FIELD PROJECT REPORTS

By

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CERTIFICATION

This is to certify that all the field projects submitted in this Bound Volume are original work carried out by **Anavarathan Somasundaram** during the two field postings of six months each under the guidance of faculty of National Institute of Epidemiology (ICMR), Chennai and the local supervisor specially nominated for this purpose. This is in partial fulfillment of the requirements for the degree of Master of Applied Epidemiology and has not been submitted earlier by him in part or whole for any other (Publication or degree) purpose.

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CONTENTS

SECTION 1
FIRST FIELD POSTING

1. Introduction / Background

1.1 Indian Public Health Scenario

India, with more than a billion population, faces the double burden of both Communicable and non-communicable diseases.[1] Infant mortality is 63 per1000 live births and under five mortality is 99, accounting for almost 23% of world's under-five mortality. [2] Maternal death at 302 per 100000 childbirths accounts for almost 25% of world's childbirth related deaths.[2] The burden of HIV is estimated to be 2.47 million.[3] Cardiovascular disease (CVD) is one of the leading cause of death in India accounting for 29% of the deaths and 11% of the DALYS.[1]

1.2 Public Health Scenario in Tamilnadu

Tamil Nadu is one of the southern states in India. Tamil Nadu has well developed public health care system. The infant mortality is 31/1000 live births and the maternal mortality is 90 per 100,000 live births.[2] Immunization vaccination coverage is high.[2] Acute diarrhoeal diseases including cholera, vector borne diseases such as dengue, malaria, chikungunya and zoonotic diseases such as leptospirosis are the communicable diseases of public health importance (DPH). HIV prevalence rates among ante-natal women is 0.37%.[5]

1.3 Assignment

I was working at Deputy Director of Health Services, in Vellore, TamilNadu prior to joining FETP. I was the District program manager looking after various public health programs. As a part of my FETP training, I have been posted at the office of the

health pertaining to the location, resources, population, health facilities, prioritizing the areas of concern and also the current scenario with special reference to MDG goals. With the available data from the different sources, I have discussed the strengths and challenges that exist in the delivery of health services based on which a conclusive report has been prepared with due recommendations for potential areas of FETP projects.

2. Methods

We used national survey reports namely NFHS -3[2] and NSSO[7] for various indicators at national and state level. We used data from official website of health[4] and economics and statistics[8], Govt of Tamil Nadu for various state level health indicators. We used census of India 2001[9] and sample registration, registration general of India 2005[10] for health indicators at national and state levels. We used District level household survey 2002-04,[11] District project officer (nutrition)[12] and District project officer (rural development)[13] reports for district level health,nutrition, water and sanitation indicators.

We reviewed reports from Health department[14] and District Family Welfare Office,[15] Vellore, to collect district level data on lab resources, and organization of health system.

We reviewed Ministry of Health and family welfare, Govt. of India,[16] UNICEF,[17,18] human development report[19] for nutrition, child health related indicators, water and sanitation indicators. Morbidity data for HIV, TB and Malaria was collected from Tamil Nadu HIV Sentinel Surveillance report,[5] Tuberculosis India 2007:RNTCP Status report[20] and Human Development Report 2006 and Roll Back Malaria program website.[21]

We used Govt. of India website and United Nations country wise MDG statistics division website for national level statistics regarding several MDG.[22,23,24]

3. Results

3.1 General Presentation

Vellore District has a population of 3800002 and area of 6077 sq.kms, Population density is very high nearly 572 people per sq.km. the proportion of urban population is 38%. Vellore district shares northern border with state of Andhra Pradesh and western border with Karnataka. It also borders northeastern border with Tiruvallur, south with Tiruvannamalai district, and eastern part with Krishnagiri districts of Tamilnadu. Communicable diseases like Chikungunya, Dengue Fever have sources traced from the neighboring districts of Andhra Pradesh. The climate is hot and humid with diarrhoea and dehydration cases, being reported in summer and post rains.

3.2 Population

The birth rate in Vellore is 17.1 according to the Vital Events survey conducted by the state government per1000 population and death rate is 6.5 per 1000 population. 9% the population is less than 10 years old, 30.2% is between 10-24years, 9% are adolescent girls and 9.2% are 60 years and above.35% of the population is below poverty line. The sex ratio is 997 and child sex ratio is 943. [9,15](Table 1)

3.3 Laboratory resources

The periphery laboratories are situated in the Primary Health centres and the Government Hospitals. All the Block PHCs and the Government Hospitals Integrated Counseling and Testing Centres, working predominantly for the diagnosis of HIV in pregnant mother and high risk group. There is a separate Entomological unit for assessing vector breeding and diagnosing vector borne diseases. Specific tests such as peripheral smear for malarial

widal test for typhoid, blood culture, stool culture, urine and stool microscopy, rapid diagnostic tests for malaria, dengue, leptospirosis, rickettsial diseases, serological tests for viral hepatitis are available in select hospitals Malaria and filaria clinics in Taluk Hospitals.

The laboratories for specific diseases such as Polio, Measles etc are attached to the King Institute, Guindy, which is a reference laboratory.. We have to transport the samples during outbreaks.I shall be working with those laboratory for outbreak investigations. There are one Government medical college in Vellore, where the microbiology department provide tertiary level laboratory facilities.

According to the RNTCP guidelines, there is a separate lab supervising and monitoring system for the effective work under RNTCP. The water analysis is done by the laboratory in TamilNadu Water supply and Drainage Board.the food lab is located at King Institute, Guindy which is also tertiary level laboarory under IDSP.

3.4 Major public health priorities

There are three major public health priorities in Vellore District . Vellore is one of the hottest places in summer and it is very cold during summer. So we can observe those communicable diseases with seasonal or climatic attributes. Measles is regularly occuring in the outbreak form. Earlier Vellore had a higher prevalence of HIV and it was a high risk area. Since there is a heavy flow of lorry traffic in the Bangalore highway. Integrated counseling and treatment centers have been set up and antiretroviral therapy is available at Government Medical college hospital. The other priority diseases are vector borne diseases owing to the environmental conditions. Another important disease is acute diarrhoeal diseases and cholera. The under fives, Geriatric, and adolescent are equal in

3.5 Organization of the health system

The Health and Family Welfare Department is headed by the Health minister and the government executive is the Health Secretary. Under him there are special and additional secretaries who are IAS officers. (Figure 1)

There are three different Directorates the Department of Public Health and preventive medicine, the Directorate of Medical Services for the Taluk and non Taluk hospitals, Director of medical education for the Medical College Hospital.

Vellore district is divided into two health unit districts with two Deputy Directors one at Vellore and another at Tirupattur. There are 67 PHCs, 11 Taluk and non Taluk hospitals., 10 municipal maternal centres. There are also ESI dispensaries, railway hospital, police hospitals which cater specific groups.

3.6 Indicators towards the millennium development goals

Goal 1. Eradicate extreme poverty and hunger

Prevalence of Underweight Children Under Five Years of Age was comparable to the state average (36%) but just higher than Tamilnadu(33.2%)level and well below the national average. The Vitamin A coverage was 89%. The proportion of infants exclusively breast fed is 43% comparable to the state but little lower than national average. (Table 3)

Goal 4. Reduce child mortality

The IMR 28 per 1000 live births and it has decreased from 53 in 1996 to 28 in 2006 and lesser compared to the state and national averages. The coverage of measles within 1 year of life is almost 100% according to the district report.

There were around 50 maternal deaths in 2007 and the deaths have come down from 120 in 2000 .the maternal mortality rate according the Vital Events survey is 1.1 per 1000. The deliveries in the institutions are more than 90% and the deliveries attendeed by skilled attendants is more than 95%. The women who received Antenatal care was 51 % before and with NRHM and inputs the AN care received is around 85% according to district reports.

Goal 6. Combat HIV/AIDS, malaria and other diseases Target 7: Halt and begin to reverse the spread of HIV/AIDS

The HIV prevalence among women attending antenatal clinics is less than 1% which is less than the expected. Condom use contraceptive prevalence rate is 5.3%. The proportion using condom by risk groups 34% in females and 68% in males.

Target 8: Halt and begin to reverse the incidence of malaria and other major diseases

There were no malaria related deaths in the past 2 years. The other dtata regarding malaria pertaining to the MDG goals within the scope of FETP is not available as of now. Insecticide treated bed nets are not included in the malaria programme in Tamilnadu.

Goal 7. Ensure environmental sustainability

Target 10: Reduce by half the proportion of people without sustainable access to safe drinking water

Population who has access to improved and safe water source is 46% according to the DLHS Household survey. Coverage with respect to improved sanitation is 47% and the practice of open air defecation is widely prevalent in the slums.

Target 17: In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries

Access to essential drugs.

The Tamil Nadu Medical Services Corporation Limited is engaged in the procurement, storage and supply of drugs, to the various Government Hospitals and Primary Health Centres. There has not been any scarcity of drugs which were informed by the local health officials during discussions held with them.

4. Discussion

Vellore district has a good public health infrastructure. The health indicators are the best in the state and the country with good ante natal services, family planning and immunization coverage. General Health indicators are close to state average and better than state average in some of the MDG indicators.

From the reports if we see that Vellore is one district that faces bouble burden of communicable and non communicable diseases. Measles outbreaks are reported every year. Despite good immunization coverage measles cases are reported. Moreover we have see if the data is reliable and useful in decision making. Epidemics of cholera also occur evry year. Both measles and cholera are closely associated with socioeconomic profile and seasonal diseases. We have look into the data for the effectiveness of surveillance system

5. Conclusions and recommendations

Despite good public health infrastructure and high achievements there are new public health challenges with emerging and remerging infections. The vulnerable sections of the society especially the elderly (9% of population) with no special schemes locally implemented. The high incidence of measles cases in the district can be studied to find out the existing epidemiological factors which will help us find further clues as to prevent morbidity and mortality.

Secondary data analysis of these issues along with the assessment of the existing surveillance system and the way in which the outbreaks are handled will be mutually beneficial as the current factors can be studied and strategies formed to further reduce the problems. In the two year programme, I shall carry out various projects and my focus will be on non-communicable diseases. I intend to choose Geriatric Disability as the topic for my dissertation and secondary data analysis of measles and its surveillance system under IDSP.

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Table 1: Characteristics of the population of Vellore district, TamilNadu, 2007, India

Population group		Population size 2007*	Proportion of the total
Age	0-4 years of age	331889	8.7
	5-14 years of age	782155	20.6
	15-29 years of age	1070862	28.2
	30-44 years of age	782653	20.6
	44-59 years of age	491064	12.9
	60 + years of age	341379	9
Sex	Male	1902650	50.1
	Female	1897351	49.9
Socio-economic status	Below poverty level‡	1292001	34
	Above poverty level‡	2508001	66
Caste	General caste(Others)	2950796	78
	Schedule caste	780316	20
	Schedule tribe	68890	2
Total		3800002	

* Census of India 2001projected

Table 2: Key public health priorities in Vellore district 2007, India

Public health priority	Key elements	Ongoing prevention and control programmes
Elderly	• 9 % of the population • no specific schemes • disability is the common issue • multiple disease presentation	**Prevention strategies adopted** • NGOs run old homes, • No special strategies except old age pension • Free treatment is available but utilization and access • Outreach services are provided with minimal focus
Cholera and acute watery Diarrhoea	• Every year outbreaks occur • Safe water supply is nearly 50% • Poor sanitary conditions • Lesser community awareness	**Prevention strategies** • Strategies for safe water is existing with les impact • Monitoring of water quality • Village health and sanitation committee
Measles	• Form 10% of the state cases • 90% immunization coverage • under reporting	**Prevention strategies** • Immunization • Diseases surveillance • Vitamin a supplementation **Control strategies:** • Early detection and case treatment. • Outbreak response measures

Table 3: Indicators of progress for the health related millennium development goals, Vellore, TamilNadu, India, 2007

Goal	Indicator	Value of the indicator		
		In Vellore	In the state	In India
Goal 1	Prevalence of underweight children < 5 years of age	35[1]	35%[1]	45.9[2]
	Proportion of population below minimum level of dietary energy consumption	36.6[3]	21.1[4]	26.10%[4]
			22.5[5]	28.3%[5]
	Percentage of children 6-59 month of age who received one dose of vitamin A in the past six months	89[6]	37.2[2]	21.0[2]
	Proportion of infants under six months who are exclusively breastfed	42.9[1]	33.3[2]	46.3[2]
		43.9[7]		
Goal 4	Under-five mortality rate	34.2[1]		74[8]
				85/1000[9]
	Infant mortality rate	28.3[1]	31[2]	57[3]
	Measles immunization among children under one	98.5[1]	92.4[2]	58.8[2]
Goal 5	Maternal mortality ratio	100	90	301[10]
	Proportion of births attended by skilled health personnel	88.9[1]	93.2[2]	48.3[3]
	Contraceptive prevalence rate	54.3[1]	61.4[2]	56.3[2]
	Percentage of women receiving antenatal care	96.5[1]	96.5[2]	50.7[2]

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Table 4 (Contd): Indicators of progress for the health related millennium development goals, Vellore, Tamilnadu, India, 2007

Goal	Indicator	Value of the indicator		
		In Vellore	In the state	In India
Goal 6 (HIV)	HIV prevalence among 15-24 years old pregnant women	0.88[12]	0.35%[12]	0.86%[13]
	Condom use rate of the contraceptive prevalence rate	0.8[1]	2.3[2]	5.3[2]
	Number of children orphaned by HIV/AIDS	NA	NA	NA
	Percentage of people using a condom during most recent higher risk sexual encounter	NA	42.1(F)[2]	34.7(F)[2]
	Percentage of STI clients who are diagnosed and treated according to guidelines	64.4F[1] 42.8 M[1]	81.8 (M) 41.9F[1] 45.5M[1]	68.1(M)[2], 32.4F[1] 25.4 M[1]
	Percentage of HIV-positive women receiving anti-retroviral treatment during pregnancy to prevent mother to child transmission of HIV	NA	NA	NA
Goal 6 (Malaria) †	Malaria death rate	0	41732[16]	0.09[14] 963[15]
	Proportion of people with uncomplicated malaria getting correct treatment at the health facility and community levels, according to the national guidelines, within 24 hours of the onset of	NA	NA	NA
	Percentage of pregnant women who have taken chemoprophylaxis or drug treatment for malaria	N.A.	N.A.	N.A.
	The proportion of households having at least one insecticide treated bed nets	NA	NA	NA

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Table 5 (Contd): Indicators of progress for the health related millennium development goals, Vellore Tamilnadu, India, 2007

Goal	Indicator	Value of the indicator		
		In Chennai	In the state	In India
Goal 6 (TB)	Prevalence and death rate associated with tuberculosis	3.1[17]	5[17]	4[17]
	Proportion of tuberculosis cases detected and cured under DOTS	89[17]	87[17]	84[17]
	Percentage of estimated new smear-positive tuberculosis cases registered under the DOTS approach	81.6[17]	70.2[17]	66.3
Goal 7	Proportion of population with sustainable access to an improved water source, urban and rural	45	84.2r[2] 83.1u	86[18]
	Proportion of urban population with access to improved sanitation	46.5	42.9T[2] R-17 U-73.5	33[18]
Goal 8	Proportion of population with access to affordable essential drugs on a sustainable basis	N.A	N.A.	N.A.

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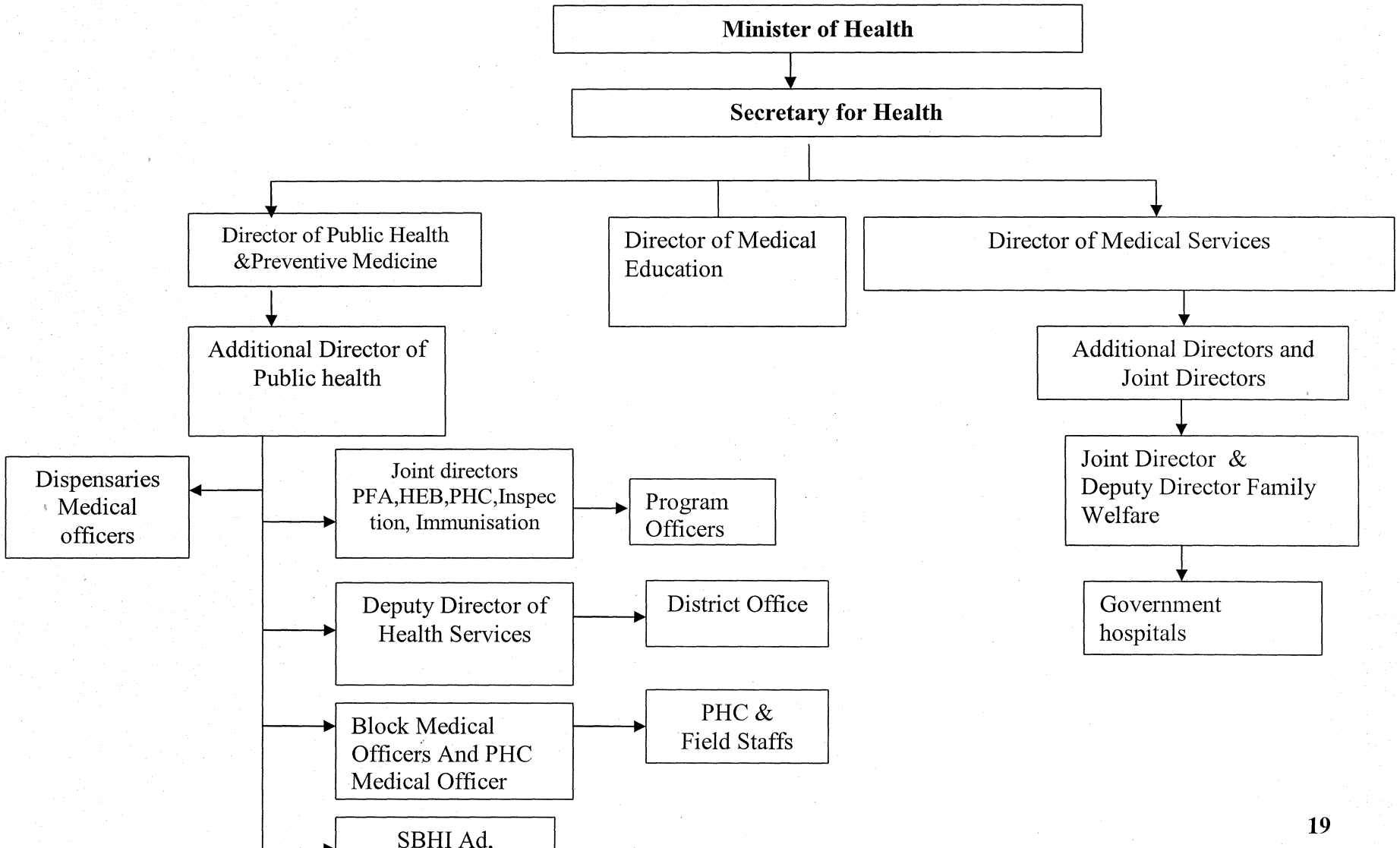
Table 6: Potential topics for the various field MAE-FETP assignments.

Assignment	Potential topic
Surveillance system description and evaluation	Measles
Secondary data analysis	Measles, Acute Diarrhoeal Diseases
Programme evaluation	Cancer control programme(Cancer cervix)
Dissertation	Geriatric health Problems/ disability

Figure 1: Organizational structure of public health – Vellore, 2007



Secondary data analysis of measles in Vellore District TamilNadu, India, 2007

Background

Measles is a highly contagious viral disease, which affects mostly children. In 2007, there were 2,79,006 cases, 1,97,000 measles deaths globally - nearly 540 deaths every day or 22 deaths every hour and 82% vaccination coverage[1]. The goal of the World Health Organization's global measles strategic plan is to reduce by half the estimated number of measles deaths by 2005 compared with 1999 estimates[2].

Measles remains an important cause of childhood mortality, especially in developing countries. The target goal set by the Indian Ministry of Health and Family Welfare is to reduce measles mortality 66% by 2010 compared with 2000 estimates[3]. Measles persists in India despite the introduction of measles vaccine into routine immunization programmes more than 25 years ago. **India**, which currently accounts for two thirds of global **measles** deaths[4].

TamilNadu is reporting nearly 1000 to 2000 cases of measles every year. Yet many cases are under-reported. Vellore district contributes one tenth of the measles cases reported in Tamil Nadu every year. Despite the reported coverage of measles immunization up to the tune of nearly 100% outbreaks do occur every year in Vellore. In this context, we analysed the measles surveillance data with the objectives to (1) Describe trends of measles (2) Identify problem areas (3) Generate hypothesis regarding the determinants of measles and provide recommendations.

Methods

Study design

We conducted a descriptive cross sectional study based on the secondary data available at the District and the Primary Health Centres

Study population

We included the whole population of Vellore as our study population.

Case definition

We defined a case of measles as the occurrence of fever with rash as diagnosed by the medical officer and subsequently confirmed by serological test for IgM positive or epidemiogically linked cases with respect time, place and person during the years 1997 to 2007

Sampling procedure

We included all the cases reported during the reference period from 1997 to 2007.

Data collection procedure

We collected data from the office of the Deputy Director of Health Services of the two health unit districts namely Vellore and Tirupattur. We included all the data pertaining to the twenty 67 Primary Health Centres, and the district administration. We pooled all the data of outbreaks and isolated cases. We collected details of age, sex and the date of onset, date of reporting of cases and also the address of the cases. For the denominators we used the projected population based on the 2001 census.

Analysis Plan

We analyzed the data by time, place and person. We drew a line-graph to describe the distribution of measles cases over time. We used the month of reporting as the month of onset of cases. We drew a map of Vellore district showing the measles cases taking the averaged incidence for the past three years. We used the projected population based on the 2001 census population and calculated population-based incidences. We analysed the trends over the months and year, incidence by blocks and incidence by age and sex.

Results

On comparing the reported cases of measles in Vellore with that of the State figures every year nearly five to ten percentage of the cases are reported from Vellore. In the year 2007, 50% of the total cases reported at the state level were from Vellore (Table 1).

The annual incidence of measles was 3 per million population in the year 1997 and increased to 8 per million population in 2007 (Figure 1). There were two deaths reported during 1997-2007. There is a peak in incidence every three or four years. Most of cases are reported during the months of January to May (Figure 2, Figure 3).

With respect to person distribution the averaged annual incidence of measles is 185 per million in the children below 5 years and it is 96 per million in the 5 to 14 years age group. Average annual incidence was higher among females as compared to males (40 vs. 36 per million population).(Table 2)

With respect to the geographical distribution of the cases two blocks did not have data during the past three years. Of the 20 blocks, five blocks reported less than five cases on an average in the three years. Additionally six blocks reported six to 10 cases 3 blocks

reported more than 11 cases. Two blocks (Nemili and Arakkonam) reported more than 50 cases on the average. (Figure 4)

In the year 2000 and 2002 only a total of seven cases were reported from Tirupattur Health Unit. In the years 1997 to 1999 and the year 2003 the Tirupattur division comprising of 10 blocks did report even a single cases in the year.

Discussion

Vellore district reported sporadic cases of measles despite high coverage for measles vaccine. Case-fatality was almost negligible. There was no shift in the age group. We identified few pockets within the district the incidence rate was very high.

Despite high coverage (92.5%, NFHS III) of measles vaccine in TamilNadu, every year cases are reported. The reported coverage of measles vaccine in Vellore district is 100%. The efficacy of measles vaccine is 85%. So every year 15% of the children accumulate as susceptible.

We observed that most of the cases reported were from outbreaks. Sporadic cases are reported in small numbers. This could be due to under reporting. There were no deaths reported except two deaths in the year 2003. India is at the disease elimination phase. So in addition to identifying high-risk areas, preparedness for the outbreak is very essential. Each case of measles has to be reported.

Our conclusions were limited by the fact the incompleteness of the individual case report forms in terms of age, sex and date of onset.

Based on our findings we suggest, (1) improve the routine reporting system in Vellore for measles (2) evaluate the surveillance system specifically for attributes with demand attention during the elimination phase (such as timeliness

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Table 1. Comparison of reported cases in Vellore with that of the State, 1997 to 2007

Year	Vellore	Tamil Nadu	India	Proportion to that of state
1997	101	2418	61,004	4%
1998	41	730	33,990	6%
1999	32	1841	21,013	2%
2000	143	820	38,835	17%
2001	27	488	51,780	6%
2002	68	512	40,044	13%
2003	174	699	47,147	25%
2004	78	1550	51,546	5%
2005	223	2423	52,454	9%
2006	133	1619	60,751	8%
2007	307	613	36,900	50%

Table 2: Average incidence of Measles by age and sex, Vellore District, TamilNadu, India, 1997-2007

Demographic characteristic		Cases	2002 Population	Averaged annual incidence per 100,000*
Age†	**< 5 yr**	569	307259	185
	5-14 yr	692	724111	96
	15-49 yr	41	2470377	2
Sex	**Male**	637	1761454	36
	Female	696	1756458	40
Total		1333	3518002	38

* Divided by 11 to average the incidence over the Eleven years (1997-2007).

† For 31 cases age was not specified, so not included for analysis

Figure 1. Annual incidence of measles per million during 1997-2007, Vellore District, TamilNadu, India

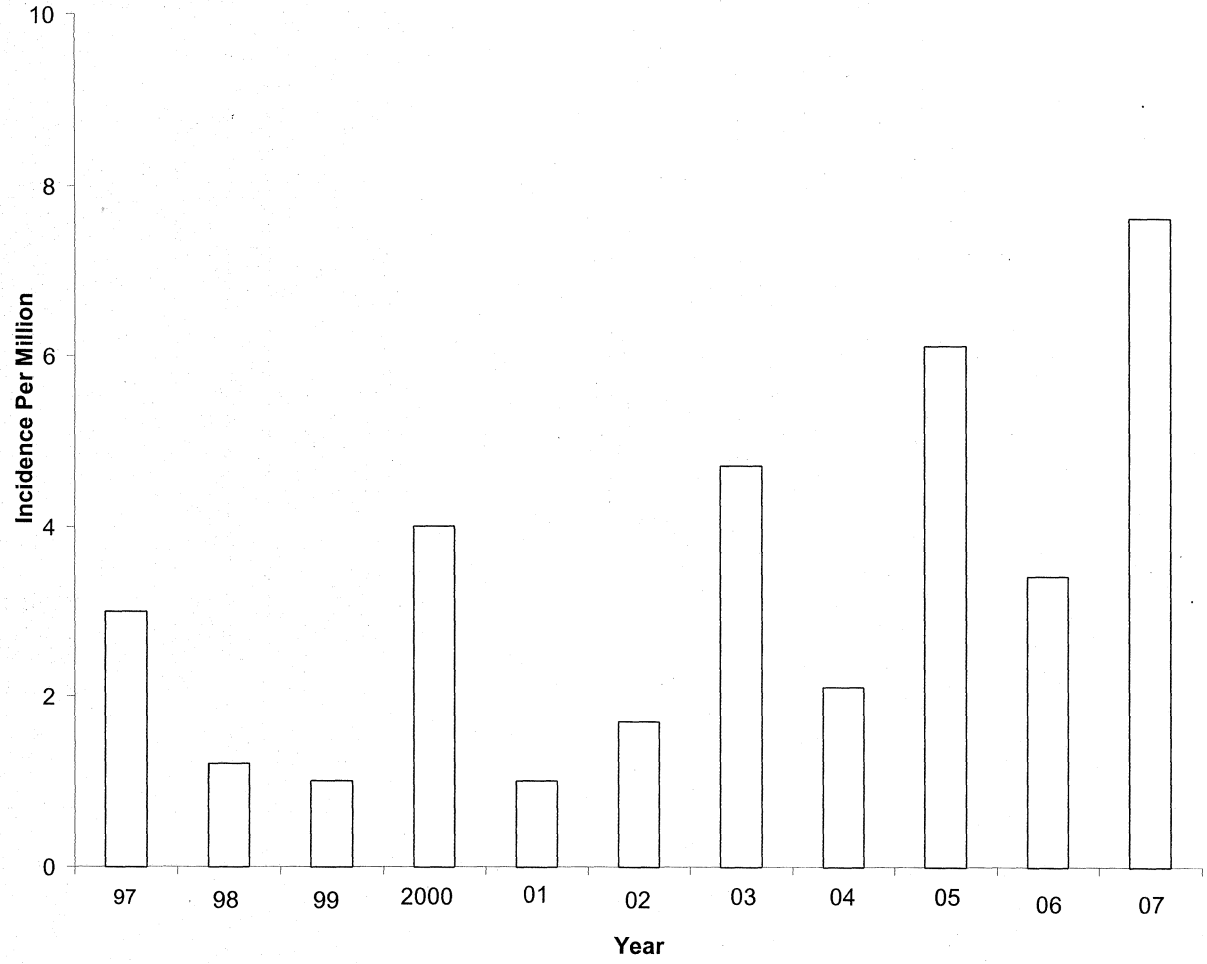
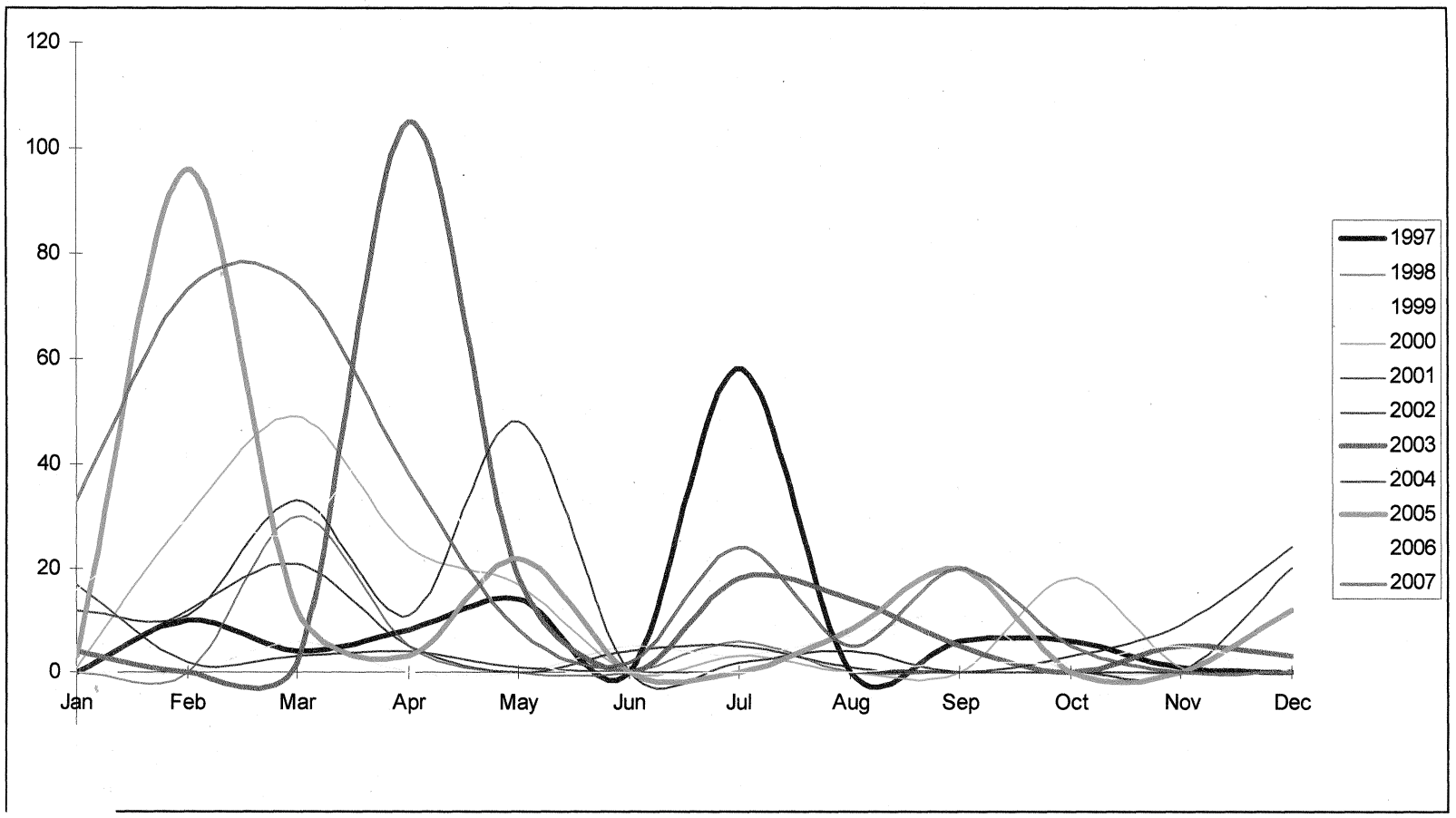


Figure 2 . Seasonal distribution of measles cases, Vellore District, TamilNadu, India, 1997 to 2007



22

Figure 3. Monthly incidence of measles cases in Vellore , TamilNadu, India, 1997 -2007

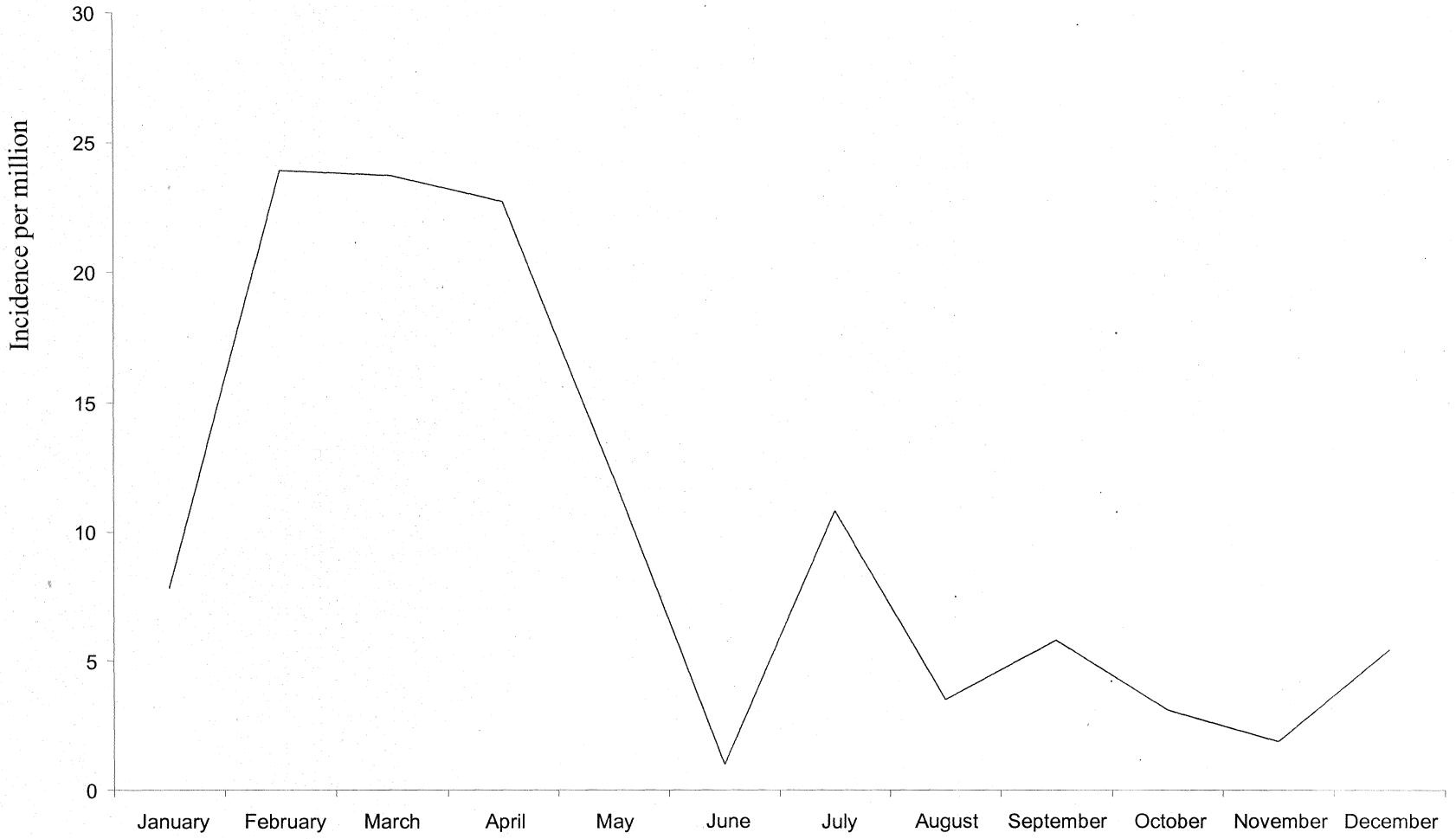
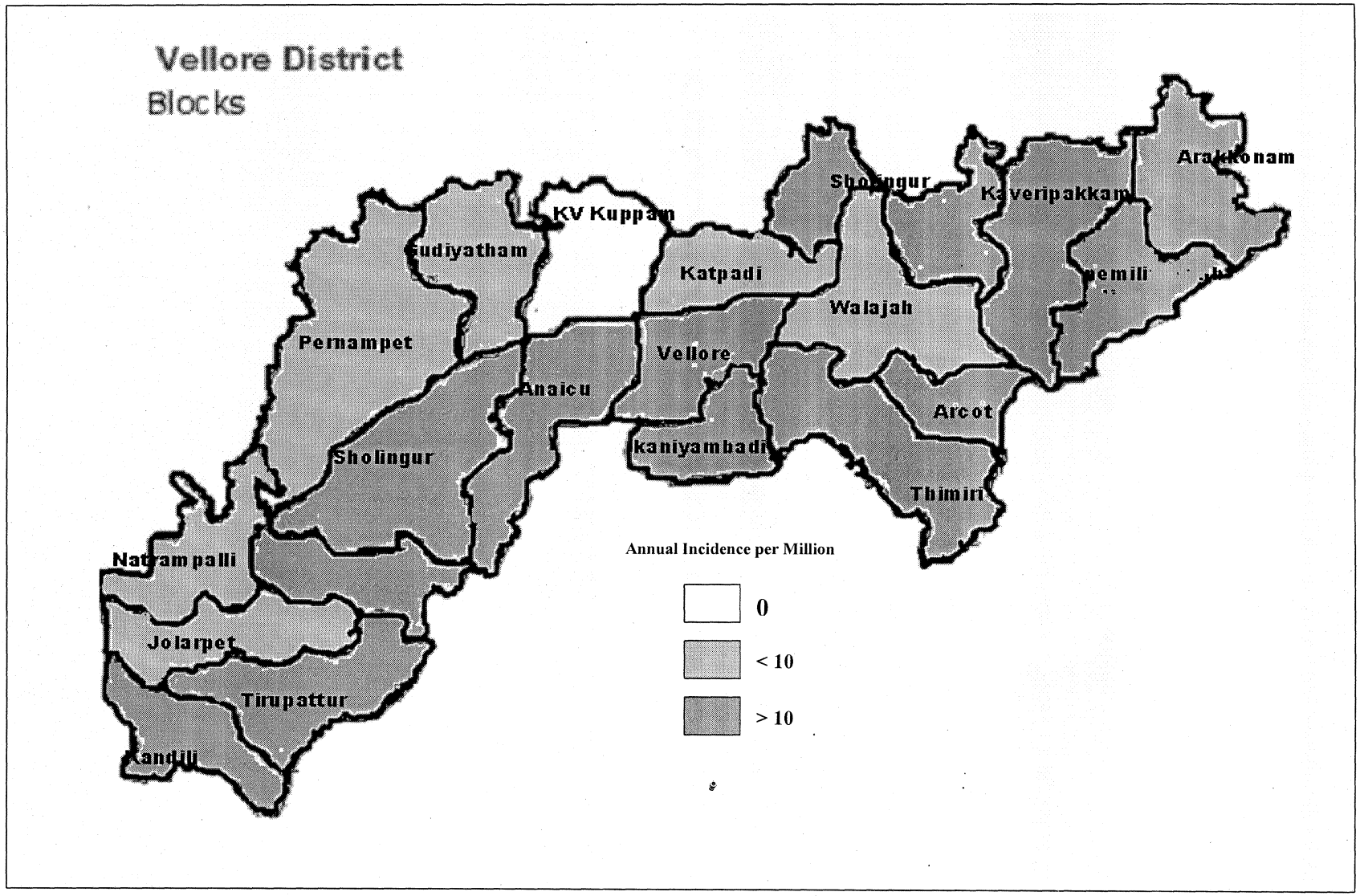


Figure 4. Average incidence of measles per million by block, Vellore District, TamilNadu, India, 2005 to 2007



SECTION 2
SECOND FIELD POSTING

Description and Evaluation of the Surveillance System for Measles in Vellore District, TamilNadu, India 2008

Introduction

Measles caused by a paramyxovirus. It is characterized by symptoms fever followed by rash, cough, coryza, and or conjunctivitis. Measles remains a leading cause of death among young children.

The WHO estimated that **globally** over 40 million cases still occurred every year contributing to approximately 530000 deaths as reported in the year 2003[1]. According to WHO estimates, in 2006 there were 242 000 measles deaths globally, and in South-East Asia region, 178,000(128 000 - 234 000) deaths occurred due to measles[2] . Overall, global measles mortality decreased by 68% between 2000 and 2006.

Four strategies are recommended for reducing measles mortality and achieving the elimination[3] are (1) providing the first dose of measles vaccine to successive cohorts of infants (2) ensuring that all children have a second opportunity for measles vaccination (3) Enhancing measles surveillance with integration of epidemiological and laboratory information (4) Improving the management of every measles case.

In addition, with a view to reducing overall childhood mortality, vitamin A supplementation should be provided through immunization services. One important strategy is measles surveillance. Surveillance helps in early identification of measles outbreaks and early initiation of outbreak control measures which will prevent complications and mortality. Surveillance also provides information regarding the occurrence of isolated cases

In India 52454 cases & 55 deaths were reported by passive surveillance in 2005. The vaccine, which has been available for more than 40 years, costs about US$ 0.33 per bundled dose[3]. the plan emphasizes at least 90% coverage in 80% of the districts of the country by 2009. And collection and use of good quality epidemiological data from active surveillance and outbreak investigations are needed to guide further action. Integrated Disease Surveillance Project (IDSP) has been implemented for disease surveillance in 2005 in India in addition to the AFP Measles integrated surveillance programme.

In TamilNadu despite coverage of measles vaccine is more than 90 %[4]. Cases are reported in many pockets either in the form of outbreaks or isolated cases. Annual incidence of measles in the year 2006 is 2.8 per 100,000 populations (1098 cases) with 29 outbreaks in different parts of the state[5]

Vellore district has been continuously reporting cases during the past ten years. On an average the proportion of cases reported by Vellore district is more than 10% of the total cases of TamilNadu[6].

Surveillance for measles is carried in Vellore district through IDSP in addition to the AFP Measles integrated surveillance under National Polio Surveillance project. IDSP is implemented since 2006 for nearly 13 diseases including measles.

Despite good immunization coverage and disease surveillance systems in vogue cases are outbreaks are periodically reported. Since surveillance alerts for our preparedness in outbreak management and control the existing surveillance system has to be evaluated for its strength and weaknesses. So we felt that there is need to asses the surveillance of measles.

We decided to evaluate this with the following objectives.

1. To describe the surveillance system of measles in Vellore district
2. To assess the different attributes of the surveillance for measles to find out whether the surveillance system meet its objectives.
3. To identify existing gaps and factors contributing to the gaps.
4. To suggest measures for improvement.

Description of the surveillance system

Population under surveillance

We conducted informal discussion with District surveillance Officer of Vellore district to know the population covered under the surveillance system.

Case definitions

From the manuals we found out the standard case definition used,

Type of system

We interviewed the stakeholders at all levels of the health system (i.e. health subcentres (HSC) to the district level). We reviewed the IDSP manual, reports, registers, guidelines and forms maintained at different levels and other operational instructions.

Data structure

We collected information on the data transmission, management and analysis, and feedback mechanism through (1) review of documents (2) interview of district officers and the staff at different levels. We reviewed the outbreak reports for understanding whether analysis of data is being done or not.

Indicators

We reviewed the documents available with the district office and the reporting units and also with that of the health workers for knowing the information regarding surveillance indicators.

Feedback

We interviewed district surveillance officer and the medical officers and the health workers to know the feedback mechanism. We also reviewed the records and documents to see the flow of feed back from the higher levels.

Action taken

We interviewed the different stakeholders to know the action taken at different levels based on the feedback or analysis of the data available at different levels.

Analysis of the surveillance system

We assessed the different attributes of the surveillance system with the following indicators:

Simplicity:

To assess the simplicity, we interviewed the 87health workers and 39 Medical officers to estimate the proportion of health workers and Medical officers who considered the system simple. We also looked for the proportion of units participating in the system and submitting reports. We also went through the reporting formats and registers for their length and contents.

Flexibility

To assess this attribute we interviewed the district officer for his opinion regarding the addition of other details and we interviewed the health workers (87) and medical officers(39) for estimating the proportion of health workers and medical officers who were ready to handle inclusion of tother diseases or additional details of measles. We reviewed the registers and formats to see if additional details could be added.

Acceptability

To assess acceptability we estimated the proportion of reporting units and field health staffs willing to participate continuously and the proportion of units regularly submitting the report.

Sensitivity

We conducted community surveys for measles cases and compared with the records of the reporting units and calculated the proportion of cases seen in the health care facility that were captured by the surveillance system.

Positive predictive value:

We reviewed the health facility reports and the laboratory reports to calculate the proportion of assess the proportion of cases subsequently confirmed by standard definition.

Representativeness: We reviewed the health facility reports and compared with that of the surveillance reports to estimate the proportion of cases that were comparable with the health facility reports with respect to time, place and person.

Timeliness: We reviewed the reports at the district level for estimating the proportion of reports submitted in time. We also reviewed the documents submitted at the district level to see the timely detection of outbreaks. We also interviewed the staffs who prepares and submits the report to the higher levels.

Usefulness

We interviewed the medical officers, district officers, health workers to assess the proportion of outbreaks notified through the surveillance system, proportion of outbreaks investigated and also the frequency of using the data available with them. For all the attributes the indicators to be used with the data required, the design of the study, source of data, tool used to collect data are given in table 2

Data collection

1. Interviews and review of reports: We used data collection instrument in the form of semi structured questionnaire for health workers, Medical officers, District level officers. We used abstraction forms to collect information regarding the data in the reporting units and also culling up information through review of reports.
2. Community survey: We used a semi structured questionnaire tool for the community survey. We selected 10 villages randomly each from the villages where there were no cases, the villages that reported sporadic cases, and those reported outbreaks.

Study design

We did a Cross sectional study for assessing the various attributes of the surveillance system.

Study population and units

We conducted the study in different reporting units of Vellore district. We included Primary Health Centres, Government Hospitals and Private Institutions for the study. For the community survey we included Vellore district population. We visited the Health facilities that are designated as reporting units for evaluating the attributes of surveillance

Sample size

WHO manual on Best practices on measles surveillance[7] suggest keeping the target of performance indicators of surveillance at 80%. On this basis, we calculated the sample size of 39 institutions, 87 health staff with a confidence coefficient of 95% and interval of 10%.

Results

Description of the surveillance system

Population under surveillance

The population under surveillance is the whole population of Vellore district which is 3800002 in 2007. Measles is common among under five children but the secondary data analysis revealed that there is a age shift and 50% of cases are above 5 years. So age specific attack rates are calculated.

Objectives

The objectives of the measles surveillance system are to (1) ensure that most cases of measles are detected, (2) that cases are correctly diagnosed, and (3) that complete information about reported cases is available.

Case definition

As per the operations manual for IDSP Clinical case description of measles is any person with Fever and, Maculopapular (non vesicular) rash lasting for more than 3 days and cough, coryza, or conjunctivitis. Laboratory criteria for diagnosis is the presence of measles specific IgM antibodies or at least a four fold increase in antibody titre in paired sample(acute and convalescent: collected at 14 days interval) or isolation of measles virus. The measles case is classified as

Suspect case: a case that meets the clinical case definition

Probable case: Any suspect case that is diagnosed as measles by Medical officer on the basis of clinical case description.

Confirmed case: A case that meets the clinical case definition and that is laboratory confirmed or linked epidemiologically to a lab confirmed case. According to IDSP guidelines a single case of measles in tribal area or more than two cases of fever with rash in

a village or in 1000 population and the to say it a outbreak more than 4 cases in a block in the same week.

Type of system

The system utilizes the existing infrastructure except for additional manpower for management information system at the district level (appointment of data managers and data entry operators The measles surveillance system under IDSP is a combination strategy of passive, stimulated passive and active methods. The health worker male and female do a passive surveillance during field visits.

The female health worker gets information about cases of measles if any in the village from the mothers who bring children for immunization. Another source of information is the anganwadi workers who pass on information to the VHN if there are any cases of fever with rash. The Measles called as Thattammai in Tamil is related with female goddess and so still there are households in the society with the traditional practice of not seeking medical care. So it is possible that the health worker misses case in the field unless she makes active search during field visits or receives reliable information.

At the Primary Health Centres the Medical Officer does passive surveillance. Medical officer looks for fever with rash and come to a probable diagnosis of measles. Whenever there are outbreaks a temporary medical camp is arranged at the village and both active and passive surveillance are being undertaken.

During outbreaks house to house surveillance is undertaken using prescribed surveillance format. Among the suspected cases serum specimens and urine samples are collected within specified time period for 5 to 10 cases for confirmation. The system includes all passive, stimulated passive and active surveillance strategy. The Measles surveillance system under IDSP provides for data collection at different levels. At the health

sub centre level by the Village health Nurses (ANM) and the Health Inspectors MPHW [male]).

At the Primary Health Centre level there are two types of data collected viz. presumptive surveillance by the medical officers and confirmatory by the lab technician. In addition to this there is provision for water quality monitoring by the health workers at the field level. The forms used are S form, P form, L form, W form for syndromic surveillance, presumptive surveillance, confirmation at lab, and water quality monitoring respectively.

Data structure

The S form which is generated from the minor ailments registers maintained by the health worker contain information regarding the number of cases of fever with rash in males and females categorized into less than 5 years and above 5 years. P form is generated from Presumptive Surveillance registers as the source records with name, age, sex, address, date of visit, etc. maintained by doctors and P form contains details of probable cases with sex classification stratified into less than and above five years.

The data generated during outbreaks contains, in addition to the line listing, name of the village affected, number of cases with age and sex, , population of the villages, serum specimens sent, number treated with Vitamin A, number immunized, complications, houses searched during surveillance etc.

Data transmission

The health workers collect data in the syndromic surveillance form(S form). Approximately for every 5000 population comprised of four to six villages and few hamlets there is a health worker. In Vellore district there are two health unit districts (HUD) viz.

Vellore and Thirupathur. In Vellore HUD the VHN fills up the S form on Saturdays and submit it to the Primary Health Centre on Saturdays.

In Thirupathur HUD the VHN reports through phone on Saturday and then submit written report on Tuesday when they come for weekly review. In the Primary Health Centre usually the Health Inspector is the person who collects the report from the VHNs and compiles it. In Vellore HUD the health inspector transmits the copy of the S form report to the Deputy Director of Health Services, Vellore along with the P form. In Tirupattur HUD in addition to the collection of S forms, consolidation of the S forms is being done.

The report is transmitted to the district on Monday from the Primary Health Centres and this is again transmitted to the state IDSP cell. Online reporting is done to transmit the data to the Government of India. On the whole there are 92 reporting units including 14 private institutions who are submitting P forms and 454 subcentres submitting S forms. At the district level the compilation is easy and also feeding in the computer for transmission is also a simple system using MS Excel format

In parallel to the IDSP measles surveillance is carried out by AFP Measles integrated system under National Polio Surveillance Project(NPSP).Weekly reporting of cases from Block PHCs and one government hospital and 4 private institutions and one medical college Hospital. No health workers are or reporting any forms in this system.

Indicators

The data is transmitted but not formally or systematically analysed either at the SubCentre level or Primary Health Centre level. During outbreak situations a preliminary report is sent to Director of Public Health as soon as the outbreak is confirmed. After the outbreak is over a final report including spot map and age sex wise break up is sent to the Director of Public Health. At district level the weekly trend of diseases are not systematically examined but

the collected data is compiled and transmitted to state IDSP cell. The state IDSP cell analyse the data collected from weekly reports received from the districts with the collaboration of Surveillance Medical officer of NPSP in AFP-Measles integrated surveillance. Regular analysis of data are not done at any level.

Feedback

At the Primary Health Centre level feedback is provided to the field staffs orally during review meetings on every Tuesday. Since information generated at the district level is not analysed systematically, feedback for triggering action is not followed up. At the district level during monthly review meetings for different categories including Medical officers instructions are given based on the reports received.

At the state level the IDSP cell provide feedback to the districts as and when required. On analysis if there is in an increasing trend of cases they give feed back immediately over phone to the Deputy Director of Health Services and give instructions for initiating action. Also during periodical meeting of the Deputy Director of Health Services the feedback is given and discussed.

Action taken

The field health staff stated that they do not use the surveillance data. The health workers interviewed stated that they do not use the data for action. At the Primary Health Centre the medical officers informed that they know that they can get information from the suspected case forms and presumptive surveillance registers to understand the change in the trend of cases but never had used them.

At the block level and the district level there are rapid response teams. The rapid response teams immediately act to the information regarding outbreaks but not used the data

to initiate action. During outbreaks the state level joint Directors are send to supervise and monitor the outbreak control activities.

The medical officers and the health workers were given one time training during the year 2006. The measles surveillance under IDSP was implemented subsequently.

In addition to the IDSP measles surveillance is also carried out through AFP –Measles integrated surveillance under National Polio Surveillance Project (WHO). Under NPSP the reporting units are the block Primary Health Centres, Government Hospitals and willing Private Hospitals. This parallel system of surveillance exists for the past three years.

Analysis of the surveillance system

Simplicity

. The health workers find no difficulty in carrying out the activity as well as reporting. They found the reporting forms to be easy (100%) to understand and write. It is one page form and three copies, which are differently coloured, that make it easy to prepare. They also expressed that the case definition is simple (100%). 20% VHNs expressed that a day has to be spared exclusively for submitting the report in person at the Primary Health Centre on Saturdays. The medical officers (100%) also expressed that the forms were simple to fill up. Presumptive surveillance register, the case definition is simple and easy to maintain.. The data manager and the data entry operator find it easy to do the online reporting.

Flexibility

The existing health infrastructure is being utilised for the IDSP surveillance system. In addition to the government health facilities (n=32), 14 private institutions are reporting. These institutions were already collaborating with government system in different activities such as, AFP Measles integrated surveillance system, family welfare operations. All (100%) The field health staff (n=87) and the medical officers (n=39)are willing to report

additional details if and when required by the higher authorities. At the district level the Deputy Directors of health services expressed that there is feasibility for including additional details with modifications of the format as required. The form is a one page form which is common for diseases listed under IDSP. The IDSP document provides for the inclusion of state specific diseases if any to be included and this has been stated in the reporting forms also.

Acceptability

All the field health staff (100%) expressed that they have no source records for generating or filling up S form. The P form is generated using the presumptive cases register which all the Primary Health Centres maintain). The block Primary Health Centres also submits measles surveillance report through AFP Measles integrated Surveillance system. .

63% (n=39) of the Medical officers expressed that they are not receiving S forms from the field health staff regularly. On any given month on an average 8-10 (39%)Primary Health Centres are not reporting. 30% of the private institutions are reporting regularly. All the medical officers and field health staff informed that the surveillance system is acceptable.

Sensitivity

In areas where outbreaks were reported the cases detected by the system when compared to the actual number of cases was 97% (n=10). In areas isolated cases were reported the cases detection by the system was 84% (n=10). In areas where no cases were reported the surveillance system also did not capture any cases(n=10).

Positive Predictive Value

Of the health workers 97% and 100% of the doctors were able to tell the case definition correctly. 93% of the health workers and 61% of the medical officers were trained in IDSP. The proportion of cases detected by the health worker that was confirmed by lab or epi link

was 95%. There were no records or registers. But 80% medical officers expressed their opinion that the health workers were able to diagnose cases correctly.

Representativeness

We compared the cases reported by the surveillance system and the cases found in the health care facilities. We verified the records of the 412 cases reported through surveillance system and found that the cases found in the health care facilities were comparable with respect to age, sex, and month of reporting, blocks from which cases were reported.

Timeliness

Of the 89 of the field health workers 37% submitted the forms in time during the past 3 months. 10% of the reporting units did not submit the P form. In routine, 74% of the facilities report within time. During outbreaks, the median time between onset and reporting is 24-48 hrs. At the district level the action is initiated within six hours of notification of cases. During emergency, notification is done over phone and rapid response team (RRT) respond to the outbreak. Of the eight reported outbreaks, 4 were reported by the field health functionaries and remaining by panchayat leaders and newspapers.

Cost

The IDSP surveillance system uses the existing infrastructure for reporting. All the health workers said that they did not incur any cost for reporting. The medical officers informed that they incur cost for the transport of samples. They do not reimburse from the budget under IDSP but they meet the expenses through other funds.

Usefulness

Of the 40 medical officers, 34 (87%) stated that they did not use the data for initiating action. All of them did analyse the data. Of the 10 outbreaks 100% were reported to the district through health workers

Discussion

The main finding of the evaluation are that the surveillance system is easy as per the health workers and the medical officers. The surveillance system is also representative, sensitive and useful. No additional cost is incurred for the reporting at the peripheral level. But the Timeliness is the main issue. Also the completeness of the report is also an area of concern

. Surveillance for measles is done through two systems viz. IDSP, AFP Polio Integrated surveillance system. Both the systems are meant for more than one disease. Our evaluation focused on surveillance mechanism of measles under IDSP. There is opportunity for periodical reorientation (once in six months) for the medical officers by the NPSP surveillance medical officer.

Vellore district has witnessed outbreaks every year and the reported data shows that the district report 10% of the total cases reported in TamilNadu every year.

The measles surveillance under IDSP is easy and acceptable for the health workers and the reporting units. During outbreaks the timeliness and sensitivity of the system helps in triggering action. The surveillance under NPSP adds strength to the system.

However, we observed that the existing weaknesses are untimely, irregular and under reporting. So according to IDSP guidelines this is not an alert system. Even a single case of measles is a warning sign of impending outbreak. So missing case of measles may lead to late detection of outbreaks and consequent increase in morbidity and mortality.

Health worker gave lesser importance to reporting and did not submit the forms in Primary Health Centre on Saturday because they went for field work on that day. In some of the Primary Health Centres the reports are informed over phone on Saturdays and subsequently written reports are submitted on every Tuesdays while coming for review meetings.

During any given week health workers covered only half of the area they cater. In recent times diversified work load and change in policy of immunization sessions the health workers were unable to cover even half of their field area. The numbers reported are less and not representative of the entire field area. Extending the reporting system at village level involving Anganwadi worker and village volunteers with good monitoring and supervision may improve the representativeness. Also including private practitioners in rural areas as reporting units will improve the surveillance system.

Analysis of data is recommended within 24 hours of reporting. But it is not followed at Primary Health Centre level or district level and the available data are not utilised for action as they did not have the expertise in analysis and use of data. Capacity building of the personnel at the district level and Primary Health Centres will be a solution to this issue. Periodic orientation is to be done. Newly recruited doctors and field health staff after the implementation of IDSP surveillance are to be trained.

Conclusions

1. The surveillance system is easy and acceptable to all the reporting units and the field staff. 2. Poor understanding of the surveillance system as evidenced by improper reporting and lack of documentation . led to underreporting of the cases. 3. Time constraints and declined field visits have resulted in giving lesser importance to the measles surveillance.

Recommendations

Participating units needs to be increased. Private practitioners in rural and urban areas need to be oriented and encouraged to participate in the surveillance system.

Refresher training to the existing health personnel to make them understand the importance of surveillance and proper training is to be conducted periodically. Orientation training to the newly recruited health personnel in the Government system needs to be conducted.

Capacity building of personnel at the PHC level and the district level for analysing the outbreaks and documenting the events needs to be done. Appropriate instruction is to be given to the personnel at different level for documenting the analysis.

A system of supervising and monitoring of the field surveillance needs to be initiated.

Private practitioners, anganwadi workers, and volunteers at the village level need to be involved in system appropriately. Appropriate instructions and guidelines are to be issued to stress the need for timely submission of reports.

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Programme evaluation - Pilot project of Cancer Cervix Screening programme, Tamilnadu, 2008

Background/Introduction

According to WHO estimates 1999-2000 cervical cancer contributed 6 % of the total cancer cases in the world and 4% of the cancer deaths were due to cancer cervix[1]. Of the total cancer cases and deaths in SEARO, , 6.4% and 10.5% respectively were contributed by cancer cervix [1]. 80% of the global burden of cervical cancer occurs in developing countries [2].India accounts for one fifth of the world's burden of cervical cancer[3]. According to cancer registry data, age adjusted incidence rate in India ranges from 13.4 to 30.1 per 100,000 women in 1999-2000 [4]. The registry based in Chennai (Tamil Nadu) reported the highest rate in India (ref). Cancer cervix documented to be one of the leading cancer problems in different parts of Tamil Nadu[5,8]

Three fourth of the patients are diagnosed at advanced stages leading to poor prospects of survival and cure [3]. Periodic screening at interval of five years showed 54-64% reduction [6]. Globally, pap smear cytology is widely accepted strategy. However, practical and cost factors limit the use widely. Visual inspection with magnification after application of Acetic acid and/or Lugol's iodine (VIA/VILI) is sensitive and cost-effective alternative for resource poor settings[3, 12]. The Government of India recommends the use of VIA technique at the Primary Health Centres (PHC) [3].

In this context, Government of Tamil Nadu has initiated a World Bank funded pilot project on cancer cervix control in two districts with the aim to increase the awareness of cancer cervix among women , to screen 30 to 60 years women for cancer, to diagnose early and treat cancer cervix cases

Based on the success of the project this will be extended to other districts of TamilNadu. to understand the strengths and the weaknesses that emerge out of this project the strategy may be modified during the course of the project and best practices will be followed elsewhere.

The evaluation has to be carried out for this purpose. National Institute of Epidemiology is entrusted with the evaluation of this activity. We took this activity as part of the FETP field work.

We evaluated the programme with the objectives to (1) Describe the different components of the Cancer cervix screening programme (2) Evaluate the performance of the programme in terms of input, process, and identify the gaps (3) Formulate recommendations for improvement .)

Methods

Description of the programme

Review of documents

We reviewed the policy guidelines, operational guidelines to understand the policy implications and operational issues of the programme. We compared the guidelines with the national (World Health organisation-Cancer cervix screening programme and international guidelines.. We reviewed the training modules to get information regarding the training components.

Interview of stakeholders

We interviewed World Bank officials, stakeholders and programme managers at all levels to get ideas of what they expected out of evaluation.

We also conducted an direct observational visit to the districts to understand the implementation of the programme to figure out our evaluation tool.

Evaluation of the programme:

We compared the operational guidelines with the actual conduct of the programme

Review of records and documents

We reviewed the record to estimate the various input indicators such as proportion of women enumerated, the proportion of women motivated, proportion of women who attended the clinic for screening, proportion institutions with facilities, proportion of positive cases referred after screening, proportion of women diagnosed with cancer by Colposcopy, etc.

Interviews

We conducted interviews in the community to estimate the proportion of women with awareness, women who went for screening , to know the reasons for non attendance,. We conducted interviews with Medical officers and health staffs to estimate their knowledge

Survey

We conducted a community survey to estimate the awareness levels, follow up levels etc. We reviewed the various documents pertaining to the programme, conducted personal interviews with programme managers, service providers, village link volunteers and beneficiaries / clients.. Based on observations we made we formulated interview schedules, observational forms etc.

We conducted surveys, personal interviews, document analysis, and observational visits for gathering evidence. We used abstraction forms, observational checklist, questionnaire to collect data from the institutions and the community for the assessment of different indicators based on logic model. We collected all the data relevant to the indicators useful for assessing program performance in terms of input, process, and output.

Methodology for awareness component

We calculated the sample size of 1120, assuming that 50% of the population may be aware of the programme with the confidence interval of 10% and confidence coefficient of 95%. We selected 10 respondents in 112 villages (56 in each district). We selected villages according to probability proportional to size. We administered a pretested semi structured questionnaire.

We conducted surveys, personal interviews, document analysis, and observational visits for gathering evidence. We used abstraction forms, observational checklist,

questionnaire to collect data from the institutions and the community for the assessment of different indicators based on logic model. We collected all the data relevant to the indicators useful for assessing program performance in terms of input, process, and output.

Methodology for Enumeration component

We interviewed the VLVs and did a document analysis of their records. We could not get an estimate for completeness of enumeration. So, assuming that 50% of the VLVs completed their enumeration correctly and maintained registers properly, we arrived at a sample of 80 VLVs (confidence coefficient-9%, confidence limit 10%).

For logistics and feasibility we selected the VLVs from the villages selected sampled for community survey. We used an abstraction form and administered a pretested questionnaire to obtain information on enumeration activity.

Methodology for Screening component

We evaluated the indicators at the screening centres. For the selection of screening centres we arrived a sample size of 26 (using right size software) based on 100 screening centres with an estima performance 90% with confidence coefficient 95% keeping a confidence limit of 10% . We us abstraction form and questionnaire to gather information for the above indicators. We administered questionnaires to M.O. and staffs (semi-structured and pretested).

Methodology for Diagnostic confirmation

We visited all the 5 Colposcopy centres and the specialist were interviewed using the abstraction form and reviewed the documents and analysed the data. We visited the

pathology department of Theni and Thanjavur medical college and assessed the diagnostic indicators as required.

Methodology for Treatment and follow up

We visited Theni and Thanjavur Medical colleges and interviewed the specialists for obtaining information indicators relevant to treatment and follow up. We also went through the reports of the institutions to get information related to the relevant indicators. We also obtained data regarding follow up indicators through community survey.

In addition to the above, we visited the district program management unit and collected data using an abstraction form at the district level by document analysis and review of records. We also conducted personal interviews with the health care managers at the district level. For the community survey and interview of VLVs we selected and trained the field investigators.

Analysis

We entered the data in excel spreadsheet and conducted analysis of collected data using EPI info software.

Results

Description of the programme

The Government started this project through TamilNadu Health Systems project in the year 2006 in Theni and Thanjavur with the objectives of **screening** all women in the age group of 30 to 60 years for cervical cancer, **identifying and treating** all cervical cancer cases and **increasing awareness** about the disease & treatment through effective IEC strategy & mobilization.

The components of this project are Awareness Generation, Motivation and Referral of eligible women for cancer screening, Screening by Visual Inspection by magnification with Acetic acid and Lugols' Iodine, Diagnostic Confirmation by Colposcopic Biopsy, and Treatment for women diagnosed with precancerous and cancerous lesions appropriately.

The **strategies** adopted are IEC for awareness generation, Enumeration and Interpersonal communication for referring women, VIA VILI technique after counseling for screening at the PHCs and GH, Colposcopy at Selected Government Hospitals for biopsy, and pathological interpretation for diagnostic confirmation and appropriate treatment strategies for cancer and precancerous lesion.

Awareness generation: The VLVs are appointed 1 each for every Health sub centre area, by the NGOs. The NGOs are selected by the District project office headed by the Joint Director of Medical Services. Cancer control officer is appointed for implementing and monitoring the programme in the district.

The VLVs thus selected enumerate the women in the age group 30-60 years by making house to house visit and maintain the list of all eligible women. The VLVs

conduct interpersonal communication with each mother and refer them to the screening centre nearest to their residence.

Screening

The women are issued with a referral slip during motivation. The women attend the screening centre. There they are counseled by a counselor who has been appointed exclusively for the project. These counselors are appointed by either the NGOs or directly by the District Project Office. The counselors explain about the diseases, procedure of screening and obtain willingness for screening. The details of the women are entered into the patient card and institutional card for reference and record purpose respectively. For screening the women is examined through VIA/VILI technique. Those who are found to be positive for screening are referred for Colposcopy to the nearest Colposcopy Centre. The Colposcopy centres are located in selected Government Hospitals and medical colleges. There are three Colposcopy centres in each district. During Colposcopy cervical biopsy is also done and the specimen is sent for pathological examination and diagnostic confirmation. The results are communicated to the Colposcopy centres and then to the patient through the cancer control officer or counselor or doctors or VLVs. The patient diagnosed to have cancer is referred for appropriate treatment. As per the protocol, the follow up of women is done after screening, Colposcopy and diagnostic confirmation for the subsequent process as per the guidelines.

Evaluation of the programme:

The results of the evaluation are given in the table.

Awareness: of the women 23% are aware of the disease, 11% knew about screening facility, IEC messages are displayed in all the institutions (100%).

Training: 77% of the female medical officers are trained, 69% of the staff nurses are trained

Facilities: 95 % of the designated centres have functional screening equipments, only 60 % of screening centres have separate rooms , 90 % the screening centres have counselors, Colposcopy centres 3 in each district,

Screening and Colposcopy : 55 % eligible women screened, Less than 50% of the positive women underwent Colposcopy, community survey revealed a screening coverage of less than 10%.52% of the women in the household underwent screening wherever VLVs visited and motivated.

Pathology: 70% of the samples sent to pathology department were processed and results declared within one month.

70% of the screening positive women in a sample (n= 173) had their biopsies done. of them 77% of the pathology results reported within 20 days of receipt.

Discussion

The main findings of the study are low level of awareness, low response for screening, with high institutional coverage than community level coverage, The referrals are less than the expected.

The reasons or factors responsible for the low level of coverage, awareness, and referral were many.

During the initial stages the VLVs identification was difficult particularly in Theni district. Only one NGO was identified in Theni district in 2007. Subsequently NGOs were identified in all blocks of Theni district and VLVs were appointed during early 2008. In both the districts refresher training was given to all VLVs to make them understand the job responsibilities better. Also the appointment of counselors in all institutions has helped in achieving performance at the institutions. These all factors have helped in the improvement in screening coverage.

VLVs selected are not having uniform educational qualification. Even though the enumeration is done properly the updation and completeness is not is lacking. The residence of the VLVs in the same HSC area will facilitate motivation of women. VLVs job remain vacant due to various factors such as inadequate salary, other employment opportunities, Pressure in work, marriage etc. at the same time a significant proportion of VLVs belong to SHG which is an opportunity to motivate during group meetings. Similarly issue of referral slips is not as per the guidelines . Since the referral slip is missed by the women or torn easily the referral slips are issued only at the time of testing. This is issued as a formal document than the appropriate use.

VLVs stated that 3-5 out of 10 women motivated are obliging and that too only along with VLVs. VLVs take women who immediately obliges to come, they don't want to lose that women who are willing on that day. Factors that hinder women accepting for screening are expenditure, not giving importance, also feeling well, will go later, fear, time, job, feedback from women who tested already etc. As a result time spent in the villages by VLV is restricted. The working hours of VLVs vary (area specific) (e.g. area where agriculture as occupation. Since the supervisors appointed in the NGOs are not working exclusively for this project there is lack of effective supervision. Also there are issues with the payment of VLVs by the NGOs.

Though Medical officers are available in all PHCs women medical officers are not available in all the PHCs. Newly joined medical officers are untrained and trained medical officers transferred..

Separate room for counseling, screening will improve the quality of the services. the Colposcopy centres available as of now is unable to cater to all the women who are referred for want of specialists and closeness to their reach.

There is discrepancy in the coverage between reported and survey results. Reported coverage in PHC areas is 37% in Thanjavur where sample villages fall. This can be due to lack of urban rural break up in the reports, duplication of reporting in the colposcopy centres of the referred women. Villages in the vicinity of the PHC/GH have a better performance than the villages far away from the screening centres.

Regarding the Colposcopy performance the reasons that half of the positive women only undergone Colposcopy is due to lack of awareness, inadequate follow up, insufficient Colposcopy centres. Increasing the Colposcopy centres will be one solution

to the issue. Mobile medical team n the PHCs may be utilised to follow up those patients and can be directly counseled at the doorsteps of the Mobile medical Team medical officer. The biopsy during Colposcopy for all screening positive women is not happening. The screening is done again at the Colposcopy centre and women turned out to be screening negative. So only in a portion of women undergoing Colposcopy biopsy is taken. But the earlier studies involving health worker doing VIA VILI, the results were consistent with the results of the gynecologists. This has to be sorted out by an expert committee to redesign the guidelines for this particular activity. The issues with the pathological department can be sorted out by supply of caskets for tissue processing, supply of appropriate registers, reorienting pathologists. The addresses written in different document needs to be taken care fo since tracing the patients during follow up particularly if found to be cancer on pathology seems to be difficult. Initiation of treatment is immediate for frank cancer cases. But for precancerous lesions CIN I , II, III, etc patient is advised to come later which leads to loss to follow up. This can be solved if the gynecologists at medical colleges adhere to the standard treatment protocol.

Limitations

We could not get village wise screening data from the available records. So comparision of reported coverage, coverage estimation of the survey .

We did not have estimation of double entries as we could not compare the records of referring institutions and referral institutions.

Conclusions

In conclusion, the achievement of screening has increased currently compared to the initial few months. The institutional activities with respect to screening are carried out effectively.

The screening performance at the institution does not reflect the actual coverage in the community. Since there are turnover of doctors and staff nurses regularly always there is a proportion remain untrained in this programme which has to be solved. Community awareness is poor and there are no community based IEC activity.

The components such as Colposcopy coverage, and follow up activities etc. needs further strengthening. Reporting is inadequate and improper and has led to poor understanding of the performance of the programme.

Recommendations

Training for newly recruited or transferred in medical officers and staff nurses to be given. Periodical reorientation is needed for the medical personnel at all levels who are part of this programme. VLVs vacancy should be filled up and they are to be given appropriate training and also they needs supportive supervision.

We need to improve the capacity and utilization of VLVs by selecting VLVs with minimum educational aptitude criteria. To avoid turning down or to increase the average screening per day in the PHCs separate room has to be arranged for screening activity. There is urgent need to improve the supervision at the field level for motivation as well as reporting.

The reported data from the institution needs to be critically examined to assess the real coverage versus reported coverage by ruling out double entries, excluding ineligible population with respect to age and area. Verify enumeration registers of VLVs. Improve the reporting system by insisting uniform reporting by NGOs, initiating reports village wise, and also getting monthly reports from pathology department.

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SECTION 3
OUTBREAK INVESTIGATION

An Outbreak of Cholera in Gandhi Nagar, Gudiyatham Block, Tirupattur Health unit District, Vellore district, TamilNadu, India, September 2007

Somasundaram.A. , FETP Scholar 2007 NIE Chennai

Mentor : Dr.P. Manickam , NIE, Chennai.

Introduction

Cholera is an acute diarrhoeal disease caused by ingestion of the bacterium Vibrio cholerae. Two serogroups of V. cholerae, O1 and O139, can cause outbreaks. V. cholerae O1 causes the majority of outbreaks Transmission occurs through direct faecal-oral contamination or through ingestion of contaminated water and food. The disease is characterized by a sudden onset of acute watery diarrhea. The explosive pattern of the outbreak is due to its short incubation period of 2hrs to five days. About 75% of people infected with cholera do not develop any symptoms. Cholera is a virulent disease that affects both children and adults. It can kill healthy adults within hours. Globally 52 countries reported a total of 131 943 cases, including 2272 deaths, in the year 2005[1]

In Vellore district sporadic cases as well as outbreaks are reported. Major outbreak occurred in the year 2004 in a semi urban area. Otherwise it is not reported regularly due to lack of systematic investigation. On 11th September 2007 village health workers informed to Medical officer of Kallapadi Primary Health Centre, Vellore a cluster of acute severe diarrhea with dehydration in a village of Gandhi Nagar. The diagnosis of cholera was suspected. On 12th September we initiated outbreak

investigation along with the health team. The objectives of the investigation were to characterize the agent, describe the persons affected, identify the source of infection and formulate practical recommendations for control.

Methods

Descriptive epidemiology

To determine the existence of an outbreak we collected the surveillance data for the PHC and the village for the years 2005, 2006 & 2007 and compared with the current year. We also collected information about any recent change in the population.

We defined a case as occurrence of diarrhea and/ or vomiting in a resident of Gandhi Nagar, from 2nd to 15th July 2007. This case definition was consistent with the definition used in the Integrated Disease Surveillance Project (IDSP). We search for cases door-to-door in the village. We used a stimulated passive surveillance to identify new cases in the village.

We collected personal history, including symptoms, from case-patients and established a line listing. We constructed an epidemic curve to describe the development of the outbreak over time. We plotted cases on a map to understand the geographical distribution of the disease. We calculated the incidence by age and sex. We generated hypotheses on the basis of the time, place and person characteristics of the outbreak.

We could identify an initial patient with a date of onset that preceded all others. We interviewed the whole family to determine whether this patient could have constituted a source of infection for the community.

Analytical epidemiology

To test the hypothesis we conducted a matched case control study. We included all the case-patients identified during case search. For each case-patient we recruited a control

matched for neighbourhood, age and sex. We included those control-subjects who apparently did not have cholera. We collected information with respect to potential exposures from subjects using a standardized, close-ended questionnaire. We defined our referent exposure period as three days preceding the illness. We calculated matched odds ratio (MOR) for discordant pairs and their 95% confidence intervals (CI). We calculated the fraction of cases attributable to the exposure in the population (PAF) using the classical formula: the proportion of cases exposed multiplied by the attributable fraction among exposed (odds ratio – 1/ odds ratio).

Laboratory investigations

To confirm our diagnosis we took stool specimens of the cases and transported in peptone water medium and sent it in cold chain to King Institute of Preventive Medicine, Chennai, TamilNadu for laboratory confirmation of the organism.

Environmental investigations

As the descriptive epidemiology and the hypothesis generating interviews pointed to a contaminated public fountain as the potential source of the outbreak, we reviewed the water supply and sanitation situation through interviews of the index case patient, observations and interviews of community leaders. We also tested the water presence of any pathological microorganisms.

Interventions

We executed prevention measures based on our conclusions and standard treatment and outbreak control protocol. We also executed locally needed measures to control the outbreak and prevent further spreading of Cholera.

Results

Descriptive epidemiology

According to surveillance data, there were no similar episodes reported during the past threeyears in the area. Further investigations ruled out recent population influx or any change in the reporting system. Thus, this episode was considered an outbreak.

We identified 34 cases among 2712 residents of the village (Attack rate: 1.3%). There were no deaths (Table 1). Among the 34 cases, 35% and 62% had dehydration.

The attack rate was higher among under five children (3.6%). Females had slightly higher attack rate. The date of onset of first case was 2nd September (Figure 1). From 7th onwards there was gradual increase in the number of cases and the peak was on 10th September. The last case was on 15th September. This led us to suspect a common source outbreak.

Of the 34 case-patients, 11 were clustered around the house where index case was living (Figure 2). Hypothesis generating interviews with this index case-patient indicated that that the case- patient (two-year old female child) had traveled with her grand mother to a nearby town located 40 kms away from Gandhi Nagar. They both visited a relative was suffering from cholera and admitted in a Government Hospital. Further probing revealed that the families living near the index case defecated in places close to the house. There is also a public fountain near the houses where small children defecate. Hence, when the index case-patient fell sick, she used the public fountain for ablutions. We detected a pipeline leakage immediate to the public fountain.

In the northern part of the village there were few cases scattered in four streets. When these cases were interviewed they had visited a small hotel near the index house and water in the hotel was taken from the pipe very near to the index case. We also understood there were cases in the northern part of the village not exposed to this water source but possibly due to person to person transmission.

Clustering of cases, pipeline leakage, the practice of open air defecation very adjoining to the house the pattern of epidemic curve all suggested there was contamination of the water in the distribution system probably led to the common source outbreak. Thus, we generated the hypothesis that the source of the outbreak could have been drinking water from the contaminated public fountain.

Analytical epidemiology

We recruited 34 matched case control sets for the case control study. Fifteen of the case-patients (44%) consumed water from the suspected public fountain used by the index case-patient compared with 4 (12%) of the 34 matched controls (MOR 12; 95% CI 1.2-92). The population attributable fraction was 41%. Eleven of the 34 case- patients (32%) consumed water supplied from the suspected public fountain at the hotel compared with 2 (6%) of the 34 matched controls had consumed the same (MOR 10; 95% CI 1.3.-78; PAF 30%).

Laboratory investigations

All the four stool specimens grew *Vibrio cholerae* El tor O1, serotype Ogawa.

Environmental investigations

A casual assessment of the environment revealed that the sanitation was poor and the drinking water tank was not kept clean. Of the 3 water specimens taken from the suspected water source, two had fecal coliforms more than 100/Cmm.

Discussion

An outbreak of cholera struck the village of Gandhi Nagar in Vellore district of Tamil Nadu in September 2007. Unlike many similar outbreaks in the district, this outbreak was investigated using applied field epidemiology methods. These investigations suggested that the outbreak might have been caused by a public water source that had been contaminated by an initial case-patient. In fact, 64% of cases could be reasonably attributed to that water source and for rest of the case-patients we did not have any specific explanation. However, a certain amount of person-to-person transmission may have occurred.

The attack rate among children under five years was the highest. Usually children under five years are not included in case definition of cholera, as different pathogens produces a similar picture like cholera in this age group[2]. IDSP guidelines suggest that in epidemic situation acute diarrhea with or without vomiting in any patient may be taken as Cholera[1]. In this outbreak the index case itself was a two-year old female child for whom the stool specimen came as positive for cholera. Of the four specimens which were confirmed as cholera two specimens were those of children including the index case-patient. Studies in India confirm that the the annualized incidence of cholera in under five year children was 6.2/ 1000 and among under two-years it was 8.6/1000 [4]

The persons who took food from a hotel were also affected it is evident from our analysis that attack rate was more in those who went to hotel for either food or beverages. It was essential that we had to rule out food poisoning. We ruled out food by poisoning as the index case did not take food or water from the hotel. Majority of those persons who gave history of either taking food or beverages were found to be males. Also there is a small labourer conglomeration in the northern part of the village that in the break time comes to take tea and snacks from the hotel. It is likely that they take water with snacks. Further 25

case patients (74%) did not report taking food or snacks from hotel. Hence, we have reasons to rule out food poisoning.

Water scarcity is common in Vellore district which is also one of the hottest and dry areas in TamilNadu. So the practice of maintaining pit taps is very common. The pit is always kept open and in unsafe environment. In many of the acute diarrhea outbreaks these pit taps have been implicated.

The drinking-water can be contaminated where there is contact with hands and bodies of people who have cholera or through contaminated articles such as buckets, cups, clothes faecal material or by infiltration into wells when the latrines are situated less than 30 metres away from the wells[2]. In Gandhi Nagar, the water source could have been contaminated with fecal materials of both index case-patient and subsequently other case-patients. Water analysis points to fecal contamination of the suspected water sources.

Our outbreak investigation suggested that the break in the pipeline and the pit tap hole with water contaminated during ablution of the small child. 83% of the case patients could be attributed to the contaminated drinking water source alone.

There were cases from the northern part of the village that were affected but did not have the same exposure. In these cases person to person transmission might have occurred.

Contaminated water sources are often reported as sources of infection during cholera (3) Other exposure factors such as lack of sewerage and toilets at residence, children defecating outdoors, poor sanitation, low income and low education levels also were associated with enteric disease[3] . 60% of the households had no toilets in their houses, 66% had the habit open air defecation and 55% of the persons interviewed did have wash their hands with soap after defecation. Such practices also favour the spread of any enteric organisms. Morover the toilets in the household do not have safe disposal. All such factors suggets that a proper snaitary conditions do not prevail. In Vellore district, the proportion of

households with toilet is 47% and safe drinking water is 45% [5]. These figures are lower than 73% which is the national average[6,7]. This is a supportive fact to implicate water in this outbreak.

Further to add up, during our environmental investigations we found that water was not treated regularly with chlorine. The water drawn from the bore well was directly supplied to the households without treatment. The source of water is infiltration galleries at the Palar river bed which runs through half of the district. Palar river remains dry during most of the year. Now the river banks act as the place for open air defecation. Human activities in and nearer to the banks probably had slowly affected the infiltration galleries. So water contamination is possible at the source point. Isolated cases of cholera reported in the nearby areas and this outbreak has occurred after the unprecedented rains in this year.

Our investigation pointed out that that the water contamination by open air defecation and unhygienic practice has resulted in the outbreak of cholera. We decided that providing immediate alternative source of water could prevent further cases.

Our investigations pointed to the consequences of unprotected water consumption and the possibility of transmission of enteric pathogens. Unhygienic practices such as open air defecation has led this common source outbreak

Based on these conclusions we formulated recommendations. We immediately arranged for fixing the pipeline leakage with the help of panchayat leader. Next we chlorinated all the water sources with the help of panchayat workers under the supervision of health inspectors. Meanwhile, we requested the local authorities to provide alternate source of water. Based on our recommendations the local authorities instructed all the households to sand fill the pit taps as they had potential to cause further spread. The health authorities and

the local panchayat authorities together engaged in education of the people regarding hygienic practices such as avoiding open air defecation and use public toilets or household toilets. We ensured that the local authorities cleaned and repaired all the pressure valves in the water distribution system for maintaining uniform pressure in all the streets so as to prevent households from digging pits for drawing water.

To summarise systematic outbreak investigations are needed to pin point the reason for outbreaks so as to engage in safe practices in the future.

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Figure1. Cholera cases by residence, Gandhi Nagar, Vellore District, Tamil Nadu, India, September,2007

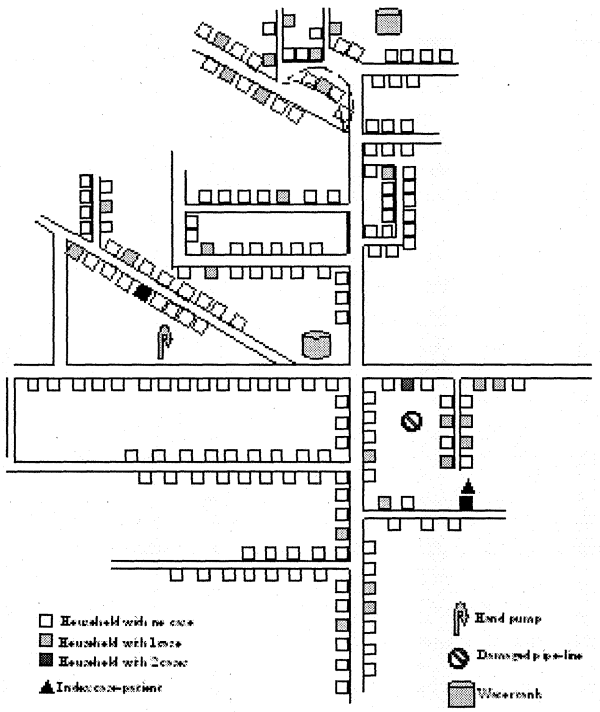

Table 1 : Attack Rates of Cholera by Age and Sex, Gandhi Nagar, Vellore District, Tamil Nadu, India, September 2007

		Number of cases	Population	Incidence
Age group	0 to 4	6	166	3.6%
	5 to 14	2	298	0.6%
	15 to 24	7	403	1.7%
	25 to 34	7	490	1.4%
	35 to 44	3	400	0.8%
	45 to 59	8	504	1.6%
	60 and above	1	171	0.6%
Gender	Male	13	1348	1.0%
	Female	21	1364	1.5%
Total		33	2712	1.2%

Figure 1. Cases of Cholera by Date of Onset, Gandhi Nagar, Vellore District, TamilNadu, India, September, 2007

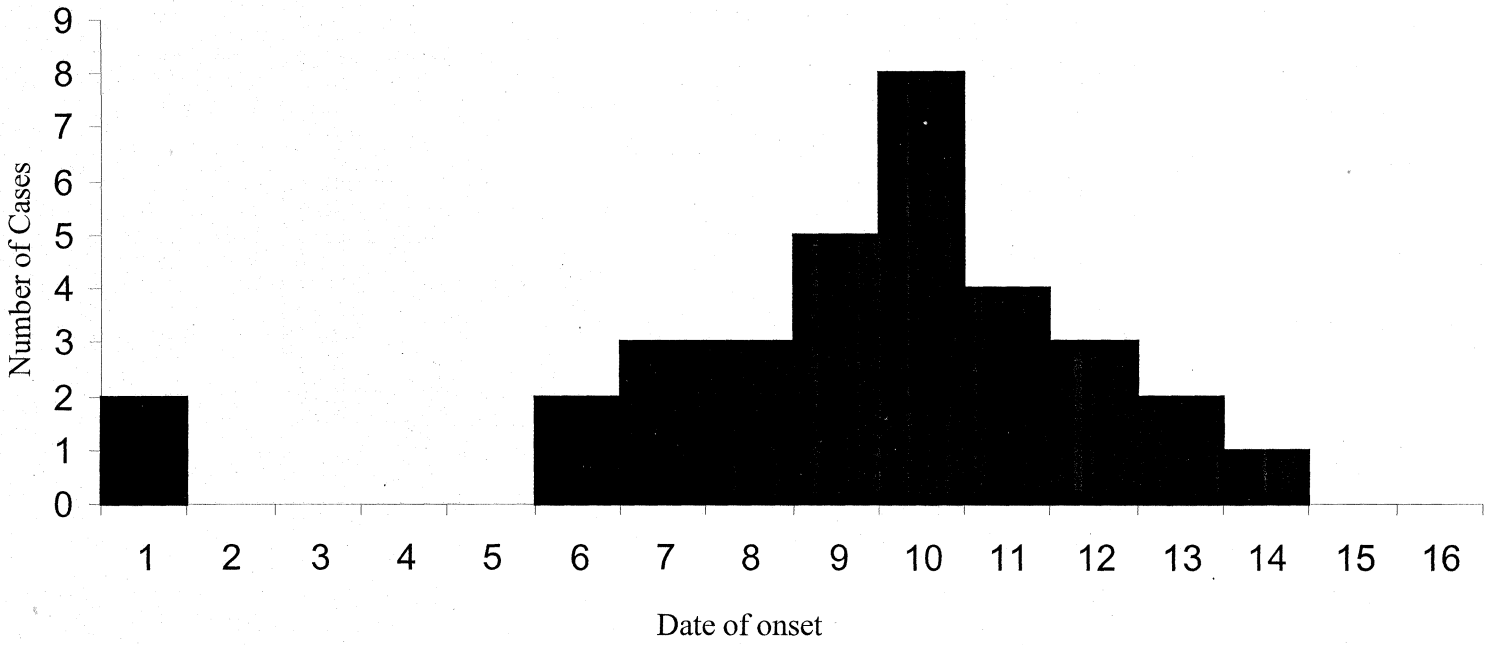

Table 2: Frequency of selected exposures among Cholera cases and controls, Case control study, Gandhi Nagar, Vellore District, TamilNadu, India, 2007

	Frequency of exposure					
	Cases (n=34)		Controls (n=34)		Matched odds ratio	95% confidence interval
	#	%	#	%		
Drinking water from the public fountain near house of index case	15	79	4	21	**12**	**1.2-92**
Drinking bore well water	8	53	7	47	1.2	0.4-3.7
Drinking water from Public fountain2	9	53	8	47	1.2	0.4-3.5
Drinking water from hotel	11	33	2	5	**10**	**1.3 -78**
Absence of hand washing	1	50	1	50	1.0	0.1-17
Drank water from a tank	4	44	5	56	0.7	0.2-3.7

SECTION 4
SCIENTIFIC STUDY CRITIQUE

Scientific paper critique form

General information:

Title of the paper: Cassia occidentalis poisoning as the probable cause of hepatomyoencephalopathy in children in Western Uttar Pradesh

Authors: **V.M.Vashishtha, Amod Kumar, T.Jacob John, N.C.Nayak**

References: **Pubmed search provides results of studies by the same authors. Many studies are conducted in animals. Senna occidentalis poisoning have also been largely studied.**

Reviewer: **Dr.A.Somasundaram**

Date: **2008-03-20**

General narrative comments:

Any outbreak investigation has to be started from proof of existence of epidemic. That has been mentioned as a justification for the whole paper. Recurrent outbreaks of hepatomyoencephalopathy have been reported from 2002-2005 in western Uttar Pradesh. The manuscript is not perfect as per the prescribed criteria. But the authors are leading to the argument and also proceeded with appropriate study design to meet the objective proposed for the study. Results section is not very sequentially presented but adequate.

The discussion could have been little smaller and some points could have been presented in the introduction itself. But in general it is a paper which has been presented in a simple and understandable manner.

The limitation of inadequate toxicology has been mentioned by the authors who give suggestions for the future researchers to explore toxicological investigations.

Area	Checklist items	Grading from 1 (strongly disagree) to 5 (strongly agree) *					Explanations †
		1	2	3	4	5	
Overall assessment of the paper	The background introduces a specific question and spells out objectives on the basis of a description of general and specific issues.			√			Gives detailed information about the local outbreak Descriptive part includes time, place, and person details in a sentence or two and not elaborated. Other cause ruled out, to find out risk with weeds consumed by children
	The methods section provides sufficient information on design, sampling, definitions, data collection, laboratory methods and data analysis.				√		Case control design, all cases with 3 controls, inclusion criteria is in detail, semi structured questionnaire used, no lab needed, analysed with Epi info
	The results section reports sound scientific data that meet the objectives. There are enough details and adequate statistical information.				√		Yes. The objective was to identify the risk and the odds ratio has been presented backed by statistical figures.
	The discussion section interprets the results to build a case on the basis of the data presented and the literature.			√			The results are elaborate, based on the data. The authors have presented the epidemiological evidence for implicating cassia for the episodes
	The limitations are described and analysed so that their impact on the capacity to conclude are well understood.				√		Yes. The limitation of not been able to do toxicology study on cases and controls has been mentioned.

* Tick appropriate box.

† Provide explanation to justify your grading of each of the items.

	and gathering additional evidence on the basis of the evidence presented.						of IEC campaigns has been mentioned. Future studies with toxicological investigations have been proposed.
Area	***Checklist items***	***Grading from 1 (strongly disagree) to 5 (strongly agree)***					***Explanations***
		1	***2***	***3***	***4***	***5***	
Methods	The design is adequate to meet the objectives.				√		Objective of the study is to find the risk of disease associated with eating weeds. Cases have already occurred. So case control is appropriate
	The population is well defined and relevant to the objectives.				√		Study population is defined and relevant to the objective.
	Definitions are specified, sound and based upon standardized criteria when available.				√		There are not many studies elsewhere. I feel that there is no standardised criteria mentioned in the literatures.
	Sampling methods are statistically sound and adapted.				√		All the cases in the study period have been taken up for the study. Controls are selected properly.
	The sample size was estimated beforehand appropriately and is adequate.				√		All cases are taken up for the study.

							cases did not perceive that weeds are poisonous they could not have observed properly whether their children ate or not. Also difficulty in recalling exposure is difficult. It seems that it needs more explanation or exploration.
	The data that were collected are well described and relevant.			√			59 variables have been included in the questionnaire. All are not described. But those described are very relevant.
	The data was collected with methods ensuring sufficient quality.			√			The information as to who interviewed the parents of the children is not mentioned. There is no mention about the methods to ensure data quality. We cannot assume either way.
	The analysis is thought beforehand and appropriate.				√		Yes. Appropriate. I am not sure whether the child having pica might have influenced on the exposure i.e. consumption of weeds. There is no mentioning of this. History of pica seems to be incidental while eliciting history.

	calculated.						possible risk factors. Odds ratio could have been mentioned for some baseline variables also. The reader has to calculate odds ratio for suspected variables .The indicators are well calculated and appropriate.
	The statistical tests are appropriate and well computed.				√		The author has analysed data in EPI info.
	Appropriate attention has been given to human subject protection.		√				As outbreak investigation are emergencies ethical issues stand secondary.
Area	***Checklist items***	***Grading from 1 (strongly disagree) to 5 (strongly agree)***					*Explanations*
		1	***2***	***3***	***4***	***5***	
Writing	The content is well distributed in the relevant chapters and sections.				√		The content in corresponding headings seems to be appropriate.
	The language is simple and clear. The word count is < 3000.				√		Language clear and simple. Word count is 2700 only.
	The writing is sequential, going from one point to the next.			√			Some more attention could have been given for the sequential writing in the results section.
	The active voice is used throughout.			√			No. it is not used throughout.
	The vocabulary is precise, consistent and standardized.				√		Precise. But not consistent. Standardised terms have been used.

figures	and or figures.						
	The choice of graph or table to display information is judicious.				√		Tables given are judicious.
	The tables are clear, exact and the totals add up.				√		Only a summary table and analytical results table are given which are quite informative. This criterion may not fit for these two tables.
	The graphs are effective, appropriate, understandable and they have a low ink-to-data ratio.			√			No graph is presented.