Table 1: Molecular and Metagenomic Testing of Persons Under Investigation

	SARS-CoV-2 RT-PCR negative PUIs (N=30)	SARS-CoV-2 RT-PCR positive PUIs (N=23)
PUIs with molecular testing for non-SARS-CoV-2 respiratory viruses	28 (93%)	15 (58%)
Flu/RSV PCR	22 (73%)	12 (46%)
Multiplex Respiratory Pathogen PCR†	24 (8%)	14 (54%)
PUIs with alternative and co-infecting viruses detected by both routine methods and mNGS	8 (29%)	0 (0%)
Specific viruses detected by both routine methods and mNGS	Influenza A (N=3), Human metapneumovirus (N=2), Human coronavirus OC43 (N=2), Human coronavirus HKU1(N=1)	n/a
PUIs with additional viruses detected by mNGS alone	3 (14%)	0 (0%)
Specific viruses detected by mNGS alone	Respiratory syncytial virus (N=1), Human metapneumovirus (N=1), Human coronavirus NL63 (N=1)	n/a
PUIs with SARS-CoV-2 detected by mNGS	0 (0%)	23 (100%)

N (%) unless otherwise stated

Abbreviations: mNGS: metagenomic sequencing, PCR: polymerase chain reaction, RT-PCR: reverse-transcriptase PCR, SARS-CoV-2: severe acute respiratory syndrome-coronavirus-2

† Multiplex respiratory panels included eSensor® Respiratory Viral Panel (GenMark Diagnostics, Inc., Carlsbad, CA) and BioFire® FilmArray® Respiratory and Pneumonia panels (BioFire Diagnostics, LLC, Salt Lake City, UT)

Conclusion: Unbiased mNGS offers the powerful opportunity to streamline testing for PUIs by assessing for SARS-CoV-2 and alternative infections simultaneously; this technique can also be used to identify co-infections, but none were observed in our study population. Interestingly, many PUIs had no infection identified on routine testing or mNGS, which may reflect inadequate sampling, rapid virus clearance, or a non-viral process.

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65. Vaccine Confidence, COVID19, and the Influence of Peer Networks

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Session: O-13. COVID-19 Epidemiology + Prevention

Background: An increased appreciation for vaccines could be expected due to COVID-19. However, surveys show a polarization in opinions with about 20% of Americans preemptively rejecting any COVID-19 vaccine, partly due to inconsistent risk communication. While Health Care Professionals (HCPs) will be heavily relied upon to encourage uptake of a COVID-19 vaccine and 70% of Americans receive their vaccine information from HCPs, 84% also rely on peer networks. Understanding that HCPs have an important, but not exclusive, influence on health decision making can signal a new approach. This study provides data on where women, the main decision-makers regarding immunization in most families access information about vaccination.

Methods: Through an online survey conducted in UK, Brazil, Germany, Italy and Canada from 10 to 19-March 2020, we collected data on where, and from whom, women aged 25–54 years access information about vaccination. We set 1000 respondents/country quotas to reflect regional differences with data weighted as necessary.

Results: 5,036 women who met inclusion criteria responded: from the UK (1,003), Brazil (1,002), Germany (1,008), Italy (1,007), and Canada (1,016). Though most likely to receive vaccination info via their HCP: in Germany, women are least likely to be influenced by HCPs, with those aged 25–34 years more likely to turn to family members or online sources; in the UK, they are more likely to find info via a health authority's website; and in Brazil, they are more likely to see info in traditional media and on Facebook. Only 50% ranked vaccine efficacy and disease risk in the Top 5 factors influencing their vaccine decisions, alongside the opinion of an HCP, recommendation of a Public Health Authority and impact of the disease.

Conclusion: HCPs, families and peers are important sources of info regarding vaccination. COVID-19 is unlikely to improve vaccine confidence as the issue becomes increasingly polarized and communications more inconsistent. We can respond by investing in health promotion and harmonized communications through peer networks. Since caregivers, their families and peers have increased weight in vaccination decisions, then they should have increased weight in preventive health strategies.

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66. What Worked (And Didn't Work): A Survey of COVID-19 Response in Michigan Nursing Homes in the Midst of the Pandemic

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Session: O-13. COVID-19 Epidemiology + Prevention

Background: Nursing home (NH) populations are at higher risk for morbidity and mortality due to COVID-19. A March 2020 NH survey indicated improvements in pandemic planning when compared to a similar survey in 2007. We surveyed NHs to evaluate how well pandemic preparedness plans and infection prevention strategies met the reality of COVID-19.

Methods: The first COVID-19 case in Michigan was reported March 10, 2020. In the setting of 46,088 cases and 4,327 deaths statewide as of May 1, we disseminated an online survey to state department-registered NHs to describe their experience of the initial pandemic wave. Responses were collected May 1–12, during which the state averaged 585 cases/day. We were particularly interested in NH preparedness, challenges, testing capacity, and adaptations made.

Results: Of 452 NHs contacted, 145 opened the survey and 143 (32%) responded. A majority (68%) indicated that their facility's pandemic response plan addressed > 90% of issues they experienced; 29% reported their plan addressed most but not all anticipated concerns (**Table 1**). As the pandemic evolved, all facilities (100%) provided additional staff education on proper personal protective equipment (PPE) use. 66% reported experiencing shortages of PPE and other supplies. Half of all facilities (50%) lacked sufficient resources to test asymptomatic residents or staff; only 36% were able to test all residents and staff with suspected COVID-19 infection. Half (52%) considered their communication regarding COVID-19 with nearby hospitals "very good." The majority of facilities (55%) experienced staffing shortages, often relying on remaining staff to work additional hours and/or contracted staff to fill deficits (**Table 2**). NH staff resignations increased, with 63% of NHs experiencing resignations; staff with greater bedside contact were more likely to leave, including nurses and nurse assistants.

Table 1. Preparation and Resources Dedicated to COVID-19 in Michigan Nursing Homes

Question	N (%)
How well has your facility's Pandemic Response Plan for COVID-19 addressed actual issues?	
Very well; plan addressed > 90% of issues	94/139 (67.6%)
Fair; plan addressed most but not all issues	40/139 (28.8%)
Not very well; plan addressed < 50% of issues	2/139 (1.4%)
Not applicable; we did not have a Pandemic Response Plan for COVID-19	3/139 (2.2%)
For residents and staff with suspected COVID-19 infection: Does your facility have resources for adequate testing?	
Yes, we can test residents, direct-care and administrative staff with symptoms	49/136 (36.0%)
Yes, we can test residents and direct-care staff with symptoms	7/136 (5.2%)
Yes, we can test residents with symptoms	58/136 (42.7%)
No, we cannot test at our facility	22/136 (16.2%)
Does your facility have resources (specimen collection/swabs, labs to perform tests) for surveillance testing of all residents and/or staff including those without symptoms?	
Yes, we can do testing of all residents, direct-care and administrative staff without symptoms	34/135 (25.2%)
Yes, we can do testing of all residents and direct-care staff without symptoms	1/135 (0.7%)
Yes, we can do testing of residents without symptoms	33/135 (24.4%)
No, we don't have resources to test any asymptomatic residents or staff	67/135 (49.6%)
How well have your nearby hospitals communicated with your facility on COVID-19?	
Communication is very good	71/136 (52.2%)
Communication is fair	47/136 (34.6%)
Communication is poor	18/136 (13.2%)
How well have state and local public health officials communicated with your facility on COVID-19?	
Communication is very good	99/136 (72.8%)
Communication is fair	34/136 (25.0%)
Communication is poor	3/136 (2.2%)
As the COVID-19 pandemic was evolving, were facility staff given additional education on PPE use?	
Yes	139/139 (100.0%)
No	0
Don't know	0
Has your facility experienced a shortage of any supplies?	
Yes	91/139 (65.5%)
No	48/139 (34.5%)
Which supplies ran low or out?	
N95 respirators	47/91 (51.7%)
Masks (surgical)	38/91 (41.8%)
Gowns	76/91 (83.5%)
Eye shields/goggles	18/91 (19.8%)
Gloves	15/91 (16.5%)
Alcohol-based sanitizer	54/91 (59.3%)
Other	10/91 (11.0%)

Table 2. Staffing Concerns amid COVID-19

Question	N (%)
Has your facility experienced staffing shortages due to absences and illness during the COVID-19 pandemic?	
Yes	76/138 (55.1%)
No	62/138 (44.9%)
Who helped with staff shortages? (check all that apply)	
Volunteers from the community	1/76 (1.3%)
Non-clinical staff filled different roles	46/76 (60.5%)
Remaining staff volunteered to work extended hours	60/76 (79.0%)
Remaining staff mandated to work extended hours	36/76 (47.4%)
Agency/contracted staff	27/76 (35.5%)
We didn't get additional help	2/76 (2.6%)
Other	7/76 (9.2%)
Has your facility experienced increased loss of staff (resignations) in the midst of COVID-19?	
Yes	87/138 (63.0%)
No	51/138 (37.0%)
Don't know	0
Which staff resigned?	
Physicians/Physician extenders	2/87 (2.3%)
Nurses (RN, LPN/LVN)	56/87 (64.4%)
Nurse assistants/CENAs	73/87 (83.9%)
Therapists (physical, occupational, speech)	4/87 (4.6%)
Housekeeping/environmental services	34/87 (39.1%)
Food service	35/87 (40.2%)
Administrative/clerical services	14/87 (16.1%)
Other	5/87 (5.8%)

Conclusion: While most NHs had a plan to respond to COVID-19 pandemic in March 2020, many facilities experienced a lack of available resources, less than ideal communication lines with local hospitals, lack of testing capacity and insufficient staff. These shortcomings indicate potential high-yield areas of improvement in pandemic preparedness in the NH setting.

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67. SARS-CoV-2 Transmission: Preliminary Findings from a Household-based Study

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Session: O-13. COVID-19 Epidemiology + Prevention

Background: Social distancing measures, such as shelter-in-place or stay-at-home orders, are recommended for control of community transmission of SARS-CoV-2. Few studies, however, have characterized the transmission of SARS-CoV-2 infections in households.

Methods: We conducted a case-ascertained study of household transmission in Nashville, TN starting in April 2020, after recommendations to stay at home were enacted. Index cases were ambulatory patients identified through clinical RT-PCR testing at Vanderbilt walk-in-clinics dispersed across the Nashville metropolitan area. For this study, the index case was the first person presenting with respiratory or compatible symptoms in a household and who lived with at least one other household member. After informed consent was obtained, household members were remotely trained in the self-collection of nasal swabs and use of REDCap electronic questionnaires. Household members completed daily symptom diaries and collected daily nasal swabs for 14 days. Contact patterns within households before and after disease onset were ascertained. Nasal swab samples were tested using RT-PCR at an academic research laboratory.

Results: At the time of writing, 18 families were enrolled (including 18 index cases and 34 household members) with at least 1 follow-up nasal swab tested. The median age of index cases and household members was 37 years (IQR: 26–46) and 27 years (15–39), respectively. The median number of days from index patient onset of symptoms to first sample collected in the household was 4 (2–5). Before onset of symptoms, 83% of index cases spent >4 hours in the same room with at least one other household member, whereas after disease onset and diagnosis, 44% did. Among 34 non-index household members, 18 (53%) had a positive test during follow-up; the median number of days from index case's symptoms onset to first positive detection in a household member was 4.5 (3–5) days. Interestingly, 13 (72%) of 18 secondary infections were detected within the first 3 days of follow-up, whereas 5 (28%) were detected during subsequent days.

Conclusion: These observations suggest that transmission of SARS-CoV-2 within households is high, with many infections detected during the initial days of study follow-up.

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68. Active Monitoring of a Healthcare Worker Cohort During the COVID-19 Epidemic

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Session: O-13. COVID-19 Epidemiology + Prevention

Background: Initial CDC recommendations for passive monitoring of COVID-19 related symptoms among staff may not be sufficient in preventing the introduction and transmission of SARS-CoV-2 in healthcare settings. We therefore implemented active monitoring for SARS-CoV-2 infection in healthcare workers (HCWs) at an academic medical center during the COVID-19 epidemic in northeast US.

Methods: We recruited a cohort of HCWs at Yale New Haven Hospital who worked in COVID-19 units and did not have COVID-19 related symptoms between March 28 and June 1, 2020. During follow-up, participants provided daily information on symptoms by responding to a web-based questionnaire, self-administered nasopharyngeal (NP) and saliva specimens every 3 days, and blood specimens every 14 days. We performed SARS-CoV-2 RT-PCR and an anti-spike protein IgM and IgG ELISA to identify virological and serological-confirmed infection, respectively.

Results: We enrolled 525 (13%) amongst 4,136 HCW of whom daily information on symptoms and NP, saliva, and blood specimens were obtained for 66% (of 13208), 42% (or 1977), 44% (of 2071) and 65% (of 1099), respectively, of the follow-up measurement points. We identified 16 (3.0% of 525) HCWs with PCR-confirmed SARS-CoV-2 infection and an additional 12 (2.3% of 525) who were not tested by PCR or had negative PCR results but had serological evidence of infection. The overall cumulative incidence of SARS-CoV-2 infection was 5.3% (28 of 525) amongst HCWs. Cases were not identified by hospital protocols for passive staff self-monitoring for symptoms. Amongst 16 PCR-confirmed cases, 9 (56%) of the 16 PCR-confirmed HCW had symptoms during or after the date of initial detection. We did not identify an epidemiological link between the 28 confirmed cases.

Conclusion: We found that a significant proportion (5.3%) of HCWs were infected with SARS-CoV-2 during the COVID-19 epidemic. In the setting of universal PPE use, infections were possibly acquired in the community rather than stemming from patient-HCW or HCW-HCW transmission. Passive monitoring of symptoms is inadequate in preventing introductions of SARS-CoV-2 into the healthcare setting due to asymptomatic and oligosymptomatic presentations.

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69. Effective Contact Tracing Strategies for COVID-19: A Municipal Health Department's Model

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Session: O-13. COVID-19 Epidemiology + Prevention

Background: During the COVID-19 pandemic, contact tracing program as part of a larger epidemiological case investigation was effectively implemented by the local department of health in Paterson, NJ. The Paterson Communicable Disease Strike Team (PCDST) was established by leveraging skills and using existing public health staff of the health department team which led to a timely and robust public health intervention.

Methods: PCDST comprised of 25 communicable disease investigators/contact tracers established in preparation for public health response in the event of large-scale communicable disease outbreaks pre-COVID. In March 2020 with initial COVID-19 cases in Paterson, PCDST was activated utilizing NJ DOH's Communicable Disease Reporting and Surveillance System (CDRSS). Additional staff members were cross-trained to augment team as new cases surged. A triage coordinator would identify and assign new cases to disease investigators at a 24/7 schedule. Disease Investigators would provide test results, perform epidemiological case interviews, elicit close contacts, and provide isolation/quarantine recommendations. Case-contact monitors followed up daily basis until completion of isolation/quarantine period.

Results: As of June 15, 2020, 6537 cases tested COVID-19 (+) in Paterson, NJ. 91% of cases and their contacts were interviewed. Peak occurred in mid-April with 263 cases on a single day. By mid-June, daily number of cases declined to 7/day. Reported COVID-19 mortality rate in Paterson (4.65%), compared to surrounding towns in the same county of Passaic (6%), other large cities in New Jersey (Newark 8%, Jersey City 7.4%) and New Jersey state (7.59%).

Conclusion: Despite limited resources, we were able to cross train and engage our frontline public health team (PCDST) to investigate and effectively contact trace new COVID-19 cases to help contain spread of infection. Although its unclear if our intervention impacted mortality rates, it is certain that contact tracing using a trained public health workforce is a model that has proven successful in Paterson. A local public health workforce vested in their communities can develop rapport needed to build trust and confidence in an intervention that elicits confidential medical information to limit viral transmission.

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70. Lack of SARS-CoV-2 Antibody Seroconversion After Prompt Identification and Cohorting of Sentinel sars-cov-2-positive Residents in a Skilled Nursing Facility

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Session: O-13. COVID-19 Epidemiology + Prevention

Background: Despite numerous outbreaks, antibody responses to SARS-CoV-2 in residents of skilled nursing facilities (SNF) are not well described. We reviewed