PROTECTIVE EFFICACY OF

"HOMOEOPATHIC GENUS

EPIDEMICUS"

ADMINISTERED DURING EPIDEMIC FEVER IN KERALA,

OCCURRED DURING MAY TO SEPTEMBER 2007,

EVALUATED

IN 8 PURPOSIVELY SELECTED WARDS

RAPID ACTION EPIDEMIC CONTROL CELL (RAECH) HOMOEOPATHY, KERALA STATE

CONTENTS

ACKNOWLEDGEMENTS

This report on the "Protective efficacy of the Homoeopathic Genus Epidemicus" administered during the epidemic fever in Kerala, was prepared by the Rapid Action Epidemic Control Cell, Homoeopathy, under the Directorate of Homoeopathy, Kerala State, India. The members of the State Level Expert Group (SLEG) and the District Level Expert Group (DLEG) of RAECH, conceptualized and designed this survey under the guidance of High Power Committee (HPC) of the RAECH.

Our sincere thanks to the Principal, HOD and Teachers of Community Medicine Department of, Govt. Homoeopathic Medical College Calicut and Thiruvananthapuram, Athurashramam N S S Homoeopathic Medical College, Kottayam, Dr. Padiyar Memmorial Homoeopathic Medical College, Ernakulam, Sree Vidhyadhiraja Homoeopathic Medical College, Nemom for their sincere cooperation; Community Medicine students of all the 5 Homoeopathic Medical Colleges, for conducting the survey; Post graduate Scholars of Govt. Homoeopathic Medical College Thiruvananthapuram, DLEG, SLEG members from Thiruvananthapuram for sincerely devoting their time to complete the data entry on time; Distict Medical Officers, Medical officers and Trained reserve group members of Thiruvananthapuram, Kollam, Pathanamthittaz,Kottayam, Idukki, Malappuram, Kozhikode for all their support; Kerala State Homoeopathic Co operative Pharmacy, (HOMCO), Alappuzha, for providing the grant; Dr. Siju Seena, Consultant Epidemologist for her technical inputs & analysis; All the authorities, Panchayat and Village officers, for granting permission, cooperation and for their valuable inputs; All the respondents who spared their time to give valuable information; All the others who have supported by their love, encouragement and prayers. Thanks to God who made it possible to complete this effort.

1. INTRODUCTION

The occurrence of an epidemic is a clear expression of some significant shift in the existing balance between the agent, host and the environment which calls for a prompt and thorough investigation of the cases to uncover the factors responsible and to guide in advocating control measures to prevent further spread. Emergencies caused by epidemics remain one of the most important challenges to the national health administrations.

Current Febrile Epidemic in Kerala

A febrile Epidemic outbreak, started at the end of May, 2007 continued through June, July, August and September with the peak incidence during the month of July. According to the available information from the media reports, more than one lakh people were affected by the epidemic. The total duration of the epidemic was about 5 to 6 months.

The first case reported from Kerala was from Pampiny Village, in Chittar, Pathanamthitta district, with further spread to the adjoining localities and to other districts of Kerala enhanced by the presence of the vector and migration. The affected districts include Trivandrum, Kollam, Pathanmthitta, Kottayam, Ernakulam, Idukki, Malapuram, Kozhikode shown shaded in the map of Kerala.

Figure 1. Map of Kerala showing the epidemic affected districts.

This outbreak could be a warning about preparedness for health authorities not only in Kerala but also in other areas where this type of epidemic fever has not occurred previously. With the extent of human travel to and from areas with active epidemic virus transmission, many areas where the disease has not previously been reported could be at risk.

2. HOMOEOPATHIC GENUS EPIDEMICUS

Definition

Genus Epidemicus is defined as a homoeopathic medicine, which is selected in such a way to cover the totality of symptoms found in the majority of patients, suffering from an epidemic inhabiting in a particular area in a given time.

Method of selection

At the beginning of the epidemic, the clinical picture of a group of affected people from each locality was studied and the most suitable Homoeopathic medicine was selected as the Genus Epidemicus for the epidemic, which was unique for each area.

Visit to the affected area

The District Medical Officer (Homoeopathy) received the news about the epidemic from the media, the press, the LSG institutions, and individuals and the District Level Expert Group was informed about the possibility of an epidemic. A team of the members from the Trained reserve group(TRG) under the RAECH comprising of 3 to 5 doctors including Government Medical officers and Private Doctors visited the affected area in each district, immediately after reporting of the initial few cases of the epidemic.

Assessment

A detailed clinical assessment including the psychological symptoms, with special reference to the characteristic symptoms of the current epidemic was done in a pre-structured case format, designed for Homoeopathic case taking and repertorization. The clinical assessment of this group of initial cases, were sent to the District level expert group (DLEG), from all affected areas from the affected districts, as the new cases started appearing.

Double Repertorization & validation

Repertorization was done at two levels to make sure the most appropriate selection of the GE and to validate the process of repertorization.

At the district level, the DLEG conducted the repertorization of these each case from the group, using the software HOMPATH and RADAR. Each group was taken together and the results of repertorization from each patient in the group were summarized to arrive at the Genus Epidemicus.

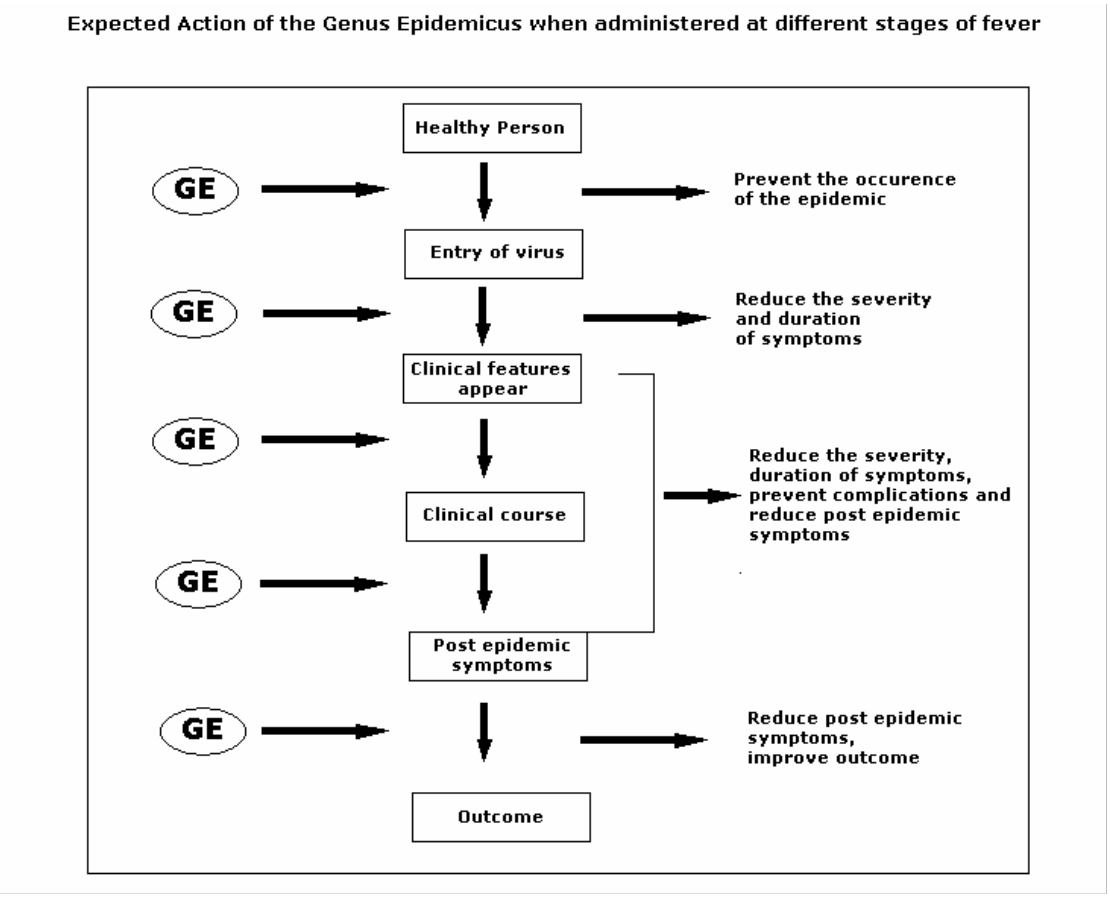
At the State level, the repertorization was repeated, to ensure the quality and confirm the Genus Epidemicus. After the discussions in the Expert group, the selected medicine was declared as the Genus Epidemicus.

Dosage

Adults (Age above 12) : 4 globules (Globule No.30/40)
Children (Age 1-12) : 2 Globules (Globule No.30/40) twice daily for 5days
Infants (Age below 1) : 1 Globules (Globule No.30/40)

Action of the genus epidemicus

Figure 2.



1. Prevent the occurrence of epidemic if administered before the entry of the virus: Once the medicine is taken, it increases person's immunity to such level that even infected mosquito-bite cannot produce active disease in the person's body.

2. Reduce the severity of symptoms, if administered after the entry of the virus

3. Prevent or reduce post epidemic symptoms and improve outcome if administered after the clinical manifestation.

3. EMERGENCY RESPONSE By RAPID ACTION EPIDEMIC CONTROL CELL –HOMOEOPATHY (RAECH)

The Epidemic Control Cell in Homoeopathy titled as RAPID ACTION EPIDEMIC CONTROL CELL – HOMOEOPATHY (RAECH) is established in 2004 under the direct control and supervision of the Directorate of Homoeopathy. It functions by coalescing the Homoeopathic Educational Institutions, organizations of general practitioners as well as medical officers in Homoeopathy with the health care delivery institutions under the Dept. of Homoeopathy.

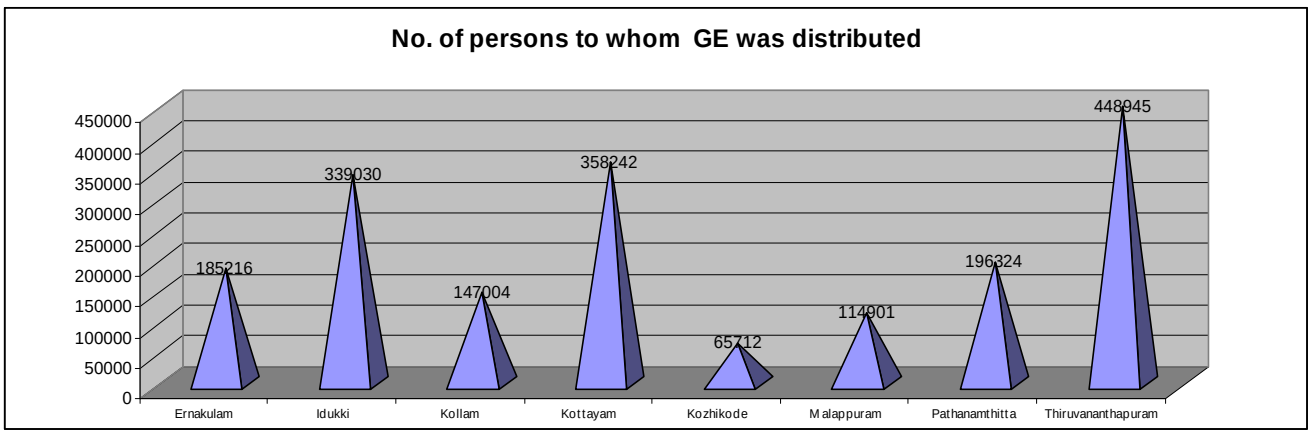
The REACH has undertaken the task of distributing the HGE, the only existing prophylaxis for such epidemic. After the administration of the HGE and decline of the epidemic, a community-based survey was conducted at 8 purposively selected wards to evaluate the efficacy of the HGE.

The Epidemic Control Cell under the Ministry of Health, Kerala State released rapid action forces to prevent the transmission of the epidemic by different vector control measures, clinical management of the affected people and mass health education campaigns. The Doctors and students from the Homoeopathic System of Medicine under various institutions in Kerala, actively contributed to such activities, while conducting the administration of the HGE.

Administration of the Genus Epidemicus

The Genus Epidemicus was administered in all the affected districts, but not uniformly. In some areas, the distribution was complete, but in certain areas, distribution was done partially, depending on the receptiveness from public, varying strengths of human resource, accessibility and the cooperation from the local authorities.

Figure 3.



Protective efficacy of "homoeopathic genus epidemicus" Administered during Epidemic fever in kerala, Occurred during May to september 2007,EvaluatedIn 8 purposively selected wards

4. JUSTIFICATION OF THIS SURVEY

Control of Epidemic fevers of viral origin

Epidemic fevers of viral origin have no specific treatment and only supportive treatment with paracetamol and analgesics was being used. The main preventive measure adopted was to reduce the transmission by eliminating mosquito breeding sites which included field activities for mosquito control and awareness campaigns. No vaccine has yet been developed for such epidemic fevers of viral origin.

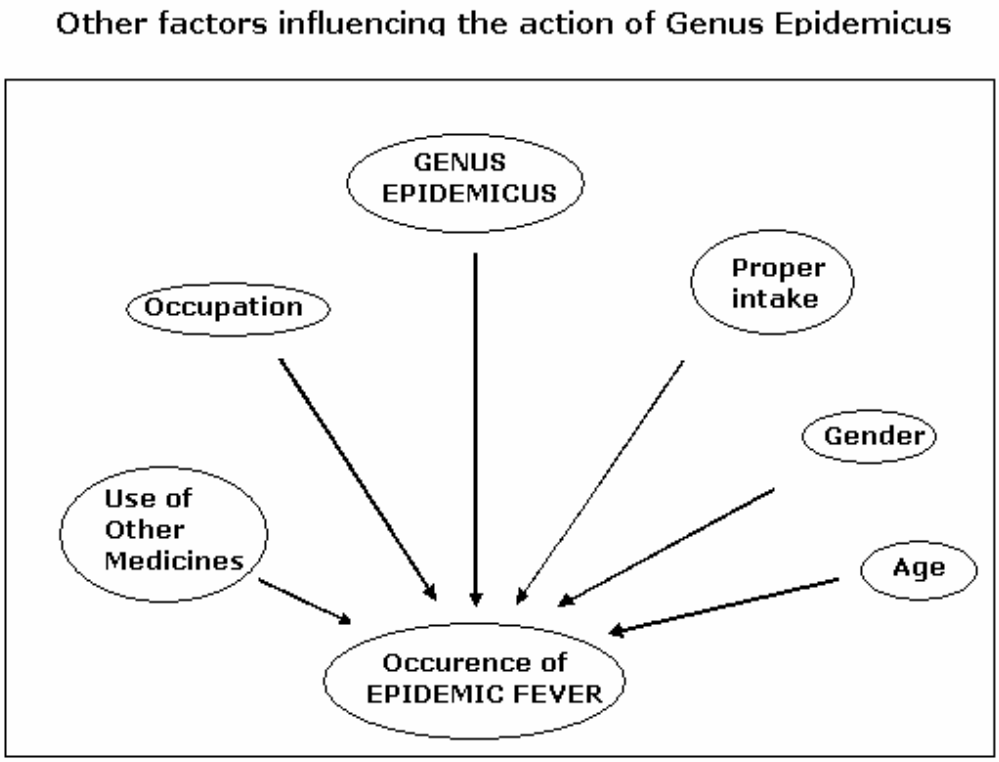
There had been claims from different parts of the world regarding the action of Homoeopathic Genus Epidemicus for prevention as well as palliation of symptoms. There has been increasing demand from the public for the HGE, during the previous epidemic outbreaks occurred in Kerala which clearly proves the protection offered by the Homoeopathic Genus Epidemicus and other constitutional Homoeopathic medicines administered during the previous epidemics. But, this claimed action had never been evaluated after the intervention.

There is no well documented evidence to prove scientifically, the effect of GE administered during previous outbreaks. The only available data include individual reports, case records from practitioners, media reports, department OP statements. There is no data available from population based studies for evaluating the effectiveness of a Homoeopathic Genus Epidemicus used for any epidemic, done in India. A Community based feedback evaluation study was hence highly essential to evaluate the effect of the “homoeopathic genus epidemicus”.

The survey was carried out two months after the decline of the epidemic, to include the effect of the drug on the course of the disease and complications.

5. HYPOTHESIS & OBJECTIVES

Figure 4.



Goal

To improve the health status of the community by reducing the occurrence of the epidemic fevers using the administration of the “homoeopathic genus epidemicus” in the state.

Objectives

1) To find out the **protection rate and protective effect** of “genus epidemicus” on the occurrence of the epidemic fever in each of the 8 selected wards.
2) To find out the **protection rate and protective effect** of the “genus epidemicus” in relation to the other factors related to the occurrence of the epidemic fever affected area.
3) To determine the **action** of the “genus epidemicus” in the development, course and outcome of the epidemic in comparison to those who have not taken the “genus epidemicus”.
4) To **compare other factors** related to the epidemic in those who have received the “genus epidemicus” with those who have not received it.

5) To arrive at **recommendations** for better use of the “genus epidemicus” for future interventions.

6. METHODOLOGY

Survey area

Survey was conducted in the 8 purposively selected wards where the epidemic had occurred and the Genus Epidemicus was administered efficiently, one from each affected districts of Kerala. The selected wards include Edappally ward, Ernakulam District, Thodupuzha muncipality 2nd ward, Idukki District, Paravattam ward, Kollam District, Thiruvarppu ward, Kottayam District, Chembukadavu ward, Kozhikkode District, Vallikunnu Panchayat 17th ward, Malappuram District, Kuttoor Gramapanchayat 1st ward, Pathanamthitta District and Vellarada Ward, Trivandrum District.

A door to door survey conducted in all the households in the 8 selected wards on the 17th and 18th of December 2007. Information was obtained about all members of the household. A literate adult member was interviewed.

Case definition

Persons who fulfilled the case definition of having an acute febrile illness during the time of occurrence of the epidemic, from May to September 2007, at each ward, were considered as the cases.

Survey design

Total Enumeration of all the selected wards was done and information about all the members of the household was obtained using an interview schedule. One interview schedule was used for each member of the family. The questionnaire included questions related to the epidemic and the HGE.

Data collection

Training was organized by the RAECH which was conducted prior to the Data collection, which covered the topics including survey methodology and interview techniques. Data was collected by the graduate students who are currently undergoing training under the Department of Community Health from 5 Homoeopathic Medical Colleges in Kerala. The colleges participated include Govt. Homoeopathic Medical Colleges in Calicut and Thiruvananthapuram, Athurashramam N S S Homoeopathic Medical College, Kottayam, Dr. Padiyar Memmorial Homoeopathic Medical College, Ernakulam, Sree Vidhyadhiraja Homoeopathic Medical College, Nemom.

Data Entry

Data entry was done in EPI INFO 3.2.2 by the Post graduates of Govt. Homoeopathic Medical College Thiruvananthapuram including the members of the State level and District level expert group.

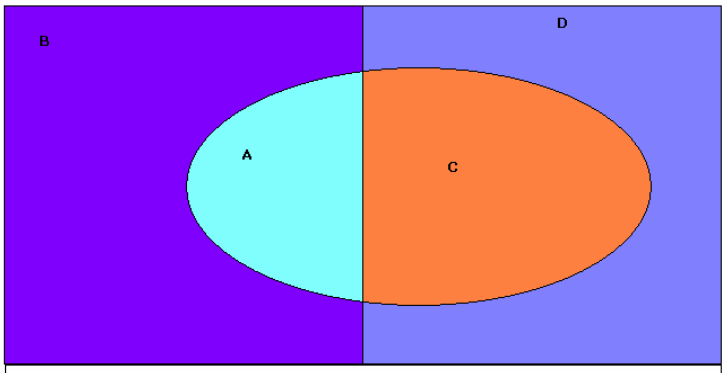
7. ANALYSIS

The data analysis was done using the Softwares EPI INFO 3.2.2, SPSS, MS Access, MS Excel.

Basic frequencies were calculated for each variable and for evaluating the protection and efficacy of the HGE, Protection rate (% of protection) and Protective effect were calculated.

Confidence interval for the odds Ratios, Test for difference between two proportions, Chi square test (Yates corrected) and the Fisher's exact test were used for statistical significance wherever appropriate. Statistical significance is indicated as * in the result tables.

Figure 5. Details of the Analysis



Total population of the survey ward	= A+B+C+D
Number of people who have taken the HGE	= A+B
Number of people who have not taken the HGE	= C+D
People who were affected by the Epidemic Fever	= A+C
Number of people who were affected by the Epidemic fever among those who have taken the HGE	= A
Number of people who were affected by the Epidemic fever among those who have not taken the HGE	= C

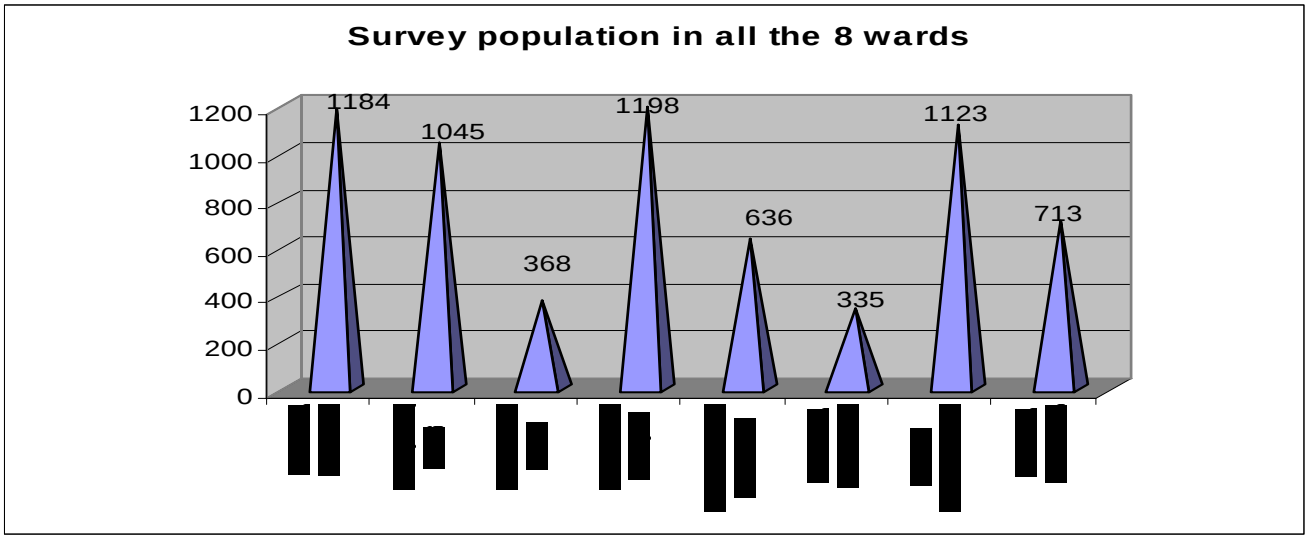
Over all Attack rate = (A+C) / (A+B+C+D) * 100

Attack rate (among those who have taken HE) = A / (A+B)* 100

Protection rate = 1-attack rate (in those who have taken HE)

Odds ratio = AD/ BC
Protective effect = 1-Odds ratio

Figure 6.



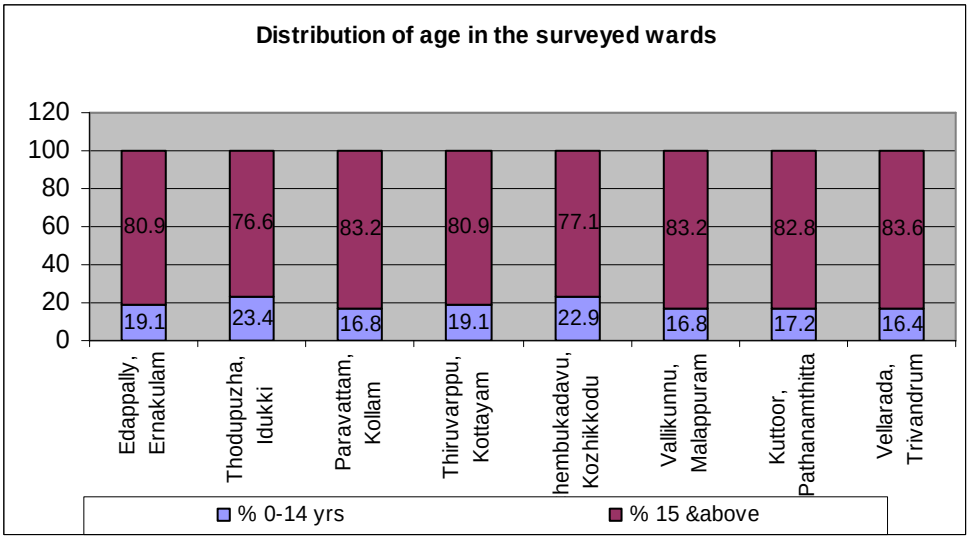
Total valid data available for analysis was **6602**

8. RESULTS

a) BASELINE CHARACTERISTICS OF THE SURVEY POPULATION

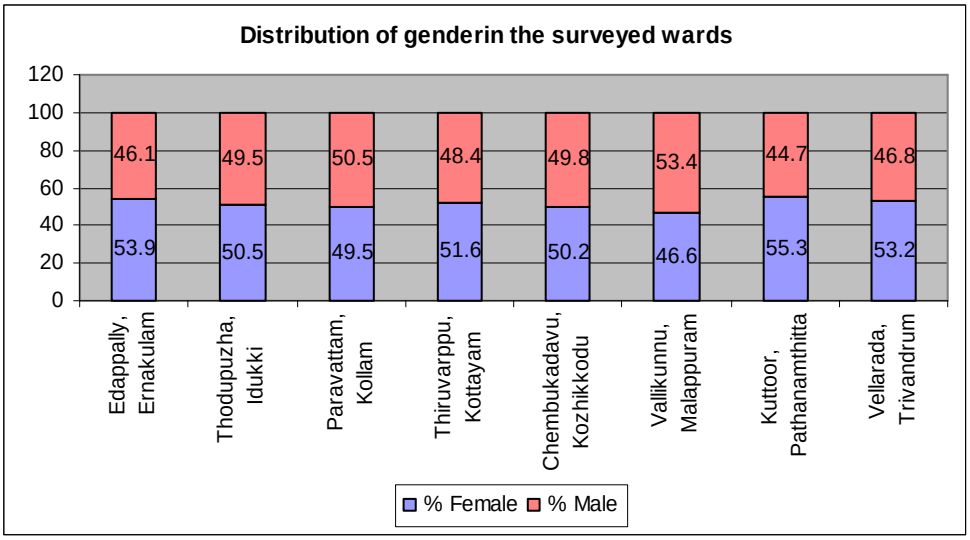
Age and gender distribution

Figure 7.



- Age distribution is uniform in all the wards

Figure 8.

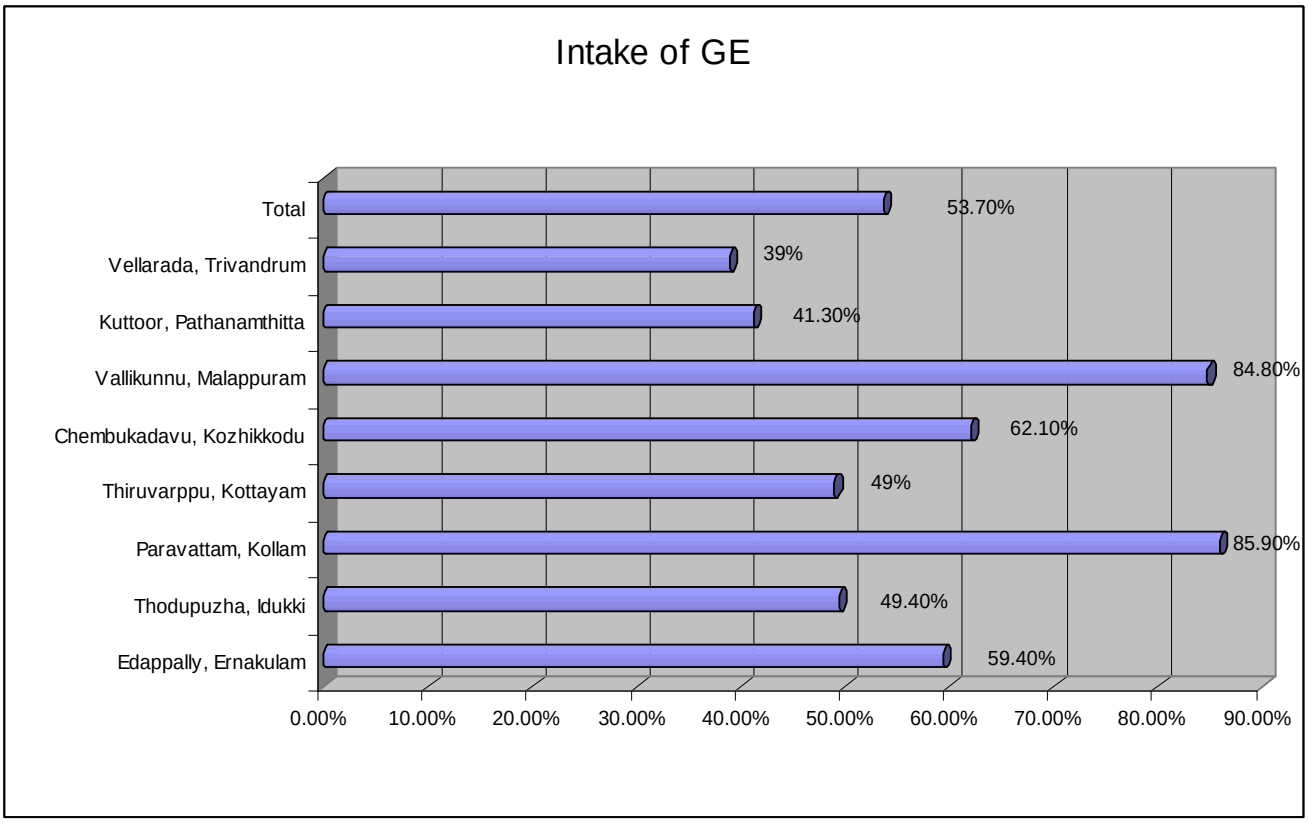


- Distribution of gender is uniform in all the wards

Table 1. Distribution of those who had taken the HGE in the surveyed wards

No	Wards, district	No of people surveyed	Missing data	Taken GE		GE Not taken	
				No	%	No	%
1	Edappally, Ernakulam	1184	1	**703**	**59.4 %**	480	40.5 %
2	Thodupuzha, Idukki	1045	5	**516**	**49.4 %**	524	50.1 %
3	Paravattam, Kollam	368	2	**316**	**85.9 %**	50	13.6 %
4	Thiruvarppu, Kottayam	1198	1	**587**	**49 %**	610	50.9 %
5	Chembukadavu, Kozhikkodu	636	6	**395**	**62.1 %**	235	36.9 %
6	Vallikunnu, Malappuram	335	1	**284**	**84.8 %**	50	14.9 %
7	Kuttoor, Pathanamthitta	1123	1	**464**	**41.3 %**	658	58.6 %
8	Vellarada, Trivandrum	713	4	**278**	**39 %**	431	60.4 %
	Total	**6602**	**21**	**3543**	**53.7 %**	3038	46 %

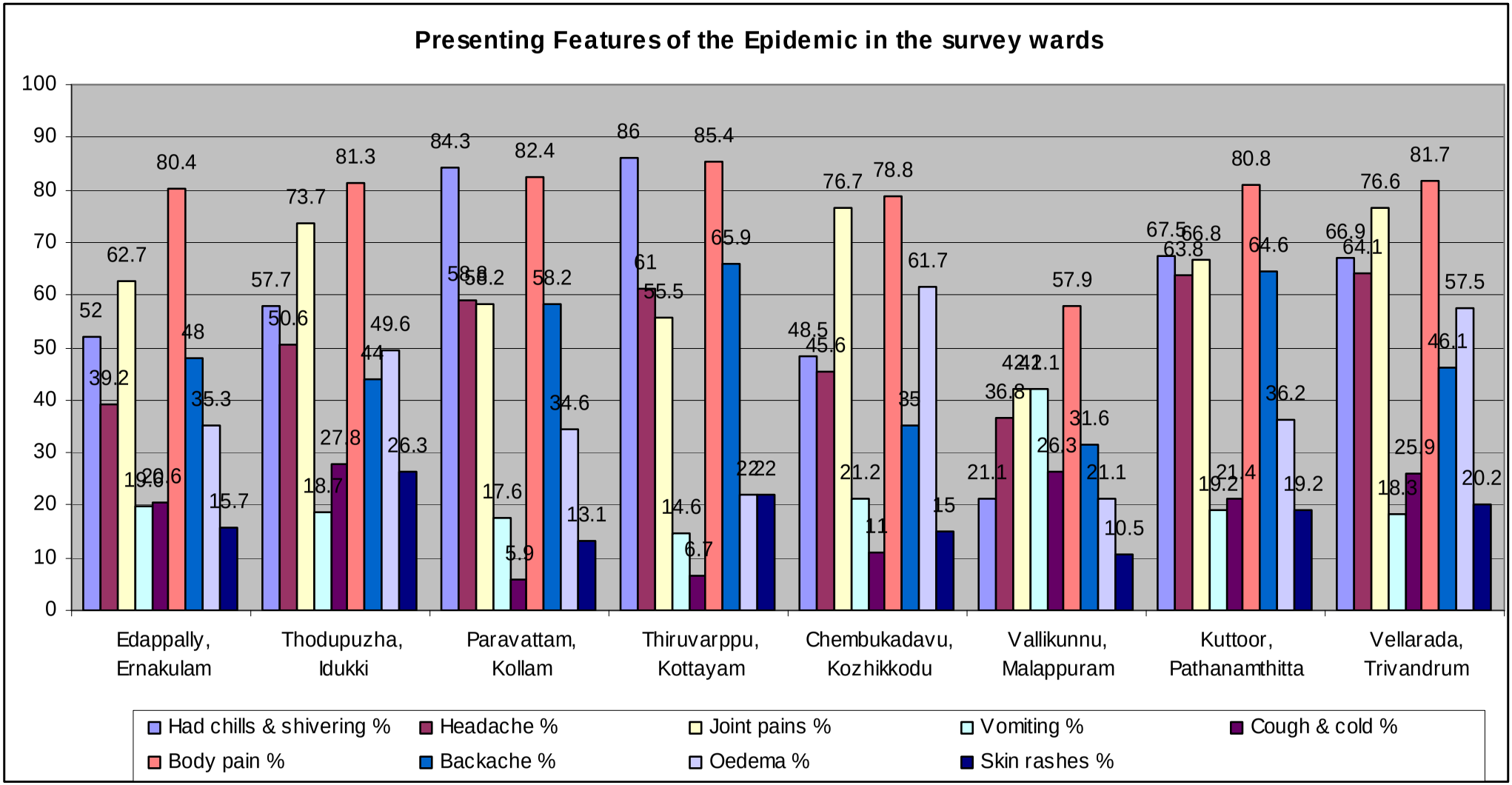
Figure 9.



Average intake = 58.86 %

- The consumption of the Genus Epidemicus varied from 39 % to 85.9%, the average being 58.86%
- In Malappuram and Kollam wards, the consumption was as high as 85% and 86% respectively
- Intake was low in Trivandrum and Pathanamthitta wards.

Figure 10.


Presenting Features of the Epidemic in the survey wards
100
90
80
70
60
50
40
30
20
10
0
52
39.2
62.7
19.6
80.4
48
35.3
15.7
57.7
50.6
73.7
18.7
81.3
27.8
44
49.6
26.3
84.3
58.8
58.2
17.6
5.9
82.4
58.2
34.6
13.1
86
61
55.5
14.6
6.7
85.4
65.9
22
22
48.5
45.6
76.7
21.2
11
78.8
35
61.7
15
21.1
36.8
42.1
26.3
57.9
31.6
21.1
10.5
67.5
63.8
66.8
19.2
80.8
64.6
36.2
19.2
66.9
64.1
76.6
18.3
81.7
25.9
46.1
57.5
20.2
Edappally, Ernakulam
Thodupuzha, Idukki
Paravattam, Kollam
Thiruvarppu, Kottayam
Chembukadavu, Kozhikkodu
Vallikunnu, Malappuram
Kuttoor, Pathanamthitta
Vellarada, Trivandrum
Had chills & shivering %
Headache %
Joint pains %
Vomiting %
Cough & cold %
Body pain %
Backache %
Oedema %
Skin rashes %

b) PRESENTING FEATURES OF THE FEBRILE EPIDEMIC

Symptoms of the epidemic in those who are affected by the epidemic (2059)

- The most common presenting feature of this epidemic was Bodypain in more than 50% of the affected population, invariably in all wards, ranging from 58 % to 85 %.
- Jointpains was the second most common symptom of epidemic, the range being 42 % to 77 % of the affected population.
- Headache was presented in the range of 36 % to 64 %
- Occurrence of Backache ranged from 31 % to 66 %

- Chills and shivering occurred more in Kollam, Kottayam, Pathanamthitta and Trivandrum wards, the over all range from 21 % to 84 %.
- Oedema occurred ranging from 21 % to 61%. In Kozhikkode and Trivandrum wards, more than 50% of patients presented with oedema.
- Vomiting ranged from 15 % to 41 % with Malappuram having highest proportion of patients affected.

- Cough & cold was less presented, with a range from 6% to 26%.
- Skin rashes presented in a range from10.5% to 25 %

c) PROTECTION OFFERED BY THE HOMOEOPATHIC GENUS EPIDEMICUS

i. PROTECTION RATE

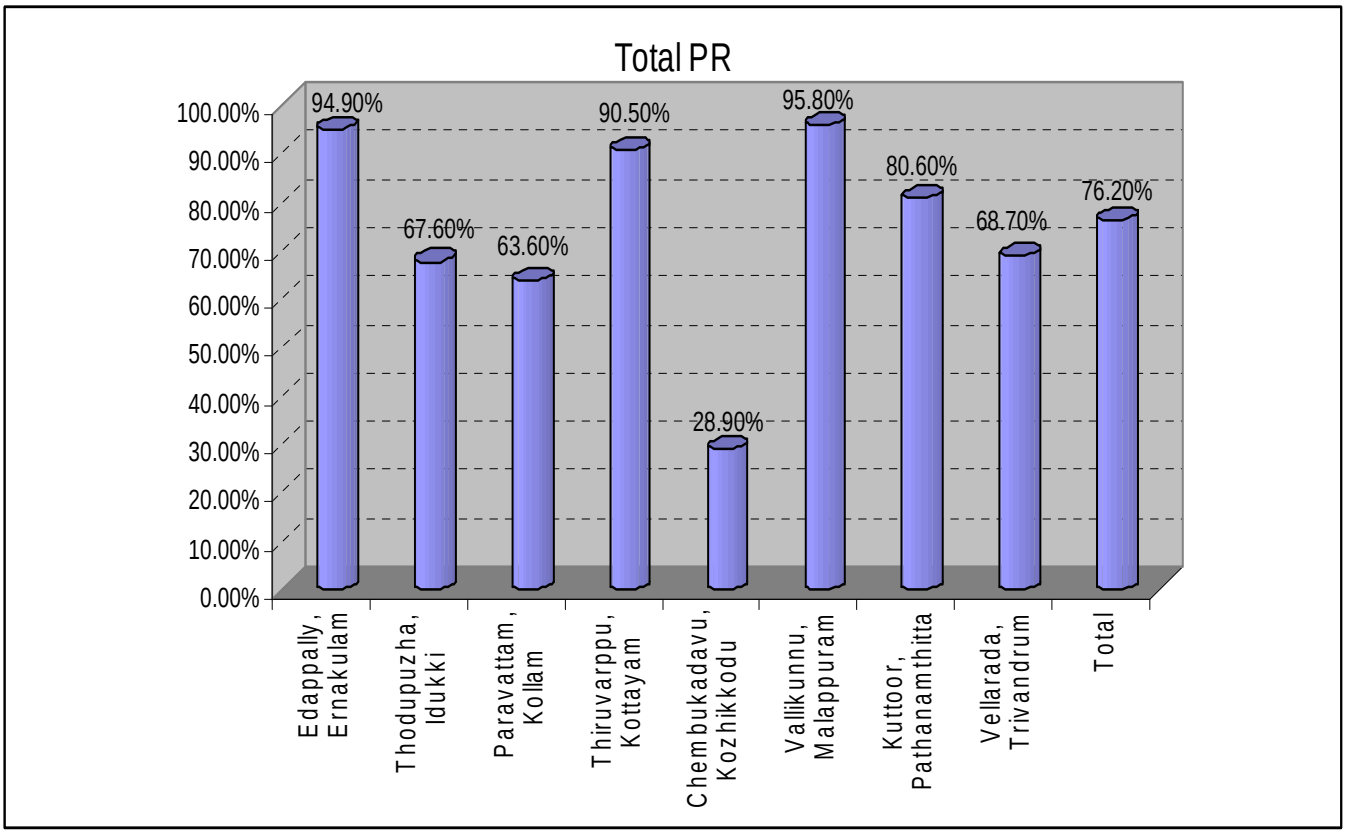
Attack rate
is the percentage of people affected by the epidemic
among those who have taken the HGE

Protection Rate
is calculated as the percentage of people not affected by the epidemic fever.
among those who have taken the HGE

Table 2. Protection Rate (in those who have taken HE) observed in all the 8 areas

No		Total persons received the GE	Missing data	No of persons affected by epidemic	**Number not affected by epidemic**	**Protection Rate** (% of people protected)
1	Edappally, Ernakulam	703	2	34	**667**	**94.9** %
2	Thodupuzha, Idukki	516	0	167	**349**	**67.6** %
3	Paravattam, Kollam	316	3	112	**201**	**63.6** %
4	Thiruvarppu, Kottayam	587	0	56	**531**	**90.5** %
5	Chembukadavu, Kozhikkodu	395	0	281	**114**	**28.9** %
6	Vallikunnu, Malappuram	284	3	9	**272**	**95.8** %
7	Kuttoor, Pathanamthitta	464	0	90	**374**	**80.6** %
8	Vellarada, Trivandrum	278	0	87	**191**	**68.7** %
	Total	3543	8	836	**2699**	**76.2 %**

Figure 11.



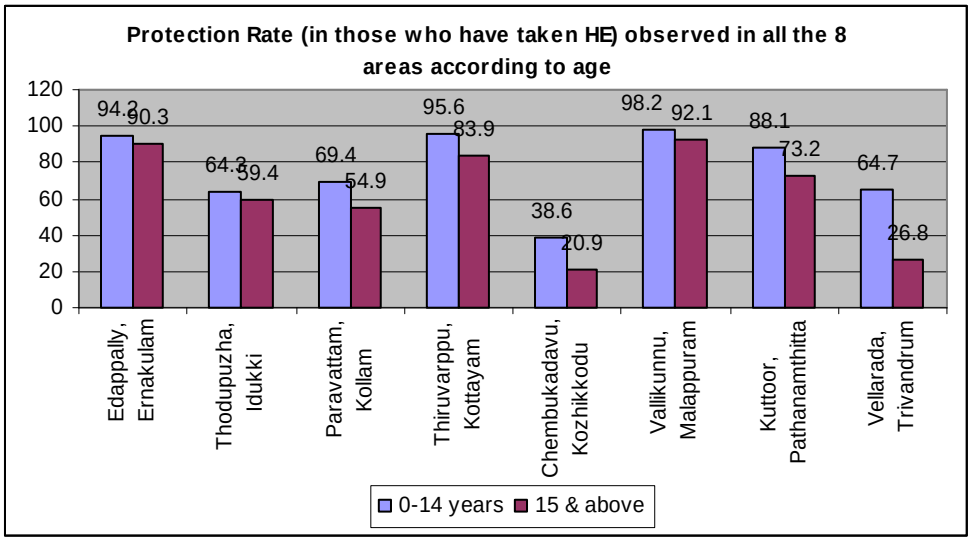
Overall percentage of protection offered by the GE in all evaluated wards is **76.2%**

- The Genus Epidemicus was able to protect 76.2% of population of all the survey wards, taken together.
- It varied from 29% in Kozhikkodu ward to 96% in Malappuram ward.
- All 7 wards except Kozhikkodu, Genus Epidemicus was able to protect more than 60% of the total population

Table 3. Protection Rate (in those who have taken HE) observed in all the 8 areas according to age

No		Number not affected by epidemic		Protection Rate (% of people protected)		
		0-14 years	15 & above	0-14 years	15 & above	p value
1	Edappally, Ernakulam	**213/226**	**862/955**	94.2	**90.3**	0.0651
2	Thodupuzha, Idukki	**157/244**	**475/799**	64.3	**59.4**	0.1708
3	Paravattam, Kollam	**43/62**	**168/306**	**69.4**	**54.9**	0.0360*
4	Thiruvarppu, Kottayam	**219/229**	**811/967**	**95.6**	**83.9**	0.0000*
5	Chembukadavu, Kozhikkodu	**56/145**	**102/489**	**38.6**	**20.9**	0.0000*
6	Vallikunnu, Malappuram	**55/56**	**255/277**	98.2	**92.1**	0.1008
7	Kuttoor, Pathanamthitta	**170/193**	**679/928**	**88.1**	**73.2**	0.0000*
8	Vellarada, Trivandrum	**75/116**	**158/590**	**64.7**	**26.8**	0.0000*
	Total					

Figure 12.



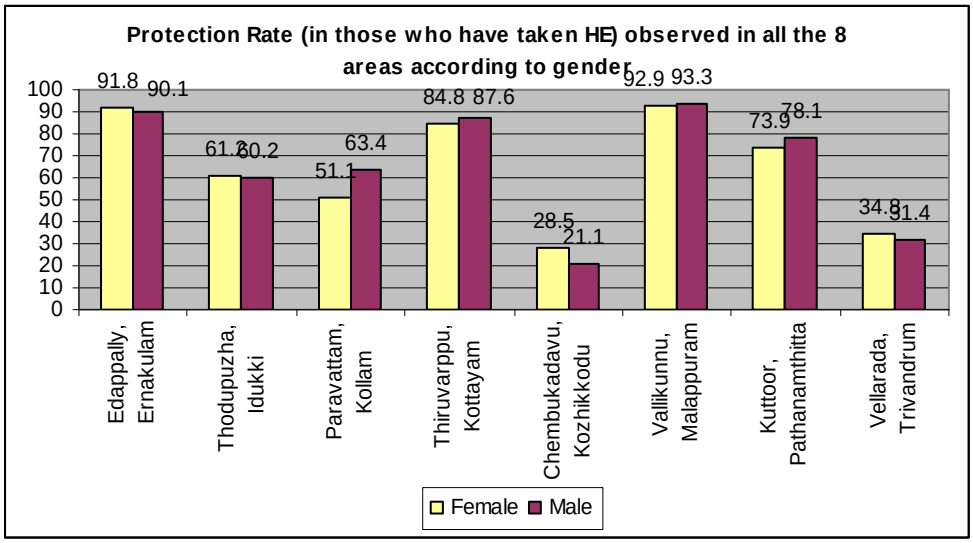
- In all the wards, percentage of people protected was more in children under 15 years of age, than those are in the age group 15 & above.
- In five wards, except Ernakulam, Idukki and Malappuram, this result showed high statistical significance (P value<0.05).

Table 4. Protection Rate (in those who have taken HE) observed in all the 8 areas according to gender

No		Number not affected by epidemic		Protection Rate (% of people protected)		P value
		F	**M**	**F**	**M**	

1	Edappally, Ernakulam	**586/638**	**492/546**	**91.8**	**90.1**	0.3081
2	Thodupuzha, Idukki	**323/528**	**311/517**	**61.2**	**60.2**	0.7408
3	Paravattam, Kollam	**93/182**	**118/186**	**51.1**	**63.4**	0.0175*
4	Thiruvarppu, Kottayam	**524/618**	**508/580**	**84.8**	**87.6**	0.1611
5	Chembukadavu, Kozhikkodu	**91/319**	**67/317**	**28.5**	**21.1**	0.0311*
6	Vallikunnu, Malappuram	**145/156**	**167/179**	**92.9**	**93.3**	0.8854
7	Kuttoor, Pathanamthitta	**459/621**	**392/502**	**73.9**	**78.1**	0.1027
8	Vellarada, Trivandrum	**132/379**	**105/334**	**34.8**	**31.4**	0.0000*

Figure 13.

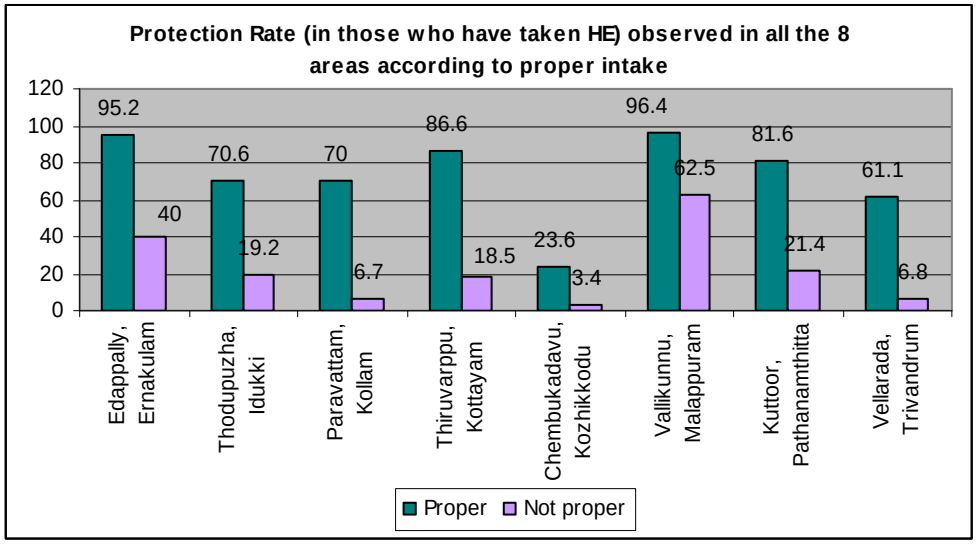


- In four survey wards, the percentage protection was more in females than males
- In the other four wards, it was more in males.
- In kozhikkodu and Trivandrum wards, the higher protection rate in females is statistically significant.
- In Kollam, significantly higher percentage of protection was seen among males.

Table 5. Protection Rate (in those who have taken HE) observed in all the 8 areas according to proper intake

No		**Number not affected by epidemic**		**Protection Rate** (% of people protected)		P value
		Proper	Not proper	Proper	Not proper	
1	Edappally, Ernakulam	**572/601**	**6/15**	**95.2**	**40**	0.0000*
2	Thodupuzha, Idukki	**267/378**	**19/99**	**70.6**	**19.2**	0.0000*
3	Paravattam, Kollam	**161/230**	**4/60**	**70**	**6.7**	0.6538
4	Thiruvarppu, Kottayam	**343/396**	**5/27**	**86.6**	**18.5**	0.0000*
5	Chembukadavu, Kozhikkodu	**75/318**	**2/59**	**23.6**	**3.4**	0.0920
6	Vallikunnu, Malappuram	**216/224**	**5/8**	**96.4**	**62.5**	0.0000*
7	Kuttoor, Pathanamthitta	**271/332**	**9/42**	**81.6**	**21.4**	0.0000*
8	Vellarada, Trivandrum	**99/162**	**3/44**	**61.1**	**6.8**	0.4026

Figure 14.

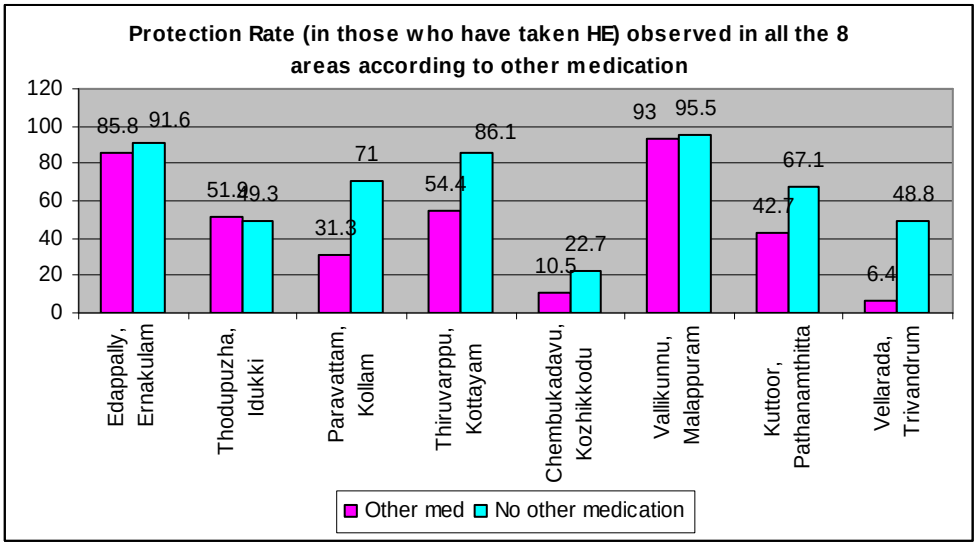


- Percentage of protection was higher in those who have taken the Genus Epidemicus properly, in all the wards.
- In 5 wards, the rate is statistically significant.

Table 6. Protection Rate (in those who have taken HE) observed in all the 8 areas & other medications

No		**Number not affected by epidemic**		**Protection Rate** (% of people protected)		t test, p value
		Other med	No other medication	Other med	No other medication	
1	Edappally, Ernakulam	**303/353**	**361/394**	**85.8**	**91.6**	0.0121*
2	Thodupuzha, Idukki	**190/366**	**110/223**	**51.9**	**49.3**	0.5406
3	Paravattam, Kollam	**40/128**	**125/176**	**31.3**	**71**	0.0000*
4	Thiruvarppu, Kottayam	**87/160**	**236/274**	**54.4**	**86.1**	0.00008*
5	Chembukadavu, Kozhikkodu	**16/153**	**71/313**	**10.5**	**22.7**	0.0016*
6	Vallikunnu, Malappuram	**80/86**	**128/134**	**93**	**95.5**	0.4274
7	Kuttoor, Pathanamthitta	**79/185**	**110/164**	**42.7**	**67.1**	0.0000*
8	Vellarada, Trivandrum	**18/448**	**81/166**	**6.4**	**48.8**	0.0007*

Figure 15.

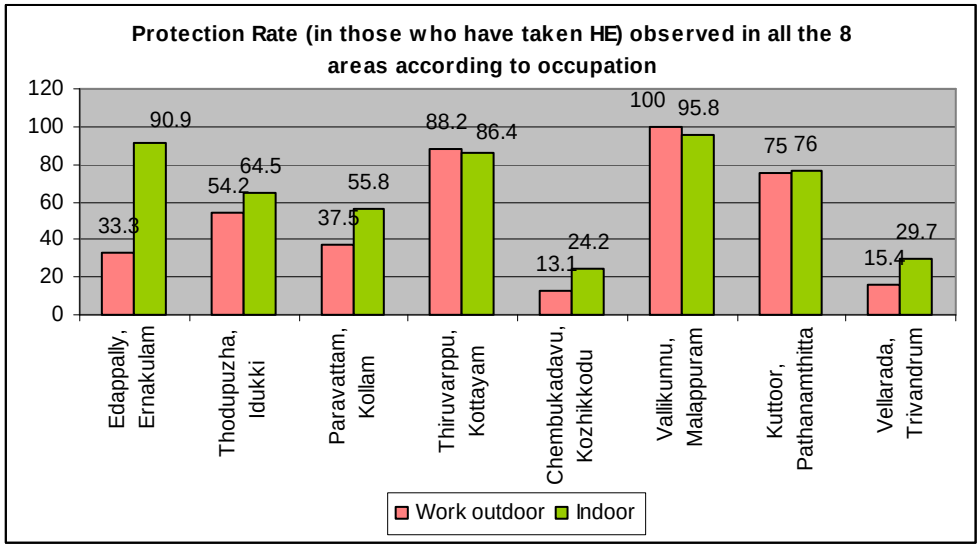


- The protection rate observed is higher among those who have not taken any other medication along with the Genus Epidemicus, in 7 wards.
- In 6 wards, except Idukki ward, the result is highly significant

Table 7. Protection Rate (in those who have taken HE) observed in all the 8 areas and occupation

No		Number not affected by epidemic		Protection Rate (% of people protected)		p value
		Work outdoor	Indoor	Work outdoor	Indoor	
1	Edappally, Ernakulam	**1/3**	**449/494**	**33.3**	**90.9**	0.0006*
2	Thodupuzha, Idukki	**13/24**	**284/440**	**54.2**	**64.5**	0.3066
3	Paravattam, Kollam	**3/8**	**87/156**	**37.5**	**55.8**	0.3118
4	Thiruvarppu, Kottayam	**15/17**	**419/485**	**88.2**	**86.4**	0.8312
5	Chembukadavu, Kozhikkodu	**11/84**	**31/128**	**13.1**	**24.2**	0.0486*
6	Vallikunnu, Malappuram	**7/7**	**115/120**	**100**	**95.8**	0.0000*
7	Kuttoor, Pathanamthitta	**6/8**	**241/317**	**75**	**76**	0.9479
8	Vellarada, Trivandrum	**2/13**	**97/327**	**15.4**	**29.7**	0.2667

Figure 16.



- The percentage of people protected was more among those who are working indoor, than those who work outdoor, in 6 wards, except Kottayam and Malappuram.
- Ernakulam and Kozhikkodu wards, the higher PR in indoor category is significant.

ii. PROTECTIVE EFFECT

Odds Ratio:

To find out the efficacy of the "genus epidemicus", protective effect is calculated from the odds ratio which gives the strength of association, whether they are associated positively or negatively (protective effect), and also the statistical significance. It can be calculated from the 2 x 2 table for exposure and disease

	Disease +	*Disease -*	
Exposure +	*A*	*b*	*a+b*
Exposure -	*C*	*d*	*c+d*
	a+c	*b+d*	*a+b+c+d*

Odds ratio = ad / bc

If the odds ratio is more than 1, the exposure is a risk factor for the development of fever.
If the odds ration is less than "1", the exposure has a protective effect.

Protective Effect

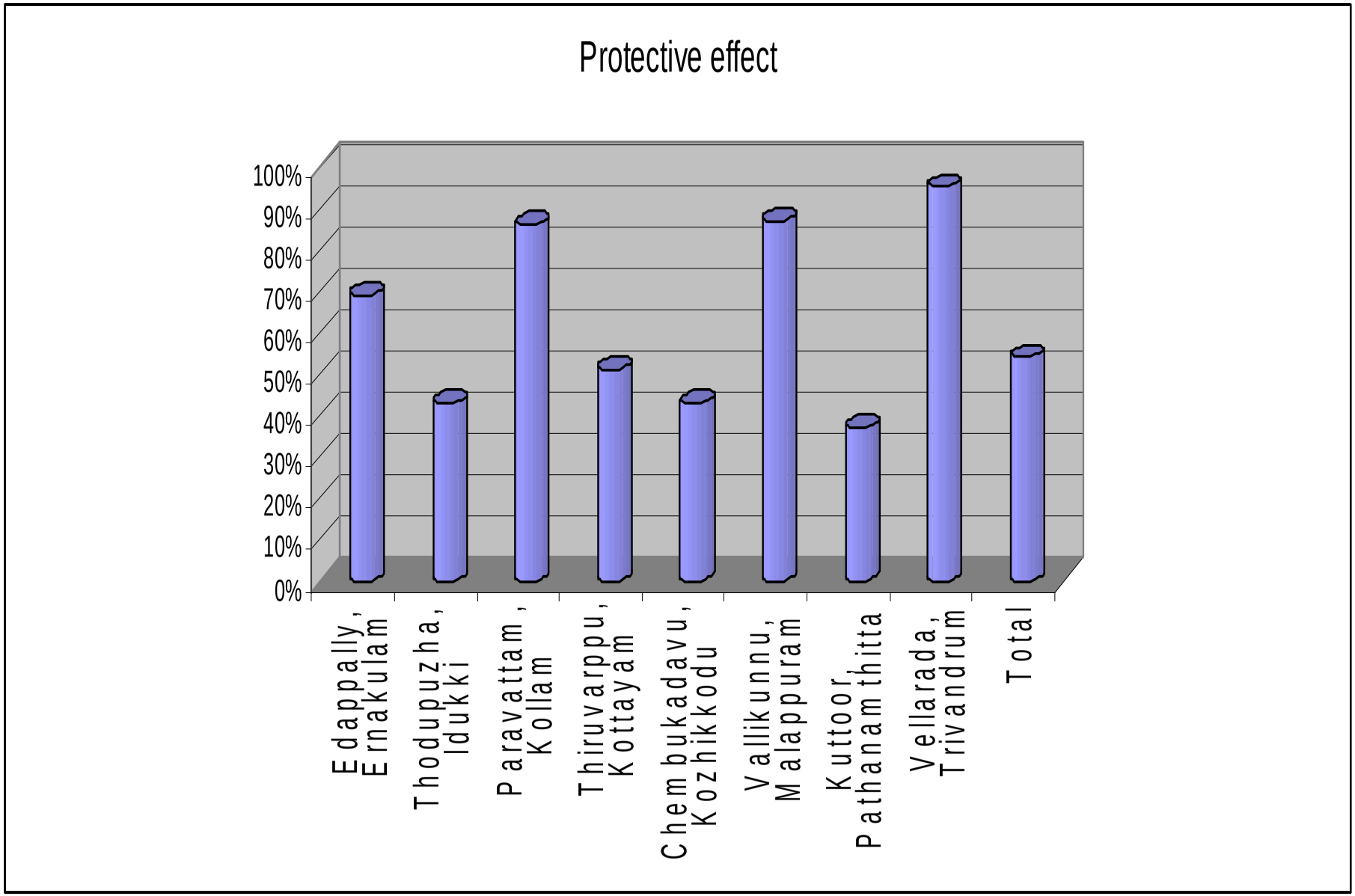
is calculated as 1-Odds ratio.

Table 8. Protective effect of the HGE (in those who have taken the HGE vs those who have not taken the HGE) observed in different districts

Districts	Chi square (p value)	Odds Ratio	Confidence interval of OR	**Protective effect**
Ernakulam	30.30 (0.0000) *	0.31	0.2, 0.48 *	**69 %**
Idukki	19.15 (0.0000) *	0.57	0.44, 0.73 *	**43 %**
Kollam	32.84 (0.0000) *	0.14	0.06, 0.3 *	**86 %**
Kottayam	16.28 (0.0001) *	0.49	0.34, 0.7 *	**51 %**
Kozhikkodu	7.53 (0.006) *	0.57	0.38, 0.86 *	**43 %**
Malappuram	19.14 (0.0000) *	0.13	0.05, 0.38 *	**87 %**
Pathanamthitta	9.33 (0.0022) *	0.63	0.47, 0.85*	**37 %**
Vellarada, Trivandrum	252.52 (0.0000) *	0.05	0.04, 0.08*	**95 %**
Over all	211.39 (0.0000) *	0.46	0.41, 0.51*	**54 %**

- In all the survey wards, the odds ratio is less than 1, which indicates that the exposure factor, the Genus Epidemicus has a definite protective effect.
- The calculated odds ratios are statistically significant in all the wards.
- The protective effect is calculated from odds ratio, which is more than 35 % in all the wards.
- It varied from 37% in Pathanamthitta ward to 95% in Trivandrum ward.
- The average Protective Effect for all the wards is 63.88 %
- The protective effect observed was above 50% for 6 wards.
- In Ernakulam, Kollam, Malappuram and Trivandrum wards, the protective effect observed was higher than 60%

Figure 17.


Protective effect
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Edappally, Ernakulam
Thodupuzha, Idukki
Paravattam, Kollam
Thiruvarppu, Kottayam
Chembukadavu, Kozhikkodu
Vallikunnu, Malappuram
Kuttoor, Pathanamthitta
Vellarada, Trivandrum
Total

Average protective effect for all the wards is 63.88%

which means that

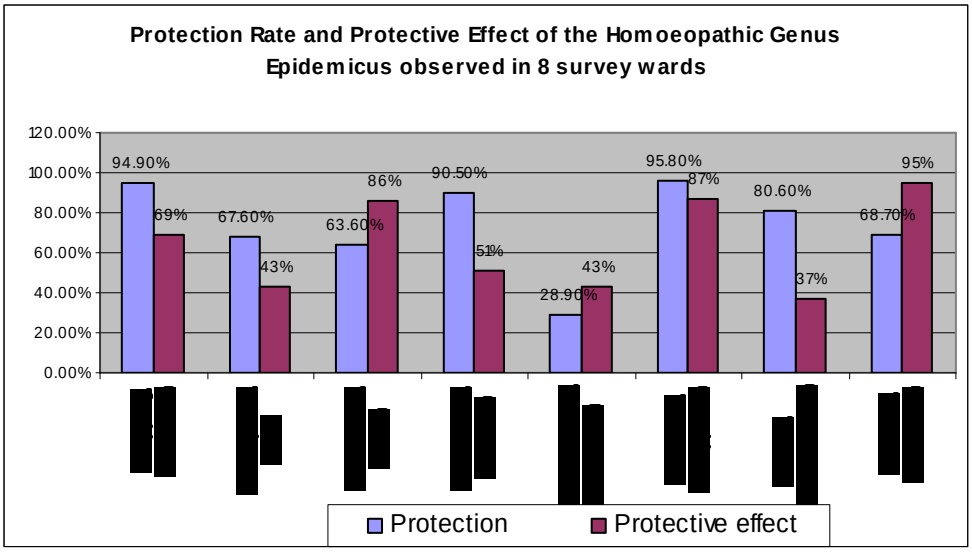
The administration of "homoeopathic genus epidemicus" significantly reduces the risk of epidemic fever by 64 %.

Or

Those who have used "homoeopathic genus epidemicus" are 64 % less likely to develop epidemic fever than those who have not used it.

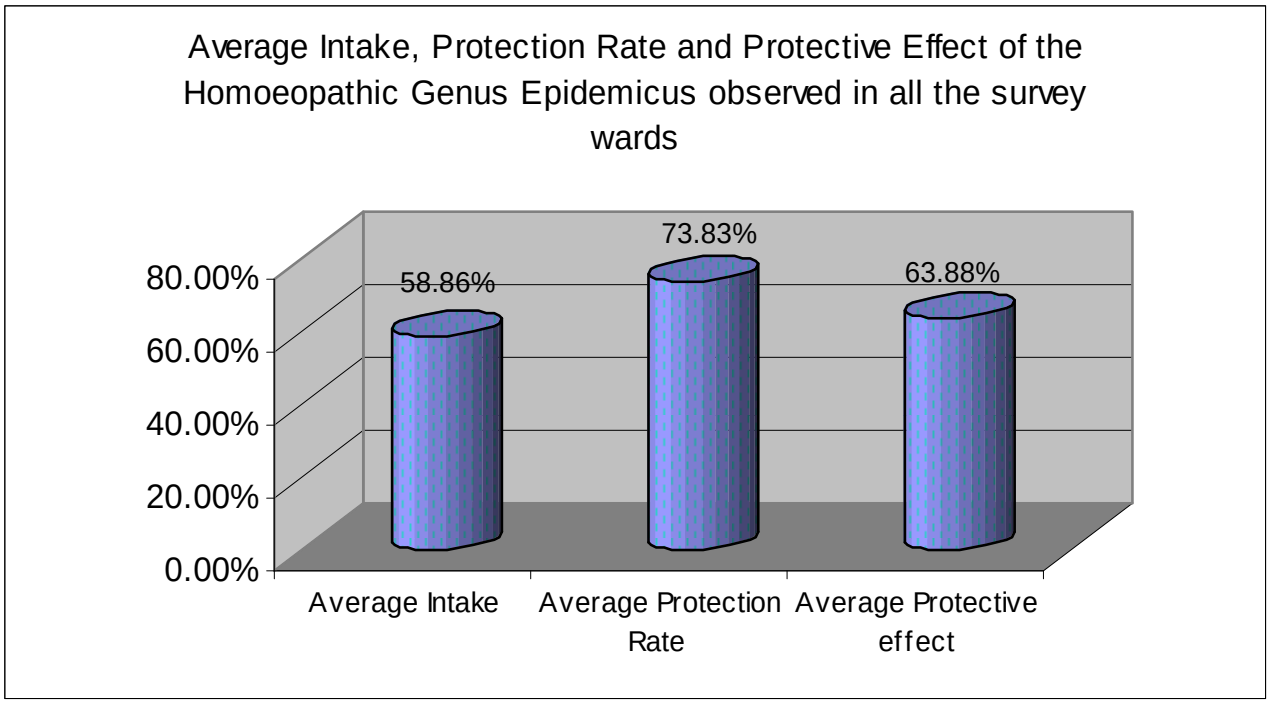
Table 9. Comparison of the protection rate, protective effect

Figure 18.



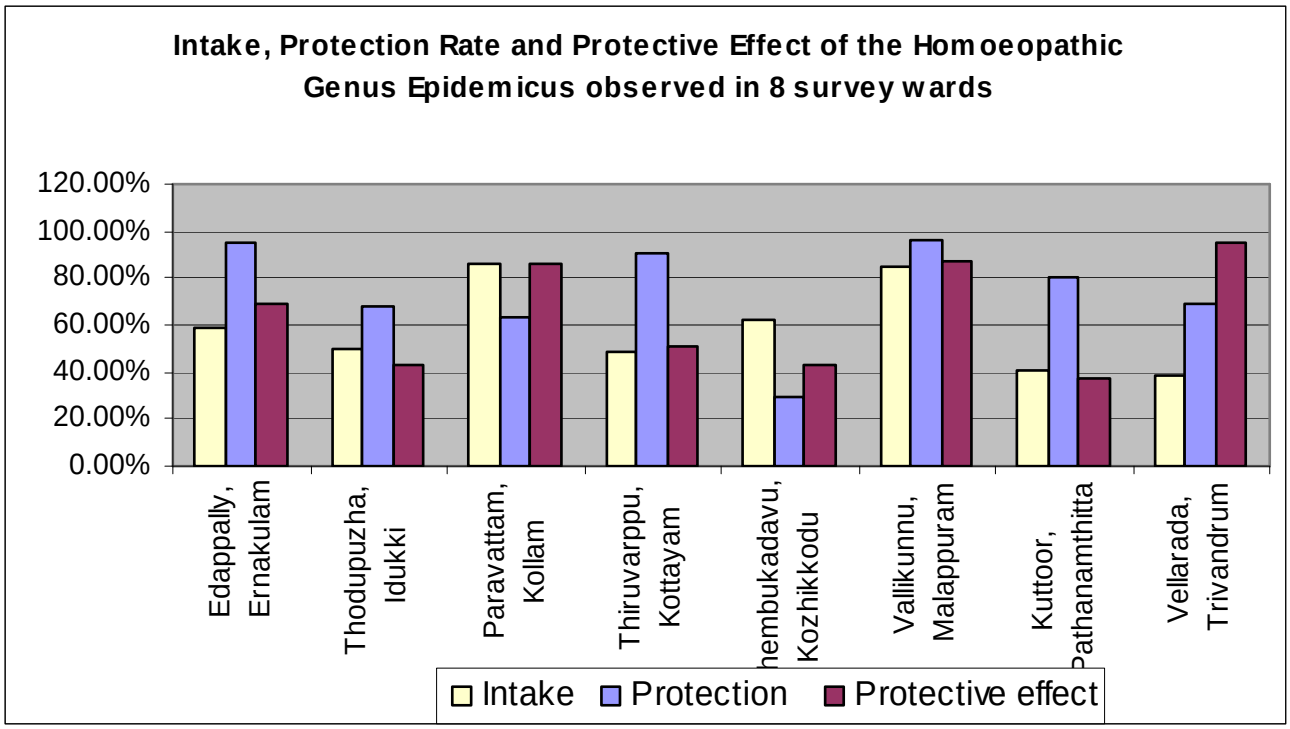
- Protective effect of HGE was higher than the protection rate (percentage of protection), in Kollam, Kozhikkodu, and Trivandrum.
- In Ernakulam, Idukki, Kottayam and Pathanamthitta wards, the percentage of protection seen was higher than the protective effect of the HE.
- In Malapppuran ward, the Protection rate and the Protective effect observed was almost same, 96% and 87% respectively.

Figure 19.



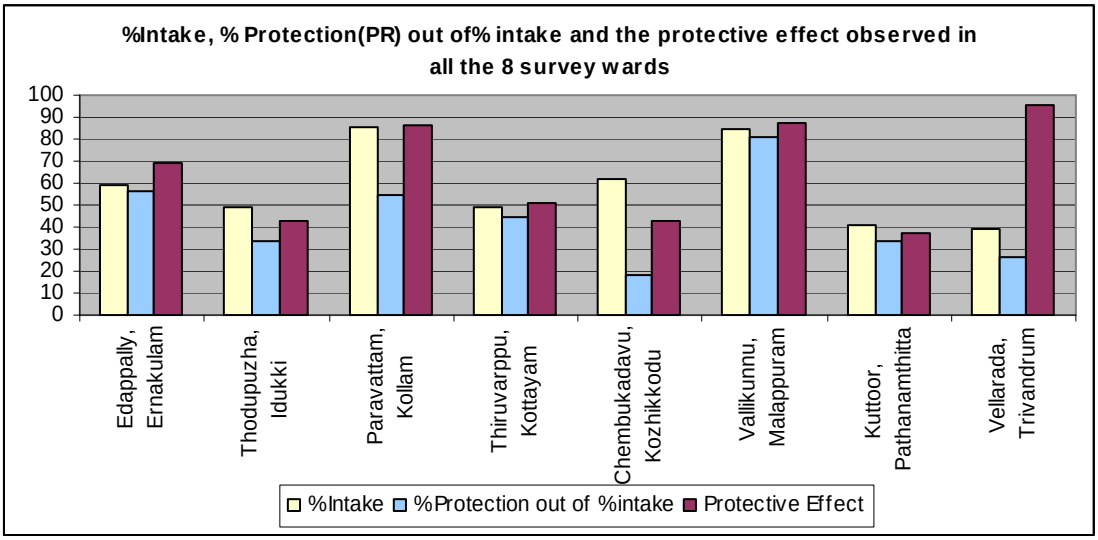
- ***Average intake of the HGE was 58.86%, for all the survey wards together***
- ***Average Protection Rate was 73.83%, for all the survey wards together***
- ***Average Protective Effect of the HGE was 63.88%, for all the survey wards together***

Figure 20.



- The intake, protection and Protective effect observed in different wards showed variation.

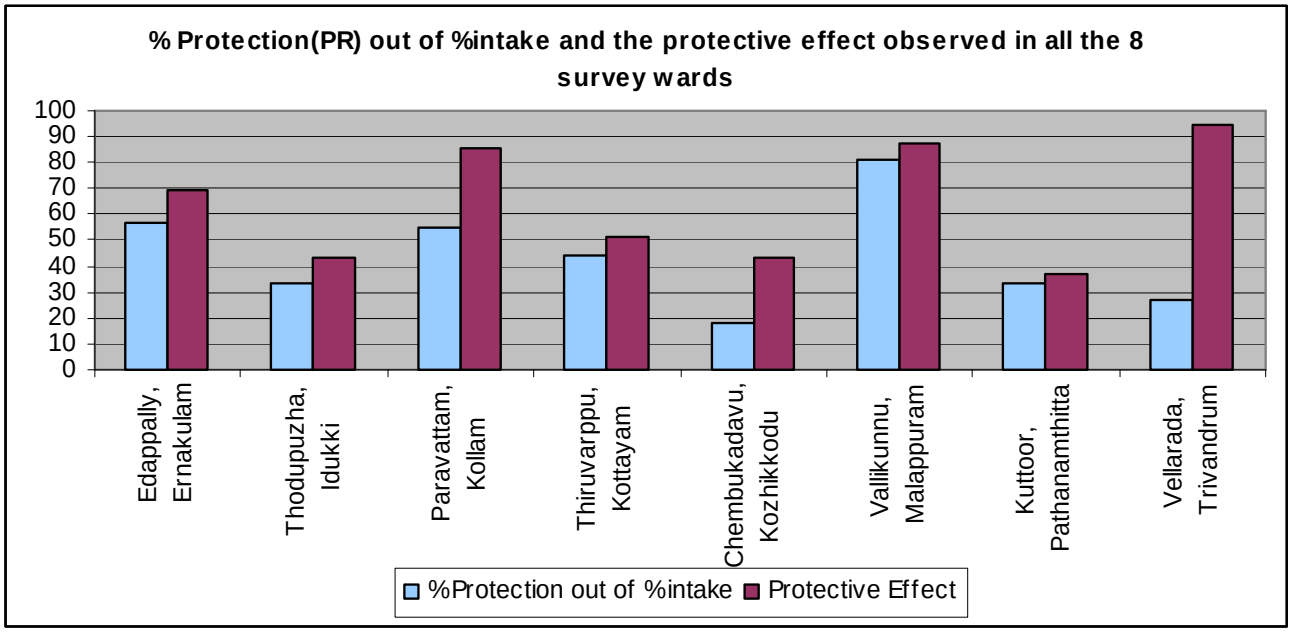
Figure 21.



- Similar pattern in observed in Ernakulam, Kottayam and Malappuram wards. The percentage of protection (PR) out of % intake was high, with proportionately higher Protective effect.
- In Idukki and Pathanamthitta wards, the Protective effect was proportionately lower than the intake.
- Kozhikkodu ward showed proportionately lower Protective effect and protection rate compared to the intake.

- In Kollam ward, the Protective effect is high and proportional to the intake, but the % of protection (PR) was low.
- In Trivandrum ward, the protective effect was very high compared to the intake.

Figure 22.

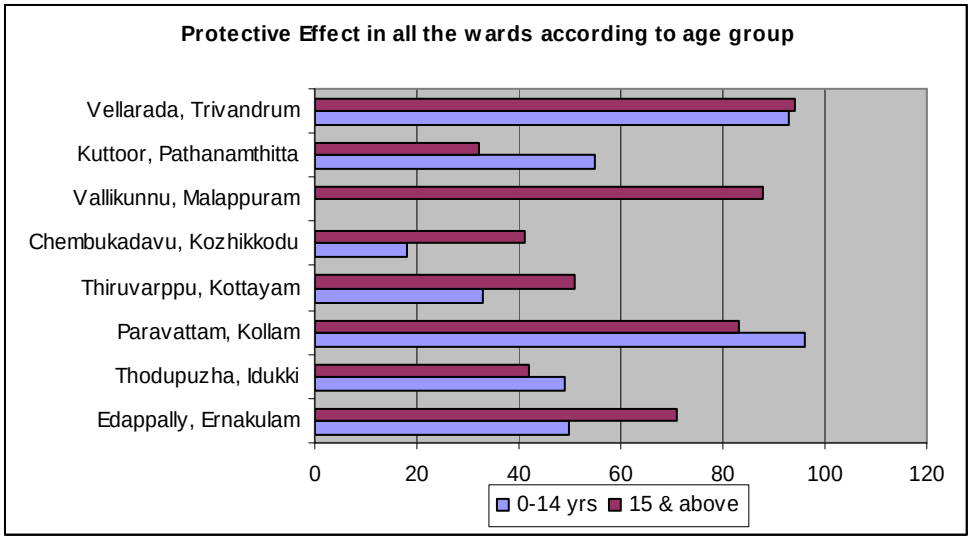


- Protective effect is higher than the protection rate (% of protection) expressed as % of intake), in all the survey wards.
- Protective effect is slightly higher in Ernakulam, Idukki, Kottayam, Malappuram and Pathanamthitta wards, than the value of protection rate(% of protection) expressed as % of intake)
- In Kollam and Kozhikkodu wards, the difference was more.
- In Trivandrum, the Protective Effect observed was much higher than the value of Protection rate expressed as % of intake.

Table 10. Protective Effect in all the wards according to age group

No		0 to 14 years		15 & above	
		PE	OR	PE	OR
1	Edappally, Ernakulam	50	0.5 NS	71	0.29*
2	Thodupuzha, Idukki	49	0.51*	42	0.58*
3	Paravattam, Kollam	96	0.04*	83	0.17*
4	Thiruvarppu, Kottayam	33	0.67	51	0.49*
5	Chembukadavu, Kozhikkodu	18	0.82	41	0.59*
6	Vallikunnu, Malappuram	Data insufficient		88	0.12*
7	Kuttoor, Pathanamthitta	55	0.45 NS	32	0.68*
8	Vellarada, Trivandrum	93	0.07*	94	0.06*

Figure 23.

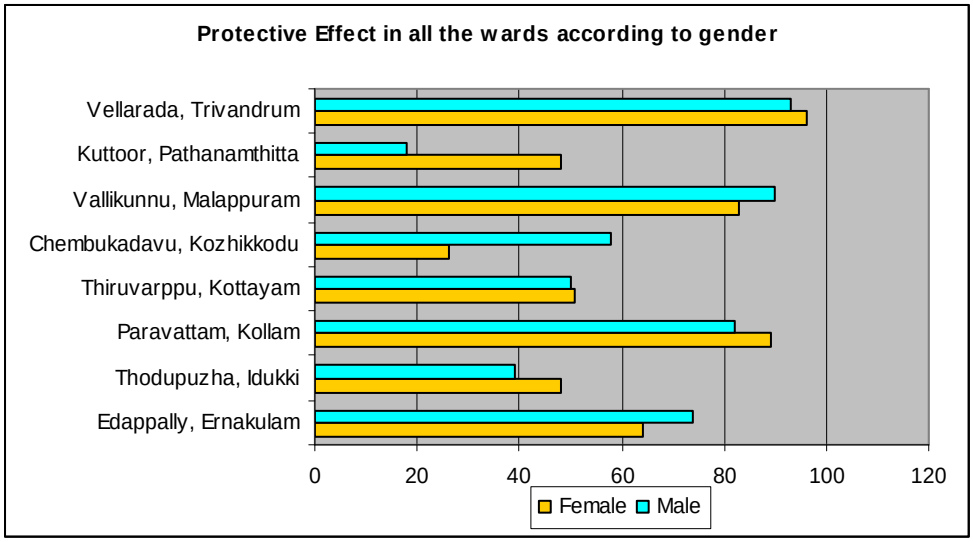


- Protective effect (Odds ratio <1) was observed in all the wards, in both the age groups.
- Higher PE was seen in the age group 15 and above, in Ernakulam, Kottayam, Kozhikkodu and Trivandrum wards.
- Higher PE was seen in the age group below 15 years, in Idukki, Kollam and Pathanamthitta wards.

Table 11. Protective Effect in all the wards according to gender

No		**Fem**		**M**	
		PE	OR	PE	**%**
1	Edappally, Ernakulam	64	0.36*	74	**0.26***
2	Thodupuzha, Idukki	48	0.52*	39	**0.61***
3	Paravattam, Kollam	89	0.11*	82	**0.18***
4	Thiruvarppu, Kottayam	51	0.49*	50	**0.50***
5	Chembukadavu, Kozhikkodu	26	0.74*	58	**0.42***
6	Vallikunnu, Malappuram	83	0.17*	90	**0.10***
7	Kuttoor, Pathanamthitta	48	0.52*	18	**0.82***
8	Vellarada, Trivandrum	96	0.04*	93	**0.07***

Figure 24.

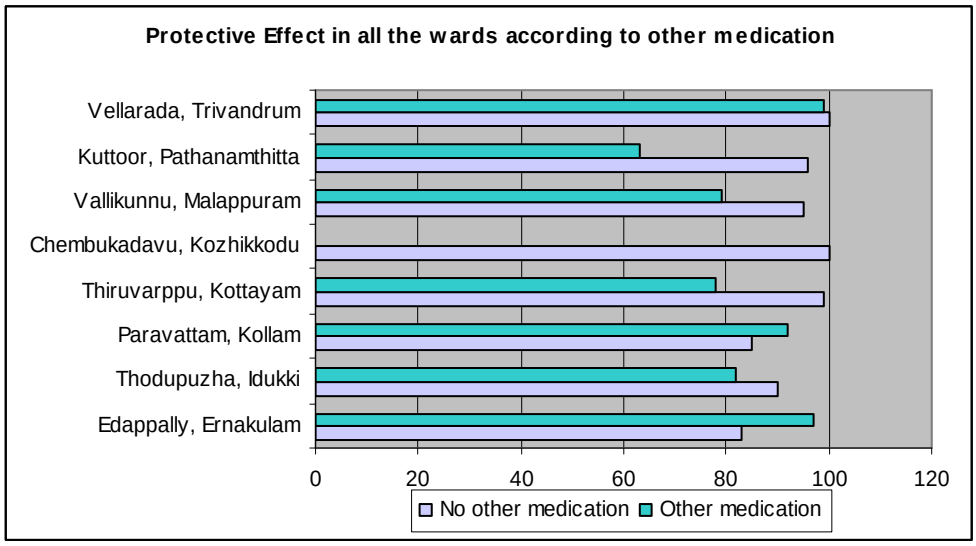


- In all the survey wards, protective effect was observed separately among females and males, all are statistically significant.
- PE was more in females, in 5 wards, and higher in males, in 3 wards, Ernakulam, Kozhikkodu and malalppuram.

Table 12. Protective Effect in all the wards according to use of other medication

No		**Not taken**		**Taken**	
		PE	OR	PE	**%**
1	Edappally, Ernakulam	83	0.17 NS	97	**0.03***
2	Thodupuzha, Idukki	90	0.10*	82	**0.18***
3	Paravattam, Kollam	85	0.15*	92	**0.08***
4	Thiruvarppu, Kottayam	99	0.01*	78	**0.22***
5	Chembukadavu, Kozhikkodu	100	0.00*	Insufficient data	
6	Vallikunnu, Malappuram	95	0.05*	79	**0.21 NS**
7	Kuttoor, Pathanamthitta	96	0.04*	63	**0.37***
8	Vellarada, Trivandrum	100	0.00*	99	**0.01***

Figure 25.



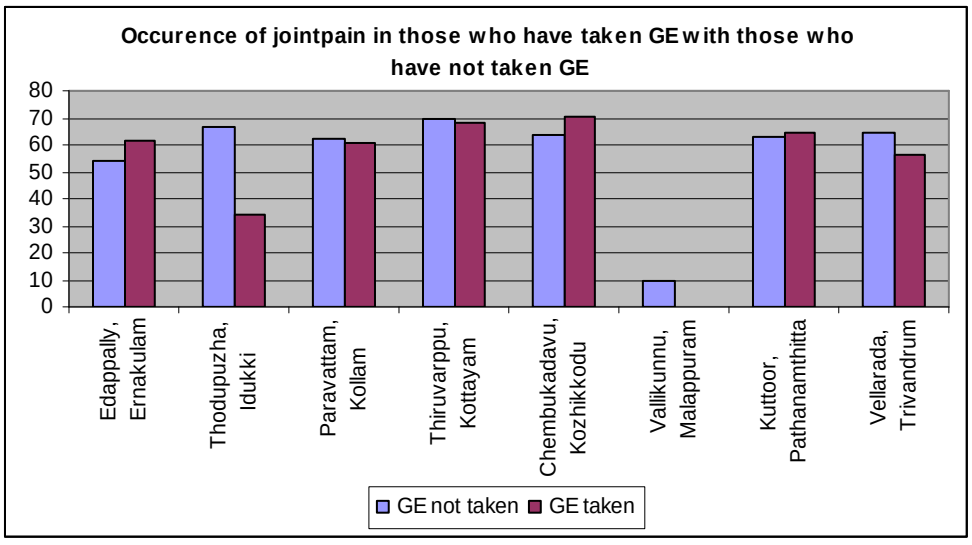
- The protective effect observed was higher in the group who has not taken any other medication with the HE, in 5 survey wards.
- Only in two wards, PE was slightly higher in those who have taken other medication, compared to those who have not taken.

iii. ACTION ON THE COURSE AND OUTCOME OF THE EPIDEMIC

Table 13. Action on the occurrence of Joint pain

No		Joint pain		%		p value
		GE not taken	GE taken	GE not taken	GE taken	
1	Edappally, Ernakulam	37/68	21/34	54.4	**61.8**	0.4785
2	Thodupuzha, Idukki	159/240	102/167	**66.3**	33.8	0.0000*
3	Paravattam, Kollam	25/40	68/112	**62.5**	60.7	0.8414
4	Thiruvarppu, Kottayam	75/108	38/56	**69.4**	67.9	0.8443
5	Chembukadavu, Kozhikkodu	121/191	197/281	63.4	**70.1**	0.1282
6	Vallikunnu, Malappuram	1/10	0/9	Insufficient data		
7	Kuttoor, Pathanamthitta	114/181	58/90	63	**64.4**	0.8218
8	Vellarada, Trivandrum	248/384	49/87	**64.6**	56.3	0.1482

Figure 26.

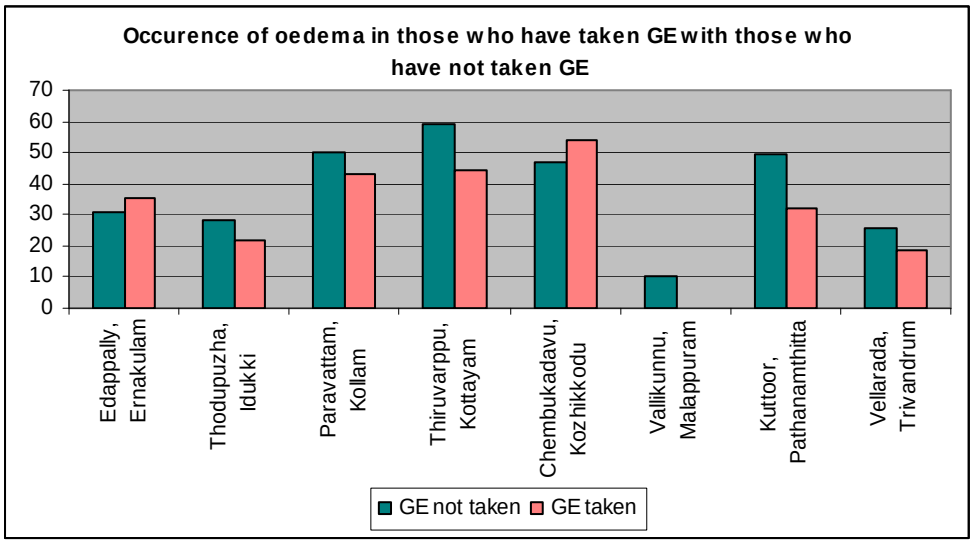


- The percentage of the population who had joint pain was higher in those who have not taken HGE, in 4 survey wards.
- In Ernakulam, Kozhikkodu and Pathanamthitta wards, the percentage was higher in those who have taken the HGE.
- Only in Idukki, the higher % observed in those who have not taken HGE was statistically significant. (p value <0.0000)

Table 14. Action on the occurrence of Oedema

No		Oedema		%		
		GE not taken	GE taken	GE not taken	GE taken	p value
1	Edappally, Ernakulam	21/68	12/34	30.9	35.3	0.6553
2	Thodupuzha, Idukki	68/240	36/131	28.3	21.6	0.1602
3	Paravattam, Kollam	20/40	48/112	50	42.9	0.4395
4	Thiruvarppu, Kottayam	64/108	25/31	59.3	44.6	0.1484
5	Chembukadavu, Kozhikkodu	90/191	151/281	47.1	53.7	0.1598
6	Vallikunnu, Malappuram	1/10	0/9	Insufficient data		
7	Kuttoor, Pathanamthitta	89/181	29/90	49.2	32.2	0.0083*
8	Vellarada, Trivandrum	98/384	16/87	25.5	18.4	0.1633

Figure 27.

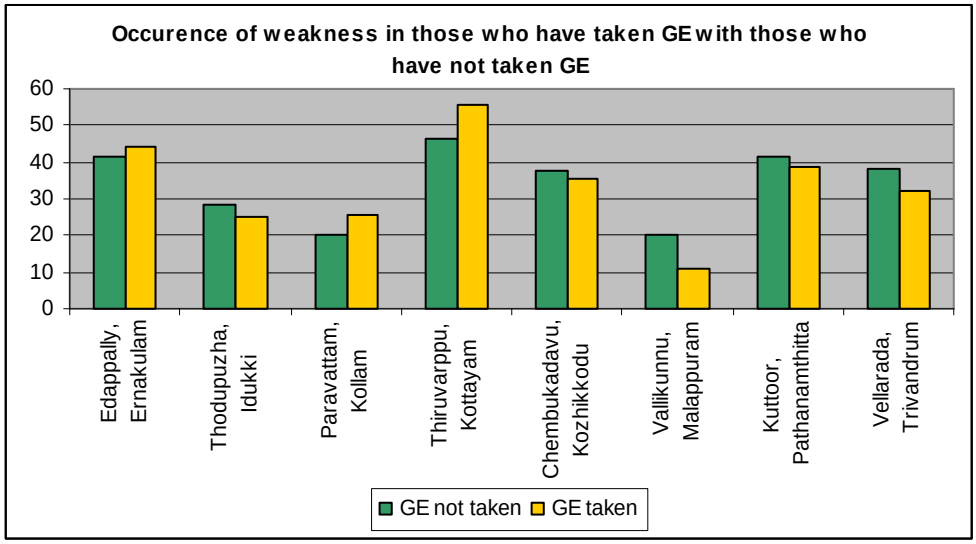


- The percentage of the population who had oedema was higher in those who have not taken HGE, in 5 survey wards.
- In Ernakulam and Kozhikkodu wards, the percentage was higher in those who have taken the HGE.
- Only in Pathanamthitta, the higher % observed in those who have not taken HGE was statistically significant. (p value <0.0083)

Table 15. Action on the occurrence of Weakness

No		Weakness		%		
		GE not taken	GE taken	GE not taken	GE taken	p value
1	Edappally, Ernakulam	28/68	15/34	41.2	**44.1**	0.7804
2	Thodupuzha, Idukki	68/240	42/167	**28.3**	25.1	0.4748
3	Paravattam, Kollam	8/40	29/83	20	**25.9**	0.4742
4	Thiruvarppu, Kottayam	50/108	31/56	46.3	**55.4**	0.2707
5	Chembukadavu, Kozhikkodu	72/191	100/281	**37.7**	35.6	0.6419
6	Vallikunnu, Malappuram	2/10	1/9	Insufficient		
7	Kuttoor, Pathanamthitta	75/181	35/90	**41.4**	38.9	0.6933
8	Vellarada, Trivandrum	146/384	28/87	**38**	32.2	0.3120

Figure 28.

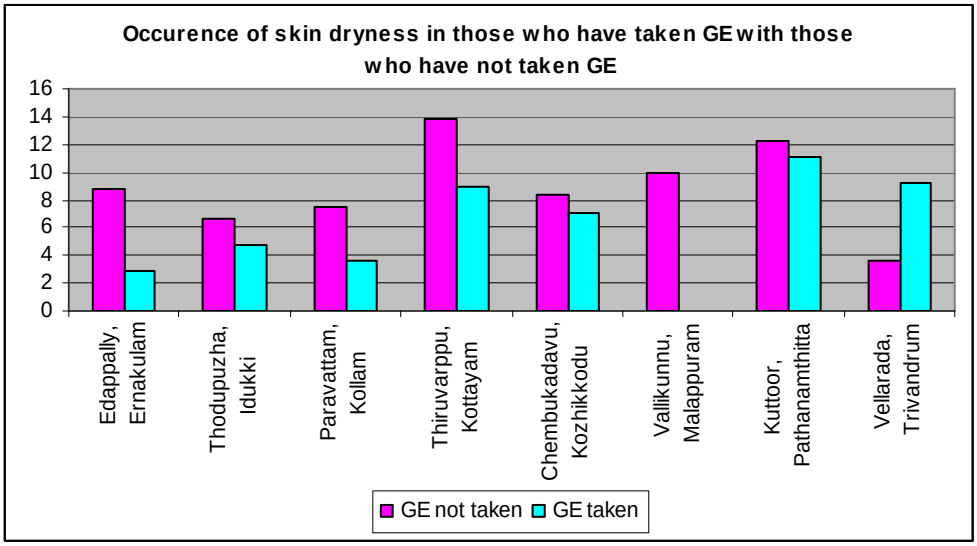


- The percentage of the population who had weakness was higher in those who have not taken HGE, in 4 survey wards.
- In Ernakulam Kollam and Kottayam wards, the percentage was higher in those who have taken the HGE.

Table 16. Action on the occurrence of Dryness of the skin

No		Skin dryness		%		
		GE not taken	GE taken	GE not taken	GE taken	p value
1	Edappally, Ernakulam	6/68	1/34	8.8	2.9	0.0000*
2	Thodupuzha, Idukki	16/240	8/167	6.7	4.8	0.0001*
3	Paravattam, Kollam	3/40	4/112	7.5	3.6	0.0000*
4	Thiruvarppu, Kottayam	15/108	5/51	13.9	8.9	0.0000*
5	Chembukadavu, Kozhikkodu	16/191	20/281	8.4	7.1	0.0012*
6	Vallikunnu, Malappuram	1/10	0/9	Insufficient data		
7	Kuttoor, Pathanamthitta	22/181	10/90	12.2	11.1	0.7920
8	Vellarada, Trivandrum	14/384	8/87	3.6	9.2	0.0000*

Figure 29.

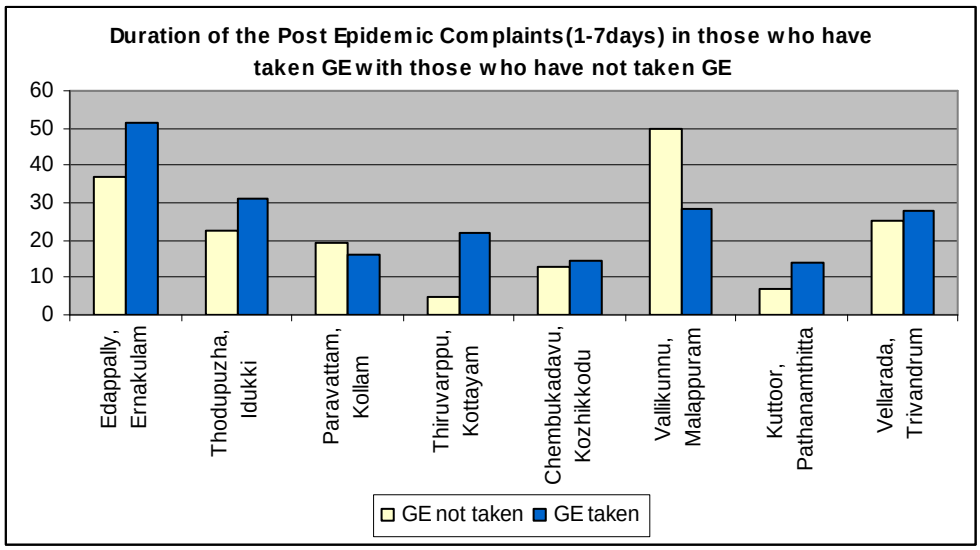


- The percentage of the population who had skin dryness was higher in those who have not taken HGE, in 7 survey wards.
- The values in 7 wards were statistically significant.

Table 17. Duration of the Post Epidemic Symptoms only 1-7 days

No		1-7 days		%		
		GE not taken	GE taken	GE not taken	GE taken	p value
1	Edappally, Ernakulam	21/57	16/31	36.8	51.6	0.1826
2	Thodupuzha, Idukki	49/220	46/149	22.3	30.9	0.0647
3	Paravattam, Kollam	7/36	16/99	19.4	16.2	0.6627
4	Thiruvarppu, Kottayam	4/86	11/50	4.7	22	0.0044
5	Chembukadavu, Kozhikkodu	21/160	35/242	13.1	14.5	0.6918
6	Vallikunnu, Malappuram	3/6	2/7	Insufficient data		
7	Kuttoor, Pathanamthitta	10/141	14/74	7.1	14	0.0000
8	Vellarada, Trivandrum	84/335	19/68	25.1	27.9	0.6297

Figure 30.

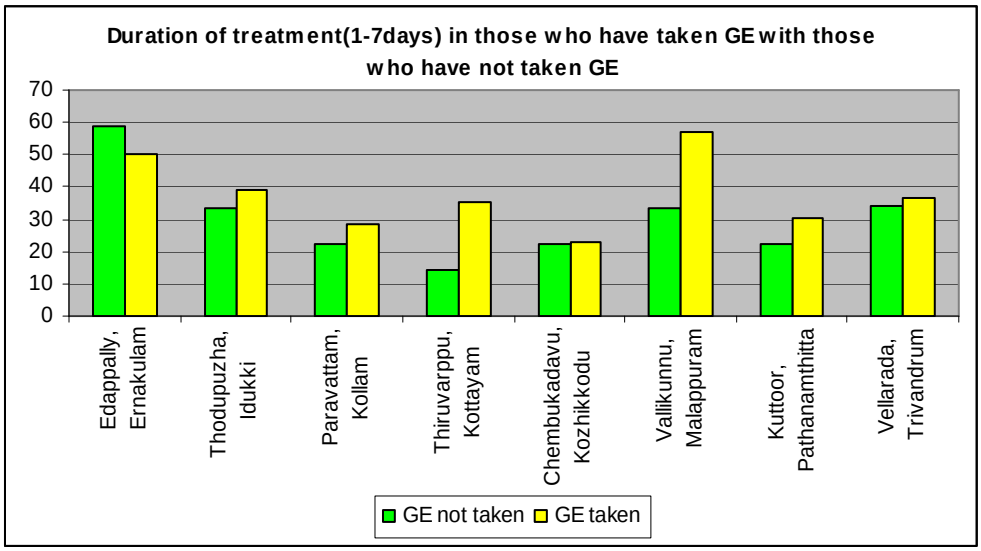


- In 6 wards, the % of population in which post epidemic symptoms remained for only 1-7 days was higher in those who have taken HGE.
- In Kottayam and Pathanamthitta, the difference observed was statistically significant.
- In Kollam and Malappuram, this was higher in those who have not taken HGE.

Table 18. Total duration of treatment only 1-7 days

No		1-7 days		%		
		GE not taken	GE taken	GE not taken	GE taken	p value
1	Edappally, Ernakulam	**37/63**	**16/32**	58.7	**50**	0.4218
2	Thodupuzha, Idukki	**75/224**	**62/159**	**33.5**	39	0.2692
3	Paravattam, Kollam	**8/36**	**29/102**	**22.2**	28.4	0.4714
4	Thiruvarppu, Kottayam	**13/92**	**17/48**	**14.1**	35.4	0.0041
5	Chembukadavu, Kozhikkodu	**35/158**	**58/253**	**22.2**	22.9	0.8690
6	Vallikunnu, Malappuram	**2/6**	**4/7**	Insufficient data		
7	Kuttoor, Pathanamthitta	**34/151**	**25/83**	**22.5**	30.1	0.2014
8	Vellarada, Trivandrum	**122/357**	**28/77**	**34.2**	36.4	0.7130

Figure 31.

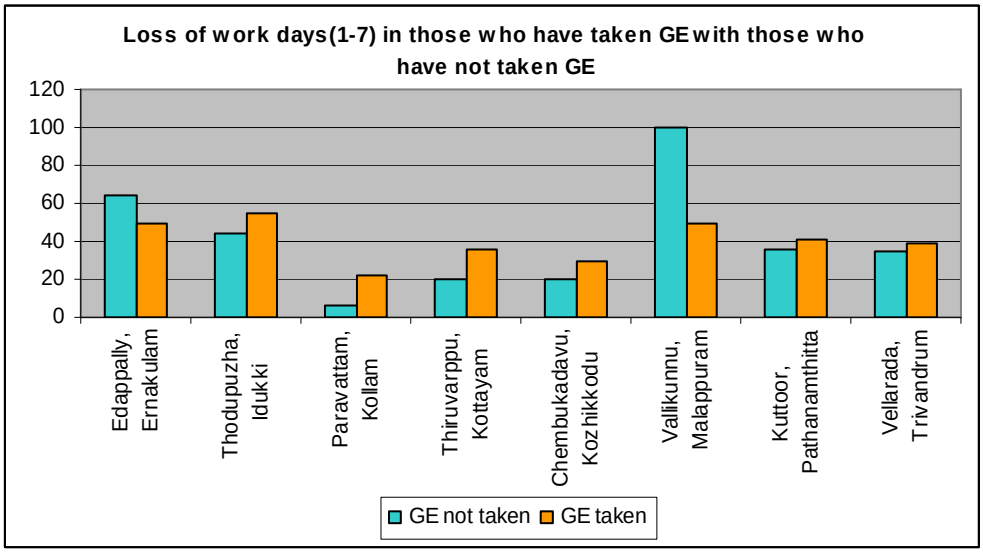


- In 6 wards, the % of population in the duration of complaints was only 1-7 days was higher in those who have taken HGE.
- In Kottayam, the difference observed was statistically significant.
- Only in Ernakulam wards, this was higher in those who have not taken HGE.

Table 19. Total work/study days lost 1-7 days only

No		1-7 days		%		
		GE not taken	GE taken	GE not taken	GE taken	p value
1	Edappally, Ernakulam	**33/51**	**13/26**	64.7	**50**	0.2174
2	Thodupuzha, Idukki	**85/191**	**71/130**	**44.5**	54.6	0.0765
3	Paravattam, Kollam	**2/33**	**20/92**	**6.1**	21.7	0.0001
4	Thiruvarppu, Kottayam	**16/80**	**17/48**	**20**	35.4	0.0622
5	Chembukadavu, Kozhikkodu	**24/118**	**55/189**	**20.3**	29.1	0.0872
6	Vallikunnu, Malappuram	**1/1**	**1/2**	Insufficient data		
7	Kuttoor, Pathanamthitta	**42/117**	**26/64**	**35.9**	40.6	0.5080
8	Vellarada, Trivandrum	**102/295**	**21/54**	**34.6**	38.9	0.5729

Figure 32.

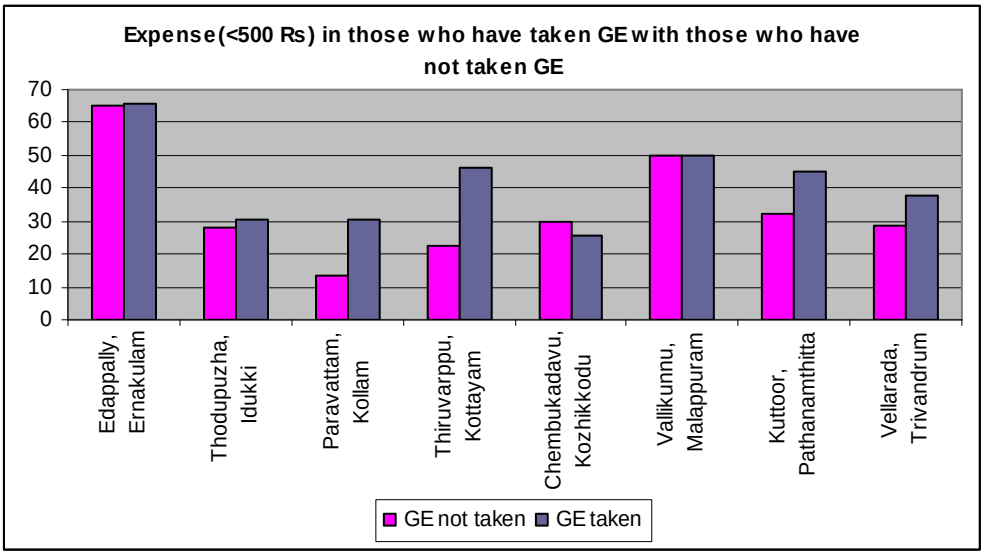


- In 6 wards, the % of population in which the work/study days lost was only 1-7 days was higher in those who have taken HGE.
- In Kollam, the difference observed was statistically significant.
- Only in Ernakulam wards, this was higher in those who have not taken HGE.

Table 20. Total amount spent <Rs 500

No		<500 Rs		%		
		GE not taken	GE taken	GE not taken	GE taken	p value
1	Edappally, Ernakulam	**41/63**	**21/32**	**65.1**	65.6	0.9231
2	Thodupuzha, Idukki	**61/220**	**49/160**	**27.7**	30.6	0.5261
3	Paravattam, Kollam	**5/38**	**30/99**	**13.2**	30.3	0.0423
4	Thiruvarppu, Kottayam	**21/92**	**23/50**	**22.8**	46	0.0054
5	Chembukadavu, Kozhikkodu	**44/148**	**56/219**	29.7	**25.6**	0.4010
6	Vallikunnu, Malappuram	**½**	**3/6**	Insufficient data		
7	Kuttoor, Pathanamthitta	**48/150**	**37/82**	**32**	45.1	0.0506
8	Vellarada, Trivandrum	**100/349**	**29/77**	**28.7**	37.7	0.1217

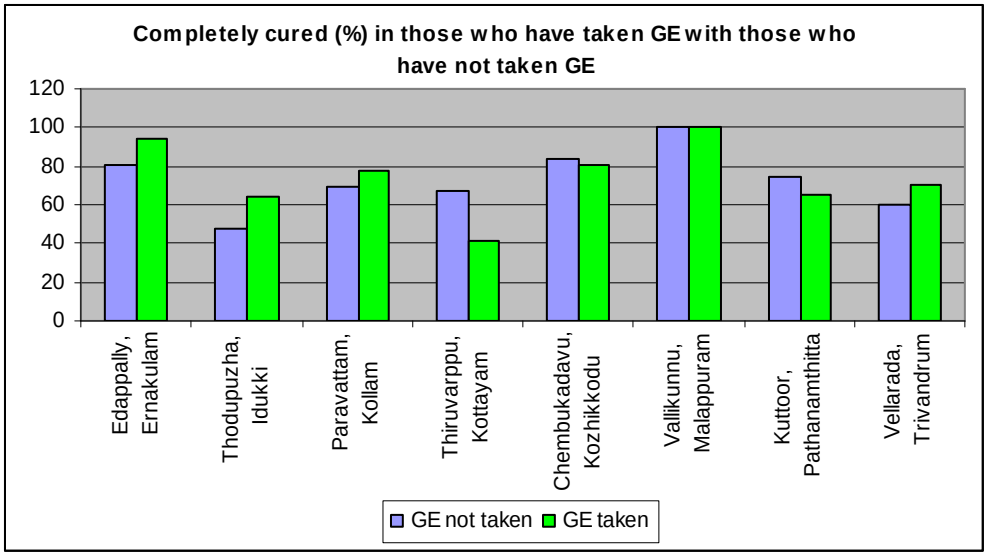
Figure 33.



- The percentage of population who have spend only < Rs 500/- for the treatment was more among those who have taken HGE, in 6 survey wards.
- In Kollam and Kottayam, the difference was statistically significant.
- Only in Kozhikkodu ward, the percentage was more among those who have not taken the HE.

Table 21. Completely cured

No		Cured completely		%		
		GE not taken	GE taken	GE not taken	GE taken	p value
1	Edappally, Ernakulam	**49/61**	**30/32**	**80.3**	93.8	0.0772
2	Thodupuzha, Idukki	**106/224**	**100/157**	**47.3**	63.7	0.0011
3	Paravattam, Kollam	**25/36**	**73/94**	**69.4**	77.7	0.2876
4	Thiruvarppu, Kottayam	**59/88**	**41/50**	67	**41**	0.0035
5	Chembukadavu, Kozhikkodu	**78/93**	**110/136**	83.9	**80.9**	0.5604
6	Vallikunnu, Malappuram	**5/5**	**7/7**	Insufficient data		
7	Kuttoor, Pathanamthitta	**79/106**	**65/75**	74.5	**65**	0.1465
8	Vellarada, Trivandrum	**181/301**	**47/67**	**60.1**	70.1	0.1284



- The percentage of affected population who were cured completely was more in those who have taken the HGE, in 4 survey wards and in Idukki wards, this was statistically significant.
- The percentage of affected population who were cured completely was more in those who have not taken the HGE, in 3 survey wards, with statistical significance in Kottayam.

9. SUMMARY & CONCLUSIONS

Findings

- Baseline characteristics of the survey population, the age and gender was uniformly distributed.
- Body pain, joint pains, headache and backache were the major symptom observed in all the wards; The occurrence of other symptoms such as chills and shivering, oedema, vomiting, cough & cold and skin rashes showed variation in all the wards.
- Average intake of the HGE was 58.86%, for all the survey wards together
- **Overall percentage of protection offered by the GE in all evaluated wards is 76.2% and the average Protection Rate was 73.83%, for all the survey wards together**
- In all the wards, percentage of people protected was more in children under 15 years of age, than those are in the age group 15 & above.
- The PE was more in females in four wards and more in males, in the other 4 wards.
- Percentage of protection was higher in those who have taken the Genus Epidemicus properly, in all the wards, and in 5 wards, this was significant statistically.
- The protection rate observed is higher among those who have not taken any other medication along with the Genus Epidemicus, in 7 wards. In 6 wards, except Idukki ward, the result is highly significant

- The percentage of people protected was more among those who are working indoor, than those who work outdoor, in 6 wards, except Kottayam and Malappuram.
- **In all the survey wards, the odds ratio is less than 1, which indicates that the exposure factor, the Genus Epidemicus has a definite protective effect.**
- **The calculated odds ratios are statistically significant in all the wards.**
- **The average Protective Effect for all the wards is 63.88 % which means that the administration of "homoeopathic genus epidemicus" significantly reduces the risk of epidemic fever by 64 % or in other words, Those who have used "homoeopathic genus epidemicus" are 64 % less likely to develop epidemic fever than those who have not used it.**
- In Ernakulam, Kollam, Malappuram and Trivandrum wards, the protective effect observed was higher than 60%
- Protective effect is higher than the protection rate (% of protection) expressed as % of intake), in all the survey wards.
- In Kollam and Kozhikkodu wards, the difference was more and in Trivandrum, the Protective Effect observed was much higher than the value of Protection rate expressed as % of intake.
- Higher PE was seen in the age group 15 and above, in Ernakulam, Kottayam, Kozhikkodu and Trivandrum wards and in the age group below 15 years, in Idukki, Kollam and Pathanamthitta wards.
- PE was more in females, in 5 wards, and higher in males, in 3 wards, Ernakulam, Kozhikkodu and malalppuram.
- The protective effect observed was higher in the group who has not taken any other medication with the HE, in 5 survey wards.
- The percentage of the population who had joint pain was higher in those who have not taken HGE, in 4 survey wards with statistically significant value in Idukki.
- The percentage of the population who had oedema was higher in those who have not taken HGE, in 5 survey wards and in Pathanamthitta, it was statistically significant.
- The percentage of the population who had weakness was higher in those who have not taken HGE, in 4 survey wards.
- The percentage of the population who had skin dryness was higher in those who have not taken HGE, in 7 survey wards with the values in 7 wards were statistically significant.
- In 6 wards, the % of population in which post epidemic symptoms remained for only 1-7 days was higher in those who have taken HE with significant values in Kottayam and Pathanamthitta wards.
- In 6 wards, the % of population in the duration of complaints was only 1-7 days was higher in those who have taken HE with statistically significant value for Kottayam ward.
- In 6 wards, the % of population in which the work/study days lost was only 1-7 days was higher in those who have taken HE and in Kollam, this showed statistical significance.
- The percentage of population who have spend only < Rs 500/- for the treatment was more among those who have taken HGE, in 6 survey wards and in Kollam and Kottayam, the difference was statistically significant.

- The percentage of affected population who were cured completely was more in those who have taken the HGE, in 4 survey wards and in Idukki wards, this was statistically significant.

Summary of findings

- **The presentation of the less common symptoms of the epidemic varied across the wards.**
- **Average consumption of the HGE was 58.96 %**
- **Average Protection Rate (% of protection) in those who have taken the HGE was 73.83%**
- **The percentage of protection called protection rate is above 60 % for 7 survey wards.**
    - **Protection rate is found to be more in children of age <15, in all wards.**
    - **Protection rate is found to be more in those who had taken it properly.**
    - **Protection rate is found to be more in those who had not taken any other medication.**
- **Definite protective effect, (ie, only if the odds ratio <1), the epidemiological index for preventive efficacy is observed in all 8 survey wards.**
    - **The observed protective effects from all 8 wards show high statistical significance. (p value=<0.00)**
    - **In Ernakulam, Kollam, Malappuram and Trivandrum wards, the protective effect observed was higher than 60%**
    - **Protective effect is higher than the protection rate (% of protection) expressed as % of intake), in all the survey wards.**
    - **Protective effect was more in females and in those who have not taken any other medication, in 5 wards.**
- **Curative action in those who have taken HGE**
    - **Significantly less % developed joint pains in Idukki.**
    - **Significantly less % developed odema in Pathanamthitta ward.**
    - **% who developed skin dryness was less in all wards, with high statistical significance in 7 wards.**
    - **Duration of epidemic symptoms was significantly less in Kottayam ward.**
    - **Duration of post epidemic symptoms was significantly less in Kottayam and Pathanamthitta.**
    - **The expense on the medicine was significantly less in Kollam and Kottayam**
    - **Higher proportion of complete cure was significant in Idukki ward.**

10. **LIMITATIONS**

- Due lack of man power and resources the survey was limited to the purposively selected wards.

- Lack of effective machinery to initiate the distribution of GE in affected area was a major set back.
- Lack of good monitoring and surveillance system associated with existing homoeopathic services affected the distribution.
- Instructions regarding dietary restrictions to be followed while taking the medicines were not given effectively, due to lack of time at the emergency.
- Socio economic impact of this illness was not studied in the current survey.
- Variations in the dose and frequency were also not taken into consideration because of the very less time available for action during the epidemic.

11. **DISCUSSION**

Protection rate (% of protection)

The average % of protection observed in the group who has taken Homoeopathic Genus Epidemicus was very high which shows that 73.83% of those who have taken the HGE were protected from developing the epidemic fever. There were other factors like mosquito control measures which also contributed to the protection in the group who had taken the HGE. But subgroup analysis showed that protection rate is more in children <5, those who had taken the HGE properly and also in those who have not taken other medication. This clearly points towards the action of the HGE being the main factor of protection.

This value gives an estimate of the protection considering only those who have taken the HGE. But the index does not compare the % of those who have not taken the HGE. Hence the protective effect was calculated from the odds ratio.

Protective Effect

Protective effect showed the action of the HGE as compared to the group which have not taken the HGE. For calculating protective effect, odds ratios were calculated for each ward which gives the ratio of the odds for the factor (HGE) in the group which consumed HGE to the odds in the group which has not consumed HGE. The odds ratio gives a value less than “1”, when the factor is not a risk factor. Odds ratio <1 shows that the factor has a protective effect on the development of the epidemic.

The odds ratios calculated for all wards were less than “1”, showing that the HGE had a definite protective action in all these wards. And all these values of odds ratios were statistically significant. The average Protective Effect for all the wards is 63.88 % which means that the administration of “homoeopathic genus epidemicus” significantly reduced the risk of epidemic fever by 64%. It should be noted that this high protective effect was achieved with only 58.96% of consumption of the HGE.

% of protection out of the % of consumption compared to Protective effect

Protective effect is higher than the protection rate (% of protection) expressed as % intake), in all the survey wards.

Curative action of the HGE

The Homoeopathic Genus Epidemicus, although administered in the prophylactic dose, had a curative action in those who were already affected by the epidemic. Many of the symptoms were significantly reduced in those who have consumed the HGE. Other advantages of reduction of duration, post epidemic symptoms, less expense, less work days lost were also attributable to the HGE which require further studies validate it.

These observations clearly prove the high protective efficacy of the Homoeopathic Genus Epidemicus administered during the fever epidemic in Kerala. Hence this should be recommended during any such epidemic outbreaks in future.

12. **RECOMMENDATIONS**

- The use of Homoeopathic Genus Epidemicus should be well promoted and made available for any epidemic outbreaks.
- Immediate measures to be taken for the RAECH to be equipped with proper infrastructure, resources and well defined Emergency Preparedness Plan.
- Establish a good monitoring and surveillance system under RAECH with necessary software support.
- Ensure proper and prompt transmission of data related to epidemic from different health care systems to RAECH.
- Conduct research studies under RAECH to further explore the action of the Homoeopathic medicine at various conditions.
- Regular trainings for doctors and paramedical staff to effectively involve in epidemic control activities.
- Develop and maintain proper guidelines to be followed during emergency, regarding quality control measures and decision about the dosage.
- Priority to be given to conduct the awareness programme, develop brochures , multimedia and interactive CDs' to students and public regarding the preventive aspect in general and the role of Homoeopathy
- Quality control of medicines and its supply during epidemics should be ensured
- Further studies needed
    - to explore the effectiveness of the Homoeopathic Genus Epidemicus
    - to develop clinical criteria for ascertainment of the individual susceptibility which is the basis for selection of dosage.
    - To determine the requirement of a booster dose for a long lasting immunity after the epidemic.
    - to assess the uniqueness and generalisability of the nature of epidemics and its relationship with selection of GE.
    - to explore the possibility of predetermination GE for different expected outbreaks
    - to find out the possible action of specific medicines and nosodes for prophylaxis.
    - to explore factors confounding the action of the GE.

- to determine Cost Effectiveness of the Homoeopathic Genus Epidemicus.