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WIRELESS TECHNOLOGY IN SERVICE OF SOCIETY- A CASE STUDY OF SNAKEBITE

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ABSTRACT

Information communication System plays an important role in the lives of affected Patients of snakebites. The information systems can be developed which may help to the mankind in emergency by transferring data. The paper explains the present scenario of Snake bite patients status in the selected sensitive area in the rural Maharashtra. Survey shows that, the unsatisfactory picture of lack of communication system for assistance to the affected patients and their further treatment by the hospitals. The paper suggests the Global Positioning System (GPS) Enabled computing model and the usage of Wireless Technology. The literature survey shows that, such model may be the need in snake bite affected areas. The Computing model based on the wireless technology is also useful for making awareness by sharing the information about the prevention of snake bites and the treatments as first Aid to the community and how does the data about the victim can be made available and communicated to the further centers such as hospitals. We mentioned here the advantages and the limitations of the proposed computing model.

The **Objective** behind the paper is to make use of Information Communication Technology (ICT) to inculcate the awareness & provide services about prevention of snakebite and treatment directly through mobile communication system. **Method:** A prospective analytical study method is used to assess various risk factors associated with snakebite. **Outcome of the study**: The paper shows the communication delays between snakebite patient and hospitals that can be overcome by using wireless technology.

Keywords: GPS, Information System, Wireless Communication, Computing Model, ICT, Prevention of Snakebite, Community.

INTRODUCTION

Snakebite is an important and serious problem in rural Maharashtra. India having 216 species of snakes out of that only 52 species of snakes are poisonous [3,5]. The time interval between snakebite and initiation of treatment is more than 6 hrs. Public Health Care centers limits the communication and information tools of IT Infrastructure. It is found that there is no proper reporting system due to underutilization of information and communication facility to report about the snakebite victim for immediate treatment. It has been observed that the snakebite patients death has been occurred even in the presence of advanced communication technology. It is due to absence of emergency treatment to the patients. Whenever any patient has suffered by the snakebite in the rural area, it has been seen that most of the cases are dead due to lack of communication between patient and treatment system i.e. hospitals. This paper

focus on the use of ICT in snakebite cases in rural Maharashtra [1]. We observed that the snakebite cases admitted [2] and referred for higher hospitals due to the unavailability of antisnake venom (ASV) that would increase the chances of uncertainty. The paper suggests a proposed computing model to help and report the location and the instant availability of the antisnake venom.

RESEARCH METHODOLOGY

Snakebite sample cases were collected and studied from the Department of the Dr Shankarrao Chavan Government Medical College and Hospital, Vazirabad, Nanded District, Maharashtra State, India are shown in Table 1.

Table 1: Snake bites cases per year from 2000-2010

Year	Snakebite cases	Death from snake bite	Percentage (%)
2000	460	29	6.30
2001	570	34	5.96
2002	540	33	6.11
2003	609	27	4.43
2004	645	34	5.27
2005	545	25	4.59
2006	625	23	3.68
2007	603	29	4.81
2008	438	14	3.20
2009	450	22	4.89
2010	427	20	4.68
Total	**5997**	**290**	**53.92**

Table 1 shows that, the average death of snakebite patients is 4.90% of total snakebite cases admitted.

Graph 1: Snakebite Patients Vs Death of Patients

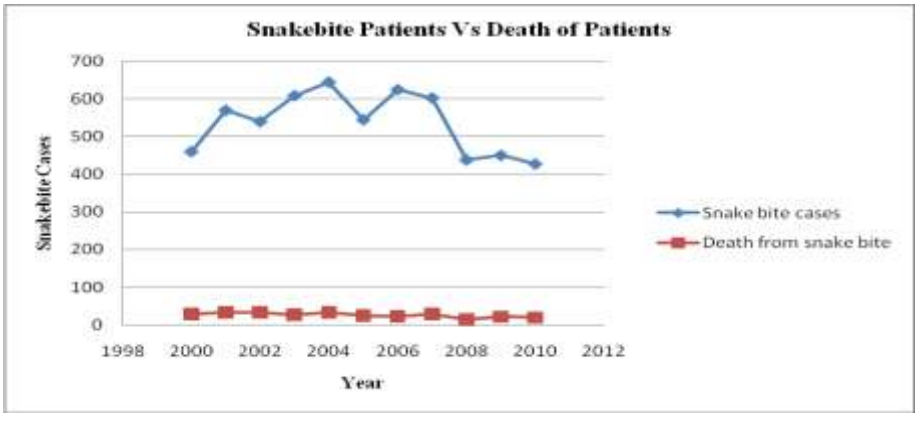
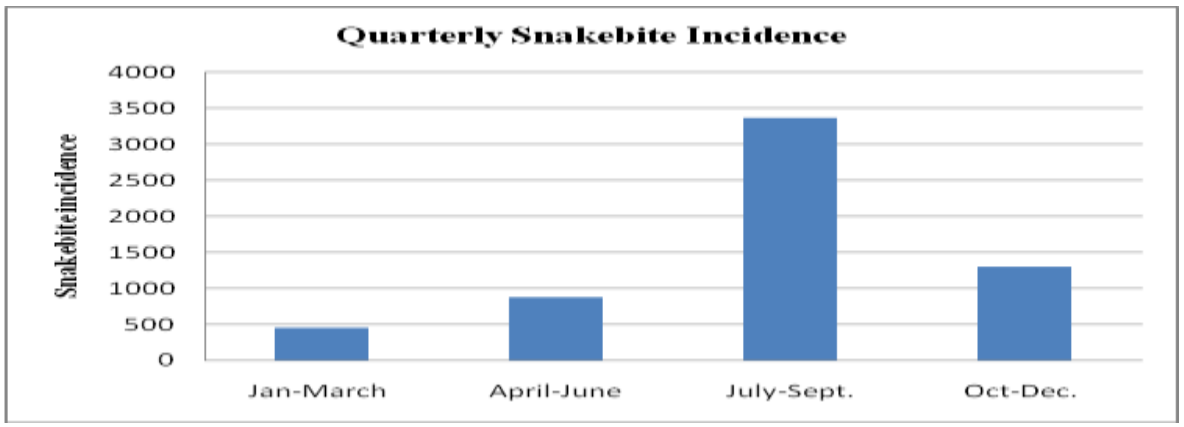


Table 2: Quarterly Snake bite Incidence in 2000-2010 yrs

Sr. No.	Month (2000-2010)	Total Cases	Percentage(%)
1	Jan-March	450	7.50
2	April-June	870	14.51
3	July-Sept.	3372	56.23
4	Oct-Dec.	1305	21.76
Total		**5997**	**100**

Table 2 shows the quarterly snakebite incidence occurred in rural area of Nanded District in Maharashtra, India

Graph 2: Quarterly Snakebite Incidence



WIRELESS COMPUTING MODEL HELPS IN TREATMENT OF SNAKE BITES

Internal Mechanism of RAC(Rural Assistance Center) Computing System:

Incoming call (toll free call) coming from GPS enabled handset [6,11] to RAC computing system is handled by GPS Tracking system to track the location otherwise handled by auto response machine to capture the name ,address, query information and store into the database . A software based knowledge management accept the general description of snakebite to find out the type of snakebite and then after further processing it, display the data about the antisnake venom [4] and nearest location of the hospital to get the immediate treatment. This data is forwarded to the caller, District Health Office (DHO) and Tahsil Health Office (THO) for further processing to get immediate treatment to save the life of snakebite victim

Fig. 1 : Ambulance having GPS Tracking System

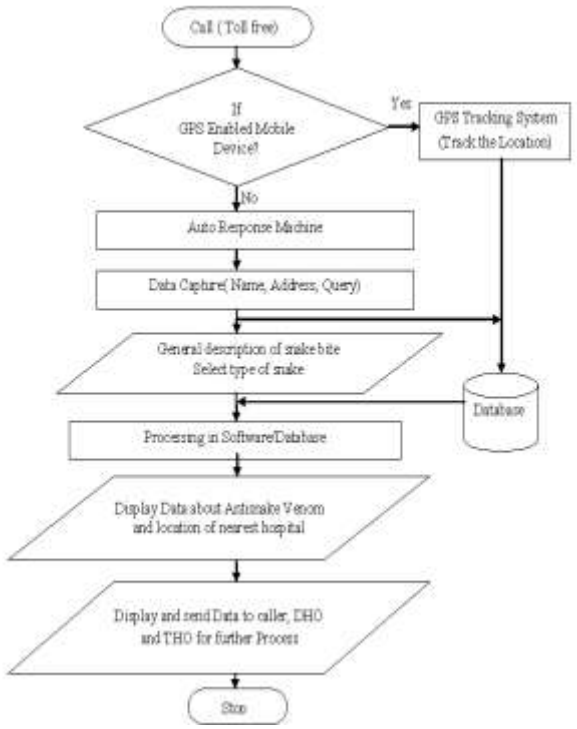


Fig. 2 Flow Diagram : Internal working of RAC (Rural Assistance Center)

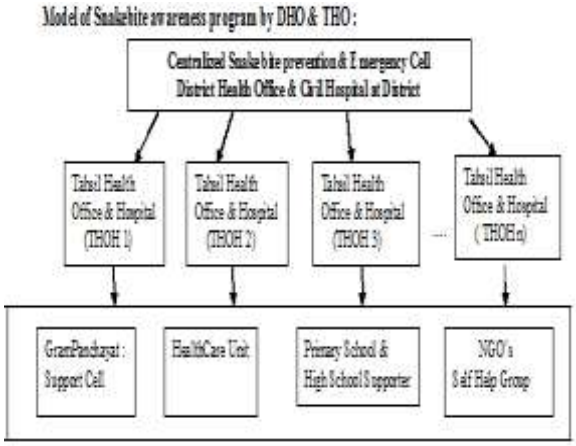


Fig 3: Developing awareness among the population through RAC (Rural Assistance Center)

Working

Rural Assistance Center (RAC) is one of the GPS and Web based information cell which shares the information about snakebite prevention programmes and awareness amongst the local users about snakebites and its adverse impact communicated through using ICT based Wireless Computing Model.

RAC interact with the following Units :

i) Local Self Help Group
ii) Farmers
iii) GramPanchayat
iv) Emergency Services and Ambulance
v) Victims: Affected Users
vi) Local Teachers and Volunteers
vii) District & Tahsil Administration
viii) Research Institutions

GPS Enabled RAC comprises a web based Computing Information Systems which is a combination of two heterogeneous technologies viz. Information Communication Technology (ICT) [8] and Medical Technology (MT). RAC must work under the control of Regional Healthcare Center in association with the above mentioned components.

Roles and Responsibilities of RAC Units

i) Local Self Help Group:

The Local self help group must be trained with the primary treatment (First Aid) given after the snakebite immediately. The Local self help group should contain two senior women members, two farmers and a snake friend as a young farmer. The Regional Health Center in association with research institution and district and Tahsil administration should provide the training of this computing system and give the updated information to the local self help group through RAC. When any snakebite incident happens then a member of Local Self Help Group should be use this system and informed so that in emergency

ii) Farmers

The farmers should be aware by the RAC with the help of Gramapanchyat Authority and Trained Teacher through Awareness Programme about Prevention of Snake bite and First Aid Treatment through Web application of RAC. These trained farmers should convey and share these information and precautions amongst the

community. The RAC should display the important and Emergency mobile [7] numbers of close by and local hospitals which provide treatment of Snake bite affected patients. In emergency the farmer should contact the above said emergency numbers and follow their instructions.

iii) Grampanchyat

The Grampanchyat authority (GRamsevek – Govt. Officio) should display the pictorial information prevention and types of snakes and basic First Aid Treatments through posters. Conduct awareness Programmes with the help of School and High Trained Teachers to the students as well as farmers in the village through interacting with the RAC system

iv) Emergency Services and Ambulance (ESA)

Emergency Services and Ambulance (ESA) should be made available by Civil Surgeon and Medical Officer through closest Primary Health Centers. They should display about various types of Snakes and their Symptoms. They should have 24x7x366 emergency ambulance service which will work with RAC computing system through Wireless Technology [9]. The Ambulance should be wireless technology based well equipped with few support of Antisnake venom. When the Emergency cell receive any phone call or instruction from RAC computing system about snakebite patient then it is their responsibility to follow the case through GPS tracking system and support to the victim so as to save the life.

v) Victims: Affected Person

Victims or Relatives should just dial the toll free number of RAC Computing system and follow the instruction and use the data and information given by the RAC Computing System.

vi) District & Tahsil Health Administration

District Health Administration has to establish the Emergency Cell regarding the Snake bite treatments through Tahsil in association with the Medical Research Institutions and Private Hospitals. It is now the Tahsil Health Administration who should also plan and execute the instructions received from the District for the prevention and treatment of snakebite patients in the villages. RAC computing system should be controlled by the Regional Health and District Health Administration by providing the updating medical information related to antisnake venom.

vii) Research Institutions

The Research institutions has to share the Innovative information about prevention and First aid treatments, post medical treatments by making the use of locally available resources and advanced technology. Research Institutions must provide the information about advanced medicines (Antisnake venom) to the RAC and update it regularly.

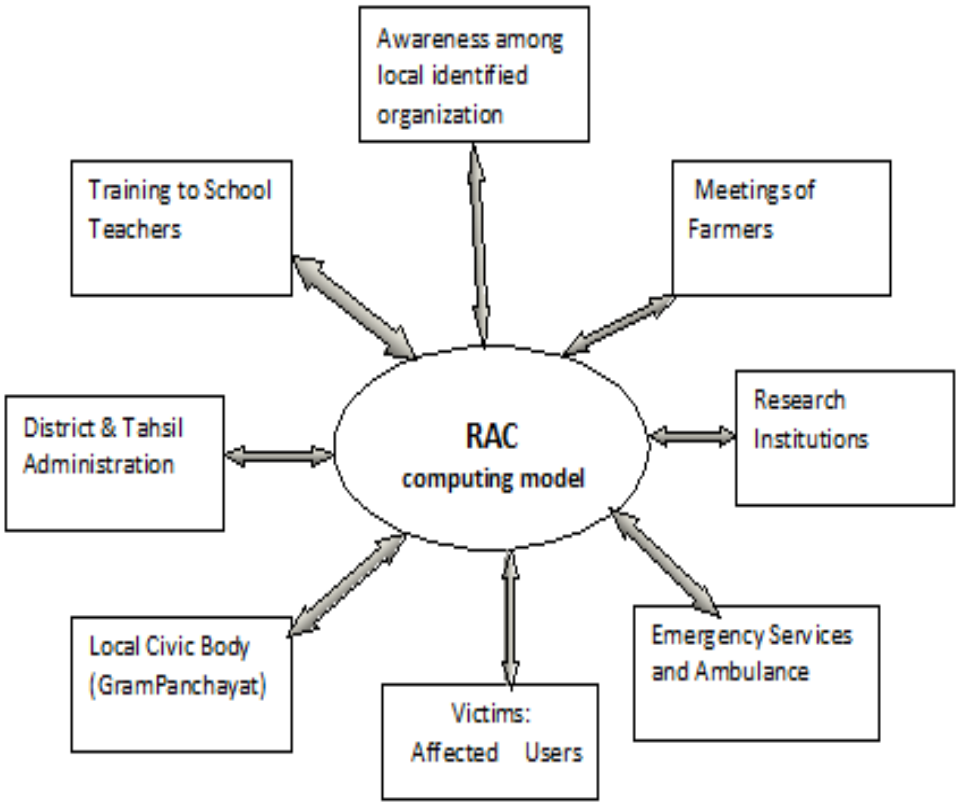


Fig. 3 : Interaction between Rural Assistance Center (RAC) units

RESULT

Implementation of RAC Computing will shows the following results

- Immediate reporting of snakebite victim
- Quick & accurate information available about antisnake venom stock and the location of nearest hospital for treatment
- Emergency ambulance and services are available through this system
- Required report generated and Easy to use
- Helps to aware about prevention of snakebite & its treatment
- Highly useful to the rural community

The study shows some limitations:

- Regular data updating is required
- High bandwidth will gives better & faster results.

DISCUSSION AND CONCLUSION

RAC Computing model is helps to create the awareness among the rural villagers for prevention & services for snakebite. It has been found that present manpower in the govt. hospital studied in this paper is comparatively less due to which communication gap between the snakebite victims and hospitals is large. This deficiency is removed by making use of this RAC computing model for the needs of rural society in emergency.

It has been concluded that the RAC computing model based on wireless technology [10] will be useful to the snakebite victims and society to save the life by providing the accurate and faster information of antisnake venom and nearest location of the hospital.

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