



## **EVALUATION OF PROMOTIONAL TOOLS IN DENGUE PREVENTION PROGRAM**

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### **ABSTRACT**

**Introduction:** *Dengue fever or more aptly dengue epidemic has established itself globally in both endemic and epidemic transmission cycles and is a painful, debilitating mosquito-borne disease caused by any one of the four closely related dengue viruses. To reduce the burden of disease, Government of India has been regular with the promotional activities to help create awareness in the population.*

**Objective:** *The study intended to assess awareness level of dengue preventive program. Furthermore, study has tried to assess the reach of promotional tools with respect to Dengue Prevention Program in Delhi and perform a comparative analysis between various promotional tools used by the Government.*

**Methodology:** *It was a cross-sectional study orchestrated in Najafgarh, Delhi. A sample size of 100 respondents was selected with the help of convenience sampling. The respondents*

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were interviewed using a structured questionnaire on their knowledge of dengue. Age (above 15years) was used as inclusion criteria. Analysis was done using IBM SPSS version 22.

**Results:** Of the study population, 70% were males and 47% subjects were of the age group 15-35years. 91% subjects were aware about dengue and methods of its prevention. 87.9% of the subjects were aware of the fact that dengue is mosquito borne and 93.4% population had taken measures to prevent mosquito breeding in-house. Out of the total, 84% were exposed to one form or the other of dengue prevention program (DPP) with broadcast media being the most penetrated tool (85%). 65.4% claim that DPP had a positive effect on their knowledge about dengue and has helped them prevent the disease.

**Conclusion:** The community is sensitive towards the seriousness of disease. Promotional tools employed by the government are able to achieve their goals and objective. But still there is a gap, as the burden of disease is not as per the threshold levels.

**Keywords**–Dengue, Promotional Tools, Delhi, Dengue Prevention Program, NVBDCP

## **1. Background**

Dengue as a disease is endemic in more than 100 countries of Africa, America, the Eastern Mediterranean, South-East Asia and the Western Pacific. The America, South East Asia and Western Pacific regions are the most seriously affected [1]. Currently, there are no licensed vaccines or therapeutics, and substantial vector control efforts have not stopped its rapid emergence and global spread [2]. 40% of the world's population is expected to be at the risk of dengue and 725,000 people die of mosquitoes every year out of which, death at every 25<sup>th</sup> minute is because of dengue [3].

As per World Health Organization (WHO) fact sheet, published in 2016, an estimated 390 million infections occur worldwide each year with about 96 million resulting in illness. These many numbers of infections are more than three times the dengue burden as estimated by the World Health Organization. Of this 96 million illness, Asia bore 70% (67.2 million infections) of this burden, and is characterized by large swathes of densely populated regions coinciding with very high suitability of disease transmission. India alone contributed 34% of the global total [2].

Given the importance of global dengue epidemic, with its staggering human and economic costs, an international effort to reduce morbidity and mortality was long overdue. WHO

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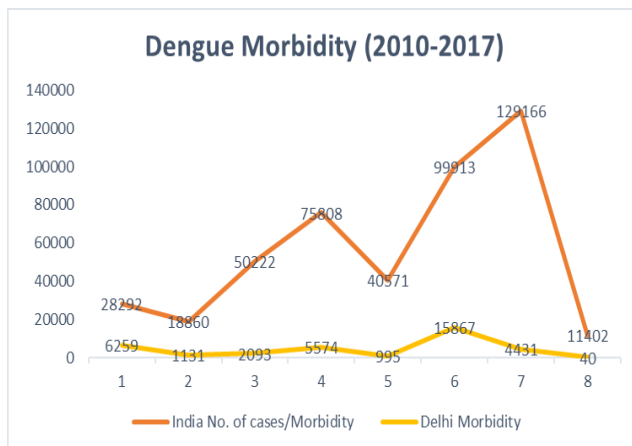
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released its global strategy for dengue prevention and control in which India was ranked 17 in list of 30 most highly endemic countries/territory (2004-2010). The goal of global strategy is to reduce burden of dengue with specific objective of reducing dengue mortality by at least 50% by 2020, reducing dengue morbidity by at least 25% by 2020. Dengue being a global threat requires a global response to be undertaken by all possible partners.

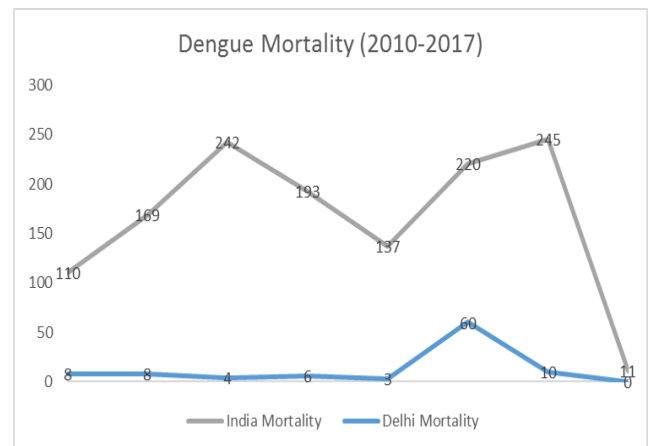
In India, Madras (now Chennai) recorded the first epidemic of clinical dengue like illness in 1780 and first virologically proven epidemic of dengue fever occurred in Calcutta and eastern coast of India in 1963-1964 [4].

Current statistics on dengue in country by National Vector Borne Disease Control Program [5] tells that the country saw a total of 99,913 cases in 2015 and out of these 220 patients died. In the following year (2016), a hike in the number of cases was observed. 29253 more cases were recorded in 2016 i.e. a total of 1,29,166 dengue patients were seen by the country. Of these 1,29,166 patients, 245 patients died. While the country saw 29% more cases in 2016 than in 2015, Delhi saw 72% less cases in 2016 in comparison to 2015. (Refer Graph-1 and Graph-2)

A staggering 15,867 cases were alleged 2015 in Delhi – worst in 20 years – with disease claiming 60 lives as per municipal reports. While in 2016, the city encountered only 4431 cases [5].



Graph-1 Dengue Morbidity (2010-2017)



Graph-2 Dengue Mortality (2010-2017)

Implementation of early case detection and referral systems for patients can help reduce the mortality due to dengue. Along with this, managing severe cases with appropriate treatment; reorienting health services to cope with dengue outbreaks; and training health personnel at all levels of the health system can be of great help.

In spite of focusing to reduce mortality, if the focus is shifted on reducing the morbidity of dengue then the burden of this mosquito borne disease can be curbed down to a great deal. Reduction in the morbidity can be done by creating a level of awareness among the population of the country regarding the prevention and intervention methods mandatory to safe guard against Dengue Hemorrhagic Fever. A further morbidity reduction can be achieved by implementing improved outbreak prediction and detection through coordinated epidemiological and entomological surveillance.

Dedicated efforts from the Government of India (GOI) have been evident over the years. GOI is regular in issuing advertisements in the leading newspapers of the country. Also in hospitals, specialized dengue control cells and designated beds for dengue patients can be seen. Fever corners across all the hospitals and dispensaries of the country are another promotional activity or intervention with respect to dengue undertaken by the government. The prices of dengue diagnostic tests are also fixed to Rs. 50 and Rs. 600 for platelet count test and NS1 ELISA test respectively to make them affordable for all.

Despite extensive efforts made in developing effective dengue control measures, the number of dengue cases, their severity and geographical boundaries are expanding alarmingly and posing dengue as one of the deadly disease [6]. Over the period of time, dengue has received much attention in the scientific as well as Indian Government's administration. However, lacunas are seen and a lot remains to be achieved for managing the disease under threshold level [6].

Alone efforts of Government cannot help achieve these thresholds. There is a need to sensitize the population on the seriousness of the disease. The importance of community participation for the prevention and control of outbreak of Dengue Fever/ Dengue Hemorrhagic Fever has also been highlighted by National Dengue Control Program. There should be encouragement among the community to take steps to protect themselves from

mosquitoes by eliminating mosquito breeding sites and taking personal measures such as use of bed nets, mosquito repellants etc. [7].

A report by The Times of India show that Government of Delhi issued advertisements worth Rs. 10.04cr between September and November over the past 3 years (2013-2014 to 2015-2016) i.e. only after dengue outbreak implying that the whole purpose of promotion is not achieved [8].

An international study observed that raising awareness about dengue was not included in school curriculum. There was a difference in the level of knowledge before health education ( $M=60.44$ ,  $SD=23.087$ ) and after health education ( $M=76.55$ ,  $SD=15.508$ ). They concluded school students could be the additional resources and mediators to plead for meticulous dengue fever preventive measures [9]. In state of Havana, Cuba, a study was conducted on inter-sectoral coordination, community empowerment and dengue prevention through which it is observed that changes were considerable in pilot and extension area (80% household involvement) over control area where little changes were observed [10].

A systematic review of published evaluation on dengue suggested that multi-faced intervention is more effective than single interventions and study concluded that coordinated involvement of local health services, trained vector control personnel, civil authorities and community could contribute to converting information into practice and encourage communities to take over prevention and control measures [11].

Importance of promotional tools is clearly highlighted in a study conducted in Aligarh, India which corroborates that good attitude does not translate into good practices thus health promotion activities should be strengthened for improving knowledge and making people receptive to the message and making it easier for them to adopt desired change of behavior [12]. Another study, conducted in a similar context, advocates that education campaigns should be organized throughout the year, not only during rainy season by ministry of health or vector borne disease control unit, management plan for prevention and control should be developed and involvement of community participation must be increased [13].

Similar study about awareness and preventive practices about dengue was done in Delhi which brought out that a gap is observed between knowledge and preventive practices although 90% of the respondents had heard of dengue and only 8% of the study population

was such who were not using any kind of preventive measures. It also identified television (59%) as an important source of information followed by information given by health personals (38%) [14].

This study was conducted in the year 2005 which is 12years ago. Since then the trend of promotions have changed and there needs to be re-assessment about the spread of awareness as done by Government of Delhi. For successful implementation of the awareness plan, promotional tools need to be carefully contemplated. This study will provide an opportunity to improve the promotional tools currently undertaken and allow widening the reach wherever required.

## **2. Objectives**

The above studies have clearly highlighted the importance of media and awareness in curbing dengue as an epidemic. This paper is an attempt to understand the level of awareness regarding the prevention program undertaken by government for the benefit of general population of the capital. A number of promotional tools are used to achieve this purpose, so the paper attempts to assess the reach of promotional tools. Furthermore, the study tries to perform a comparative analysis between the used promotional tools by the Government of Delhi and India.

With the help of above mentioned objectives, an attempt has been done to know about the reach of promotional tools as undertaken by Government of Delhi and thereby assess the level of knowledge among the population.

## **3. Methodology**

As per India Today, Delhi is one of the 18 endemic states along with Tamil Nadu, West Bengal, Kerala and others [15]. The study was undertaken in Delhi because in the year 2015, according to National Vector Borne Disease Control Programme (NVBDCP) maximum numbers of cases were reported from Delhi followed by Punjab, Haryana, West Bengal, Gujarat, Karnataka, Maharashtra, Kerala, Tamil Nadu, Rajasthan, Andhra Pradesh, Uttar Pradesh, Orissa, Madhya Pradesh, Arunachal Pradesh, Bihar, Uttarakhand, Telangana and other states [5].

Of all the civic zones in the capital, this cross-sectional study was orchestrated in Najafgarh under South MCD. The reasons for selecting Najafgarh, Delhi as the study area is that, this civic zone recorded 808 cases which is the highest number of cases among all the civic zones in the National Capital [15].

Study was conducted between January to March 2017 and a sample of 100 mixed respondents distinct on their gender, occupational background and income strata as put out. The selection of samples was done using the convenience sampling method and the ease of approach of the respondents. Age (above 15yrs) was used as an inclusion criteria and population below 15yrs of age (generally referred to as dependable population) was not taken into consideration for the study.

The perusal of the study was undertaken using a pre-tested and modified structural questionnaire. The evaluation instrument collected information under 3 sub-divisions with heading:

1. Respondent Background
2. Dengue Awareness
3. Promotion and Education Exposure

The instrument aimed at collecting information on demographics, transmission of dengue, general symptoms and vulnerable areas in the house for mosquito breeding, promotional tools and the knowledge acquired from the promotional tool.

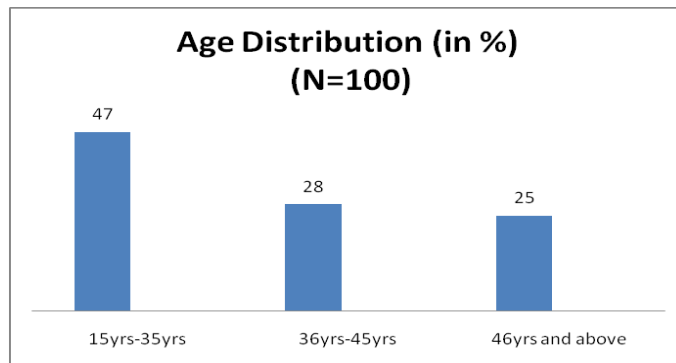
Before the start of interview, permission from each interviewee was taken in the form of a written consent duly signed by each of the sample respondent. The data so collected was coded and analyzed with the help of IBM SPSS version 22. Statistical tools were used in accordance to with the objectives of the research. Descriptive statistics was mainly used on data. Ethical clearance was taken from the ethical society of the institute.

#### **4. Results**

Out of the total sample size of 100 respondents, male respondents showed larger proportion than female i.e. 70% and 30% respectively. By this, it can be known that the locality was

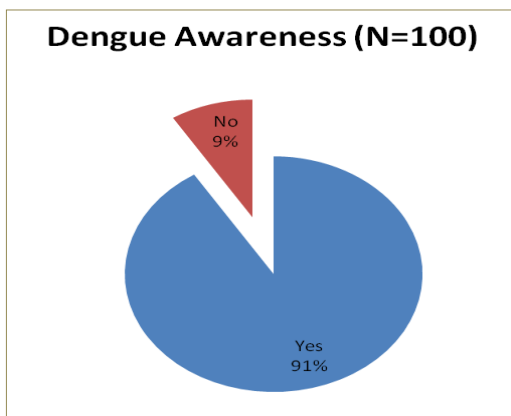
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dominated by male population. 47% of these mixed respondents were in the age range of 15-35years. While respondents in the age group of 36-45years and 46years and above were only 28% and 25% respectively. (Graph-3)

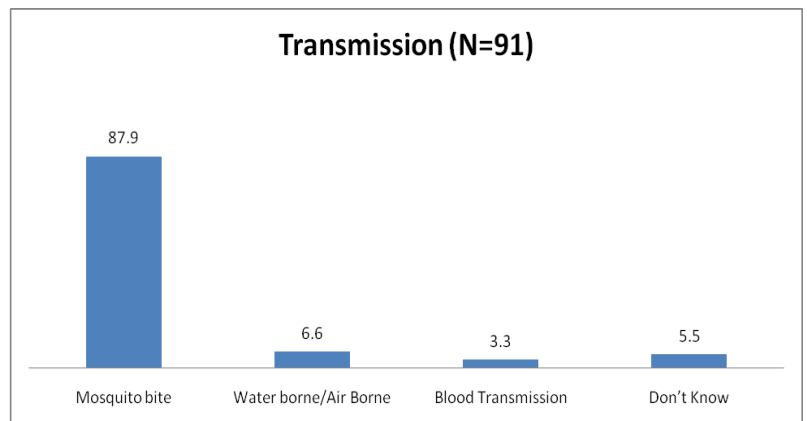


Graph 3- Distribution of age

Although most of the respondents came from lower income strata i.e. 73% of respondents had an income below 2lakh, the respondents showed a satisfying education level. 53% subjects had undergone basic schooling means were minimum 10<sup>th</sup> or 12<sup>th</sup> pass and only 10% sample population was uneducated.



Graph 4- Awareness among respondents about dengue



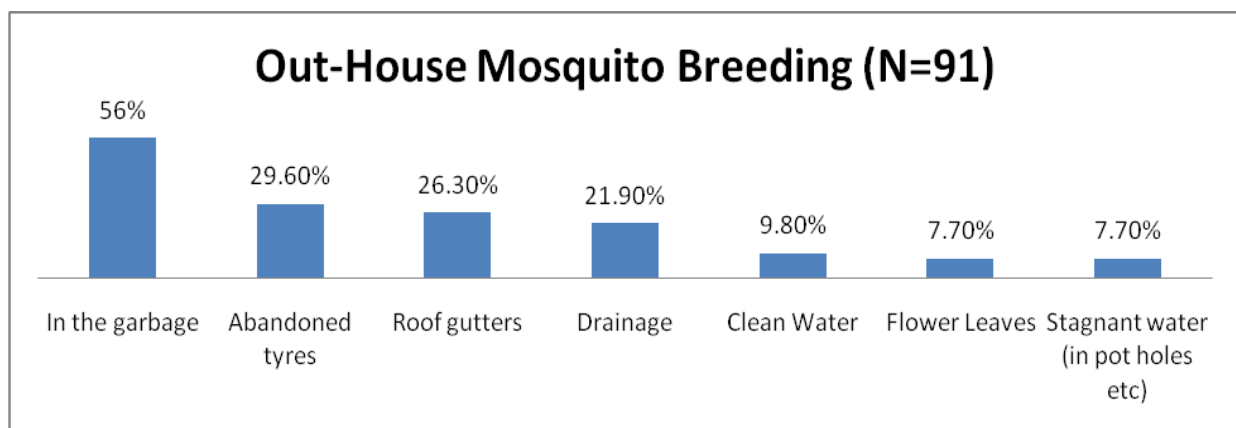
Graph 5- Knowledge among subjects regarding spread of dengue

It was positive to find that 91% of the total sample size was aware about the prevalence of dengue and information relating to it (Graph-4). This 91% population was exposed to

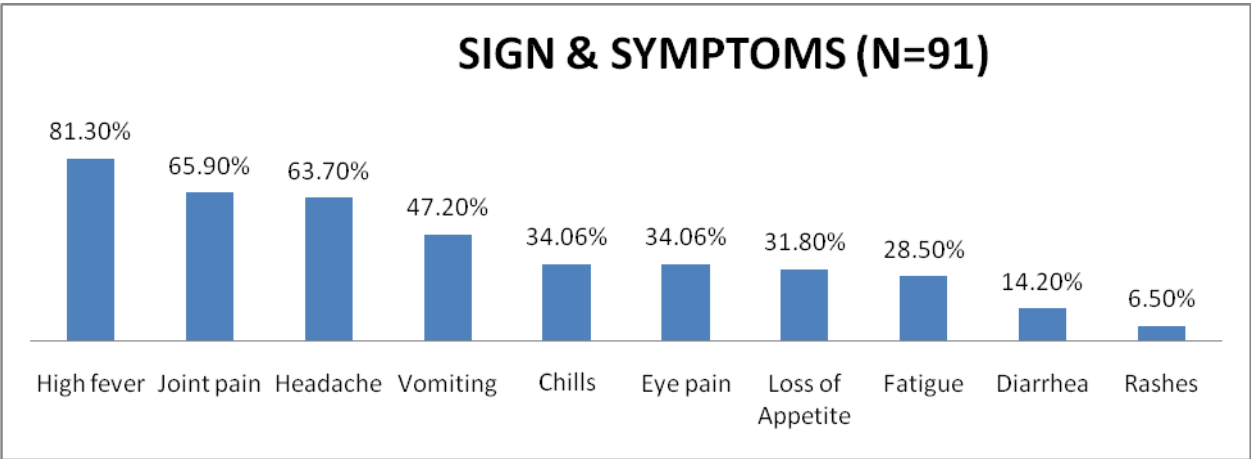


information relating to dengue in one form or the other. The transmission of dengue among humans is through Aedes mosquito and 87.9% were aware about the fact that dengue is spread via mosquito bite. While 5% respondents had no clue about its spread, only 7% population indicated the transmission to be either airborne or waterborne (Graph 5).

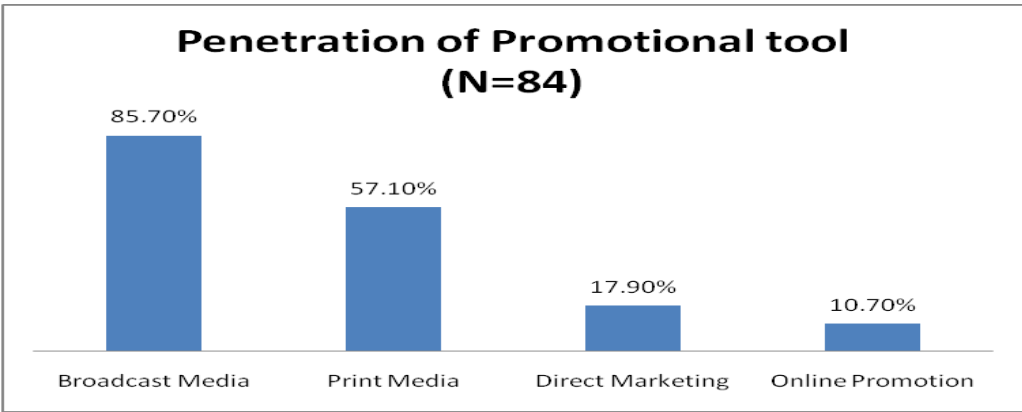
Pertaining to vulnerable areas of mosquito breeding inside house, most of the subjects (89%) were informed of open water tanks and containers. Majority (93.4%) had taken measures to prevent this in-house mosquito breeding. 90% of the population prefers seeking medical care over self medication. While respondents were acquainted with mosquito breeding locations inside house, only a few were aware that Aedes breed in clean/fresh water outside house. Most of them believed it to breed either in the garbage or drainage (Graph-6)



Awareness about the signs and symptoms of dengue also seemed to be high. Common symptoms such as high fever (81.30%), joint pain (65.90%), headache (63.70%) and others were well known by the interviewees (Graph-7).



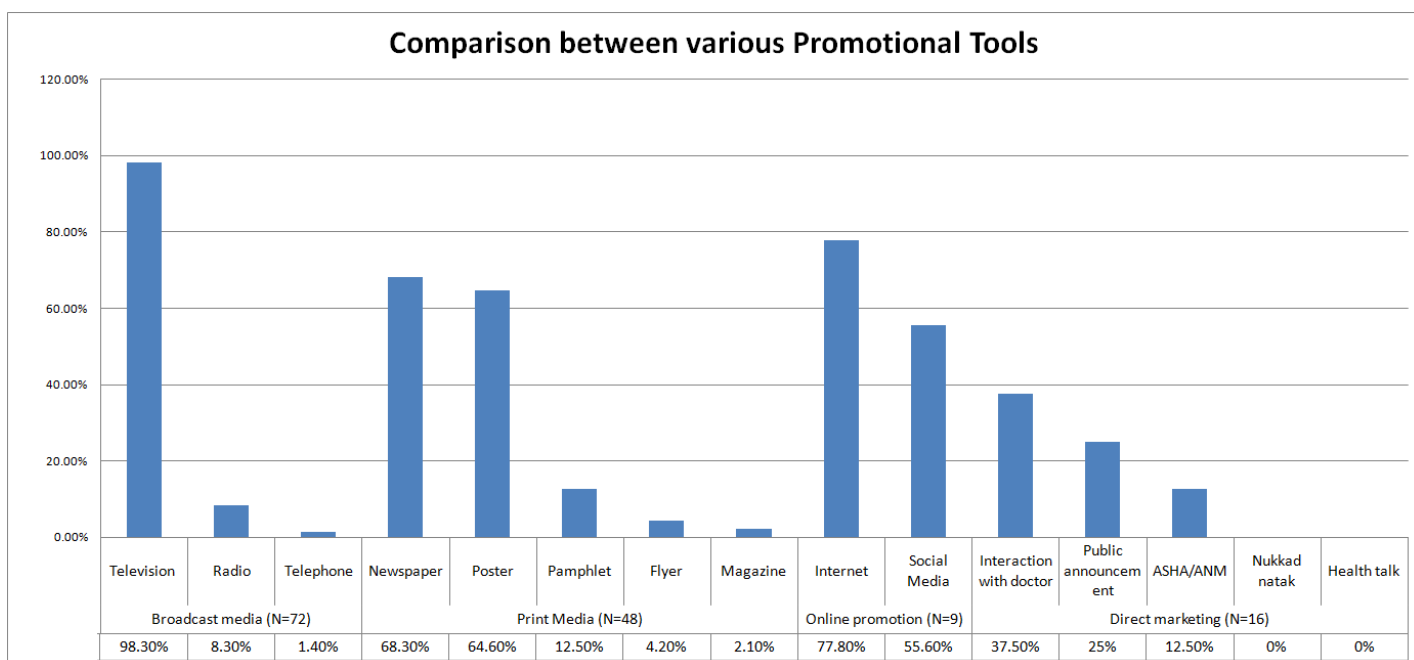
Graph-7 Knowledge among individuals regarding signs and symptoms of dengue



Graph-8 Penetration of promotional tools

Dengue Promotion Program (DPP) can be termed successful as 84% of the sample population is exposed to it in one form or the other with broadcast media being the most penetrated tool (85%) followed by print media (57%) (Graph-8).

Further bifurcating, out of the various tools used by Government of India to educate people, televisions (98%), newspapers (68.75%) and posters (64.5%) were able to reach maximum respondents (Graph 9).



Graph-9 Reach of various promotional tools as used by Government of India

The months of August and September experience maximum cases of dengue fever and as per analysis maximum burden of advertisements was in the month of July and August (just prior to epidemic outbreak). 71.4% population mentioned that they were satisfied with the interventions undertaken by the Government of Delhi and 70% of the population agrees to the fact that promotional programs taught them prevention methods pertaining to dengue.

With respect to level of dengue awareness, seemingly high in the area, it can be concluded that this awareness is a result of Dengue Prevention Program (DPP) because 65.4% respondents claim DPP has positively affected their knowledge about dengue, its intervention and prevention.

## 5. Discussion

The GDP spending of India in healthcare is 4.05%. Epidemics such as dengue and chikungunya drain a major part of this spending. As reported by Times of India, 10.04cr had been spent only on the promotion about creating awareness about dengue [8]. The aim seems to be fulfilled as 91% of the people had knowledge pertaining to dengue epidemic. By now, this fact can be clearly established that the efforts undertaken by government alone cannot

help the country to curb the burden of dengue fever. Participation of the community is a must and the population needs to join hands against dengue virus.

From the study findings it is evident that people are aware about the disease (91% awareness reported) but yet the burden is expected to increase. This situation is indicative of lack of behavioral change among the masses. There is a need to transform the knowledge pertaining to dengue into change in the behavior.

In comparison to the findings highlighted by Ng S [9], school children in Najafgarh have brief understanding about dengue (95% school children interviewed could answer questions about dengue). Maximum burden of dengue promotion as recalled by the subjects was July-August, in contrast to September-November as alleged by Times of India report [8].

One major problem that was highlighted in the study is that the respondents were unable to recall the promotions they had viewed during dengue epidemic outbreak. Consistently with the report of Gupta et. al. (2014), education campaigns should be organized throughout year and not just the rainy season [13]. Organizing campaigns throughout the year will not only help with the poor recall of promotions undertaken but this will further help in behavior change among the population.

Humans tend to practice things till the time they are forced upon them. Similar is the situation here, till the time promotions pertaining to dengue ask people to keep their surroundings clean and mosquito free they tend to be sensitive towards it. The moment promotions stop, people tend to pull hand back from all the interventions they have been undertaking to prevent mosquito breeding.

85% people were exposed to the broadcast media, specifically, television. The reason for this inclination could be the availability of television in households and also, being financially weak this segment of respondents is not much exposed to the online promotion such as social media and applications as developed to intervene dengue.

Public announcements and door to door campaigns can be strong tools to increase this awareness. Also placing posters and hoardings in the local areas and not just near hospitals and bus stands (65.55% respondents had seen hoarding in these two locations only) may help target housewives and elderly people who spend more time in houses.

Transforming this knowledge into behavioral change for dengue prevention is necessary and approach must be multifaced as they are found to be more effective in consistency with findings of Heintze et al (2007) [11]. Community must be empowered for making suggestions so as prevention program has a wider impact with involvement of members of community [10].

This study is an attempt to help the policy makers of Government to understand the penetration of various promotional tools and the affect that they can bring in the population. Also, this is a baseline study which can be used to carry out intervention studies in the future.

## **6. Limitation of the study**

This study has attempted at assess the various parameters of promotional tools like reach of the tool among the respondents and their level of awareness. With time, the methods of promotion change making the promotional studies dynamic studies. A few years ago, digitalization was not so much popular among the people of the country. But today the trend has changed. Earlier, people used to prefer reading a newspaper and there was not much penetration of broadcast media which is not true in the current scenario. Also, the expectation of people from promotions has changed a great deal from the older times.

Due to the mentioned reasons, promotional studies need to be undertaken at regular intervals so that a clear picture of the required objective can be attained.

In cross-sectional studies, assessment of exposure and outcome are done simultaneously. As a result of which there is generally no evidence of a temporal relationship between exposure and outcome. The use of convenience sampling restricts this study to Najafgarh in Delhi and hence cannot be true for other demographic regions.

## **References**

1. National Health Portal (n.d), “Dengue Fever”, available at: <https://www.nhp.gov.in/disease/musculo-skeletal-bone-joints-/dengue-fever> (accessed February 2017).
2. Bhatt, S. et al, “The global distribution and burden of dengue”, *Nature*, 496(7446), 2013, 504-507.

3. Indian Environmental Portal (n.d), “ Deadly Mosquito Bites”, available at: [http://www.indiaenvironmentportal.org.in/media/iep/infographics/dengue/dengue\\_threat.html](http://www.indiaenvironmentportal.org.in/media/iep/infographics/dengue/dengue_threat.html) (accessed February 2017).
4. Gupta N., Srivastava S., Jain A., and Chaturvedi U., “Dengue in India”, *Indian Journal Of Medical Research*, 136(3), 2012, 373-390.
5. NVBDCP (December 2016), “Dengue Cases and Deaths in the Country Since 2014”, available at: <http://www.nvbdc.gov.in/den-cd.html> (accessed Feb 2017).
6. Gupta B., and Reddy B. P., “Fight against dengue in India: progresses and challenges”, *Parasitology Research*, 112(4), 2013, 1367-78.
7. Aarogya.com (n.d), “National Dengue Control Program”, available at: <http://www.aarogya.com/health-resources/health-programs/national-dengue-control-programme.html> (accessed Feb 2017)
8. Jha, D. N. (2016), “Dengue : Ads Only after Outbreak”, Times of India, 27 September.
9. Ng S. W., Lim S. Y., and Beth M., “A study to determine the effectiveness of health education on knowledge of dengue fever and preventive measures among high school students in a selected private school”, *International journal of contemporary Pediatrics*, 3(2), 2016, 553-558.
10. Sanchez L., Perez D., Cruz G., Castro M., Kourí G., Shkedy Z., Vanlerberghe V., and Van der Stuyft P., “Intersectoral coordination, community empowerment and dengue prevention: six years of controlled interventions in Playa Municipality, Havana, Cuba”, *Tropical Medicine & International Health*, 14(11), 2009, 1356-1364.
11. Heintze C., Garrido M. V., and Kroeger A., “What do community-based dengue control programmes achieve? A systematic review of published evaluations”, *Transactions of the Royal Society of Tropical Medicine and Hygiene*, 101, 2007, 317-325.

12. Abedi A. J., Khan Z., Ansari A., and Amir A., “Is knowledge and attitude correlating with Practices? A KAP study on Dengue Fever”, *Journal of Epidemiology and Community health*, 65(1), 2011.
13. Gupta S., Malhotra A. K., Verma S. K., Deka M., Rai P., Yadav R., Singh S., “A Study on Knowledge, Attitude and Practices Regarding Dengue Fever among People Living in Urban Area of Jhansi City (UP)”, *Journal of Evolution of Medical and Dental Sciences*, 3(73), 2014, 15388-15398.
14. Acharya A., Goswami K., Srinath S., and Goswami A., “Awareness about dengue syndrome and related preventive practices amongst residents of an urban resettlement colony of south Delhi” *Journal of Vector Borne Disease*, 42(3), 2005, 122-127.
15. Agarwal S. (2015), “Delhi Battles worst dengue outbreaks in 20 years, 10,252 cases reported”, Mail today, October 13.
16. WHO (2012), “Global Strategy for Dengue Prevention and Control”, available at: <http://www.who.int/denguecontrol/9789241504034/en/> (accessed February 2017).
17. WHO (2016), “Dengue and Severe Dengue”, available at: <http://www.who.int/en/news-room/fact-sheets/detail/dengue-and-severe-dengue> (accessed February 2017).