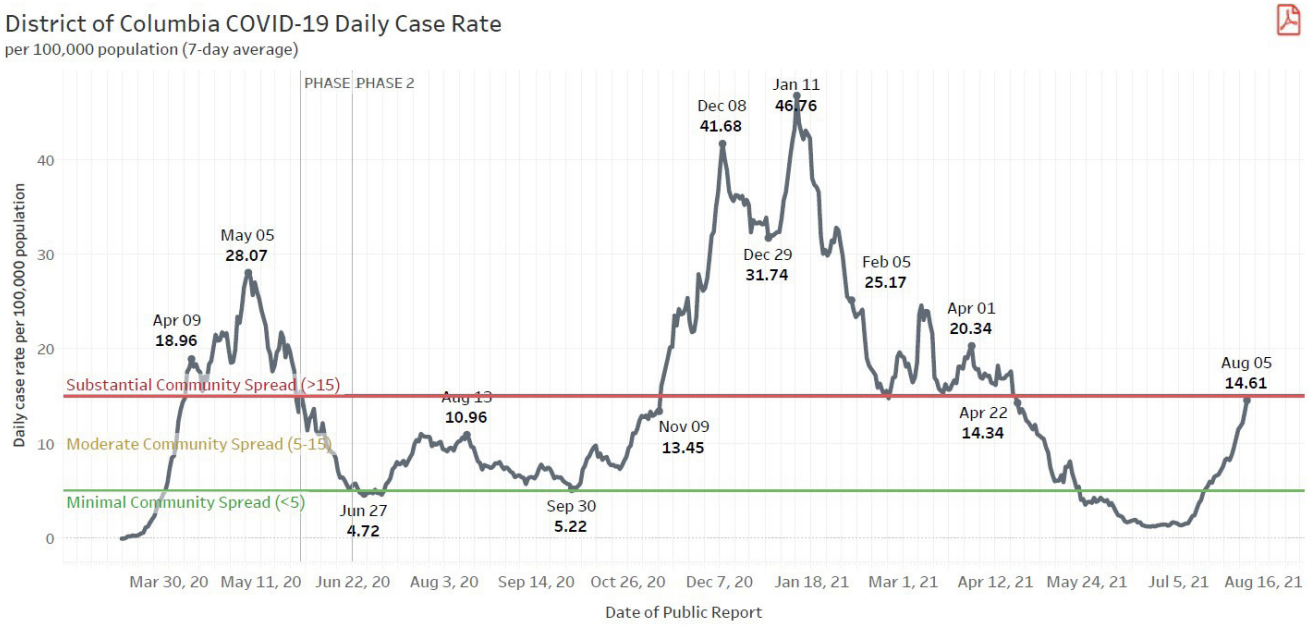
A COVID-19 SPECIAL REPORT

National COVID-19 Data Quality Audit: District of Columbia

August 16, 2021

A report by the Office of the District of Columbia Auditor



Data Source: DC Health. Data subject to change on a daily basis

Data Notes: The line represents a seven day average of the daily case rate per 100,000 population. The number of daily cases is subject to the timeliness of test results reported from laboratories and may not always reflect the number of new positive tests on a given day. Data reflect ongoing data quality improvements.

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Executive Summary

Office of the District of Columbia Auditor

Why ODCA Did This Audit

ODCA is participating in the National Data Quality COVID-19 Audit effort led by the Delaware State Auditor. This multistate audit seeks to gather information about what COVID-19 data states are collecting and reporting to provide a basis for improved and more consistent data collection nationally in the future.

What ODCA Found

DC Health has built detailed systems and teams to collect, analyze, and report COVID-19 data. At the same time, opportunities exist for reporting more information that the public needs. Through participating in the National Data Quality COVID-19 Audit ("multistate audit") effort, we found that the District published a wide range of COVID-19 data, specifically, 166 COVID-19 related data points on www.coronavirus.dc.gov ("the website"), which included most COVID-19 data points identified by the multistate audit.

We also found that key COVID-19 data—positive cases and death—matched what DC Health reported publicly. The District also was proactive in publishing vaccination data which DC Health has continued to expand. However, the District could report more mortality data. While our review did not evaluate the performance of testing, hospitals, contact tracing, and death certifications during the pandemic, we found that, overall, DC Health and the Office of the Chief Medical Examiner (OCME) had procedures in place to monitor this data. We also note that while substantial progress has been made in reporting school-related data, there is still room for improvement.

What ODCA Recommends

1. The Mayor/Office of the City Administrator should clarify who is responsible for publishing death data and publish the additional information contained in the internal OCME COVID-19 related deaths report, including comorbidity data, on the data pages of the coronavirus website.
2. The Mayor should initiate a comprehensive review of the COVID-19 pandemic response culminating in a public report with DC Health, OCME, HSEMA, and any other key agencies to determine what worked and what should be done differently in the face of a similar health emergency including any recommended updates to the District's Emergency Response Plan.
3. DC Health should publish weekly childcare center case data over time as it is doing for K-12 schools.
4. DC Health should publish case numbers at each school even when there were fewer than five cases cumulatively at a school.

Background

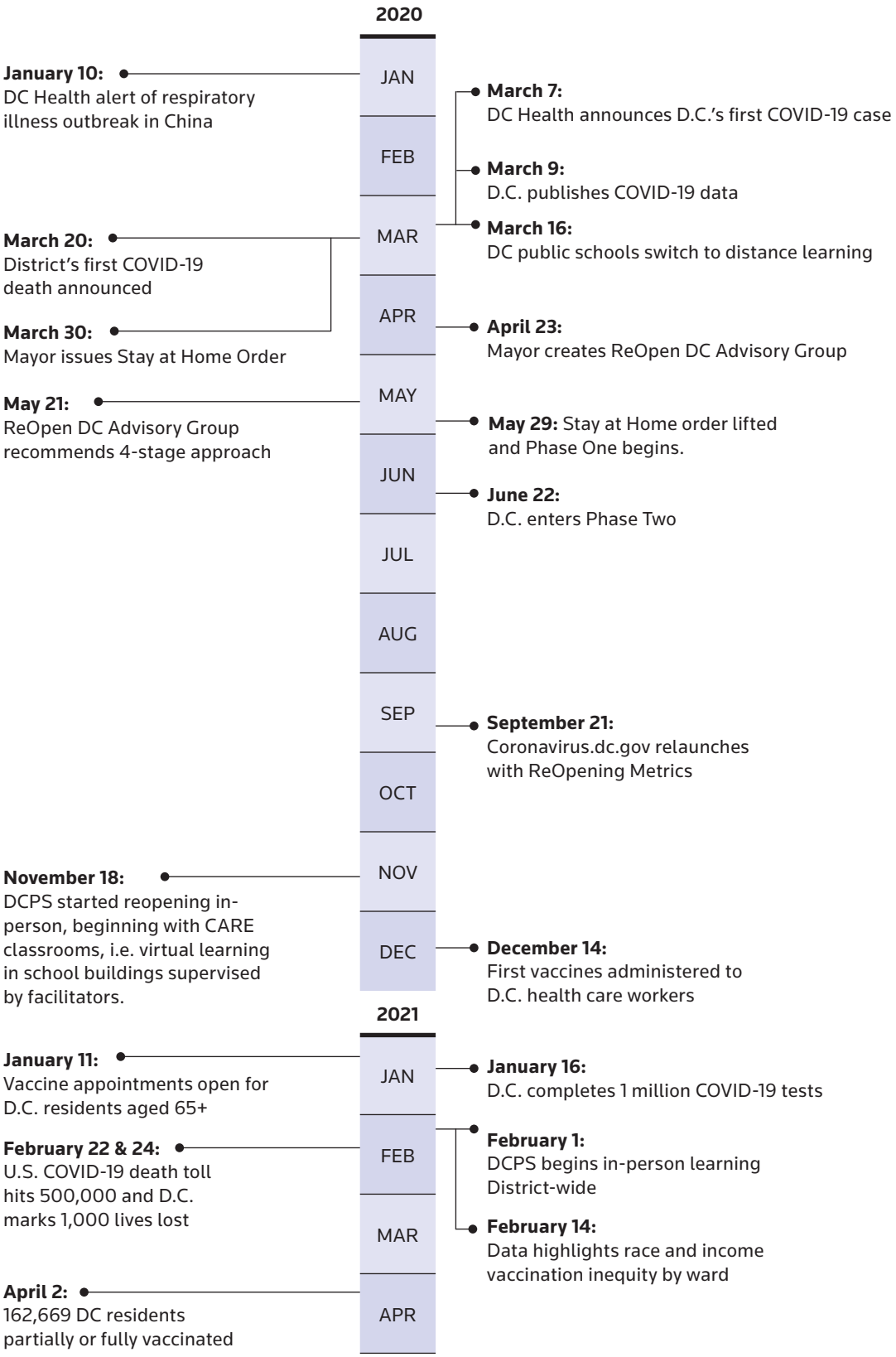
COVID-19 has impacted every District resident, whether by the virus infecting them or their loved ones, and/or through economic, social, and educational consequences. As of August 6, 2021, there have been more than 50,000 COVID-19 cases in the District and 1,149 residents have lost their lives to the virus.

D.C. Mayor Muriel Bowser directed the District government's pandemic response through an Emergency Operations Center (EOC), a multi-agency effort based at DC Health's Health Emergency Coordination Center.[1] DC Health, the District's health department, is tasked with leading the public health response and its Director, Dr. LaQuandra S. Nesbitt, serves as the chief public health advisor and strategist to the EOC and the Mayor. The Office of the Chief Medical Examiner (OCME) certifies all COVID-19 deaths in the District. At the start of the pandemic and through 2020, Dr. Roger Mitchell filled the role of the District's Chief Medical Examiner, and in late January 2021, Mayor Bowser named Dr. Francisco J. Diaz to the position.

ODCA created a timeline of major milestones of COVID-19's impact in the District and actions taken to respond, as seen in Figure 1.

1 https://mayor.dc.gov/release/mayor-bowser-declares-public-health-emergency

Figure 1: Major COVID-19 Milestones in the District



Source: ODCA

ODCA also put together a more detailed timeline of key milestones of the COVID-19 pandemic in the District, which can be found in Appendix A.

Early in the pandemic, Mayor Bowser began hosting weekly press conferences that provided a COVID-19 data update and frequently included Dr. Nesbitt. Daily, the Mayor posted COVID-19 case counts and deaths in addition to data updated daily at the website where the District developed its own COVID-19 dashboard.

The lack of standardized COVID-19 data across different jurisdictions has been a topic of concern from the start of the pandemic. The Government Accountability Office (GAO) reported in January 2021 that the federal government did not have a process to systematically ensure the collection of standardized data, and as a result:

> COVID-19 information that is collected and reported by states and other entities to the federal government is often incomplete and inconsistent. The lack of complete and consistent data limits HHS's and others' ability to monitor trends in the burden of the pandemic across states and regions, make informed comparisons between such areas, and assess the impact of public health actions to prevent and mitigate the spread of COVID-19.[2]

To develop a framework states could use to assess data quality, the Delaware State Auditor initiated a multistate task force in July 2020 which created a COVID-19 data quality audit template. ODCA joined this initiative, and the following report is D.C.'s contribution to this national effort.

As a first step, we released a Special Report on November 23, 2020, that analyzed the District's data reporting as compared to the 15 essential indicators recommended by Resolve to Save Lives, the organization led by former Centers for Disease Control and Prevention (CDC) Director Tom Frieden.[3] We found DC Health demonstrated significant improvements in data reporting through the spring and fall 2020 of the pandemic. In October 2020, Resolve to Save Lives named D.C. one of the nation's top four COVID-19 dashboards.[4] This report on data was one of many ODCA-issued COVID-19 reports, as listed below:

- April 22, 2021: Bending the Curve: Policies to Mitigate COVID-19 in D.C. & the Region
- January 26, 2021: Analysis of Demographics and Mobility Across D.C. During COVID-19
- January 11, 2021: D.C. Serves Grab & Go Meals Quickly, Efficiently During COVID-19
- December 9, 2020: School Closures as a Pandemic Mitigation Policy
- November 24, 2020: Mitigation Policy During the Pandemic
- November 23, 2020: The District's COVID-19 Data Reporting is Strong but Opportunities Exist for Improvement and Increased Transparency
- May 8, 2020: COVID-19 Federal Funding Streams Available to the District of Columbia

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2 COVID-19: *Critical Vaccine Distribution, Supply Chain, Program Integrity, and Other Challenges Require Focused Federal Attention*, January 2021, page 4, see: https://www.gao.gov/assets/gao-21-265.pdf

3 https://resolvetosavelives.org/

4 https://preventepidemics.org/wp-content/uploads/2020/11/RTSL_Tracking-COVID-in-US_Appendix-2.pdf

Objectives, Scope, and Methodology

Objectives

This report is part of ODCA's participation in the National Data Quality COVID-19 Audit ("multistate audit") led by the Delaware State Auditor. This multistate audit seeks to gather information about what COVID-19 data states are collecting and reporting, as described in Appendix B.[5]

The objectives of this report were to:

- Determine what COVID-19 related data DC Health and OCME were collecting.
- Examine how DC Health and OCME were collecting, reporting, and monitoring COVID-19 related data.

As we were in the midst of this public health emergency and did not want to add too great a burden to agencies that were actively responding, our objective for this report was not to audit the performance of DC Health and OCME in responding to the COVID-19 pandemic (i.e. analyzing the results of its programming or technologies). Rather, by determining what data was being collected and what processes were in place for accurate data collection and reporting, we hope to provide confidence in the data. We also wanted to support a multistate effort allowing for comparisons among states and the eventual identification of best practices.

Scope

The scope of our review was from March 2020 through April 5, 2021.

Methodology

To conduct this review, we:

- Utilized a list of suggested questions from the Delaware State Auditor for a multistate audit to gather information on the District's COVID-19 data reporting, as seen in Appendix B.
- Interviewed District government staff.
- Interviewed public health experts.
- Reviewed DC Health and OCME plans, policies, documents, and procedures.
- Reviewed District COVID-19 health notices and guidance.
- Reviewed DC Health and OCME annual performance plans.
- Participated in monthly calls led by the Delaware State Auditor with government auditors from across the United States.
- Compiled a list of COVID-19 data that the District was publicly reporting on its www.coronavirus.dc.gov website (see Appendix C).

5 "State Auditor McGuiness Announces Creation of a National COVID-19 Data Quality Audit Template," State Auditor Kathy McGuiness, Tuesday, July 28, 2020, see: https://news.delaware.gov/2020/07/28/state-auditor-mcguiness-announces-creation-of-a-national-covid-19-data-quality-audit-template/

- Utilized IDEA Data Analytics Software to analyze cumulative positive case and death data to identify duplicates and demographic data for completeness.
- Listened to weekly COVID-19 oversight calls between the D.C. Council and the D.C. executive branch.
- Watched the D.C. Mayor's weekly press conferences.
- Watched D.C. Council COVID-19 related oversight hearings.

This report was drafted, reviewed, and approved in accordance with standards outlined in ODCA's Audit Policies and Procedures.

Audit Results

We found that though the District published a wide range of COVID-19 data the District could be publishing more mortality related data. We also found that key COVID-19 data—positive cases and death—matched what DC Health reported publicly.

The District was proactive in publishing some data points, including vaccination data, which DC Health has continued to expand. Based on conversations with DC Health and OCME staff, we found a commitment to data quality and to continuous assessment and improvement of their processes.

DC Health and OCME were collecting and reporting a wide range of COVID-19 related data and have continually added new data, but opportunities exist to further expand public reporting.

The District was publicly reporting 166 COVID-19 related data points on the website as of April 5, 2021. This included data webpages detailing:

- COVID-19 Surveillance.
- Reopening Metrics.
- Outbreak Data.
- Exposure Activities.
- Vaccinations.

We have compiled the data points published on the website's data pages in Appendix C. Figure 2 provides an overview of this data.

Figure 2: Number of Data Points Reported Publicly by Category

Category	Number of Data Elements Publicly Reported
Cases & Testing (daily case rate, positive case rate, total overall number of tests, etc.)	18
Vaccinations	18
Hospitals (ICU beds, ventilators, etc.)	14
Assisted Living Facility & Skilled Nursing Facility	12
Schools (public, private, charter)	12
Contact Tracing	6
Death	6
Exposure Activities & Outbreaks	4
Mask Wearing	1

Category	Number of Data Elements Publicly Reported
District Government Agency Data: personnel and client/ resident cases, quarantine, and death related data	
Public Safety Agencies (FEMS, MPD, OUC)	19
Department of Corrections (DOC)	14
Department of Youth Rehabilitation Services (DYRS)	14
Human Services Agencies (CFSA, DDS, DHS)	11
St. Elizabeth's Hospital	10
Department of Motor Vehicles (DMV)	7

Source: ODCA Analysis of www.coronavirus.dc.gov/data

DC Health expanded data reporting throughout the pandemic on the website. A good example is the launch of a Vaccination Data page on January 3, 2021, with data on vaccine administration, coverage, demographics, and supply. Before the first vaccine was given, DC Health was proactively planning what data to include and how to visualize it.

In some cases, DC Health published the data after multiple requests from legislators, journalists, and the public.[6] For example, DC Health listened to stakeholders and published Outbreak Data, even as its fears were realized that outbreak data could and would be misinterpreted.[7] After our requests and confusion among the public about how outbreaks were defined, DC Health added "a plausible epidemiological link" to its definition of an outbreak, as follows: "An outbreak is defined as two or more cases of COVID-19 reported at a location *which have a plausible epidemiological link*." In the Outbreak Data Notes, DC Health began defining a plausible epidemiological link between cases as ">15 minutes of cumulative exposure time in the same immediate vicinity."[8] This definition clarified that an outbreak is based on location and a specific timeframe. DC Health also issued a Health Notice[9] with specific guidance on what constitutes an outbreak in long-term care, hospital, and outpatient settings.

D.C. was collecting and reporting most data included in the multistate audit.

The multistate audit sought information about 59 distinct data collection, monitoring, and reporting related questions. We found the District was answering 47 and partially answering another six questions, i.e. a total of 53 out of 59. Forty-three of the questions included information that should be publicly

6 D.C. Councilmember Elissa Silverman Newsletter, November 24, 2020, see: https://www.elissasilverman.com/newsletter_11242020

7 Zauzmer, Julie. "D.C. publishes reams of coronavirus data. Some say it brings more questions than answers." *The Washington Post*, Dec. 12, 2020, see: https://www.washingtonpost.com/local/dc-bowser-coronavirus-data/2020/12/12/c18e1596-39b5-11eb-bc68-96af0daae728_story.html

8 https://coronavirus.dc.gov/sites/default/files/D.C./sites/coronavirus/page_content/attachments/Outbreak_data_notes_2021-2-19.pdf

9 https://dchealth.dc.gov/sites/default/files/dc/sites/doh/publication/attachments/COVID-19_DC_Health_%20Notice_Outbreak_2021.3.10_FINAL.pdf

reported. Of these 43, the District was publicly reporting on 32 elements (74%) of COVID-19 related data and guidance.

Appendix D provides our completion of the multistate audit template for the District. Examples of COVID-19 data from the audit template that D.C. was not collecting or reporting include:

- DC Health was collecting antigen and antibody test results, but not publishing the data. DC Health prepared a report on findings from the antibody study it conducted, but the report is not yet public.
- DC Health did not monitor COVID-19 test administration (i.e. testing processes) or conduct result verification to ensure test result accuracy. DC Health informed us that in one case with the Public Health Lab, DC Health worked with staff to ensure accuracy of results for a new testing machine.
- DC Health did not collect the number of tests (i.e. total tests, positive cases) at rehabilitation facilities.

In addition to the multistate audit, ODCA had other COVID-19 data collection questions that we posed to DC Health and OCME. We found that DC Health and OCME were publicly reporting or partially reporting most of those data elements, but there were exceptions. For example, we learned that neither OCME or DC Health tracked the number of and/or the rate of uninsured for patients who died of COVID-19. Appendix E provides our analysis of ODCA's additional data questions.

The multistate audit questions also covered guidance. We found that DC Health was early and prompt in issuing guidance in response to CDC COVID-19 guidance and World Health Organization (WHO) actions. We summarized COVID-19 related health notices from the Health Guidance[10] page at the website and DC Health's Health Notice page[11] in Appendix F.

The District made progress since ODCA's November COVID-19 data best practices report, but some key data elements are still not reported.

Since we released the November 23, 2020, report that analyzed D.C.'s COVID-19 data reporting as compared to the 15 indicators recommended by the public health organization Resolve to Save Lives, DC Health has made 10 additions or partial additions to its data reporting that were responsive to our recommendations, including:

- **Mask Wearing Prevalence**
- **Exposure Activity Data**
- **Assisted Living Facility Data:** DC Health is now reporting cumulative cases and death data for assisted living facilities as well as skilled nursing homes in downloadable data on the website. However, new cases and death counts are not presented. In terms of other congregate residential facilities, DC Health is not reporting cases and deaths at the facility level for homeless shelters, Department of Corrections facilities (jails, halfway homes), and group homes.

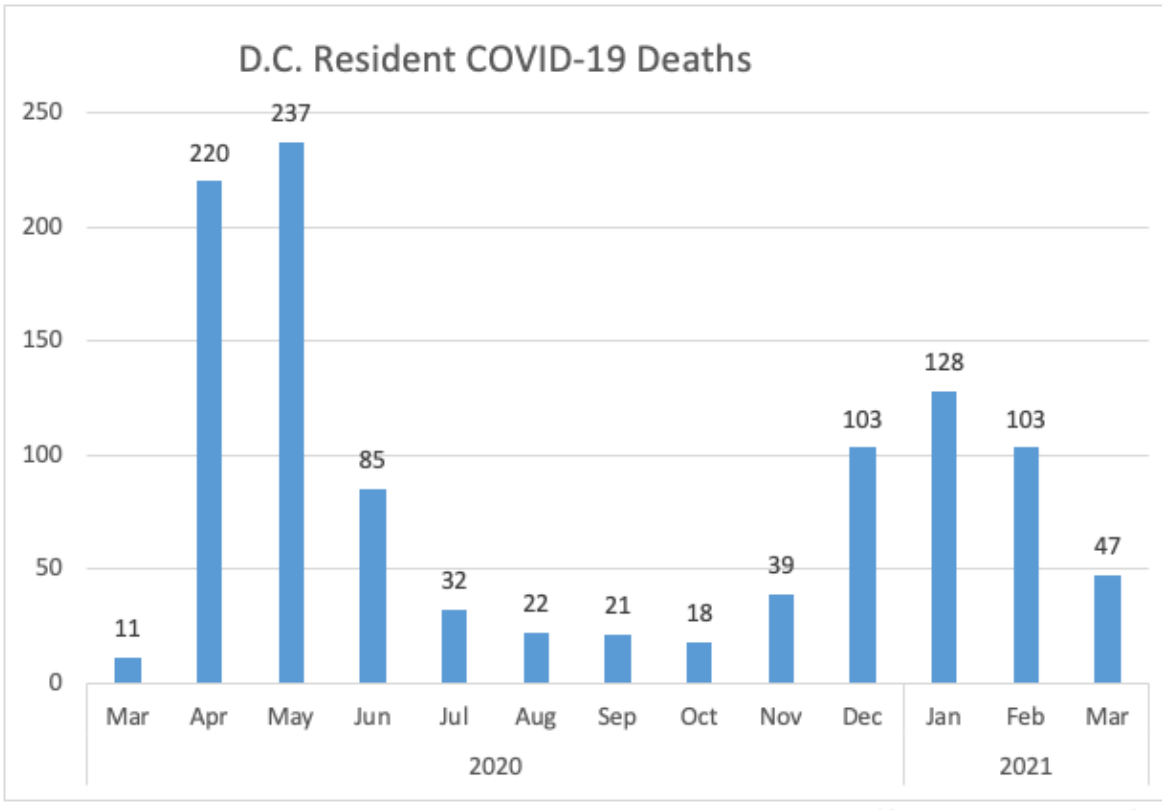
10 https://coronavirus.dc.gov/healthguidance
11 https://dchealth.dc.gov/page/health-notices

Nine of our recommendations have not yet been addressed, including publishing:

- **Daily Death Counts.** Throughout the pandemic and as of the end of our audit scope, only cumulative death data is being reported on the data pages of the website, not the number of deaths per day as our November report recommended.[12] Daily death counts are only reported in news releases for each day on the Newsroom page of the website.[13] Along with new cases, the number of new deaths is one of the most basic indicators in a pandemic.

To illustrate the value of this data, ODCA created a simple monthly death total from the beginning of the pandemic through March 2021 in Figure 3. DC Health can decide how exactly to report deaths over time, but new deaths should be reported in a clear visualization that allows the user to grasp trends in COVID-19 mortality.

Figure 3: ODCA-Created Graph to Show Death Counts by Month in the District



Source: ODCA based on downloadable data from June 1, 2021 on https://coronavirus.dc.gov/data

12 ODCA. *The District's COVID-19 Data Reporting is Strong but Opportunities Exist for Improvement and Increased Transparency.* November 23, 2021. https://dcauditor.org/report/the-districts-covid-19-data-reporting-is-strong-but-opportunities-exist-for-improvement-and-increased-transparency/, pg. 8.

13 https://coronavirus.dc.gov/newsroom

- **Population Figures (i.e. denominators).** We recommended that "DC Health should report what population figures it is using for any metrics, e.g. the District population and demographic group population."[14]
- **Explanation of Sudden Changes.** We suggested in our first report that any spikes in reopening metrics should be explained. For example, on March 8, 2021, DC Health published a backlog of 196 cases caused by delays in lab reporting. Since data is presented by the date it is reported to DC Health, not the test date, the publishing of this data caused a spike in several reopening metrics, including the daily case rate as well as the mean test turnaround time. However, since DC Health did not note the reason for the spike with the data on the Reopening Metrics page and graphs, this reporting of a backlog led to confusion by Councilmembers who thought that the District had experienced a spike in cases on March 8, 2021.

Lack of ownership of death data leads to missed opportunities in communicating with the public.

OCME also is collecting other mortality information that should be made public. In terms of deciding what COVID-19 death data to report on the data pages of the website, officials with both OCME and DC Health said they did not believe it was their responsibility. This has led to missed opportunities in clearly presenting data.

OCME produces an informative internal report, complete with graphics and statistics that includes comorbidity and place of death data, which could contribute to the public's understanding of the pandemic. We could find no reason why this information was not made public. For example, comorbidity data could have added context to DC Health's decision to open vaccinations to people with certain chronic medical conditions before the general population. Figure 4 provides an example of this data from October 19, 2020, which OCME collected and reported to DC Health and other District agencies.

14 ODCA. *The District's COVID-19 Data Reporting is Strong but Opportunities Exist for Improvement and Increased Transparency.* November 23, 2021. https://dcauditor.org/report/the-districts-covid-19-data-reporting-is-strong-but-opportunities-exist-for-improvement-and-increased-transparency/, pg. 11-14, 18.

Figure 4: OCME Data on Comorbidity Prevalence in COVID-19 Deaths from October 2021

Prevalence of Comorbidities among COVID-19 Deaths (n=542)		
Comorbidities	**# of Deaths**	**% of COVID Cases**
Asthma	26	5%
COPD	47	9%
Diabetes	248	46%
Hypertension	381	70%
Cancer	57	11%
HIV	14	3%
Other	276	51%

Note: The other category includes conditions such as: chronic kidney disease, obesity, congestive heart failure, sarcoidosis, lupus, end stage renal, coronary artery disease, cerebrovascular infarction, endocarditis, pulmonary fibrosis, atrial fibrillation, and cardiomyopathy.

Source: OCME COVID-19 Related Death Report as of October 19, 2020

Recommendation

1. The Mayor/Office of the City Administrator should clarify who is responsible for publishing death data and publish the additional information contained in the internal OCME COVID-19 related deaths report, including comorbidity data, on the data pages of the coronavirus website.

DC Health has procedures to monitor COVID-19 data they are collecting and reporting.

We conducted both a data review of positive cases and deaths and a review of data collection and monitoring procedures in place during our scope from March 2020 through April 5, 2021. While our review did not evaluate the effectiveness of COVID-19 related testing facilities, contact tracing programs, and the certification of COVID-19 death certifications, we found that, overall, DC Health and OCME had procedures in place and implemented these procedures to collect, monitor, disseminate, and report COVID-19 data.

Data Review: Our Analysis Found the Positive Case and Death Data Matched DC Health's Reporting

To understand the pandemic in D.C., we reviewed the key dataset of positive cases and deaths. We analyzed cumulative data from DC Health that underlie the totals posted on January 12, 2021, when the District reported 32,600 cases and 831 deaths since the beginning of the pandemic. Using advanced data analytics software, we found 10 possible duplicates in the positive cases (representing less than 0.0005%) and zero duplicates in the death data. Finding so few possible duplicates in 32,600 cases is an excellent result. For five of the 10 cases that were definitely duplicates, DC Health later identified and removed the duplicate entries, suggesting that DC Health is monitoring and improving the accuracy of case counts. We do note, though, that we did not review all test results, only positive cases; we therefore cannot confirm that all positive tests made it into the positive case count provided. We do also note that there also have

been occasional challenges with backlogged data.[15]

DC Health also provided a detailed data dictionary that they had developed for the dataset. As mentioned in our November 2020 report, we also encourage DC Health to publish a data dictionary for the downloadable data that they publish.

We also found a high level of completeness of demographic information for positive cases and deaths. We reviewed four key demographic fields—age, sex, race, ethnicity—from the dataset from January 12, 2021. This dataset was pulled from DC Health's Research Electronic Data Capture (REDCap) system which laboratories and providers use to report test results to DC Health. For age, sex, and race, in the dataset that we analyzed, we found that there were very few missing data, i.e. under 1.2% of entries were missing age, sex, or race.

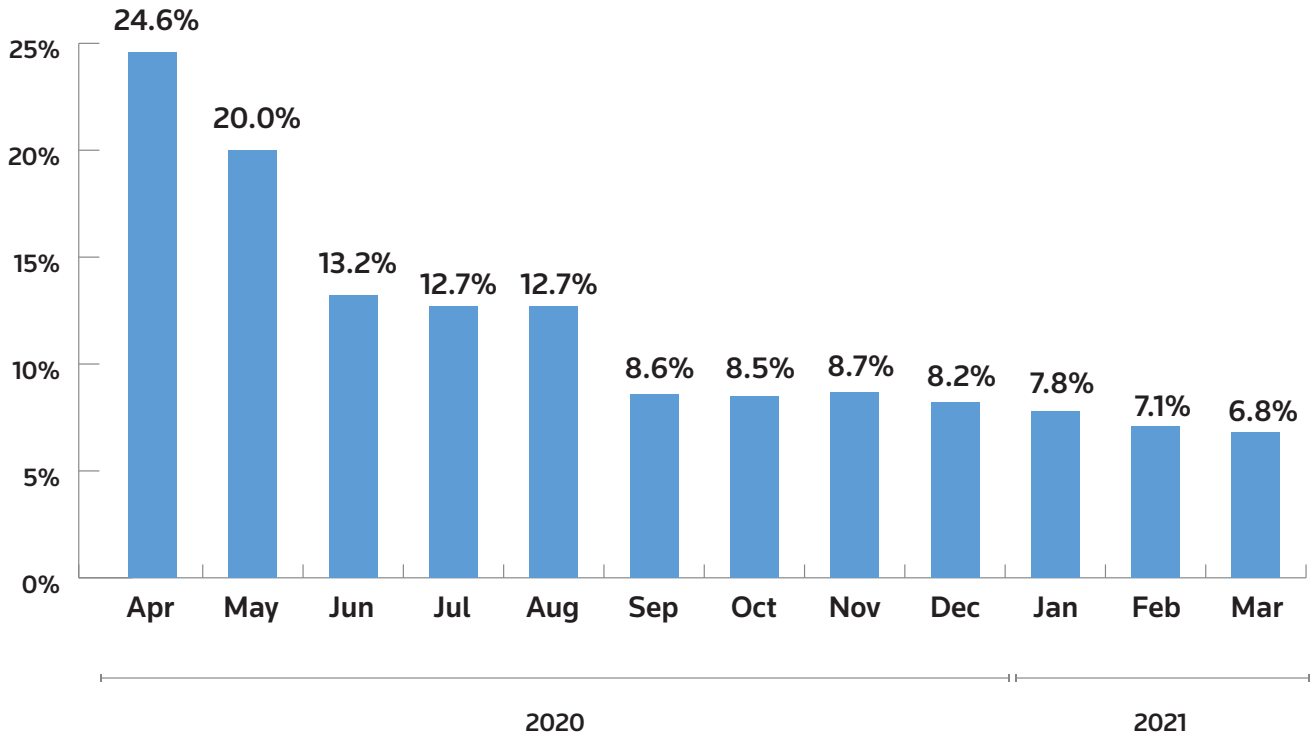
Ethnicity did appear to be a more challenging data field to collect from labs and providers; nearly 20% of data was missing for ethnicity. DC Health improved completeness over time by filling in additional demographic information gained by searching the Chesapeake Regional Information System for our Patients (CRISP) database,[16] the designated Health Information Exchange for Maryland and the District, or by using information obtained during contact tracing. CRISP has D.C., Maryland, and sometimes Virginia hospital patient record data. DC Health updates the downloadable data published on the website as it finds additional demographic data. In the downloadable data for January 12, 2021, we found that only 8% of ethnicity data was missing, showing that DC Health had filled in additional information for previous cases.

We also reviewed over a year of downloadable data from April 5, 2020 through March 31, 2021. In examining data over the pandemic, completeness of the ethnicity data has improved over time, suggesting DC Health prioritized completing missing demographic data. Figure 5 shows the decline in the percentage of ethnicity data that is missing by month.

15 https://coronavirus.dc.gov/release/coronavirus-data-march-8-2021

16 CRISP is a non-profit organization that facilitates the electronic transfer of clinical information between disparate health information systems. https://www.crisphealth.org/

Figure 5: Percentage of Missing Ethnicity Data for Positive Cases Declined Over Time



Source: ODCA generated graph from downloadable data presented on https://coronavirus.dc.gov/data as of March 31, 2021

DC Health described processes for improving data quality and completeness. For some test results, both the labs and providers submit information. DC Health uses both sources to fill out data fields, such as demographic information, that may have been missing from one of the reports. At the same time, DC Health has processes in place to identify and remove duplications, including checking that testing reports sent by labs and reporters are not already in the system and running a de-duplication program.

Process Review: COVID-19 Testing Results Data Collection and Monitoring

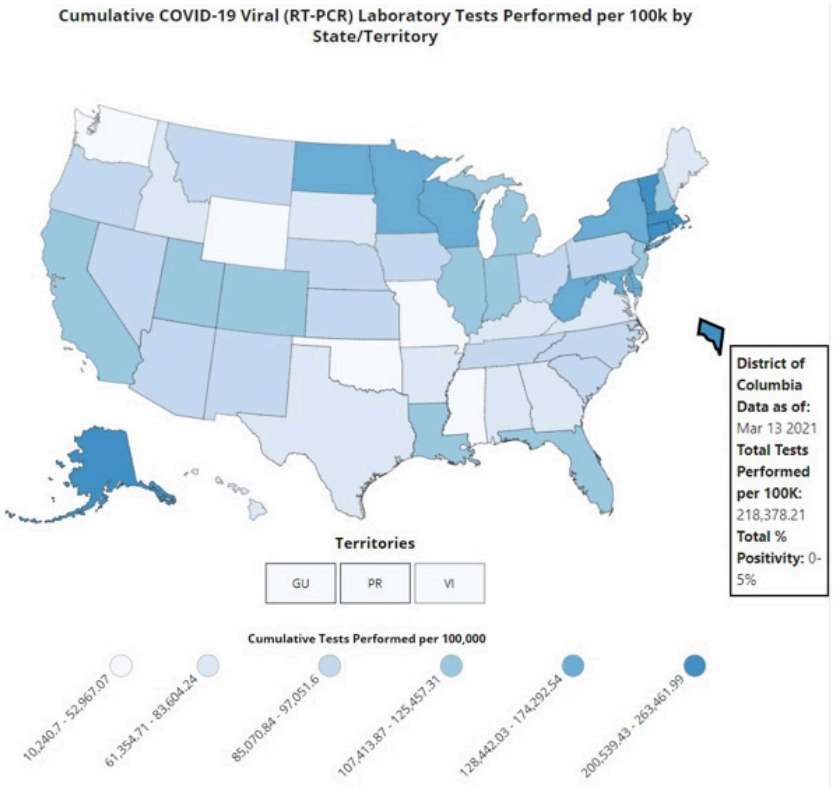
We spoke at length with DC Health on how it collects and reports testing data. The following sections provide an overview of the District's testing capacity; guidance; test types and test information; residency determinations; and electronic laboratory reporting.

The District's Testing Capacity Throughout the Pandemic

The District's public testing program has been robust, comprising 16 sites throughout the District at the height of the pandemic, including two with drive-through options. The public testing sites opened in April

2020[17] and expanded throughout 2020.[18] The District policy has been "Need a test, get a test" throughout most of the pandemic. The District began asking for insurance information on November 23, 2020 but has continued to allow anyone to get tested regardless of insurance status.[19] The number of people getting tested each day for COVID-19 in the District increased tenfold from the early months of the pandemic. In April 2020, when testing was more restricted, on average 550 people were getting tested each day. By December 2020 during one of the worst phases of the pandemic, 6,624 people were receiving tests each day on average. The positivity rate decreased greatly from its highs of around 30% in April 2020 as testing increased. The District has done well in terms of per capita testing rates compared to many other states. According to Johns Hopkins University, D.C. ranked #8 among states in testing totals by population, as of March 12, 2021.[20] The District has also been a leader in per capita testing rates according to the CDC's data[21] as of March 13, 2021, as seen in Figure 6.

Figure 6: CDC Data Shows D.C. In Highest Category of COVID-19 Tests Performed Since the Beginning of the Pandemic from March 13, 2021



Source: CDC, https://covid.cdc.gov/covid-data-tracker/#testing_testsper100K as of March 13, 2021

17 https://coronavirus.dc.gov/release/mayor-bowser-and-first-lady-obama-encourage-residents-covid-19-symptoms-get-tested
18 https://coronavirus.dc.gov/release/need-test-get-test-district-expands-free-covid-19-testing-firehouses-across-dc
19 Beginning Monday, November 23, individuals who have health insurance will be asked to provide their insurance information when registering for a test at a public site, see: https://coronavirus.dc.gov/testing
20 https://coronavirus.jhu.edu/testing/states-comparison/testing-state-totals-bypop
21 https://covid.cdc.gov/covid-data-tracker/#testing_testsper100K – as of March 13, 2021

Testing Guidance

DC Health issued guidance on January 28, 2020, that testing had to be approved by the CDC. The District Department of Forensic Sciences Public Health Lab initially handled COVID-19 testing in the District, and the first COVID-19 case was identified on March 7, 2020. On March 13, 2020, DC Health issued guidance that since testing was now available at commercial and hospital labs, healthcare providers could also use those options to get patients tested. As testing capacity increased and as the CDC updated its own guidance, DC Health updated and expanded testing priority groups for the District.

In addition to publishing Health Notices for providers[22] and other COVID-19 Health guidance[23] on the website, DC Health disseminated guidance through its listservs of registered healthcare providers and labs. If a provider or a lab not on DC Health's listserv reported test results, DC Health added that provider or lab to the appropriate listserv.

DC Health did not issue specific guidance for testing young children. Initially, public sites only provided testing for children age 6 and older until expanding to children age 3 and older.

Test Types & Case Information

DC Health collects molecular, antigen, and antibody test results.[24] DC Health stated that it has always kept results separate by test type, using different codes. The District never combined positive antibody and molecular testing results in reporting total cases, an issue that caused confusion in other states early in the pandemic.

The District only reports molecular polymerase chain reaction (PCR) test results for its daily case rate. The District does not publicly report on antigen test results.

DC Health reports molecular (PCR) test results by date that DC Health received the result, not by specimen collection date. Reinfections are also not counted as new cases (as of March 2021). Figure 7 describes the information that DC Health collects.

Test Types
Molecular Test: a diagnostic test that detects genetic material from the virus. Reverse Transcription Polymerase Chain Reaction (RT-PCR) is one type of molecular test.
Antigen Test: a diagnostic test that detects specific proteins from the virus. It is also known as a rapid test.
Antibody (Serology) Test: detects antibodies that are made by your immune system in response to a threat, such as a specific virus; not used to diagnose active infection.

22 DC Health – Health Notices Page: https://dchealth.dc.gov/page/health-notices
23 District COVID-19 Health Guidance page: https://coronavirus.dc.gov/healthguidance
24 FDA. Coronavirus Disease 2019 Testing Basics. https://www.fda.gov/media/138094/download

Figure 7: Information DC Health Collects on COVID-19 Cases

Demographic	date of birth, race, ethnicity, sex at birth, gender, sexual orientation, pronouns, address
Exposure	occupation, travel history, activities during the exposure period, activities during infectious period
High Risk Group	homeless, long term care resident, etc.
Health	symptoms, underlying conditions, hospitalization (admission and discharge date)
Mortality	death date, death location

Source: ODCA

Residency Determination

The total positive cases reported on the website data pages include only District resident cases. However, for the total positive case count, a District resident is defined as anyone staying in the District after their test during the contact tracing and monitoring period, not where someone officially declares their residence.

To make a residency determination, DC Health generally uses the address provided by the lab report. If the report provides no address for a test result, staff searches for the person in CRISP. If a person reports a Maryland or Virginia address, the District can transfer the test information electronically to either state. If the lab report lists an address from another state, DC Health reaches out to the patient to determine whether the person is staying in D.C. during contact tracing and monitoring by DC Health, and if so, DC Health counts that person as a District resident. If the person is not staying in the District during contact tracing and monitoring, then the District sends their test result to the other state. If DC Health is unable to determine an address, it includes the test in the District's total case count.

For some healthcare facilities and long-term care facilities like skilled nursing homes where employees are frequently tested, labs sometimes send the results with the employer's address. DC Health checks results against a list of facility staff to determine residency.

Electronic Laboratory Reporting

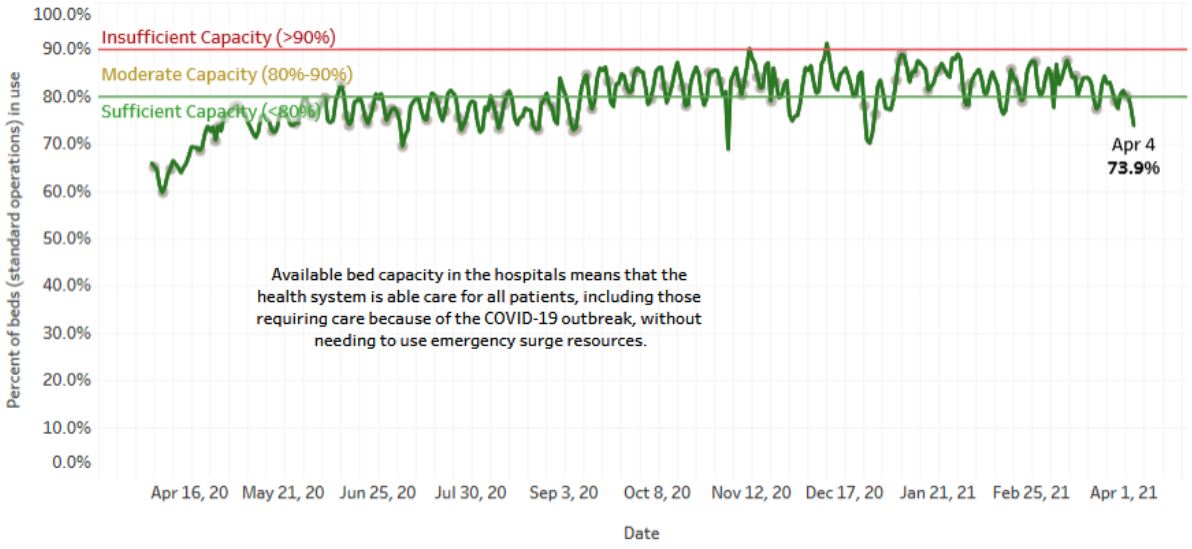
In October 2020, DC Health began requiring labs to report results electronically. Electronic reporting results in faster delivery of results, reduces the risk of human error when entering data manually, and facilitates the identification of duplicates. DC Health reported that most labs are now sending results electronically, and DC Health is helping the remaining labs convert to electronic reporting.

Some labs are able to send results electronically via Health Level 7 (HL7) messaging. HL7 is a nationally recognized standard language for securely exchanging healthcare data; it is also used internationally. The CDC has been promoting the use of HL7 as part of its push to expand electronic laboratory reporting (ELR) to state and local health departments.[25] When onboarding labs that were reporting test results electronically, DC Health validated that the results sent via HL7 were accurately transferring to its database.

Building Upon Partnerships: Hospital COVID-19 Data Collection

A key component of DC Health gathering reliable and complete COVID-19 data from hospitals was its partnership with the D.C. Hospital Association (DCHA). DC Health provided guidance to hospitals, with assistance from DCHA, on how to count available ICU beds, hospital beds, and ventilators. DC Health also provided a grant to DCHA to develop a reporting system using EMResource for collecting and reporting COVID-19 hospital data. EMResource replaced a legacy system that hospitals were using during the first few months of the pandemic that was not as dynamic or user friendly. The DCHA team explained that this involved building a unified system for hospitals to report data to both DC Health and the federal Department of Health and Human Services (HHS). All the District's hospitals, with the exception of Sibley Memorial Hospital, use this system to report required data. Hospitals must submit data daily on items such as COVID-19 patient bed counts, available beds, and available medicines, as illustrated in Figure 8.

Figure 8: How the District is Reporting on Hospital Bed Utilization



Source: DC Hospital self-report to Health Emergency Preparedness and Response Administration, DC Health; DC Hospital Association.
Metric Definition: The number of beds currently in use for patient care divided by the total number of beds available under standard operations in acute care hospitals within DC.

DCHA provided ODCA with a virtual tour of EMResource and walked us through how the system prompts data quality checks, daily audits, and data scrubs on weekends. DCHA shared that the system has been

25 https://www.cdc.gov/elr/index.html

continually evolving to adapt to reporting needs and that they regularly audit the data. They also shared that there are weekly meetings between DCHA, DC Health, and hospitals to troubleshoot and improve user experience.

OCME's advance preparation and decision to certify all COVID-19 deaths led to consistent collection and monitoring of COVID related deaths in the District.

We found that OCME has been notable in its handling of COVID-19 deaths by being alert early in the pandemic, centralizing authority and death certifications, and relying on its training and preparation for a mass fatality event. The District was the only jurisdiction where the Chief Medical Officer took over certifying all COVID-19 deaths, including hospital deaths, and taking possession of all bodies. Florida at one point attempted this but eventually was overwhelmed so the Florida Chief Medical Examiner switched to allowing hospitals to certify deaths.

Advance Preparation: OCME Had Conducted Emergency Preparedness for a Mass Fatality Event

Prior to the pandemic, OCME brought on board leadership with mass fatality experience and has had a mass fatality management plan in place since 2018 that included annual training. OCME was able to rely on this knowledge base to handle COVID-19.[26] From 2013 through 2020, Dr. Mitchell was the District's Chief Medical Examiner, and had a background in mass fatality review.[27]

OCME's Mass Fatality Plan had a corresponding Field Operations Guide with detailed procedures for the transportation of bodies, managing a highly infectious disease outbreak, and training staff. The plan and guide suggest a high level of preparedness to handle the pandemic, and indeed, OCME took steps detailed in these documents to respond to the pandemic, including taking custody of all bodies potentially infected by COVID-19 and obtaining additional refrigerated storage.

Early Action: OCME moved quickly to handle a pandemic

OCME reported that in January 2020, its staff started investigating deaths as possible COVID-19 cases, inquiring about flu-like symptoms and recent travel since testing was not available yet. OCME also made an early decision to certify all COVID-19 deaths occurring in the District. HSEMA activated the District Response Plan under which OCME, "will coordinate all mass fatality management efforts, including investigating, establishing a temporary morgue(s), coordinating transportation of remains, performing postmortem examinations and identifications, securing evidence, certifying cause and manner of death, and releasing remains." The District Response Plan draws from the D.C. Code which requires any infectious disease deaths that could constitute a threat to be reported to OCME and for OCME to take

26 https://oca.dc.gov/sites/default/files/dc/sites/oca/publication/attachments/OCME20.pdf

27 Dr. Mitchell left OCME for an appointment at Howard University in January 2021. Dr. Francisco Diaz is currently in the position of the Chief Medical Examiner, see: https://ocme.D.C..gov/page/executive-staff-ocme From April 2020 until his departure, Dr. Mitchell was also serving as Deputy Mayor for Public Safety and Justice, and his Deputy Director Dr. Diaz had been playing an acting role.

charge of the body.[28]

OCME set up a COVID-19 disaster morgue with a 600-cadaver capacity to handle a surge in COVID-19 deaths which it maintained through July 2020. OCME rented refrigerated trucks and converted tents into field deployable morgue units. Other jurisdictions throughout the U.S. have had to scramble during surges in the pandemic to buy refrigerated trucks.[29] OCME had these procedures in place from the beginning. Figure 9 shows OCME efforts to establish emergency morgue operations to prepare for COVID-19 fatalities.

Figure 9: OCME Efforts to Establish an Emergency Morgue in the District

Source: OCME

28 D.C. Code § 5-1405(b), 5-1406(a) https://code.dccouncil.us/dc/council/code/titles/5/chapters/14/

29 "Texas deployed its National Guard to help with overflowing morgues in El Paso as the coronavirus death toll rises," Morgan McFall-Johnsen, Business Insider, Nov. 21, 2020, see: https://www.businessinsider.com/el-paso-coronavirus-overwhelmed-morgues-calling-texas-national-guard-2020-11. "'A mass fatality event': California struggles with backlog of bodies of COVID-19 victims," Rong-Gong Lin II and Luke Money, Los Angeles Times, Jan. 9, 2021, see: https://www.latimes.com/california/story/2021-01-09/with-hospital-morgues-overwhelmed-by-bodies-coroner-begins-storing-bodies-as-covid-deaths-surge

OCME COVID-19 Certification Process Allows the District to have Only Confirmed, not Probable COVID-19 Deaths

The District had a consistent process for certifying COVID-19 deaths unlike jurisdictions that rely on a mix of chief medical examiner and coroners to certify deaths. The District also avoided the category "probable" COVID-19 death because OCME certified all COVID-19 deaths. Having the Chief Medical Examiner certify all deaths lead to accurate, consistent data.

The National Center for Health Statistics (NCHS) noted that one challenge with death data quality is that death certifiers may not be well trained, an issue that the District avoids by having OCME certify all deaths. Nationally, NCHS has seen problems with death certifications in about 20-30% of reported COVID-19 deaths. NCHS praised OCME as highly professional and doing a good job during a webinar on COVID-19 data.

OCME's death certification process works as follows. OCME takes possession of all bodies that are potential COVID-19 deaths. In the case of hospital deaths, hospitals report the death to OCME, and OCME reviews hospital records and COVID-19 test results that accompany the body to certify the death. In the case of a potential COVID-19 community or non-hospital death (e.g. home, street, nursing home, hospice, or jail), the death must be called into OCME. OCME will ask about signs of a potential COVID-19 infection including flu-like symptoms, travel, or a recent hospital stay. If there are signs of a potential COVID-19 infection, OCME brings the body to its facility and conducts an examination, including a chest x-ray and a COVID-19 test if there is no record of one. The Public Health Lab then analyzes COVID-19 tests.

OCME sends DC Health and other executive branch agencies a daily report of the COVID-19 deaths that it has certified over the last 24 hours, with a cutoff at noon on the day of the report. Also, daily, DC Health and OCME reconcile the COVID-19 deaths that are to be reported publicly. Deaths reported daily on coronavirus.dc.gov are based on when deaths are reported by OCME to DC Health after they are certified, not by date of death.

OCME also completes required fields in DC Health's Vital Statistics System. It may take five or more days for certified COVID-19 deaths to be fully recorded in the Vital Records System. For District residents that die of COVID-19 outside of the District, OCME receives death information via DC Health. OCME then confirms with that state's medical examiner or coroner that this is a COVID-19 death and reports back to DC Health.

We are encouraged that OCME and DC Health have shown a willingness to learn from the challenges of the pandemic. OCME plans on doing an After-Action Report to learn from their experience and anticipate providing a national example for how to handle death certification and fatality management during a pandemic. In May 2021, DC Health released a report[30] that catalogues the pandemic's impact on the District, outlines a framework for a post-pandemic recovery, and provides recommendations for changes needed across the District's healthcare system. While we welcome the forward-looking nature of this

30 DC Health. May 2021. "COVID-19 Pandemic Health and Healthcare Recovery Report." https://dchealth.dc.gov/sites/default/files/dc/sites/doh/page_content/attachments/Pandemic-Recovery-Report_May-2021.pdf

report, we also encourage the District to complement this report with a full review of the government's pandemic response, identifying what worked and what did not. We strongly believe that such a review will be an essential tool in strengthening our emergency response infrastructure including public health, responding with effective policies and interventions, and preparing for future emergencies.

Recommendation

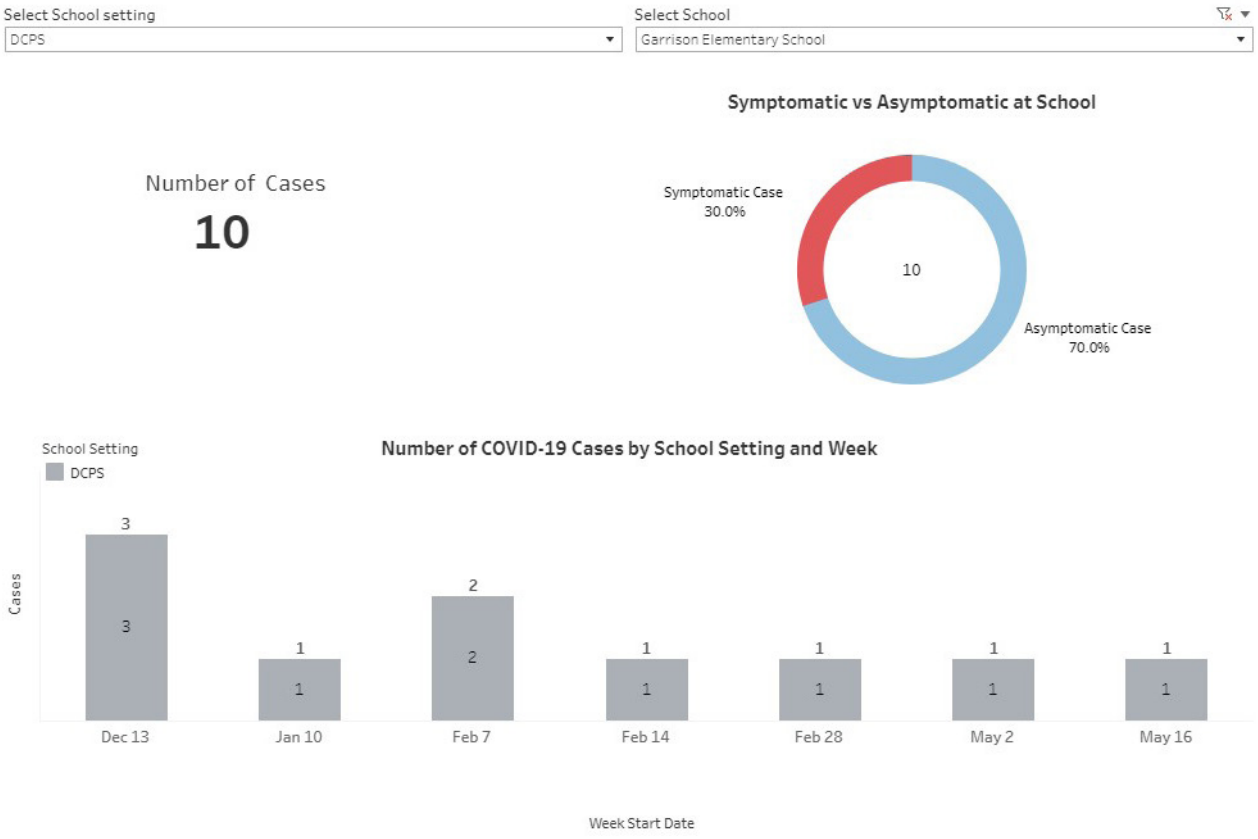
2. The Mayor should initiate a comprehensive review of the COVID-19 pandemic response culminating in a public report with DC Health, OCME, HSEMA, and any other key agencies to determine what worked and what should be done differently in the face of a similar health emergency including any recommended updates to the District's Emergency Response Plan.

Auditor's Observations

While substantial progress has been made in reporting school related data, there is still room for improvement.

In our November 2021 report, we expressed an Auditor's Concern that "Reopening schools creates new public reporting needs down to the school level."[31] DC Health publishes a K-12 Schools Data page[32] which allows the user to view the number of cases at each school in the District over time (as seen in Figure 10). The reporting is clear, allowing parents to see when cases occurred.

Figure 10: DC Health Reporting Schools' COVID-19 Cases Over Time: Garrison Elementary as an Example



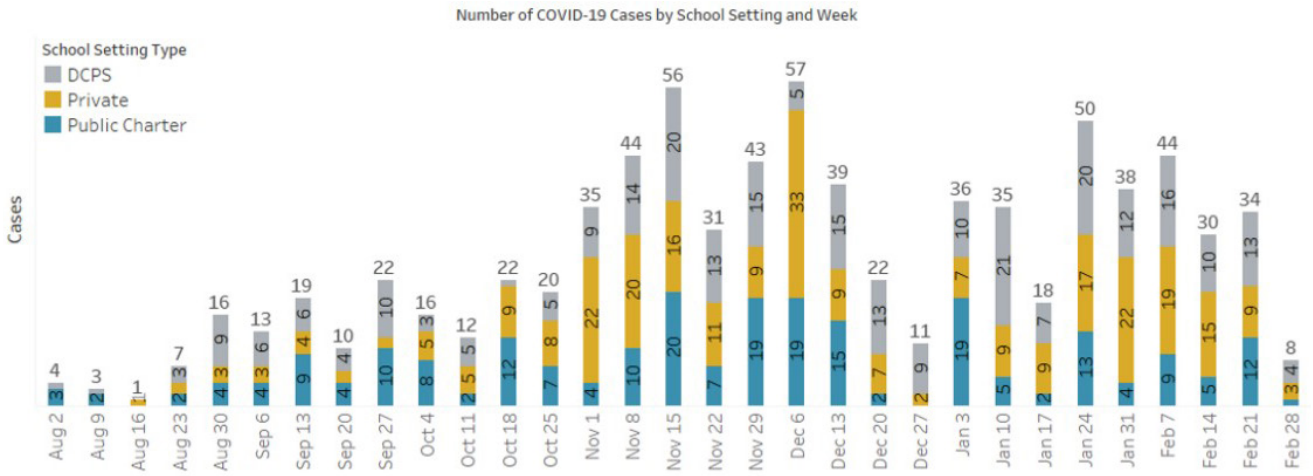
Source: https://coronavirus.dc.gov/data/schools as of May 25, 2021

31 Ibid, pg. 21-23
32 https://coronavirus.dc.gov/data/schools

However, schools that have had five or fewer COVID-19 cases since the beginning of the pandemic do not have data displayed. DC Health does not believe it should publish case numbers when there are fewer than five cases. However, DCPS is already publicly reporting all cases as they occur regardless of number on their Reopen Strong website.

The K-12 schools data page[33] is a thorough update from March 15, 2021, when for the first time, DC Health presented weekly cases over time in a Situational Update as seen in Figure 11 and then published that information on the outbreak data page.[34] In the future, more timely information during a pandemic about school cases would likely be useful to parents and District residents as a whole. As the graph itself notes, "By October 2020, DCPS, charter, and private schools all had some component of in person learning." March 2021 was also the first time any charter school and private school case data had been published by DC Health. DC Health, by continuing to revise its school reporting, now has a transparent template for such information if needed.

Figure 11: Weekly School Cases by School Type



Source: DC Health. March 15, 2021 Situational Update[35]

While progress has been made in school reporting, DC Health is still not reporting COVID-19 cases at childcare centers on the coronavirus webpage. This lack of a one-stop shop for data on cases at childcare centers is not in line with practices of our neighboring jurisdictions. For example, Virginia is reporting outbreaks in multiple congregate settings, including daycare centers.

33 https://coronavirus.dc.gov/data/schools
34 https://coronavirus.dc.gov/page/outbreak-data
35 https://mayor.dc.gov/sites/default/files/dc/sites/coronavirus/release_content/attachments/Situational-Update-Presentation_03-15-21.pdf, pg. 31.

COVID-19 Reporting in Educational Facilities

DC Health issued and updated guidance to schools, childcare centers, and universities. All three are required to report cases among students or staff to DC Health. DC Health trained DCPS and charter school nurses how to report cases and reported having points of contact at private schools.

DC Public Schools Testing

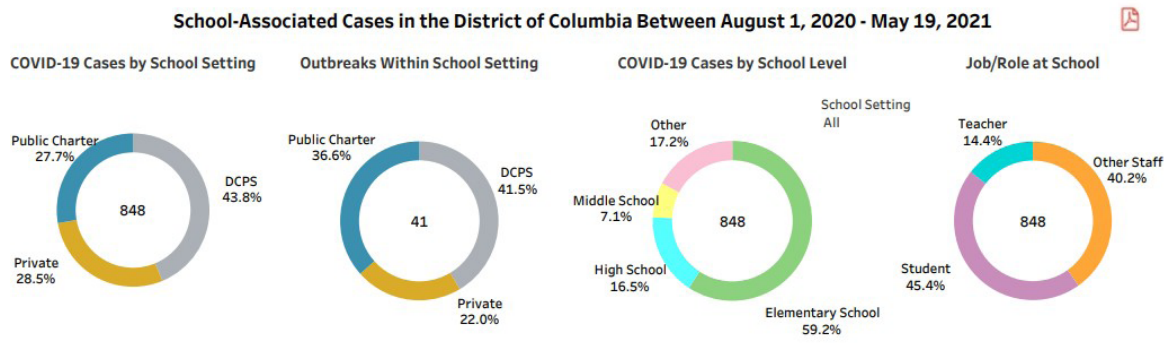
Although not representative of all students in the District, the process DCPS follows for both symptomatic and asymptomatic testing provides a window into how reporting on testing could be improved across all schools. DCPS currently has a bifurcated testing system for students who are symptomatic and asymptomatic, i.e. surveillance testing. Students must have different consent forms to participate in symptomatic and asymptomatic testing.[36] The symptomatic testing form is valid for the remainder of the school year whereas the asymptomatic consent form is valid only for 90 days. So far, the District has no consistent, public reporting on the percentage of students participating in in-person learning who have either type of consent form on file.

On March 10, 2021, DCPS Chancellor Dr. Lewis Ferebee testified to the D.C. Council that of the approximately 10,000 students participating in in-person learning, approximately 3,851 students have asymptomatic consent forms on file. However, this information is not reported publicly online.

Reporting on school cases could be improved

DC Health is publishing some data on testing in schools, as shown in Figure 12.

Figure 12: Cases by School Type, Level, and Role Reported on the K-12 Schools Page



Source: https://coronavirus.dc.gov/data/schools as of May 25, 2021

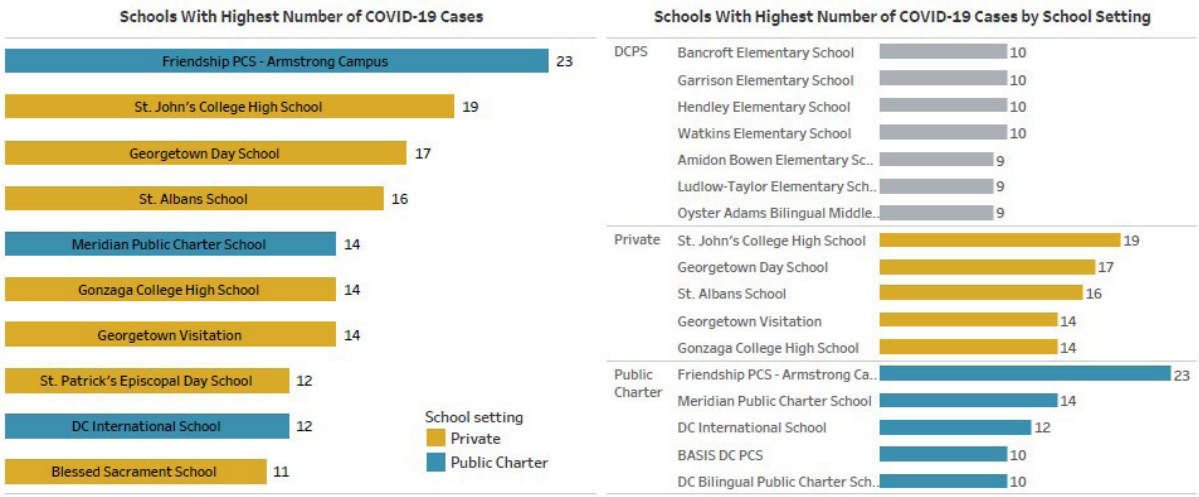
However, more information on population figures, i.e. denominators, or per capita rates, is needed for the various data presented.

36 DCPS Asymptomatic Testing Protocol: "Update on COVID-19 Asymptomatic Testing for Students." March 11, 2021. https://dcps-reopenstrong.com/chancellor/update-on-covid-19-asymptomatic-testing-for-students%E2%80%AF/

The graphs on the percentage of cases by school type (public, charter, private), by school level (elementary, middle, high school), and by role (e.g. staff, teachers, and students) would be more helpful if the user knew how many students and staff were in-person in each category. For example, private schools make up a lower percentage of cases than in public schools, but we cannot tell from the graphs if private schools simply have fewer students and staff in-person than public schools. Additionally, the number and percentage of students participating in asymptomatic and symptomatic testing (i.e. for DCPS, have consent forms on file) and the number of students and staff tested on a weekly basis would be helpful.

DC Health is also publishing the names of the top 10 schools District-wide and the top five schools by school type (public, charter, private) with the most cumulative cases as seen in Figure 13. However, without a denominator, this data is of limited use for comparison since some schools have been open longer with more students in attendance and private schools especially may have more frequent testing protocols.

Figure 13: Schools with the Most Cumulative Cases in the District



Source: https://coronavirus.dc.gov/data/schools as of May 25, 2021

We encourage DC Health to consider reporting on more testing data for DCPS, public charter, and private schools. To summarize, the following data are not yet published:

a. Number of students in-person.
b. Percentage and number of in-person learning students who have consent forms on file for each program.
c. Number of students and staff tested weekly by each program.
d. Number of positive cases identified weekly among students and staff by each program.

These data could add to our understanding of COVID-19 prevalence in schools. The data could be useful for evaluating the effectiveness of the testing programs, not only for the District but for other school districts to learn from the District's experience in designing their school testing programs. These are questions of national interest. For instance, a news report in Baltimore cited the Baltimore City schools testing program as likely helping contain community infections although studies are needed.[37]

Recommendations

3. DC Health should publish weekly childcare center case data over time as it is doing for K-12 schools.
4. DC Health should publish case numbers at each school even when there were fewer than five cases cumulatively at a school.

DC Health has continuously improved internal processes for its contact tracing program.

We spoke several times with DC Health's contact tracing team, who also provided a virtual tour of the information system used to manage the contract tracing program, Salesforce ("the system"). They described multiple goals of the contact tracing program,[38] including to:

- Control COVID-19 infection and transmission by quickly identifying potential contacts and making sure they quarantine.
- Notify positive cases quickly that they are positive and give guidance to isolate.
- Identify any community clusters so that the DC Health epidemiology team can investigate and provide education to the location (i.e. daycare, workplace).
- Conduct a virtual home assessment to determine if individuals can safely quarantine at home, and if not, provide suggestions on what they can do based on home layout.
- Link people who are positive cases to needed food or housing resources.

DC Health's contact tracing process begins when DC Health receives positive test data at night and the following day, cleans and imports the data into the contact tracing system. The contact tracers, who receive two weeks of intensive training, use the system to make calls and read a script to collect information about the client's activities during their infectious period, including time of day and location, as well as their close contacts. The close contacts are then contacted by the contact tracers, who inform them of their exposure to a positive case and the need to get tested and quarantine.

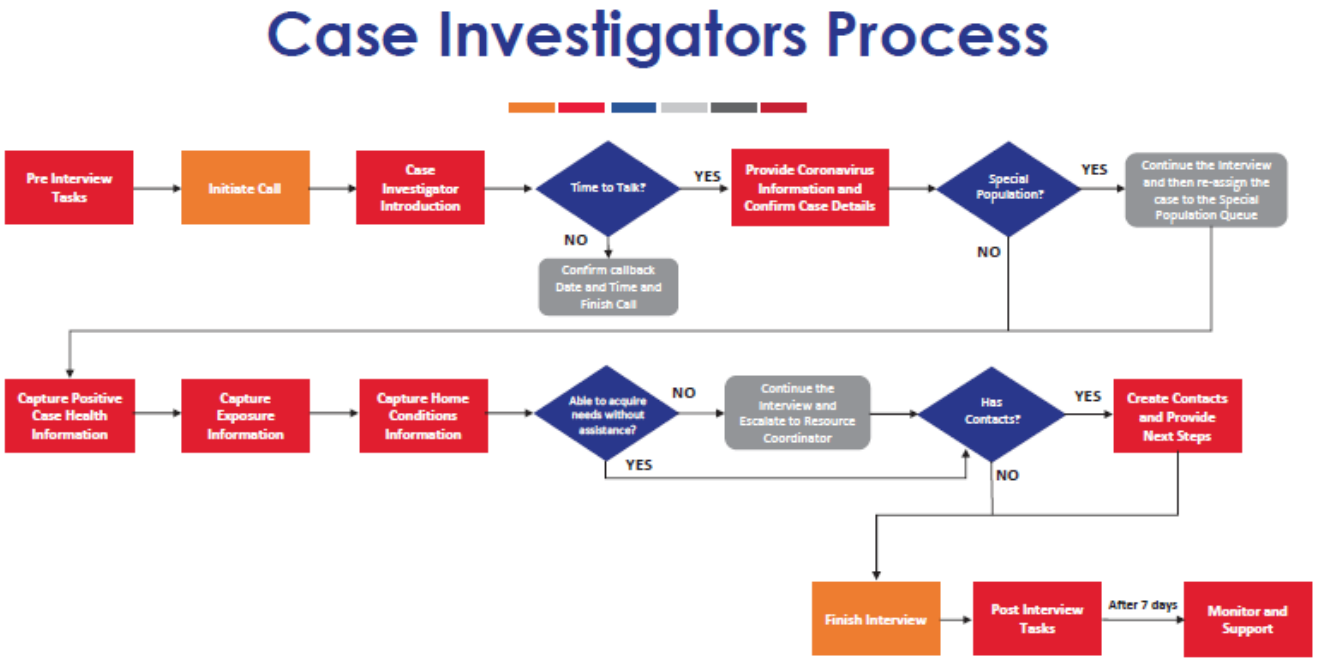
The contact trace force will maintain contact, either by phone, in-person, or via a text message questionnaire, with someone who tests positive for 10–14 days and ask questions about the person's well-being, encouraging them to maintain their quarantine and if the person's condition deteriorates, calling

37 Baltimore Sun. May 12, 2021. "COVID testing program helping Baltimore City school system track and contain infections." https://www.baltimoresun.com/education/bs-prem-md-covid-city-schools-testing-20210512-xrxipl6ji5ah5ed4a35sv4goe4-story.html

38 https://coronavirus.dc.gov/dccontacttraceforce

911 if needed. If someone misses several check-ins or indicates they do not plan to quarantine, DC Health staff will conduct a home visit. Figure 14 shows a DC Health visual of the process, which has since been revised.

Figure 14: DC Health Flow Chart of Contact Tracing Process



Source: DC Health

While there has been some critical feedback about the program from residents[39] and complaints about safety protocols from contact tracers,[40,41] we saw evidence that the contact tracing system has been continually strengthened and adapted. We reviewed a list of enhancements that had been made to the program from June 2020 through February 2021 to improve the program's interactions with people testing positive and close contacts, deliver key information to them, and ensure data quality. For example, DC Health:

- Added nurses to conduct home testing and established mail-in testing to reduce the risk of positive individuals going to a public testing site, and added a feature to the system that allowed the testing requests to be made during the contact tracing call.

39 "My wife and I both recently tested positive for COVID and thankfully recovered. I thought we'd share our experience." Prince Of Petworth, December 29, 2020, see: https://www.popville.com/2020/12/tested-positive-covid-DC-share-our-experience/

40 Zauzmer, Julie. "These D.C. contact tracers pay house calls — and worry they're spreading the virus." March 13, 2021. https://www.washingtonpost.com/local/dc-politics/home-visit-contact-tracers/2021/03/12/3348a8b0-7b4f-11eb-b3d1-9e5aa3d5220c_story.html

41 Zauzmer, Julie. "D.C. contact tracer says she was fired for a tweet that raised questions about overtime pay." December 22, 2021. https://www.washingtonpost.com/local/dc-politics/dc-contact-tracer-fired/2020/12/21/beb05542-4157-11eb-9453-fc-36ba051781_story.html

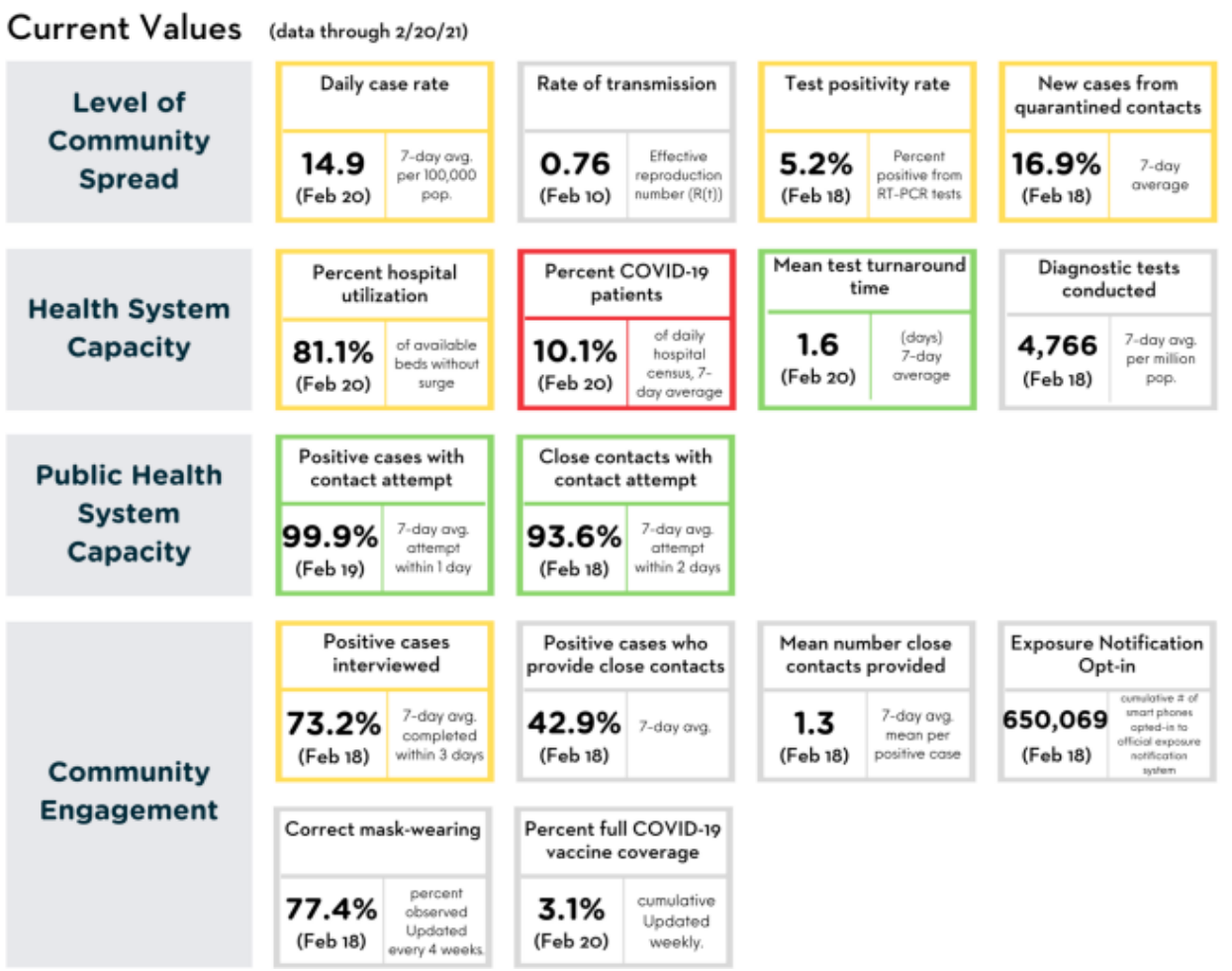
- Recorded all calls for supervisors to use in training and professional development.
- Required the completion of data fields such as race and ethnicity, as it was not required early on and negatively impacted data quality.
- Revamped the questions about gender identity and sexual orientation because of feedback from staff and user experiences. DC Health leveraged the experience of staff investigators who have done work around HIV/AIDS to make changes.
- Designed a system that logs the location and time of the activities that positive cases report. If two people report this same location within the same window of time, the system will cluster these through an algorithm, record it as possibly being epidemiologically linked and automatically report it to the DC Health epidemiology team. This was partly how DC Health was able to report on outbreak data. DC Health believes they are the first jurisdiction to do this.
- Allowed the system to record specific location details of exposure details (such as specifying the floor and room in response to positive cases at universities). This is another feature that DC Health reports as being the first jurisdiction to implement.

The District has also been reporting on performance metrics related to contact tracing in its Reopening Metrics,[42] specifically during our scope through April 5, 2021, including:

- New cases from quarantined contacts (which has varied somewhere between 15% and 20% percent since mid-February 2021).
- Positive cases with contact attempt (which has generally been 99% since August 2020).
- Close contacts with contact attempt (which has been over 90% since the first week of July 2020).
- Positive cases interviewed (which has been between 68% and 80% since October).
- Positive cases who provide close contacts (which has been between 32% and 60% since June 2020).
- Mean number close contacts provided (which has generally been between 1 and 2 since July 2020).
- Exposure Notification Opt-in (which was more than 600,000 in February 2021).

42 https://coronavirus.dc.gov/page/reopening-metrics

Figure 15: Several Reopening Metrics Relate to Contact Tracing



Source: DC Health

A notable feature of DC Health's contact tracing system is that it contracted with a private company to design a smooth web data input experience. From what we learned in interviews and reviewing changes to the system, the contract allowed DC Health to make improvements to the system 17 times since July 2020.

In addition to spending several hours speaking with us, DC Health's contact tracing team maintained a positive and open tone with our team, such as being frank about challenges and sharing documents freely. This response is notable as other audit shops have not received such cooperation and transparency, as described by the Hawaii State Auditor in reference to their Department of Health: "instead of cooperation and assistance, we encountered barriers, delays, and ultimately were denied access to those responsible for leading the department's contact tracing…".[43]

43 Office of the Auditor, State of Hawai'i, "Report on the Department of Health's Contact Tracing Efforts," Report No. 20-10, August 2020, page i, see: https://files.hawaii.gov/auditor/Reports/2020/20-10.pdf

DC CAN technology will need further study.

Another component of the contact tracing program is the DC COVID Alert Notice (DC CAN) app the Mayor announced on October 20, 2020. DC CAN is an app, developed by Google and Apple, that is designed to alert people if they have been near a positive case. Smartphone users either download the app on an Android phone or opt into exposure notifications on an iPhone.

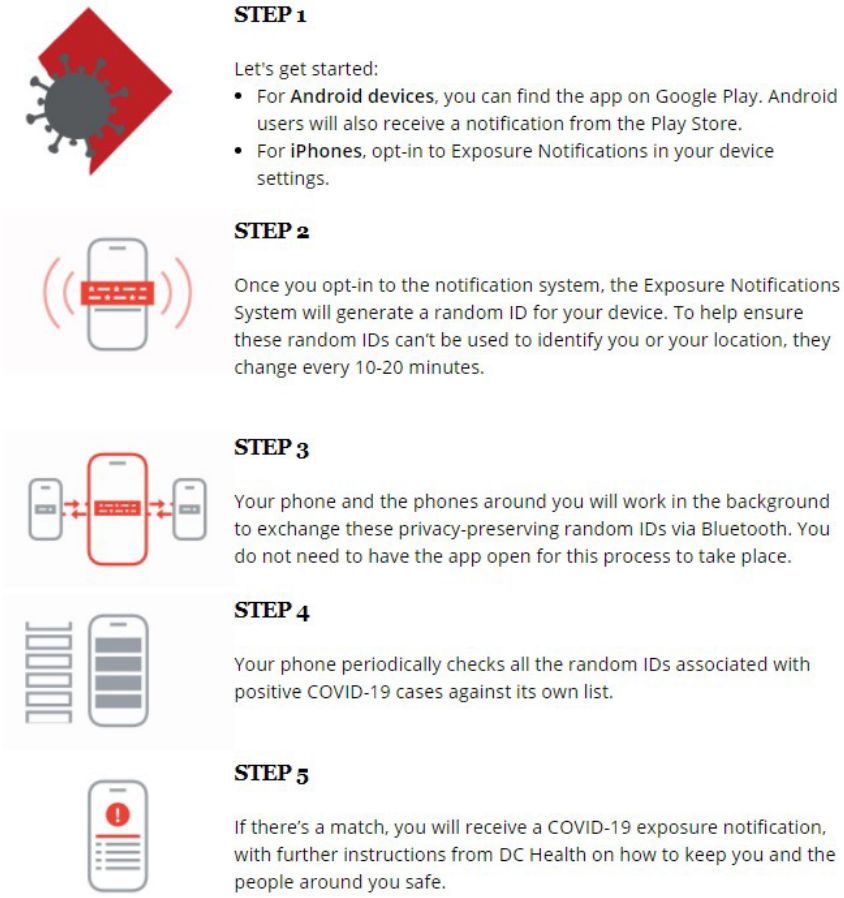
Figure 16: DC CAN Marketing Images

Source: https://coronavirus.dc.gov/dccan

The District devoted an entire menu on its coronavirus website[44] to DC CAN, publishing clear information on how it works, what privacy features are available, and how to opt in. When DC CAN is activated, a user's phone is assigned a random ID every 10-20 minutes. The user's phone exchanges these random IDs via Bluetooth with other phones nearby. The location of the phones is not tracked. The user's phone periodically checks all the random IDs associated with positive COVID-19 cases against its own list.

44 https://coronavirus.dc.gov/dccan

Figure 17: DC CAN Steps Published on the Website[45]



Original: https://coronavirus.dc.gov/dccan

As of May 23, 2021, there have been 827,690 smartphone opt ins to DC CAN. The total does not equal the number of unique smartphones that have opted in; rather, if a user opted in, later opted out, and then opted in again, both opt ins would be counted.

The goal of DC CAN is to "assist the contact tracing efforts by the Coronavirus Contact Trace Force." In mid-January 2021, DC Health stated that under 1,000 people who tested positive for COVID-19 had received the code to send out notifications to potential close contacts via the app. DC CAN users may not be notifying others via the app because of a multistep process that users who test positive need to complete to notify potential close contacts.

If you test positive and have opted into the DC CAN app, the multistep process works as follows:

1. A DC Health contact tracer sends you a link and an 8-digit code by text message during your contact tracing interview.

45 https://coronavirus.dc.gov/dccan

2. You click on the link which opens the app and populates it with your test date and date of symptom onset.
3. You click "Share a COVID-19 diagnosis" and enter your 8-digit code to verify your diagnosis.
4. The app sends out notifications to smartphones that you have been nearby in the last two weeks.

Another challenge is that DC Health only has limited visibility of the process. The notification system was built with privacy in mind, an important condition for encouraging people to opt in. As a result, while DC Health can tell if a person has clicked on the link sent by DC Health via text message, it cannot see whether someone successfully clicks to share their diagnosis and enter the 8-digit code. Not everyone completes all of these steps, and DC Health cannot tell who may need assistance sending out potential exposure notifications. As one member of the contact tracing team said, "You want to be ethically consistent and transparent about not storing people's data. We don't want to go back on our word, but… how far do we go with this program if we cannot troubleshoot it?" DC Health also does not have access to the aggregate number of potential close contacts that have been alerted by DC CAN. These issues are not the fault of DC Health but instead are central to how the DC CAN app was designed to protect privacy.

To its credit DC Health has been trying different strategies to get more out of DC CAN. DC Health is pursuing a data sharing agreement to access aggregate close contact data and exploring automating sending out 8-digit activation codes to anyone with a positive test in DC Health's electronic lab reporting system. DC Health mentioned that it is doing additional analyses to see what conclusions it can draw from DC CAN data.

As the pandemic subsides, DC Health should analyze the experience with DC CAN and draw lessons for the future about how technology could help in future epidemics and where it is likely to fall short. DC Health's experience could inform future technology that tries to find the right balance between protecting privacy and keeping the tool useful for public health authorities' contact tracing efforts.

Conclusion

DC Health has built detailed systems and teams to collect, analyze, and report COVID-19 data. At the same time, opportunities exist for reporting more information that the public needs.

We encourage DC Health to quickly implement our report recommendations and to implement our November 2020 report's recommendations, prioritizing actions based on needs at this point in the public health emergency. We fully acknowledge that DC Health has been in a learning and improving mode, and we believe that DC Health can further refine its public communication of data, leaving it better prepared for future public health threats.

DC Health has shown a willingness to adapt and enhance its systems to respond to the pandemic. In our interviews, we saw evidence of a dedicated, competent staff who has been committed throughout the pandemic to providing the guidance, information, and systems needed to manage the pandemic and keep as many District residents healthy as possible. DC Health oversees a robust public testing program and is monitoring all test results from public and private providers. DC Health has collaborated with the D.C. Hospital Association to capture hospital capacity metrics. DC Health has enhanced its public dashboard although some gaps remain in supplying the public with information. DC Health has a robust internal IT system for managing contact tracing data that it has significantly improved over the course of the pandemic.

OCME took a lead role from the beginning of the pandemic by choosing to certify all COVID-19 deaths. OCME had also prepared for such a public health crisis by developing plans and operational guidance in place including for a pandemic, likely allowing it to quickly gear up to handle the high number of deaths. Having an experienced agency oversee all death certifications brought consistency and more accuracy to the District's COVID-19 mortality data. In a national context where death numbers have been challenged for being overcounted but where experts have concluded that deaths are likely undercounted, OCME deployed its resources to attempt to ensure that the COVID-19 death counts for the District were as accurate as possible. OCME is producing valuable data reports, and we hope that the responsibility for publicly reporting additional death data will be clarified to ensure that information is shared with the public.

This audit undertaken in the midst of a public health emergency, was limited in its scope. We collected information about the processes in place to ensure the accurate collection, analysis, and reporting of key COVID-19 data. We also did a limited data review of two key sets of data, positive cases and deaths, for duplications and completeness of demographic information. We conducted interviews with DC health and OCME staff. DC Health and OCME were offered the opportunity but declined to provide written comments on this report.

We sought to shed light on some of the behind-the-scenes operations at DC Health and OCME that are financed by taxpayer dollars. However, we did not conduct a full performance audit which would have demanded more intensive staff resources on the part of DC Health and OCME and potentially interfered with the emergency response. Thus, this audit is not able to speak to how well different pillars of the response worked-- from public health policies to testing to contact tracing to COVID-19 care.

We anticipate that in the future as the pandemic lessens there will be more robust evaluations conducted of the District's response. We recommend that the leadership in the District government complete a thorough, open, and collaborative review. The District has lost more than 1,000 residents. At the beginning of April 2021, the United States had the highest COVID-19 death toll in the world. We owe it to ourselves and those we have lost to contribute to knowledge that will prevent such suffering and death in the future.

Summary of Report Recommendations

Most of the recommendations in this report can be implemented without any additional costs, and/or help to advance the goals of D.C. government, as seen below.

Recommendation	Is There a Cost to the Agency/ Entity to Implement?	Potential to Generate Revenue or Savings to the District?	Specific Agency/Entity or District-Wide Goal Advanced by Recommendation
1. The Mayor/Office of the City Administrator should clarify who is responsible for publishing death data and publish the additional information contained in the internal OCME COVID-19 related deaths report, including comorbidity data, on the data pages of the coronavirus website.	No	No	Create and maintain a highly efficient, transparent, and responsive District government. – Strategic Objective for most DC government agencies, including the FY20 Department of Health (DC Health) and Office of the Chief Medical Examiner (OCME) Performance Plans[46]
2. The Mayor should initiate a comprehensive review of the COVID-19 pandemic response culminating in a public report with DC Health, OCME, HSEMA, and any other key agencies to determine what worked and what should be done differently in the face of a similar health emergency including any recommended updates to the District's Emergency Response Plan.	Yes	Yes	
3. DC Health should publish weekly childcare center case data over time as it is doing for K-12 schools.	No	No	
4. DC Health should publish case numbers at each school even when there were fewer than five cases cumulatively at a school.	No	No	

46 https://oca.dc.gov/sites/default/files/dc/sites/oca/publication/attachments/DOH20.pdf, https://oca.dc.gov/sites/default/files/dc/sites/oca/publication/attachments/OCME20.pdf

Appendices

Appendix A

District Pandemic Timeline

2020

January 10: DC Health issued an alert about a respiratory illness outbreak in China and the importance of asking patients about recent travel history[47]

January 21: The first case of COVID-19 is identified in the U.S.[48]

March 7: DC Health announced the District's first COVID-19 case[49]

March 9: D.C. began publishing COVID-19 data[50] and updating it daily on March 14[51]

March 11: The Mayor declared a public emergency[52] and a public health emergency[53]

March 16: DC public schools switched to distance learning, and the Mayor issued an order prohibiting mass gathering of more than 50 people[54]

March 20: DC Health announced the first COVID-19[55] death in the District and extended the Public Health Emergency[56]

March 24: The Mayor ordered the closure of non-essential businesses[57]

March 29: The District received a Major Disaster Declaration for COVID-19[58]

March 30: The Mayor issued a Stay at Home Order[59]

April 17: The Mayor extended the Public Health Emergency[60]

April 23: The Mayor created a ReOpen DC Advisory Group to make recommendations for a "sustainable reopening of the District"

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47 https://dchealth.dc.gov/sites/default/files/dc/sites/doh/publication/attachments/HAN_Pneumonia_of_Unknown_Etiology_Update.pdf
48 https://dchealth.dc.gov/sites/default/files/dc/sites/doh/publication/attachments/2019nCoV_HAN_28thJan_FINAL.pdf
49 https://coronavirus.dc.gov/release/dc-department-health-confirms-first-coronavirus-case
50 https://coronavirus.dc.gov/newsroom?field_date_value[min][date]=&field_date_value[max][date]=&keys=&field_release_type_tid=All&sort_by=field_date_value&sort_order=ASC&page=1
51 https://coronavirus.dc.gov/newsroom?field_date_value[min][date]=&field_date_value[max][date]=&keys=&field_release_type_tid=All&sort_by=field_date_value&sort_order=ASC&page=3
52 https://mayor.dc.gov/sites/default/files/dc/sites/mayormb/release_content/attachments/MO.DeclarationofPublicEmergency03.11.20.pdf
53 https://coronavirus.dc.gov/release/mayor-bowser-declares-public-health-emergency
54 https://coronavirus.dc.gov/release/mayor-bowser-adjusts-district-columbia-government%E2%80%99s-operating-status https://mayor.dc.gov/sites/default/files/dc/sites/mayormb/publication/attachments/MO-Prohibition-on-Mass-Gatherings-During-Public-Health-Emergency.pdf
55 https://coronavirus.dc.gov/release/dc-health-announces-first-covid-19-related-death
56 https://coronavirus.dc.gov/release/mayor%E2%80%99s-order-2020-050-extensions-public-emergency-and-public-health-emergency-coronavirus
57 https://coronavirus.dc.gov/sites/default/files/dc/sites/mayormb/release_content/attachments/Mayor%27s%20Order%202020-053%20Closure%20of%20Non-Essential%20Businesses%20and%20Prohibiti....pdf
58 https://coronavirus.dc.gov/release/mayor-bowser-announces-dc-receives-federal-disaster-declaration-covid-19
59 https://coronavirus.dc.gov/release/mayor-bowser-issues-stay-home-order
60 https://coronavirus.dc.gov/release/mayor-bowser-extends-public-health-emergency-stay-home-order-and-closure-non-essential

May 4: The Mayor shared a COVID-19 Situational Update with ReOpen DC Metrics[61]

May 13: The Mayor issued a COVID-19 Situational Update with more precise reopening metrics[62]

May 21: ReOpen DC Advisory Group recommends a 4-stage approach for reopening[63]

May 29: Stay at Home order lifted and Phase One begins.[64] This allowed certain activities to restart, including nonessential businesses to reopen with protections in place for minimum business operations, and continued a prohibition of gatherings of more than 10 people.

June 22: The District enters Phase Two.[65] It included a mask requirement, quarantine rules for coming from out of state, and limiting gatherings to 50 people.

July 22: The Mayor extended the Public Health Emergency[66]

September 21: The Coronavirus.dc.gov website is relaunched with a Reopening Metrics page, additional data and visualizations[67]

October 7: The Mayor extended the Public Health Emergency[68]

October 20: The Mayor unveils DC COVID Alert Notice (DC CAN) that allows mobile device users to receive an alert when they may have been exposed to someone who has tested positive for COVID-19.[69]

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61 https://coronavirus.dc.gov/sites/default/files/dc/sites/coronavirus/page_content/attachments/Situational-Update-Presentation_05042020.pdf

62 https://coronavirus.dc.gov/sites/default/files/dc/sites/coronavirus/page_content/attachments/Situational-Update-Presentation_051320.pdf

63 https://coronavirus.dc.gov/sites/default/files/dc/sites/coronavirus/page_content/images/COVID19-Situational-Update-Presentation_052120.pdf

64 https://coronavirus.dc.gov/sites/default/files/dc/sites/coronavirus/page_content/attachments/MO2020-067.pdf https://coronavirus.dc.gov/sites/default/files/dc/sites/coronavirus/page_content/attachments/Situational-Update-Presentation_052720.pdf
https://coronavirus.dc.gov/release/mayor-bowser-announces-plans-open-streateries-and-lower-citywide-speed-limit-dc-reimagines

65 https://coronavirus.dc.gov/sites/default/files/dc/sites/coronavirus/page_content/attachments/Mayors-Order-2020-075-06-19-20.pdf
https://coronavirus.dc.gov/release/mayor-bowser-announces-phase-two-begins-monday-june-22

66 https://coronavirus.dc.gov/page/mayor%E2%80%99s-order-2020-079-extensions-public-emergency-and-public-health-emergency-and-delegations

67 https://coronavirus.dc.gov/sites/default/files/dc/sites/coronavirus/page_content/attachments/Situational-Update-Presentation_09-21-2020.pdf

68 https://coronavirus.dc.gov/sites/default/files/dc/sites/coronavirus/page_content/attachments/Mayor%27s%20Order%202020-103%20%2010-7-2020%20%281%29.pdf

69 https://coronavirus.dc.gov/release/mayor-bowser-urges-dc-residents-opt-dc-covid-alert-notice-dc-can-receive-exposure

November 18: DCPS started opening CARE classrooms, which was virtual learning in school buildings and supported by classroom facilitators[70]

November 27: DC Health releases a COVID-19 Vaccination Plan[71]

December 10: DC Health shares the results of its Community Mask Audit conducted at 151 locations that found 72% of people wearing their masks correctly[72]

December 14: D.C. launched its COVID-19 Vaccination Program with the administration of vaccines to health care workers[73] and on December 17, DC Health Director Dr. Nesbitt received her vaccine dose publicly at a press conference along with other healthcare workers and first responders.

December 18: Extension of the Public Emergency and Public Health Emergency and Implementation of a Holiday Pause on Various Activities to Flatten the Curve of COVID-19 Cases[74]

2021

January 11: D.C. residents aged 65 and older can make vaccine appointments[75]

January 16: D.C. completes 1 million COVID-19 tests[76]

January 25: In-person staff, including teachers and support staff, at D.C. Public Schools (DCPS) and public charter schools begin receiving the COVID-19 vaccine[77]

February 1: In-person learning begins District-wide for DCPS[78]

February 7: Vaccine appointments open for in-person childcare and charter school workers[79]

February 14: Data highlights discrepancy in vaccinations by ward, highlighting a large race and income inequity[80]

70 https://dcpsreopenstrong.com/schedule/care/
71 https://coronavirus.dc.gov/sites/default/files/dc/sites/coronavirus/page_content/attachments/DC_COVID-19%20Vaccination%20Plan%2011.27.pdf
72 https://coronavirus.dc.gov/sites/default/files/dc/sites/coronavirus/release_content/attachments/Situational-Update-Presentation-12-10-20.pdf
73 https://coronavirus.dc.gov/release/dc-health-launches-portal-district-workers-health-care-settings-schedule-vaccination
74 https://coronavirus.dc.gov/sites/default/files/dc/sites/coronavirus/page_content/attachments/Mayor%27s%20Order%20127%2012-18-2020.pdf
75 https://coronavirus.dc.gov/release/mayor-bowser-announces-beginning-monday-january-11-dc-residents-aged-65-and-older-can
76 https://coronavirus.dc.gov/release/mayor-bowser-marks-1-million-completed-coronavirus-tests-dc
77 https://coronavirus.dc.gov/release/dc-health-continues-rollout-vaccinations-dc-teachers-and-police
78 https://dcpsreopenstrong.com/
79 https://coronavirus.dc.gov/release/mayor-bowser-announces-vaccination-appointments-will-open-child-care-providers-and-charter
80 https://coronavirus.dc.gov/data/vaccination

February 18: Individuals who work in grocery stores, health/human services, manufacturing, and food packaging eligible to book vaccine appointments[81]

February 22 & 24: U.S. COVID-19 death toll hits 500,000[82] and D.C. marks 1,000 lives lost

April 2: 162,669 DC residents partially or fully vaccinated[83]

81 https://coronavirus.dc.gov/release/mayor-bowser-announces-new-populations-eligible-vaccinations-grocery-store-workers-outreach

82 https://coronavirus.dc.gov/sites/default/files/dc/sites/coronavirus/page_content/attachments/Situational%20Update%20Presentation_02.22.21.pdf

83 https://coronavirus.dc.gov/sites/default/files/dc/sites/mayormb/release_content/attachments/Situational-Update-Presentation_04-05-21.pdf

Appendix B

National Data Quality COVID-19 Audit Template

National Data Quality COVID-19 Audit Template

July 2020

STATE OF MISSISSIPPI
OFFICE OF THE STATE AUDITOR
SHAD WHITE
STATE AUDITOR

Overview

Government reports and media coverage of the COVID-19 pandemic in the United States has shown variation in how each state has approached data collection, reporting, and monitoring of COVID-19 cases. Each of these variables impacts a state's public health response in mitigating the spread of COVID-19. Delaware State Auditor Kathy McGuiness identified an opportunity to develop a general framework that states could use to assess data quality that would ensure a consistent approach for comparing results nationwide. With initial coordination assistance from the National State Auditors Association, a multistate audit task force with representation from state auditors' offices in Delaware, Florida, Mississippi, Ohio, and Pennsylvania was formed to consider methods for reviewing the following related to COVID-19 cases:

- Data collection,
- Data quality,
- Communication, and
- Best practices.

The COVID-19 Audit Task Force created this universal Performance Audit template to provide a consistent approach for states to assess data quality and subsequent virus mitigation efforts both individually and collectively. Its intent is to supply meaningful and understandable results regarding the accuracy of data collection and interpretation as a way to improve understanding of the pandemic's progression and to better guide public health actions through the use of applied analytical techniques. This effort may also result in recommendations and best practices states can adopt for use during this pandemic or future public health crises.

National Data Quality COVID-19 Audit Template

Background:

The following audit template is intended to be broadly applicable across states. Although this engagement is entirely voluntary for states to undertake, the hope is for states choosing to participate to initiate a Performance Audit this fall. Though your state may have additional questions that you wish to add, consistent results on this brief set of questions will help State Auditors, public health officials, the general public, and those charged with governance to better understand the available data on cases and better address testing and data tracking in the future. States participating and wanting to also share their results with other participating states will have the ability to send information electronically to state_auditor@delaware.gov. Delaware State Auditor Kathy McGuiness will coordinate with the National State Auditors Association to disseminate.

To help us establish an informational baseline and understand your state's audit approach, please include answers to the following:

1) What, if any, professional standards did your office follow in conducting this Performance Audit (Yellow Book, Red Book, other, none)?
2) When your office undertook this audit, in what re-opening phase was your state in?
3) In undertaking this Performance Audit,
    a. What was the timeframe (dates) of data and information reviewed, and
    b. How many months of data and information did your office review?
4) Did you experience any difficulty in obtaining the information you needed from the appropriate agencies?
5) Were the results of this Performance Audit beneficial to your state?

Intent:

How can states increase the accuracy of data collection and interpretation and more effectively apply analytical techniques to improve their understanding of the pandemic's progression and to better guide public health actions?

Objectives:

Collection

- What COVID-19 case data did the state collect?
    - Did the data collected include:
        - Test type (e.g., nasal or throat swab, antibody test, etc.),
        - Test results,
        - Case information (e.g., gender, race, age, ethnicity, location, exposure source, etc.),
        - Case classifications (e.g., confirmed and probable cases), and
        - Outcome (e.g., recoveries and deaths)?

- What COVID-19 treatment data did the state collect?
    - Did the data collected include:
        - Availability of ICU beds,
        - Availability of ventilators, and
        - Patient health status (e.g., hospitalizations, ICU admissions and/or patients with underlying conditions)?

- How frequently did the state collect data for each variable?

Reporting

- Did the state identify entities performing testing?
- What guidance did the state provide to entities performing COVID-19 testing for reporting results?
    - How was the guidance disseminated to those entities?
    - If updates were made to the guidance, how did the state ensure entities were notified of the changes?
    - Did the guidance include:
        - What information was to be reported,
        - How to determine residence (e.g., was the person tested a resident of their county,[1] another county and tested in the county, another state and visiting the state, etc.), and
        - How to report revisions to previously reported testing results and what documentation must be submitted to support the revisions?

[1] The term county as used in this document is intended to encompass equivalent terminology for states that do not use county to define administrative divisions within the state.

- Was the data collected and reported adequate for monitoring purposes and was the data reported timely?
    - Were results reported including:
        - The number of positive COVID-19 tests,
        - The number of positive COVID-19 antibody tests,
        - The number of negative COVID-19 tests,
        - The number of negative COVID-19 antibody tests,
        - The number of recoveries,
        - The number of deaths,
        - Source of exposure,
        - Confined settings tests (e.g. long-term care facilities, rehabilitation facilities, mental health facilities, group homes, prisons and jails),
        - Breakdown of data by county, and
        - As of dates for the results published?
    - Were available ICU beds reported?
        - Did the state provide guidance on how to count available ICU beds?
        - Was the data timely updated?
        - Did the published data include the as of date for the data?
    - Were available ventilators reported?
        - Did the state provide guidance on how to count available ventilators?
        - Was the data timely updated?
        - Did the published data include the as of date for the data?

- How did the state differentiate between positive COVID-19 tests and positive COVID-19 antibody tests in reporting?

Monitoring

- Did the state monitor how COVID-19 testing results were coded to determine whether the cases were coded and reported in accordance with established guidelines?

- Did the state adequately monitor or sample COVID-19 testing processes (test administration) and resulting data (result verification) to ensure accuracy?

- Did the state provide sufficient guidance to entities providing care to COVID-19 patients related to determining the cause of death, including when co-morbidity conditions existed?

- Did the state adequately monitor the use of provided guidance in reporting the cause of death?

- Did the state have adequate processes in place to contact and monitor COVID-19 positive individuals?
    - How often did the state contact positive individuals?
    - What procedures do they follow if they cannot contact positive individuals?

- How long does the state follow-up with individuals?
- What were the state's procedures if symptoms intensified for the individuals they contact?

Appendix C

ODCA Compilation of COVID-19 Data the District is Reporting

Category	Data
Cases	Daily Case Rate: new confirmed cases per 100,000 (7-day average)
Cases	Rate of Transmission R(t) (Effective Reproductive Number)
Cases	New Cases from Quarantined Contacts (7-day average)
Cases	Total Cases by Ward
Cases	Total Cases by Race
Cases	Age-Adjusted Rate by Ward (per 100K)
Cases	Total Positives by Ethnicity
Cases	Total Positives by Neighborhood
Cases	Positive Case Rates (per 100K population) by Age Categories
Death	Community Cases Tested by OCME: OCME Confirmed COVID-19 Positive Deaths (number and percent)
Death	Number of Deaths (daily)
Death	Lives Lost by Race (daily)
Death	Lives Lost by Sex (daily)
Death	Lives Lost by Age (daily)
Death	Lives Lost by Ward (daily)
Testing	Total Overall Number of Tests (daily)
Testing	Total Number of DC Residents Tested (daily)
Testing	Total Positives (daily)
Testing	Cleared from Isolation (daily)
Testing	Total Tests by Neighborhood
Testing	Total Recovered
Testing	Positivity Rate (7-day average)
Testing	Mean test turnaround time (7-day average): case data reported to DC Health, specimen collection date and date received by DC Health
Testing	Diagnostic tests conducted (7-day average per million population)
Contact Tracing	Percent of Positive Cases with Contact Attempt within 1 Day (7-day average)
Contact Tracing	Percent of Close Contacts with Contact Attempt within 2 Days (7-day average)
Contact Tracing	Percent of Positive Cases interviewed within 3 days of case import into contact tracing system (7-day average)
Contact Tracing	Percent of Positive cases who provide close contacts (7-day average)
Contact Tracing	Number of smart phones opted into exposure notification system (DC CAN): Data provided from Apple and Google on a daily basis
Contact Tracing	Mean number of close contacts provided per positive case (7-day average)

Category	Data
Hospitals	Total Beds Available (Standard Operations)
Hospitals	Total Beds Including Medical Surge Within Hospitals
Hospitals	Total Beds Including Medical Surge Within Hospitals and Alternate Sites
Hospitals	Total ICU Beds in Hospitals
Hospitals	ICU Beds Available
Hospitals	Total Reported Ventilators in Hospitals
Hospitals	In-Use Ventilators in Hospitals
Hospitals	Available Ventilators in Hospitals
Hospitals	Total Ventilators Available Including Medical Surge
Hospitals	Total COVID-19 Patients in DC Hospitals
Hospitals	Total COVID-19 Patients in ICU
Hospitals	Total Patients in DC Hospitals (COVID and non-COVID)
Hospitals	Percent of beds utilized at acute care hospitals (based on total number of beds under standard operations)
Hospitals	Percent of COVID-19 patients of total hospitalized patients (acute in-patient, 7-day average)
Exposure Activities	Number of COVID-19 Positive District Residents Interviewed Per Week and Percent of those Residents Reporting Activities
Exposure Activities	Characteristics of Social-Related Activities
Outbreak Data	Outbreaks by Setting
Outbreak Data	Number of Outbreaks by Setting Type and Week
Mask Wearing	Percent of people correctly wearing masks
Vaccinations	Percent full COVID-19 vaccine coverage
Vaccinations	Individuals Partially or Fully Vaccinated by Administration Date (DC resident and non-resident)
Vaccinations	Coverage % by neighborhood (DC residents, 65+)
Vaccinations	Coverage % by ward (DC residents, 65+)
Vaccinations	Count by neighborhood (DC residents, 65+)
Vaccinations	Count by ward (DC residents, 65+)
Vaccinations	Race of Partially or Fully Vaccinated DC residents
Vaccinations	First dose delivered and reported doses administered
Vaccinations	Ethnicity of Partially or Fully Vaccinated DC residents
Vaccinations	Gender of Partially or Fully Vaccinated DC residents
Vaccinations	Age group of Partially or Fully Vaccinated DC residents
Vaccinations	Total doses delivered
Vaccinations	Total doses administered

Category	Data
Vaccinations	Percent doses administered
Vaccinations	Total doses delivered and administered by allocation source (District allocation, federal partnership)
Vaccinations	Adherence to second dose appointments (by ward and 65+)
Vaccinations	Registrations from vaccinate.dc.gov
Vaccinations	Bookings from vaccinate.dc.gov
DMV Personnel	Total Number Personnel Who Have Tested Positive
DMV Personnel	Total Number Personnel Who Have Tested Positive and OUT
DMV Personnel	Total Number Personnel Recovered and Returned to Work
DMV Personnel	Total Number of Personnel in Quarantine Due to COVID-19
DMV Personnel	Total Number of Personnel Out Due to Positive Tests/Quarantine
DMV Personnel	Number of Personnel Returned to Work
DMV Personnel	Number of Lives Lost Among Personnel
Human Services - CFSA	Number of Personnel Who Have Tested Positive
Human Services - CFSA	Number of Personnel Currently in Quarantine
Human Services - CFSA	Number of Personnel Returned to Work
Human Services - CFSA	Number of Lives Lost Among Personnel
Human Services - DDS	Number of DDA-Connected People Who Have Tested Positive
Human Services - DDS	Number of DDA-Connected People Who Have Recovered
Human Services - DDS	Number of Lives Lost Among DDA-Connected People
Human Services - DHS	Total Number of Positive Cases of People Who Were in Shelter
Human Services - DHS	Total Number of People in Remote Quarantine
Human Services - DHS	Of People in Remote Quarantine, Total Number from Shelters
Human Services - DHS	Total Number of Lives Lost Among Individuals in the Homeless Service System
Public Safety - DOC	Total Number of Personnel Who Have Tested Positive
Public Safety - DOC	Total Number Tested Positive OUT
Public Safety - DOC	Total Number Recovered and Returned to Work
Public Safety - DOC	Total Number of Personnel in Quarantine Due to COVID-19
Public Safety - DOC	Total Number of Personnel Out Due to Positive Tests/Quarantine
Public Safety - DOC	Number of Personnel Returned to Work
Public Safety - DOC	Total Number of Lives Lost Among Personnel
Public Safety - DOC	Total Number of Residents Who Have Tested Positive
Public Safety - DOC	Total Number of Residents Tested Positive in Isolation
Public Safety - DOC	Total Number of Residents Recovered
Public Safety - DOC	Total Number of Residents in Quarantine Due to COVID-19

Category	Data
Public Safety - DOC	Total Number of Residents Out Due to Positive Tests/Quarantine
Public Safety - DOC	Total Number of Residents Returned to General Population
Public Safety - DOC	Total Number of Lives Among Residents
Public Safety - DYRS	Total Number of Personnel Out Who Have Tested Positive
Public Safety - DYRS	Total Number Tested Positive OUT
Public Safety - DYRS	Number of Personnel Returned to Work
Public Safety - DYRS	Total Number of Personnel in Quarantine Due to COVID-19
Public Safety - DYRS	Total Number of Personnel Out Due to Positive Tests/Quarantine
Public Safety - DYRS	Number of Personnel Returned to Work
Public Safety - DYRS	Total Number of Lives Among Personnel
Public Safety - DYRS	Total Number of Residents Isolated Who Have Tested Positive
Public Safety - DYRS	Total Number Tested Positive OUT
Public Safety - DYRS	Total Number Recovered
Public Safety - DYRS	Total Number of Residents in Quarantine Due to COVID-19
Public Safety - DYRS	Total Number of Residents Not in General Population Due to Positive Tests/Quarantine
Public Safety - DYRS	Total Number of Residents No Longer Isolated/In Quarantine
Public Safety - DYRS	Total Number of Residents Returned to General Population After Recovery
Public Safety - FEMS	Total Number of Personnel Who Have Tested Positive
Public Safety - FEMS	Total Number Personnel Tested Positive and OUT
Public Safety - FEMS	Total Number Personnel Recovered and Returned to Work
Public Safety - FEMS	Total Number of Personnel in Quarantine Due to COVID-19
Public Safety - FEMS	Total Number of Personnel Out Due to Positive Tests/Quarantine
Public Safety - FEMS	Number of Personnel Returned to Work
Public Safety - MPD	Total Number of Personnel Who Have Tested Positive
Public Safety - MPD	Total Number Personnel Who Have Tested Positive and OUT
Public Safety - MPD	Total Number Personnel Recovered and Returned to Work
Public Safety - MPD	Total Number of Personnel in Quarantine Due to COVID-19
Public Safety - MPD	Total Number of Personnel Out Due to Positive Tests/Quarantine
Public Safety - MPD	Number of Personnel Returned to Work
Public Safety - MPD	Number of Lives Lost Among Personnel
Public Safety - OUC	Total Number of Personnel Out Who Have Tested Positive
Public Safety - OUC	Total Number Tested Positive OUT
Public Safety - OUC	Number of Personnel Returned to Work
Public Safety - OUC	Total Number of Personnel in Quarantine Due to COVID-19
Public Safety - OUC	Total Number of Personnel Out Due to Positive Tests/Quarantine

Category	Data
Public Safety - OUC	Number of Personnel Returned to Work
Human Services - Saint Elizabeth's Hospital	Total Number of Individuals in Care (IIC) in Quarantine or Isolation Who Have Tested Positive
Human Services - Saint Elizabeth's Hospital	Total Number of Individuals in Care (IIC) in Quarantine or Isolation Due to Exposure to or Symptoms Consistent with COVID-19
Human Services - Saint Elizabeth's Hospital	Total Number of Individuals in Care (IIC) Who Currently are Isolated/In Quarantine
Human Services - Saint Elizabeth's Hospital	Total Number of Residents No Longer Isolated/In Quarantine
Human Services - Saint Elizabeth's Hospital	Total Number of Lives Lost Among Individuals in Care (IIC)
Human Services - Saint Elizabeth's Hospital	Total Number of Personnel Out Who Have Tested Positive
Human Services - Saint Elizabeth's Hospital	Total Number of Personnel in Quarantine Due to COVID-19
Human Services - Saint Elizabeth's Hospital	Total Number of Personnel Out Due to Positive Tests/Quarantine
Human Services - Saint Elizabeth's Hospital	Number of Personnel Returned to Work
Human Services - Saint Elizabeth's Hospital	Number of Lives Lost Among Personnel
Skilled Nursing Facility	Total Resident Positive Cases (Symptomatic Residents)
Skilled Nursing Facility	Resident Loss of Life
Skilled Nursing Facility	Residents Recovered
Skilled Nursing Facility	Total Personnel Positive Cases (Symptomatic Personnel)
Skilled Nursing Facility	Personnel Loss of Life
Skilled Nursing Facility	Personnel Recovered
Assisted Living Facility	Total Resident Positive Cases; (Symptomatic Residents):
Assisted Living Facility	Resident Loss of Life:
Assisted Living Facility	Residents Recovered:
Assisted Living Facility	Total Personnel Positive Cases; (Symptomatic Personnel):
Assisted Living Facility	Personnel Loss of Life:
Assisted Living Facility	Personnel Recovered:
Schools	Total Number of (In-Person) DCPS Personnel Tested Positive
Schools	Total Number of (In-Person) DCPS Personnel Currently in Quarantine
Schools	Total Number of (In-Person) DCPS Students Tested Positive
Schools	Total Number of (In-Person) DCPS Students Currently in Quarantine

Category	Data
Schools	Percent of School-Associated Cases by School Setting (charter, DCPS, private)
Schools	Percent of Outbreaks within School Setting (charter, DCPS, private)
Schools	Percent of School-Associated Cases by School Level (elementary, middle, high school, other)
Schools	Schools with Highest Number of Cases (DCS, private, charter)
Schools	Schools with Highest Number of Cases by Setting (by job/role- student, teacher, other staff)
Schools	Percent of School-Associated Cases by job/role at school (student, teacher, other staff)
Schools	Percent of School-Associated Cases by symptomatic/asymptomatic
Schools	Weekly Number of COVID-19 cases by School Setting (charter, DCPS, private)

Appendix D

The District's Answers to Multistate Audit Questions

#	Researchable Question	Yes, No, Partial?	Details (if yes), Why Not (if no)	Data Source	Frequency of Collection	Public, Partial Public, Not Public, N/A (https://coronavirus.dc.gov/)
	Collection					
1	Did DC collect test type: molecular (PCR)?	Yes	None	Majority of tests conducted electronically submitted, some sent efax	Daily	Public
2	Did DC collect test type: antigen?	Yes	None	Majority of tests conducted electronically submitted, some sent efax	Daily	Not Public
3	Did DC collect test type: antibody (i.e. serology)?	Yes	None	Majority of tests conducted electronically submitted, some sent efax	Daily	Not Public
4	Did DC collect test results data?	Yes	Positive, Negative, Inconclusive	Majority of tests results electronically submitted, some sent efax	Daily	Public
5	Did DC collect case information: gender?	Yes	None	Medical providers and testing laboratories	Daily	Public
6	Did DC collect case information: race?	Yes	None	Medical providers and testing laboratories	Daily	Public
7	Did DC collect case information: age?	Yes	None	Medical providers and testing laboratories	Daily	Public
8	Did DC collect case information: ethnicity?	Yes	None	Medical providers and testing laboratories	Daily	Public

#	Researchable Question	Yes, No, Partial?	Details (if yes), Why Not (if no)	Data Source	Frequency of Collection	Public, Partial Public, Not Public, N/A (https://coronavirus.dc.gov/)
9	Did DC collect case information: location?	Yes	Address. Ward and neighborhood cases reported publicly.	Medical providers and testing laboratories	Daily	Not Public
10	Did DC collect case information: exposure source?	Yes	Activities during exposure period because DC Health cannot be sure of exposure source which is difficult to verify.	Contact tracing salesforce platform; DC Health investigations team	Daily	Public
11	Did DC collect other case information?	Yes	Case information: date of birth, race and ethnicity, sex at birth, pronouns, gender, sexual orientation, address, activities during the exposure period, occupation, Travel history, Patient high risk group, high risk group details (homeless, LTC resident, etc.), activities during infectious period, symptoms, hospitalization, hospitalization details (admission, discharge date), underlying conditions, death date, death location.	Contact tracing and investigations team	Daily	Not Public
12	Did DC collect case classifications (e.g. confirmed and probable cases)?	Yes	Confirmed, probable cases based on positive antigen-test.	Medical providers and testing laboratories	Daily	Partial Public

#	Researchable Question	Yes, No, Partial?	Details (if yes), Why Not (if no)	Data Source	Frequency of Collection	Public, Partial Public, Not Public, N/A (https://coronavirus.dc.gov/)
13	Did DC collect case outcome data (e.g. recovery and deaths)?	Yes	Cleared from Isolation: 10 days have passed since symptom onset date (or test collection date if asymptomatic); if the person has symptoms their symptoms must be improving, and they also must be without a fever for 24h without fever-reducing medications. Lost to Follow-up: case dies or does not respond to multiple follow-up requests. Death due to COVID-19, non-COVID-19 death.	Contact Tracing Salesforce Platform	Daily	Public
14	Did DC collect the availability of ICU beds?	Yes	DC Hospital Association uses the EMResource portal to collect data from DC hospitals, except Sibley Memorial Hospital who reports directly to HHS. DC Hospital Association developed EMResource system from a grant from DC Health. DC Health can view and pull the data from the system. The system is also used for hospital reporting to HHS.	EMResource portal (except Sibley Memorial Hospital who reports directly) where hospitals to report facility level data to inform the local and national response efforts. District's 13 Acute Care Hospitals are: Howard University Hospital, United Medical Center, MedStar Washington Hospital Center, Children's National Medical Center, Sibley Memorial Hospital, George Washington University Hospital, Georgetown University Hospital.	Daily	Public
15	Did DC collect the availability of ventilators?	Yes	DC Health collects patient use of ventilators as well as the total number in supply via EMResource, except Sibley Memorial Hospital which reports directly.	EMResource (except Sibley Memorial Hospital which reports directly to HHS).	Every 4 days	Public

#	Researchable Question	Yes, No, Partial?	Details (if yes), Why Not (if no)	Data Source	Frequency of Collection	Public, Partial Public, Not Public, N/A (https://coronavirus.dc.gov/)
16	Did DC collect COVID hospitalizations?	Yes	Percentage of hospitalizations that are COVID-19 positive (acute in patient, 7-day average).	Several sources: CRISP: A regional health information exchange (HIE) serving Maryland and the District of Columbia. https://crisphealth.org/; NHSN: National Healthcare Safety Network (CDC); EMResource portal	Daily	Public
17	Did DC collect ICU admissions?	Yes	Total COVID-19 Patients in ICU.	EMResource	Daily	Public
18	Is DC collecting additional information on hospitalized COVID patients?	Yes	Date of hospital admissions and discharge, as well as ICU admissions and discharge date.	Daily patient-level line lists from hospitals	Daily	Not Public
19	Did DC collect patient underlying conditions?	Yes	Information is collected based on what is available on the patient chart listed as previous conditions. We capture anything that is listed on the patient's chart.	Several sources: CRISP, patient chart review, clinical documents received from providers, contact tracing.	Daily	Not Public
	Reporting					
20	Did DC identify entities performing testing?	Yes	DC Health requires all entities to register with DC Health.	Self-reporting, existing DC Health lists	Ongoing	Public

#	Researchable Question	Yes, No, Partial?	Details (if yes), Why Not (if no)	Data Source	Frequency of Collection	Public, Partial Public, Not Public, N/A (https://coronavirus.dc.gov/)
21	What guidance did the state provide to entities performing COVID-19 testing for reporting results?	Yes	Monthly/regular guidance provided by DC Health to providers and labs.	DC Health website, list serv	Ongoing	Public
22	Was the guidance disseminated to those entities?	Yes	DC Health list serv and website, etc.	DC Health	Ongoing	N/A
23	If updates were made to the guidance, were entities notified of the changes?	Yes	DC Health list serv and website, etc.	DC Health	Ongoing	N/A
24	Did the guidance include what information was to be reported?	Yes	Travel history, occupation, underlying conditions, etc.	Guidance: DC Health; Case information: Healthcare providers, self-reported	Ongoing	N/A
25	Did the guidance include how to determine residence (e.g. was the person tested a resident of DC, etc.)?	Yes	Address is required to be gathered by providers and labs, and guidance instructs how to handle MD and VA residents.	Self-reporting, CRISP, hospital data, staffing lists (i.e. long-term care)	Ongoing	N/A

#	Researchable Question	Yes, No, Partial?	Details (if yes), Why Not (if no)	Data Source	Frequency of Collection	Public, Partial Public, Not Public, N/A (https://coronavirus.dc.gov/)
26	Did the guidance include how to report revisions to previously reported testing results and what documentation must be submitted to support the revisions?	No	Nothing formal but accomplished through communications.	N/A	N/A	N/A
27	Did DC report the number of positive COVID-19 tests (i.e. molecular and antigen)?	Yes	Positive molecular test results are being published. Antigen positive tests are not.	Healthcare providers and testing laboratories; OCME; out-of-state health departments	Daily	Public
28	Did DC report the number of positive COVID-19 antibody tests?	No	DC Health is collecting the data. DC Health compiled a report on its findings and is preparing articles for publication.	Healthcare providers and testing laboratories	Ongoing	Not Public
29	Did DC report the number of negative COVID-19 tests (i.e. molecular and antigen)?	No	DC Health is collecting the data. The negative molecular test data can be determined by subtracting total tested and total positive results. DC Health is not reporting antigen test results.	Healthcare providers and testing laboratories	Daily	Not Public
30	Did DC report the number of negative COVID-19 antibody tests?	No	DC Health is collecting the data, compiled a report on its findings and is preparing articles for publication.	Healthcare providers and testing laboratories	Ongoing	Not Public

#	Researchable Question	Yes, No, Partial?	Details (if yes), Why Not (if no)	Data Source	Frequency of Collection	Public, Partial Public, Not Public, N/A (https://coronavirus.dc.gov/)
31	Did DC report the number of recoveries?	Yes	However, DC Health is reporting on cleared from isolation, which is different than recoveries.	Contact tracing and investigations team	Ongoing	Public
32	Did DC report the number of deaths?	Yes	Stratified cumulative deaths by race, sex, age, ward. New deaths are not reported daily on the coronavirus data pages (but are in Mayor's press release).	OCME investigations and hospital data	Daily	Public
33	Did DC report the source of exposure?	Yes	Activities during the exposure period reported by the percentage of interviewed cases.	Contact Tracing Salesforce Platform	Weekly	Public
34	Did DC report the number of confined settings tests (i.e. total tests, positive cases): **long-term care facilities?**	Partial	It is reporting facility level. It is reporting the cases cumulatively, making it difficult to identify current outbreaks: Total Positive Cases, Resident Loss of Life, Residents recovered, total Personnel Positive Cases (Symptomatic Personnel), Personnel Loss of Life, Personnel Recovered. No reporting of total tests.	Multiple sources (testing labs, facilities reporting)	Daily	Public
35	Did DC report the number of confined settings tests (i.e. total tests, positive cases): **rehabilitation facilities?**	No	DC Health does not collect this information.	DC Health interview	N/A	Not Public

#	Researchable Question	Yes, No, Partial?	Details (if yes), Why Not (if no)	Data Source	Frequency of Collection	Public, Partial Public, Not Public, N/A (https://coronavirus.dc.gov/)
36	Did DC report the number of confined settings tests (i.e. total tests, positive cases): **mental health facilities?**	Partial	It is reporting on St. Elizabeths Hospital personnel and individuals in care (IIC): total number of personnel who have tested positive, total number of personnel in quarantine due to COVID-19; Total Number of Personnel Out Due to Positive Tests/ Quarantine; Number of Personnel Returned to Work; Number of Lives Lost Among Personnel; Total Number of IIC in Quarantine or Isolation Who Have Tested Positive; Total Number of IIC in Quarantine of Isolation Due to Exposures to or Symptoms Consistent with COVID-19; total Number of IIC Who Currently are Isolated/In Quarantine; Total Number of IIC No Longer Isolated/In Quarantine; Total Number of Lives Lost. No reporting of total tests.	Multiple sources (testing facilities, Department of Human Services)	Daily	Public
37	Did DC report the number of confined settings tests (i.e. total tests, positive cases): **group home facilities?**	Partial	DC Health is collecting this information, but it is not reported by facility. DDS-connected individuals' cases and deaths is reported cumulatively. No reporting of total tests.	Multiple (testing facilities, government agencies)	Daily	Partial Public

#	Researchable Question	Yes, No, Partial?	Details (if yes), Why Not (if no)	Data Source	Frequency of Collection	Public, Partial Public, Not Public, N/A (https://coronavirus.dc.gov/)
38	Did DC report the number of confined settings tests (i.e. total tests, positive cases): **prisons and jails?**	Partial	Reporting cumulative cases for DOC & DYRS residents and personnel, making it difficult to identify a current outbreak: total personnel positive; total number tested positive OUT; total number recovered and returned to work; total number of personnel in quarantine due to COVID-19; total number of personnel out due to positive tests/quarantine; Number of Personnel Returned to Work; Number of Lives Lost Among Personnel; Total Number of Residents Who Have Tested Positive; Total Number in Isolation of Positive Test; Total Number Recovered; Total Number of Residents Not in General Population Due to Positive Tests/Quarantine; Total Number of Residents Returned to General Population After Recovery/End of Quarantine; Total Number of Lives Lost Among Residents. DC Health is also collecting specific halfway house location and case data but is not publicly reporting it. No reporting of total tests.	Multiple sources (electronic laboratory reporting, direct reporting by healthcare providers, information shared by other agencies Department of Corrections (DOC), DYRS)	Daily	Partial Public

#	Researchable Question	Yes, No, Partial?	Details (if yes), Why Not (if no)	Data Source	Frequency of Collection	Public, Partial Public, Not Public, N/A (https://coronavirus.dc.gov/)
39	Did DC report the number of confined settings tests (i.e. total tests, positive cases): **homeless shelters?**	Partial	Cumulative total cases for the homeless shelter system, not individual shelter data is reported publicly. Also, no total tests. The Department of Human Services (DHS) provides a summary of data for all sheltered individuals on the coronavirus website.	Multiple sources (electronic laboratory reporting, direct reporting by healthcare providers, information shared by DHS)	Daily	Partial Public
40	Did DC report the number of confined settings tests (i.e. total tests, positive cases): **assisted living?**	Partial	It is reporting at a facility level. It is reporting the cases cumulatively, making it difficult to identify current outbreak. It is reporting: Total Resident Positive Cases; (Symptomatic Residents): Resident Loss of Life: Residents Recovered: Total Personnel Positive Cases; (Symptomatic Personnel): Personnel Loss of Life: Personnel Recovered. No reporting of total tests.	Multiple (facility reporting, lab reporting)	Daily	Public
41	Did DC report the breakdown of testing data by ward?	Yes	Cumulative; Neighborhood and Ward	Healthcare providers and testing laboratories	Daily	Public
42	Did DC report the as of dates for the reports published?	Yes	DC Health publishes data daily by 10 am with a date. Reopening Metrics specify an as of date.	N/A	Daily	Public

#	Researchable Question	Yes, No, Partial?	Details (if yes), Why Not (if no)	Data Source	Frequency of Collection	Public, Partial Public, Not Public, N/A (https://coronavirus.dc.gov/)
43	Were available ICU beds reported?	Yes		EMResource	Daily	Public
44	Did the state provide guidance on how to count available ICU beds and hospital beds?	Yes	DC Health collaborated with the DC Hospital Association to develop guidance to count ICU beds and hospital beds.	DC Health interview, DC Hospital Association interview	Daily	N/A
45	Was the ICU bed data timely updated?	Yes	Daily	EMResource	Daily	Public
46	Did DC report the as of dates for the ICU data published?	Yes	Daily count	EMResource	Daily	Public
47	Were available ventilators reported?	Yes	Daily count	EMResource	Daily	Public
48	Did the state provide guidance on how to count available ventilators?	Yes	DC Health collaborated with the DC Hospital Association to develop guidance to count available ventilators. DC Health also shared HHS guidance.	DC Health interview, DC Hospital Association interview	N/A	N/A
49	Was the ventilator data timely updated?	Yes	Daily count	EMResource	Daily	Public

#	Researchable Question	Yes, No, Partial?	Details (if yes), Why Not (if no)	Data Source	Frequency of Collection	Public, Partial Public, Not Public, N/A (https://coronavirus.dc.gov/)
50	Did DC differentiate between positive COVID-19 tests and positive COVID-19 antibody tests in reporting?	Yes	Molecular, antigen, and antibody tests are coded differently in the DC Health reporting system to keep results separate.	Healthcare providers and laboratories	Daily	Not Public
	Monitoring					
51	Did DC monitor how COVID-19 testing results were coded to determine whether the cases were coded and reported in accordance with established guidelines?	Yes	DC Health mentioned taking the following actions to ensure accurate testing data: ■ validation that data submitted electronically by labs maps accurately to DC Health's system ■ daily review of labs to ensure none are missing ■ cross-check of raw file and process file ■ additional checks on data that may not be pushed into system ■ fixing software issues/bugs (e.g. DC Health identified that month and day were inverting in some cases and fixed the problem)	Healthcare providers and laboratories	Daily	N/A

#	Researchable Question	Yes, No, Partial?	Details (if yes), Why Not (if no)	Data Source	Frequency of Collection	Public, Partial Public, Not Public, N/A (https://coronavirus.dc.gov/)
52	Did DC adequately monitor or sample COVID-19 testing processes (test administration) and resulting data (result verification) to ensure accuracy?	No	DC Health does not monitor test administration. In one instance with the Public Health Lab, DC Health worked with staff to ensure accuracy of results of a new testing machine.	N/A	N/A	N/A
53	Did DC provide sufficient guidance to entities providing care to COVID-19 patients related to determining the cause of death, including when co-morbidity conditions existed?	Yes	OCME assumed the certification process of all COVID related deaths in D.C. There are some exceptions, but those certifications have been with the approval of OCME.	OCME interview; OCME memo	Daily	N/A
54	Did DC adequately monitor the use of provided guidance in reporting the cause of death?	Yes	DC Health reconciles OCME information daily; OCME follows its SOPs and conducts COVID-19 testing.	OCME daily death report; data obtained from DC Health from other jurisdictions	Daily	N/A
55	Did DC have adequate processes in place to contact and monitor COVID-19 positive individuals?	Yes	DC Health developed training manuals and call guides for staff. DC Health also developed an online system to input data that automates key program milestones (i.e. when to get tested, isolation date, virtual assistant follow up).	DC Health interview, call guided script, and system demo	Daily	N/A

#	Researchable Question	Yes, No, Partial?	Details (if yes), Why Not (if no)	Data Source	Frequency of Collection	Public, Partial Public, Not Public, N/A (https://coronavirus.dc.gov/)
56	Was DC in regular contact with positive individuals?	Yes	Daily or every other day either through the Virtual Assistant text messages or through calls.	DC Health interview	Daily or every other day	N/A
57	Did they have procedures in place if they cannot contact positive individuals?	Yes	DC Health conducts home visits if they are not able to contact individuals.	DC Health interview	N/A	N/A
58	Does DC have a timeframe for how long DC follows up with individuals?	Yes	DC Health follows up with individuals through the end of their isolation or quarantine period, i.e. at least 10 days from symptom onset date or test date.	DC Health interview	N/A	N/A
59	Does DC have procedures if symptoms intensified for the individuals they contact?	Yes	DC Health monitors individuals' symptoms either through daily text messages or calls daily or every other day. DC Health will contact 911 if immediate medical attention is needed.	DC Health interview	N/A	N/A

Appendix E

The District's Answers to ODCA Questions

#	Researchable Question	Yes, No, Partial?	Details (if yes), Why Not (if no)	Data Source	Frequency of Collection	Public, Not Public, Partial Public,Not Accessible (N/A)
1	Is D.C. collecting the number of, and/or rate, of uninsured for patients who died of COVID-19?	No	Neither OCME nor DC Health are tracking this data.	N/A	N/A	Not Public
2	Does DC report on the place of death?	Yes	OCME reports % of community vs. hospital deaths, as well as # deaths in vulnerable populations (i.e. DC jail, homeless) in its daily reports to DC Health. Yet DC Health does not publicly release this data. It does release death totals for specific nursing homes, jails, homeless shelters (in general)	OCME daily report to DC Health	Daily	Partial Public
3	Does DC report on probable/ confirmed deaths?	Yes	DC reports on confirmed deaths. DC does not report probable deaths because OCME is certifying all deaths in the District, i.e. all COVID-19 deaths are confirmed. Death counts include DC residents who died out-of-state.	OCME daily report to DC Health, OCME memo	Daily	Public

#	Researchable Question	Yes, No, Partial?	Details (if yes), Why Not (if no)	Data Source	Frequency of Collection	Public, Not Public, Partial Public,Not Accessible (N/A)
4	Is there a lag in reporting lab results to DC Health?	Partial	DC Health stated that occasionally labs fail to report, but most labs are reporting electronically on a daily or twice daily basis, so reporting lags are not a widespread problem. A small number of labs are not reporting electronically therefore DC Health has to convert their data to the electronic system which takes more time. However, lags in reporting results to DC Health can occur. On March 9, 2021, DC Health published backlogged case data from seven facilities which caused an artificial spike in cases (and meant previous cases had been underreported).	Healthcare providers and testing laboratories	Daily	N/A
5	Does DC report on DC residents who are tested in MD and VA and in other states?	Yes	DC has data sharing relationships with MD and VA to count DC residents who tested positive outside of DC. These positive cases are included in the positive case count and are not counted separately.	Electronic data sharing system for DC, MD, and VA; CRISP for DC and MD; Other state health departments	Daily	Public

#	Researchable Question	Yes, No, Partial?	Details (if yes), Why Not (if no)	Data Source	Frequency of Collection	Public, Not Public, Partial Public,Not Accessible (N/A)
6	Does DC report deaths of DC residents who died outside of the District, in MD and VA and in other states?	Yes	DC Health receives this data and ensures it is included in the death count. OCME includes DC residents who died out of state in its daily death report.	Other state health departments; hospital data	Ongoing	Public
7	Is information being collected on schools and childcare centers regarding cases and deaths and is the data publicly reported?	Yes	Schools and childcares centers are required to report cases through the DC Health reporting form. DCPS cumulative cases are being posted on the COVID-19 Surveillance data page. On the Outbreak data page additional information is reported: number of outbreaks at schools and childcare centers; weekly cases by school setting (public, private, charter); percentage of cases by school type, by job/role (student, teacher, other staff), by a/symptomatic; and School names for 15 schools with the highest number of cases. Otherwise, there is no school-level reporting for private and public charter schools, nor childcare center names. For DCPS, specific school names are being reported on the DCPS Reopen Strong website when cases occur.	Data source: DC Health; Self reporting by schools; contact tracing Reporting: DCPS page: https://coronavirus.dc.gov/node/1506966; Outbreak page: https://coronavirus.dc.gov/page/outbreak-data; DCPS Reopen Strong website: https://dcpsreopenstrong.com/category/articles/	Daily	Partial public

#	Researchable Question	Yes, No, Partial?	Details (if yes), Why Not (if no)	Data Source	Frequency of Collection	Public, Not Public, Partial Public,Not Accessible (N/A)
8	Did DC provide sufficient guidance when there is a potential COVID-19 death at home?	Yes	OCME provided us with the SOPs which covers this duty that is a part of their normal workload. D.C. Code § 5-1405(b), 5-1406(a) also requires infectious disease deaths that are a threat to public health be reported to OCME and that OCME take charge of the body.	OCME SOPs, OCME memo, D.C. Code	N/A	N/A
9	Is there guidance for testing children?	No	DC Health issued no specific guidance for testing children. DC Public testing sites limit testing to testing children over the age of 3.	N/A	N/A	Not Public
10	Does DC collect and report on the date of death?	Yes	DC Health and OCME explained that the deaths reported daily are based on when they are reported by OCME to DC Health after they are certified, not by date of death. Date of death however is reported in Vital Statistics.	OCME death certifications; hospitals and other entities that complete vital statistics forms; other state health departments	Daily	N/A

#	Researchable Question	Yes, No, Partial?	Details (if yes), Why Not (if no)	Data Source	Frequency of Collection	Public, Not Public, Partial Public,Not Accessible (N/A)
11	Is there a lag between the death, death certification, and death reporting?	Partial	OCME aims to complete post-mortem examinations within 24 hours of receiving a body at their facility. The daily death report that OCME provides to DC Health includes all deaths certified up to a noon cutoff on that date. DC Health and OCME reconcile their data to ensure there are no duplicates or missing cases. There is a lag for reporting deaths in Vital Statistics (goal of 5 days is not always met due to number of entities required to fill out the form).	OCME daily report to DC Health; hospital data; CRISP; other state health departments/chief medical examiners	Daily	N/A
12	Does DC have a definition for an outbreak?	Yes	DC Health defines an outbreak as two or more cases of COVID-19 reported at a location which have a plausible epidemiological link. A plausible epidemiological link between cases is defined as ">15 minutes of cumulative exposure time in the same immediate vicinity." DC Health also issues specific guidance on what constitutes an outbreak in long-term care, hospital, and outpatient settings.	https://coronavirus.dc.gov/page/outbreak-data https://coronavirus.dc.gov/sites/default/files/dc/sites/coronavirus/page_content/attachments/Outbreak_data_notes_2021-2-19.pdf https://dchealth.dc.gov/sites/default/files/dc/sites/doh/publication/attachments/COVID-19_DC_Health_%20Notice_Outbreak_2021.3.10_FINAL.pdf	Daily but reported weekly	Partial public

Appendix F

Health Notices from DC Health

Date	DC Health Guidance Summary:[84] https://dchealth.dc.gov/page/health-notices
January 10, 2020	Following CDC Guidance (1/8/20) and monitoring of a cluster of pneumonia of unknown etiology in China, this Health Alert Notice provided "situational awareness about this outbreak and reinforces the importance of asking patients about recent travel history. Health care providers should immediately notify the District of Columbia Department of Health (DC Health) of any patients with severe respiratory disease who report recent travel to Wuhan City, China."
January 28, 2020	After the first case was identified in the U.S. on January 21 and CDC released guidance on January 17, 2020, this Health Notice provided updated situational awareness and "guidance for evaluation of patients under investigation (PUI) for 2019-nCoV, prevention and infection control guidance, including the addition of an eye protection recommendation, and additional information on specimen collection."
January 31, 2020	After the World Health Organization (WHO) identified COVID-19 as an international public health emergency on January 30, 2020, and six cases were identified in the U.S., this Health Notice provided "updated guidance for evaluation of PUIs for 2019-nCoV, prevention and infection control guidance, and information on specimen collection."
February 28, 2020	After the CDC updated travel guidance and COVID-19 had been detected in 50 locations internationally, this Health Notice provided "updated guidance on evaluating and testing persons under investigation (PUIs) for COVID-19 in response to CDC's Health Alert Network Update released on February 28, 2020."
March 5, 2020	After the CDC updated its testing guidance, this Health Notice described "the PUI criteria for testing, which are based on exposure risk and signs or symptoms compatible with illness, and the community risk in the District of Columbia. This Health Notice also includes the processes for testing approvals."
March 19, 2020[85]	After 10 confirmed positive cases in DC and updated CDC guidance, this notice provided an update on testing and PPE recommendations. It also noted that DC Health would follow up with positive cases.

84 Some of the health notices described below may have been subsequently removed from the DC Health website and replaced with updated guidance.

85 Website notes guidance as March 13, 2020, but guidance is dated March 19, 2020

Date	DC Health Guidance Summary: https://dchealth.dc.gov/page/health-notices
March 20, 2020	This guidance provided "an overview for DC Healthcare Providers about 1) updated specimen collection and submission instructions and 2) required disposition for discontinuing home isolation for persons diagnosed with COVID-19. DC Health has not yet adopted clinical criteria for diagnosing COVID-19 cases. All cases must be laboratory confirmed for COVID-19."
March 26, 2020	Following updated CDC guidance on 3/24/20, this notice provided "Updated Priorities for Testing Patients with Suspected COVID-19 Infection and Updated Prioritization of Contact Tracing by DC Health."
April 21, 2020	This Health Notice provided updated testing priorities and modified guidance to allow providers to order testing from DC Department of Forensic Science Public Health Laboratory (DFS PHL) without prior approval from DC Health.
May 7, 2020	This Health Notice required reporting of positive and negative point-of-care and serology tests. It updated testing priorities and guidance on discontinuation of home isolation.
May 11, 2020	The May 11, 2020 Health Notice guidance outlines current information and reporting requirements of a pediatric multi-system inflammatory syndrome that may be related to COVID-19.
July 15, 2020	This Health Notice requires healthcare employers must begin timely reporting of all cases and deaths of healthcare personnel infected with COVID-19 who work in DC.
August 3, 2020	This Health Notice updates requirements that labs and providers report all positive and negative results for COVID-19 viral (nucleic acid or antigen) and antibody testing. It also updates testing priorities and guidance on discontinuation of home isolation.
December 28, 2020	This Health Notice provides guidance and reporting guidelines antigen testing. This Health Notice updated a September 17, 2020 Health Notice.
January 15, 2021	This health notice provides information on safe administration, clinical considerations, reporting requirements, and highlights important resources for healthcare providers on the Pfizer-BioNTech and Moderna COVID-19 Vaccinations. This Health Notice was updated March 10, 2021.

Date	DC Health Guidance Summary: https://dchealth.dc.gov/page/health-notices
February 2, 2021	This Health Notice provides guidance and reporting guidelines for COVID-19 antigen testing in the setting of moderate to substantial community spread.
February 11, 2021	This Health Notice provides information for healthcare providers on what is currently known about the SARS-CoV-2 variants and provides resources providers can use to access the most up-to-date information.
March 9, 2021	This health notice follows the FDA's 2/27/21 Emergency Use Authorization for the Janssen/Johnson & Johnson COVID-19 Vaccine in the U.S., and provides information on safe administration, clinical considerations, reporting requirements, and highlights important resources for healthcare providers.
March 10, 2021	This Health Notice provides information on **1)** The definition of a COVID-19 outbreak in the long-term care setting **2)** The definition of a COVID-19 outbreak in the hospital setting **3)** The definition of a COVID-19 outbreak in the outpatient setting, **4)** The infection control recommendations to mitigate the outbreak, and **5)** Reporting thresholds.
	Education: Guidance to childcare centers, schools, and universities:[86] https://coronavirus.dc.gov/healthguidance
July 29, 2020	DC Health issued guidance that childcare facilities must implement to reduce COVID transmission. Childcare facilities must report cases among children or staff who interact frequently with children to DC Health.
November 9, 2020	Universities and colleges must report cases it is notified about to DC Health among staff and among students who were on campus or spent time in a University-owned building in the 2 weeks prior to the test or symptom onset date.
December 8, 2020	This guidance lists measures schools should implement to reduce COVID transmission. Schools must report COVID-19 cases among staff and among students to DC Health. DC Health does not recommend repeated (e.g., surveillance) testing of students or staff who do not have symptoms or known exposures.

86 Some of the guidance described here may have been subsequently removed and replaced with updated guidance.

Date	DC Health Guidance Summary: https://dchealth.dc.gov/page/health-notices[84]
January 15, 2021	DC Health issued updated guidance to childcare facilities. The guidance adds language that was included in the December 8, 2020 school guidance that DC Health does not recommend surveillance testing. It also adds more detail to each section of the original July 29, 2021 guidance including saying when an exposed cohort should be dismissed and for how long and that children and staff should be tested if anyone in their household tests positive.
February 25, 2021	DC Health issued updated guidance to schools stating that schools may consider testing a random sample of at least 10% of students a week. This is a change from December 8, 2020 guidance that recommended against surveillance testing of students.
March 25, 2021	DC Health updated guidance to schools, providing more details on screening testing which "might be an effective tool at reducing transmission in schools when combined with prevention measures, such as mask use, physical distancing." The Notice also listed screening testing for sports as a potential tool.

About ODCA

The mission of the Office of the District of Columbia Auditor (ODCA) is to support the Council of the District of Columbia by making sound recommendations that improve the effectiveness, efficiency, and accountability of the District government.

To fulfill our mission, we conduct performance audits, non-audit reviews, and revenue certifications. The residents of the District of Columbia are one of our primary customers and we strive to keep the residents of the District of Columbia informed on how their government is operating and how their tax money is being spent.

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