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Use of geographic information system and socio-economic predictors of vaccine uptake in a cluster randomized cholera vaccine trial in Bangladesh

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Background: Oral cholera vaccines (OCVs) are being used to control cholera. However, the benefit of the vaccine may be reduced because of low vaccine uptake in some settings. This study describes the effect of socio-economic predictors on vaccine uptake in a geographically defined cluster randomized clinical trial.

Methods: This was a three-arm (vaccine, vaccine plus behavioral change and non-intervention) cluster randomized trial conducted in Dhaka, Bangladesh. Socio-demographic and vaccination data were collected from 2,68,896 participants. A geographical information system (GIS) was used for design and implements the vaccination program. A logistic regression model was used for analysis.

Results: The GIS supported the vaccination program by identifying ideal locations of vaccination centers and providing daily coverage maps during the activity. Among 1,88,206 study participants, 1,23,686 (66%) received two complete doses of vaccine. Vaccine uptake rate was significantly higher in females than males (aOR:1.80; CI=1.75-1.84) and younger participants than older (aOR:2.19; CI=2.13-3.26). Individuals living in their house or having higher monthly family expenditure were more likely to receive two doses of the vaccine in comparison to those residing in rental housing with lower monthly family expenditure (aOR:1.60; CI=1.50-1.70; aOR:1.14; 95%CI=1.10-1.18 respectively). Individuals who treated water for drinking and used own tap as a source of water were more likely to receive the vaccine than their counterpart (aOR:1.23; CI=1.17-1.29; aOR:1.14; CI=1.02-1.25 respectively). Vaccine uptake was also significantly higher in participants residing farther away from health facilities (aOR:1.80; CI= 1.36-2.37).

Conclusions: This study found that the GIS was useful in the vaccination program. Consideration of socio-economic factors can help improve OCV uptake and therefore the effectiveness of OCV vaccination in a community.

Biography

Amit Saha is an Epidemiologist with a special interest in the epidemiology of vaccine-preventable diseases and promoting the implementation of vaccines in resource-poor settings. He is a medical graduate and holds PhD in public health from the University of Sydney. He is an Associate Scientist in the group of Infectious Disease Division at icddr,b in Bangladesh and currently working as a lecturer at Kirby Institute, UNSW. He has over fifteen years of professional experience in a wide range of fields in infectious diseases epidemiology and large field-based clinical studies on enteric vaccines in low and middle-income countries.

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