

2021 THE YEAR IN REVIEW

MADISON COUNTY DEPARTMENT OF HEALTH





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Impact Vaccination



IMPACT: VACCINATION

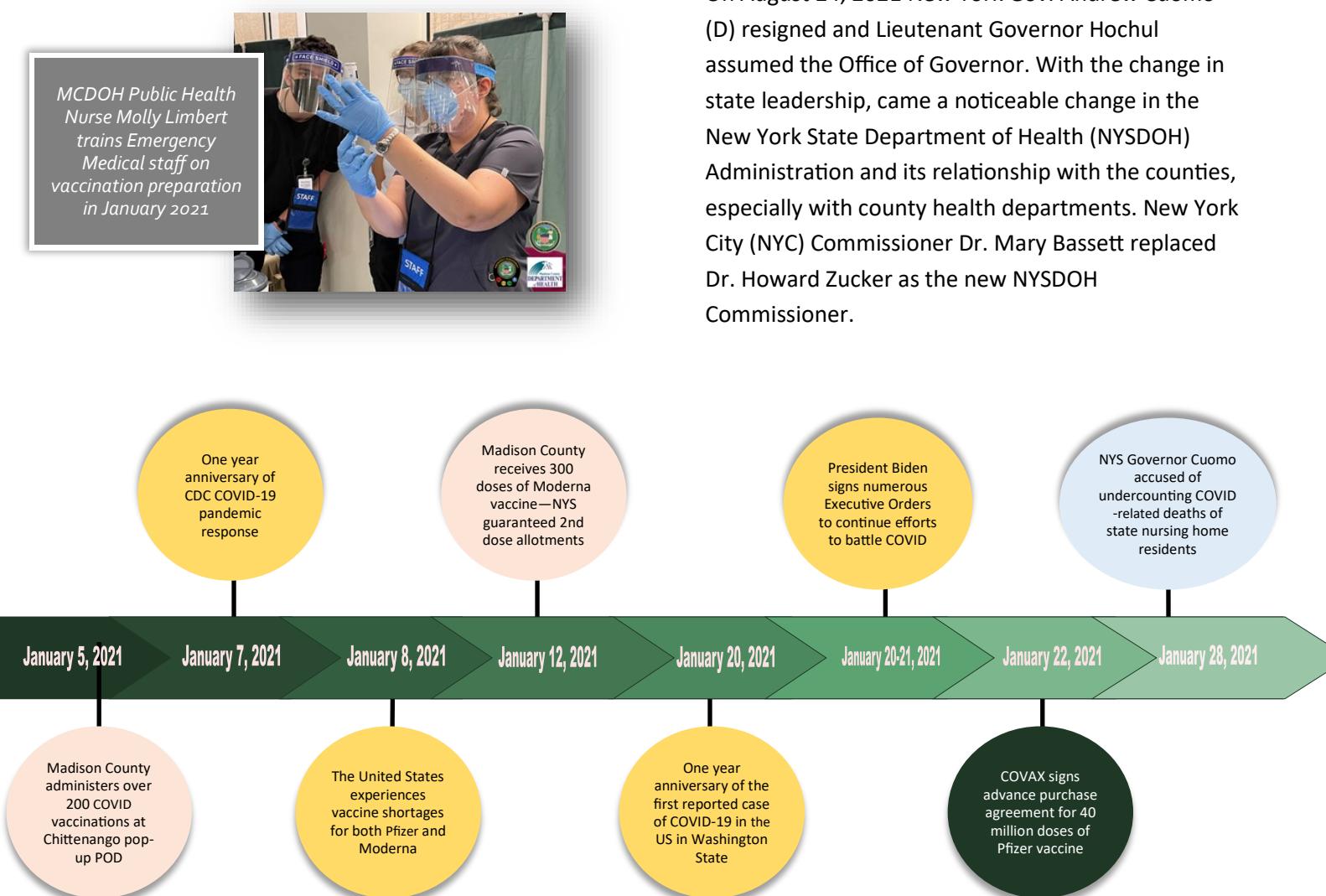
The year 2021 started off with 340 active COVID-19 cases, quickly surging to 421 active cases by January 8, 2021. By mid-March, the number of active cases plunged significantly (33 cases on March 13, 2021). However, the emergence of the Delta and Omicron variants, in late April and in November, triggered a surge in cases to 606 cases on December 31, 2021, the highest levels of the pandemic to date; doubling the number of active cases (311) observed one year earlier, on December 31, 2020. The number of positive cases in 2021 (6,970), nearly tripled the number of cases observed in 2020 (2,411).

The COVID-19 vaccines arrived at the end of 2020 and beginning of 2021. With the introduction of the vaccine, new challenges arose concerning vaccine misinformation, vaccine supply limitations and

prioritization criteria, and the implementation of an untested vaccine distribution model utilizing an overstressed hospital system. Furthermore, vaccine mandates for health care workers dramatically affected the continued provision of health care services as many refused and were subsequently terminated or left their jobs; creating a greater health risk to the public.

COVID testing took a more prominent role in the response efforts in 2021. The addition of rapid testing and the availability of at-home test kits enhanced testing capacity however, it created further challenges in terms of test result validity/credibility, protocols and guidance changes, requests for isolation and quarantine orders for work sites, and more.

On August 24, 2021 New York Gov. Andrew Cuomo (D) resigned and Lieutenant Governor Hochul assumed the Office of Governor. With the change in state leadership, came a noticeable change in the New York State Department of Health (NYSDOH) Administration and its relationship with the counties, especially with county health departments. New York City (NYC) Commissioner Dr. Mary Bassett replaced Dr. Howard Zucker as the new NYSDOH Commissioner.



Numerous personnel changes ensued within the NYSDOH administration. The new state administration actively engaged the Local Health Department's (LHD) in collaborating and planning the COVID response efforts going forward.

The Madison County Department of Health (MCDOH) and Office of Emergency Management (OEM) led the County's response. It wasn't until late 2020 that there seemed to be a proverbial light at the end of the tunnel with the development of a vaccine.

The first vaccination clinic held by MCDOH staff was on December 31, 2020 at the County Office Building. Just as quickly as the vaccination gave way to hope, came new challenges.

Along with MCDOH testing, contact tracing, and case investigation efforts, came the coordination of a limited supply of vaccine and the emerging threat of a vaccine-resistant strain out of South Africa and Brazil spreading quickly to the rest of the world, including the United States (US).

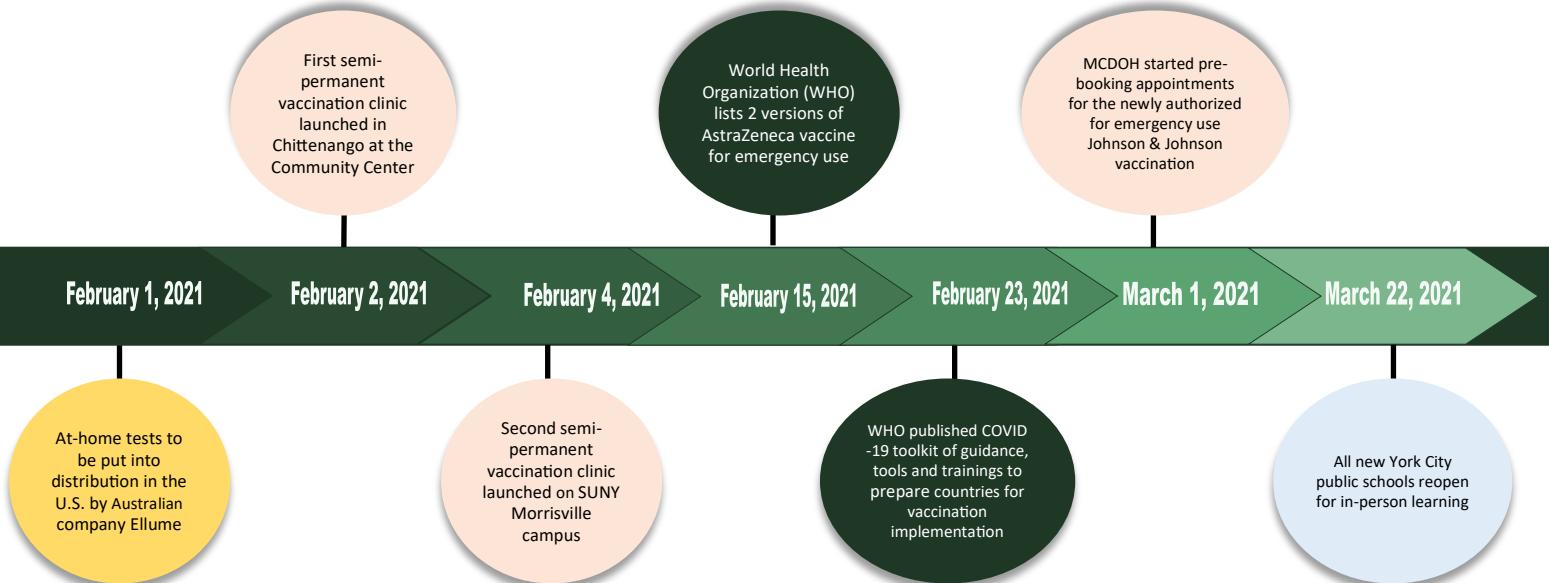
To address the limited supply of vaccine available relative to high demand, New York State (NYS) developed a prioritization strategy that broke down the perceived "need" into categories of individuals

more susceptible to transmission based on age, residence, and health status, as well as one's level of public interaction in their professions. Madison County aligned with the requirements and moved forward with a series of semi-permanent vaccination clinics in several locations across the county.



Madison County Chairman John Becker at the SUNY Morrisville vaccination clinic site in March 2021

Local Health Departments were limited in who they could vaccinate, required proof of eligibility, and were getting pressure to use all doses in a vial once opened. Furthermore, LHDs were given directives that "All



facilities, entities, and practices receiving vaccine doses have an obligation to quickly utilize all doses, per New York's 'Use it or Lose it' policy and Executive Order 202.88. If any vaccine is not administered within seven days of receipt, remaining doses may be removed, and entities may not be allocated future vaccine doses."

The vaccination clinic model that Madison County launched are referred to as Points of Disbursement or PODs. The first POD started on January 5, 2021 and was located in Chittenango. Utilizing MCDOH and OEM staff, along with per diem EMTs and volunteers, the county provided first and second dose vaccinations for large numbers of those on the eligible list to receive their first dose of vaccine and schedule the second dose in the upcoming weeks.

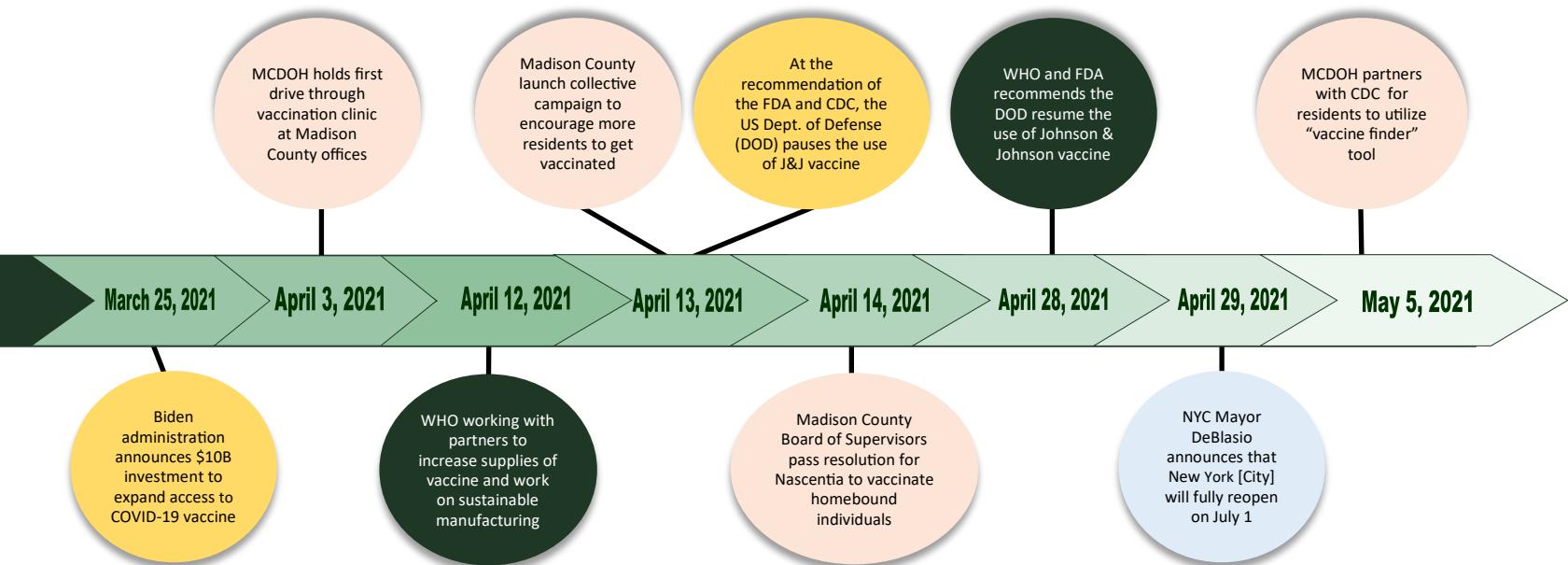
As New York State expanded the eligibility lists, the need increased for qualified staff to assist with administering vaccinations. With only four full-time nurses on staff, MCDOH recognized the need to expand capacity and hired a number of Emergency Medical Technicians (EMT), Paramedics, and nurses to assist with vaccination efforts. In addition, a pool of volunteers including retired county employees, medical reserve volunteers, community members,



Rebecca LaPorte, Community Health Director and Ken Cronn, Public Health Sanitarian helping with the Green Empire Farms vaccination clinic.

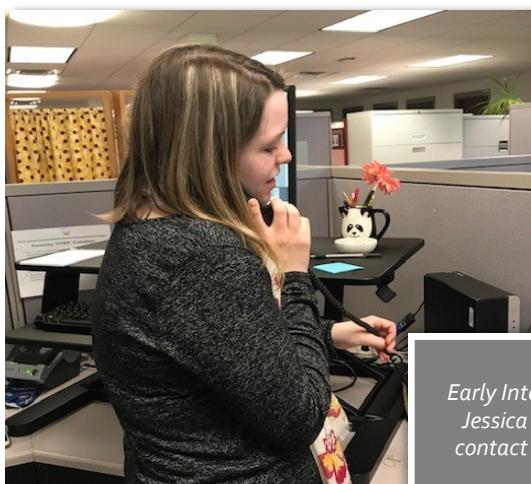
and current Madison County staff from other departments were utilized in our vaccination efforts.

The addition of EMTs, Paramedics, and volunteers facilitated the opening of two more POD sites within the county, one in Morrisville at the SUNY campus, and one in the Northside Plaza in Oneida. The additional staff allowed MCDOH to hold four (4) targeted vaccine events at the Green Empire Farms (GEF). The events were coordinated with the arrival of new workers to Green Empire Farms. A total of 303 vaccinations were administered at GEF.



To further enhance vaccination efforts, the MCDOH offered numerous pop-up and drive-through pods throughout the county. In addition, MCDOH partnered with the Office of Aging and Nascentia Health Inc., to provide vaccinations to home-bound individuals. MCDOH also provided vaccinations to jail inmates along with correctional facility staff.

The vaccination efforts added to the burden placed on MCDOH staff as they continued to carry out the case investigation of all positive cases in Madison County, as well as contact tracing of those suspected and exposed individuals.

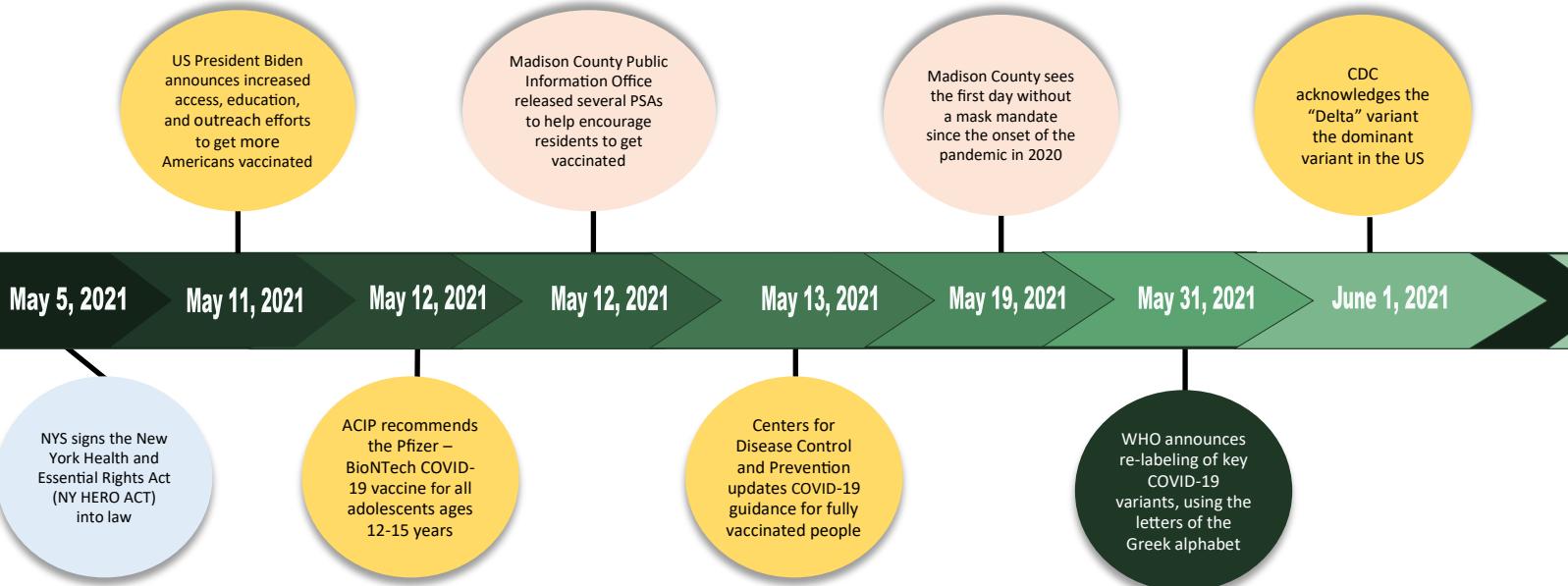


Early Intervention Staff, Jessica Salay making contact tracing calls in 2021.

Since the onset of the virus in March 2020, though many public services throughout the county were scaled back or paused entirely, several county departments were forced to kick into high gear; and that is exactly what Madison County Public Health did. Building Five in Wampsville was a constant hum of daily activity with office staff and volunteers making upwards of seventy five calls each day to residents to discuss isolation and quarantine requirements, changes in symptoms, or determine additional needs, such as food and/or medications.

The MCDOH immunization team balanced the demands of scheduling vaccination clinics, ordering vaccine during a national shortage, maintaining proper inventory for a limited supply of personal protection equipment (PPE) , while maintaining their own safety and wellbeing.

As vaccine data became available, certain population groups nationwide, demonstrated lower vaccination rates than other groups. Madison County established a Health Equity (HE) Task force to improve vaccination rates among these vulnerable groups. The HE Task Force was co-chaired by Community Action Program and The Rural Health Council of Madison County. The task force was comprised of 52 individuals



representing 28 community agencies and interest groups who worked with and/or served these vulnerable populations. The advice from the Task Force helped the MCDOH implement outreach and vaccination events that targeted these specific groups.

With the introduction and administration of vaccines

throughout the county, there was a sense of the county moving on the road to recovery. However, in late February 2021 reports emerged internationally, of an extremely rare condition characterized by thromboembolic events (blood

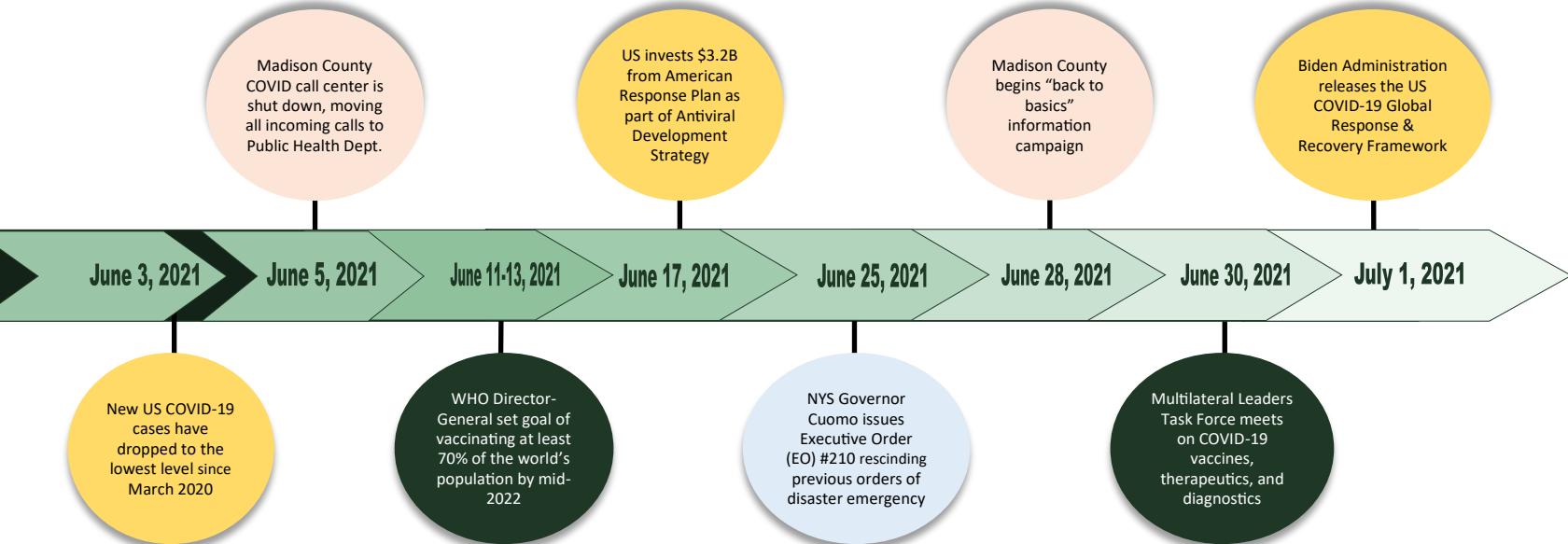
clots) accompanied by thrombocytopenia (low platelets) following the first dose of the AstraZeneca (AZ) COVID-19 vaccination, an adenovirus vector-based vaccine.

Subsequently, we started seeing reports in the United States of a small number of a similar syndrome following receipt of the Johnson & Johnson/Janssen COVID-19 vaccine (also an adenovirus vector-based vaccine). Following a detailed investigation and temporary pause in the use of the vaccine in the US,

the Centers for Disease Control and Prevention (CDC) and the US Food and Drug Administration (FDA) announced the resumption of the use of the vaccine for all age groups on April 23, 2021.

Additional reports continued throughout the early part of 2021, citing rare cases of

myocarditis (inflammation of the heart muscle) and pericarditis (inflammation of the outer lining of the heart) after children and teens ages 5 years and older got the Pfizer-BioNTech COVID-19 vaccine.





Delta Rushes

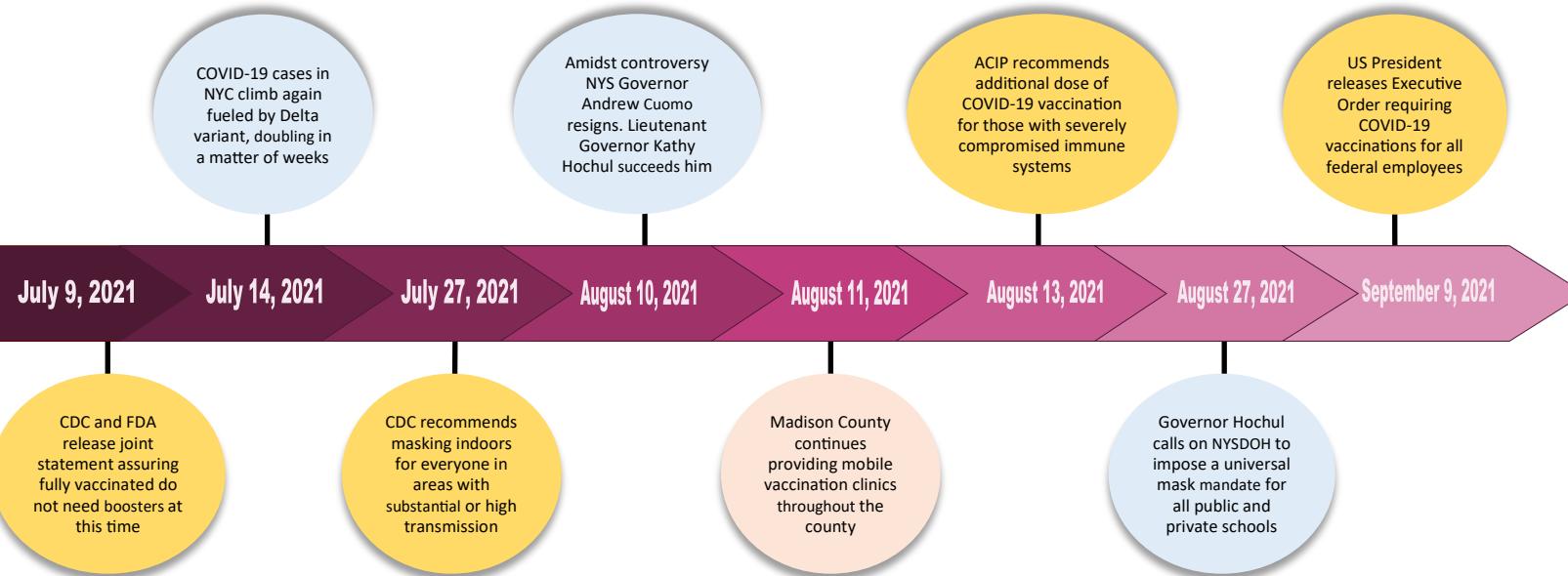
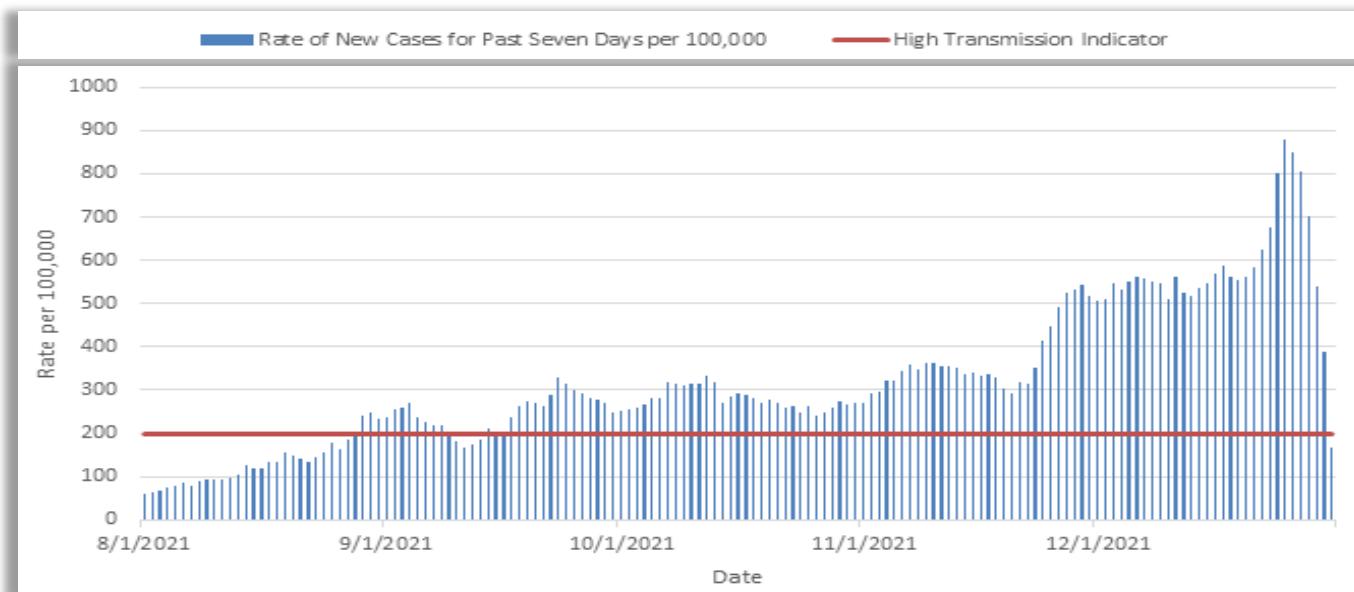


DELTA RUSHES

As the year moved forward, more and more residents either became fully vaccinated, or developed natural immunity from contracting COVID. This resulted in a dramatic decrease in case numbers in Madison County. Businesses that had been operating under limited circumstances, and many of those who had been closed altogether since 2020, were starting to enter back into normal business hours and services.

Life was seeming carefully refreshed, and the Spring of 2021 felt lighter and more rewarding with each new day. Slowly the world started to come back up for air. However, this did not last long as cases dramatically increased towards the end of the Summer till the end of the year; bringing the highest number of cases throughout the entire pandemic. (See Figure 1).

Figure 1: Rate of New Cases in Seven Days per 100,000 Residents August —December 2021



In 2021, the tasks associated with investigation and tracing became standard practice, and staff and volunteers developed routines and practices that they learned to function successfully. As Madison County worked hard to protect the residents of our county, the rest of the state was in progress to do the same. The New York Health and Essential Rights Act (NY HERO Act) was signed into law on May 5, 2021.

The law mandated extensive new workplace health and safety protections in response to the COVID-19 pandemic. The purpose of the NY HERO Act was to protect employees against exposure and disease during a future airborne infectious disease outbreak.

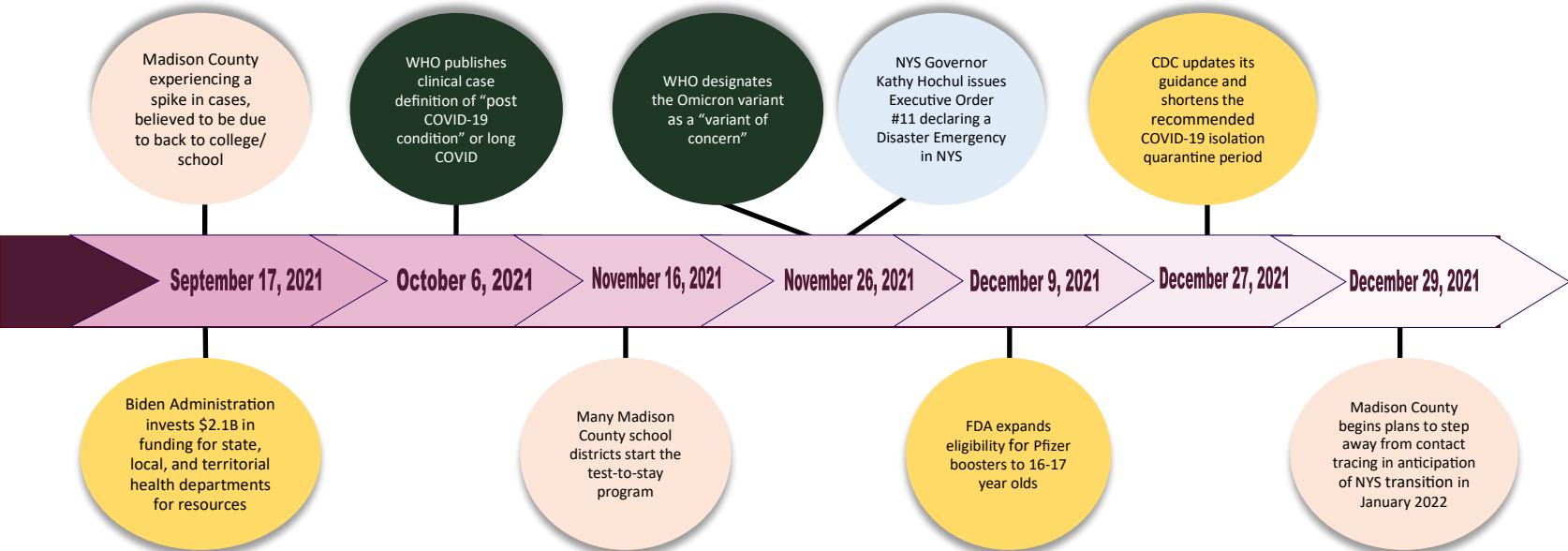
Despite the best efforts of so many Madison County residents to maintain precautions and safe practices across the county, the newly coined “Delta” variant was bound and determined to take its place in our communities; and that it did. By the end of August 2021, the number of positive cases began to creep back up as the fall rolled on. After an early summer, where numbers were down to single digit new cases each day, this increase was alarming and discouraging to see. Schools and businesses were forced to reinstate mask mandates, and social distancing practices and precautions that had been lifted just a few months previously. Thus began a new concern

that was becoming more and more prevalent everywhere; the toll that the last year and a half was taking on the mental health of our residents and community members.

In May of 2021, Madison County Chairman John M. Becker organized the Madison County Mental Health Task Force to assess COVID-19’s impact on the mental wellbeing of county residents.

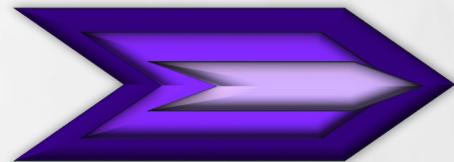
In addition to the Task Force, the Madison County Mental Health Department expanded their telehealth services to respond to a 38% increase in the number of clients during the first two years of COVID. At the same time, 60% more youth were served during this period than in previous years. In 2021 alone, the Mental Health Department saw a 46% increase in the number of visits conducted, for a total of over 23,000.

Other organizations in the county began mental health initiatives as a result of the pandemic. The Madison County Rural Health Council, in collaboration with the County Mental Health Department, launched a Mental Health First Aid program targeting youth and school personnel.





*Breakthroughs
& Omicron*



BREAKTHROUGHS & OMICRON

By the end of the summer vaccination rates reached 63.3% of the total adult population of Madison County who received at least one dose of the COVID-19 vaccination. In a county with just under 70,000 residents, this equates to about 43,000 individuals, 12 years old and older, who received their vaccination.

Although the vaccines offered boasted high efficacy rates among their products, a percentage of fully vaccinated individuals (0.25%) labeled “breakthrough” cases were reported. By early September, Madison County reported 110 breakthrough cases out of the 43,000+ vaccinated residents. Although breakthrough cases occurred, individuals that were vaccinated were less likely to experience a severe response, hospitalization, or death. With these breakthrough occurrences came the realization that we were likely in for another tough holiday season, facing high positivity rates and an increase in cases.

With the return of schools and colleges allowing for in-person attendance, numerous businesses reopening, along with lifting of mask mandates and social distancing practices (May 19, 2021), cases were expected to rise. However, the introduction of the fast-moving, highly contagious Delta variant, proved to be more than anyone expected. The high case numbers experienced during and after the holiday season in 2020, were surpassed by staggering highs by December 2021, as shown in **Figure 1 (See page 11)**. Moreover, by the end of November 2021, a new, more contagious variant emerged, posing its own level of threat to the world.

By the end of 2021, the Omicron variant had a hold in numerous countries around the world and was moving quickly in the US. Whereas the Delta variant was a stronger and seemingly more severe variant, the Omicron was less severe, but far more contagious than Delta. By November 26, 2021 the World Health Organization declared Omicron the leading “variant of concern.” The emergence of the Omicron variant coupled with the increase in positive cases triggered New York State Governor Kathy Hochul to re-issue a

mask mandate on December 13, 2021 for all indoor public places, unless these same public places implemented a vaccination requirement. What seemed like a break in the virus’ hold earlier in the year, was met with an even harder hit as the year closed.

Though the positive case numbers reached all-time highs by the end of 2021, various factors including, previous immunity, vaccine protection, and the availability of treatment options (Molnupiravir and Paxlovid) contributed to an overall decrease in the severity of the virus and need for hospitalization.

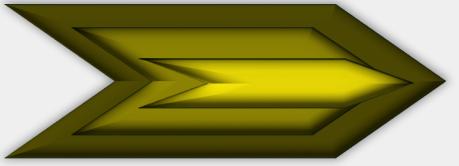
On December 27, 2021 the Centers for Disease Control and Prevention (CDC) made significant adjustments to the isolation and quarantine recommendations by shortening the recommended isolation period for people with COVID-19 from 10 to 5 days, followed by 5 days of wearing a mask around others if they are asymptomatic or if their symptoms were resolving. At least this was a positive way to end a roller coaster of a year, and gave something for everyone to look forward to in 2022; a glimpse of getting back to our “normal” way of life.

The role of testing expanded in 2021 beyond its initial surveillance role of identifying positive cases, to include: ongoing testing requirements for participation in events, work, and other related activities; work-related sick leave; determining level of community transmission, and ongoing research, data collection, and quality assurance activities for the various tests themselves.

Numerous test kits became available in 2021 that offered different types of test for different testing purposes. Certain tests were more effective for clinical diagnosis (PCR), while other tests were better for screening (Pool Testing) or surveillance activities (Rapid Tests). The MCDOH established their own testing events to compliment and eventually replace the testing events spearheaded by Upstate Medical’s Mobile Unit. See **Table 1 (See page 16)** for testing event data.



Testing



TESTING

Table 1: MCDOH/Upstate Mobile COVID-19 Tests Administered in 2021

Tests Administered	Comments
Upstate Mobile Unit	Held 11 testing events on the County campus in Wampsville from January 1 to March 25, 2021. Reported a decrease in testing at each subsequent event.
934	
MCDOH	MCDOH– Held 20 events, 2 locations, Rapid Testing (symptomatic testing)
829	
Total	
1,763	

On May 20, 2021 NYSDOH allocated \$2,002,968 to Madison County to enable school districts to establish a COVID screen testing program to support and maintain in-person learning. MCDOH met with Madison-Oneida BOCES to discuss the coordination of testing for all school districts within the county. The Madison-Oneida BOCES agreed to coordinate testing activities within all schools in Madison County, including those outside of their normal BOCES jurisdiction. MCDOH submitted a letter to the NYSDOH requesting that the funds be directed to BOCES. NYSDOH approved MCDOH's request and contracted directly with BOCES to coordinate school testing.

MCDOH assisted the Madison-Oneida BOCES in coordinating a Pool Testing strategy between BOCES and Quadrant Biosciences. **Figure 2** depicts the number of tests administered by each participating school district.

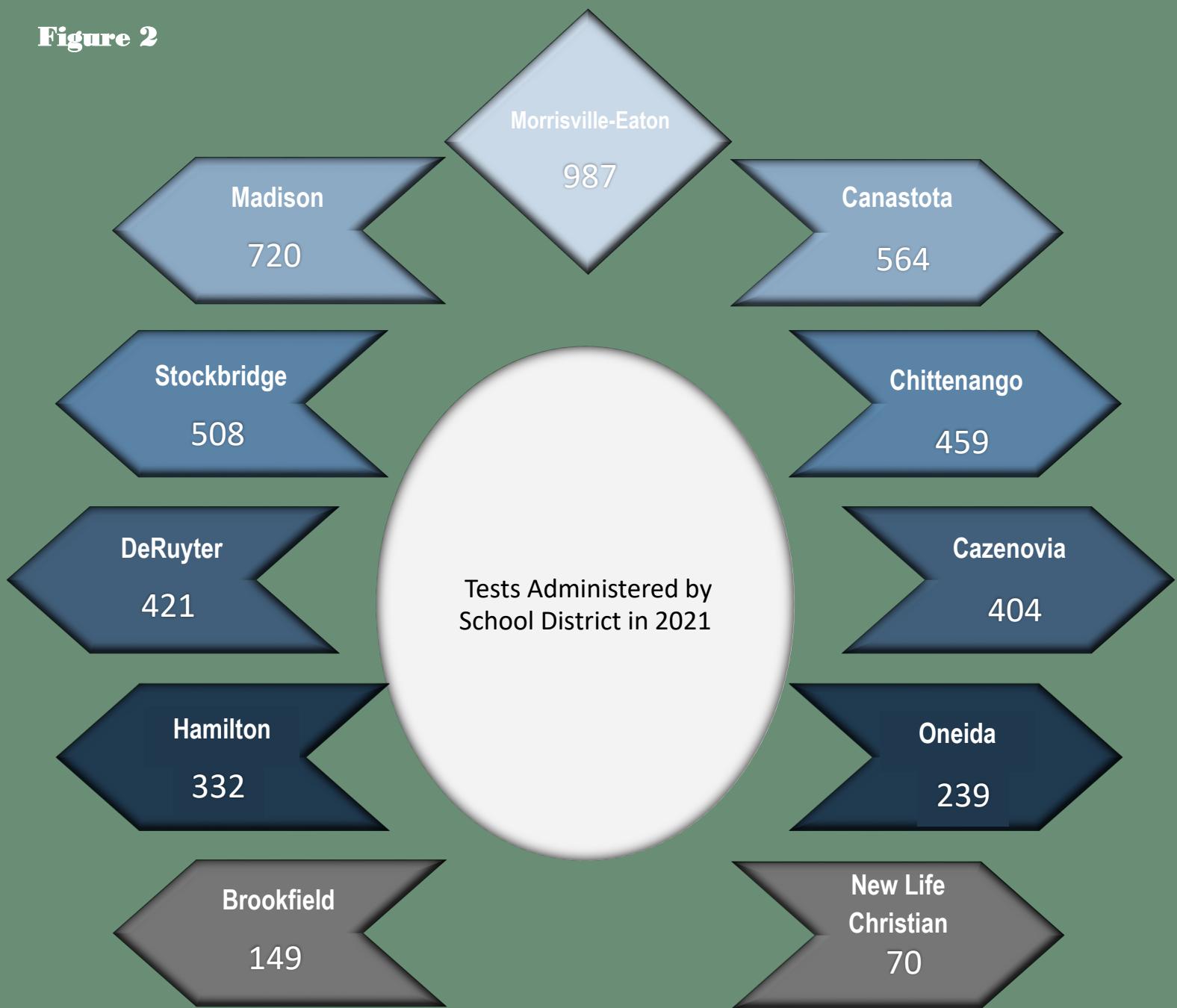
Madison County was one of the first counties in the State to initiate a Test to Stay (TTS) program, modeling its program after Saratoga County's. On November 4, 2021, the Madison School District initiated the TTS program in their school district; the first school district to do so in Madison County. "Test to Stay" (TTS) is a test-based, modified quarantine protocol for K-12 students and school personnel who have been exposed to COVID-19. It allowed students and school personnel to attend school-based activities in person during the quarantine period so long as they had no symptoms and tested negative for COVID-19.

Madison County was one of the first counties in NYS to initiate wastewater testing (WWT) for COVID-19, starting in July 2020. Wastewater surveillance allows for large populations to be efficiently and cost-effectively screened for the presence of the COVID-19 virus by detecting viral RNA shed into the public water sewer systems. This surveillance data appeared

promising as an early warning of COVID-19 infections a community. Initially, MCDOH tested public systems associated with our three colleges (Cazenovia, Colgate, and SUNY Morrisville) and their respective communities to gauge the potential impact of COVID transmission from returning college students and

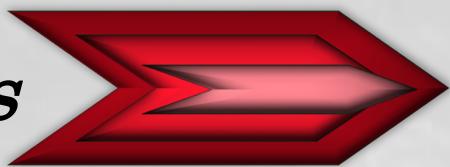
staff. By the end of 2021 MCDOH expanded wastewater sampling to 11 locations across Madison County. Wastewater test results prompted community outreach and education, along with targeted testing events.

Figure 2





Issues & Challenges



ISSUES & CHALLENGES



Information and Communication

Similar to 2020, providing and communicating accurate information, while dispelling misinformation, remained a significant component of our response effort in 2021.

Communication between the State and Counties continued to be fragmented and inadequate. (See sidebar on page 20). The New York State Association of County Health Officers (NYSACHO) became a critical conduit for information through coordinated meetings with the state and county health officials.

Public discussion of false or misleading information about COVID-19 continued to be a prominent feature of the pandemic. Some notable cases of misinformation that occurred during the second year of the pandemic focused on the efficacy and safety of the vaccines such as: The vaccine's effect on fertility, the insertion of microchips into the vaccine, distrust of the vaccine type (mRNA) and its rapid development, and the emergence of adverse vaccine reactions; including severe allergic reaction (anaphylaxis), blood clotting and myocarditis. The risk, albeit rare, for Myocarditis and blood clots from COVID-19 vaccines created further concerns and subsequent reluctance of residents to get vaccinated.

On January 28, 2021 the New York Attorney General (AG) released a report on the impact of COVID-19 in the state's nursing homes. The AG found that NYS had

underreported nursing home deaths by almost 68%. New York's mishandling of COVID-19 data differed from incomplete data reported in other states in one key aspect; the Cuomo administration repeatedly overstated its performance in nursing homes based on data analyses that the state knew were incomplete and misleading. This report came at a time when the trust in government was already dwindling.

2021 brought more guidance documents, testing requirements for return to work and school, increased resistance to isolation and quarantine orders, and an increase in verbal abuse directed towards MCDOH staff.

The County's Joint Information Center (JIC) was reactivated on November 18, 2020 and remained active until May 27, 2021. The JIC focused on general, non-clinical questions while specific questions about the COVID-19 vaccine were directed to the MCDOH Nurse Hotline. During this seven-month period, the JIC answered over 3,500 calls. At the end of May 2021, the JIC was deactivated due to a decrease in call volume. Following the deactivation of the JIC, all subsequent calls were handled by the MCDOH staff.

The frequent changes to the school guidance language along with the different guidance applications based on grade level, testing requirements, differing county guidance, and a heightened community focus on children's safety, manifested into a growing dependency on the MCDOH to resolve and direct school district activities.

MCDOH received frequent requests from school districts to approve their proposed school guidance in response to the state guidance documents. MCDOH reinforced the need for schools to adhere to state and federal guidance and that the school's decisions on guidance implementation should be in consultation with their Medical Director and board of education. MCDOH assisted the schools in translating the intent of the guidance and obtaining clarification from the State.

The Governor announced that high risk sports (e.g., basketball, football, wrestling, etc.) could occur as permitted by their local health authority, effective February 1, 2021. This allowed students in higher-risk sports to participate in individual or distanced group training and organized no/low-contact group training and other types of play, including competitions and tournaments.

The Governor's announcement came during a press conference. Counties received no forewarning of this directive nor were they provided with any guidance specific to high risk sports in schools. Although some communication occurred between county LHD's on a regional level, the development and implementation of county-level guidance lacked consistency across the state. The various County guidance documents were particularly problematic when neighboring counties crafted conflicting guidance that left school districts questioning which guidance applied in instances where sports teams traveled between counties, or when school districts straddled more than one county.

In February, the Madison County Board of Health (BOH) conducted a review of the current data and indicated in a letter to the school districts that it was "safest if schools did not participate in high-risk sports" at that time. However, the BOH did indicate that "if schools choose to allow for high-risk sports, they must follow the NYSDOH Interim Guidance for Sports and Recreation During the COVID-19 Public Health Emergency and the Madison County Board of Health requirements." The decision to engage in high risk sports was the responsibility of the school leadership in consultation with their medical directors.

The BOH incorporated metrics within their recommendations by which high-risk sports could resume. By March, a month after the BOH issued its letter, the community levels fell below the metrics set by the BOH, prompting them to withdraw their initial position on high risk sports. However, the BOH maintained its recommendation that wrestling, because of the intimate contact that occurs in this sport, should

State/County Communications

By the end of 2020, County Health Departments were frustrated by the lack of communication between the State and the counties. On 12/22/20 NYSAC and NYSACHO issued a joint letter to Commissioner Zucker requesting the state to elevate and bring visibility to the role counties and local health departments play in COVID -19 vaccine administration. This letter specified the following requests:

- Continued intentional inclusion of county health officials in all upcoming calls and meetings with hospitals and involved stakeholders (HUBS, hospitals, and vaccine priority populations) to strengthen partnerships and incorporation of the LHD's role within correspondence issued to involved stakeholders.
- Immediate issuance of information that defines the role local health departments will play in the statewide vaccine distribution plan including direction on how the COVID-19 POD plans will be utilized during this effort.
- Each County Health Official should have a mandated leadership seat within the hospital vaccine HUB structure to ensure public health is visibly represented.
- Share details surrounding state planning efforts and vaccine distribution with local health departments. County Health Officials are working to strengthen vaccine uptake, reduce vaccine hesitancy and build trust within our communities to ensure we reach statewide herd immunity. Without transparency in details surrounding vaccine distribution planning, we risk the possibility of increased public distrust of the vaccine and potential failure in the collective vaccination efforts necessary to end this pandemic.
- To ensure equitable distribution of vaccine supply, local health departments must be granted access to county-level demographic information and reports to allow us to track progress on vaccine distribution and ensure we are meeting at-risk populations. This data is necessary to assure that vaccine distribution is grounded in equity and social justice.

not commence until the Fall when vaccination rates would be higher.

For the 2020-2021 school year, public schools were required to report positive test numbers to NYSDOH for students and school personnel, whether class was in-person or remote, and the types of tests and laboratories used. Unfortunately, this information was not provided directly to local health departments. County Health Department staff had to visit the state's site and manually obtain each school's data. Fortunately, MCDOH was able to obtain a substantial amount of this information through our case investigation and contact tracing activities. However, the additional effort required an expenditure of staff time and resources to compile the information.

The school case reports caused confusion amongst our residents as the number of cases reported by schools districts differed from county reports – MCDOH experienced a similar issue where the local college data, also posted on their respective websites, differed from the county numbers. Several school districts span county boarders and have staff and/or students who live in neighboring counties that attend or work at the school. Test results for students or staff living in a neighboring county would not be reported to MCDOH. In addition, some school districts accepted home test results while other districts did not. MCDOH received several calls from parents and

school personnel, who used home test kits, asking why they had not be contacted.

The MCDOH received and reported laboratory confirmed antigen PCR test results through the State's Electronic Clinical Laboratory Reporting System (ECLRS). MCDOH did not receive home test results through ECLRS and would not know who tested positive. Furthermore, the Madison County Board of Health recommended that home test kits results not be accepted by school districts as there was no way to verify the legitimacy of the test results. At the time, the use of home test kits created problems for individuals who tested positive and needed a release order from isolation or quarantine, to return to work or school. The conflicting case numbers between school districts and the County reports generated further distrust in published government data.

The Centers for Disease Control and Prevention (CDC) developed Community transmission indicators in the fall of 2020 (prior to vaccine availability) to reflect the goal of limiting transmission in anticipation of vaccines becoming available (*See Table 2*). CDC's zones of transmission were instituted and used to drive response activities. The CDC relied on two metrics to define community transmission: the Total new cases per 100,000 persons in the past 7 days, and the Percentage of Nucleic Acid Amplification Test results that were positive during the past 7 days.

Table 2: Indicators of Community Transmission

Indicator	Low Transmission	Moderate Transmission	Substantial Transmission	High Transmission
Total new cases per 100,000 persons in the past 7 days	0-9	10-49	50-99	≥100
Percentage of Nucleic Acid Amplification Test results that are positive during the past 7 days	<5.0%	5.0%-7.9%	8.0%-9.9%	≥10.0%

Source: Centers for Disease Control and Prevention, September 2020.

CDC used the Community Transmission table to inform setting-specific guidance and layered prevention strategies (e.g., screen testing in schools, masking, etc.). Likewise, public health practitioners, schools, businesses, and community organizations relied on these metrics to inform decisions about their own prevention measures. However, neither of the community transmission indicators reflect medically significant disease, healthcare strain, nor the results from home self-tests. Community transmission levels were largely driven by case incidence, which did not differentiate mild and severe disease.

Providing data and information to the general public about COVID-19 continued to play a prominent role in the department's response efforts. With the introduction of vaccines, new and revised state and federal guidance documents, expanded testing, and the emergence of new variants, spurred the Department's Website information modifications. In March 2021, MCDOH revised website information to include case characteristics, testing data, trends data, percent positivity, and vaccine data. Our ability to provide ongoing data and information was challenged in August 2021, when our Health Statistician, who was maintaining the current data on our website, went on leave.

MCDOH continued its regularly scheduled virtual meetings with private and public school superintendents, hospital & nursing home leadership, college health centers, and county leadership. These scheduled meetings were important opportunities to discuss the guidance changes and coordinate response efforts.

Non-pharmaceutical Interventions (NPI)

Non-pharmaceutical interventions such as testing, masking, contract tracing and case investigation, and isolation and quarantine, assumed a more prominent, yet more challenging, role in our response efforts in 2021.

Testing



With the expanding role of testing and the introduction of numerous, yet different, testing kits and methods, came more guidance documents, more testing providers, and more educational, operational and logistical challenges for the MCDOH.

Several establishments such as urgent care centers, pharmacies, local colleges, nursing homes, hospitals, and public schools provided testing activities for our residents. Although multiple testing locations existed within the county and in neighboring counties, each site was different in respect to their testing capacity, types of tests given, eligibility criteria, turnaround time for test results, need for follow up testing, and pre-testing conditions, such as an individual needing to be symptomatic or asymptomatic prior to testing.

In September, MCDOH received 1,000 CareStart Antigen rapid test kits from the State. The CareStart test was used for testing individuals who were symptomatic. MCDOH made these test kits available to school districts to use for students and staff who exhibited symptoms while at school. School nurses administered the tests, and if positive, the student or staff member were sent home. If negative they could remain in school but would need a follow up test two days later as per test kit guidance.

Schools were required to enter test results (positive and negative) into the state lab reporting system, called ECLRS, on the same day as the test date. Participating schools were required to either possess

their own Limited Service Laboratory Permit for COVID-19 antigen testing from the NYSDOH, or partner with an entity (e.g., Hospital, Clinic, or MCDOH) that possessed a Limited Service Laboratory Permit for COVID-19 antigen testing from NYSDOH. MCDOH agreed to allow the schools to conduct testing under the County's laboratory permit and provided training to the school's nursing staff. A standing order template for testing was developed and disseminated to all the school districts. Those districts interested in testing were required to complete the training and have their Medical Director sign, date and return the standing order to MCDOH. Nine school districts conducted rapid COVID-19 antigen testing (BinaxNow or CareStart tests) under the MCDOH's Limited Service Laboratory (LSL) – Brookfield, Cazenovia, Chittenango, DeRuyter, Hamilton, Morrisville-Eaton Oneida, and Stockbridge. A total of 27 school nurses received the necessary ECLRS training that allowed them to report rapid test results in ECLRS under MCDOH's permit.



In November of 2021, MCDOH, in collaboration with the local school districts, implemented a "Test to Stay" (TTS) program for students and staff. In addition to the CareStart Test Kits, MCDOH provided BinaxNow and iHealth test kits, guidance and program criteria to school districts for the Test to Stay program. TTS is a strategy that allows close contacts to avoid school exclusion (but not other parameters of quarantine) by testing negative with a rapid NAAT or antigen test on each school day for seven days after exposure. The exposed person, who is allowed to remain in school through TTS, continued to quarantine outside of

school instruction/academic periods (on weekends/holidays when the seven-day TTS period was still active). Similar to the mandated school testing requirements, schools partnered with MCDOH to utilize the Limited Service Laboratory Permit for COVID-19 antigen testing. Although all school nurses were trained on the use of ECLRs, not all schools participated in the Test to Stay program (*See Figure 2 page 17*).

Participating schools were required to obtain parental permission prior to the administration of a test. Participants in the Test to Stay program reported to the school nurse each morning. Schools conducted the tests upon the staff or student's arrival, prior to reporting to class. The Madison County Board of Health (MCBOH) recommended that home test kit results NOT be accepted by school districts as there was no way to verify the test results. Finally, in December of 2021, the New York State Department of Health supported "Test to Stay" (TTS) as a modified quarantine strategy.

The Test to Stay program occurred concurrently with the State's mandatory testing of students and staff. The Madison-Oneida BOCES coordinated the mandatory testing for all the school districts.

MCDOH offered BinaxNow and CareStart rapid antigen tests, to the general population, during our mobile testing operations between October 2021 and January 2022. The County, through the use of our rapid site assessment team, secured mobile testing sites at a vacant bank facility located at the Northside Shopping Center in Oneida and at the old County Highway garage in Morrisville.

Waste Water Testing (WWT)

In June 2021, MCDOH received CDC/NYSDOH funding (ELC Detection Funds) that was used for waste water testing expenses. Beginning in September 2021, waste water testing for COVID-19 was expanded to six of nine public waste water treatment systems (67%) serving the county, except for the Village of Hamilton,

Table 3: 2021 COVID-19 Testing: Participating Public Waste Water System and Population Served

Public Wastewater System	Participation	Population Served	Percent of Total County Population ²	Percent of Total Population Participating
City of Oneida	Yes	10,329	15.3%	15.3%
Madison Marketplace	No	100	0.1%	--
Morrisville State College	Yes	3,450	5.1%	5.1%
Sylvan Beach WWTP ¹	No	Unknown	--	--
Village of Canastota	Yes	4,605	6.8%	6.8%
Village of Cazenovia	Yes	3,500	5.2%	5.2%
Village of Chittenango	Yes	4,880	7.2%	7.2%
Village of Hamilton ³	No	3,904	5.8%	--
Village of Morrisville	Yes	2,456	3.6%	3.6%
TOTAL		33,224	49.1%	43.2%

¹ From Bridgeport to Oneida Creek Rt. 13. WWTP located in Oneida County. Number of people served at the time of the project was not known.

² Total Madison County Population for 2021 = 67,658

³ Includes Colgate University

Madison Marketplace, and Sylvan Beach WWTP, who did not participate. The participating systems served approximately 43% of the total county population (**Table 3**). Roughly 50% of the county's population rely on private/non-public waste water systems, such as individual septic systems, for their wastewater disposal. These private/non-public systems were not tested.



The use of WWT data is limited. Decisions could not be made nor definitive conclusions formed based solely on the waste water data alone. The COVID-19 waste water testing represented another data source – used in conjunction with other available information and metrics – to assist in understanding COVID-19 impacts in our community.

A total of seventy-six (76) waste water samples were collected from the participating systems in 2021. Of

these samples, 55% of the samples were classified as quantifiable detection indicating active transmission; 32% of the samples were classified as detected but not quantifiable, indicating an early/latent infection or potential outbreak; and the remaining 13% of the samples collected COVID-19 was not detected. MCDOH established a website for the waste water test results and provided test result classifications and their implications for public health action.

Masking

Governor Cuomo announced on May 17, 2021 that New York State would adopt the CDC guidance on mask use for fully vaccinated individuals, thereby ending the mask mandate issued on December 13, 2020. Under the new guidance, fully vaccinated individuals were no longer required to wear masks in most public settings; exceptions applied to Pre-K to 12 schools, public transit, healthcare settings, correctional facilities, and other specified settings. The private sector, although not mandated, could still require masks for everyone in their establishments, consistent with the CDC guidance. Unvaccinated people were asked to wear masks in all public settings while around others.

The loosening of the mask restrictions was met with mixed reactions; both positive and negative. For

many, there was the perception that the ending of the mask mandate signaled the end of the pandemic. Others experienced a level of trepidation that developed from concerns that the lifting the mandate was too soon and unsafe. Consequently, the MCDOH received complaints from residents that business X either was, or was not requiring masks.

On December 13, 2021, Governor Hochul issued a new mask mandate for all indoor public places, unless these same public places implemented a vaccination requirement. This mandate was in response to the new Omicron variant and rising case rates. Similar to the April 2020 mask mandate, the State looked to Counties to enforce. However, the circumstances in 2021 were vastly different and enforcement of the mask mandate was not feasible.

MCDOH enforced the April 2020 mandate, which applied to only essential businesses. All other types of businesses and venues (e.g., malls, sporting events, large gatherings, non-essential businesses, etc.) were closed at that time. The 2021 mandate applied to "any indoor space that is not a private residence." Although this description was not further defined, it clearly applied to substantially more entities than essential businesses.



Staff in other Departments throughout the county pitched in to help with COVID-19 calls and contact tracing and investigations.

With the significant rise in cases and a decrease in volunteers in 2021, contact tracing and case investigation activities involved considerably more staff time. MCDOH pulled staff from other divisions within the department to help with these activities, as well as, maximized the use of the state's contact tracing employees. Even with MCDOH's existing resources, the department was 150 cases behind in contact tracing and investigation activities at the time of the new mandate.

Additionally, MCDOH staff operated testing events twice a week in 2021. This same staff, when not testing, or contact tracing, conducted weekly vaccination clinics. Non-clinical department staff, EMS staff, and volunteers assisted in both testing and vaccination efforts. In April 2020 there were no vaccination clinics, and testing events were provided through a partnership with Upstate Medical and Nascentia home care agency, and included only minimal number of county staff (PH and EMS).

For the 2020 mask mandate, the state established an anonymous complaint system that would allow individuals to submit complaints about non-compliant businesses. That system was not available in 2021. Likewise in 2020, the New York State Liquor Authority conducted enforcement activities concurrent with county enforcement activities. No state agency was charged with enforcement activities under the 2021 mask mandate.

Analogous to the 2020 mask mandate, the 2021 mask mandate came with limited guidance materials or clarification on enforcement activities. For those entities that MCDOH had authority to regulate (e.g. permitted facilities), a failure to comply with the mask mandate could result in the loss of their operating permit. However, for the majority of entities designated under the 2021 mask mandate, MCDOH did not have regulatory authority. These entities could ignore, and did, the fine without any recourse.

When the first mask mandate was issued in 2020, Madison County had 31 active COVID-19 cases. The 2021 mask mandate was issued when the county's active case load was 10 times higher (381). In 2020, MCDOH maintained a list of over 100 volunteers who assisted with contact tracing and other response activities; allowing MCDOH staff to carry out enforcement activities. In 2021, the list of volunteers dropped to under 10 individuals, as many of the volunteers returned to their own jobs. MCDOH staff who carried out enforcement activities in 2020 were reassigned to assist with contact tracing, case investigation, and to support vaccine and testing events in 2021.

In 2020, MCDOH implemented a 3 step enforcement process that involved an initial warning along with outreach and education, a subsequent visit/inspection, and a potential fine. However, staff limitations prevented enforcement activities in 2021. Nonetheless, MCDOH did distribute materials to affected businesses and venues to educate them on the new mask mandate, help them interpret its implementation, and provide them with posters and signage.

The Madison County Board of Supervisors unanimously passed a resolution on December 16, 2021 supporting mask wearing while leaving enforcement activities to the State. After push back from the counties, the State conceded that the mask protocol was "expected to be self-enforcing" and LHD's could pursue enforcement if they so choose. Each county differed in their approach to enforcement, which in turn added confusion for residents and businesses.

Contact tracing and investigation

By the beginning of 2021, the State had significantly increased its staffing of contact tracing personnel. With the surge of cases at the end of 2020 and into 2021 and the decrease in the number of volunteers, MCDOH became more dependent on the State's CommCare staff to shoulder the case investigation and contact tracing activities.



Isolation and quarantine

The overall increase in positive cases in 2021 was accompanied with a rise in individuals that were isolated or quarantined, and, in turn, a rise in the number of individuals that needed release orders from isolation or quarantine.

As the year progressed, the collective impact from the development of COVID-19 treatment options, the availability of home test kits, and rising vaccination rates influenced a change in the federal government's philosophy that gradually shifted the responsibility for testing, and subsequently the release from isolation and quarantine, to the individual. The change in responsibility was accompanied by a rising demand from employers for release orders for employees who were isolated or quarantined. As a result, MCDOH experienced an increased demand for release orders from residents wanting to return to work.

Unlike in 2020 where each release order was manually prepared and mailed to an individual, the State's CommCare system was upgraded to facilitate electronic transmission of a release order. However, MCDOH staff still needed to ensure certain conditions were met to issue a release order. The CommCare system only provided the release feature for individuals that were tested through a laboratory or provider. For those conducting home tests, MCDOH staff had to manually generate the release orders. Although the CommCare system facilitated the transmission of the release order electronically, certain providers, such as the regional Veteran's hospital (VA) and the Oneida Indian Nation's (OIN) health center were not a part of the State's laboratory reporting system (ECLRS). The VA and OIN relied on fax or normal mail to report test results to the County. MCDOH staff manually entered these results into CommCare in order to utilize the electronic release order function.



The increased use, availability, and acceptance of home test results exacerbated the demands for release orders. Towards the end of 2021, MCDOH worked closely with the County's Information Technology (IT) Department to create an on-line form that would generate isolation orders for residents. Unfortunately, when the on-line form was activated, the site was inundated by requests for orders and the system became bogged down. Fortunately MCDOH only used this form for a short time period. By the end of December, 2021, the State provided self-attestation forms on their website, which allowed MCDOH to

direct our residents to the state website to complete the form. Through the State's system the individual received a release order signed by the NYS Health Commissioner.

Vaccination Planning & Administration

Vaccinations were the focus for the pandemic response efforts in 2021. Vaccine scarcity, prioritized eligibility, provider penalties and fines, misinformation, poor communication, an altered and fractured distribution system, storage issues, multi-dose regimens, 3 different vaccines with different preparatory regimens, and concerns about the vaccine side effects significantly shaped our vaccination efforts.

At the beginning of 2021, the State established several requirements associated with vaccine administration including:

- COVID-19 vaccine must be given according to the prioritization plan established by the NYSDOH. The vaccine cannot be used for any other populations or groups other than those listed as eligible in NYSDOH guidance, pursuant to Executive Order 202.88. (*See Table 4 page 28*).
- All facilities, entities, and practices receiving vaccine doses had an obligation to quickly utilize all doses, per New York's "Use it or lose it" policy. If any vaccine was not administered within seven days of receipt, the remaining doses could be removed, and entities not be allocated future vaccine doses.
- Providing a vaccine to someone who was not deemed eligible at the time could result in fines to providers, including the county health department. These vaccine conditions set by the state caused MCDOH to maintain documentation on a person's eligibility for all vaccines administered in fear of a potential audit by the state. In hindsight, this activity was time consuming and unnecessary.
- Vaccine had to be used within 6 hours after opening the vial and was not to be wasted.

Although two vaccines (Moderna & Pfizer) were initially available at the beginning of 2021, the amount of vaccine available was limited. By the end of January 2021, 7 million NYS residents were deemed eligible, but only 300,000 vaccine doses were available (first dose only). The State distributed initial dose amounts based on county population, packaging size (Pfizer = 1170 doses/pack; Moderna = 100 dose/pack) and storage capacity and requirements (Pfizer = -80°C Moderna = -20°C). These factors dictated what vaccine a county received. As a result, the larger counties tended to receive Pfizer vaccine while the smaller counties, such as Madison, received Moderna.

Early on people decided which vaccine they wanted to receive. Madison County residents who wanted the Pfizer vaccine had to go to a neighboring county. Additionally, each vaccine required a second dose within 3-4 weeks of the first dose. The State required that individuals could only receive their second dose at the same location they received their first dose, and, based on federal requirements, the second dose must be of the same vaccine (Pfizer or Moderna). Needing to travel out of county for a specific vaccine discouraged individuals from getting vaccinated.

Eligibility requirements for the vaccine changed on a weekly basis during the first six weeks of 2021. Each county established their own approach in handling proof of eligibility, which created some confusion for residents. Moreover, changes to eligibility occurred



before the county had the opportunity to vaccinate prior eligible residents. These constant changes created vaccination event promotion challenges, along with operational challenges, such as determining eligibility. Although the eligibility criteria changed frequently, restrictions remained on providers as to which eligibility group they could administer the vaccine. (**Table 4**) The list of eligible individuals quickly exceeded vaccine availability. The constant changes to eligibility occurred at a time when threats of fines and other repercussions from the State were pronounced. The difficulties residents had in finding a vaccine site, combined with the exclusionary conditions for targeted populations,

Table 4: The New York State Department of Health Prioritization and Allocation Framework

Phase	Eligible Group	Vaccine Administrator
1A	High-risk hospital and FQHC staff, including OMH psychiatric centers; Emergency Medical Services (EMS) personnel; Medical Examiners and Coroners; Funeral workers who have direct contact with infectious material and bodily fluids; Agency staff and residents in congregate living situations run by the OPWDD, OMH and OASAS; Urgent Care providers; Staff administering the COVID-19 vaccine	Hospitals
1B	Other essential worker population (police, fire, teachers, public transit, etc.).	Local Health Departments (LHD)
1C	Adults with high-risk medical conditions and people 65 years of age or older not already vaccinated in earlier phases	Pharmacies

frustrated residents and deterred them from getting vaccinated. The County's call center staff helped numerous residents find the appropriate vaccination site.

The introduction of vaccines to the response efforts arrived with communication challenges related to the distribution and administration of the vaccine. At the end of 2020, the implementation of an untested "HUB" model for vaccine distribution utilizing an overstressed hospital system created problems with ordering and receiving vaccine.

The hospital "HUBs" were meant to coordinate the necessary planning activities to ensure widespread vaccination coverage. The HUBs were responsible for the administration and distribution of the vaccine in each region. Unfortunately, the hospital's inexperience in mass vaccine distribution combined with poor communication channels at the State level, created distribution setbacks. For example, following the December 31, 2020 vaccine event, MCDOH requested 300 doses of vaccine for the first week of January. On January 3, MCDOH received notification from the state that the vaccine request form needed to be completed, by the HUB, before MCDOH would receive any further vaccine. On the same day, MCDOH received a separate email from the state requesting that the HUB complete a vaccine request form, on behalf of MCDOH, for the initial 100 doses of vaccine that had already been approved, received and administered on December 31, 2020. The State had inadvertently directed MCDOH's initial 100 dose request to the Mohawk Valley HUB, which was not the HUB for our region. Although the State's regional HUB representative acknowledged that our vaccine requests had been approved, subsequent emails from the State's redistribution personnel in Albany focused only on the proper completion of the forms, without offering a resolution for acquiring additional vaccine.

Subsequently, a lack of clear communication, even between the State's offices, caused MCDOH to seek

out 300 doses of vaccine for a scheduled clinic. MCDOH contacted the HUB for assistance. Although the HUB initially located the requested doses from a hospital in the HUB regional network, the hospital backed out of providing the vaccine the day before the MCDOH scheduled clinic. The HUB did not secure additional vaccine to meet our request, and as a result, MCDOH had to cancel the vaccination clinic. This in turn caused considerable frustration for both the residents who had registered for the event and for the MCDOH staff who had to reschedule these individuals. Even when MCDOH rescheduled the clinic for January 20th, vaccine supply remained limited and MCDOH couldn't accommodate all those who had registered for the earlier clinic.



MCDOH Nurse, Rebecca LaPorte readies a vaccine at the April 2021 drive-through vaccination clinic.

Simultaneously, and in addition to the Department's efforts to secure the 300 doses of vaccine, NYSDOH staff encouraged MCDOH to order 1000 doses of vaccine directly from McKesson, a pharmaceutical distribution supply chain company. MCDOH ordered 1000 doses, however MCDOH never received any of the doses requested from McKesson.

Several vaccine distribution channels that included federal, state, and pharmaceutical distribution supply chain companies (e.g., McKesson), were involved with distributing vaccine to the local level. The Federal Government provided vaccines directly to the local nursing homes and pharmacies, while vaccine supplies for local health departments were obtained via the HUB system, or directly from a pharmaceutical

distribution supply chain organization. By February, the State informed nursing homes to obtain vaccine from their local health department, contrary to the HUB approach.

On March 12, 2021 MCDOH administered its first 1170 doses of Pfizer vaccine at the Oneida Towers vaccination site. Oneida Health and the NYSDOH assisted MCDOH in the administration of the vaccine at this site. By April, MCDOH received the Janssen's COVID-19 vaccine, which unlike the Pfizer and Moderna vaccines, required the administration of only one dose. However, the efficacy of the Janssen vaccine was considerably lower than the Pfizer and Moderna vaccines. Coordinating the administration of three different vaccines posed logistical challenges as each had different storage requirements, pre-administration prep, dosing schedules, vaccine efficacy, and consumer preferences. In some instances, extra doses were extracted from the vials making the coordination of the second dose problematic.



MCDOH Staff and Volunteer preparing for the vaccination clinic at the Oneida Towers in March 2021.

Scheduling second doses for individuals who received their first shot elsewhere was tricky given the State's requirement that individuals get their second dose at the same location that they received their first dose. In one instance, an elderly resident, while on vacation,

received their 1st dose in a hospital in North Carolina, after being hospitalized. Upon returning home to Madison County they needed their second dose. Obtaining permission from the state to vaccinate this individual was time consuming, and, in retrospect, unnecessary.

By May, positive COVID-19 cases occurred among individuals who were previously vaccinated. Subsequently, the efficacy of the vaccine and the need to be vaccinated came into question. Counties were asked by the State DOH to identify those positive cases that were vaccinated against COVID-19 and complete a CommCare-based questionnaire to verify the information given by patient with information in the state's immunization reporting system - NYSIIS. Unfortunately vaccine information in NYSIIS could not be imported into Commcare. Subsequently, counties needed to manually look up and enter the information into CommCare, which was an unnecessary and time consuming extra step.

MCDOH pandemic plans, developed prior to the COVID-19 pandemic, identified schools as vaccination sites. However, when MCDOH needed vaccination sites within the county, school leadership were reluctant to host vaccination events at their facilities. School leadership expressed concerns about potential disease spread within their facility coupled with pressure from parents and staff.

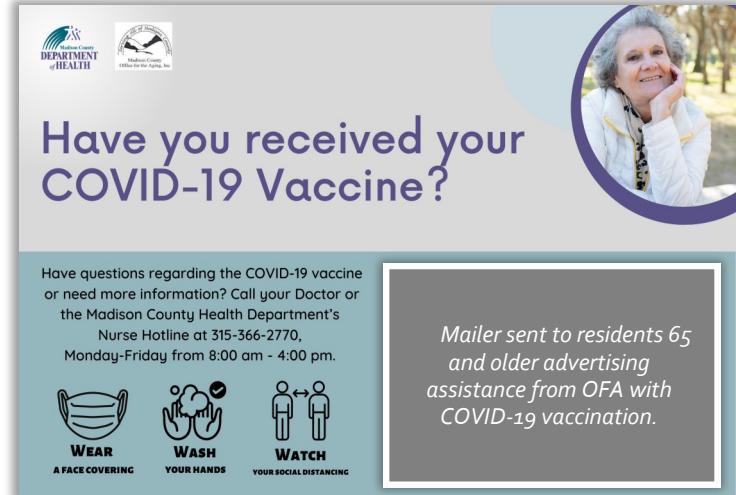
MCDOH worked closely with the County's Office of Emergency Management (OEM) to identify potential vaccination sites. A site assessment team, composed of staff from Facilities Management, IT, OEM, and MCDOH, identified and assessed various possible sites within Madison County. The site assessment activities resulted in identifying three "fixed" locations; two in the northern part and one in the southern part of the county. The first site identified was the Parks and Recreation building in Chittenango. The second site was Hamilton Hall on the SUNY Morrisville campus. The establishment of the State University of New York

(SUNY) Morrisville site allowed the county to provide a larger scale vaccination site. The third vaccination site was a vacant bank building located in the Northern Shopping center in Oneida. Additionally, MCDOH coordinated six drive thru vaccination events throughout the county to provide more vaccination opportunities to residents.

In January of 2021, MCDOH established a Madison County Health Equity Task Force to ensure the equitable distribution of vaccine to our most vulnerable populations. The executive directors for both the Community Action Program and the Rural Health Council of Madison County agreed to co-chair a 37-member task force, comprised of community organization representatives and individual residents, to identify populations and strategies for targeted vaccine outreach. The Health Equity Task Force identified individuals over 65 yrs. old, pregnant women or expecting mothers, and farm workers and undocumented farm workers as the focus of the vaccination efforts.

Residents aged 65 and older represented an initial priority group to receive vaccinations. The State provided an online link for registering for a vaccination; however, the online registration process posed difficulties for those individuals who were challenged with navigating the internet, or to individuals who lacked internet access. MCDOH partnered with the Madison County's Office for the Aging (OFA) who assisted the over 65 population in registering for vaccinations. Additionally, OFA was instrumental in helping MCDOH identify individuals who were homebound and in need of vaccinations.

In early April, MCDOH started vaccinating homebound individuals with initial assistance from Nascentia Health Inc.'s home care nurses. Although Nascentia vaccinated homebound residents initially, growing demands from their own clientele caused them to cease vaccine efforts in Madison County. MCDOH staff assumed the homebound vaccination efforts in



August, 2021. A total of 108 homebound individuals were vaccinated in 2021. MCDOH also vaccinated incarcerated individuals and jail staff.

MCDOH utilized vaccination rates by zip code data to identify locations for targeted vaccine events. The following locations were identified; West Eaton, North Brookfield, Bouckville, DeRuyter, and Peterboro. At all locations MCDOH offered J&J vaccine, a single-dose vaccine, to address concerns about people needing to return for a second dose.

In anticipation of the need to vaccinate employees at the Green Empire Farms (GEF), MCDOH scheduled 4 vaccination events at GEF and administered 303 vaccinations. Vaccine events were coordinated with the influx of new groups of worker brought into the facility, which involved the need for language translations (e.g. forms) and interpreter services.

Various providers contributed to the overall county-wide vaccination efforts. College health centers, hospitals, and nursing homes provided vaccines to their employees, patients or students. Pharmacies represented a key vaccine provider in the county. Initially pharmacies were identified as the provider for individuals 65 years of age and older. However, as eligibility expanded, pharmacies offered vaccines to all residents. In one example, a local employer requested a vaccine event at their facility. MCDOH was unable to

Table 5: MCDOH Administered COVID-19 Vaccines in 2021

Vaccine	Doses Administered
Pfizer (12 yrs+)	
1 st Dose	1,881
2 nd Dose	1,853
Booster Dose	256
Pfizer (5 – 11 yrs. old)	
1 st Dose	250
2 nd Dose	179
Moderna (18 yrs+)	
1 st Dose	6,639
2 nd Dose	6,576
Booster Doses	758
J&J	
1 st Dose	961
Booster Dose	81
Total Administered	19,434
<p>Note: Moderna was not administered to individuals under the age of 18 yrs. in 2021.</p> <p>Also, Pfizer 5-11 years was not authorized for a booster dose until 2022</p>	

conduct a vaccine event. MCDOH contacted Dougherty Pharmacy, who was able to provide vaccinations to the employees.

Unfortunately, private provider offices did not participate in administering COVID-19 vaccinations. The providers cited storage, staffing, and space issues (i.e., separate area for 15 minute post vaccination waiting period), as reasons for not offering the COVID-19 vaccine.

By May, MCDOH saw a substantial decrease in demand for vaccinations. MCDOH returned to normal clinic operations to help residents, especially children “catch up” on their immunizations that were neglected due to the pandemic and school closures. MCDOH integrated COVID-19 vaccinations into our normal immunization clinic scheduling.

MCDOH administered 19,434 vaccines in 2021, (**Table 5**). Of those vaccines administered, MCDOH noted eight adverse vaccine reactions (<0.04%) that were reported to the Vaccine Adverse Event Reporting System (VAERS). Of those eight, two individuals were administered the drug epinephrine in response to a severe allergic reaction (anaphylaxis). The remaining reactions consisted of complaints of sore arm, headache, anxiety, and swollen lymph nodes under the arm. Residents were encouraged to submit their vaccine reaction information through the Federal VAERS or V-Safe system.

MCDOH was instrumental in redistributing doses of vaccines to community partners including; hospitals, the Mary Rose Clinic, nursing homes, colleges, and local pharmacies. In total, 9,151 doses of vaccines (Pfizer, Moderna, and J&J) were redistributed to our community partners.

On August 26, 2021 the NY's Public Health and Health Planning Council (PHHPC) issued an emergency rule mandating COVID-19 vaccinations for all health care workers in the state. Under the regulation, covered entities "shall continuously require personnel to be fully vaccinated against COVID-19." The emergency regulations precluded any potential exemption from the vaccine mandate for held religious beliefs, an option that was previously contained in both the summary order and the initial version of the emergency regulations. Covered entities, including local health departments, had to meet requirements by October of 2021.

In response to the healthcare worker vaccine mandate, NYS experienced an exodus of health care workers that further hampered response efforts; especially during the fall/winter months when the emergence of the Omicron variant drove positive case numbers to their highest levels of the pandemic. Thousands of health care workers in New York State, including several hundred health care workers in the CNY region, left their job due to the vaccine mandate. About a third of those employees loss their job due to "firing" (for not getting vaccinated). The remaining two-thirds of the lost jobs stemmed from resignations, retirements, or furloughs by employees waiting to see how litigation against the mandate played out. By November 2021, Upstate University Hospital, in neighboring Onondaga County, closed about 20% of its bed capacity and stopped elective surgeries in response to staff shortages (~400 vacant positions). Madison County hospitals experienced similar staff impacts.

Resources

The lack of test kits and limited amounts of vaccine related supplies, such as syringes and vaccines, challenged the local response efforts in 2021. At a time when these resources were of the utmost importance to protect individuals and minimize the spread of disease, their availability was scarce and difficult to obtain.

By March 2021 the state-provided COVID-19 rapid antigen test kits were nearing their expiration dates. This prompted Madison County to exchange these test kits with newer kits from neighboring Onondaga County. Onondaga County was able to utilize Madison County's test kits before their expiration. Additionally, MCDOH staff traveled to Broome County, on two separate occasions to obtain more test kits due to the growing demand for tests.

For the first two months of 2021, MCDOH administered only Moderna vaccine. MCDOH had the cold storage capacity for Moderna with our existing refrigeration units (Temp = -20°C). However, in March of 2021, MCDOH received its first doses of Pfizer vaccine. The receipt of Pfizer vaccine prompted MCDOH to contract with Colgate University for use of their ultra-cold freezer to house the vaccine. In October, MCDOH purchased an ultra-cold freezer for vaccine storage within the department.

Starting in 2020, MCDOH received federal funds to promote and support vaccine activities including:

- COVID-19 Enhanced Detection Grant – Received grant in 2020 but as of 01/01/2021 only \$36,543.61 had been utilized, leaving \$659,718 unspent. These funds were originally awarded for COVID-19 Testing and contact tracing expenses, but their use was changed to allow for COVID-19 vaccination expenses. These funds covered mostly personnel services for new staff needed for contact tracing and investigation, and then for new staff that worked the vaccination clinics. Some funds covered the cost of additional cell phones for contact tracing and investigation staff. The remaining funds were applied to vaccination advertising, purchase of rapid test kits, waste water testing equipment and analysis costs (**Figure 3 Page 34**), an ultra-cold freezer for vaccine storage, and clinic supplies.



Figure 3:

*Madison County
Department of Health –
Waste water sample collection
equipment. 2021*

- [COVID-19 Vaccine Response Grant](#) – Received funds in August 2021 for the purpose of promoting and increasing COVID-19 vaccine, and other vaccine uptake. The majority of the funding went towards Personal Service costs to operate our COVID-19 clinics. Only \$14,083.51 was utilized in 2021. Total amount of the grant was \$202,919.65. Funds were used to offset staff time spent at COVID-19 clinics, with a small portion applied to clinic supplies. The grant runs through June of 2024.

For both grants, funds could not be used to supplant existing expenses. As the bulk of our expenses were related to existing staff costs, MCDOH was challenged to maximize the full use of the funds.

MCDOH decided prior to receiving the COVID-19 vaccine that the County would bill for the administration of the vaccine. Although costs associated with a declared emergency could be FEMA reimbursable, FEMA required that all other available sources of funding needed to be exhausted or not available before they would provide reimbursement. FEMA would not reimburse what could be covered with other federal or state funding streams. If insurance was available, the insurance claim needed to be filed first. MCDOH received approximately

\$400,000 in COVID-19 vaccine reimbursement through billing private and public Insurances for an administrative fee. The COVID-19 vaccine, itself, was free to providers, and therefore not a billable expense.

Having adequate staff became a significant resource challenge during the pandemic. The amount of manpower hours needed to carry out pandemic-related activities was substantial and eventually involved all department staff, a large number of volunteers, and the hiring of EMTs and paramedics.

Table 6 provides a summary of key response activities and the manpower hours (mphs) attributed to those activities for 2020 and 2021. As depicted in the table, the manpower hours for each response activity increased significantly in 2021. For example, the mphs attributed to contract tracing and case investigations rose by almost 200%. The mphs depicted in this table do not reflect the hours of other COVID-19-related work activities such as; planning, community outreach, education and promotion efforts, data collection and analysis, reporting, responding to calls/inquiries, reviewing guidance materials, hiring of staff, waste water analysis, onboarding volunteers, follow up on isolation and quarantine visits, office-related work, and meetings.

Unlike in 2020, the number of volunteers decreased dramatically in 2021, dropping from 111 to 10 volunteers. Many of the individuals who volunteered in 2020 returned to work once the State allowed businesses and organizations to reopen. Fortunately, the decrease in our volunteers paralleled an increase in case investigation/contact tracing staff at the State. Although we continued to conduct case investigation/contact tracing activities with department staff, the bulk of these activities were shouldered by the state staff.

In 2021, several key staffing adjustments impacted our response activities. In June, the Director of Community Health, who managed the clinical and

Table 6: Specific COVID-19 Response Activity by Average Manpower Hours - 2021

[NOTE: The average full-time county employee is paid for 1,950 hours per year.]

Activity	Description	Number	Manpower Hours 2021	Manpower Hours 2020	Change 2020 - 2021
Case Investigation	30 minutes per interview	6,970 positive cases	3,485	1,177	+2,308
Contact Tracing	30 minutes per interview	Ave. 10 contacts per positive case = 69,700 contacts	34,850	11,765	+23,085
Vaccination PODs	4 PODs/week over 52 weeks @ 4 hrs/POD	8 staff per POD event	7,680	105	+7,575
Home Delivered Vaccinations	108 Individuals @ 30 minutes per individual	2 staff per visit	108	--	+108
Testing					
Upstate Mobile MCDOH	Nineteen(19), 7 hour events Eleven (11) – 4 hour events Twenty (20) - 4 hour events	3 staff per event 5 staff per event 6 staff per event	-- 934 829	399 -- --	+1,364
		Total	47,886	13,446	+34,440

disease surveillance activities, resigned. The division's Nurse Epidemiologist was promoted to the director position. The vacant Nurse Epidemiologist position was reclassified to a public health nurse (PHN) position and a PHN was hired.

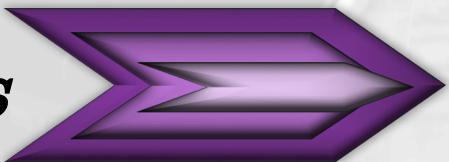
Four staff were out on extended leave in 2021. Two of the staff worked in the Children with Special Health Care Needs division (CSHCN) and provided the day-to-day program services along with assisting with case investigation and contact tracing responsibilities. The third staff member was in the Environmental Health

division, and likewise, provided the day-to-day program services. The fourth staff member was the Health Statistician who was solely responsible for maintaining the daily response data and graphics. Prior to her leave, the Health Statistician cross-trained the Public Health Director and Director of Community Health on maintaining the daily data demands.

The end of 2021 saw the highest number of positive cases over the course of the pandemic, further taxing staff and resources, and creating an overwhelming sense of urgency to control the spread of the virus.



Case Studies



CASE STUDY

Hamilton Elementary School Cluster

April 2021

The Hamilton Elementary School was defined as a cluster by Madison County Department of Health on Monday, April 26, 2021. Further investigation of the cases was conducted to better understand the type of transmission between the positive cases and identify potential mitigation strategies for future practice.

A staff member was identified as the primary case. This individual was exposed to a positive case living in their household with symptom onset of 4/17/2021. Following the case investigation conducted by a New York State contact tracer, 43 contacts (9 staff, 34 students) were identified and placed under mandatory quarantine. Of those contacts, 5 individuals subsequently tested positive. However, 3 of those subsequent cases were also exposed to positive cases in other settings (household, social gatherings) and cannot be categorized solely as school transmission.

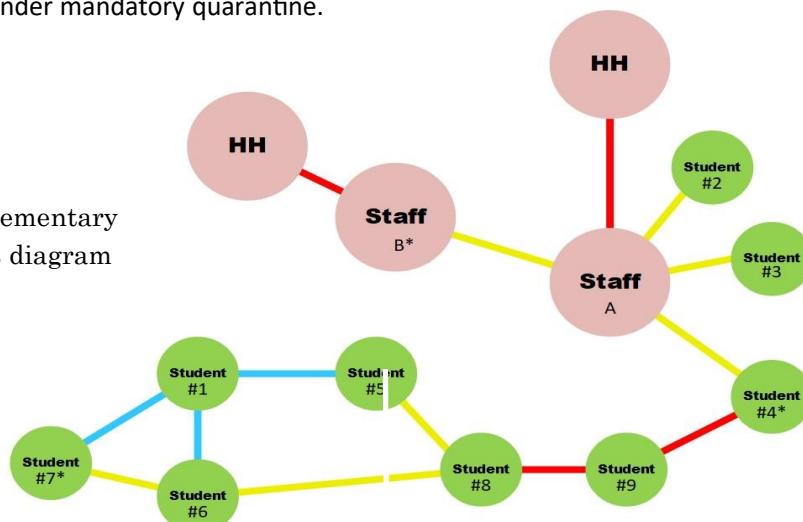
Within 2 days of the primary case testing positive, a student at Hamilton Elementary School tested positive for COVID-19. During the case interview, the contact tracer identified that this child attended a social gathering with 6 peers and those individuals were placed under mandatory quarantine.

This student had no known contact to the primary case. They also did not attend school while contagious (48 hours prior to symptom onset). Of the contacts who attended the social gathering, 3 students subsequently tested positive.

One of the students placed under quarantine due to school exposure from two classmates, who attended the social gathering mentioned above, later tested positive. Afterwards two of their siblings, who also attend Hamilton Elementary School, tested positive.

In summary, there are only 3 contacts who tested positive for COVID-19 after being placed under quarantine due to a school exposure with no other known exposures. There are several external factors that likely contributed to the influx of positive cases in the Hamilton area and specifically the Hamilton School District. Factors include 1) an increase in youth cases as more adults become vaccinated, 2) transmission in high-risk settings in the community (i.e. Colgate University, daycare centers), and 3) higher rate of COVID-19 in local community, particularly among family members.

Figure 4: Hamilton Elementary School Transmissions diagram



External Factors:

- Increase in youth cases of COVID-19 across Madison County
- Uptick in Hamilton Township cases, including University, daycare center, and household members

KEY:

- HH – Household Member
- Adult
- Student
- School Contact
- Household Contact
- Social Contact

* Cannot determine type of transmission

CASE STUDY

COVID-19 Cases and Transmission in a Public School—Canastota School District

January 2021

Overview

In response to the COVID-19 global pandemic, New York State school districts closed in-person learning the week of March 16, 2020. In July 2020, the New York State Department of Health issued guidance for reopening schools starting in the Fall of 2020. Protocols included reducing student density to six feet distance between pupils (12 feet distance in physical education and music courses), face mask compliance, personal hygiene and disinfection practices, and contact tracing activities. School districts were required to submit plans that adhered to the NYSDOH guidance.¹

At the end of 2020, Madison County experienced its second wave of COVID cases in concert with high community transmission, as per the CDC's Screening Testing Recommendations for K-12 Schools by Level of Community Transmission.² From September 2020 to January 2021 case rate in the county rose significantly (from 19 to 421 active cases, a 2,116% increase). On January 8, Madison County recorded 421 active cases in the County, the highest to date. Until January 2021, no in-school transmission was observed. Schools were impacted indirectly when staff/faculty and students contracted the virus outside of the school setting (e.g., home, recreational events, social gatherings) and were subsequently placed in isolation or quarantine, keeping them from attending school.

A COVID Cluster

In January 2021, the Madison County Department of Health (MCDOH) with support from the New York State

Department of Health Regional Office identified a COVID-19 disease cluster³ among school personnel and students at the Peterboro Street Elementary in the Canastota School District. Between 01/15/2021 and 01/20/2021, 5 staff members tested positive for COVID-19. Case investigations were conducted and 88 close⁴ or proximate⁵ contacts were identified and placed under mandatory quarantine to monitor symptoms. Subsequently, 1 staff member and 3 students tested positive while under mandatory quarantine from one of the original staff members. The spread continued to family members of those subsequent cases bringing the total number of positive cases to 16 people (Figure 5). Testing was not a requirement and it is unknown the total number of tests among the contacts identified.

At the time of the investigation, the Canastota School District had a cumulative percent positivity of 5.1% (*COVID-19 School Report Card*, 2021).⁶ On January 15, 2021, Madison County's 7-day percent positivity average was 5.7% (14-day average: 7.2%).⁷

MCDOH staff reviewed case investigations from the 5 original positive cases. Of those cases, all five experienced symptoms of COVID-19 and worked 3-4 days during infectious period. Two of the cases were associated by close contact during the school day, but outside of their respective classrooms. There was one case and subsequent contact who tested positive who worked in the same classroom as teacher and teacher's aide, spending an extended period of time together in the same enclosed space. Another positive case was identified as the physical education teacher, who taught

¹ NYSDOH. INTERIM GUIDANCE FOR IN-PERSON INSTRUCTION AT PRE-K TO GRADE 12 SCHOOLS DURING THE COVID-19 PUBLIC HEALTH EMERGENCY. July 13, 2020

² <https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/k-12-guidance.html>. September 2020

³ Cluster is defined as two or more confirmed cases among the same group of people within a 14-day period with potential connection in time and place at the location.

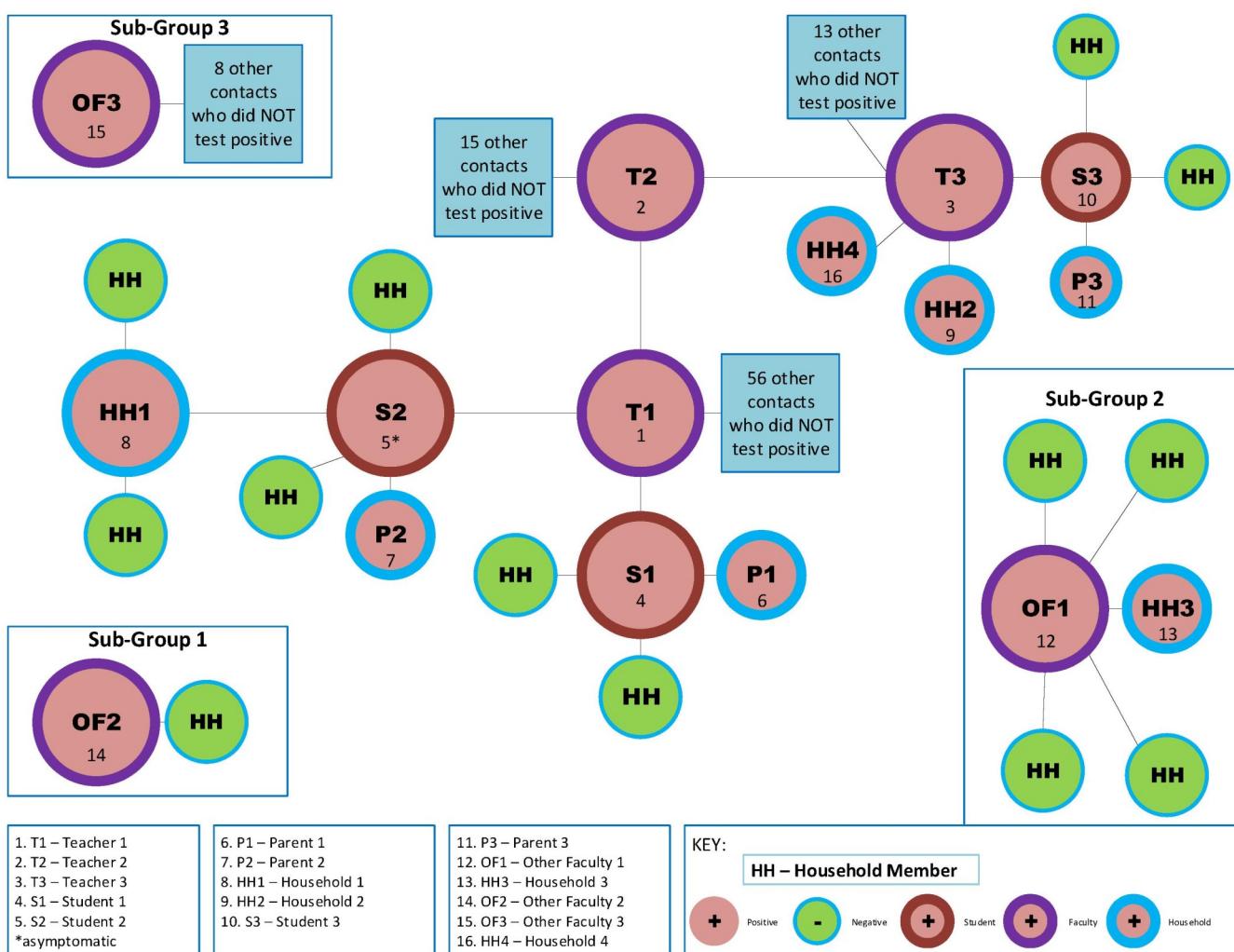
⁴ Close contact: people with physical contact of positive case or within 6 feet of distance for 15 minutes or longer in one interaction or cumulative over a 24-hour period

⁵ Proximate contact: people within the same enclosed space (e.g. classroom) for greater than 1 hour during a 24-hour period

⁶ Percent positivity is calculated by number of students and staff who tested positive divided by the total number of students and staff onsite.

⁷ Percent positivity is calculated by the number of positive tests divided by the total number of tests administered in a given timeframe.

Figure 5: Canastota Elementary School Transmissions diagram



multiple student cohorts. Gym classes did not have assigned seats; however, the class layout included students in fixed locations with 12-foot distance between spots.

The other three staff members tested positive within the same timeframe, but were not identified as known exposures in the case investigations. It is unknown whether another student or staff member may have contracted the virus from them.

Over the February school break period, MCDOH staff conducted an onsite visit to further assess the classroom settings and interview school leadership. The purpose was to assess the physical layouts of each room, their air

handling systems, and if and how these features may have contributed to disease spread.

Air Handling System

The five original cases worked in five different locations – two classrooms, library, nurse’s office, and gymnasium. The MCDOH staff evaluated the room specifications and air handling system for the classroom and gymnasium, each with a positive case and 2 subsequent contacts testing positive (see Appendix A).

In the gymnasium, the heating and cooling is provided by 2 ceiling mounted heating unit identified as UV-B01A and UV-B01B. Both units are horizontal ceiling style positioned on the northern side of the gym and force air

in a southerly direction across the gym. Both units have air intakes for recirculation on the bottom portion of the unit and are supplied with fresh air from the outside via a 33" x 32" louvered vent located on the exterior norther wall. MERV-8 rating for filters for both UV-B01A and UV-B01B.

Each unit has a design flow of 1500 cubic feet per minute (CFM). Testing completed in October of 2018 indicated that each unit was meeting specification for flow with results greater than 1500 CFM. **(Figure 6)**

The classrooms with three positive cases is a shared space with minimal separation. Both rooms are partially separated by girls and boys restrooms. Each room's heating and cooling is supplied by a single vertical floor mounted units identified as UV-130 and UV-131. Both units are mounted on the northern exterior wall. Both units have recirculation intakes located at the bottom of each unit and draw fresh air from the outside of the northern exterior wall. Air flow is directed from each unit in a northerly direction. MERV-9 rating for filters for both UV-130 and UV-131. The analysis of air flow is dependent on the assumption that windows and doors of the facility were closed.

Each unit has a design flow of 1000 cubic feet per minute (CFM). Testing completed in October of 2018 indicated that each unit was meeting specification for flow with results greater than 1000 CFM. **(Figure 7)**

The school is served by a gravity pressure release system. When the schools pressure increases above a set pressure differential with the ambient air, the building will exhaust air out a dampener on the roof via electric actuators. While a pressure differential can be set, the ventilation system is passive. Logged data regarding operation of the ventilation system is not available. Gravity vents are located throughout the building. The lack of logged data limits the ability to predict air movement within class rooms 130 and 131 and the Gymnasium therefore any conclusions would be hypothetical.

Figure 6: Gymnasium Ceiling Mounted Units

October 2018—Unit Flow Testing Results

Unit UV-B01A

Specified CFM: 1500

Actual CFM: 1529

Unit UV-B01B

Specified CFM: 1500

Actual CFM: 1532



Unit UV-B01A (Gymnasium)

Figure 7: Classroom Floor Mounted Units

October 2018—Unit Flow Testing Results

Unit UV-130

Specified CFM: 1000

Actual CFM: 1025

Unit UV-131

Specified CFM: 1500

Actual CFM: 1117

Unit UV-130 (Classroom)



MERV is an acronym for Minimum Efficiency Reporting Value. MERV ratings are determined by filter manufacturers using American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standard 52.2. The higher the MERV rating, the greater the filters ability to remove particles from the air ranging in sizes from 0.3 microns to 10 microns in diameter. As part of the New York Forward program, Gov. Cuomo announced that shopping malls of 800,000 square feet or more must have filters with MERV-11 rating with additional ventilation and air filtration mitigation protocols or MERV-13 ratings could open at decreased capacities. Based on studies conducted by ASHRAE and input from experts, New York State imposed requirements for some facilities, specifically higher risk locations like fitness centers and large congregational settings, such as malls and schools, to meet various mechanical filtration benchmarks in order to open at a decreased capacity. Because the COVID-19 virus is small, approximately 0.14 micron the higher MERV rated filters have greater efficacy at filtering out the virus particles. The greater the number of virus particles removed the less the potential for spread. Many existing commercial units such as units UV-B01A, UV-B01B, UV-130, and UV131 found at the Canastota Central School District are designed to meet MERV 6 or MERV 8 filter. Many existing Heating Ventilation Air Condition (HVAC) systems are not be able to accommodate higher efficiency filters without making dramatic and often costly enhancements.

Discussion

Several limitations should be considered in regards to the cluster identification and analysis of Peterboro Street Elementary. First, contact tracing is not a perfect science. Contract tracers spend a limited amount of time (15 minutes to an hour) speaking with positive cases and may not be able to conduct a thorough investigation. Positive cases may have recall bias in that they do not accurately remember the events leading up to and during symptoms. They also may not know the individual to whom they were exposed. For example, the gym class

did not have a seating chart, Contact tracers rely on the recollection of positive cases for the events and interactions in and out of the classroom days or sometimes weeks after the fact.

Contact tracing is our only tool for source determination and it is difficult to distinguish transmission of the virus. In this situation, there can be human error in determining whether the virus was contracted in the school or community setting. This is particularly true given that in January 2021 the County was experiencing the largest case rate to date and therefore, the level of community transmission was high.

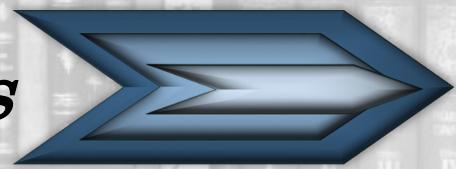
Lastly, school surveillance testing did not take place during the 2020-2021 school year. This would have been particularly helpful among quarantined individuals. We cannot draw a conclusion if there were any asymptomatic cases before that may have contributed to the spread or linked the 6 staff members. We also cannot say for certain if there were more cases among those quarantined as they were not required to test before returning to school.

The air handling system, particularly in the gymnasium, may have contributed to the spread of the virus amongst the students. According to interviews with school staff, the positive case was positioned in front of the air handling system. Even though the students were supposedly positioned 12 feet apart, they were down “wind” of the positive case. Although no direct measurement of the air flow in the room was taken, the flow of air could be felt at a distance greater than 12 feet.

Conclusion

There is evidence of school transmission in at least one classroom setting given the number of contacts who tested positive while under quarantine. While mask adherence and surface disinfection play a role in combatting disease transmission, physical distancing and air flow may have contributed more to how the virus spread in the Peterboro Street Elementary cluster.

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Inside Front Page Photo: *Vintage White Christmas* by Ginger Vaas of Cazenovia

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