Project Overview

The Utah Health and Economic Recovery (HERO) Project is a collaboration between the University of Utah, University of Utah Health, the Study Design and Biostatistical Core of the Center for Clinical and Translational Science, and the Governor’s Office of Management and Budget to provide information to decision makers regarding how many Utahns have actually been infected by the COVID-19 virus. At this time, the HERO Project has collected data from over 8,500 participants.

Phase One of the two-phase project aims to measure the proportion of people who have COVID-19 antibodies in Davis, Salt Lake, Summit, and Utah Counties in order to understand prevalence within the population and other factors associated with the virus. Phase Two will extend the same work to Utah’s other counties, assess communities that may have high viral activity, focus on students/children to help guide best practices for returning to school, and monitor changes in antibody prevalence over time.

Phase One Main Findings

- It is estimated that the overall 4-county seroprevalence (or the overall number of adults with detectable COVID-19 antibodies) is 0.96% with an approximate 95% confidence interval of 0.42% - 1.81%. The study is using the best tests available to yield accurate estimates.
- About 30% of cases have been detected through existing testing external to this study. The estimated seroprevalence to case count ratio is 3.4 (estimated 95% confidence interval: 1.5 – 6.4), meaning that for every detected case, approximately 2.4 infections are undetected. This is lower than case count ratios reported through surveillance programs in other states and suggests that testing was especially comprehensive during the early months of the pandemic in Utah.
- Roughly 30% of participants who were seropositive (or had COVID-19 antibodies) reported having a prior positive COVID test, which is consistent with the detected fraction reported above (1/3.4 or 29%).
- The case fatality rate (the ratio of fatalities to diagnosed cases) in Utah is approximately 1.0%. However, because the seroprevalence to case count ratio is 3.4, this implies that the infection fatality rate is approximately 0.29% with an approximate 95% confidence interval of 0.16% to 0.67%. Note: the term “case fatality rate” refers to COVID-19 related deaths among known positive cases for a COVID-19 infection, while the term “infection mortality rate” includes both known and unknown COVID-19 infections.
- 78 participants from 65 households had a positive serology result (had COVID-19 antibodies). There were 49 households with at least two individuals tested and at least one who was seropositive. Given a total of 62 positive individuals in these 49 households, there were 13 secondary positive individuals and 92 negative individuals (individuals who did not have COVID-19 antibodies) resulting in an estimated 12.4% secondary attack rate within households (the percent of infections among household contacts).

Implications

Phase One has two implications. First, the low seroprevalence and the high case-detection rate indicate that Utah’s early efforts to monitor and limit COVID-19 infections have been successful. Second, the low seroprevalence indicates a highly susceptible population. As efforts to restore economic and social activities are underway, it is imperative that recommended preventive measures are followed to retain the benefits achieved through substantial statewide efforts over the past few months. NOTE: these data largely reflect infections that occurred up until the beginning of June, before current increases in detected cases.
Overview of Project Design

The HERO Project provides the first randomized, representative estimate of seroprevalence in Utah using two different systematic sampling designs. The project’s primary sampling design targeted 10,694 randomly selected households and used an intensive sampling process including both in-person visits and mailings to maximize the response rate across these households. Because of the need to conduct in-person visits and obtain laboratory testing, the primary design used a clustered sampling approach in which the targeted households were sampled from 23 of 229 compact geographic areas (defined by two or more adjacent Census tracts) which were themselves randomly selected across the four-county area. An additional 10,040 households across the same four counties were recruited by mailings, but did not receive in-person visits. This “letter only” sampling design was able to broadly sample across all geographic areas within the four counties, but the less intensive sampling led to a higher rate of non-response. Both the primary and secondary designs utilized stratified random sampling based on 15 strata defined by combinations of the COVID-19 cumulative case count at the start of the study, median age, and the proportion of individuals self-identifying as Hispanic to the Census. The stratified sampling plan assured adequate representation in the project across the different ethnicity, age, and COVID-19 case-count groups. By taking into account the relative proportions of individuals within each stratum, our data analyses are able to make inferences to the full population across these strata, as well as to important subgroups of individuals.