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RESEARCH ARTICLE

EMERGING ARBOVIRAL INFECTIONS IN EASTERN INDIA.

Dr. Kumari Seema¹, MD, Dr. Manoj Kumar¹, MD, Dr. Ashok Sharma¹, MD, Dr. Amber Prasad¹, MD, Mr. Nikesh Sinha², MSc, Zulfiquar Ali Bhutoo¹, MMLT² and Poonam Kumari¹, BMLT².

1. Department of Microbiology, Rajendra Institute of Medical Sciences, Ranchi.
2. Viral Research and Diagnostic Laboratory, Rajendra Institute of Medical Sciences, Ranchi.

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Abstract

The arboviral diseases (arthropod-borne viral) are caused by a wide variety of RNA viruses with a life cycle that requires both a host (birds or mammals) and a vector⁶. More than 130 arboviruses are known to cause human disease, and are responsible for some of the most explosive epidemics of emerging infectious diseases over the past decade. The study was conducted at department of Microbiology at Rajendra Institute of Medical College, Ranchi at ICMR DHR VRDL center for 5 years from 2012 – 2016. It has been seen that there is rapid increase of dengue cases from 2012 to 2016. It has also been observed that the infection is more prominent in the rural area than the urban areas and the infection has no effect on the gender. This retrospective study highlighted rain, temperature and relative humidity as the major and important climatic factors, which could alone or collectively be responsible for an outbreak, and also the drastic fall in the platelet count which is life threatening is highlighted.

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Introduction:-

Contagions or rapidly spreading highly infectious diseases, with an estimated high fatality rate of 17 million deaths per year worldwide are major issue of public health concern¹⁻³. The most overpopulated and economically backward countries in Southeast Asia are particularly vulnerable. Among the emerging infectious diseases, the arboviral diseases group has particularly warrant attention in global health landscape with its potential for epidemics and its unprecedented spread^{4,5}. The arboviral diseases (arthropod-borne viral) are caused by a wide variety of RNA viruses with a life cycle that requires both a host (birds or mammals) and a vector⁶. The transmission is preceded by a biological replication in an arthropod vector (e.g. mosquitoes, sandflies, ticks, or midges) and these viruses typically circulate among wild animals. More than 130 arboviruses are known to cause human disease, and are responsible for some of the most explosive epidemics of emerging infectious diseases over the past decade. Most arboviruses of public health importance belong to one of three virus genera: Flavivirus, Alphavirus and Bunyavirus. Arboviral diseases include: WNV disease, Yellow fever (YF), DEN, Murray Valley fever (MV), JE, Equine encephalitis, CHIK fever, Rift Valley fever (RFV) and among the tick-borne diseases, tick-borne encephalitis, hemorrhagic fevers except KFDV, CCHF are less common infections. Although most arboviral infections are asymptomatic, clinical manifestations range from mild febrile illness to severe encephalitis and are even occasionally fatal. Case definition and adequate surveillance, therefore, are major challenges. Treatment for arboviral diseases is mainly supportive^{6,7}.

Corresponding Author:- Kumari Seema.

Address:- Department of Microbiology, Rajendra Institute of Medical Sciences, Ranchi.

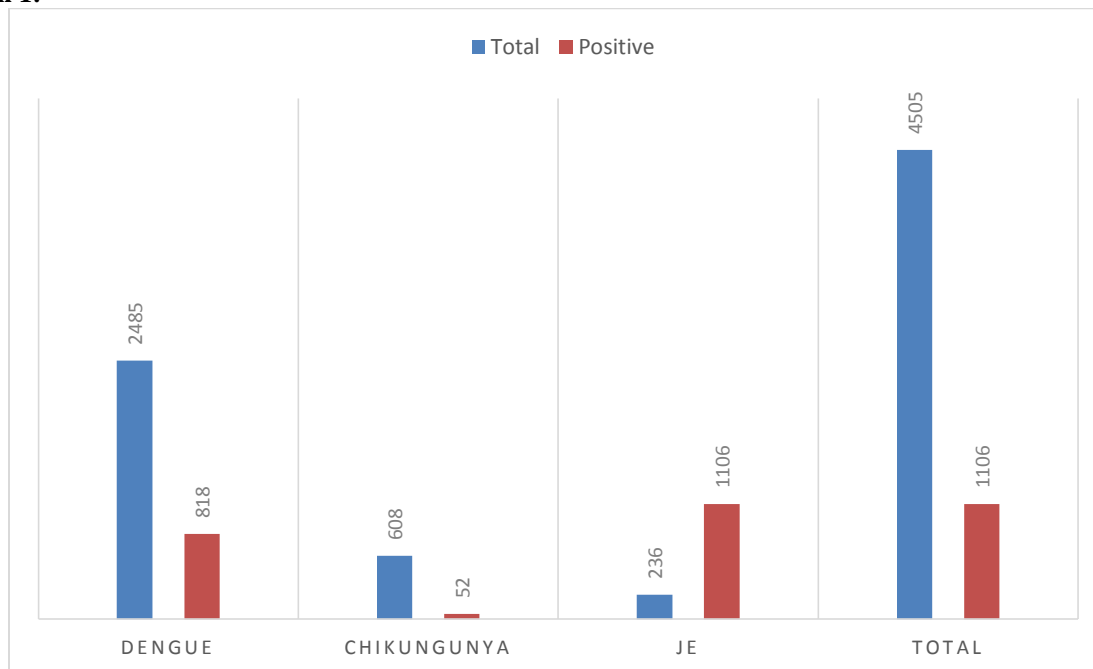
Materials and Method – The study was conducted at department of Microbiology at Rajendra Institute of Medical College, Ranchi at ICMR DHR VRDL center. The study period was for 5 years from 2012 – 2016. All the patients suspected of the viral fever with complaints of rash, arthralgia, malaise and malaise with retro orbital pains and headache were screened for dengue and chikungunya and patients with complaints of new onset of seizures, change in mental status, increased somnolence altered sensorium with neck rigidity and irritability were screened for Japanese encephalitis. The blood samples were collected for suspected cases of dengue and chikungunya and CSF for patients suspected with Japanese Encephalitis. All the samples are collected in an universal precaution and stored in a sterile manner in cryopreservative vials . The tests are performed as per the kits provided by NIV Pune. A total of 4505 suspected samples of Dengue, Chikungunya and Japanese encephalitis were collected from Jan 2012 – Dec 2016. A total of 2485 suspected samples for Dengue, 608 suspected samples for Chikungunya and 1106 suspected samples for Japanese Encephalitis were collected.

Results – A total of 25% of suspected samples received are positive with 33% of dengue , 8.55 of chikungunya and 2.55 of JE are positive as depicted in Graph 1. The male is to female ratio is 2.4, with total male sample being 3203 and total female sample being 1302. The number of people living in urban area 1793 while 2712 people reside in urban area. Year wise distribution of total patients and positivity is reported is Table 1 and Graph 2. Table 2 and Graph 3 depicts the total number of patients year wise having arboviral infections. The total illiterate persons are 943 and literate 1542.

Table 1:-

	2012		2013		2014		2015		2016	
	Total	Positive	Total	Positive	Total	Positive	Total	Positive	Total	Positive
Dengue	144	54	423	118	310	49	462	156	1146	491
Chikungunya	49	0	125	1	34	0	41	0	359	51
JE	97	15	308	70	204	30	313	70	490	51

Graph 1:-



Graph 2:-

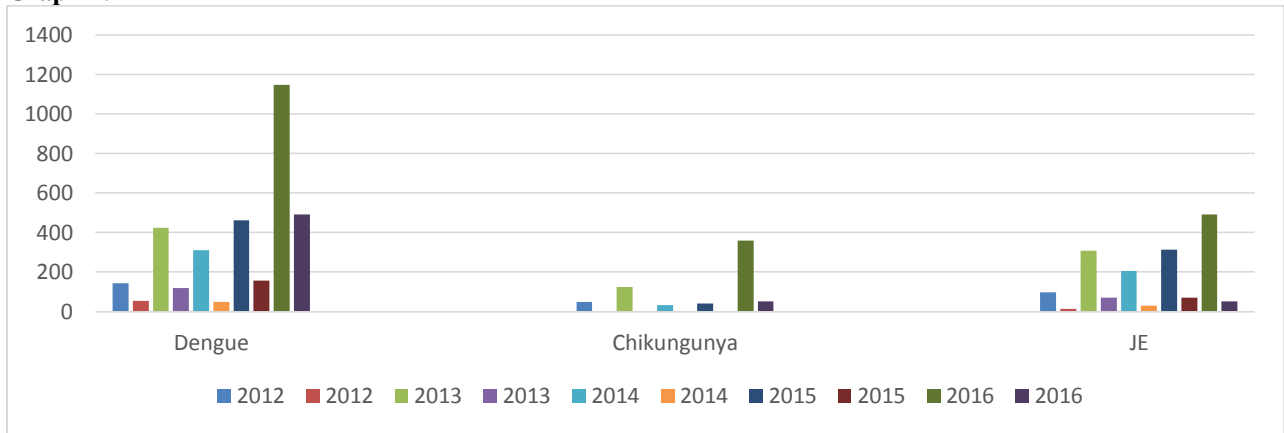
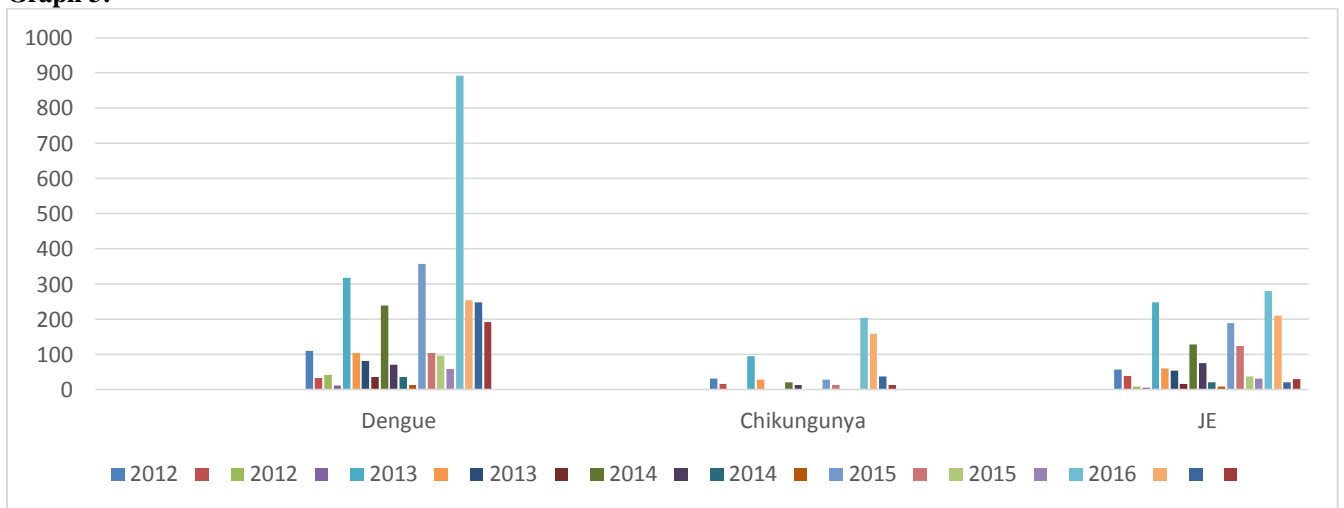


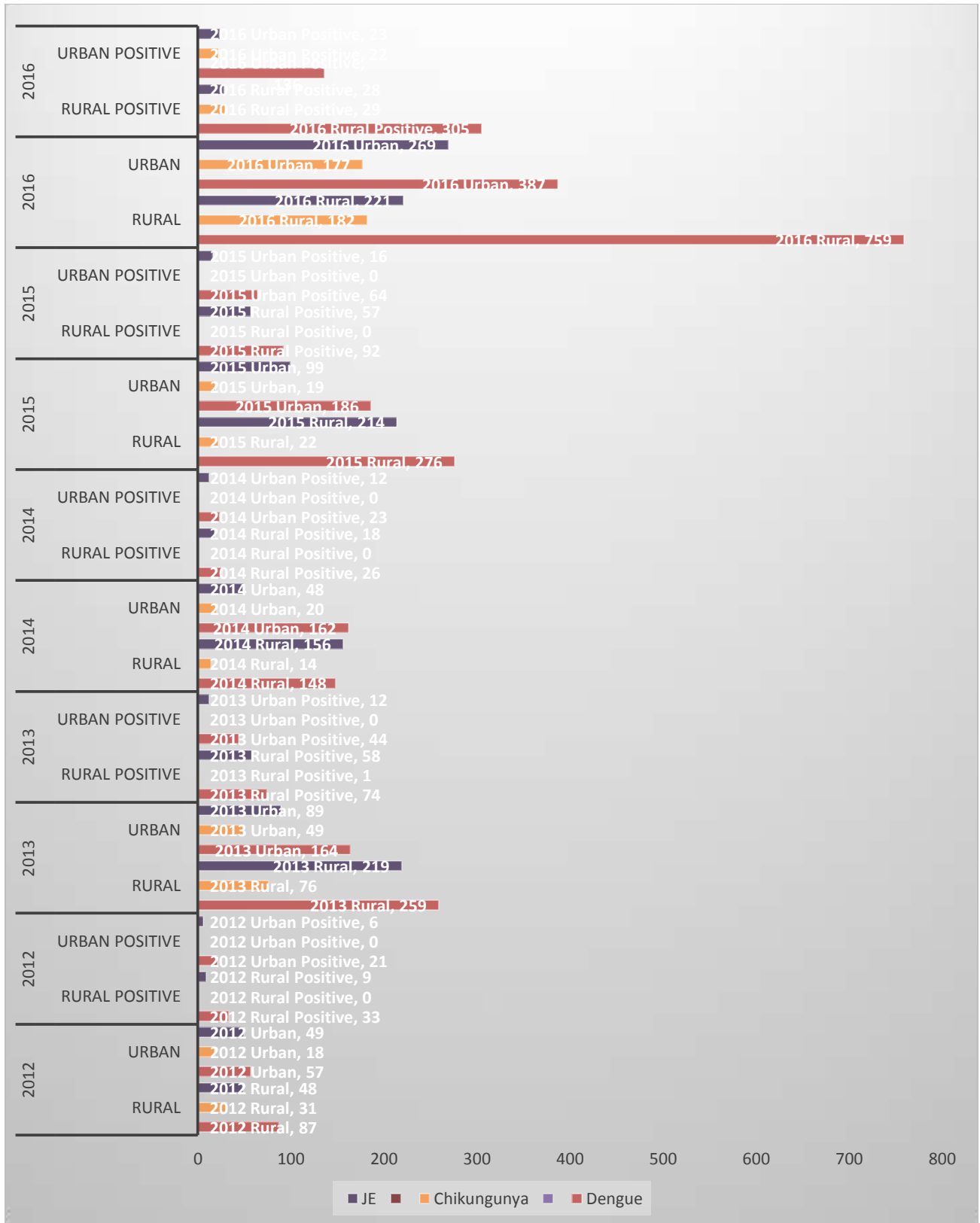
Table 2:-

	2012				2013				2014				2015				2016			
	Male	Female	Male positive	Female positive	Male	Female	Male positive	Female positive	Male	Female	Male positive	Female positive	Male	Female	Male positive	Female positive	Male	Female	Male positive	Female positive
Dengue	111	33	42	12	318	105	82	36	239	71	36	13	358	104	97	59	892	254	249	192
Chikungunya	32	17	0	0	96	29	1	0	21	13	0	0	28	13	0	0	205	159	38	13
JE	58	39	9	6	248	60	54	16	128	76	21	9	189	124	38	32	280	210	21	30

Graph 3:-



Graph 4:- The rural to urban population distribution is as depicted in the graphical form.



Discussion:-

It has been seen that there is rapid increase of dengue cases from 2012 to 2016. It has also been observed that the infection is more prominent in the rural area than the urban areas and the infection has no effect on the gender.

Conclusion:-

This retrospective study highlighted rain, temperature and relative humidity as the major and important climatic factors, which could alone or collectively be responsible for an outbreak, and also the drastic fall in the platelet count which is life threatening is highlighted. More studies in this regard could further reveal the correlation between the climatic changes. Platelet count and dengue outbreaks which would help in making the strategies and plans to forecast any outbreak in future well in advance.

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