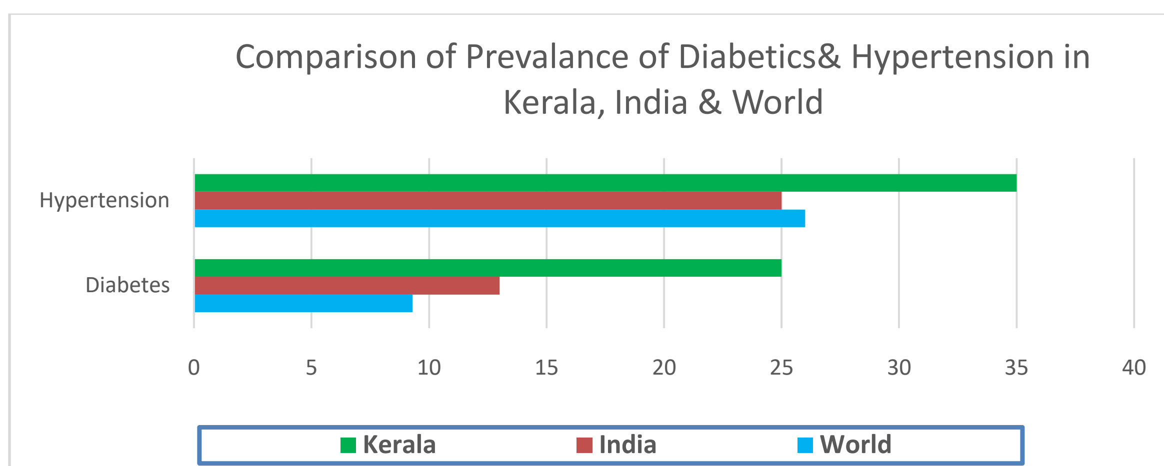
NON COMMUNICABLE DISEASES CONTROL PROGRAM (AMRUTHAM AAROGYAM)

The state of Kerala is unambiguously placed at the highest epidemiologic transitions zone which had exerted drastic effects on the morbidity and mortality tables of the state. The rampant urbanization and modernization which had infiltrated even to the grass root levels of the state, irrespective of the region and economic strata, influenced lifestyle of the population making the state fertile for Non Communicable diseases to flourish. The mortality and morbidity due to lifestyle diseases soon began to surpass those due to communicable diseases & RCH issues combined. The available studies on prevalence of these diseases indicate high trends of NCD placing the state in the top spot of prevalence chart. The study conducted by Achuthamenon Centre for Health Science Studies in 2017 was a shocking revelation into precarious the position of the state with findings pointing that one in five of the population being diabetic and one in three being hypertensive. This along with the poor control rates and high out of pocket expenditure for the management of this diseases made Kerala the hub of Non Communicable Diseases in the country.

Even though the state has witnessed a steep decrease in the use of tobacco in the GATS 2016 study with the prevalence dipping to 12% from 21%, the increasing affinity to alcohol is affecting the health sector with studies showing the prevalence rate as high as 44% and age of initiation coming down every year.

The unhealthy dietary practices and lack of physical exercise in all sections of the population irrespective of the age and economic status has contributed to the rise in lifestyle diseases with the statistics pointing that 52% of the total death in the age productive age group between 30 and 70 being due to one or other cause of NCD.



Evolution of NCD Control program

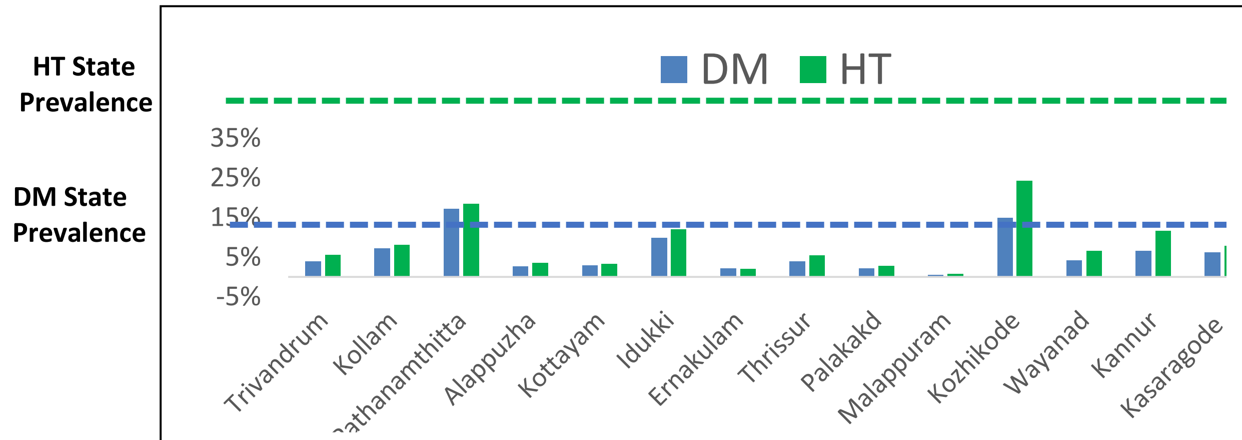
The strategic thinking on controlling the epidemic of Non Communicable Diseases started in the first decade of this century with a handful of localized projects and government sponsored pilots in selected districts of the state. But it was after the introduction of the centrally sponsored National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) programme in 5 districts, that a structured programme for control of NCDs was developed in the state. The political leadership had shown a responsible stand in favour of NCD control activities on a broad frame work which resulted in the evolution of a state run Non Communicable Diseases Control programme- **Amrutham Arogyam**

Amrutham Arogyam-

Objectives of the program lie in 4 levels

- Primordial level: Reduction of risk factors in the population
- Primary level : Health education for the population on healthy diet, Exercise and ill effects of addiction
- Secondary level- Screening for the population above 30 years of age for Non Communicable Diseases irrespective of their disease conditions and free supply of medicines for all detected with NCDs
- Tertiary level- Early management and treatment of complications

DM, HT Patients under treatment / State Prevalence

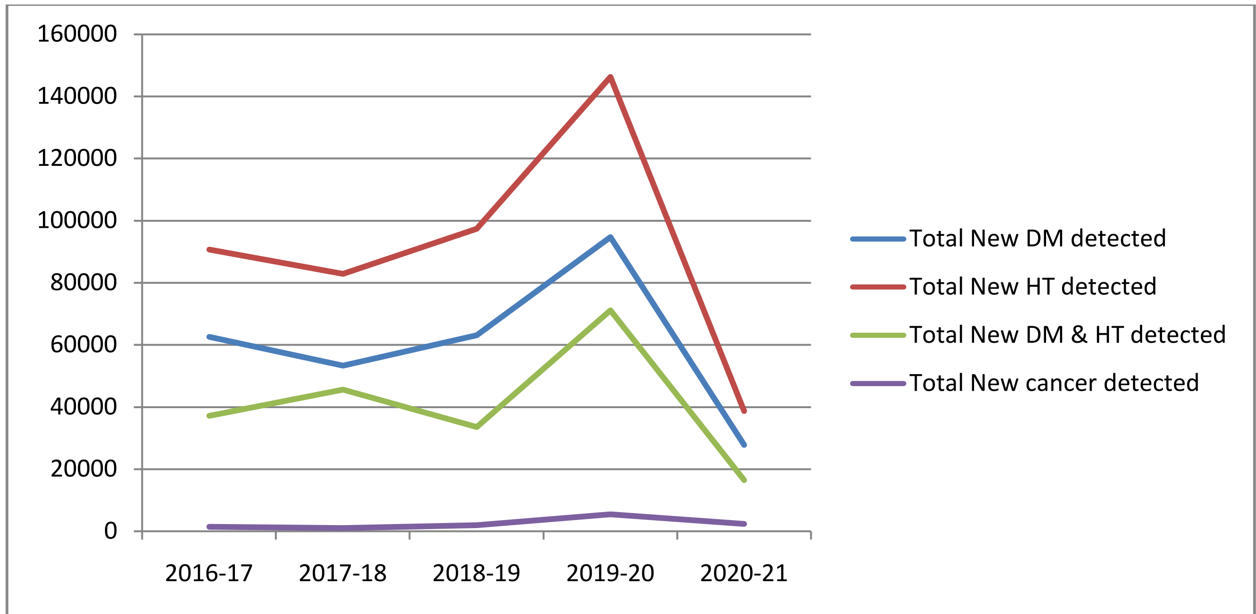


Coverage

Amrutham Arogyam programme covers the entire state spreading across all districts and the services rendered through all district/General hospitals, Sub district level hospitals, Community Health Centers, Primary Health Centers and even the 5400 Sub centers which cater to a population of five thousand. Kerala is the only state where the entire health system is equipped with NCD screening program

Screening

The population above 30 years was subjected to screening at the Amrutham Arogyam clinics for NCDs. So far one crore 34 Lakhs (**1.34 Crore**) people were subjected to screening out of which **9.01 Lakhs** new diabetes cases, **10.06 Lakhs** new hypertension patients and **3.09 Lakhs** patients with both the diseases were detected. Nearly 27 Lakhs Diabetes patients and 31 Lakhs hypertension patients have been registered and availing the benefits in the programme.



Indicators	2016-17	2017-18	2018-19	2019-20	2020-21
Total New DM detected	62634	53379	63130	94693	27827
Total New HT detected	90682	82921	97456	146308	38723
Total New DM & HT detected	37121	45602	33576	71090	16457
Total New cancer detected	1424	971	1862	5431	2303

Medicines and logistics

All NCD clinics including subcentre clinic were provided glucometers, BP apparatus and weighing machines for screening. Special equipment like Spirometers, Non Mydriatric Cameras, Fat impedance machines, Biothesiometers, Hand held dopplers, Trop T analysers were provided to the NCD clinics based on their service provisions.

A treatment protocol was prepared for the management of Diabetes and Hypertension by the National and State level experts, which was published as a Government Order. All medicines including insulin prescribed in the protocol was procured and distributed up to primary health centers and distributed to the population free of cost.

Special Programmes under Amrutham Arogyam

1. The Kerala COPD Prevention and Control Program- *"SWAAS"*

(STEP WISE APPROACH to AIRWAY DISEASES)

COPD is one of the leading causes of mortality and morbidity worldwide. As per the Global Burden of Diseases estimates for India, COPD is the second leading cause of mortality in India. Kerala has taken the bold step of formulating COPD prevention and control program in the country for the first time and the official declaration of the program was done by the honorable minister for health and family welfare on February 7th 2017.

The objectives of the Kerala COPD prevention and control program

1. Identification of COPD in the early stages of the diseases
2. Develop a structured program for COPD diagnosis and treatment, starting from the primary care level up to the tertiary care level, including the Medical Colleges
3. Develop a system for generating information on disease burden of COPD, health seeking behavior and health system needs which will aid in further planning and strategizing for COPD management in Kerala.

In the first phase, the programme has been implemented in 179 primary health centers (2018-20) covering population of 4,000,000 and 39 secondary and tertiary care hospital. About four hundred doctors, 400 staff nurses and multipurpose workers were trained on diagnosis and treatment of COPD. Trainings & capacity building focused on Tobacco cessation, prevention of indoor and outdoor air pollution, use of clean fuel, occupational health, performing spirometry inhaler technique, pulmonary rehabilitation and medication compliance. Diagnosed patients were registered and followed up at regular intervals.

Services

The programme aims at diagnosing COPD at FHC level by doing pulmonary function test (PFT) using Spirometers supplied to all Family Health Centres. The staff nurses and Medical Officers

were trained in doing Spirometer based diagnosis and treatment was initiated only after making proper diagnosis. Expensive medicines like Aerosols, supporting equipment like Oxygen Concentrator, Pulse Oxymeter and metered dose devices were procured and supplied to all FHCs. The district and Sub district level SWAAS clinics provided Spirometry and specialized management services like non invasive ventilators and other equipment as per the SWAAS guidelines.

Chest Disease Hospital, Pulayanarkottah, Thiruvananthapuram was designated and upgraded as State COPD Centre where a comprehensive service package for COPD is delivered. These include curative services, ICU Care, Rehabilitative services and smoking cessation .This unit is functioning as the state monitoring cell of COPD Programme

Achievements

- ***SWAAS Clinics are functional in 14 District Hospitals***
- ***SWAAS Clinics are functional in 270 FHCs***

	2018-19	2019-20	2020-21	Total
Symptomatic Screening	47601	63206	38063	148870
Swaas clinic-FHC	89	90	91	270
Swaas clinic- DH/GH/THQH	14	25	10	49
Spirometry Screening	9147	18428	1952	29527
COPD Diagnosed	4677	11557	3709	19943
Asthma Diagnosed	4145	7081	1829	13055

Number of patients undergone symptomatic screening (Attended SWAAS clinic)	148870
Number of patients screened with Spirometry	29527
Number of COPD diagnosed	19943
Number of Asthma diagnosed	*11226*
Number of patients received smoking cessation services	*13752*
Number of patients who Quit smoking	*2503*
Number of patients received pulmonary rehabilitation services	*12298*
Number of alternate diagnosis made (TB/Cancer ,ILD , Bronchiectasis, Cardiac Diseases etc)	*740*

2.INDIA HYPERTENSION CONTROL INITIATIVE(IHCI)

The India Hypertension Control Initiative (IHCI) is a collaborative project of Indian Council of Medical Research (ICMR), Ministry of Health and Family Welfare (MoHFW), Government of Kerala, World Health Organization (WHO), and Resolve to Save Lives initiative of Vital Strategies.

Kerala State also incorporated Diabetes control and monitoring along with IHCI. The Initiative is implemented in four districts of Kerala-Thiruvananthapuram, Thrissur, Kannur and Wayanad

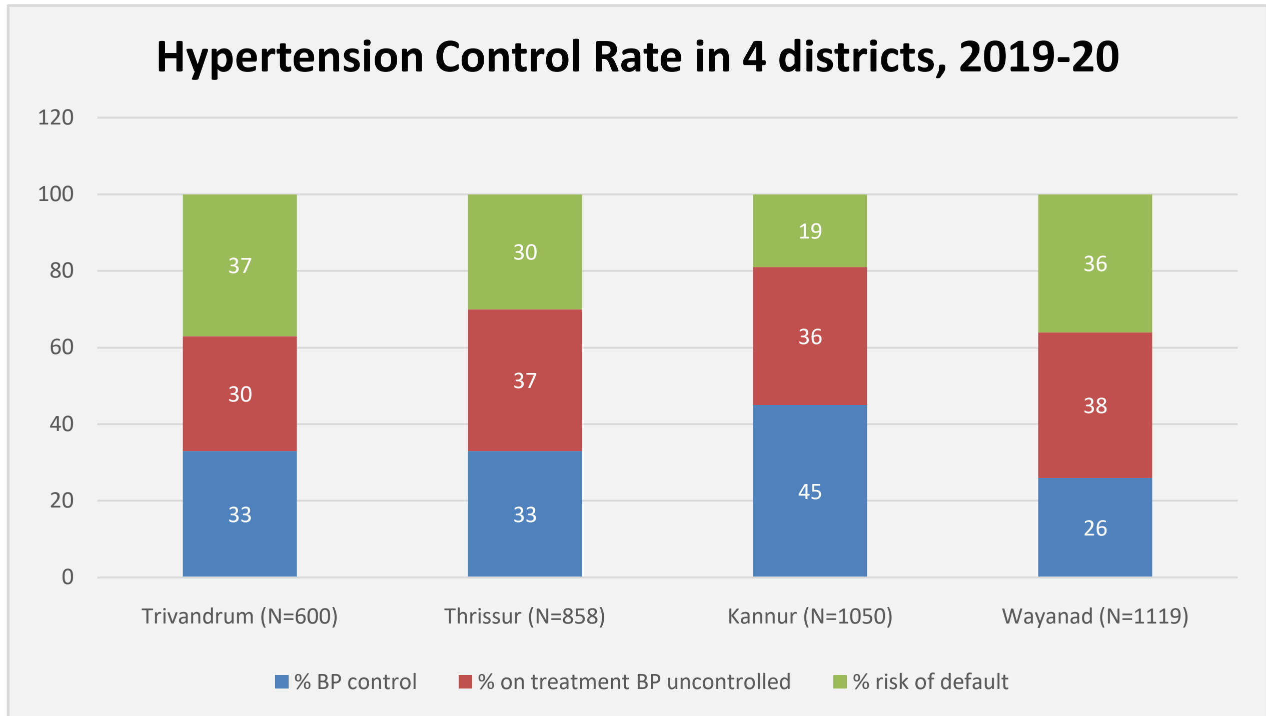
Strategies of the Initiative:

The IHCI is focused on five essential components of scalable treatment of hypertension, based on WHO HEARTS Package. It will support the adoption of standardized simplified treatment plans for managing high blood pressure, ensure the regular and uninterrupted supply of quality-assured medications, task sharing so health workers who are accessible to patients can distribute medications already prescribed by the medical officer, and patient-centred services that reduce the barriers to treatment adherence. Data on hypertension will be improved through streamlined monitoring systems, and the lessons learned, and practice-based evidence will inform further interventions to improve cardiovascular care.

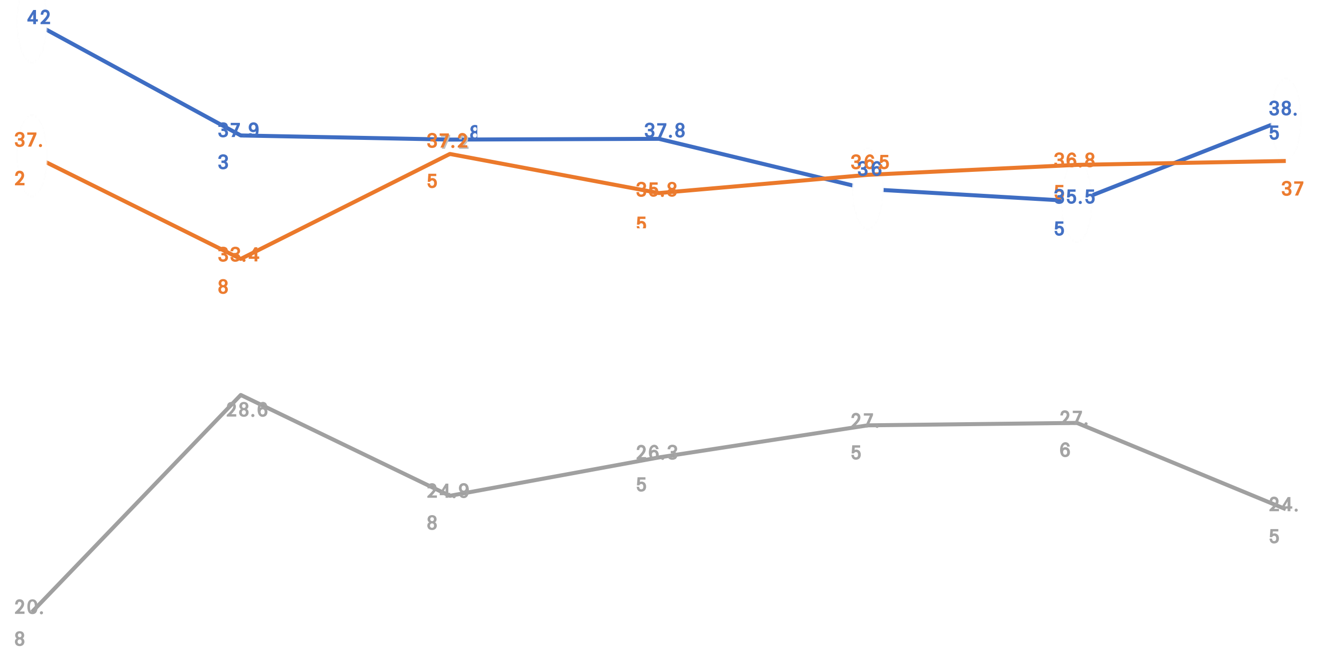
Services under the Initiative:

- All patients 18 years and above visiting any PHC or CHC is subjected to BP measurement
- Patients whose BP values are more than or equal to 140/90 are referred to Medical officer for treatment initiation, in which lifestyle modification is the first modality of treatment followed by pharmacological management as per the decided treatment protocol.
- Patients initiated on treatment are registered under the program with a Treatment card maintained for every patient at the facility level and a patient pass book at the patient level.
- Details of Patients registered with treatment card are documented in a Hypertension facility register to facilitate cohort monitoring after 6 months of treatment initiation.

- Cohort monitoring of patients registered under the Initiative after 2 quarters of registration and treatment initiation.
- Identification of defaulters and ensuring tracking of defaulters through field workers.



KERALA OVERALL OUTCOME (CONTROL RATES 2018+ 2019 QUARTER 3)



Achievement

Control rates among Hypertension patients on treatment has increased from 13% to 38.1% and for the first time defaulters were tracked and was able to decrease the defaulter rate to 27.6% from 55%.

3. NAYANAMRITHAM- Diabetic Retinopathy Screening

Diabetic Retinopathy is a common complication of longstanding Diabetes Mellitus which can end up in total loss of vision. The progress of Diabetic Retinopathy is in different stages and complete effective treatment is available if the condition is detected in the early stages. With the technical support provided by E-health, Health Services department had implemented a care pathway in the public health system involving the primary centres, secondary centres and tertiary care centres in Thiruvananthapuram district of Kerala.

The DR screening was done using a hand held Non mydriatic Camera which can take fundus photograph for the diagnosis of diabetic retinopathy and it stages. Training was imparted to staff Nurses, who would take fundus photograph of Diabetic & hypertensive patients visiting the NCD clinics. The captured image will be transmitted to a state retinopathy centre located in the Regional Institute of Ophthalmology and manned by trained Optometrists who would evaluate the picture and send back the diagnosis and advice on management. Asha workers and other field workers play an active role in identifying the diabetic patients in the community and encouraging them to take part in the screening programme.

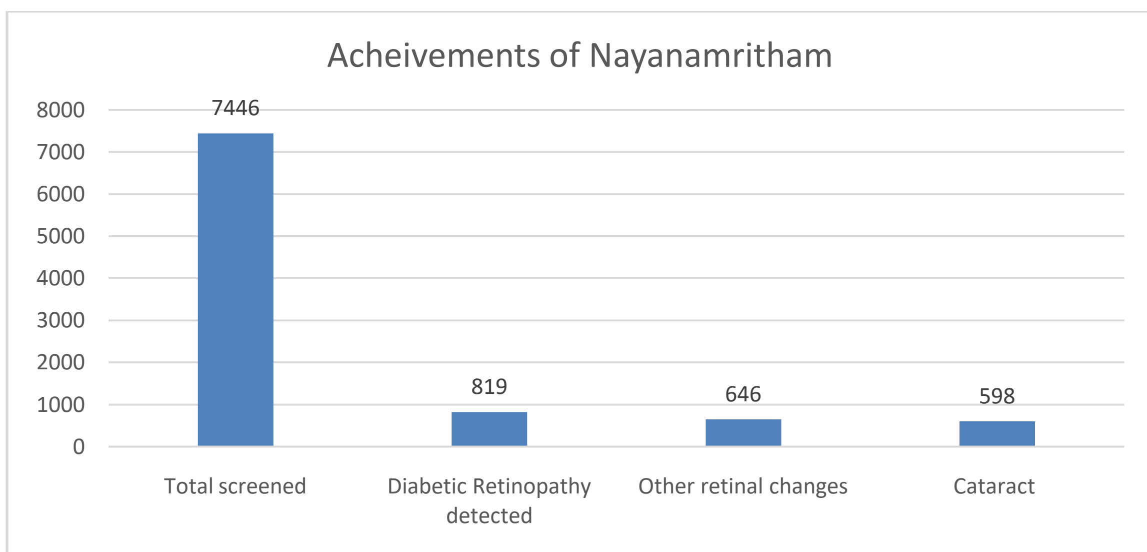
Scale- up of the programme to other districts:

In the process of expanding the screening programme throughout the state, 52 Non mydriatic cameras were procured through NHM in 18-19 and approval was received for procuring 100 more cameras in ROP 19-20.

State is planning to include retinopathy screening in all the family health centres.

Achievements

- ***Diabetic Retinopathy clinics are functional at 14 District Hospitals and 16 Family Health Centres are currently functioning as DR screening sites using Non Mydriatic cameras***
- ***Total patients screened (July 2018 to February 2020)- 7446and of those patients, 2063 patients were referred for further treatment and evaluation***
- ***819 cases were detected with Diabetic Retinopathy and 646 cases diagnosed with other retinal changes. Cataract cases can also be identified through the screening***.
- ***As part of the programme, laser machines were provided to 3 General Hospital/Taluk Hospitals to ensure the treatment of the retinopathy cases.***
- ***90 laser treatments had been performed at the hospitals for those in need***.



4. Population Based Screening

In the State of Kerala even though there is clinic based data on the prevalence of Non Communicable Diseases, there is no population based registry of these diseases. The state has initiated population based screening of Non communicable diseases at four districts with the support of ASHA volunteers who would visit the houses in their jurisdiction and collect information on the status of Non Communicable Diseases and its risk factors. Based on this data camp based and home based screening will be conducted for those who are unaware of their

NCD status and the total data will be consolidated health centre level, district level and state level. This programme is now expanded to all districts under NHM.

5. CAPD Clinics(Continuous Ambulatory Peritoneal Dialysis)

Haemodialysis centres are mushrooming in the state of Kerala due to the increase in patients with renal complications, which have affected quality of life adversely along with the economic burden it has inflicted. To alleviate this situation the state health department has initiated a programme to promote CAPD which is cost effective and convenient to the people as they can continue dialysis without affecting their daily life chores. CAPD centres were set up at 3 district hospitals and are planning to expand the programme in all districts based on the evaluation of existing centres.

6. Diabetic Foot Clinics(Padasparsham)

Diabetic foot is a major complication of long standing diabetes and may result in loss of limbs if not detected at an early stage. The state health department have procured Biothesiometer, Handheld dopplers and Monofilament for detection of early diabetic foot and the Medical Officers were given training on Diabetic foot Management by Indian Institute of Diabetes. Diabetic foot clinics were established in selected district and sub district level hospitals and steps are being taken for expansion of the programme to all hospitals.

7. Cancer Management

Kerala has the highest incidence and prevalence of Cancers and the State average is much above the National average. The cancer treatment facilities in Government sector is insufficient to cater the burden of increasing cancer rates as statistics quote that nearly 55000 people are registered as new cancer cases every year. This had affected the cancer patients residing in districts where cancer treatment facilities were unavailable in Government Sector. To alleviate the miseries of cancer patients residing in these districts and also to decrease the over burdening of Regional Cancer Centres, an innovative model of decentralized cancer care services was initiated in the state. The Assistant Surgeons were trained in Comprehensive Cancer

Management and posted at District level Hospitals were cancer treatment facilities including day care chemotherapy were set up using State Plan fund and NHM fund. At present 24 hospitals across Kerala have the District Cancer care facility and over 72000 chemotherapies have already been done through these centres, in addition to over 3000 new detection of cases. More over Palliative Chemotherapy wards were set up in all District Hospitals for treating the terminally the cancer patients

Achievements

- ***24 District cancer care units functional in state***
- ***72000 chemotherapy done***
- ***3000 new cases detected***
- ***14 district palliative chemotherapy wards***

District	Name of Hospital	
	1	DH Nedumangadu
Thiruvananthapuram	2	GH Thiruvananthapuram
Kollam	3	District Hospital
	4	THQH, Punalur
Pathanamthitta	5	GH, Pathanamthitta
	6	DH Kozhenchery
Alappuzha	7	GH Alappuzha
	8	DH Mavelikkara
Kottayam	9	GH Pala
	10 10	DH Kottayam
Idukki	11	DH Thodupuzha
Ernakulam	12	GH Ernakulam
Thrissur	13	THQH Vadakkancheri
	14	GH Thrissur

Palakkad	15	DH Palakkad
	16	THQH Ottappalam
Malappuram	17	DH Tirur
	18	DH Perinthalmanna
	19	DH Nilambur
Kozhikode	20	Beach Hospital
Wayanad	21	Tribal Hospital, Nalloornadu
Kannur	22	DH Kannur
	23	GH Thalassery
Kasaragode	24	GH Kanhangad

8. Stroke Management (SIRAS- Stroke Identification Rehabilitation Awareness and Stabilisation Programme)

Stroke is a complication of Hypertension, which is occurring due to an occlusion of blood vessels due to clot or due to a hemorrhage of cerebral vessels. Stroke Management is time bound and the recovery depends on time frame within the patient reaches the treatment centres which is usually 4 hours. Stroke Management is complicated as the management requires specialized skill, infrastructure and expensive medicines for stroke thrombolysis . Health department started stroke management programme **SIRAS** by training the Physicians in stroke management at SCTIMST and setting up stroke ICUs in the district hospitals which have CT scan and Tele Radiology services. **Tissue Plasminogen Activator (TPA)** – the medicine which cost over Rs.50000/- was procured using NCD funds. Nine District Hospitals have started functioning stroke clinics and the rest of the districts are completing stroke ICUs.

Stroke units in Kerala

Sl No	District	Nameof institution
1	Thiruvananthapuram	GH Trivandrum
2	Kollam	DH Kollam
3	Pathanamthitta	GH Pathanamthitta
4	Alappuzha	* GH Alappuzha
5	Kottayam	GH Kottayam
6	Ernakulam	GH Ernakulam
7	Thrissur	GH Thrissur
8	Palakkad	DH Palakkad
9.	Malappuram	DH Perinthalmanna
10	Kozhikode	GH Kozhikode

Achievement

- ***Stroke clinics are functional in 10 District Hospitals***
- ***130 Thrombolysis were done in these stroke clinics***

* GH Alappuzha pending

360^0 Metabolic Centre of Excellence

As a part of the mission to control the life style diseases, an exemplary center named 360 degree metabolic center of excellence started functioning at Ernakulam General Hospital, by the Government of Kerala with external support.

Patient gets a unique ID once they register at the center. They can then move towards the Pre Clinical area where Basic information such as Patient's height, weight, Blood Pressure, etc are monitored and recorded. With the help of advanced point of care (POC) devices, patient gets the test results within short duration from the lab. After analysing the lab reports, if required, doctor guide the patient for further tests and steps such as nutritional counselling, Physiotherapy, Pulmonary function test, Retinal Scanning, Diabetic foot assessment, etc which are available under one roof.

Treatment Summary (including test results, diagnosis etc) are getting collected using data base management systems and the data is saved for the future reference.

Patient gets the complete treatment summary while they leave the center. Using tele calling facility patient gets a reminder call before few days of the scheduled follow up date.

Addressing the health care needs of the elderly and chronic disease patients through volunteer activity during Covid- 19 pandemic

Back ground

Kerala state has the highest life expectancy of 75 years and also harbors highest elderly population percentage of nearly 15.6% among the total population. This high number of elderly population has posed many social and health issues, since a substantial percentage of the elderly are living with one or more chronic health issues. Around 2 Lakhs elderly are living single and nearly 21000 of the elderly are inmates of 619 old age homes sprawling across the state.

Even though in the state of Kerala has achieved top spots in the health indices like IMR,MMR etc, the score sheet of Non Communicable Diseases is on the negative side basically due to the life style changes the population imbibed due to the rampant urbanization and modernization. The prevalence of Diabetes and Hypertension are one of the highest in the country and evidences prove that the heart attack mortality, Stroke incidence, prevalence of renal diseases is at the highest level. On top of this the state also harbors a high burden of cancer cases with statistics showing the cancer density higher than that of the national average. A recent study done in Kerala points out that one out of 5 as Diabetic and one out of 3 as hypertensive, which shows the depth of these chronic diseases, which had crept into the society at large . The combination of high elderly population along with high density of chronic illness has posed a serious challenge to the management of Covid -19 in the state.

Covid- 19 and elderly

From the initial days of covid-19 pandemic management, the state had exerted its focus on elderly care owing to the low immunity levels of the elderly with the inherent risk of harboring the infection and the risk of worsening of the existing conditions. Chronic diseases like diabetes also affect the immunity and are likely to further complicate the existing diseases. Hence it was extremely important to protect the elderly from getting the infection. Reverse quarantine was implemented, where the younger generation had the freedom to move about protecting the elderly at their homes, observing all Covid protocols. A sensitive issue of provision of healthcare to this section of people who were confined to their homes arised and a solution to provide health care at their door step had to be evolved.

Volunteer activity for elderly care and chronic disease

The health department had associated with Social Justice Department, Women and Child Department, Kudumbasree Mission etc for a structured volunteer based elderly care campaign during Covid-19 pandemic. Accordingly volunteer groups were formed at ward level and district level for coordinated activities for protection of elderly from covid-19 .Multi prong activities were planned which were monitored at district and state level.

Volunteer List for elderly care

Sl. No	District	ASHA	Kudumbasree volunteers	Palliative volunteers	**Total**
1	Thiruvananrthapuram	2690	28628	600	**310942**
2	Kollam	2029	22685	500	
3	Pathanathitta	1075	9391	350	
4	Alappuzha	2100	19813	450	
5	Kottayam	1580	14850	500	

6	Idukki	1070	12831	900	
7	Ernakulum	2298	23015	1000	
8	Thrissur	2377	22871	3300	
9	Palakkad	2375	22783	1200	
10	Malappuram	3225	26233	2000	
11	Kozhikode	1838	27468	1500	
12	Wayanad	906	9251	650	
13	Kannur	1958	19523	450	
14	Kasaragod	954	10925	800	
	Total	**26475**	**270267**	14200	

Activity 1: Telephonic call

The Anganawadi workers & Kudumbasree volunteers contacted the elderly people residing in their jurisdiction and enquired about their health needs based on a questionnaire developed by a health department. The health requirements like health condition, availability of medicines, Covid-19 symptoms, psycho social needs etc were recorded in a application and analyzed daily. The elderly people requiring help were thus identified and their needs were referred to the concerned department for swift action.

Total calls registered by Anganwadi workers

1	**Trivandrum**	**326032**
2	**Kollam**	**366310**
3	**Pathanamthitta**	**186105**
4	**Alappuzha**	**307482**
5	**Kottayam**	**285124**
6	**Idukki**	**149837**
7	**Ernakulam**	**410988**
8	**Thrissur**	**469573**
9	**Palakkad**	**315449**
10	**Malappuram**	**376297**
11	**Kozhikode**	**278498**
12	**Wayanad**	**81542**
13	**Kannur**	**324251**
14	**Kasaragod**	**126978**
	TOTAL	**4004466**

Activity 2: Distribution of services to door step

The request for medical care and psycho social care were transferred to health department and other needs like nutrition support and other consumables were transferred to local self government. The health department through ASHA volunteers and palliative care volunteers distributed the health needs to their door step of the elderly completing the loop of activities. Medicines, consumables etc were distributed to the homes of elderly and below poverty line patients as per the demand generated

Activity 3: Call centre at Districts

A call centre was established at district level where the elderly people could seek any help throughout the day by calling a toll free number at district level. Their needs were redirected to the concerned department for action within 24 hour.

Activity 4: Activity at Old age homes

619 old age homes are registered in Kerala with a total strength of 21000 inmates. Old age homes being vulnerable to Covid -19 infection were given prime importance. Symptoms screening was done for all elderly patients and antigen test for Covid-19 was done all inmates based on the symptomatic screening. The actions were done jointly by Health Service Department and Social Justice Department.

Activity 5: Distribution of NCD medicines

The state NCD division procured all emergency drugs including insulin anticipating the surge in non communicable diseases. Due to the lock down and the resultant travel restriction people were unable to travel to NCD clinics posing a threat of flaring of diseases due to the non consumption of medicines. To tackle these precarious situation NCD medicines for 1 month was issued to all registered BPL patients and elderly patients at their door step through ASHA

and Palliative care workers. This was followed up regularly by the health workers and a vigilant eye on drug position was also maintained.

Output

46 Lakhs elderly persons were contacted by the Anganawadi workers and Kudumbasree workers through regular telephonic calls. 17% of them required medicines which were supplied to them through health department. Other requirement like Nutritional support, phsycho social support was also addressed. Around 2 Lakhs people living single were contacted by the psycho social team and given the much needed psycho social support.

Neraly1000-1500 calls were received at district call centre at every district seeking help in the various segments. The needs were addressed regularly. Health care check up were done at all old age homes and nearly 20,000 people were subjected to antigen testing for Covid-19 .114 persons residing in various old age homes were found to be covid positive and appropriate measures were taken to contain the infection from spreading to larger group.

From the NCD clinics medicines worth Rs 32 crore were procured and distributed to the people at their door step. Approximately 16.5 Lakhs people received medicines at their homes, which had helped in maintaining compliance to Hypertension and Diabetes management, which helped in keeping the mortality rate low during this period.