Mini-protocol to investigate an outbreak of cholera in Barwai, Bhopal District, Madhya Pradesh, 2006

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Background - justification

- An outbreak of cholera (confirmed by the laboratory) was reported in Barwai village on 15 September 2006.
- Descriptive epidemiology findings suggested that (1) most cases clustered around a hand pump and that (2) the outbreak had a common source.
- An analytical approach is needed to test the hypothesis that the hand pump was the source of infection.

Objectives

- To estimate the strength of the association between drinking hand pump water and cholera;
- To estimate the fraction of cases attributable to the hand pump.

Proposed methods

Design, population and sample

- Matched case-control investigation in Barwai village, Bhopal district, Madhya Pradesh.
- All cases of cholera reported during outbreak minus the few cases before the peak, as they may be source cases and not secondary to the suspected common source.

Definitions

- Cases meeting the WHO case definition.
- One matched control-subject among the neighbours in the same age category (0-5, 5-14, 15-29, 30-59 and 60+).

Data collection

- Standardized, closed ended questionnaire.
- Possible exposures to investigate in additional to demographic and socio-economic characteristics will include: drinking water from the hand pump, contact with another case, eating outside the home near street hotel and hygienic practices.

Analysis plan

- Matched odds ratio using the method of discordant pairs.
- For exposures associated with illness: population attributable fraction using the formula: Proportion of cases exposed x (OR-1/OR).

Sample size

- If the pump is the common source of the outbreak, the association should be strong. Thus, to detect an odds ratio of four, with 80% power and for 95% confidence intervals, assuming 20% of exposure to the pump among controls, 40 cases and 40 controls will be required. The number of cases reported to date allows such sample size.

Human subject protection

- Confidentiality will be maintained through the use of unique identifiers given to every case and control.
- The project will be exempt from ethical committee approval, as it constitutes an emergency response to an outbreak.

Expected benefit

- Evidence to close access to the pump and identify the source of contamination.
- Recommendations to prevent such event in future.
- Promotion of proper sanitation and hygienic practice by Information, Education and Communication.