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Abstract:

In April 2020, in response to staff concerns about the COVID-19 pandemic, a comprehensive testing program was developed to evaluate the prevalence of asymptomatic COVID-19 infection among our health care workers (HCWs) and to compare the incidence of infection in our HCW to the rates of infection in the community. From April 22nd to September 25th 2020, of 12,236 nasopharyngeal PCR tests performed on asymptomatic HCWs only 39 were positive (0.32%) and upon chart review only three of these HCW we found to be truly asymptomatic, corresponding to a 0.02% prevalence of truly asymptomatic infection in HCWs. During the study period, the overall percent of positive PCRs among all HCW was 1.2% (combined symptomatic, pauci-symptomatic, pre-symptomatic and asymptomatic) and was much lower than the rate of 4.5% reported in the community. From April 22nd to July 28th, the point prevalence of prior COVID-19 exposure was also evaluated by measuring SARS CoV-2 IgG antibodies in serum and was found to be below 1% of our asymptomatic HCWs. These results reflect both the relative safety of the healthcare environment as well as the thoroughness of our testing program.

Introduction:

The SARS-CoV-2 pandemic remains a major threat worldwide. High infection rates have been reported in HCWs in hard-hit regions^{2,3}, raising concerns about the effectiveness of personal protective equipment in protecting HCWs and of nosocomial transmission. Estimated rates of asymptomatic infection cover a broad range and are based on models developed from large population studies and smaller outbreak investigations. In general, 17.9% to 30.8% of infections are estimated to be asymptomatic^{4,6}. Asymptomatic or pauci-symptomatic infections are likely a significant source of transmission⁵ because virus shedding occurs at similar rates regardless of symptoms⁷ and transmission events have been clearly linked to people without symptoms⁸⁻¹⁰.

We designed a HCW testing program to address patient and employee concerns about healthcare exposures in our 808-bed health system. During the time of employee testing, the inpatient burden of COVID-19 was approximately 5.8%. The mean number of inpatients with a diagnosis of COVID was 34 (range: 19-52) and the mean daily census was 582 (range: 492-651).

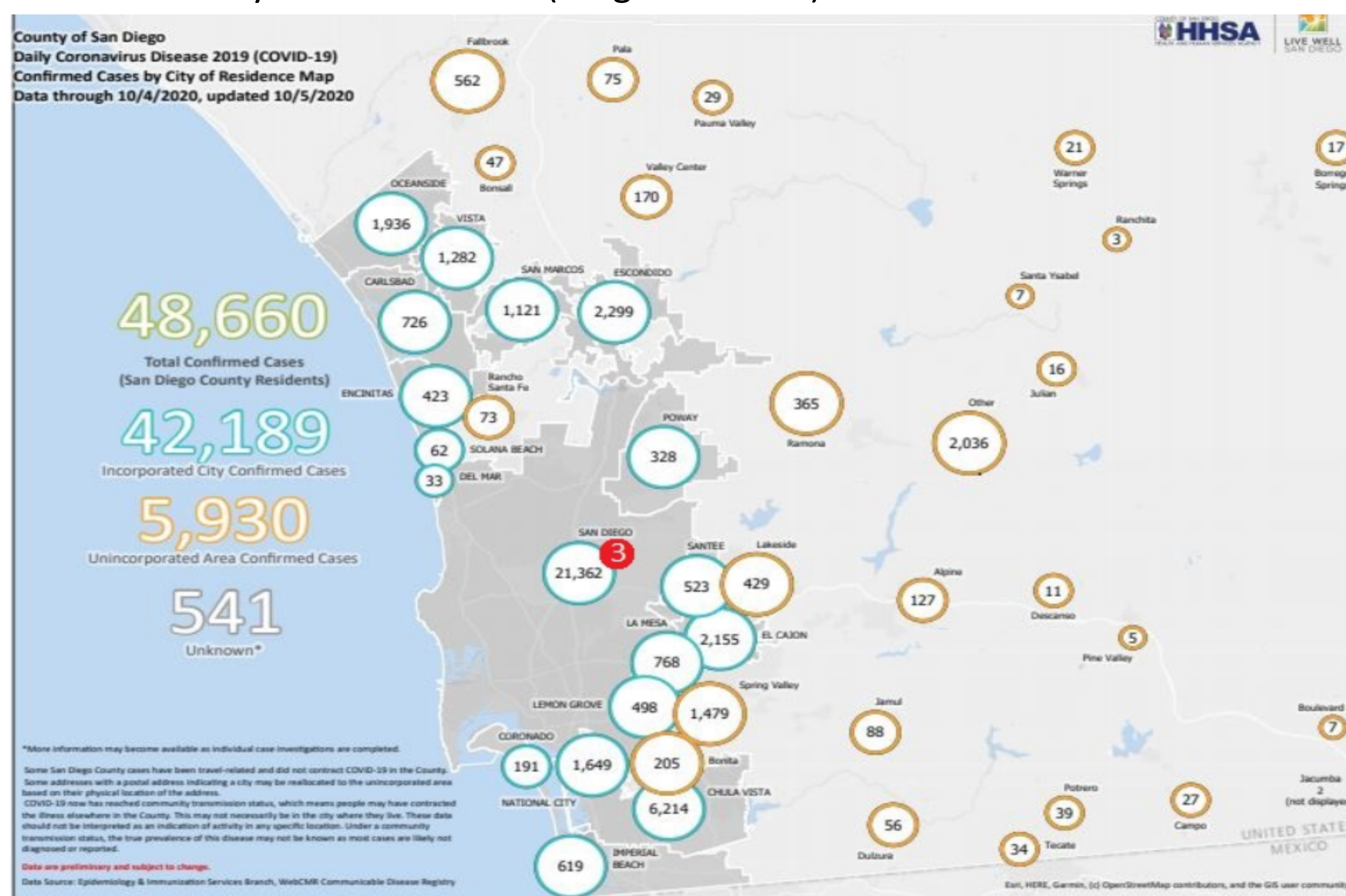


Table 3, San Diego County Public Health-Coronavirus Cases by city of Residence: Time period reflects April 1, 2020 to October 12, 2020

* “3” Represents the true number of asymptomatic HCW at UC San Diego Health

Methods:

- SARS-CoV-2 testing of asymptomatic HCWs with paired nasopharyngeal or mid-turbinate swab for PCR (Roche) and serum IgG antibody testing (Diazyme)
- True asymptomatic HCWs were identified through chart review and contact tracing assessments
- Tableau and ArcGIS dashboards were used to identify proportions from laboratory-tracking reports at UC San Diego Health and the County of San Diego

Results:

- 12,236 PCR tests were performed on asymptomatic HCWs
- 39 (0.3%) HCWs tested positive for SARS-CoV-2 RNA
- Of the 39 HCWs, 3 (0.02%) were identified as true asymptomatic
- 9,323 serologic tests (anti-SARS-CoV-2 IgG) were performed
- 90 were positive (1.0%) and none had a concurrent positive PCR. After July 28, tracking capabilities for the serologic tests were discontinued
- The proportion of asymptomatic to symptomatic HCWs was lower (1.5%) than that of San Diego County (12%), where 5,542 asymptomatic cases were identified

	Asymptomatic COVID-19 PCR	Symptomatic/ Exposure COVID-19 PCR	IgG Positive
True Asymptomatic Positives with Chart Review	3	-	-
Number of Lab Reported Positives	39	168	90
Completed Tests	12,236	4150	9323

Table 1, UCSD Health’s Asymptomatic and Symptomatic COVID-19 PCR and IgG. PCR time period reflects April 22, 2020 – September 25, 2020. Defined as campus staff and faculty in UC San Diego Health and Health Sciences manually identified at the time of COVID test entry (actual numbers may be higher as some health employees tested as patients may not have been identified). IgG time period reflects April 22, 2020 – July 28, 2020.

Testing of UCSD Healthcare Workers	Cumulative Incidence %
% True Asymptomatic	0.02%
% Asymptomatic	0.3%
% Symptomatic	3.9%
% IgG positive	1.0%
Cumulative (asymptomatic and Symptomatic) %	1.2%

Table 2, UCSD Health’s Cumulative Incidence Percentage. Time period reflects April 22, 2020 – September 25, 2020. IgG time period reflects April 22, 2020 – July 28, 2020

San Diego County Public Health:	Results
Asymptomatic Positive Cases (%)	5542 (12%)
Total Cases	46,095

Table 3, San Diego County Public Health Asymptomatic Report: Time period reflects April 1, 2020 to September 28, 2020

Discussion/Conclusions:

- At the peak incidence of the local epidemic in San Diego County, the cumulative rates of both asymptomatic and symptomatic PCR positive HCWs were lower at UC San Diego Health than those reported by San Diego County, suggesting that exposures were more likely to have occurred in the community
- In the three HCWs who remained asymptomatic after positive PCR testing, a likely community exposure source was identified
- Longitudinal follow-up of PCR positive HCWs, originally identified as asymptomatic, revealed that the majority had symptoms; suggesting that in a population of adult HCWs, the presumed positive asymptomatic rate may be over-estimated
- Our data suggest that availability of and correct use of PPE, including universal masking and eye protection, has helped to further minimize the risk of SARS-CoV-2 transmissions within the healthcare setting
- Our results indicate that, assuming robust testing capacity is available, a comprehensive testing program of HCWs should include a two-prong approach:
 - (a) Daily screening and aggressive testing of HCWs with any symptoms (including individual with minimal or minor symptoms)
 - (b) Asymptomatic testing that focuses on identifying HCWs who are at higher risk for occupational exposure (e.g. Emergency Department, respiratory therapy, and other HCWs involved in aerosol-generating procedures) and/or community exposure (taking public transportation, living in congregate housing, etc.)

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