

**Serologic Survey for *Vibrio cholerae* Infection in Haiti with
Assessment of Risk Factors for Asymptomatic, Mild,
Moderate, and Severe Disease**

Supporting Statement for an Emergency Clearance Request:

Section A

(Revised 1/14/11)

Point of Contact

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A. Justification

1. Circumstances Making the Collection of Information Necessary

On October 21, 2010, an outbreak of cholera caused by a hybrid *Vibrio cholerae* O1 strain was confirmed in Haiti; large segments of the population remain at risk of disease due to inadequacies in the water, sanitation, and hygiene infrastructure worsened by the earthquake in January 2010. As of December 26, 2010, a total of 148,787 cases of cholera, resulting in 83,166 hospitalizations and 3,333 deaths, had been reported in Haiti. The Centers for Disease Control and Prevention (CDC) has been asked to provide technical and epidemiological support to the Ministère de la Santé Publique et de la Population (MSPP) in Haiti to assist in the cholera response. Estimating resource needs, including liters of IV fluids, hospital beds, and treatment centers, is complicated by the fact that *V. cholerae* infection causes a wide spectrum of disease, ranging from asymptomatic infection to severe watery diarrhea. Few studies have examined the percentage of infected individuals who develop severe disease, but estimates have ranged from 2-11% depending on the outbreak setting and type of *V. cholerae*.

Two serologic surveys in Haiti are proposed for measuring the seroprevalence of *V. cholerae* infection, the disease attack rate, and predictors of infection, disease, and severity of disease within highly-affected communities. The results of these studies will reveal, for the highly affected communities in which the studies are conducted, both the proportion of persons asymptotically infected with *V. cholerae* (those who are seropositive but do not develop cholera disease) as well as proportions with and risk factors for severe disease. Criteria for vibriocidal and cholera toxin antibody titers will be established by testing positive and negative controls. These studies aim to describe, with high internal validity, the range of outcomes of intense exposure to *V. cholerae* in single communities. This information will be useful for the country as a whole; although the range of intensity of *V. cholerae* exposure may vary, the health and genetic background of the host population as well as the environmental/sanitation/water conditions are fairly uniform, country-wide. Current estimates for progression to severe disease are derived generally from Asian populations with endemic, rather than epidemic, cholera caused by a different *Vibrio cholerae* strain. The estimate provided from this study then, while not directly representative of the entire population, would still provide useful information not otherwise available, and will aid in projections and resource allocation.

Proposal 1— this is a cross-sectional study in a region where cholera was common in the preceding 3–6 weeks. All consenting persons older than age 2 years residing in 500 households within a study area selected based on the best available in-country knowledge of logistics, feasibility, and recent high attack rate will be recruited for approximately 2,400 participants. The households will not be randomly selected but rather censused, as the objective is to enroll all consenting households in the defined area. Haitian enumerators will verbally administer Creole questionnaires about demographics, symptoms, and potential risk factors for cholera. Phlebotomists will collect a single blood specimen from each participant for *V. cholerae* serology, as well as tests for previously identified cholera risk factors including *Helicobacter pylori* serology, ABO blood type, and nutritional status.

Proposal 2—this is a prospective cohort study in a region near a cholera treatment hospital with a high burden of cholera admissions. Again, the study site will be selected

based on the best available up-to-date in-country knowledge of logistics, feasibility, and disease burden. From the households of 300 consenting hospitalized cholera patients, sequentially selected from the cholera treatment hospital, all consenting household contacts of the patients will be recruited, for a total of about 900 persons. As in Proposal 1, the index patients and household members will be surveyed and their blood tested. In addition, the study team will return to the households 2 weeks later with a follow-up questionnaire about recent symptoms, and a second blood specimen will be tested for paired *V. cholerae* serology.

The CDC's National Center for Emerging and Zoonotic Infectious Diseases (NCEZID) requests OMB approval to collect survey information for this study. Emergency clearance is requested because the cholera epidemic was unanticipated and because delays in obtaining normal clearance would likely result in harm to affected populations. Carrying out the cholera serologic survey at this stage of the cholera epidemic is important for two reasons. First, serologic surveys rely on antibody titers to indicate recent infection, and the results of these laboratory tests will become unreliable at later stages of the epidemic. Because of the dynamics of the serologic response to *Vibrio cholerae*, the study must be initiated within a window period of no more than 6 weeks from the time in which cholera spreads through the population where the survey will take place and be completed within 2 months. Second, CDC expects the results of this study to provide valuable information to guide the current public health response as the epidemic continues. The results of this survey will be helpful in anticipating the outbreak response resource needs and in targeting treatment to high-risk populations.

This manner of research is authorized under Sections 301 and 307 of the Public Health Service Act (appendix 1).

2. Purpose and Use of Information Collection

The primary objectives are to:

- 1) Survey study participants in a Haitian community that has been heavily affected by cholera using a questionnaire addressing demographics, symptoms, and potential risk factors for cholera and a blood test examining *V. cholerae* antibody status and markers for potential risk factors for severe disease.
- 2) Use information from this survey to determine the prevalence of infection and the proportion of infections that were asymptomatic, mild, moderate, and severe in a heavily affected Haitian community and to investigate potential risk factors for severe disease.

This study will be conducted in collaboration with Haiti MSPP. CDC and MSPP will provide a publicly available final written report that will be shared with other U.S. and Haitian government agencies, international health organizations, the medical and public health community, and non-governmental organizations to assist in the cholera response. This report will not contain individual information.

3. Use of Improved Information Technology and Burden Reduction

Trained Haitian enumerators will administer the questionnaire. Personal digital assistants (PDAs) will be used to assist in data collection if logistically possible. If PDAs are not available, enumerators will record study data on a paper-and-pencil questionnaire form.

Trained Haitian phlebotomists will collect blood samples.

4. Efforts to Identify Duplication and Use of Similar Information

This is a new study. Information has not been previously collected for this purpose.

5. Impact on Small Businesses or Other Small Entities

There will be no impact on small business.

6. Consequences of Collecting the Information Less Frequent Collection

Proposal 1 is a one-time data collection.

Proposal 2 involves two visits for data collection, an initial survey visit and a subsequent follow-up visit after 14 days. In this study design, the follow-up blood test and questionnaire are essential to determining new-onset infections by symptoms and changes in antibody titer, and thus the investigators feel the second visit is warranted to maintain the integrity of the survey.

7. Special Circumstances Relating to the Guidelines of 5 CFR 1320.5

There are no special circumstances.

8. Comments in Response to the Federal Register Notice/Outside Consultation

Due to the emergency nature of the program announce, OMB has waived the FRN requirements for this collection.

9. Explanation of any Payment/Gift to Respondents

Survey respondents may receive oral rehydration salts and basic water purification materials for their participation.

10. Assurance of Confidentiality Provided to Respondents

Data will be treated in a secure manner and will not be disclosed, unless otherwise compelled by law. Copies of data questionnaires and associated documents will be maintained by authorized MSPP and CDC investigators in secure locations and electronic files will be maintained on secure computers. The data will be restricted to study investigators only. In proposal 1, no personal information will be collected other than demographic information. In proposal 2, the names and addresses of participants will be recorded and stored along with participant ID numbers in a file and database. These personal identification data are only required so that investigators can return for the second blood draw and questionnaire. Documents that contain any personal identifiers will be maintained under secure conditions with limited access and will not be transmitted off-site. After the second visit, this list of names and addresses will be destroyed and there will be no link between names, blood samples and questionnaires. Access to personal identifier data will only be available to MSPP and CDC investigators involved in arranging and performing follow-up visits. Participants will not be identified in any publication.

11. Justification for Sensitive Questions

Participants will be asked about Human Immunodeficiency Virus (HIV) status because HIV infection can affect cholera severity and the immune response measured by antibody levels. This information will be used in an analysis of risk factors for severe cholera and when analyzing antibody titers. HIV status will not be linked to any personal identifiers apart from demographic information. It will be kept private.

Participants will be asked for informed consent and will be informed that participation and all responses are optional and that they can choose to opt out at any point.

12. Estimates of Annualized Burden Hours (Total Hours & Wages)

Proposal 1 will enroll approximately 2400 recipients and the survey, including the study explanation, consent, questionnaire, and blood test, is estimated to take 20 minutes to complete.

The total estimated burden hours are 800

12A. Estimated Annualized Burden Hours—**Proposal 1**

Type of Respondent	Form Name	No. of Respondents	No. Responses per Respondent	Average Burden per Response (in hours)	Total Burden Hours
Serological Survey Participants	Serological Survey Questionnaire	2400	1	20/60	800
Total					800

12B. Cost estimates for a single respondent that has to complete the preliminary application—**Proposal 1**

Form Name	Total Burden Hours	Hourly Wage Rate	Total Respondent Costs
Serological Survey Questionnaire	800	\$0.50*	\$400
Total			\$400

*Based on gross national income per capita of \$949. 67% of employed people live on less than \$1.25 a day.

(United Nations Human Development Report 2010; <http://hdr.undp.org/en/mediacentre/>)

Proposal 2 will enroll approximately 1200 participants (300 hospitalized patients and 900 household contacts) who will complete two surveys on visits two weeks apart. The initial survey is estimated to take 20 minutes to complete, and the follow-up visit is estimated to take 10 minutes to complete.

The total estimated burden hours are 600.

12A. Estimated Annualized Burden Hours—**Proposal 2**

Type of Respondent	Form Name	No. of Respondents	No. Responses per Respondent	Average Burden per Response (in hours)	Total Burden Hours
Serological Survey Participants	Initial Questionnaire	1200	1	20/60	400
Serological Survey Participants	Follow-up Questionnaire	1200	1	10/60	200
Total					600

12B. Cost estimates for a single respondent that has to complete the preliminary application
—*Proposal 2*

Form Name	Total Burden Hours	Hourly Wage Rate	Total Respondent Costs
Serological Survey Questionnaire	600	\$0.50*	\$300
Total			\$300

*Based on gross national income per capita of \$949. 67% of employed people live on less than \$1.25 a day.

(United Nations Human Development Report 2010; <http://hdr.undp.org/en/mediacentre/>)

13. Estimates of other Total Annual Cost Burden to Respondents or Record Keepers/Capital Costs

There are no additional recordkeeping/capital costs.

14. Annualized Cost to Federal Government (each study type)

Epidemiologists will be creating the survey, collecting and analyzing the data, and reporting the results. Haitian phlebotomists and enumerators will conduct the interviews and perform phlebotomy. The annualized cost to the Federal Government is \$12,696.

Type of Employee	Total Burden Hours	Hourly Wage Rate	Total Federal Costs
Federally-Employed Epidemiologist	200	\$39.48	\$7,896
Haitian Contractor - Phlebotomist	1280	\$2.50	\$3,200
Haitian Contractor - Enumerator	1280	\$1.25	\$1,600
Total			12696

The average hourly wage rate for an epidemiologist is estimated at the GS-13, step 6 level.

In recent investigations, CDC has paid Haitian enumerators \$10/day. Estimate that an enumerator and phlebotomist pair can perform 15 surveys per day including transportation time.

15. Explanation for Program Changes or Adjustments

This is a new data collection.

16. Plans for Tabulation and Publication and Project Time Schedule

Data collection will begin upon IRB and OMB approval, ideally by February 2011 but no later than April 2011. Each survey will take approximately one month to conduct.

Laboratory analysis of blood specimens will require 6 months. Data analysis and reporting will occur shortly after completion of laboratory testing.

17. Reason(s) Display of OMB Expiration Date is Inappropriate

Not applicable.

18. Exceptions to Certification for Paperwork Reduction Act Submissions

There are no exceptions to the certification.