



HERO Community Testing: Salt Lake County March-April Update

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The [Utah Health and Economic Recovery Outreach \(HERO\) Project](#) began in May 2020 as a collaborative statewide testing and analysis project to understand the community-based spread of Covid-19. The goal of the HERO Project is to collect and utilize high-quality local data to help inform decision-makers seeking to guide Utah's citizens and economy through a safe return to normalcy. Beginning in March 2021, the project team is publishing update reports on community testing, impacts of Covid-19 on Utah businesses and consumers, school testing, work in long-term care facilities, and vaccine uptake, impact, and implications. This report focuses on the [HERO Project's community-based testing](#) in Salt Lake County and serves as an update to the [Key Findings in Salt Lake County Community Testing report published March 31, 2021](#).

Background

Since the HERO Project began in May 2020, the team has conducted approximately 37,000 tests on nearly 30,000 individuals across the state of Utah, testing both for active infection and antibody presence—an indicator of infection in the past and, presumably, immunity in the present and future. Salt Lake County—chosen in part for the county's ability to inform understanding of the rate of spread in Utah's most urban areas, which have a diverse population—has been a frequent site of testing, with five rounds taking place between May 2020 and April 2021. The most recent round, occurring between mid-March and mid-April 2021, tested upwards of 2000 individuals.

Testing Results

PCR Positivity

During four weeks of testing throughout March and April 2021 in the geographic areas of Granite and Salt Lake City School Districts, the HERO Project determined that **less than 1%** of individuals tested were PCR positive—meaning that they were infected at the time of testing or very recently before. This rate continues to drop over time, indicating the decrease in spread as natural and vaccine-induced immunity, bolstered by prevention measures like mask-wearing reach greater numbers of Utahns.

Total Antibody Positivity

In contrast to PCR testing, antibody testing is focused on whether a patient has developed an immune response that can come from prior infection or vaccination. To determine the overall prevalence of antibodies, the HERO team utilizes the rate of antibody positivity among all participants regardless of whether they had received a vaccine (some participants were previously infected and have also been vaccinated, as vaccination is recommended regardless of past infection to provide more complete and longer-lasting immunity). This measure, shown in the first columns of the table below, provides an estimate of the proportion of the population that has at least partial immunity. Although herd immunity is a complex subject that is not fully understood, current best estimates place 75-90% of the total population immune as the range in which transmission will cease or fall to very low levels. As shown in the table, roughly **47%** of a March-April 2021 sample of residents of northern Salt Lake County had some evidence of immunity. The highest rate of antibody positivity is among those 46-65 years old and over 65 (at 54% and 95%, respectively), which are the groups with the highest vaccine coverage. Utah's vaccination program has been effective thus far, but there is still a great deal that needs to be done before reaching the target level of population immunity. Importantly, insights from these data can help direct priorities for the ongoing vaccination campaign in Utah.

Antibody Positivity from Prior Infection

To determine the prevalence of antibodies due to past infection, the HERO team uses the rate of antibody positivity among unvaccinated people. A positive antibody test indicates past infection, which is generally associated with at least partial immunity. However, immunity after infection does not appear to be as complete or as long-lasting as immunity after vaccination, underscoring the importance of a successful vaccination campaign. As shown below, the overall antibody prevalence among tested individuals who were not vaccinated is around **16%** without adjusting for test accuracy. Results were similar when test accuracy was taken into account. There is a notable disparity in infection rates between Hispanic and non-Hispanic individuals, with the former testing positive for antibodies at more than twice the rate of the latter.

Another striking finding among non-vaccinated individuals is that the antibody positivity in children younger than 12 (15%) is very similar to those 12-17 (17%) and 18-25 (20%); however, the rate of diagnosed infection [reported by the Utah Department of Health](#) among those younger than 14 (6%) is less than one-third the rate for those 15-24 (18%). This suggests that a large proportion of infections in younger children go undiagnosed.

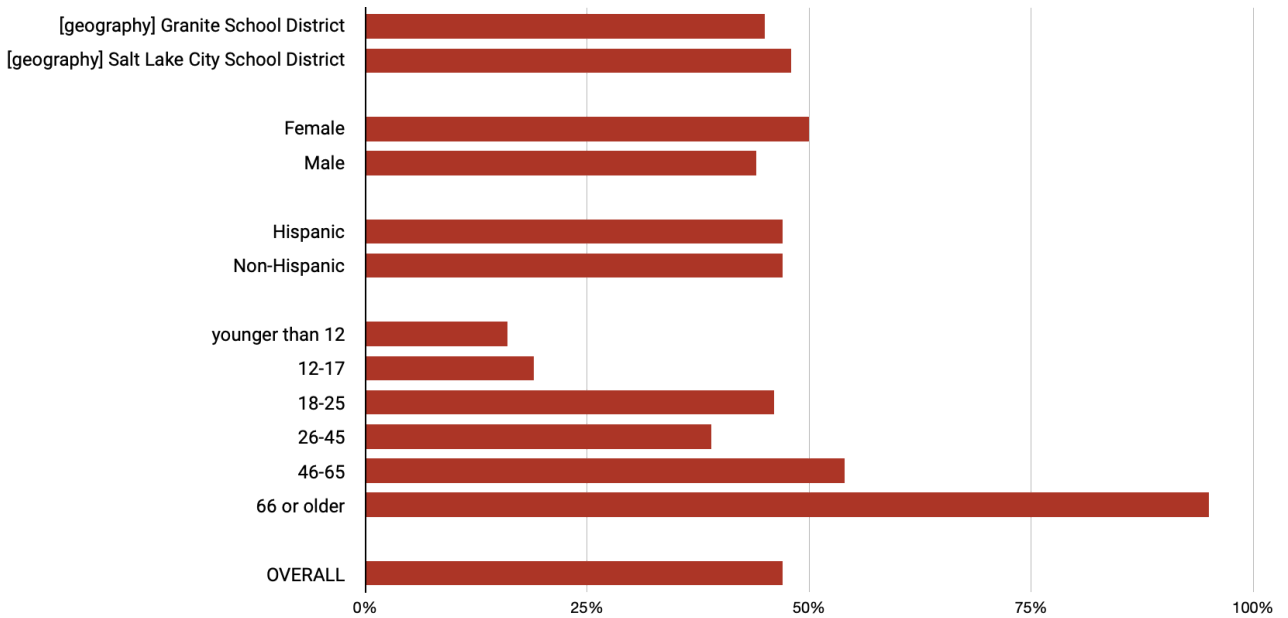
Antibody positivity among tested respondents, by vaccination status

Population Subgroup	ALL RESPONDENTS		UNVACCINATED RESPONDENTS		
	# Tested	# (%) Positive	# Tested	# (%) Positive; unadjusted*	% Positive; adjusted**
Geographic Area: Granite School District	952	430 (45%)	563	94 (17%)	18%
Geographic Area: Salt Lake City School District	1362	657 (48%)	710	113 (16%)	17%
Sex: Female	1214	610 (50%)	623	97 (16%)	17%
Sex: Male	1083	472 (44%)	637	109 (17%)	18%
Ethnicity: Hispanic	203	96 (47%)	136	42 (31%)	35%
Ethnicity: Non-Hispanic	2085	978 (47%)	1130	163 (14%)	15%
Age: younger than 12	292	46 (16%)	283	42 (15%)	16%
Age: 12-17	129	25 (19%)	119	20 (17%)	18%
Age: 18-25	191	87 (46%)	124	25 (20%)	22%
Age: 26-45	838	329 (39%)	546	78 (14%)	15%
Age: 46-65	537	291 (54%)	186	39 (21%)	23%
Age: 66 or older	327	309 (95%)	15	3 (20%)	22%
OVERALL		47%		16%	16%

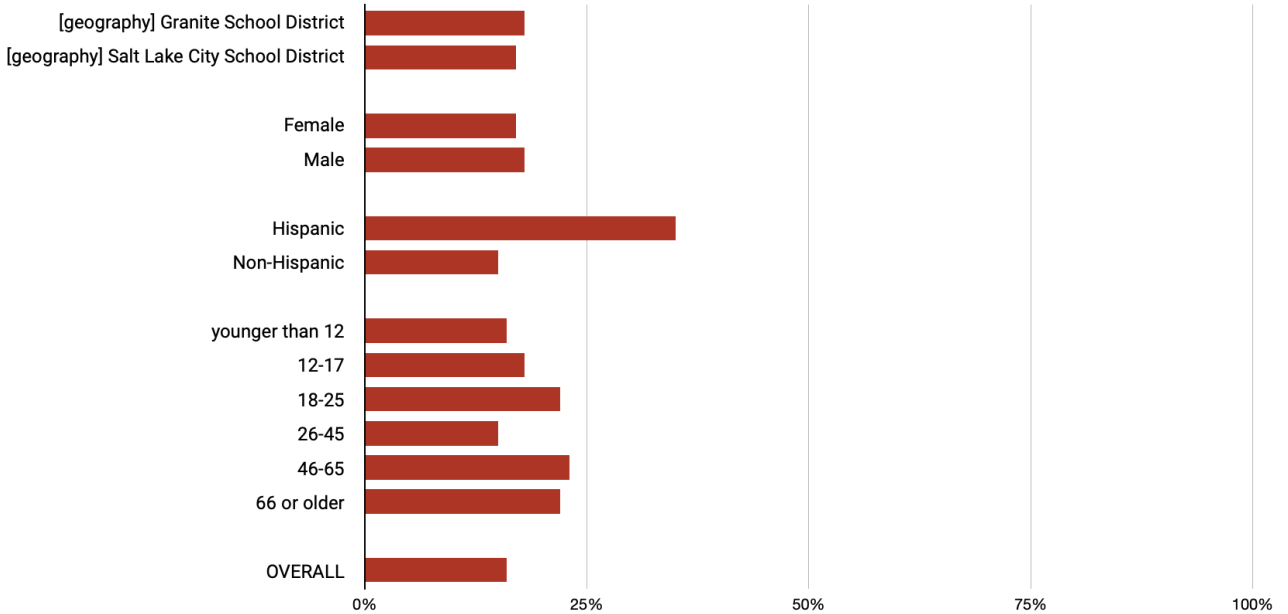
* these results come from HERO Project testing with the EuroImmun test

** adjusted using HERO Project estimates of antibody test accuracy

Antibody positivity among tested respondents, all respondents



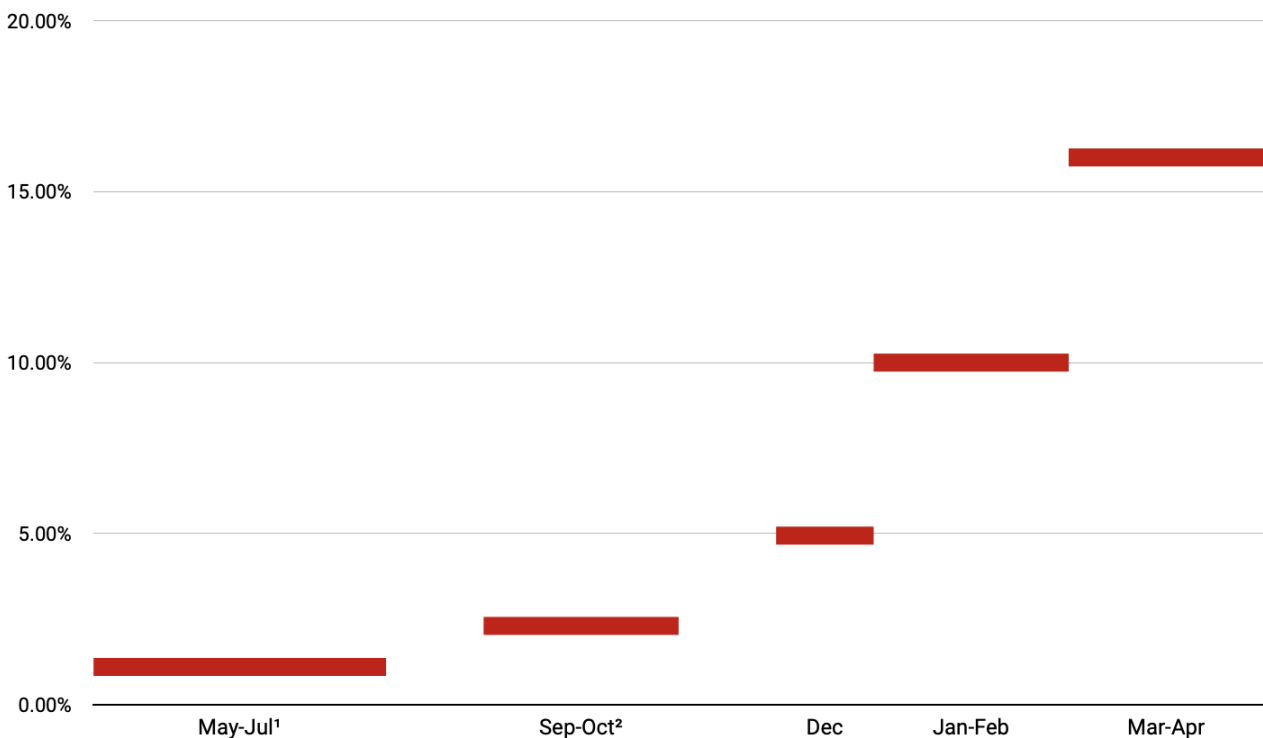
Antibody positivity among tested respondents, unvaccinated respondents



Tracking Results Over Time

Throughout the 10 months in which the HERO Project has been testing in Utah communities, the cumulative prevalence of Covid-19 antibodies has been gradually increasing, as shown below. In the first wave of testing in Salt Lake County (May through July 2020), participants had antibody prevalence estimated at 1.10% without adjusting for testing accuracy. The second round of testing (September & October 2020) saw an increased prevalence of 2.30% while the third (December 2020) was higher still, at 4.94%. The fourth round (January & February 2021) revealed a prevalence of approximately 10% specifically among unvaccinated Utahns. In this round of testing, the prevalence was approximately **16%**. This increase is expected, given the spread of the virus throughout the state. While the exact probability of reinfection is yet unknown, it is widely understood that increasing antibody presence among a community is associated with growth in natural immunity to the virus, which will be critical to consider as Utah continues to move towards herd immunity.

Antibody prevalence in Salt Lake County HERO Project testing, May 2020-Apr 2021



¹ Round 1 of testing in May-Jul 2020 also includes data from Davis, Summit, and Utah Counties

² Round 2 of testing in Sep-Oct 2020 also includes data from Davis and Utah Counties

Detection Fraction

To estimate the effectiveness of state testing procedures at capturing cases within the community, the HERO Project uses a measure called detection fraction, which essentially measures the percentage of positive Covid-19 cases that have been caught by state testing procedures. Early in the pandemic, HERO estimated a detection rate of approximately 40%, meaning that for each case detected, 1.5 cases went undetected. Over time and across geography, this rate has increased substantially, averaging to approximately 60% detection. This means that for every 3 detected cases, there are around 2 undetected cases. In the March-April 2021 testing of central concern to this report, HERO findings suggest that between **50-60%** of infections in individuals who continue to be unvaccinated had been detected by state testing efforts.

Next Steps

Moving forward, the HERO Project will focus on a number of priorities including understanding the impacts of and factors supporting vaccine uptake, Covid-19 activity in long-term care facilities, and more. The HERO team will continue to publish results on a regular basis, seeking to inform the public and decision-makers about moving towards normalcy with safety in mind.

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