

## A web based relational database management system for filariasis control

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### Abstract:

The present study describes a RDBMS (relational database management system) for the effective management of Filariasis, a vector borne disease. Filariasis infects 120 million people from 83 countries. The possible re-emergence of the disease and the complexity of existing control programs warrant the development of new strategies. A database containing comprehensive data associated with filariasis finds utility in disease control. We have developed a database containing information on the socio-economic status of patients, mosquito collection procedures, mosquito dissection data, filariasis survey report and mass blood data. The database can be searched using a user friendly web interface.

**Keywords:** Filariasis; web-based; RDBMS; control measures; disease management

**Availability:** <http://www.webfil.org> (login and password can be obtained from the authors)

### Background:

Filariasis is a serious public health problem. [1] It is one of the leading causes of disability in 48 million people from the Indian sub-continent. The annual economic loss due to filariasis burden is huge. [2, 3] The disease is caused by nematode worms *Wuchereria bancrofti*, *Brugia malayi* and *Brugia timori* transmitted by female mosquitoes *Culex*, *Anopheles*, *Mansoniids* and others. [3] The NFCP (National Filaria Control Programme) was launched in India during 1955. However, the NFGP showed limited progress due to lack of skilled manpower, inadequate funding, improper estimation of vector/disease transmission rates, improper implementation of control programmes and ineffective communication between the field workers and health administrators. [4, 5] Hence, a database is necessary to identify parameters representing the spread of the disease. This will help in the design of effective control strategies. Here, we describe a database containing information on filariasis.

### Methodology:

#### Dataset:

The epidemiology, entomology and socio-economic data associated with filariasis were collected from 45 rural areas in the Indian state of Andhra Pradesh during 1998 to 2001.

### Database Interface:

The database can be accessed using login and password obtained from the authors. The interface helps to search the database based on epidemiological, entomological and socio-economical parameters (Figure 1A).

### Database design:

The database consists of two suites, namely, (1) data entry suite, and (2) report generation suite. The data entry suite contains ADD, MODIFY, DELETE and SEARCH options for effective and easy update.

### Data entry suite:

Data entry is feasible for socio-economic data (serial number, date, village, taluk, district, unit name, sex, age, affected organ, occupation, family background, filariasis awareness, mosquito avoidance, water supply, structure of house, presence of animals, habitat, number of earning members of the family, average income and education status of parents), mosquito collection data (adult mosquito count, species name, type of catching stations (random/fixed), total collection, time spent, male mosquitoes number, females mosquitoes number, and density per 10 man hour (10MHD)), mosquito dissection data (infection rate and infectivity rate), filariasis survey (disease rate) and mass blood survey (micro-filarial rate in night blood).

10MHD is calculated as (total female mosquitoes collected/time spent)\*10. The infection rate and infectivity rate is defined as (female mosquitoes (*Culex quinquefasciatus*) with all stages of larvae/total mosquitoes dissected)\*100 and (female mosquitoes (*Culex quinquefasciatus*) with III stage of larvae/total mosquitoes dissected)\*100, respectively. Disease rate is estimated as (total diseased/total sampled)\*100. Micro-filarial rate is defined as (positive blood samples/total blood samples collected)\*100.

The screenshot shows two parts of the web database. Part (A) is the login interface, which includes a navigation menu with options like 'Socio Economic Details', 'Mosquito Collection Details', 'Mosquito Dissection Details', 'Filariasis Survey', 'Mass Blood Survey', 'Lymphatic Filariasis Database', and 'Reports'. Below the menu is a header for the 'Database Management System for the Integrated Control of Bancroftian Filariasis in East and West Godavari Districts of Andhra Pradesh'. A login form with 'User Name' and 'Password' fields and 'Submit' and 'Reset' buttons is visible. Part (B) is a report titled 'EFFECT OF STRUCTURE OF HOUSE ON PREVALENCE OF DISEASE' for 'UNIT WISE DETAILS OF EAST GODAVARI DISTRICT' dated '29 April 2005'. The report contains a table with columns for 'DISTRICT', 'UNIT', 'HUT', 'RCC', 'THATCHED', and 'TILED'.

DISTRICT	UNIT	HUT	RCC	THATCHED	TILED
<b>AUGUST 1998</b>					
East Godavari	AMALAPURAM	9	6	0	7
		40.91%	27.27%	0.00%	31.82%
East Godavari	KAKINADA	7	17	0	20
		15.91%	38.64%	0.00%	45.45%
East Godavari	PEDDAPURAM	20	9	0	55
		23.81%	10.71%	0.00%	65.48%
East Godavari	PITHAPURAM	15	1	0	21
		40.54%	2.70%	0.00%	56.76%
East Godavari	R.C.PURAM	0	4	2	4
		0.00%	40.00%	20.00%	40.00%
East Godavari	RAJAHMUNDRY	7	10	0	13
		22.22%	33.33%	0.00%	49.22%

Figure 1: A web database for filariasis management. (A) web interface, (B) report generated in the database.

### Report generation suite:

The database facilitates the generation of a report consisting of several information in the database according to the input parameters selected by the user (Figure 1B).

### Utility:

The RDBMS system for filariasis is critical for the understanding of vector dynamics towards disease management. This will help to develop effective control programs. We propose to develop similar RDBMS system for diseases like Malaria, Japanese encephalitis, Dengue and others.

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