Investigation of SARS-CoV-2 Seroprevalence and Factors Associated with Seropositivity in a Community Setting

Request for OMB approval of a New Information Collection

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Supporting Statement A

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- **Goal of the study:** The goal of this information collection is to (1) determine the extent of infection in communities as determined by overall SARS-CoV-2 seroprevalence; and (2) determine factors associated with SARS-CoV-2 seropositivity among persons residing in areas with evidence of community transmission.
- **Intended use of the resulting data:** The resulting data will be used to inform decisions about prevention and control strategies as well as community mitigation interventions. Further, the data obtained can inform burden estimates and modeling.
- **Methods to be used to collect:** CDC will select respondents using a multi-cluster sampling method. A cross-sectional household survey design will be used to measure SARS-CoV-2 seroprevalence. CDC will collect blood from all respondents. The investigations (total of up to four) will be one-time sampling events.
- **The subpopulation to be studied:** Eligible respondents include all persons residing in selected households in areas with evidence of community transmission of SARS-CoV-2.
- **How data will be analyzed:** CDC accredited laboratories will analyze the blood samples. Epidemiologists and statisticians will conduct descriptive analyses and higher-level statistical analyses of the investigation information.

1. Circumstances Making the Collection of Information Necessary

The Centers for Disease Control and Prevention (CDC), National Center for Immunization and Respiratory Diseases (NCRID), Division of Viral Diseases (DVD) requests a 180-day emergency approval for a new information collection, "Investigation of SARS-CoV-2 Seroprevalence and Factors Associated with Seropositivity in a Community Setting."

Coronavirus disease 2019 (COVID-19), caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was first reported in Wuhan, Hubei Province, China in late December 2019. On February 26, 2020, CDC announced that an infection with the novel coronavirus had been confirmed "in a person who reportedly did not have relevant travel history or exposure to another known patient with COVID-19," making this the first suspected United States (U.S.) case of community transmission (1). On March 11, 2020, the World Health Organization declared COVID-19 a pandemic, and President Trump proclaimed the outbreak a national emergency on March 13, 2020. As of April 20, 2020, more than 700,000 cases of SARS-CoV-2 have been confirmed.

Current epidemiologic data in the U.S. suggests that sustained community transmission of SARS-CoV-2 is occurring in certain areas. The extent of transmission of SARS-CoV-2 in community settings is currently unknown. In the case of a novel virus, such as SARS-CoV-2, initial seroprevalence in the population is expected to be negligible; therefore, seroprevalence estimates can be useful to understand cumulative incidence in a given population. Antibody seropositivity may also provide data about asymptomatic or subclinical infections that would not be detected by surveillance that relies on medical visits. These data could supplement medically attended infection rates and contribute to understanding the overall burden of COVID-19. This information could also contribute to modeling estimates to

inform decisions about prevention and control strategies as well as community mitigation interventions in the U.S. response to COVID-19.

This information collection request (ICR) is designed to cover the conduct of multiple community-based seroprevalence studies (up to four). Because this is an Emergency Clearance conducted in the context of HHS's declared public health emergency, Part B provides criteria for how decisions regarding sampling will be made and how differences in precision and generalizability based on differences in sampling will be communicated.

This information collection is authorized by Section 301 of the Public Health Service Act (42 USC 241 (Attachment 1).

2. Purpose and Use of Information Collection

The data collected under this ICR will be used immediately by CDC's emergency COVID-19 response at the national level, and by state and local health departments, to understand the cumulative incidence in a given population within their jurisdiction. Additionally, antibody seropositivity data could supplement data on medically attended infection rates and contribute to describing the overall burden of COVID-19. Data collected during this investigation is essential to developing and assessing public health prevention measures by contributing to modeling estimates to inform decisions about prevention and control strategies as well as community mitigation interventions in the U.S. response to COVID-19; thus, improving the overall public health response.

A cross-sectional household survey design will be used to measure SARS-CoV-2 seroprevalence at one or more time points in ≥1 U.S. areas with evidence of community transmission of SARS-CoV-2. Areas with existing population-based hospital surveillance platforms with well-defined catchment areas will be preferentially selected. The investigation population will consist of all persons residing in selected households from selected defined geographic areas, according to the sampling framework. CDC and health departments alike will use this seroprevalence data to prioritize the allocation of resources and response efforts.

This seroprevalence investigation is one component of a larger strategy to understand SARS-CoV-2 seroprevalence in the U.S. The larger approach also includes protocols for serosurveys in certain geographic areas using residual or banked sera. These approaches have their own protocols, which are different from the activity proposed here. The sampling and testing approach may differ across protocols. This activity adds value to the larger approach because of the systematic sampling scheme and addition of epidemiologic data collected using a standardized questionnaire.

The sampling and testing approach will be taken into consideration in the analysis and interpretation of data from this protocol. In particular, the test characteristics (including sensitivity and specificity) will be considered. CDC will be clear about the contribution of sampling error and testing error when results are released.

Information Collection and Sampling Steps: This ICR will allow CDC to identify, recruit, consent, and question eligible investigation respondents. A protocol has been prepared that will be used for all investigations (Attachment 5). The investigations will be conducted by trained CDC, state/local health department staff and/or contractors. The steps in the information collection and sampling include:

1. The investigations will employ a multistage cluster sampling design using a modified CDC Community Assessment for Public Health Emergency Response (CASPER) framework (OMB Control No. 0920-1036, expiration date: 02/28/2021). The primary investigations in this investigation will select Census blocks using Probability Proportional to Size (PPS) sampling without replacement, as described here (https://v8doc.sas.com/sashtml/stat/chap63/sect20.htm). However, other sites may use existing population-based surveillance platforms for sampling these investigations. A defined area such as a census block will be selected by probability proportional to size with evidence of community transmission of SARS-CoV-2.

2. Survey teams will then select households by systematic random sampling to enroll a pre-determined number of households per cluster (Attachment 4a).

3. All individuals in the enrolled household will be invited to participate. Information will be provided to the households in advance so they can make an informed decision as to whether they want to participate (Attachment 4b). When the household is approached, an official letter from CDC, State and County Health Departments will be given to the individual. If they agree to participate, the investigators will explain the survey in more detail and confirm their interest in having their household participate.

4. All individuals within the selected households will complete a standardized questionnaire (Attachment 3a) which will capture information on household characteristics, age, sex, race, ethnicity, exposures, underlying medical conditions and symptoms consistent with COVID-19 infection that occurred prior to the survey. The questionnaire will be administered in person. For children or adults with cognitive impairments, a parent or caregiver may answer for them.

5. One respondent in each household (an adult who knows all residents of the household) will provide responses for the household questionnaire (Attachment 3b). The household questionnaire will capture information on household characteristics and document all household members, whether they are present at the time of the visit or not.

6. Blood samples will be collected by trained phlebotomists from all individuals in the household and tested for antibodies to SARS-CoV-2 using an enzyme-linked immunosorbent assay with confirmatory microneutralization testing as needed.

The information to be collected during the investigation include:

- Basic demographics
- COVID-19 exposure risks
- Behaviors related to shelter-in-place orders
- Underlying medical conditions
- Recent medical history (specifically relating to symptoms consistent with COVID-19 infection)

- Venous blood sample to test for antibodies to SARS-CoV2

Teams of surveyor and a phlebotomist will be deployed to collect the data. Each survey team will be assigned specific clusters (such as census blocks) to complete and will be responsible for determining how to move through the specified area (with support from the planning team); coordinating follow up household visits, where needed; ensuring appropriate Personal Protective Equipment (PPE) is worn for each household visit; and delivering collected blood samples and biohazard waste materials to the laboratory at the end of each day (Attachment 4a). By the end of each survey an estimated 1,000 individuals (average members per household = 2.5) will be enrolled during a 4-day data collection period and a 2-day mop-up period. A total of 3 surveys in various geographical areas will be performed during the 180-day OMB PRA clearance period.

All data for the investigations will be collected via a secure web-based application, and participation is voluntary. Participating health departments can access investigation data at any time and analyze it through the REDCap application (Attachment 3c). Investigators plan to use SARS-CoV2 data from multiple sites to establish and update statistical benchmarks of seroprevalence at various geographic levels.

3. Use of Improved Information Technology and Burden Reduction

The team surveyor will conduct the questionnaires and capture the responses electronically via secure internet on CDC-issued cell phones or tablets through RedCap Mobile App. If there are any issues with the electronic data collection, surveyors should capture the information on the back-up paper questionnaires. Only the minimum amount of information necessary for data collection is requested.

4. Efforts to Identify Duplication and Use of Similar Information

CDC is not aware of the availability of any similar information to these community-based investigations. There are other seroprevalence studies being conducted by CDC and other institutions, but these studies entail the collection and testing convenience samples.

5. Impact on Small Businesses or Other Small Entities

This data collection will not involve small businesses.

6. Consequences of Collecting the Information Less Frequently

This is a one-time information collection at each site.

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

This request fully complies with the regulation 5 CFR 1320.5.

8. Comments in Response to the Federal Register Notice and Efforts to Consult Outside the Agency

A. Because this is a request for an emergency clearance, CDC asks that the 60-day public comment period be waived.

B. CDC has been contacted and urged by state and local health department representatives to conduct seroepidemiological studies.

9. Explanation of Any Payment or Gift to Respondents

No monetary incentive is provided to participants.

10. Protection of the Privacy and Confidentiality of Information Provided by Respondents

CDC's Information Systems Security Officer reviewed this submission and determined that the Privacy Act does not apply. All participant information contained on investigation forms, in laboratory reports, and in electronic files will be kept private to the fullest extent allowed by law. Specimens and investigation forms will be linked through a unique investigation number only. A unique identifier will be assigned to each individual and data will only be retrieved by the unique identifier.

Only the investigation staff will have access to the participants' information. Physical documents containing investigation data such as back-up paper questionnaire forms, will be stored in a locked file cabinet in the CDC investigation coordinator's office. These data collection forms will be destroyed at the time the investigation has ended. At that same time, all PII will be deleted from the investigation database and any separate specimen data will be de-identified. All electronic files will subsequently be stored in a password protected database on a CDC secure network. The results from this investigation will be published or presented for scientific purposes in aggregate form only so that individuals cannot be identified.

11. Institutional Review Board (IRB) and Justification for Sensitive Questions

Institutional Review Board (IRB)

The COVID-19 Incident Management System (IMS) Human Subjects Advisor has determined that this information collection a non-research public health surveillance activity, as outlined in 45 CFR 46.102(*l*)(2). IRB approval is not required (Attachment 7).

Justification for Sensitive Questions

There are no planned sensitive questions being asked on the household or individual questionnaires.

12. Estimates of Annualized Burden Hours and Costs

A. Estimated Annualized Burden Hours

By the end of the investigation, an estimated 1,000 individuals (average members per household = 2.5) will be enrolled at each site. Investigations will be conducted at a total of four sites throughout the 180-day OMB PRA clearance period (1,000 respondents at each site x 4 sites = 4,000 respondents).

We have estimated that the individual questionnaire will take an average of 20 minutes to complete per participant. We estimate the household questionnaire will take 15 minutes to complete. Blood collection procedures should follow national guidelines and we estimate will take 10 minutes per participant. For each investigation, the total estimated burden is 605 hours. For all four investigations, the total estimated burden is 2,420 hours (605 hours x 4 sites).

Type of Respondent	Form Name	No. of Respondents	No. Responses per Respondent	Avg. Burden per response (in hrs.)	Total Burden (in hrs.)
Household participant	Individual Questionnaire	4,000	1	20/60	1,333
Household participant	Household Questionnaire	1,680	1	15/60	420
Household participant	Blood collection (no form)	4,000	1	10/60	667
Total/site					2,420

B. Estimated Annualized Burden Costs

The average annual response burden cost is estimated to be $15,560.60 for each investigation. The total average annual response burden cost for all four sites is estimated to be $62,242,40. The hourly wage estimates are based on the Bureau of Labor Statistics May 2019 National Occupational Employment and Wage Estimates (https://www.bls.gov/oes/current/oes_nat.htm#00-0000). The mean hourly wage rate for all occupations ($25.72) was used.

Type of Respondent	Form Name	Total Burden Hours	Hourly Wage Rate	Total Respondent Costs
General Public	Individual Questionnaire	1,333	$25.72	$34,284.76
	Household Questionnaires	420	$25.72	$10,802.40
	Blood Collection	667	$25.72	$17,155.24
Total/site				$62,242.40

13. Estimates of Other Total Annual Cost Burden to Respondents or Record Keepers

There are no costs to respondents other than their time to participate.

14. Annualized Cost to the Government

The total annualized cost to the government is $901,168.40. The cost of each investigation is $225,292.10. A total of four investigations will be conducted during the 180-day OMB PRA clearance ($225,292.10 x 4 = $901,168.40).

Staff or Contractor	Average Number of Staff per Investigation	Average Number of Hours per Investigation	Average Hourly Rate	Average Cost per Investigation

CDC Principal Investigator (GS-15)	1	200	$52.40	$10,480
CDC Investigation Coordinator (GS-14)	1	700	$44.55	$31,185
Analyst (GS-13)	2	700	$37.70	$26,390
Data Manager (GS-13)	2	700	$37.70	$26,390
Communicator (GS-13)	1	500	$37.70	$18,850
Field Supervisor (GS-12)	15	60	$31.70	$1,997.10
Contract Costs	NA	NA	NA	$110,000
			Total Cost per Investigation	$225,292.10
			Total Cost	$901,168.40
https://www.opm.gov/policy-data-oversight/pay-leave/salaries-wages/2020/general-schedule/				

15. Explanation for Program Changes or Adjustments

This is a new emergency information collection request.

16. Plans for Tabulation and Publication and Project Time Schedule

Estimated dates for implementing and completing key activities.

	Investigation Timeline in Months					
	1	2	3	4	5	6
Investigator Coordination Meeting	**X**					
Questionnaire Development	**X**					
Investigation Training	**X**					
Recruitment	**X**					
Data Collection	**X**					
Data Management	**X**	**X**				
Data Analysis		**X**				
Laboratory Analysis		**X**	**X**			
Results interpretation		**X**	**X**	**X**		
Interim Project Report				**X**		
Final Project Reports					**X**	
Final Project Review Process					**X**	**X**
Dissemination of Project Outcomes					**X**	**X**

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

The display of the OMB Expiration date is not inappropriate.

18. Exceptions to Certification for Paperwork Reduction Act Submissions

There are no exceptions to the certification.

References

https://www.cdc.gov/media/releases/2020/s0226-Covid-19-spread.html

Attachments

Attachment 1 – Authorizing Legislation

Attachment 2 – 60-day FRN

Attachment 3a – Individual Questionnaire

Attachment 3b – Household Questionnaire

Attachment 4a – Field Team SOP

Attachment 4b – Consent Form

Attachment 5 – Investigation Protocol

Attachment 6 – Letter of Invitation

Attachment 7 – IRB Non-Research Determination