Immunization as Cancer Prevention

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West Virginia Immunization Network Summit
Summersville, WV
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WEST VIRGINIA Department of Health & Human Resources
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West Virginia Cancer Registry (WVCR)

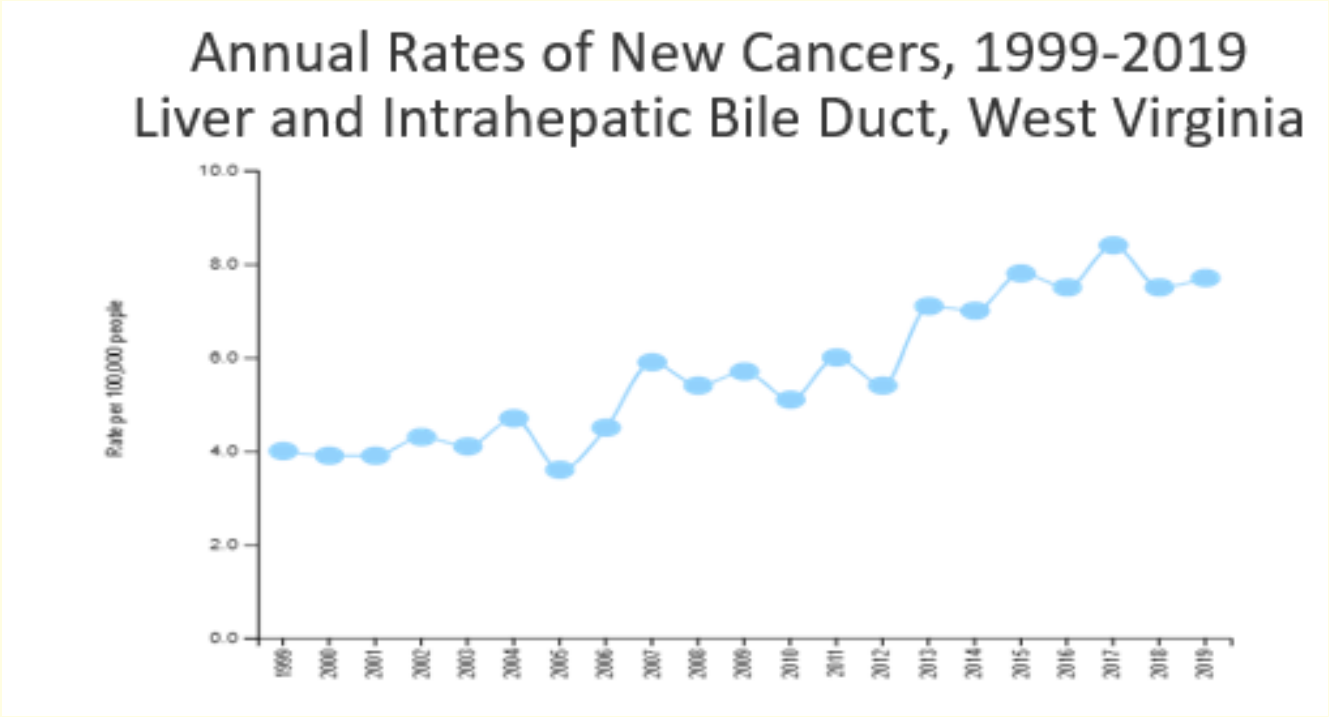
- The WVCR is a population-based registry that maintains data on all cancers occurring in persons residing in West Virginia
- Any case of cancer diagnosed after December 31, 1992, where the primary tumor is determined to be malignant or carcinoma in situ, is reportable by law
- Anyone who diagnoses or treats cancer must report cases to the WVCR
- WVCR receives cases through interstate data exchanges when West Virginia residents are diagnosed or treated in other states
- WVCR consistently meets the highest standards of data completeness, timeliness, and accuracy

Viruses Associated With Cancer

- Hepatitis B and Hepatitis C
  - Liver cancer
- Human Papillomavirus (HPV)
  - Cervical cancer
  - Cancers of the penis, anus, vagina, vulva, mouth, and throat
- Others
  - Epstein-Barr virus (a type of herpes)
  - Human Immunodeficiency Virus (HIV)
  - Human herpes virus 8
  - Human T-lymphotrophic virus-1
  - Merkel cell polyomavirus

Viral Hepatitis and Liver Cancer

- Nationwide, about 50% of liver cancers are associated with viral hepatitis
- In West Virginia, that number is about 66% due to our high rates of hepatitis infections
  - 75% for males; 46% for females



Hepatitis Vaccination and Treatment

- Vaccines are available to prevent HBV
  - Available for all ages
  - 3-dose series
  - Series completion can be a challenge
- Treatment is available for HCV
  - HCV treatment can be complicated, expensive, and may take months to complete
  - Treatment uptake is currently low, but improving among some target populations (PWID)
- Successful hepatitis vaccination and treatment programs will reduce liver cancer incidence in West Virginia

Human Papillomavirus (HPV)

- More than 200 subtypes of HPV
  - Most are low-risk and cause no disease, but may still cause genital or oropharyngeal warts
  - About 14 subtypes are considered high-risk variants, with HPV16 and HPV18 causing most HPV-related cancers
  - Current vaccines offer protection against many of these high-risk variants
- Currently, most everyone has been infected with HPV
  - Usually within months to a few years of becoming sexually active
  - Roughly half of these infections are with a high-risk type of HPV
  - Most infections are resolved naturally by the immune system and do not cause cancer
  - Persistent infections may lead to cancer

HPV and Cancer

- Cervical cancer
  - Nearly 100% caused by HPV
- Oropharyngeal cancers
  - Throat, tonsils, back of tongue
  - Around 70% caused by HPV
- Anal cancer
  - About twice as common in women as men
  - More than 90% caused by HPV
- Penile cancer
  - More than 60% caused by HPV
- Vaginal cancer
  - About 75% caused by HPV
- Vulvar cancer
  - About 70% caused by HPV

HPV Vaccination

- No current treatment for HPV
- Childhood vaccination is recommended (ages 9 – 26)
  - 2-dose series if started before age of 15
  - 3-dose series if started after age 15
  - Less benefit at older ages since most already have HPV
- Is HPV vaccination effective?
  - In 2008, the United Kingdom introduced HPV vaccine to all 12 and 13-yr-old girls
  - 87% reduction in abnormal cervical screenings
  - “Almost eliminated” cervical cancer in women born since 1995

References

- U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on 2022 submission data (1999-2020): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, released June 2022.
- WVCR, data from 1999 to 2020

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Visit us on the web:
cancerregistry.wv.gov

2022 West Virginia Cancer Burden Report:
oeps.wv.gov/cancer/documents/data/burdenreport2022.pdf

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ELC Support for Screening and Testing to Reopen and Keep Schools Operating Safely

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West Virginia Immunization Summit
June 9, 2023

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Objectives

1. To inform on the intent of the ELC Reopening Schools award.

2. To describe the activities and outcome of this award.

ELC Reopening Schools Award

Through the *American Rescue Plan Act of 2021,* funds were made available to jurisdictions by the U.S. Department of Health and Human Services through the Centers for Disease Control and Prevention (CDC) Epidemiology and Laboratory Capacity (ELC) cooperative agreement in response to COVID.

Goals

- Encourage continuity and enhancement of existing COVID-related activities
- Establish screening testing programs in schools extending through the end of the school year and into summer activities and subsequent school year
- Maintain health departments' integral role in the screening testing ecosystem
- Ensure a holistic assessment and monitoring of disease burden

ELC Reopening Schools Award (continued)

Priorities Areas:

- Surveillance, Detection, and Response
- Prevention and Intervention
- Communication, Coordination, and Partnership

Project Period: April 2021 - July 2023

Target Setting:

- Schools (K-12) - public, private
- Childcare facilities

Activities and Objectives

- Provided COVID tests to schools to increase access to COVID-19 tests
- Purchased vehicles to offer on-site COVID testing
- Purchased portable air-filtration systems to improve air quality in West Virginia schools, childcare facilities, and school-based health centers
- Purchased sanitizing supplies to enhance environmental cleaning

Centers for Disease Control and Prevention. (2021, June 2). *Ventilation in Buildings*. Centers for Disease Control and Prevention. Retrieved March 30, 2023, from www.cdc.gov/coronavirus/2019-ncov/community/ventilation.html#:~:text=While%20these%20systems%20do%20not,need%20for%20conditioning%20outdoor%20air

Outcome

- COVID tests to K-12 schools = 29,752
- Vehicles:
  - 16 COVID mobiles vans to local health departments (LHDs)
  - Three COVID mobile vans and one SUV for the West Virginia Department of Health and Human Resources, Bureau for Public Health (BPH), Center for Threat Preparedness (CTP)
- Distributed air-filtration systems to West Virginia schools, childcare facilities, and school-based health centers
- Distributed sanitizing supplies to West Virginia K-12 schools

COVID-19 Mobile Vans

- The vans provided to LHDs (16) and BPH, CTP (3) for school COVID testing events and community COVID testing

Photo credit: Mitch Sutton, Office of Governor Jim Justice

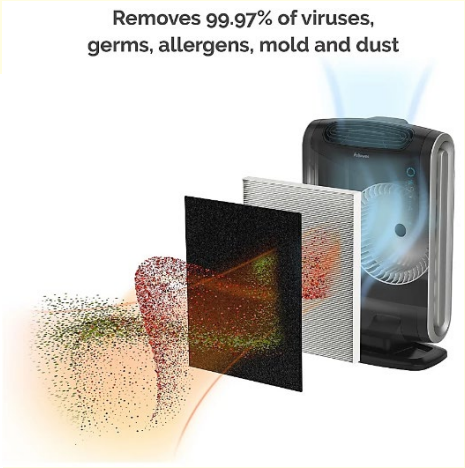
Air Flow System and Cleaning Supplies

- Through School Superintendents of all West Virginia public schools
  - Public Schools - 40/55 Counties
- Through the West Virginia Private School Coordinator
  - Private Schools - 24/55 Counties
- DHHR's list of childcare providers
  - Childcare providers - 41/55 Counties
- Through the WV Primary Care Association
  - School-Based Health Centers - 23/55 Counties

Air Purifiers

- Air purifiers improve air quality and reduce COVID-19 transmission and other airborne pathogens
- HEPA filter removes the source of allergens and irritants
- Active Carbon filter traps most odors and pollutants for cleaner indoor air quality

Air Purifiers = 17,292
HEPA Replacement Filters = 34,584
Carbon Replacement Filters = 34,584



Other Items

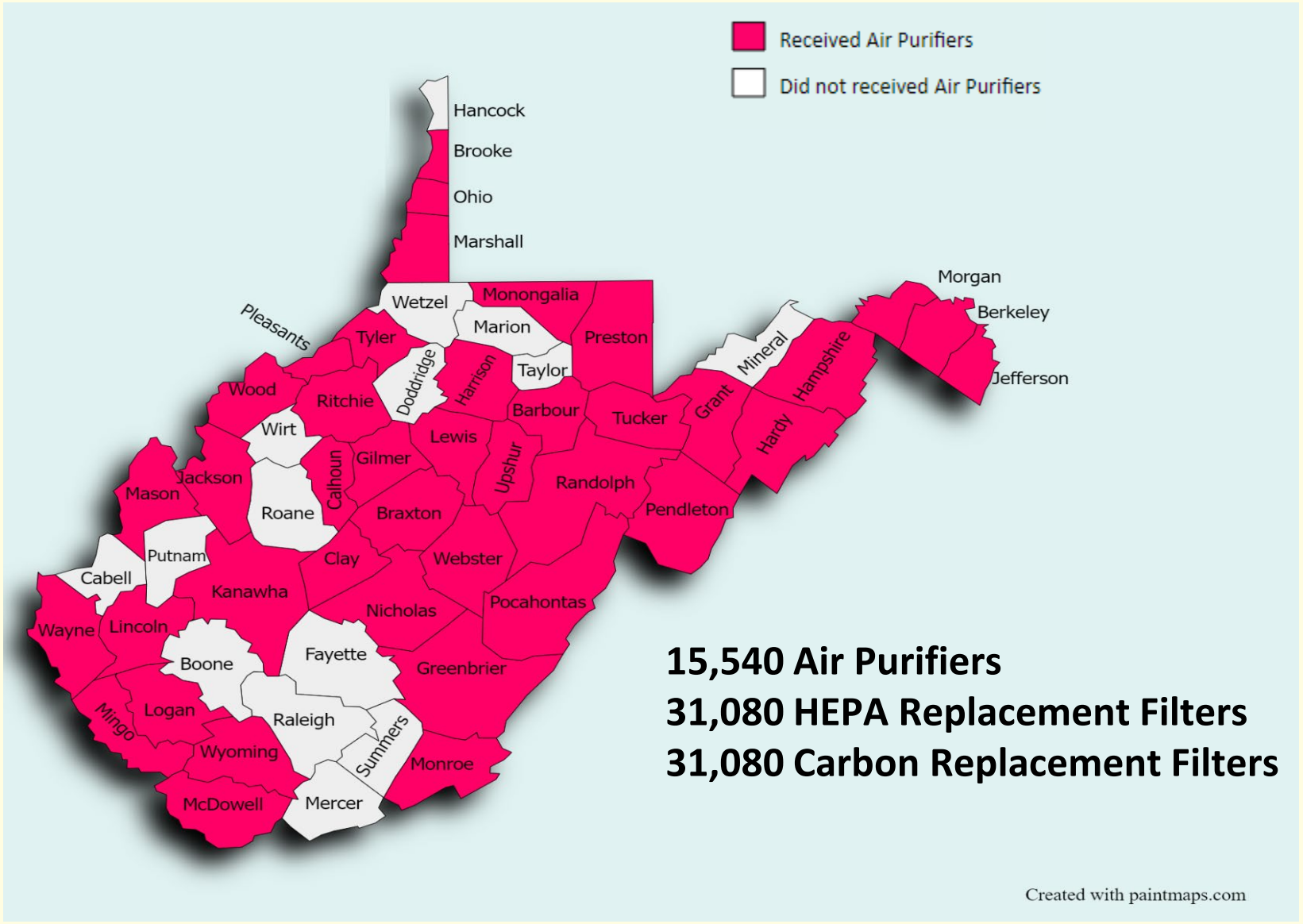
- Oscillating fans = 3,280
- AAA batteries (fan remote control) = 3,280
- Disinfecting wipes = 17,044
- Hand sanitizing wipes = 28,605

Feedback

Survey of 400 recipients:

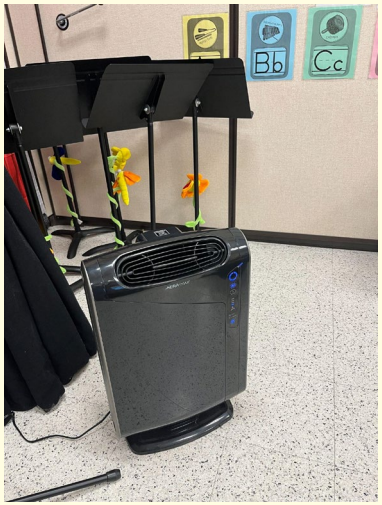
- 42% response rate
- 30% of participants noticed significant improvement in the health of students
- 93% of participants placed their air purifier within a classroom
- 52% of participants gave positive feedback

Public Schools

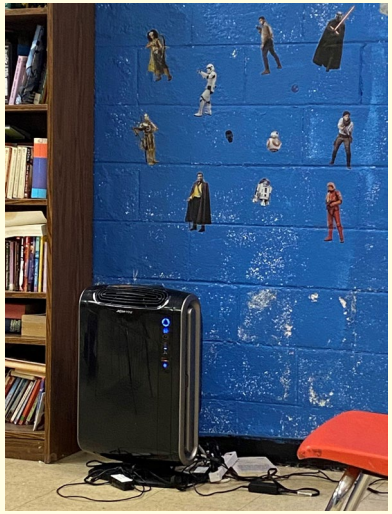


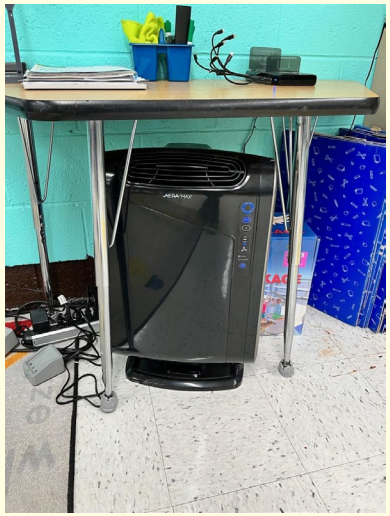
Public School Testimonials

"The air purifier helped reduce dust and other particles in the air of my classroom. I noticed that my students and I did not catch colds, etc. from contagious students who attended class with noticeable symptoms. Between the air purifier use and the use of Lysol wipes to clean tables, I have been healthier even though I am in a new building environment."
- Braxton Co. High School teacher

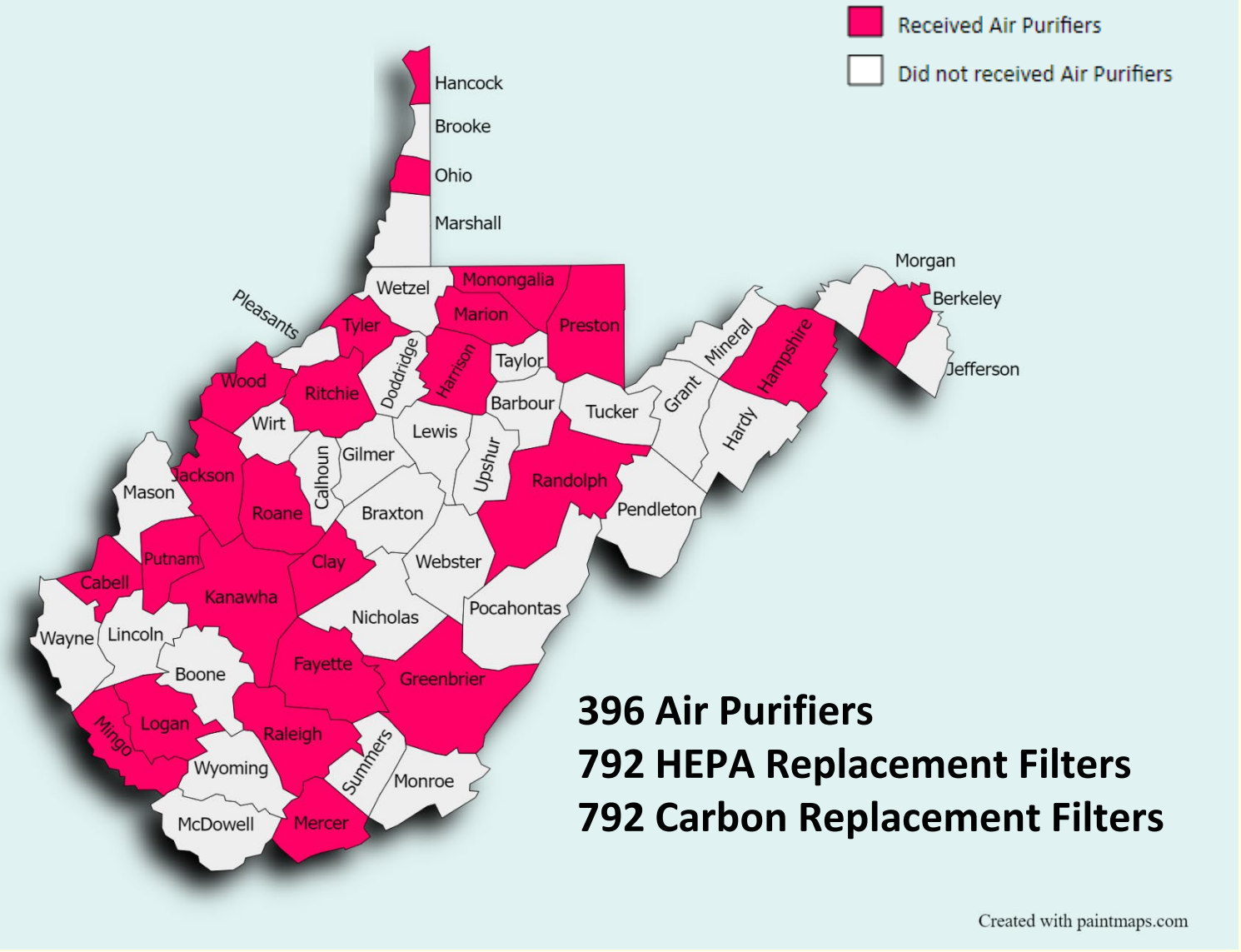


"Overall, very helpful for the environment of the classroom."
- Logan Middle School teacher



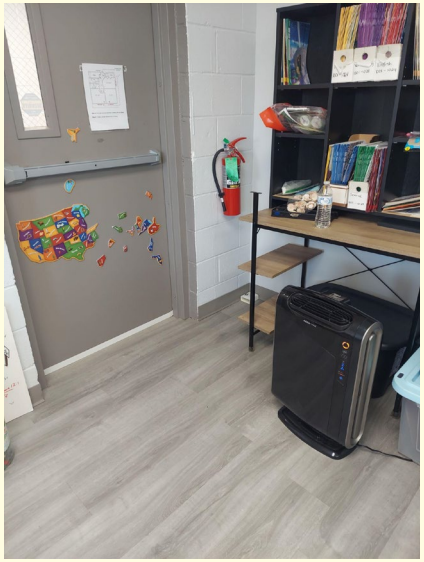


Private Schools

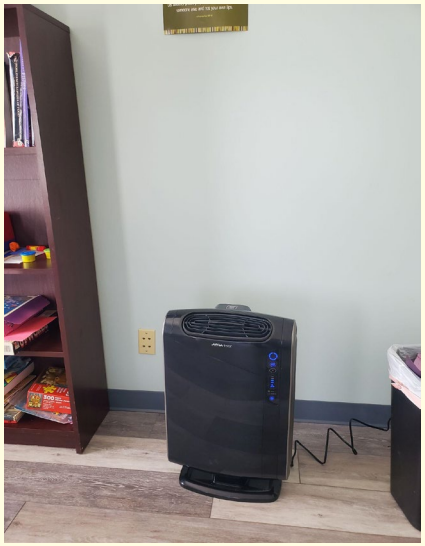


Private School Testimonials

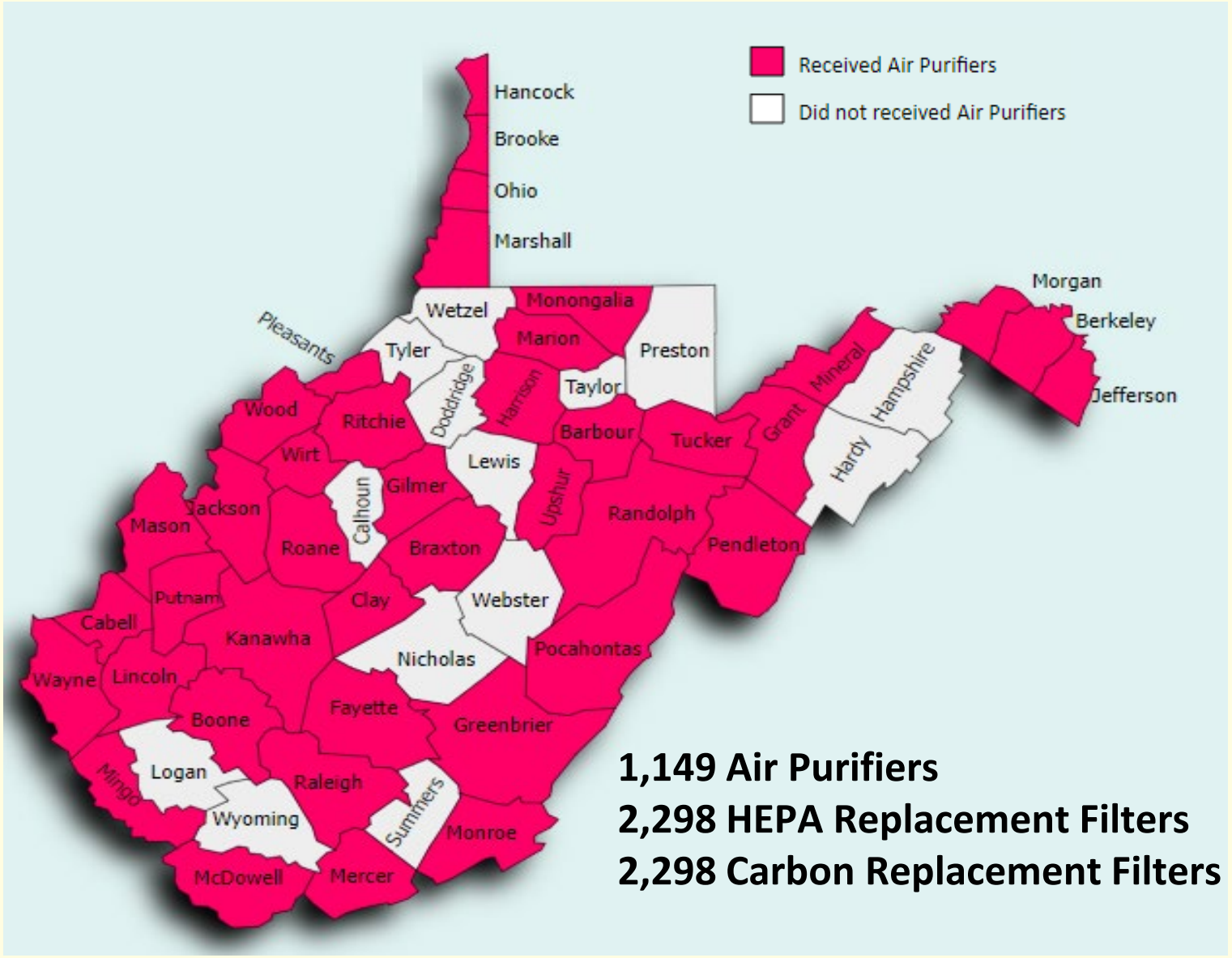
"I think it was a great idea to provide air purifiers for schools." - *Greenbrier Valley Academy principal*



"We appreciate the purifiers."
- Indian Creek Christian School principal



Childcare Facilities



Childcare Facility Testimonials

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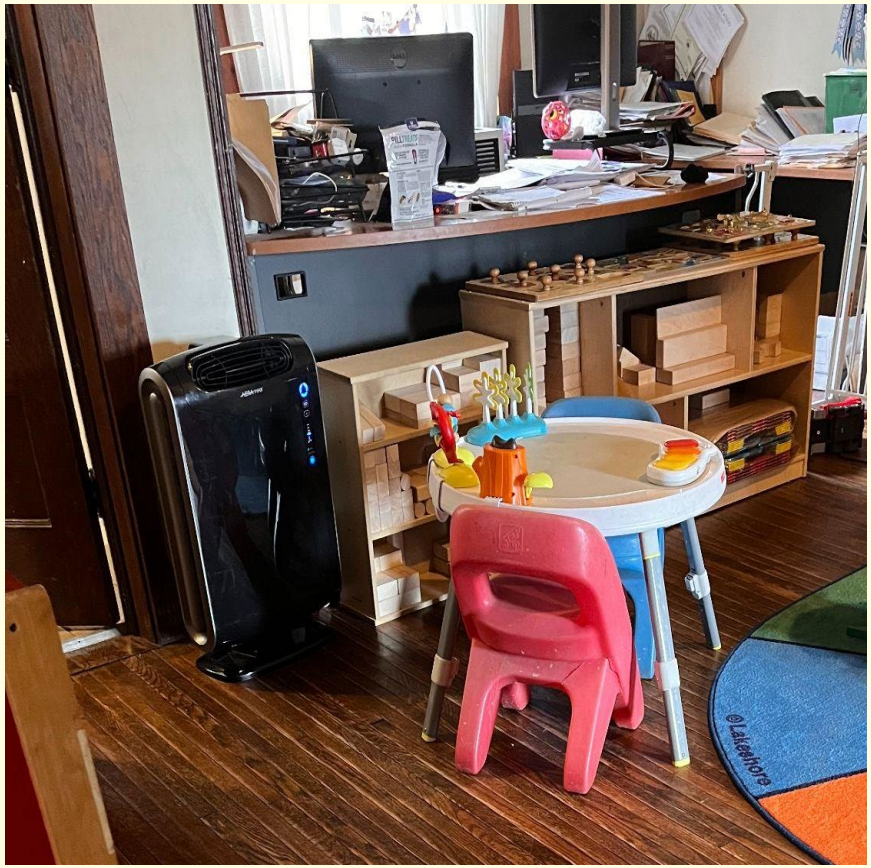
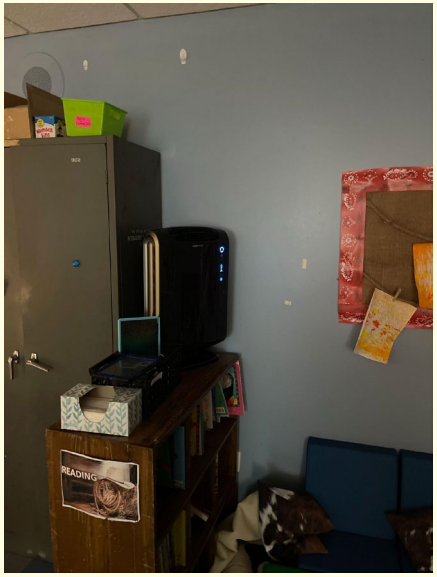
"Air purifiers are very helpful with the quality of air. It is nice not to have the smells that are associated with childcare, especially during diaper changing time."
- *Early Education Station teacher*





"We appreciate all of the air purifiers for our classrooms. Since COVID, we have implemented additional health and safety protocols. The purifiers are something that we were hoping to purchase, and we were very happy when we were selected to receive them with the grant funds."
- *Living Water Child Care branch director*

School Based Health Centers

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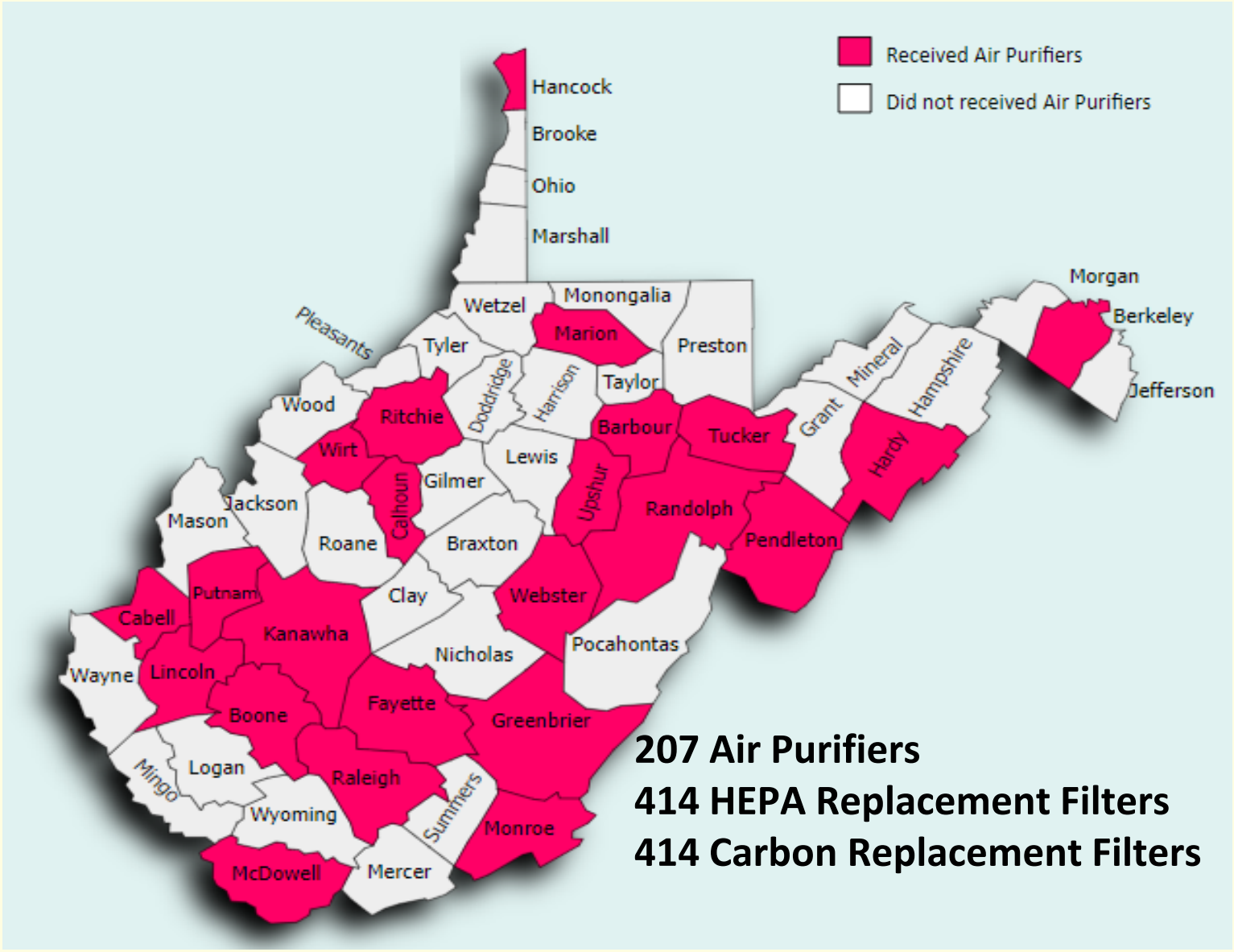

Conclusion

The air purifiers, replacement filters, fans, disinfecting wipes, and hand sanitizing wipes has made a significant impact on the K-12 community.

Acknowledgement

- U.S. Department of Health and Human Services and CDC*
- Khalil Burton - past ELC School Project Coordinator
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- Shannon McBee, MPH, CHES - State Epidemiologist
- Tim Priddy and team - CTP
- School Superintendents for WV Public Schools
- Dustin Lambert - WV Private Schools
- John Kennedy - WV Primary Care Association
- Other partners

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Multi-Inflammatory Syndrome in Children (MIS-C) West Virginia




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WV Immunization Summit
June 9, 2023

Objectives

- Inform on the process of MIS-C surveillance in West Virginia.
- Describe MIS-C morbidity in West Virginia.

MIS-C Case Definition

2020 Case Definition:

- Person <21 years old presenting with fever, lab. evidence of inflammation, and evidence of clinically severe illness requiring hospitalization, with multisystem (>2) organ involvement; AND
- No alternative plausible diagnoses; AND
- Positive for current or recent SARS-CoV-2 infection by RT-PCR, serology, or antigen test; or exposure to a suspected or confirmed COVID-19 case within the 4 weeks prior to the onset of symptoms.

2023 Case Definition (revised):

- Duration of fever not required
- CRP ≥ 3mg/dl to indicate systemic inflammation
- Organ system involvement criteria adjusted to include shock. Removed respiratory, neurologic, renal criteria
- Timing of positive SARS-CoV-2 lab test relative to MIS-C illness

MIS-C Background

MIS-C is a severe hyperinflammatory condition occurring two to six weeks after infection with SARS-CoV-2.

MIS-C detection in West Virginia

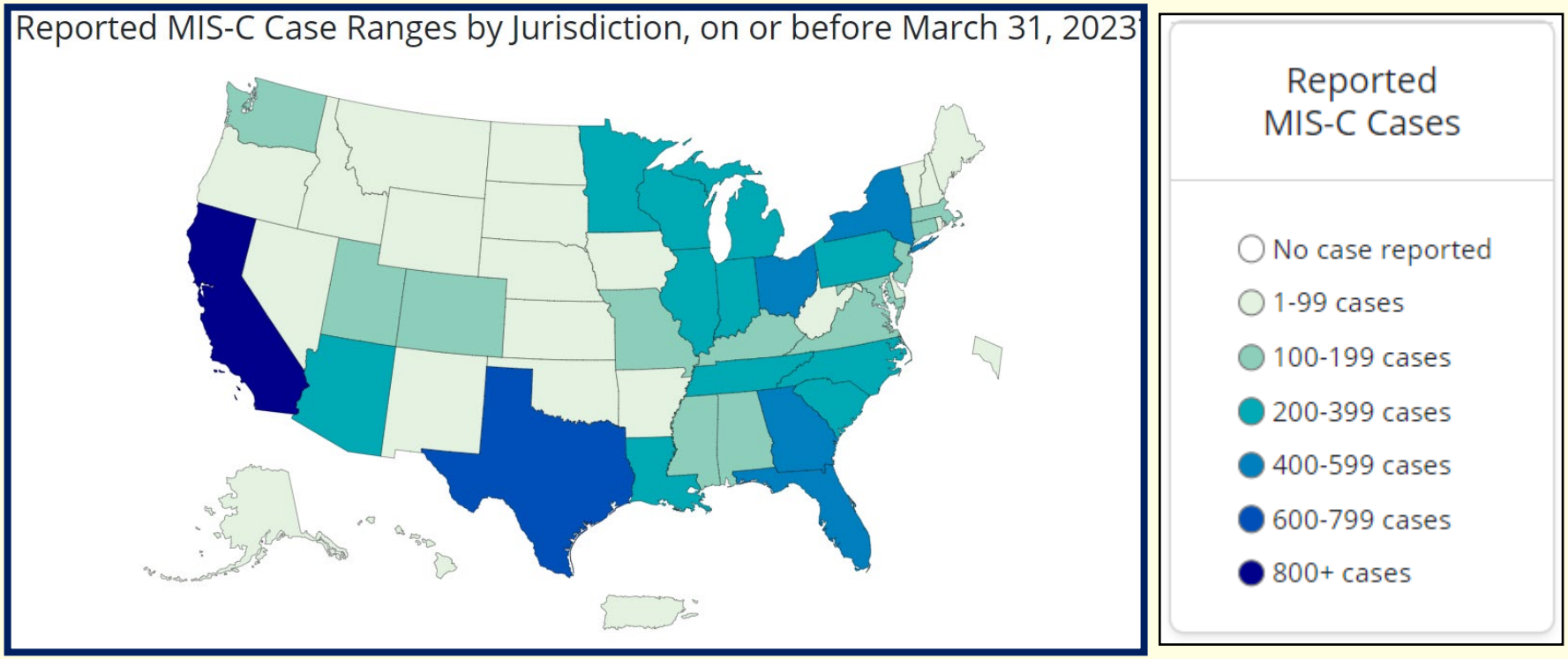
- Surveillance
  - Syndromic surveillance
  - Active surveillance at three West Virginia tertiary/pediatric hospitals using ICD-10 codes

- MIS-C nurse investigates, information is reported to the Centers for Disease Control and Prevention (CDC)

- Voluntary reporting to CDC

MIS-C Surveillance

MIS-C Cases (February 2020 to March 2023)	**United States**	**West Virginia**
Total MIS-C cases	9,445	42
Death	78	0



https://covid.cdc.gov/covid-data-tracker/#mis-national-surveillance

MIS-C Case Counts in West Virginia, n=42

YEAR OF REPORT	2021	2022	2023
Total number investigated	340	105	17
Total number of MIS-C cases	23	18	1
AGE GROUP (BY YEARS)			
<1	0	1	0
1 to 4	3	3	0
5 to 11	12	11	1
12 to 15	5	2	0
16-20	3	1	0

MIS-C Case Demographics

Demographics	2021	2022	2023
GENDER			
Male	18	9	1
Female	5	9	0
RACE and ETHNICITY			
Asian	0	0	0
Black	0	1	0
Hispanic	0	0	0
White	22	16	1
Other/Multiple	1	0	0
Missing	0	1	0

Clinical Features and Underlying Condition

Health Status	2021	2022	2023
CLINICAL FEATURES			
Fever ≤ 2 days	2	2	0
Fever ≥ 3 days	21	16	1
Missing/Unknown	0	0	0
UNDERLYING MEDICAL CONDITION (n=10)			
Obesity*	4	2	0
Chronic Lung Disease (including Asthma)	1	3	0
Missing/Unknown	0	0	0

*Obesity was determined using CDC's BMI table

Organ System Involvement

ORGAN SYSTEM	2021	2022	2023
Hematologic	21	15	1
Gastrointestinal	17	13	1
Dermatologic	15	13	1
Cardiac	13	9	0
Respiratory	7	6	1
Neurologic	2	3	0
Renal	3	2	0
Missing or Unknown	0	0	0

Cases may have more than 1 organ system involvement.

Treatment

TREATMENT	2021	2022	2023
IV Immunoglobulins	18	14	1
Systemic corticosteroids	18	13	1
Other immunomodulatory treatment (anakinra)	3	2	0
No immunomodulatory treatment	20	16	0
Extracorporeal Membrane Oxygenation (ECMO)	0	1	0

Cases may have received more than 1 type of treatment.

Clinical Outcome

OUTCOMES	2021	2022	2023
Total number of MIS-C cases admitted to hospital	23	18	1
Total days in hospital, median*	6	2	3
Total number of MIS-C cases in ICU	9	5	0
Death	0	0	0
Missing or Unknown	0	0	0

All MIS-C cases have improved or are improving.

*Estimate median by counting the number of MIS-C cases and arrange the cases in increasing order of number of hospital days. If the number of cases is uneven, add 1 and divide the results by 2 to get the rank of the data point whose value is the median.

Summary

- Main risk factor: SARS-CoV-2 infection
- Most children with MIS-C do not have any reported underlying medical conditions. For those with underlying medical condition, obesity is the most common.
- Protect a child from MIS-C:
  - ✓ Stay Up to Date with COVID-19 Vaccines Including Boosters
  - ✓ How to Protect Yourself and Others
- MIS-C Resources for Healthcare Providers: https://www.cdc.gov/mis/mis-c/hcp/provider-resources/index.html

Acknowledgement

1. U.S. Department of Health and Human Services and CDC*

2. Lesley Roush, RN – MIS-C Abstractor

3. Three West Virginia hospitals:
   - West Virginia University Hospital System
   - Cabell-Huntington Hospital
   - Charleston Area Medical Centers (CAMC)

4. West Virginia Department of Health and Human Resources, Office of Epidemiology and Prevention Services and Office of Management Information Systems

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Influenza A(H3N2)v Detections at the Jackson County Junior Fair 2022




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2023 West Virginia Immunization Summit
June 9, 2023

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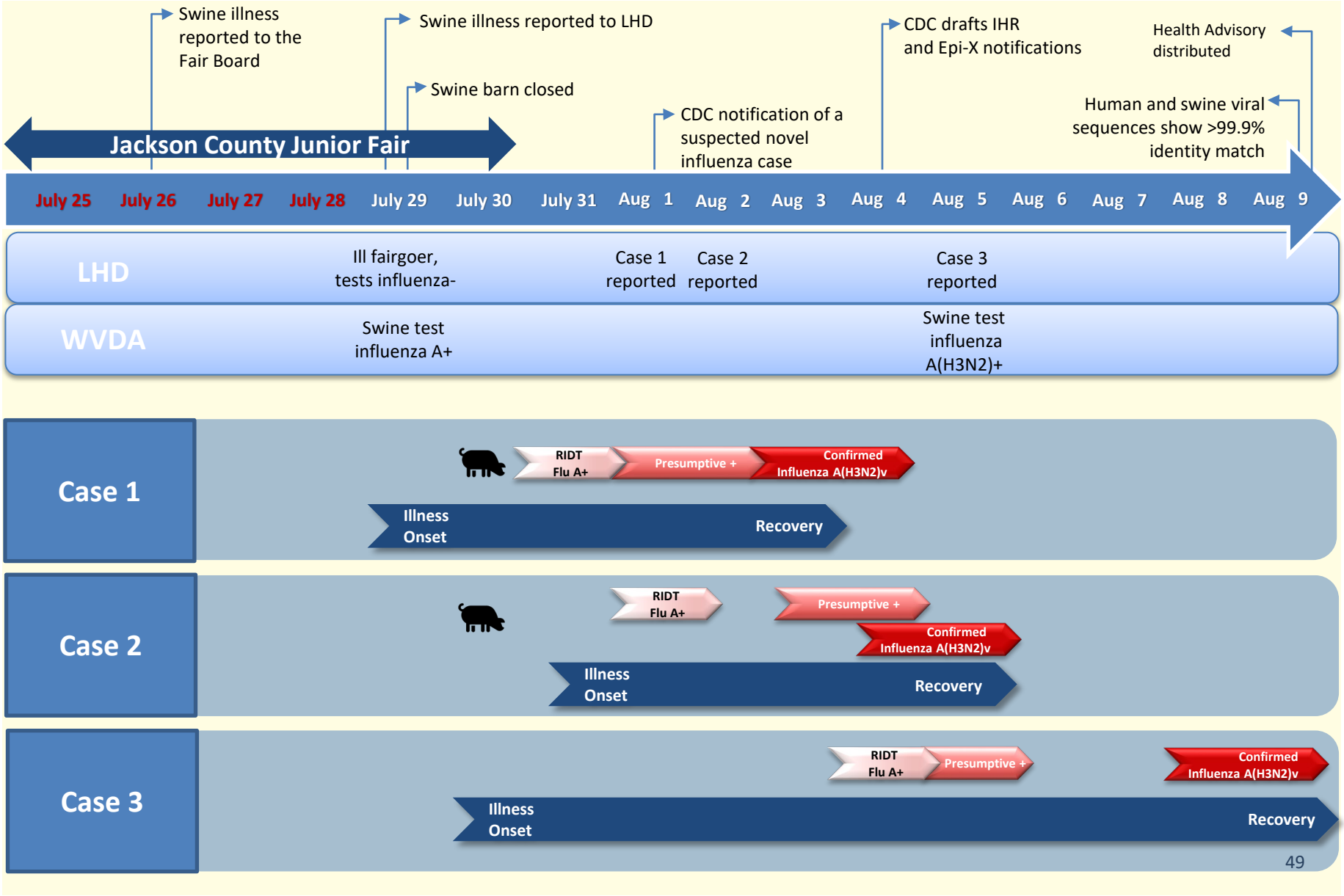
Objectives

- Identify the partners involved in an outbreak investigation of Influenza A(H3N2)v during a fair.
- Understand the steps taken to control an Influenza A(H3N2)v outbreak.
- Understand the recommendations made by public health to the fair board, cases, and contacts.

Agencies Involved

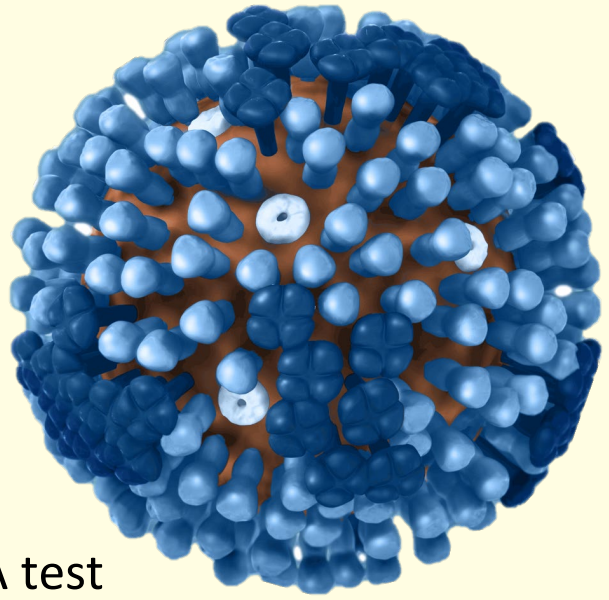
- Fair Board
- Jackson County Local Health Department (LHD)
- National Veterinary Services Laboratory
- Centers for Disease Control and Prevention (CDC)
- West Virginia Department of Health and Human Resources (DHHR), Office of Epidemiology and Prevention Services (OEPS)
- DHHR, West Virginia Office of Laboratory Services (WV OLS)
- West Virginia Department of Agriculture (WVDA)

Outbreak Timeline



Case Definition

- **Animal Cases:**
  - Ill swine: fever (106-108^{o} F and a cough)
  - CONFIRMED: A positive RT-PCR influenza A test received from testing at the Moorefield Animal Diagnostic Laboratory and confirmed by the National Veterinary Services Laboratory.



- **Human Cases:**
  - Acute respiratory illness after attending the Jackson County Junior Fair.
  - Acute respiratory illness in a person with an epidemiologic link to a confirmed case.
  - CONFIRMED: A positive RT-PCR influenza A test using an assay capable of detecting novel influenza strains and confirmed by the CDC.

Surveillance Methods

- Local healthcare providers were asked to consider novel influenza infection in patients that reported acute respiratory illness after attendance at an agricultural event.
- Healthcare providers were reminded to notify the LHD of any suspected novel influenza cases.
- Swine influenza testing through the Moorefield Animal Diagnostic Laboratory and confirmatory testing at the National Veterinary Services Laboratory.
- Testing through the WV OLS when suspected cases of novel influenza were reported to the LHD.
- Confirmatory testing of novel influenza cases at the CDC laboratory when WV OLS testing results presumptive positive for novel influenza viruses.
- A Health Advisory was distributed across the state to healthcare providers for situational awareness and to communicate recommendations for patients that report acute respiratory illness after attendance at an agricultural event.

Epidemiologic Data Overview

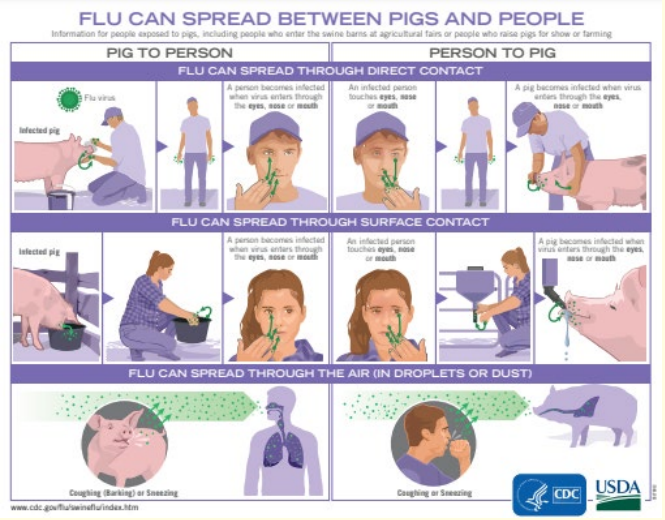
- A total of three cases were confirmed to be infected with Influenza A(H3N2)v after attending the Jackson County Junior Fair.
- All cases were under the age of 18.
- Two of the three cases were hog exhibitors with access to the swine barn.
- One case had no exposure to pigs and did not visit the swine barn.
- Symptoms: Fever, cough, sore throat, large throat blisters, muscle aches, headache, shortness of breath, diarrhea, eye redness, rash, and fatigue.
- None of the cases had any comorbidities or pre-existing medical conditions.
- Two cases were prescribed antiviral medications.
- No hospitalizations or deaths occurred.
- One case had received their seasonal influenza vaccine for the current season.
- Three household contacts reported symptoms but were not confirmed to have influenza and all recovered.

Public Health Recommendations

- Cases and/or their guardians were educated on hand hygiene and respiratory etiquette.
- Cases and/or their guardians were educated to avoid close contact with other people until being fever free for 24 hours without the use of fever reducing medication.
- Cases and/or their guardians were educated to avoid contact with swine for days following symptom onset and until fever free for 24 hours without the use of fever reducing medication.
- Contacts were educated to follow up with a healthcare provider should they develop symptoms.
- Cases and/or their guardians were educated on the benefits of receiving an influenza vaccine annually.

Public Health Recommendations (continued)

- **Recommendations to Fair Board:**
  - Emphasize biosecurity during agriculture fair events.
  - Evaluate swine for illness as they arrive at an agricultural fair and immediately send ill swine home.
  - Close the swine barn to the public.
  - Post signage on preventing influenza transmission between pigs and people.



Lessons Learned

- The delay between identification of ill swine (first onset: 7/26/22) and closure of the swine barn (7/29/2022) could result in more additional exposures and/or repeated exposures of healthy swine and fairgoers. Added measures are needed to prevent delays in reporting ill swine to public health.

- Case identification was based on physician report which may lead to underreporting for persons whose illness was mild and did not seek medical attention.

Successes

- The rapid response from the Jackson County LHD lead to the quick identification of novel influenza cases and appropriate recommendations to cases and their families.

- The WVDA staff were on-scene the same day illness in the swine barn was reported to the LHD. State veterinary staff collected specimens from the ill swine and ensured management of sick animals.

- The WV OLS prioritized testing of suspected novel influenza cases with turn around times of less than 24 hours. Novel influenza specimens were promptly shipped to the CDC for confirmation.

- Communication between state and local health, WV OLS, WVDA, and community healthcare providers facilitated the prompt and appropriate implementation of public health measures to prevent further potential exposures and reduce the risk of secondary spread.

Summary and Conclusion

- An outbreak of novel influenza, Influenza A(H3N2)v, occurred at the Jackson County Junior Fair in July 2022. An estimated 24,000-30,000 people attended the fair which included pig exhibits and an auction. Ill swine were reported to the LHD three days after the first pig became sick. Results from the National Veterinary Services Laboratory confirmed that ill pigs were infected with Influenza A(H3N2).

- Three fairgoers were infected with Influenza A(H3N2)v. Two cases had direct exposure to sick pigs. All three were under the age of 18 and were able to recover at home. No secondary cases were identified.

- The genomic sequence from the swine samples was a >99.9% match to the influenza virus sequence taken from the human cases.

Sentinel Provider Recruitment, 2023-2024

- Sentinel provider recruitment will start on July 10, 2023.

- NEW FOCUS: Recruitment of hospitals as sentinel providers in counties that are unable to secure an outpatient provider's participation.

- When recruiting providers that have NOT previously participated in ILINet, please keep in mind:
  - Large providers that see more than 500 patients a week must submit data for validation before the deadline in September.
  - There is no enrollment deadline or data validation process for providers that see fewer than 500 patients a week.

- Providers that have participated in ILINet during the current or past seasons do not have a data validation requirement although they still need to declare their intention to participate in the 2023-2024 season or their ILINet accounts will be deactivated.

- LHDs are encouraged to complete the recruitment process early to ensure that sentinel providers can take advantage of the incentives being offered.

Contact Information

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