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### Adult Japanese Encephalitis mass vaccination campaign: A rapid convenience assessment

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#### KEYWORDS

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Vaccination;  
SA 14-14-2;  
RCA;  
ASHA

#### A B S T R A C T

Japanese Encephalitis (JE) virus infection has no longer confined to children population and extended from young children to adults in Assam, India. The adult JE Mass Vaccination campaign targeting the age group 15–70 years have been implemented in February 2014 in 7 endemic districts of Assam with SA 14-14-2 vaccine. In campaign-completed areas, we collaborated with local workers to identify neighborhoods at greatest risk of poor coverage. Convenience household assessment conducted to identify 20 target adults in 20 household randomly from each locality by random. If a household had more than one target adult, we included only one adult by random method. Total 361 household were visited to interview 328 target adults. Among them 57.62% were vaccinated and 42.38% were unvaccinated. Target adults from rural areas were vaccinated more (64.8%) in comparison to urban area 35%. Non-vaccinated respondent (27%) cited chronic illness as the most common reason. While 15% did not think campaign was important. The 80% respondents learnt about the campaign through ASHA/Link worker.

### Introduction

Japanese Encephalitis is a vaccine preventable mosquito born viral disease and recognized as a major public health problem across Asia. Approximately 20–30 percent of JE cases die while 30–50 percent develops neuropsychiatric sequelae (WHO, 2006). It is primarily a disease of children and most adults in endemic countries have natural immunity after childhood infection. In some areas of northern India, Nepal, and Sri Lanka, all age group are affected (Campbell *et al.*, 2011).

Since JE has a bad prognosis, the acquisition of JE will have a big impact on patient himself, patient's family, and society, and become a huge burden on medical cost (Chen *et al.*, 2013). Moreover, there are currently no specific antiviral or other curative medications for JE. Immunization is the only reliable and effective method to control disease. Experience from countries including Australia, Japan, Republic of Korea, and Thailand has shown that

immunization has been a critical factor in achieving JE control.

JE vaccination campaigns were started in India in 2006 in a phased manner following the massive outbreak of JE in 2005 in Eastern Uttar Pradesh and adjoining districts of Bihar. Children between the age group of 1 to 15 years were vaccinated with a single dose of live, attenuated SA14-14-2 vaccine, manufactured by the Chengdu Institute of Biological Products in China (Operational Guide for Japanese Encephalitis Vaccination, 2010).

The vaccine is considered safe, affordable, and effective (WHO, 2005; Liu *et al.*, 1997; Yaïch, 2009; Kumar *et al.*, 2009). However in recent years, JE virus infection is no longer confined to children population and has extended from young children to adults in different districts of Assam, India. No study has been published that clearly describe the impact of an immunization program using this vaccine in adults. However, a study conducted in Nepal found a significantly greater impact of JE vaccine on its incidence in districts that targeted vaccination to the entire population aged  $\geq 1$  year compared with districts that only vaccinated children aged 1–15 years (Upreti *et al.*, 2013). In 2011, Adult JE vaccination was conducted for the first time in India on experimental basis in Sibsagar district of Assam.

Thereafter, to control effectively the burden of JE in adult population, the Government of Assam carried out a mass vaccination campaigns in seven high risk districts of the state in February 2014 which included Kamrup (Metro), Golaghat, Jorhat, Dibrugarh, Tinsukia, Dhemaji and Lakhimpur District. During the campaign, adults aged between 15 and 70 years were vaccinated with a single dose of live attenuated SA 14-14-2 vaccine.

As it is known that achieving uniformly high coverage in the target area is critical to reaching herd immunity and disease control goals, and real-time monitoring allows rapid targeting of additional activities to areas with inadequate coverage. So we conducted a Rapid Convenience Assessment (RCA) in Jorhat district: To assess the completeness of the vaccination and to find out the most effective mode of social mobilization in JE mass vaccination campaign for adult.

## **Materials and methods**

In campaign-completed areas, we collaborated with local workers to identify five neighborhoods at greatest risk of poor coverage. Convenience household assessment conducted in each identified area to identify 20 target adults in 20 household randomly. If a household had more than one target adult, we included only one adult from each household randomly. A standard paper monitoring format was used to collect information about the vaccination status and reasons for non vaccination. Vaccination status was confirmed by looking in to the indelible ink finger marking done at the time of vaccination.

If any unvaccinated occupant of target age 15 to 70 years were found they were referred to the nearest fixed sites for vaccination. We also inquired with the vaccinated beneficiaries about the source of information of the campaign. Multiple responses were accepted about the source of information. The survey was conducted within as soon as the area declared as completed for campaign activities by the designated health department officials.

## **Results and discussion**

A total of 328 adults (15–70 years) were interviewed after surveying 361 households in the identified five neighborhoods at

greatest risk of poor coverage in the Jorhat district of Assam. These five areas are Baghchung, Solmara, Dhapkota, Titabor and Jorhat-Urban.

Among the targeted adults, 57.62% were vaccinated and 42.38% were unvaccinated (Fig. 1). Target adults from rural areas comprising of Baghchung, Solmara, Dhapkota and Titabor were vaccinated more (64.8%) in comparison to Jorhat urban (35%) (Fig. 2).

Titabor had the highest (67.5%) of vaccinated adults followed by Baghchung (64.8%). The most common reason cited by the respondents for missed vaccination (Table 1) was chronic illness 38 (27%) and 20 (15%) respondents did not think that the campaign was important. About 11 (8%) did not know about the campaign. One session site had no vaccine and four session sites had no vaccinator in place at the time of mass campaign.

The Adult JE mass vaccination campaign which was conducted included both IEC (information, education, communication) and IPC (Interpersonal communication) as modes of communication and social mobilization. In our study it has been observed that majority of the respondents (80%) learnt about the campaign through ASHA/Link worker followed by poster/banner (10%). On the contrary, none of the respondents have cited school teacher or students and beating of drum as the source of getting information about the adult vaccination campaign (Fig. 3).

Japanese Encephalitis (JE) over the years has emerged as one of the major public health problems in Assam due to its complex eco-epidemiology (NPPCJA, 2014). There has been an increase in AES/JE cases over the years from 2007 to 2013 in Assam with similar increasing trend

in Jorhat district (National Vector Borne Disease Control Programme). Following the introduction of JE vaccination program in Assam for children of 1–15 years age group in 2006, the people infected with JE virus has changed from young children population to young and mid-age adults (Borthakur *et al.*, 2013). Similar age shifting was also observed in Taiwan (Chen *et al.*, 2013). In our study, among the targeted adults, vaccination coverage was only (57.62%) which was much below the set target.

Coverage was better in rural areas (64.8) compared to urban areas which indicates a better awareness among the rural mass as well as the Health care Personnel about the campaign. The most common reason for missed vaccination was chronic illness (27%) of respondent at time of vaccination while 15% respondents did not think that the campaign was important. The Adult JE mass vaccination campaign included both IEC (information, education, communication) and IPC (Interpersonal communication) as modes of communication and social mobilization. In our study it has been observed that majority of the respondents (80%) learnt about the campaign through ASHA/Link worker followed by poster/banner (10%) which signifies that ASHA/Link workers have an important role in success of the campaign. In a study by Goel *et al.* (2007) it was observed that for 53% of mothers, ANM/Health workers were major source of information for routine immunization.

Similar findings were observed by Singh *et al.* (2005) where 43.94% of the respondents had learnt about Pulse Polio Immunization from the health workers. On the other hand, the role of the school teachers or students & beating of drum as a method of communication for the adult vaccination campaign could not be established.

About 8% did not know about the campaign which showed that IEC activities could not reach all target beneficiaries which has adversely affected the social mobilization in some areas. One session site had no vaccine and four session sites had no vaccinator in place at the time of mass campaign which warrants the need for efficient logistic and manpower planning.

Similarly in a study which reviewed the various factors associated with missed vaccination in mass immunization campaigns, found that use of logistic spreadsheets, influence of mass media, personal invitation, incentives for participation were the key factors for the success of any mass campaign. However, concern about safety of vaccines, people living in 'remote' urban areas, distance from the vaccination site, unawareness of the campaign and lack of time of the vaccinee are hurdles for success of any mass campaign (Weiss *et al.*, 2009).

### Conclusion

The findings of our study emphasizes that achieving high coverage in the target areas

is critical for success of any mass campaign and warrants further action. ASHAs and Link workers play a critical role in sensitizing the public for the campaign. Although JE vaccination campaigns with the live attenuated vaccine SA-14-14-2 has been started in the adult population in several districts of Assam, continued concerted efforts in surveillance and immunization is of prime importance to keep this vector borne disease under control.

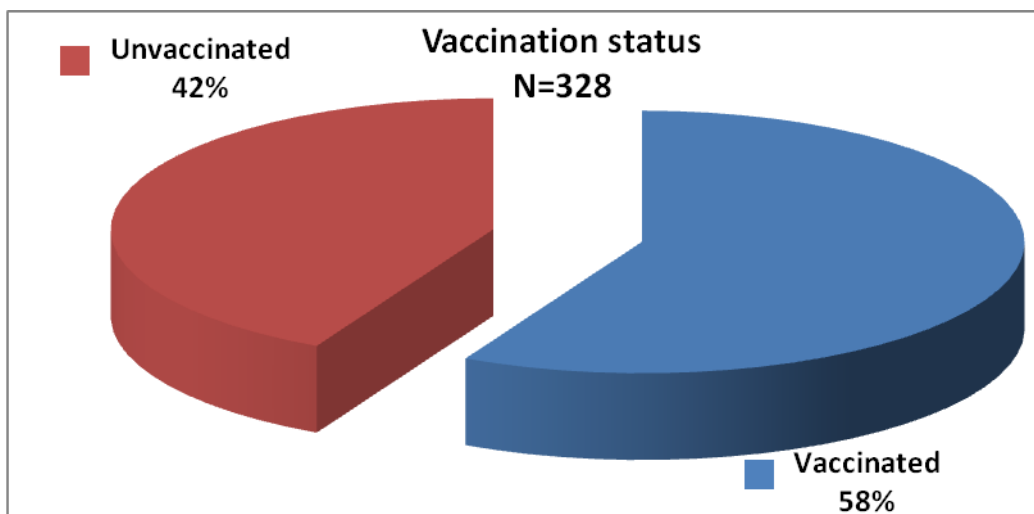
### Competing Interests

The Authors have declared that no competing interests exist.

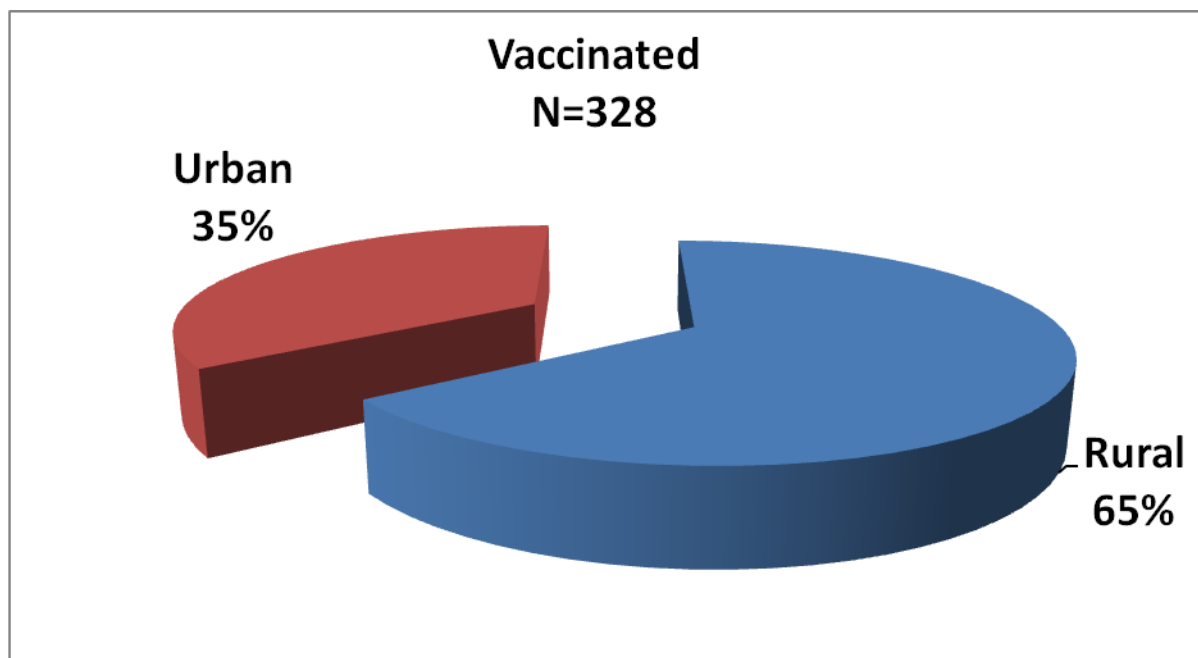
### Authors' contribution

BRD, GK conceived, designed conducted the study, they also wrote the manuscript. HB, ND was jointly responsible for study concept and writing part of the manuscript. AHM analyzed the data in this study. All authors have seen and approved the final proof of this manuscript.

Fig.1 Showing adult vaccination status



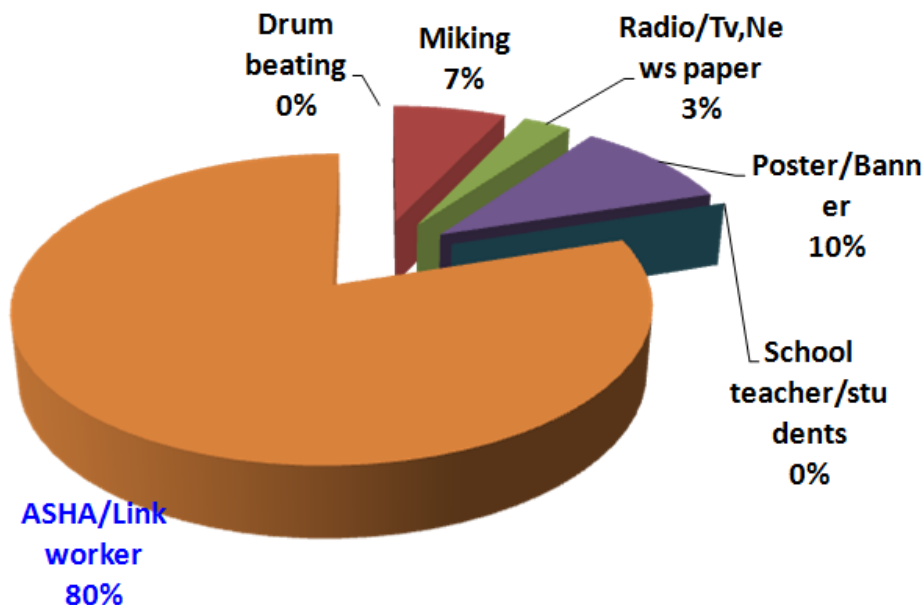
**Fig.2** Showing Status of vaccination according to settings of the respondents



**Table.1** Showing reasons for missed vaccination

Sl. No.	Reasons	No. of persons
1	Parents did not know about the campaign	11 (8%)
2	Parents did not know about the place or date of the campaign	3 (2%)
3	Parents did not think that the campaign was important	20 (15%)
4	The person was sick( <b>chronic illness</b> )	38 (27%)
5	There was no vaccine at the session site	1 (0.9%)
6	There was no vaccinator at the session site	4 (3%)
7	Fear of injection	5 (4%)
8	Fear of AEFI	4 (3%)
9	Very long queue	6 (5%)
10	Travelling	2 (1%)
11	Others	45 (32%)

Fig.3 Showing how target recipient came to know about the vaccination campaign



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