

Chikungunya Preventative Spray in a Village of South India

Summary of Insect Disease Vectors Survey:

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Auroville. Tamilnadu - India

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BACKGROUND:

An outbreak of Chikungunya Fever transmitted by *Aedes sp.* mosquito, erupted in the area around Auroville, Tamil Nadu India, in 2006. In efforts to prevent the spread of this disease, a Probiotics spray was formulated and sprayed once a month for six months on the homes and outside areas in the village of Kulapalayam for 2,455 people. The spray started in August 1st, 2007 and finalizes in January, 2008.

A survey was designed to find both the villagers' response to the spray and the spray's effectiveness. Edayanchavadi, a village with a similar population in the same area, was also affected by Chikungunya Fever but did not receive the Probiotics spray. A separate survey was conducted in this village and survey results from both villages were compared to deduce whether the Probiotics spray was effective.

The surveys were randomly conducted by going from door to door in separate parts of the village, as well as by meeting with different youth and women's groups. The surveys represent 9.6% of the total population Kulapalayam; and 10.94% of the total population of Edayanchavadi.

- Data from Auroville Health Centre and Sub-centers shows that Chikungunya cases began in September of 2006 when it was recognized as an epidemic. The following data was collected from the 5 subcentres at the end of 2006:

Village	September	October	November	December	Total
Edayanchavady	77	72	58	18	225
Puthurai	23	27	39	32	121
Rayapudupakkam	9	23	31	40	103
Thuruvai	34	62	90	47	239
Kottakarai	4	15	29	39	87
Total	147	199	274	176	775

- The number of Chikungunya cases diagnosed in the Auroville Health Centre for the year of 2006 was 441, these came mainly from Kulapalayam and some cases were from Auroville.
- Chikungunya cases recorded at the Auroville Health Centre for the year 2007:

January 2007	56
February 2007	38
March 2007	42

- Estimated costs/patient to be treated for each disease, noting that they all fluctuate on a case by case basis:

Dengue	Up to Rs 10,000- 15,000
Malaria	Maximum Rs 200-300
Chikungunya	Rs 2,000-5,000

AIMS OF THE SURVEY:

Villagers in Kuilapalayam were asked

- What the spray was for
- If they thought the spray was successful
- If they were happy about the spraying
- If they wanted the spraying to continue

Villagers in Edayanchavadi were asked

- How they controlled the mosquito menace
- What else could do around their homes for mosquito prevention
- If they were interested in having their homes organically sprayed

INFORMATION GATHERED:

I. 47 surveys were conducted in Kuilapalayam.

- There was mixed understanding about how the spray worked. Many people thought that it was supposed to kill all mosquitoes, while others understood that it was mainly designed to prevent the transmission of disease from one kind of mosquito.
- 24 of 47 people (51%) said that the spray was successful, 10 (21%) said that the spray was marginally effective, it worked for a few weeks but then the mosquitoes returned, 9 (19%) said that they did not know, or that there was no change, and 4 (9%) said that it was ineffective. See Figure 1.
- Every participant, but one, said that they were happy about the spray (98%). One participant (2%) said that they felt indifferent.
- Every participant, but one said that they wanted spraying to continue. 11 (23%) suggested that the spraying be more frequent, and 7 (15%) said that they wanted more spray to be used or that they wanted the spray to be more potent. One person wanted the spraying to stop (2%)

II. Villagers in both Edayanchavadi and Kuilapalayam were asked about the number of adults and children in their households

III Villagers reported the numbers of Chikungunya cases in their households in 2006 and 2007.

Figure 1. Effectiveness (%) of Insect Disease Vector spray in Kuilapalayam

Spray Effectiveness (%) in Kuilapalayam

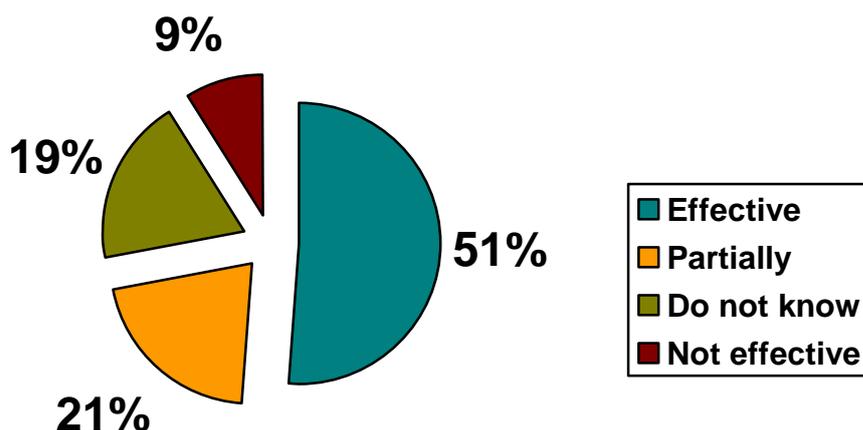


Table No.1. Basic data on families interviewed

	Kuilapalayam	Edayanchavadi
Total household members	280	297
Total children (under 18)	90	74
Total adults	189	223
Total # surveys	47	58

Table No.2. Chinkungunya cases based in total village population.

	Kuilapalayam	Edayanchavadi
# cases in 2006	65%	88%
# cases in 2007	8%	14%

IV Surrounding conditions

- In Kuilapalayam 28% people had stagnant water near by their homes.
- In Edayanchavadi 38% people commented on water around their homes. Many weren't interviewed at their homes, so it is possible that the stagnant water problem is larger that reported.

Additionally, in both villages, garbage heaps and thick vegetation and cattle were also commented on as increasing the mosquito problem.

V External patterns

Villagers were also questioned as to what whether they had any family members traveling to areas outside of the Auroville/Pondicherry area.

- About 5% of family members traveled in Kuilapalayam
 - About 4% of family members traveled in Edayanchavadi
- Chennai was the most frequent location of travel, followed by Hyderabad.

CONCLUSIONS

The survey showed that Chikungunya Virus severely affected both Kuilapalayam and Edayanchavadi in 2006. Both in 2006 and 2007 the Chikungunya epidemic was more severe in Edayanchavadi. Information from the Auroville Costal Development Center and commentary from the survey participants suggests that public sanitation issues, namely the presence of stagnant water in streets and surrounding homes, are a large problem for these villages. This waste water provides an excellent habitat for mosquito larvae and leads directly to proliferation of mosquitoes that are vectors to dangerous diseases such as Chikungunya. Edayanchavadi appears to have more waste water, likewise the incidence of Chikungunya was much higher in this area.

Because the incidence of Chikungunya in Kuilapalayam was much less than in Edayanchavadi in 2007, it is difficult to deduce the effectiveness of the spray by comparing these two villages. However, the response to the Probiotic spray in Kuilapalayam was overall very positive. The vast majority of villagers in Kuilapalayam are happy about the spraying and they want it to continue.

Survey data shows that incidence of Chikungunya Virus has less from 2006 to 2007 in both villages. Survey data shows that incidence of Chikungunya Virus was 33.33% less in Kuilapalayam than in Edayanchavadi in 2007. This suggests that the spray shows prevention on insect disease vectors. The incidence of the disease in terms of ratio between Kuilapalayam/Edayanchavadi for 2006 was 1:1.35 and in the meantime for 2007 was 1:1.8; then had a control on the area sprayed. More studies have to be carried out to determine the overall effectiveness of the Probiotic spray in the coming years.

Villagers in Kuilapalayam explained, the village would benefit from more frequent spraying of the Probiotic spray. Along with fighting the disease on a physical level, the Probiotic spray helped raise Chikungunya awareness in the surrounding area.

In addition to continuing the spray, Chikungunya prevention campaigns should include instructions on how to keep the area in and around one's home clean and dry. By educating people on the benefits of removing garbage heaps and waste water from the areas around their homes and offering practical solutions on how to do so, mosquito habitats can be greatly reduced.

REFERENCES

- Banerjee K, Mourya DT, Malunekar AS. Susceptibility and transmissibility of different strains of *Aedes aegypti* mosquitoes to Chikungunya virus. *Indian J Med Res* 1988; 87 : 134-8.
- Correa, M. Preliminary report on organic malaria control using Probiotic. 2005;1-8.
- Mourya DT, Malunekar AS, Banerjee K. Susceptibility and transmissibility of *Aedes aegypti* to four strains of Chikungunya virus. *Indian J Med Res* 1987; 86 : 185-90.
- N. Gopal Raj. Chikungunya: where did this disease come from? *The Hindu*, Nov 27, 2007.

ANNEXURES

I. Auroville Coastal Development Center information on Basic Data Village-wise

	Kuilapalayam	Edayanchavadi
Population	2455	2651
Females	1220	1347
Males	1235	1304
Water		
Available water	90,000 liters	2,56,000 liters
Common Taps	20	60
Individual Taps	220	375
Toilets		
Common Toilets	3	6
Individual Toilets	110	200
Health Care	Auroville Health Center	CAV subcenter (one doctor)
	Free hospital care in Pondy and Gov. Hospital	Free hospital care in Pondy and Gov. Hospital
Main occupations	Agriculture, Auroville	Agriculture, Auroville
Punchayat	Bommaipalayam	Irumbai
Leader	Prema	Saraswathi
Vice President	Datchinamorthy	Nagappan
Common Facilities	Higher Secondary School Public Toilets HC Panchayat Office Village AO Office Bank Dental Clinic	Middle School (93 students) Public toilets Police station
Needs	Police Station Drainage More Water Tanks (in progress) Pond and 4 Wells Deepened	Proper streets
Electricity	30 one bulb systems	26 one bulb systems

Information from Jerald Morris at Auroville Coastal Development Center and Sendhil in a meeting on December 4th 2007.

All data is recent, most was collected in September 2007, and some is 10-12 months old.

Jerald Morris estimates that a family's average income in either village is about Rs3,000-5,000 a month. Also the villages are roughly the same size with 500-550 families a piece. He says that sanitation management was attempted but the government interfered and collects garbage now, though most families cannot afford it. This means heaps of waste is dumped in open lots and on the periphery of the village.

II. Survey form for each village (Kuilapalayam and Edanchavady)

Control of Insect Disease Vectors – SURVEY in Kuilapalayam

Name of Participant:

Family Name

Date: No. Members in the family ___ Adults _____ Children _____

Village:

Area Sprayed (Description):

1. Do you understand the purpose of spraying? Explain.

Yes No

Comments _____

2. Was spraying successful, were there fewer cases of fever in your area? Explain.

Yes No

3. How many cases of Chikungunya were in your household last year, in 2006?

4. How many cases of Chikungunya were in your household this year, in 2007?

5. Are you happy with the spraying?

Yes No

6. Do you want the spraying to continue?

Yes No

if yes, would you be willing to contribute financially to continue the spraying?

Yes No Comments _____

7. Is there any member of the family traveling to areas currently not covered by the spray (Outside of AV)?

Yes No

If yes, which place?

8. Do you have any Comments or Suggestions?

Control of Insect Disease Vectors – SURVEY in Edayanchavadi

Name of Participant:

Family Name

Date: _____ No. Members in the family ___ Adults _____ Children _____

1. How many cases of Chikungunya were in your household last year, in 2006?

2. How many cases of Chikungunya were in your household this year, in 2007?

3. Is there any member of the family traveling to areas currently not covered by the spray (Outside of AV)?

Yes No

If yes, which place?

4. What do you do to control mosquitoes around your home?

5. What else could be done in your area to control mosquitoes? Any Comments?

6. Would you be interested in having the area around your home sprayed with a natural solution to help control the spread of disease through mosquitoes?

Yes No

Do you have any Comments or Suggestions?

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