available in local PHC for follow up medication and care.
    c. We are NOT recommending gate-keeping by PHC, where patients have to compulsorily be seen by PHC and only if they refer will higher facilities see. That is neither feasible (at this stage) nor desirable. What we are recommending is
        i. All cases seen at DH/TH/CHC should have a post-consultation feedback to the primary care provider telling them what follow up can happen at PHC level. For this to happen the specialist should feel that the PHC is part of

his/her team- and for this some team-building between them is the main key.

ii. Further systematic feedback referral formats and protocols can be developed.

iii. E-records will help- but need not be waited for. Even now patients can provide the consultant the patient number which the specialist can see- and vice versa. Without patient enabling access to the record, the record should not be accessible to other providers. (Research access is differently regulated).

d. As seen in Noolpuzha, telemedicine used by the PHC doctors to access specialist back-up consultation can play a big role. In Noolpuzha the FHC was able to manage a very high level of dermatology care due to a weekly telemedicine connect with district dermatologist. Unfortunately for logistic reasons, this service has ceased for 6 months.

e. If continuity of care arrangements are made the range of services provided by the FHC can expand dramatically- and include many more chronic conditions related to eye and ear diseases, mental health, dermatology, rheumatology, - which currently are not available today.

f. In the absence of continuity of care arrangements – the early identification and management of complications is very inadequate. Thus all diabetes must be checked for diabetic retinopathy, about once a year- but that is not happening. But it is not only that- the current standard of care should require one specialist consultation once a year for all chronic illness- so that there is effective 'clinical supportive supervision" of what the primary care doctor is doing. It will- when combined with telemedicine and periodic group meetings- also help the primary doctors in continuing learning and skill up-gradation.

2. Effective coverage is far lower than required: The program is not yet adequately population based.

a. In absolute numbers, FHCs are managing a large number of NCDs, but as a proportion of the population which is need of healthcare coverage is only about 12% (in the UPHC) to about 25% in the better functioning PHCs. Thus for example in FHS Thillankery with a population of 16400 we expect population of 8200 to be above 30 and therefore requiring screening and if NCDs are 30% then about 2460 cases of DM and HT. In fact 9258 have been screened and this screening picked up about 1261 cases (995 HT, 554 DM and 288 with both). There are no systems to ensure that same person is not being screened twice- and on enquiries we learn that there are many persons who have never been screened. Of this 1261, only about 382 (DM-57; HT-325 and both 129) are registered for treatment. Further only about 50 % of these – about 191 would be controlled. There is a similar situation across all FHCs/PHCs/UPHCs.

b. We know from public health research that unless we have at least 50% coverage, the program is not cost-effective. At 70% coverage the program is cost-saving. What this means is that the reduction in complications and deaths is so low that we are spending a lot on managing complications- and relatively less on primary care. At 70% coverage, our expenditure on primary care would go up significantly, but the costs of managing complications would go down so much that on the whole we have saved money. (we are referring to societal costs- what government spends+ what people spend out of pocket). A large proportion of the hemiplegics, and chronic kidney disease and renal transplantation patients which are currently under palliative care or have died prematurely could have been prevented if 70% coverage had been achieved. Hence the state must set itself a goal of 70% coverage. In UK's NHS and in Thailand's UHC if the primary care team achieves a 90% control of DM and HT they qualify for an annual bonus. But to achieve it here we have to address the following system gaps.
c. Most important- is that the FHS must feel itself responsible for the entire population- even those who did not seek care. NQAS ensures quality of care for those who came to the FHC. But the public health team must do other things to reach out to those who did not come. There is an assumption today, that the rest are using private providers. This is true to some extent. But clearly many are not able to maintain regular medication and follow up- especially since in most of the GPs visited there were no, or very few providers within that GP area. Even otherwise it is very costly – and leads to many unwanted tests and medicines. To address this problem, consider the following corrective measures:
d. Use of clear population based indicators- using data provided by the ASHAs/Sub-centers, at all times FHCs and sub-centers and ASHAs should be able to report on proportion of individuals at risk who are screened; proportion of those positive who are on treatment, and proportion of those on treatment who are controlled., and proportion of individuals at risk and those who screened postive who developed a complication or died.
e. Ensure easy access to medication:
    i. This requires distribution through the sub-centers and the ASHAs. Efforts at this have been made but responding to a petition from pharmacists, this distribution has been stayed. Legally a legal brief should be prepared that a) points to the difference between drug distribution and dispensing role b) makes use of schedule K of the Drugs and Cosmetics act to legitimize distribution c)points out with scientific evidence studies the large number excess deaths that are happening because of this stay.
    ii. At another level there is a need for (i) negotiations with pharmacists as also (ii) building up a public consciousness on the high number of deaths and disability and impoverishment due to poor medication access.

iii. The use of tribal mobile units has to some extent been able to overcome constraints on drug distribution and access. The tribal mobile unit has a schedule of visits to the different villages, reaching every village/hamlet every month and the drugs for chronic illness are made available through it. The mobile unit has a pharmacist and nurse and doctor on it.

iv. Patient support groups in the village formed by patients themselves could receive the medications of their neighbours from tribal mobile units or even directly.

f. There is a need for considerable strengthening of the sub-centers. Indeed, going by international experience- UK, Thailand, Brazil and Cuba in particular, most of what is happening at the FHC should happen at the level of the sub-center- that is one unit for 5000 population. Even if that will take longer, the least is to implement the current NHM-HWC policy that call for three health workers and one mid level care provider at the sub-center. This in the Kerala context could be interpreted as three JPHN or JHI plus one HI per sub-center. Currently there is one JPHN plus one JHI per sub-center and one HI per three or four sub-centers. This would enable the necessary follow up.

g. ASHAs must be oriented to reaching out to those who are most vulnerable and marginalized. One is seriously concerned that the activist dimension of the ASHA is fading. That unionization leads to better wages should not be a problem for financing if it is associated with the provision of universal healthcare- and 8 hours job description. But where unionization leads to an identity-formation of being part of the state apparatus, instead of the community it is a problem. It could lead to a failure to identify with and stand up for the weakest sections within the community and to play a mobilizational role within such sections. The ASHA today knows that large number of persons in her charge who have NCDs are not seeking/taking regular healthcare, but does not see it as her job to change such behavior or even be responsible to achieve better life-styles. This is not the ASHAs problem, nor even of the unions. It is a problem of both system design. A three day orientation camp for ASHAs and the activation of village committees and patient groups in vulnerable communities would go along way to correcting this

h. Behaviour Change Communication (also referred to as IEC activity or just as health education) to inform people on better health seeking with regard to secondary prevention is very inadequate. On life style changes there is a lot of IEC around- especially on diet, but these do not appear adequately designed and delivered. Good quality formative and concurrent research would be required to improve this.

i. With regard to patient preference for private sector the following may be noted often this is due to a good personalized doctor-patient relationship- and therefore such visits could be welcome.

But the lesson for public health services is that a lack of a system of giving appointments or of patients expressing preference for a doctor within the facility is a huge barrier to the development of adequate doctor-patient relations in the public sector. When this problem was discussed with government doctors and nurses in the PHC they raised a number of legitimate concerns regarding such a system. But clearly Kerala has reached a stage where public services must learn to do this. The way forward is to provide an enabling order and then implement using facility level dialogue and sharing of best practices from facilities in this regard. This too will improve patient coverage and compliance.

j. Data of those being followed up regularly in private sector (as self-reported), could be ascertained by ASHAs from the families and included into the population based indicators. This will help identify those who are marginalized from all care- both public and private.

3. Institutional Deliveries:

a. Kerala has over 98% institutional delivery- and a low mortality rate. However about 71 % of rural household deliveries and 68% of urban household deliveries are happening at private facilities (NSSO 75th round). Delivery costs average Rs 30,000 in the private sector as compared to Rs 6000 in the pubic sector. These figures from NSSO are confirmed on our field level enquiries. Further we found in our interviews with ASHAs and some community members that those who have PM-JAY insurance are getting a discount and pay about Rs 25,000- which is far from the cashless services that is expected. Possibly the private hospital is "double-billing."

b. The lower proportion of births in the public sector is clearly related to the huge over-crowding that we see in public health care facilities. The number of public sector facilities providing delivery services are relatively few, and this is by design. Almost all sub-centers, and PHCs and even CHCs do not conduct delivery. Delivery happens only at taluk hospitals, district hospitals and medical college hospitals. At the DH visited there is such over-crowding that there is a complete loss of privacy. The wards become noisy, bustling places – far from what a mother would want for the first day with her child or on when she is in labour pain. If despite it, so many women come here, it is because of the high degree of trust and confidence they have. Further because of this high degree of trust and confidence, even rich patients come for these services- and there is some concern that this would displace poor patients and therefore not to be encouraged.

c. Every provider and manager we met believe that in Kerala, there is a behavior change such that people would have deliveries only in large hospitals with gynecologists and operation theatres. C-section rates are over 35% even in public hospitals and in private hospitals it could reach 70% plus. Therefore this is a problem that will not go away.

d. While accepting that de-privatization of maternity services is not a priority- the following actions may be considered: (a)Designating

more CHCs- especially block CHCs and all taluk and general hospitals as quality providers of maternity services. There would be a gynecologist and operation theatre in this facilities- and on call anesthetist in case of emergencies- but mostly dealing with normal deliveries. A few FHCs could also be considered. (b) Maternity wards – or even hospitals in the district headquarters town and in major urban areas- especially if it is doing over 200 deliveries per month (or some such similar threshold)(c) much greater awareness on the benefits of normal delivery and the avoidance of C-section unless necessary.

4. **Mental Health Program:**
    a. This is a great initiative-but much more requires to be done. Currently depression detection is less than 10 in a FHC area of over 20,000. But in every facility visited the records of deaths shows suicides in young adults. The PHQ-9 is a useful screening tool- but ASHAs need much more training on this regard. Its not part of the work-up in FHCs either, unless the doctor specifically calls for it. Stigma is very much there- but not being recognized as such. Takes the form of loud denial among ASHAs- even for such problems as insomnia. The main form of stigma is not others isolating the patient- but the patients own sense of shame in admitting to it . At the FHC also there is little confidence in managing this.
    b. We would suggest a strong round of training, much more referral material including STGs that are readily available at the FHC and sub-center, tele-medicine back-up. Also to consider hand-holding from some agencies to build best practice blocks or districts which can then be used to sensitise and train. The state has the correct policy framework, but is seriously under-estimating the challenge of implementation.

5. **Emergency Response and Trauma Care:**

    This needs to be looked at closer. The two districts visited did not have designated trauma care centers or capacity. They had one 108 emergency response ambulance per 2 lakh population, when what is required is usually about one per 50 to 75000. Private not for profit ambulances are said to close gaps- but it is not clear how they would do so. However this needs to be studied further.

6. **User fees- and paying wards:**

    a. There are no user fees except for diagnostics and a minor registration fee. Worth considering whether even the diagnostic fee can be done away with.
    b. Some hospitals have paying wards- and they are well occupied. In view of privacy requirements and as a measure of universalization where middle class can also avail of these facilities, paying wards

have great value. Retaining middle class clientele is good for public image, for professional pride, for improving quality of services and for advocacy on government to improve service provision. Typically a paying ward not only charges for bed fees based on the quality of the room provided (C, B, A, A+ etc), but for all services and the fee for all services is graded, based on the category of room occupied. There is a wide welcome of such arrangements in providers- since they see a number of patients coming in who are clearly affluent and can be made to pay.

c. While deciding on whether to expand such paying wards the following points may be kept in mind:
d. Public provision of services can be regarded as a form of tax based insurance scheme. Thus the taxes we pay, is what pays for free hospital services. In that perspective, the rich are not getting free services, but what they have paid for. Those who pay less taxes or no taxes, get the same care- and this is how equity in access works. Point- do not resent the rich using these "free services"
e. Capital has to be invested in building up paying wards. The prices we charge for services may not recover the entire investment made. It will also means diversion of scarce public investment in a non-equity direction.
f. Budgetary funds available to hospitals are inadequate. So if paying wards are developed and some categories of patients are charged, it is a form of raising revenue. Thus organized workers can be paid for by ESI and private sector can cover its employees etc. Private insurance and public insurance can also bring in resources. So where private wards exist, or where capital can be found without compromising the existing health budgets, a case could be made for expanding paying wards.

7. **What to do with CHCs** ?:

a. More thinking could go into CHC development. All CHCs are functional only at the level of a PHC, even though they have 20 beds and provisions for specialists. Some of the CHCs which are catering to a sector (30,000 population unit of one or two GPs) are actually misnamed PHCs and can now be converted to FHCs. In these blocks the taluk hospital is providing secondary care. On the other hand there are 3 "block CHCs " which have a referral as well as administrative heirarchial relationship with the FHC and should be developed as the equivalent of the taluk hospital.
b. Today the total number of public sector beds in the district of Wayanad is about 610 (including the 88 functional beds of one "Delivery point" CHC and not counting the redundant beds of the other CHCs). That is only about one thirds of the norm of 2 per 1000. The sanctioned bed strength is about 900 which is still short. Therefore upgrading block CHCs (not all CHCs) to 50 beds hospitals would be useful. But more than beds, it is the HR and the

service package of these hospitals that will need priority. Even 20 beds is good enough for quality secondary care.

8. **Pace and strategy of Scaling Up:** The Health department proposes to scale up Aardam from 178 FHCs to 510+ in the coming year. This is most welcome. The current scale while it is impressive will still not show up in state level statistics. But with this expansion close to 70% of facilities would be covered. Looking at the uneven development, there are some requirement on the scaling up that we flag below:
    a. One needs to develop mid level management and strengthen institutional support for each element of the scaling up- especially on NQAS, on infrastructure development, on training for panchayats and facility managers, of training on providers on STGs, on implementation of SWAS and ASHVASAM, of E-Health, for organization of diagnostics, of advocacy to support the program. This would mean some more state and district level officers who look after these programs along with necessary office support and enabling powers and rules. We have good institutional support for drugs logistics in the form of KMSC. This also manages emergency response, and imaging outsourcing- and would therefore require strengthening. New institutions may become required for NQAS and for infrastructure support. Strengthening existing institutions may be adequate for other purposes
    b. The expansion of the package of services available in each level and the training and logistics required for this could expand even before infrastructure expands. However HR would have to expand in parallel.
    c. One needs to expand HR responsive to rising range and volume of of services- and build systems of workforce recruitment and management that are appropriate to this need.
    d. One has to consider new PHCs and Sub-centers in areas where there are deficits- most of which could be urban or peri-urban areas.

9. **Data Management (and e-health).**
    a. Though we commented favourably on e-health support to providers in the FHC, this system does not currently generate monthly reports or population based analysis. That is a back-end function and these functions must be built in.
    b. One notes that the MCTS, system- currently upgraded to RCH system is huge and unwieldy, and most unfriendly for use of information at local and middle levels. The digitization component of this is an add-on to existing burden of register management.
    c. The number of registers at the level of the rural ASHA are manageable. But the urban ASHA and all sub-centers have 48 poorly constructed multiple registers to fill . Digitization of some of the registers is time consuming and laborious and adds little or no value to their work. Many of registers are meant for reporting- but much of the information is never sought for. They are not used, or

readily usable to inform local action. Rationalization of all of this registers based on the principle of collecting only such information as is required for action at that level and avoiding duplication- would reduce the burden of the peripheral staff and make

d. There is talk of moving to an EHR system loaded on state or central servers. Existing experience should advise caution. There is merit in considering an alternative architecture where the data of each facility and of each district is stored in a distinct server space and available for analysis at that level. These distinct systems should be able to export the aggregated data or patient files in the format required into state or central applications as and when required. The centre and state can specify its information needs for each program and for reviewing district systems- and its systems should be able to receive this information from the multiple systems that operate and facility and district level.

10. Persisting Stigma on public services and the ideological baggage:

a. One persistent problem that comes in the way of improvement is stigmatization of public health services as necessarily of poor quality and perception of people "preferring private sector because of better quality". Due to the recent reforms this problem has greatly reduced, and that is one of the big successes of this program.
b. However whenever faced with any operational problem, the providers and managers are quick to lapse to this argument. This prevents them from critical analysis and innovation for improvement. Most often private sector choice is a distress choice- because selective care policies have made most services unavailable within public systems. Even now the lack of continuity of care, of privacy , of a system of appointments are the objective reasons- which innovations in organization of services can address.
c. Further the market creates a perception of what is good care, which itself is problematic and manipulates and even creates unnecessary supplier induced demands. There were many examples of this during the visit- for example comments on quality of drugs in public hospitals, reasons attributed for private sector choice for deliveries etc.
d. Clearly there is a need to educate the public on market distortions of healthcare needs, as well as the causes and remedies. A good booklet on political economy of health and healthcare could be a starting point.

11. The PM-JAY is perceived as playing a useful role. However some concerns are:

a. The number of claims are more from public sector, but in terms of claims value, more of the reimbursement goes to private sector. This is partly because private clinics preferentially use it for high

end procedures like angiography and bypass and knee replacements etc. Some of it is supply induced demand- but some of it is also essential care. The main hospitals who benefit from PMJAY are the 750 bed private medical college and the district hospital.

b. Inquiries with community and ASHAs indicate that in private sector what they get from empanelled hospitals is more of a discount in the price than cashless services.
c. The use of PM-JAY earnings by public hospitals needs to be studied further. Our impression is that it varies across facilities.

12. Engaging with Private Sector:

a. There are no other PPPs in these districts. The district officers and panchayat heads did not see any advantage in such PPPs and would rather focus on strengthening public services. On the possibility of roping in private providers to provide primary health care through contractual arrangements , there was frank skepticism of feasibility and desirability, even from doctors in private practice. Private practice is seen as supplemental to their public service- and they would prefer the free market rather than regulation in the private sphere.
b. The state has adopted a clinical establishments act. This act excludes individual providers' private clinics- the GP practice. The nursing homes have to register- but even this is slow to proceed and meeting with resistance.
c. With the strengthening of public services, the proportion seeking care in the public facilities has increase. The general view is to focus on this.

Section IV:

Summary and Implications for Action:

Kerala has been in the past and remains even now a great example of " Good Health and Low Costs". The states life expectancy is much better than what would be predicted from its GDP per capita- when compared to other states or even other nations. It also has held the position of the lowest in child mortality and maternal mortality among large states for many decades now. Behind these remarkable health outcomes is both the role of better social determinants, which itself is a result of considerable importance given to social development throughout its history. It is also the result of much better functioning health systems.

In the last two decades, Kerala's health sector performance has been under considerable stress due to a variety of reasons. The first and most important of these is the epidemiological and demographic transition-which leaves Kerala with a much older population and a much higher level of chronic illness. India's public health system is designed to address problems of fertility and to focus on maternal and child survival as well as control deaths due to the common communicable diseases. In all of these Kerala has done well.

In communicable diseases however, the challenge is far from over. Though the decline in mortality is a cause for celebration, frequent outbreaks of new infections – like swine flu and nipah virus, or the re-emergence of old scourges like diphtheria or dengue cause panic and suck away resources and distract attention from core health systems strengthening. As climate change exposes Kerala to more frequent extreme weather events and flooding, these outbreaks of communicable disease may persist into the coming decades as well.

But above all, the form in which Kerala's performance is most undermined is in the considerable rise in out of pocket expenditure in health care, leading to high levels of catastrophic health expenditure and impoverishment. This is due to three inter-related factors- the rise of chronic illness, a considerable increase in healthcare consumption, and the need to resort to an unregulated, high priced private healthcare providers. The gravity of this problem can be understood from the statistic, that 52.5 % of the population in the poorest quintile in rural areas 60% in urban areas need to go to private sector for hospitalization despite not being covered by insurance- despite the almost inevitable impoverishment that result. The reasons for this can be listed as follows:

1. The services available in the public primary health care level are very selective. Most primary health care needs were not being addressed by these centers. Sub-centers are even narrower in the package of services available.
2. The nearest public facility where the larger package/range of necessary services are available are the secondary and tertiary care facilities which are either too far away or too crowded and difficult to access.
3. Most outpatient care needs are related to chronic illness, and the organization of services in the public sector is all not geared to managing

chronic illness. For preventive and supportive management of chronic illness, other than making the services physically available, the public services needs to address issues related to timings of out-patient functioning, , the practice of giving appointments, the need for sustained case follow up, and the continuity of care between specialist and primary level. The nature of relationship that is required between provider and patient required for chronic illness care cannot be easily established in a large public hospital, though this is possible in a primary care center.

4. The government infrastructure and service delivery capacity at secondary and tertiary level is seriously deficient- and hence there is gross over-crowding that pushes out many needy patients. These are informal forms of rationing. This effect is most seen in institutional delivery, where the government facilities offering delivery services are limited to 79 across the states and these are all over-crowded. It has not been possible to shift these services to more peripheral facilities- which could be due to reasons of health seeking behavior (as perceived by the program managers) or due to sub-optimal organization of public secondary care services as is more likely in our view.
5. Engagement with the private sector through insurance is not likely to contribute to health outcomes- which are far more dependent on universal coverage with primary healthcare measures addressing chronic illness and containment of emergent communicable disease. They are also not leading to financial protection in secondary and tertiary care. Regulation of private sector through the clinical establishments act has also been a challenge, and regulation of prices in the private sector is not even on the agenda.

The Kerala LDF Initiatives in the health sector:

The Kerala government seems seized of all these features and has shown considerable creativity and clarity in addressing all of the above problems. Most of the health systems strengthening measures introduced are based on internal consultations and learning from best practices- and hence these are much more appropriate. The focus is on strengthening public service delivery.

Engagement with the private healthcare sector: Strategic purchasing from private sector is much discussed elsewhere in India and abroad. In Kerala, strategic purchasing of health care is limited to publicly funded health insurance, and this has had a limited role to play. Some ancillary services like ambulance services were outsourced but now have been brought back into state run autonomous institutions.

Even in the publicly funded health insurance, about 40% of the funds flow into reimbursement of public hospitals and are therefore potentially available for strengthening public facilities. When the beneficiary chooses the private provider, the financial protection impact is less certain.

There have been efforts at regulation of the private sector through a clinical establishments act, but this faces resistance and progress is slow. The Kerala act design excludes private GPs from its ambit. For other clinical establishments the

current requirement is only for registration and later to reach a set of quality standards. There are no provisions on limiting kick-backs or other conflict of interests or

Strengthening Public Health Service Delivery: The flagship intervention of the Kerala government is the **Aadram program**- an innovative program that started with the objective of *t*ransforming Out Patient (OP) services to become people-friendly and upgrading Primary Health Centres to Family Health Centres (FHCs) , introducing specialist services of district and sub-district hospitals. This program has had remarkable success in its first phase of establishing 170 FHCs and there is considerable enthusiasm to proceed to the next 500 centers. The total target is 800 centers.
In parallel to the FHCs, the state has also initiated a number of public health programs to address the new range of healthcare priorities. There are also many pre-existing aspects like panchayat involvement that have been strengthened.

We would therefore list the main measures at strengthening public health services as:

1. Increase in a relatively more comprehensive range of ambulatory services that are available and utilized in the PHC level, once it is transformed to a FHC- thus breaking away from the selective primary health care policy of the past. This has led to significant utilization of these services.

   The services now included in the primary care package (with policy intent to universalize) are

   i. Palliative care services- which terms covers a whole range of home care services
   ii. Hypertension and Diabetes: screening and follow up care for hypertension and diabetes including prevention and early detection and response to complications
   iii. Chronic respiratory illness and asthma
   iv. Depression- prevention, early detection and response,
   v. Other mental health problems
   vi. Wider range of detection and management for acute minor illness
   vii. Iron Sucrose for moderate and severe anemia in pregnant women
   viii. Better referral services for children

2. In parallel to expanding the basket of available services there have been corresponding measures to make both necessary drugs and diagnostics available, and increase human resource deployment in these PHCs. There are over 100 medicines and 54 diagnostics on the essentials list of the FHC. This also includes improved logistics for consumables- through both internal pharmacies and the Karunya Pharmacy initiatives.

3. Making FHC (family health centres) much more patient-friendly through a great improvement in infrastructure with special effort to make it attractive, provide better amenities for waiting patients, timings and patient flow management – and a form of brand-image building using “standardization” of facilities.

4. Effective implementation of the national quality accreditation scheme. This not only contributes to better patient experience, but also to safety, productivity and provider satisfaction aspects.

5. Strengthening the district hospital and a selection of sub-district taluk hospitals to provide a much higher range of specialist care- including the introduction of cardiology, neurology and nephrology services- as well as all the Aardram measures that make the hospital patient friendly.

6. Strengthening the ASHA program by assuring her a better income (about Rs 7000 to 9000 per month) and also expanding her skills and job description to include non-communicable diseases. The earlier task description of promoting institutional delivery, antenatal care and immunizations are largely tasks that have little value addition to systems outcomes, given that already these outcomes had been achieved.

7. Strengthening tribal health program- through introduction of hamlet level ASHAs, tribal area health coordinators and mobile clinics that deliver follow up for chronic illness.
8. Strengthening patient transport and emergency response systems.
9. Strengthening disease surveillance.

One specific feature of Kerala's approach to strengthening public services is its tremendous success in involving the elected panchayats (local self government measures). This has played a central role in making these facilities patient friendly, and creating a great sense of trust and public ownership of these facilities. Further it has brought in considerable resources for primary health care, as also ensured that resources committed from the state budget are spent far more effectively.

Though every one of these measures is a great step forward, and there is enough that is working to merit scaling up these initiatives state-wide, there are some last mile gaps in some of the above strategies where we would recommend the following:

a. Greater attention to continuity of care between specialist and the primary care provider. This should not be limited to an appeal for the same- but should undertake innovative institutional measures similar to what Aardram has done to address other gaps.
b. Much greater attention to reaching over 70% coverage for all the new primary healthcare programs that it has launched. This requires above all a much greater effort at strengthening the health sub-center. This requires that in the least there are three health workers- could be 2 women and one male- and a CHO. Kerala is proposing a trained staff nurse as CHO, which would work if it is a nurse practitioner level of training. Also the 4-5 ASHAs there would require higher levels of training. The legal barriers to drug dispensation/distribution at this level should also be overcome by legal means (using flexibilities under

schedule K of the drugs and cosmetics act) or institutional innovation (eg pharmacists as the JHI, or mobile clinics for dispensation)

c. In District and sub-district hospitals, which are already under Aardram, further increasing the attention to patient friendliness and quality standards in in-patient care- on the lines of what has worked for out-patient care. Including the GHs and CHCs also within the ambit of Aardram program- and making the latter also capable of regular in-patient care. The declining proportion of institutional deliveries in public hospitals (falling from 34% in 2014 to 29 % in 2017) must be seen as reflecting the problems of both lack of bed capacity and patient friendliness of the public hospital. Working on this indicator could show the way forward. In a resource crunched situation it could include the re-introduction of paying wards, where hospitality arrangements are more comfortable. Publicly funded health insurance could also be consciously leveraged to address this goals.
d. Thinking through the scaling up strategies. Scaling up is urgently required, but this is the stage where many programmes falter. We now know the problems of scaling up, and should be able to address it better. One important learning is that a strategy for creating and supporting expanded mid level management capacity twould be required for scaling up. Another is that good concurrent evaluation or even participatory assessment of all the "units" being scaled up- (for example Swaas, Aaswasam, nayanamirtham and so on). This will help identify and close deign gaps and build capacity for scaling up.

In conclusion:

In sharp contrast to some of mainstream theories of health sector reform, it is important to note that Keralas efforts at health systems strengthening are NOT based on making market forces act on public service delivery, or by encouraging competition as the route to achieving quality of care.

Keralas approach to health systems strengthening is about making public service delivery better. But where the current government has broken fresh ground is that it is looking to creative and participatory design innovations in the organization of service delivery to improve the performance of public services.

It is also based on trying to build a much larger sense of ownership and pride by the community in their public healthcare facilities, which in turn leads to much higher levels of trust between individual provider and patient as well as between government facility and the community.

With respect to financing, the important observation is that the decisions of the individual provider with regards to patient care as well as the decisions of the health care management with respect to its objectives are both ring-fenced from any monetary gain. This has to potential to greatly reduce irrational and wasteful care and make for much more efficient system desigh. However (in mainstream health sector reform theory) such removal of monetary incentives within a market driven and defined

society can lead to denial of care, or the unchecked play of professional power in doctor –patient relationships. If this had not happened it is partly due to political will, partly due to the nature of panchayats and in part due to high levels of health and civic awareness that kerala is blessed with. But these three strengths would still have not been enough to bring back confidence in the public system, but for the introduction of creative design efforts. If it had been business as usual- with the only efforts being at enforcement of desired provider behavior through tighter monitoring (which now gets reduced to digital surveillance) mixed with lamenting the difficulties of dealing with doctors as a professional group, Kerala could not have arrived at these solutions and these results.

The Macro-economic and political challenge:

Many of the components of the Aardram program are at the pilot stage and even its most prominent component, the family health centres reaches about one fifth of the population. The scale of implementation is large enough for proof of the concept, and for capacity building, but not large enough for a population wide impact.

The main challenges that the government would face in scaling up and stabilizing this model are:

a) Whether the state government will have the fiscal space required to increase its investments in health care? Such fiscal space would require much greater fiscal federalism than is available today and an overall adequate growth rate of its own.
b) Whether the central government will provide the federalism in planning required for the state to proceed with its innovative approaches? While Kerala could continue to learn from the center and the experience in other states, it should not be forced to conform to the central design to avail of central funding. Even in the development of its health information system, the center can ask and be given verifiable state and district level information, but should not dictate, the applications, systems and methods in which it is collected and analysed.
c) Whether the state has the technical capacity (public health capacity) to build on this approach? Such technical capacity would depend on institutionalizing constant learning and feedbacks from the field. It would also involve engagement with a larger pool of national and international public health expertise without getting overwhelmed by their academic prestige or uncritically absorbing their frameworks of analysis

It is not as if the central government has not contributed to the state success. Much of the initiatives are financed from the NHM and the state has made good use of the limited flexibility available within the NHM. At the technical level, central initiatives like the Ayushman Bharat's health

and wellness centers component has contributed to shaping the concept of the Family Health Center.

But for scaling up state-wide and closing the gaps that this study identifies, the state is going to require a significantly higher investment much of it going into a larger workforce, and much more autonomy in health planning, and even higher levels of technical capacity than it has deployed so far. To ensure sustainability, there is also an urgent need for good internal advocacy and community mobilization so that the scaling up of this approach to cover the entire state becomes a peoples demand and a peoples movement. Too often, pointing to its many gaps, successful alternative approaches to public service strengthening are dismantled-not because they are failing, but because they are in danger of succeeding. There are always many vested interests who would prefer the status quo. A supportive peoples mobilization and wider civil society engagement is thus essential for sustainability of such initiatives.

But clearly, Kerala's current path of health systems strengthening, if persisted with, could emerge as an effective, equity sensitive, affordable and community based approach that other states in India, and other nations in the world could learn from.

Annexure 1:

Facilities visited as part of the Field Assessment Tour

In Wayanad:

- Noolpuzha- FHC
- Vadakkanad- HSC
- Tribal Village- Vadakkanad
- Kalpetta- GH
- Wayanad- DMO office
- Edavaka- PHC
- Mananthavadi- DH
- RMM Periya- CHC

In Kannur:

- Thillankaery- FHC
- Taliparamaba- UPHC
- Cherutayam- FHC
- Naruth- HSC
- Kannur- DMO office

Figure 2: Top 15 causes of Most years of life (YLL) lost, by sex- 2016: Measure of Mortality:

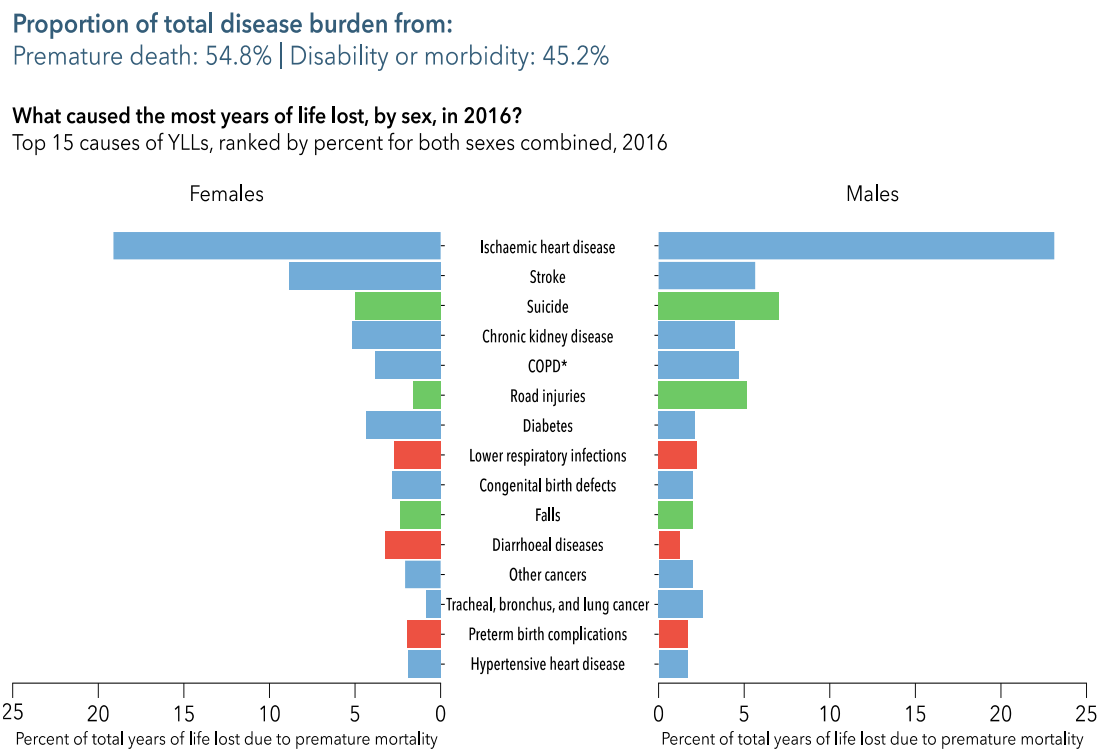


Figure 3: Top 15 caused of most years of life lived with disability – by sex- (measure of morbidity.

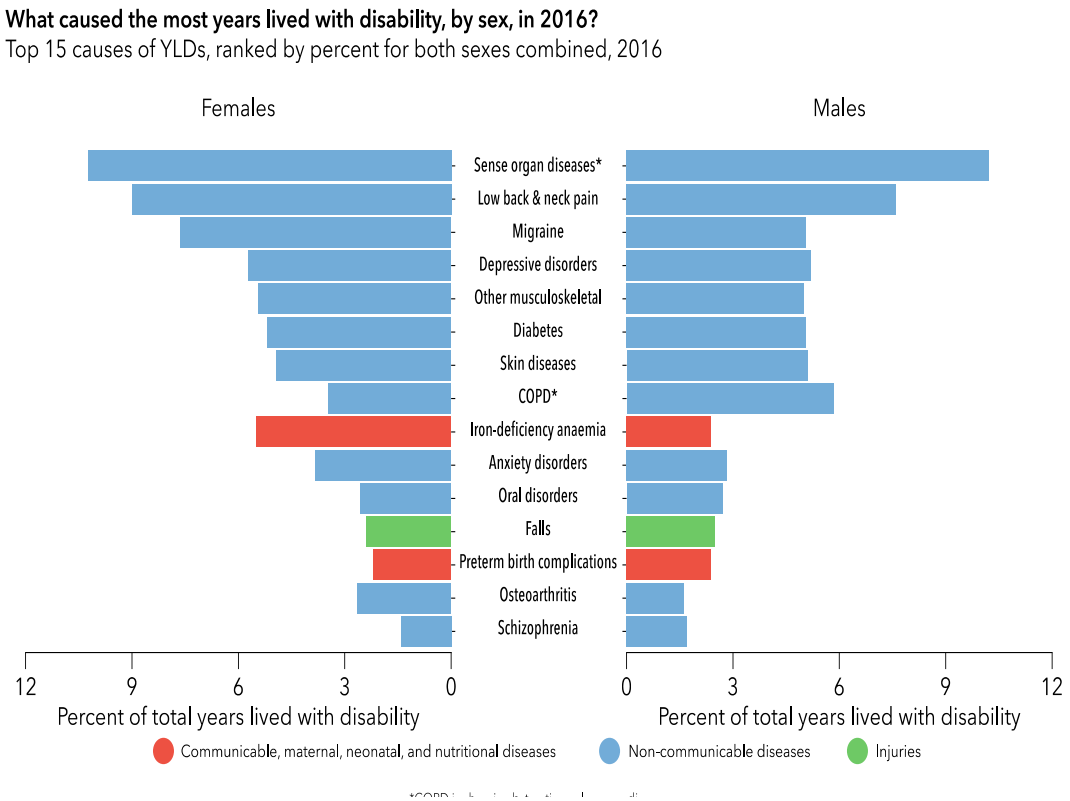


Figure 4:

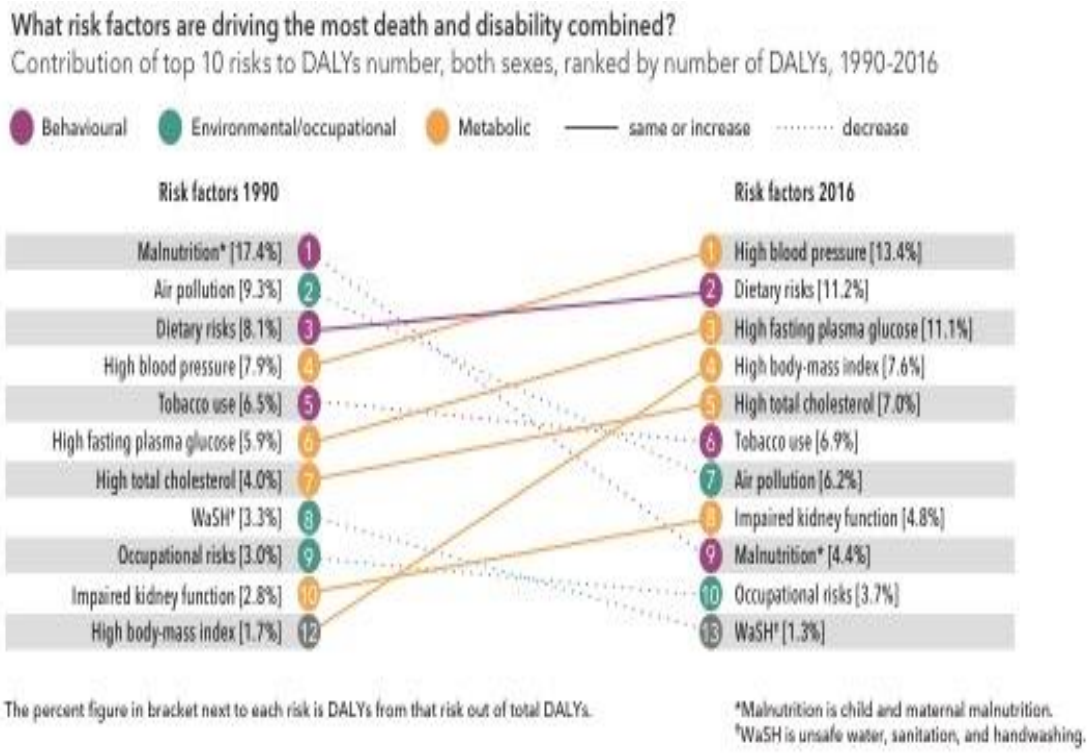

What risk factors are driving the most death and disability combined?
Contribution of top 10 risks to DALYs number, both sexes, ranked by number of DALYs, 1990-2016
Behavioural
Environmental/occupational
Metabolic
same or increase
decrease
Risk factors 1990
Malnutrition* [17.4%] 1
Air pollution [9.3%] 2
Dietary risks [8.1%] 3
High blood pressure [7.9%] 4
Tobacco use [6.5%] 5
High fasting plasma glucose [5.9%] 6
High total cholesterol [4.0%] 7
WaSH† [3.3%] 8
Occupational risks [3.0%] 9
Impaired kidney function [2.8%] 10
High body-mass index [1.7%] 12
Risk factors 2016
1 High blood pressure [13.4%]
2 Dietary risks [11.2%]
3 High fasting plasma glucose [11.1%]
4 High body-mass index [7.6%]
5 High total cholesterol [7.0%]
6 Tobacco use [6.9%]
7 Air pollution [6.2%]
8 Impaired kidney function [4.8%]
9 Malnutrition* [4.4%]
10 Occupational risks [3.7%]
13 WaSH† [1.3%]
The percent figure in bracket next to each risk is DALYs from that risk out of total DALYs.
*Malnutrition is child and maternal malnutrition.
†WaSH is unsafe water, sanitation, and handwashing.

Table 1: Share of different provider during hospitalization in All India and Kerala: evidence from 71st and 75th Round NSS

	All India						Kerala					
	71st Round, 2014		75th Round, 2017-18				71st Round, 2014		75th Round, 2017-18			
	Pub	Pvt	Pub	Pvt	Trust/NGO	Pvt.Total	Pub	Pvt	Pub	Pvt	Trust/NGO	Pvt.Total
Total	**38.4**	**61.6**	**42.0**	**55.3**	**2.7**	**58.0**	**33.9**	**66.2**	**38.3**	**57.9**	**3.8**	**61.7**
Rural	41.9	58.1	45.7	51.9	2.4	54.3	34.4	65.6	40.0	56.9	3.1	60.0
Urban	32.0	68.0	35.3	61.4	3.3	64.7	33.0	67.0	35.8	59.4	4.6	64.2
Gender												
Male	37.5	62.5	41.0	56.2	2.8	59.0	36.6	63.4	39.2	56.6	4.3	60.8
Female	39.3	60.7	43.1	54.3	2.6	56.9	31.8	68.2	37.3	59.4	3.3	62.7
Social Group												
ST	59.6	40.4	64.7	33.2	2.1	35.3	69.4	30.6	62.7	36.4	0.9	37.3
SC	49.5	50.5	51.4	46.1	2.5	48.6	55.7	44.3	58.4	40.7	0.9	41.6
OBC	33.4	66.6	38.9	58.5	2.7	61.1	34.7	65.3	41.8	54.6	3.6	58.2
GEN	34.5	65.5	36.4	60.6	3.0	63.6	23.0	77.0	24.4	70.4	5.2	75.6
Economic Class-Rural												
Poorest	57.7	42.3	53.5	44.7	1.9	46.5	48.6	51.4	47.5	50.6	1.8	52.5
Poor	52.3	47.7	50.5	47.6	1.9	49.5	46.1	53.9	43.6	51.6	4.8	56.4
Middle	43.6	56.4	48.6	48.8	2.6	51.4	37.2	62.8	47.9	48.6	3.5	52.1
Rich	41.0	59.0	43.7	53.9	2.4	56.3	23.5	76.5	31.9	63.3	4.8	68.1
Richest	27.4	72.6	37.6	59.7	2.8	62.4	20.2	79.8	23.6	75.1	1.3	76.4
Total	41.9	58.1	45.7	51.9	2.4	54.3	34.4	65.6	40.0	56.9	3.1	60.0
Economic Class Urban												
Poorest	46.0	54.0	48.2	48.9	3.0	51.8	49.3	50.7	40.1	54.4	5.5	59.9
Poor	40.2	59.8	43.0	54.2	2.8	57.0	40.6	59.4	44.4	53.8	1.8	55.6
Middle	32.4	67.6	34.1	62.1	3.8	65.9	27.8	72.3	42.2	50.3	7.5	57.8
Rich	24.5	75.5	28.3	68.2	3.5	71.7	26.6	73.4	27.5	66.6	5.9	72.5
Richest	15.9	84.1	15.8	80.6	3.6	84.2	15.1	84.9	14.5	80.3	5.3	85.5
Total	32.0	68.0	35.3	61.4	3.3	64.7	33.0	67.0	35.8	59.4	4.9	64.2

Table 2 : Share of different provider of out-patient care in All India and Kerala: evidence from 71st and 75th Round NSS

	All India							Kerala						
	71st Round, 2014		75th Round, 2017-18					71st Round, 2014		75th Round, 2017-18				
	Pub	Pvt	Pub	Pvt	Trust/NGO	Informal	Pvt.total	Pub	Pvt	Pub	Pvt	Trust/NGO	Informal	Pvt.total
Total	**25.8**	**74.2**	**30.2**	**65.8**	**1.1**	**3.03**	**69.8**	**34.0**	**66.0**	**47.5**	**50.9**	**1.44**	**0.2**	**52.5**
Rural	28.5	71.5	32.6	62.2	0.9	4.3	67.4	36.3	63.7	51.8	46.7	1.52	0.03	48.2
Urban	21.2	78.8	26.2	71.6	1.3	0.9	73.8	31.1	68.9	41.7	56.5	1.33	0.43	58.3
Gender														
Male	24.6	75.4	29.9	66.0	1.0	3.2	70.1	32.3	67.7	47.2	50.9	1.7	0.3	52.8
Female	26.8	73.2	30.4	65.6	1.1	2.9	69.6	35.6	64.4	47.7	50.8	1.3	0.1	52.3
Social Group														
ST	48.6	51.4	41.8	50.3	1.6	6.3	58.2	13.9	86.2	67.6	32.4	0.0	0.0	32.4
SC	29.9	70.1	34.4	60.1	0.6	4.9	65.6	57.7	42.3	66.1	32.6	1.3	0.0	33.9
OBC	26.0	74.0	32.1	63.8	1.1	3.1	67.9	33.3	66.7	53.1	45.3	1.2	0.4	46.9
GEN	19.3	80.7	23.9	73.4	1.2	1.6	76.1	28.2	71.9	34.0	64.1	1.9	0.0	66.0
Ec. Class- Rural														
Poorest	33.8	66.2	37.3	56.3	0.9	5.5	62.7	55.9	44.2	61.3	37.9	0.8	0.0	38.7
Poor	32.5	67.5	31.8	64.6	0.7	3.0	68.2	38.6	61.4	59.0	39.7	1.2	0.0	41
Middle	28.5	71.5	29.7	62.9	1.5	5.9	70.3	38.9	61.1	53.7	44.5	1.9	0.0	46.3
Rich	24.5	75.5	33.1	60.5	0.5	5.9	66.9	25.7	74.4	47.5	49.5	2.9	0.1	52.5
Richest	26.0	74.0	32.4	64.5	0.9	2.2	67.6	21.9	78.1	37.9	61.2	0.9	0.0	62.1
Total	28.5	71.5	32.6	62.2	0.9	4.3	67.4	36.3	63.7	51.8	46.7	1.5	0.0	48.2
Urban														
Poorest	28.3	71.7	37.6	60.5	0.6	1.4	62.4	44.2	55.8	53.5	45.2	0.7	0.7	46.5
Poor	25.2	74.8	29.5	67.3	**1.3**	2.0	70.5	28.6	71.4	51.6	47.5	0.5	0.4	48.4
Middle	21.2	78.8	25.6	72.5	1.3	0.6	74.4	34.4	65.6	49.8	48.0	2.2	0.0	50.2
Rich	18.2	81.8	21.0	77.7	1.0	0.4	79.0	23.5	76.5	26.5	71.1	2.4	0.0	73.5
Richest	13.6	86.4	16.6	80.8	2.3	0.4	83.4	20.3	79.7	20.5	77.3	0.9	1.5	79.5