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RESEARCH ARTICLE

COMMUNITY SUSTAINED MULTIDISCIPLINARY APPROACH IN COVID PANDEMIC MANAGEMENT - A FIELD EXPERIENCE FROM INDIA- A CASE REPORT

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Abstract

COVID pandemic with repeated outbreaks is associated with newer genomic variants and bound to create professional fatigue, which needs a community-based strategy to control the disease. During March 2021, the Tirunelveli district health authority adopted a "Community Sustained Multidisciplinary Approach" (CSMA) and was hypothesised to be more productive in managing the 2nd wave. It was a community-centric approach with primary prevention, early diagnosis & referral, early treatment and reduction of morbidity and mortality. The strategy included community-friendly lock-down with social security, community sustained micro-containment, women self-help group sustained hamlet level screening and a time-sensitive patient referral with monitoring of oxygen requirement. This study concludes that resource-constrained public health systems need to adopt a community-based approach to contain the pandemic efficiently, as demonstrated in Tirunelveli district through a "Community Sustained Multidisciplinary Approach". This unique public health approach had a vital role in the efficient containment of the pandemic.

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Introduction:-

The novel SARS-CoV2 pandemic has affected 30,837,22 Indians, of whom 4,08,040 have died till 11th July 2021.Maharashtra ranks the first state in the highest number of patients (58,98,550), followed by Karnataka (27,57,324), Kerala (27,16,655) Tamil Nadu (23,39,705), and Andhra Pradesh (18,03,074) as of 13th June 2021.(1)The Tamil Nadu state health department has adopted different strategies to manage the second wave. Although lockdown has reduced the spread of the infection, it resulted in serious economic hardships.(2) Given the rapid changes in the viral genomic profile, we expect multiple waves of infection in the future, leading to fatigue in the pandemic response by the health system. Hence, we proposed a Community Sustained Multi-Disciplinary Approach (CSMA) as an efficient public health response to manage the pandemic.

The second surge of the covid infection started almost simultaneously in the five districts, namely Chennai, Chengalpattu, Coimbatore, Madurai, and Tirunelveli, except Chennai, started two weeks earlier during March 2021.

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Compared with the first wave, there was a sharp increase in new cases and the test positivity rate (TPR) increased from 0.1% to 21.66%.

The "Community Sustained Multidisciplinary Approach" (CSMA) strategy was defined as a community-centric approach with three arms of management, namely primary prevention, early diagnosis & treatment and reduction of morbidity and mortality. The district control room with a toll-free call facility and a website "covidcaretirunelveli.in" was fully operational by the 3rd week of March to monitor the progress of the CSMA.

I. Primary Prevention Strategies

a. Community awareness campaign:

The district implemented 543 IEC campaigns through health care workers on the ground and mass media on a 4-point agenda such as mask-wearing in public, hand wash practices, social distancing and early testing. Masks were made available at the entry of all hospitals and public offices.

b. Community leaders to tackle vaccine hesitancy:

Due to hesitancy, the community leaders were promoted to drive vaccine acceptance. We briefed the community leaders, including the legislature members, industry, schools, & trade organisations and the community members consisting of women's self-help groups, Mid-day meal scheme workers and teachers on the importance of vaccination. They have been requested to be change agents in informing the community.

c. Community friendly lock-down with socio-economic support:

The government has enforced the state-wide lockdown with a mandatory e-pass for inter-district travel. The district ensured community-friendly lockdown by various measures such as shifting markets to larger open ventilated spaces, door delivery services, and restriction of social gatherings by closing the auditoriums, marriage halls, cinema halls, parks, fitness centres and liquor shops. We deployed camera fitted drones to monitor the lockdown in specific areas. Mobile announcement units and the mobile throat swabbing units were established. The MGNREGS economically supported the migrant labours by local employment. With an average INR.239.58 for an average of 13.57 days per household, MGNREGS also took care of unskilled labourers.

d. Community Sustained Technology Enabled Micro-containment:

At the second wave, the Tirunelveli district had 55 containment zones, secured by 33 monitoring teams consisting of revenue, police, and local bodies**.** The specific areas were identified as micro containment zones and monitored using a computerised heat mapping tool installed at the district war room. The community-friendly approach was implemented for monitoring, and punitive physical restriction techniques like barricading were avoided.

II. EarlyDiagnosis& Treatment

a.Community-supported hamlet level screening:

The district has deployed volunteers as community teams for a house-to-house screening in unique commando mode. The incharge medical officer of the PHCs regularly trained the team consists of community volunteers, panchayat level federations and women from Self-Help Groups (MahalirThittam). The training included using finger pulse oximeters, infrared thermometers and Personal Protective Equipment (PPE) and decontamination procedures. A vehicle, usually a school bus sourced from a local education institution, was allotted to each team. Around 249869 households were covered systematically, such as mapping suspects, detecting symptomatic persons, directing the lab technicians for swab collection, tracing contacts, ensuring home isolation, triaging and referral to appropriate treatment centres as per government guidelines, and follow up of positive cases. (Table-1) A village health nurse / Anganwadi worker was assigned to every 100 households in the hamlet to coordinate the activities. Concerned medical officers conducted ILI camps in areas of surveillance, and timely referral was systemised. Five mobile units were stationed in each block to mobilise covid suspects and transport the samples maintaining the cold chain.

Covid positive ANC mothers were referred to the nearby ANC Covid Care Centres (CCC) and monitored post-discharge. The team shared the information of children whose parents or caretakers were admitted in covid care facilities with the district child welfare office and arranged food through the community.

III. Reduction of Morbidity and Mortality

a.Capacity building of rural health system:

The district was prepared with 38 covid management health facilities. To compare with the above mentioned four cities, a hub and spoke model was envisaged at TVMCH, a hub with 1320 beds connected by the four roads to the spokes that were the CCC at the rural areas of the district. A treatment centre with 398 beds was created on a

government school campus near the COVID Hospital. The district health authority had good inventory management, especially for oxygen and PPEs.

b.Monitoring of Oxygen Utilization:
The district health authority maintained live tracking of oxygen logistics to ensure rational consumption and achieved the lowest per capita oxygen consumption among the districts in the state, even with a high load of 6,528 active cases as of 18th May 2021. About 30 trained staff nurses were deployed to monitor the oxygen flow rates, to figure out the optimal amount of oxygen flow needed, counsel the patients to aid in weaning off from oxygen masks. We maintained the oxygen consumption between 5.8 - 6.5 Kilo-litres a day during the peak patient flow at TVMCH.

Impact assessment:
Case Fatality Rate (CFR) of 5 districts namely Tirunelveli, Chengalpattu, Madurai, Coimbatore and Chennai were compared. CFR of Tirunelveli district was low compared to other districts. All the districts had a spike in CFR from May 25 to June 10, yet Tirunelveli had lowest CFR among the 5 districts. By end of June, Coimbatore CFR which was closest to Tirunelveli started to rise; Only Chengalpattu and Tirunelveli had declining CFR, with Tirunelveli reporting least CFR which throws light on the effectiveness of CSMA in Covid control. (Figure – 2

Covid 19 cases per million population was calculated for the 5 districts. Though Tirunelveli exhibited increase in cases per million population compared to Coimbatore and Madurai by 2nd week of March, it was able to bring down the cases within 2 weeks and recorded the lowest cases per million population among the 5 districts. (Figure – 3)

Discussion:-

Community participation, one of the principles of primary health care, is the need of the hour to leave no one behind, especially in pandemics.[1]The United Kingdom documented the participation of 1 million volunteers in disaster response.[2] Community volunteering is essential in a country like India, where the consistently working health system is bound to be burnout in the subsequent waves. Marston. C et al[3] documented that health care should be prepared to co-opt the community, for a quality response during disasters. Tirunelveli district experimented with CSMA to reap long term benefits in managing the pandemic.

Peter Williams, President of the International Institute of Rural Reconstruction (IIRR), New York, USA, stressed that education is important in helping communities during outbreaks. CSMA's focused awareness campaigns have proved the same.[4] Educating and involving the community leaders has tackled vaccine hesitancy and strengthened vaccination drive. [5,6]

A study done by Kusuma D et aI reported [7] that communities with lower socioeconomic indicators had lesser compliance to the preventive measures. The CSMA promoted economic support through community activities which converted the lockdown as community-friendly. Job cards were issued for migrant labourers ensuring financial protection during the lockdown.

Though WHO has underlined the need for digital health interventions, Public Health has been reluctant.[8,9] The computerized heat mapping tool identified the focus of infection enabling containment.

Panigrahi et al (2021) documented those proactive steps are taken for prevention, containment, treatment of SARS-CoV2 in India need to be strengthened and integrated into the rural health system. Using the corpus of community representatives in disease surveillance as a self-sustaining model is unique.This district is preparing for a long term near to home model of pandemic management in the near future taking into account the upcoming waves of the pandemic. [10]

An analysis of patient behaviour showed that patients with COVID 19 and suspects converged at Designated COVID Hospital, TVMCH due to the availability of adequate oxygen supported beds and assurance of 24*7 service. The unique triaging centre[11,12]resulted in a rapid decrease in ambulance standing time from one hour to less than 5 minutes and reduced the turnaround time for new patients.

The district health authority placed continuous effort in live tracking and dashboarding of oxygen needs, supply chains, movement of vehicles carrying replenishments ensuring that the consumption was rational by deploying 30 trained staff nurses to monitor oxygen flow rates.[13]

There is dearth in studies on measuring impacts of community sustained measures on Covid as it is a novel approach. Our district had the lowest Case Fatality Rate and rapid decline in cases per million population among the 5 districts compared.

Conclusion:-

A socio-economically supported community sensitive lockdown is essential to ensure compliance with the pandemic directives, henceforth reducing the peak, and increasing recovery rates. Health systems need to co-opt the community as a major stakeholder in disaster management.

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Conflicts of Interest:
Nil.

Table 1:- Block-wise distribution of Hamlet Level Screening Camps.

No	Name of the block	Population	No. of Household	No of Community Volunteers		Total		
				n	%	SC	SU	TE
1	Ambai	102671	34199	924	0.9	216851	716	375
2	Cheranmadevi	75667	20612	811	1.07	122403	766	330
3	Kalakad	116640	28196	447	0.38	208467	581	416
4	Manur	93884	23159	286	0.3	147155	215	112
5	Nanguneri	56607	16004	398	0.7	259220	595	389
6	Palayamkottai	116465	30620	486	0.42	314819	109	192
7	Papakudi	60233	15921	256	0.43	252029	855	168
8	Radhapuram	95678	22095	431	0.45	429281	267	327
9	Valliyoor	222211	59063	791	0.36	428372	471	325
	Total	940056	249869	4830	1.93	2378597	4575	2634
SC- Screened, SU-Suspected and TE-Tested for Covid								

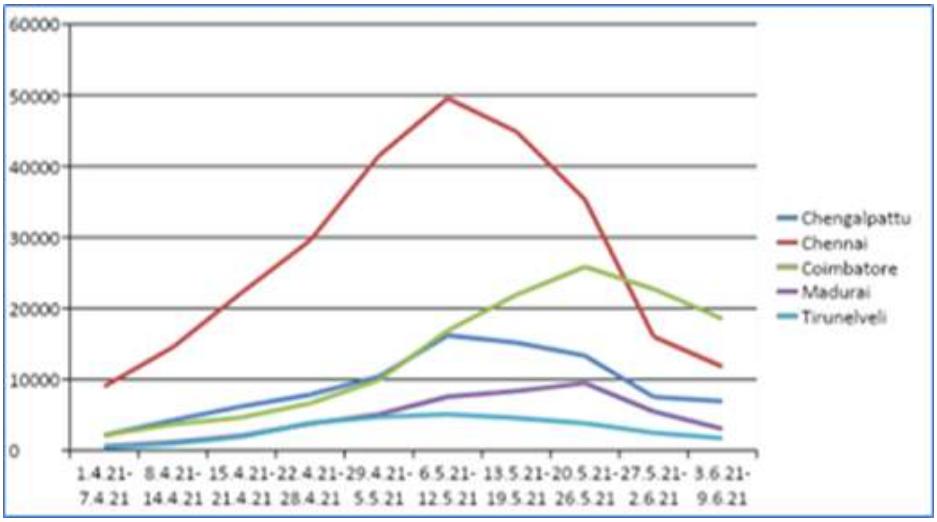

Figure 1:- Weekly distribution of SARS-CoV2 positive new cases reported among certain districts of Tamil Nadu between April and June, 2021.

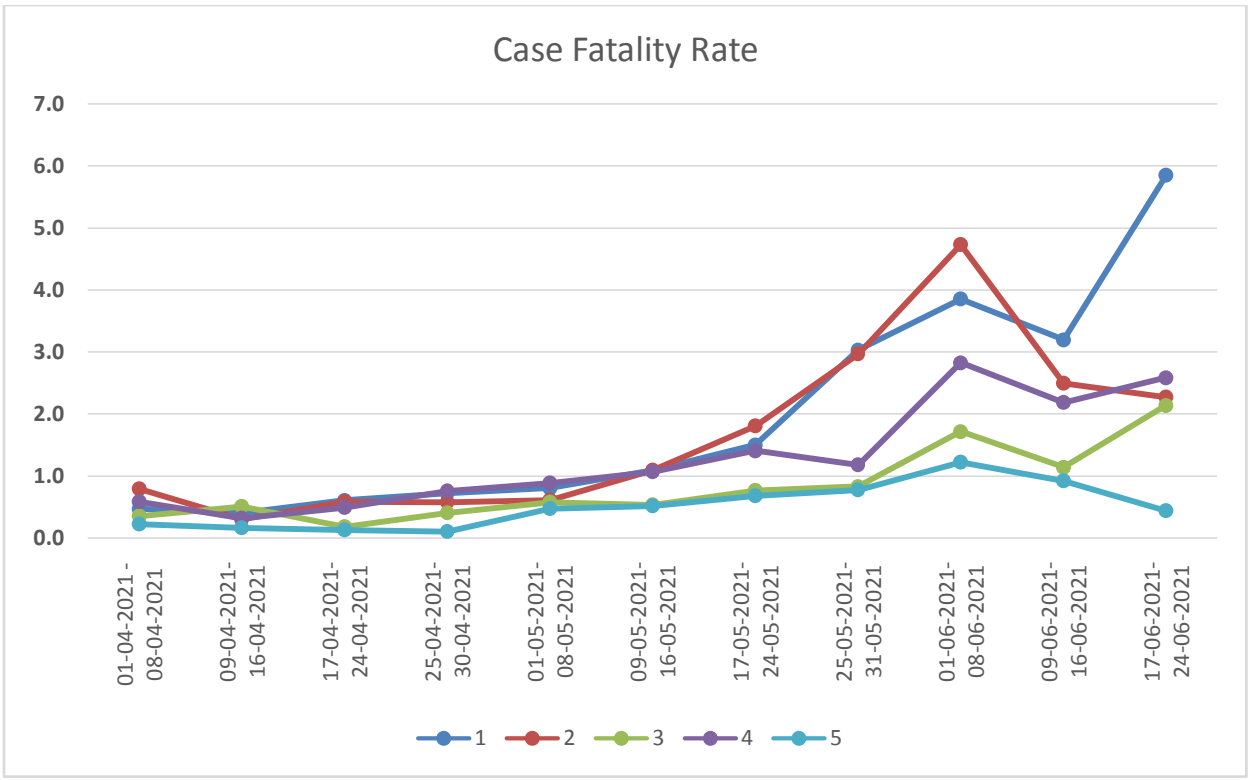

Figure 2:- Case Fatality Rate among certain districts of Tamil Nadu between April and June, 2021.

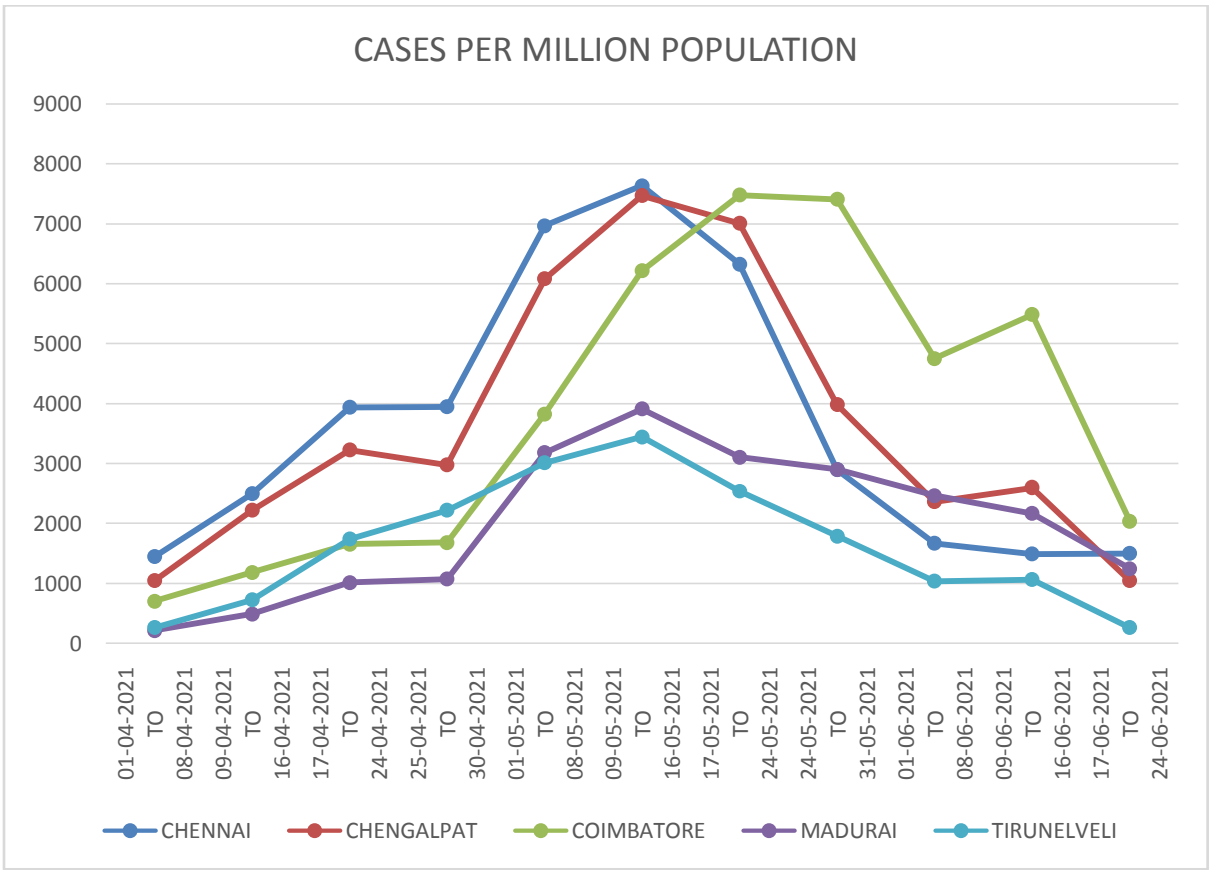

Figure 3:- Cases per million population among certain districts of Tamil Nadu between April and June, 2021.

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