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**NEWS RELEASE**

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FOR RELEASE January 31, 2022

Auditor of State Rob Sand today released a report on a review of the State's reporting of COVID-19 data. The review covered the period March 1, 2020 through May 17, 2021. In July 2020, Auditor Sand, along with other State Auditor's offices joined a bipartisan COVID-19 Audit Task Force. The Task Force includes various states who agreed to issue individual reports on their state's reporting of COVID-19 data. Sand reported the procedures developed by the COVID-19 Audit Task Force were included in the review of Iowa's reporting of COVID-19 data performed by the Iowa Office of Auditor of State.

Importantly, Sand reported the COVID-19 data reported on the State's public Dashboard by the Iowa Department of Public Health (IDPH) was supported by the lab results submitted to IDPH. Sand reported the data recorded in the IDPH Iowa Disease Surveillance System (IDSS) agreed to the data uploaded to the DOMO database which is used to update the State's public Dashboard. DOMO, Inc. is a cloud-based software company. In addition, delays and late-recorded test results appear to be attributable entirely to private labs submitting results late, rather than to Iowa state government issues.

Sand also reported opportunities exist for the State to make improvements to its website for the purpose of enhancing transparency and accountability. With the emergence of new COVID-19 variants, it is important comprehensive data be readily available to the public and officials of entities such as school districts and long-term care facilities for purposes of analysis and decision-making. Specifically, officials should consider updating the information on the State's dashboard on a daily basis and include information unique to various user groups.

A copy of the report is available for review on the Auditor of State's web site at <https://www.auditor.iowa.gov/reports/file/67546/embed> and has been filed with other audit entities participating in the COVID-19 Audit Task Force.

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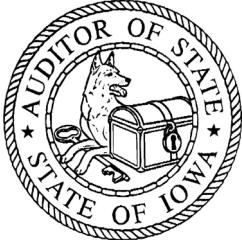
**REPORT ON A REVIEW OF THE  
STATE OF IOWA'S REPORTING OF COVID-19 DATA  
ADMINISTERED BY THE  
IOWA DEPARTMENT OF PUBLIC HEALTH**

**FOR THE PERIOD  
MARCH 1, 2020 THROUGH MAY 17, 2021**

**Report on a Review of the  
State's COVID-19 Dashboard  
Administered by the Iowa Department of Public Health**

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Rob Sand  
Auditor of State

Auditor of State's Report

To the Honorable Kim Reynolds, Governor; Members of the Iowa Legislature; and  
Director Kelly Garcia, Iowa Department of Public Health:

In conjunction with our audit of the financial statements of the State of Iowa and in accordance with Chapter 11 of the *Code of Iowa*, we have conducted a review of the State of Iowa's (State's) reporting of COVID-19 data and the integrity of the underlying data. The review covered the period March 1, 2020 through May 17, 2021. We reviewed the integrity of the COVID-19 data collected and reported by the State to determine compliance with applicable sections of the *Code of Iowa*, reporting requirements established by the Center for Disease Control and Prevention (CDC), and compliance with reporting requirements under the Coronavirus Aid, Relief, and Economic Security Act (CARES Act). In conducting our review, we performed the following procedures:

- (1) Reviewed applicable sections of the *Code of Iowa*, CDC guidance, and requirements of the CARES Act to determine requirements for reporting and tracking the spread of COVID-19.
- (2) Interviewed officials and personnel from the Iowa Department of Public Health (IDPH) and other State officials to gain an understanding of the how COVID-19 data is collected and reported by IDPH and uploaded and reported on the dashboards available to the public which are maintained on a cloud-based system operated by DOMO, a vendor under contract with IDPH.
- (3) Analyzed and reconciled the data uploaded by IDPH to the dashboard maintained by DOMO to determine completeness and compliance with the reporting requirements established by the CDC and IDPH.
- (4) Reconciled the data uploaded from the DOMO database to the States Coronavirus website to determine if the data reported was complete.
- (5) Compared selected cases records recorded in the DOMO database to the IDPH Iowa Disease Surveillance System (IDSS) to determine if the information reported in the DOMO database agreed with the information reported in IDSS.
- (6) For selected dates, recalculated the 14-day and 7-day positivity rates reported on the State's website to determine the accuracy of the information reported.

Based on these procedures, we determined the data reported on the State's public Dashboard (Dashboard) was supported by the test results submitted by various labs to IDPH. The results submitted and recorded in IDSS agreed to the results recorded in the DOMO database used to update the Dashboard.

Using information recorded in the DOMO database, we were able to recalculate the reported positivity rates within 0.5% of the positivity rates reported by the State. Therefore, the positivity rates reported by the State are materially accurate and are supported by the data recorded in the DOMO database. Because we did not review the procedures used by labs for collecting and reporting COVID-19 test results, we cannot determine if all test results were properly submitted to IDPH.

Based on these procedures, we did not identify any significant concerns regarding the integrity of the data. However, we identified several items to be considered by IDPH officials in addressing the ongoing response to the emergence of new COVID-19 variants and potential future pandemics or similar situations where data is provided to the public.

The procedures described above do not constitute an audit of financial statements conducted in accordance with U.S. generally accepted auditing standards. Had we performed additional procedures, other matters might have come to our attention which would have been reported to you. A copy of this report has been filed with other audit entities participating in the bipartisan, multistate COVID-19 Audit Task Force.

We would like to acknowledge the assistance extended to us by the officials and personnel of the Iowa Department of Public Health and the State Hygienic Laboratory during the course of our review.



ROB SAND  
Auditor of State

December 10, 2021

## Introduction

### Background

On February 11, 2020, the World Health Organization (WHO) announced, the official name for the disease responsible for the 2019 novel coronavirus outbreak was “coronavirus disease 2019,” abbreviated as COVID-19. Formerly, this disease was referred to as “2019 novel coronavirus” or “2019-nCoV”.<sup>1</sup> Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the virus that causes COVID-19, is highly contagious and has generated a worldwide pandemic.<sup>2</sup>

The following is a timeline of key dates from the WHO “Timeline: WHO’s COVID-19 Response which can be found at: <https://www.who.int/news/item/29-06-2020-covidtimeline>.

- December 2019 – WHO representatives identified reports of viral pneumonia of unknown cause on a website of the Wuhan (China) Municipal Health Commission and the WHO’s Epidemic Intelligence from Open Sources (EIOS) platform. The viral pneumonia was later determined to be COVID-19.
- January 5, 2020 – The WHO issued its first Disease Outbreak News report regarding the viral pneumonia. The report contained information about the number of cases and their clinical status; details about response measures in Wuhan; and WHO’s risk assessment and advice on public health measures. It advised that “WHO’s recommendations on public health measures and surveillance of influenza and severe acute respiratory infections still apply.”
- January 21, 2020 The United States of America (USA) reported its first confirmed case of the novel coronavirus. This was the first case in the WHO Region of the Americas.
- January 30, 2020 - The WHO Director-General declared the novel coronavirus outbreak a public health emergency of international concern, WHO's highest level of alarm.
- February 4, 2020 – The WHO Director-General urged Member States to prepare themselves by taking action now, saying “We have a window of opportunity. While 99% of cases are in China, in the rest of the world we only have 176 cases.” At that date there had been 20,471 confirmed cases in China with 425 deaths and there were 176 cases in 24 countries outside China with one death in the Philippines. A WHO representative also reported “it is possible that there may be individuals who are asymptomatic that shed virus, but we need more detailed studies around this to determine how often that is happening and if this is leading to secondary transmission.”
- March 11, 2020 - WHO made the assessment that COVID-19 could be characterized as a pandemic.

According to the United States Centers for Disease Control and Prevention (CDC), COVID-19 is predominantly a respiratory illness that can affect other organs. People with COVID-19 have had a wide range of symptoms reported, ranging from mild symptoms to severe illness. Symptoms may appear 2 to 14 days after exposure to the virus. As the disease spread, the WHO, CDC, and State Public Health Departments tracked the spread and issued guidance to mitigate/reduce further spread.

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<sup>1</sup> CDC. “Coronavirus Disease 2019 (COVID-19) FAQ” Centers for Disease Control and Prevention, (2020), <https://www.cdc.gov/coronavirus/2019-ncov/faq.html#:~:text=In%20COVID%2D19%2C,%2Drespiratory%20tract%20illnesses>.

<sup>2</sup> Sharma, Atul et al. “Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2): a global pandemic and treatment strategies.” International journal of antimicrobial agents vol. 56,2 (2020): 106054. doi:10.1016/j.ijantimicag.2020.106054

## COVID-19 in Iowa

The Iowa Department of Public Health (IDPH) is responsible for detecting, preventing, and responding to infectious disease, including but not limited to epidemics and pandemics. Chapter 139A of the *Code of Iowa (Code)*, titled “Communicable and Infectious Diseases and Poisonings,” establishes the framework within which IDPH and other relevant parties must perform their work related to infectious diseases. It provides requirements of what diseases healthcare providers or public, private, or hospital clinical laboratory must report to IDPH and how to report them. The *Code* also provides authority for isolation and quarantine of individuals by public health authorities at the state and local government levels.

The following is a timeline of actions taken by Iowa officials based on information from the IDPH website:

- March 3, 2020 – IDPH urged Iowans returning from countries affected by COVID-19 to self-isolate. In its press release, IDPH stated “there were no confirmed cases of COVID-19 in Iowa at this time.”
- March 5, 2020 – IDPH issued a mandatory reporting order to temporarily designate confirmed or suspected cases of COVID-19 as a reportable disease. The mandatory reporting order requires all healthcare providers and public, private, and hospital clinicians to immediately report all positive laboratory tests for COVID-19 to the Department prior to patient notification.
- March 8, 2020 – IDPH issued a press release stating “Testing at Iowa’s State Hygienic Laboratory has indicated three presumptive positive cases of COVID-19 in Iowa residents. The cases identified were located in Johnson County.”
- March 9, 2020 – Governor Reynolds signs a proclamation of disaster emergency to respond to the COVID-19 pandemic. The proclamation activated the disaster response and recovery aspects of the Iowa Department of Homeland Security and Emergency Management’s Iowa Emergency Response Plan and those additional response plans applicable to the counties affected by the disaster. In addition, it authorized the use and deployment of all available State resources, supplies, equipment, and materials as are reasonably necessary to assist those citizens located in the disaster affected counties. In the proclamation, the Governor ordered all State agencies to utilize such personnel, equipment, and facilities as necessary to assist the Iowa Department of Public Health (IDPH) and the Iowa Department of Homeland Security and Emergency Management in performing any and all activities to prevent, contain, and mitigate the effects of the COVID-19 virus. A copy of this proclamation is available at <https://coronavirus.iowa.gov/pages/proclamations> along with other related proclamations.
- March 17, 2020 – Governor Reynolds issued a State of Public Health Disaster Emergency.
- March 19, 2020 – IDPH issued a mandatory reporting order requiring all Iowa health care providers and public, private, and hospital laboratories immediately report all positive and negative Coronavirus Disease 2019 (COVID-19) testing results to the Department. Reports were required to be made electronically through the Iowa Disease Surveillance System (IDSS) when a facility had electronic transmission capabilities, otherwise reports were to be faxed to IDPH. The March 19, 2020 mandatory reporting order rescinded and replaced the March 5, 2020 temporary COVID-19 mandatory reporting order. IDPH officials reported there were no exceptions to this order. **Appendix A** includes a copy of the March 19, 2020 mandatory reporting order.
- April 18, 2020 – IDPH ordered “all Iowa health care providers and public, private, and hospital laboratories are required to immediately report all positive and negative SARS-CoV-2 testing results to the department. Reports must be made electronically through the Iowa Disease Surveillance System (IDSS) when a facility has electronic transmission



capabilities, otherwise reports can be faxed to [fax number].” This proclamation was a reiteration of the proclamation issued on March 19, 2020.

- April 21, 2020 – A press release was issued which stated, “Today, Governor Kim Reynolds launched the Test Iowa Initiative to expand testing capacity to limit the spread of COVID-19 in Iowa.” The press release also quoted the Governor as saying, “I am encouraging Iowans to go to [testiowa.com](https://testiowa.com) to complete their own health assessment. This type of information will help Iowans assess eligibility for testing and further inform the state’s response to COVID-19.” During the week prior to April 21, 2020, the State entered a contract with Nomi Health Inc. (which subcontracted with DOMO) to provide test kits and a reporting platform.

### **COVID-19 Testing Definitions**

According to the United States Department of Health and Human Services (HHS), a rapid and thorough public health response to the COVID-19 pandemic requires complete and comprehensive laboratory testing data, including standardized test results and relevant demographic data. The U.S. Food and Drug Administration (FDA) approved the following tests for diagnosing a COVID-19 infection:

- Polymerase Chain Reaction (PCR) test – A PCR test, also called a molecular test, detects the genetic material of the virus using a lab technique called PCR.
- Antigen test – This test detects certain proteins in the virus. While antigen tests are very specific for COVID-19, they are not as sensitive as molecular PCR tests. Because PCR tests are considered more reliable than antigen tests, depending on the situation, a PCR test may be performed to confirm a negative/positive antigen test result.

Both the PCR and antigen tests may be performed and analyzed on-site if the facility has a lab with the proper equipment. If the tests are analyzed on-site, the test results may be available in minutes, hours, or the same day. However, many testing sites send the samples to an outside lab for testing. In these cases, it may take a several days, or longer for the test results to be reported. The length of time depends on where the lab is located and the number of tests the lab has in the queue to process.

### **COVID-19 Testing and Reporting in Iowa**

The State entered into an emergency no-bid contract with Nomi Health effective April 14, 2020 for services related to the Test Iowa initiative. The contract was signed on behalf of the State by Paul Trombino III, COO and interim Director of the Department of Administrative Services. Under the contract, Nomi Health provided a statewide digital health assessment platform and assessment questionnaire, inventory tracking, all testing supplies, hardware, PCR machines, and testing kits. The contract also included the implementation and maintenance of a COVID-19 data dashboard on a cloud-based website.

A data dashboard is a reporting tool that monitors, analyzes, and visually reports key metrics and data points to track a specific process<sup>3</sup>. Data dashboards take vast amounts of raw data and consolidate it in a way that enables the reader to interpret the data in order to make decisions. Wikipedia defines a dashboard as a type of graphical user interface which often provides at-a-glance views of key performance indicators relevant to a particular objective or business process. The dashboard is typically accessible by a web browser and is linked to a data source which is regularly updated.

According to an IDPH news release dated April 14, 2020, “The State has released a public dashboard that will be updated daily to include comprehensive tracking of COVID-19 in Iowa. The new dashboard includes cases, deaths, and tests conducted in each county. The State will be providing

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<sup>3</sup> What is a data dashboard? Klipfolio, <https://www.klipfolio.com/resources/articles/what-is-data-dashboard#:~:text=A%20data%20dashboard%20is%20an,business%2C%20department%20or%20specific%20process>

demographic information that was not previously provided as well as Iowa’s epidemiological curve.” The dashboard initially included only PCR test results. Antigen test results were added in August 2020.

As previously stated, the Governor launched the Test Iowa Initiative (Test Iowa) on April 21, 2020 to expand testing capacity and to help limit the spread of COVID-19 in Iowa. Prior to April 21, individuals were primarily tested for COVID-19 at local health providers. After April 21, 2020 individuals could also be tested at Test Iowa drive-thru sites, selected Walgreens and Hy-Vee stores, and various other locations. Test Iowa sites administered only PCR tests. Antigen tests were not administered at Test Iowa sites. Prior to establishing a contractual arrangement with Iowa in mid-April, Nomi Health and DOMO were part of a partnership which had already launched a similar initiative in the State of Utah.

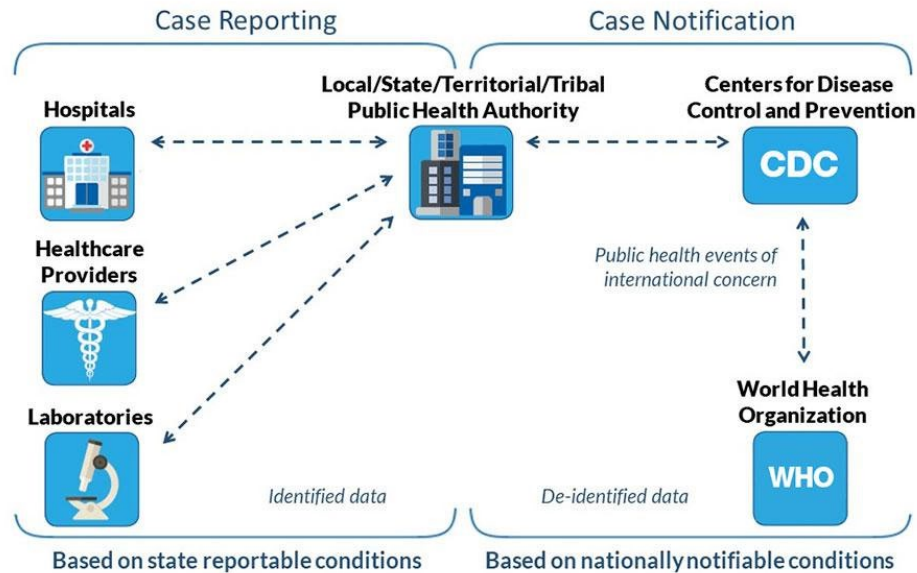
All tests performed at Test Iowa sites were sent to the State Hygienic Lab (SHL) at the University of Iowa for analysis. However, tests performed at other sites were sent to various in-state and out-of-state labs for analysis, including the SHL.

**Table 1** summarizes the flow of COVID-19 test data from the test site to its reporting on the State’s dashboard.

<b>Entity</b>	<b>Description</b>
<b>Test Site</b>	Staff at COVID-19 testing sites collect specimens using the PCR or antigen test kits. Specimens are then sent to an in- or out-of-state lab. Some test sites, such as emergency rooms, have the ability to analyze specimens on site and submit results to IDPH rather than sending the samples to an off-site lab. These sites have CLIA waivers.
<b>Lab</b>	The lab is required to be certified as a Clinical Laboratory Improvement Amendments (CLIA) certified laboratory for analysis unless a waiver has been issued.  Laboratories and healthcare providers are required by IDPH’s mandatory reporting order to immediately report all positive and negative COVID-19 results. Under IDPH’s order, immediate is defined as “reporting within one day of the test being performed.” Reports must be made through IDSS or other electronic means as directed by IDPH. This standard was used by IDPH at the beginning of the pandemic and is consistent with federal reporting requirements under the Coronavirus Aid, Relief, and Economic Security Act (CARES Act) and with state law.  After the test kits have been processed, the results are electronically transmitted to IDSS.
<b>IDSS</b>	IDSS is an electronic database used by IDPH to collect and analyze data reported for various infectious diseases. IDSS enables local public health, hospitals, laboratories, and IDPH to collaborate electronically as they perform disease reporting and surveillance activities across the state. IDSS cannot be viewed by the public. According to IDPH officials, all county health departments have access to all information in IDSS for the residents of their jurisdiction.  Information is transmitted from IDSS to DOMO. The frequency of the updates varied from daily to multiple times within a day during our testing period.
<b>DOMO</b>	As previously stated, DOMO is a cloud-based dashboard which allows users to visualize large amounts of data. At the end of 2020, COVID case investigation work was transitioned to occur from within the IDSS system to within DOMO, where it now occurs. DOMO was used to build a more flexible, accessible option for the increasing volume of cases. The procedure as of May 17, 2021 required test results to be reported in IDSS and then transferred/uploaded to DOMO.
<b>Data Dashboard</b>	IDSS data is uploaded multiple times each day to the data dashboard maintained by DOMO on behalf of the State.

The CDC’s website includes the following chart which shows the data flows between the various reporting entities.

# Case Surveillance



Source: <https://www.cdc.gov/coronavirus/2019-ncov/covid-data/faq-surveillance.html>

In a report issued on July 14, 2020, the Office of Auditor of State reported the SHL was analyzing every potential COVID-19 specimen collected through Test Iowa. However, SHL sends Test Iowa results exclusively to a private entity that is a part of the Test Iowa program, rather than reporting them immediately to IDPH as required by the Code. The result then goes to another private company, then to another state entity, prior to finally reaching IDPH.

In addition, we reported the Test Iowa reporting chain, which includes three intermediaries prior to test results being reported to IDPH, is wasteful and risky when compared to immediate reporting. Each link in the chain is an area where the integrity, reliability, and timely transmission of information is put at unnecessary risk of error, equipment failure, maladministration, outright falsification, or any other cause. The reporting chain for Test Iowa is contrary to law, takes apparently pointless risks, and increases taxpayer risk of legal liabilities.

The report also states no documentation was provided of an IDPH order establishing the reporting chain currently used. As SHL reports being instructed to report in this manner and IDPH does not deny that, such instruction must have been verbal.

On July 10, 2020 the SHL provided a written response which is included as an Appendix in the report. As illustrated by the Appendix included in the report, SHL officials reported "...SHL is currently reporting all COVID-19 test results, including those associated with the Test Iowa program, to the Iowa Department of Public Health in accordance with IDPH's Statewide Standing Order for COVID-19 Testing." However, the Statewide Standing Order for COVID-19 Testing refers to Iowa Code section 139A.3, Chapter 641 of the Iowa Administrative Code and the Mandatory Reporting Order, dated April 18, 2020 and signed by the IDPH Director and the IDPH Medical Director, all require immediate reporting to IDPH. A verbal order would not comply with Code requirements.

IDPH officials reported the condition and processing capabilities of IDSS is a primary reason data was initially reported to DOMO. IDSS is a legacy system and outdated. It almost stopped working because of its inability to handle the vast amounts of data and queries necessary to respond to the COVID-19 pandemic. Officials also reported systems similar to IDSS in other states failed as a result of being outdated. By partnering with DOMO, IDPH did not experience a disruption of data processing.

## Calculating positivity rates

According to the CDC, there are three different methods for calculating the percent of tests which are positive for COVID-19 (positivity rate). When any of the methods are consistently applied, they are useful for monitoring trends and decision making. State and local officials may consider adopting some or all three of the following methods if the methods suit their surveillance needs.

- Test over test, which is used by the CDC, is calculated as the number of positive tests divided by the sum of the number of positive tests and number of negative tests.
- People over tests, which is used by some states, is calculated as the number of new people with positive tests divided by the sum of the number of positive tests and number of negative tests.
- People over people, which is also used by some states, is calculated as the number of new people with positive tests divided by the sum of the number of people with positive tests and the number of people with negative tests. This may also be referred to as individual over individuals.

In general, according to the CDC, for federal COVID-19 response reporting purposes, laboratory test positivity rate has represented the percentage of all PCR tests conducted that are positive. Although the methods used by different organizations to calculate positivity rate can differ, positivity rate has provided insights into transmission of infectious diseases, including COVID-19, in a geographical area, such as the state or a county.

The interpretation of positivity rate depends on the volume of COVID-19 diagnostic laboratory testing reported to state and local health departments and the criteria used for determining what populations are tested. The CDC states, “A high PCR positivity rate occurs when many of the test results among those being tested and reported in a community are positive. This can mean that there are widespread infections in the community tested; or only a subset of the community at greatest risk for SARS-CoV-2 infection is being tested; or there are reporting processes or delays that skew the results.” The laboratory test percent positive goes down when more people tested are negative. In general, positivity rate will go down as more persons are being screened in non-outbreak settings (e.g., routine screening in schools, long-term care facilities, workplaces) and the results are reported.

According to the CDC, the integrity of COVID-19 data collection is important to:

- monitor the spread and severity of the disease,
- understand risk factors for severe disease and transmission,
- estimate disease burden, such as death and loss of health due to the disease,
- produce data for forecasting the spread and impact of the disease, and
- understand how the disease impacts the capacity of the healthcare system.

Government data is expected to be a reliable source of information for the public, as this data is the basis for government officials’ decisions on public health and social measures. Each state in the U.S. made efforts to provide the public with timely and transparent COVID-19 data via their websites and data dashboards. However, a July 2020 review of outbreak data by former CDC Director, Tom Frieden, revealed that no state discloses even half of what health experts consider essential indicators for managing the disease.

The States use the information collected to help determine when mitigation efforts, such as wearing masks, closing schools, and restricting travel may help reduce the spread. Without accurate data, State, local, and other users relying on the data may not make the correct decision when implementing mitigation measures.

## Reporting by Labs and State Dashboard

As previously stated, IDPH requires all Iowa health care providers and public, private, and hospital laboratories to immediately report all positive and negative COVID-19 results. The CDC also requires test results be submitted within 24 hours to the appropriate state, tribal, local, or territorial public health department based on the individual's residence. In addition, the Coronavirus Aid, Relief, and Economic Security (CARES) Act and its June 4, 2020 implementation guidance require every CLIA certified COVID-19 testing site to report every diagnostic and screening test result (both positive and negative results) performed to detect SARS-CoV-2 or to diagnose a possible case of COVID-19 (e.g., molecular, antigen, antibody) to the appropriate state or local public health department, based on the individual's residence. The results are also reported to the CDC.

During the COVID-19 response, state and jurisdictional health departments voluntarily sent testing data to CDC using the National Notifiable Diseases Surveillance System. To protect individuals' privacy, COVID-19 testing data is sent to CDC without personal identifiers, such as names or home addresses. A national standardized case definition is used to define confirmed, probable, and suspect cases and deaths (de-identified). National case surveillance data focus on capturing demographic and risk factor information about people with COVID-19.

The CARES Act requires that as of August 1, 2020, laboratory testing data include 18 data elements in the data reported. This requirement was subsequently updated effective January 8, 2021. As a result, labs must report each element to IDPH. The data elements include the patients race and ethnicity, the type of COVID-19 test used, the ordering provider, and the testing facility. **Appendix B** includes a list of all 18 data elements which must be reported along with six demographic elements which were also required to be submitted.

In addition, the CDC requires labs to report to state health departments specific contact information for the patient and the ordering provider, including patient name, patient street address, patient phone number, patient date of birth, ordering provider address, and ordering provider phone number. The data elements reported by the labs to IDPH are collected and recorded in IDSS.

DOMO, Inc., a subcontractor under the Nomi Health contract. The State's public website, which is located at <https://coronavirus.iowa.gov/> (State's website), is hosted by the Office of the Chief Information Officer (OCIO). OCIO provides user accounts to Homeland Security Emergency Management Division (HSEMD) and IDPH in order to access and edit the site. Since the launch of the site, HSEMD and IDPH have worked together to create and maintain the site content. IDSS data is pushed to DOMO to prepare the dashboards which IDPH and HSEMD embed on the website. State officials and other users, including private companies, other public entities, and others, use the data dashboards, the related COVID-19 statistics reported on the State's website, information from the CDC, other state and federal officials, and other sources when decision-making on mitigation efforts.

As previously stated, labs are required to report their results of COVID-19 tests administered in Iowa to IDPH through the IDSS system. Each lab has their own terminology for test results. The labs report the case data and test results as positive, negative, inconclusive, indeterminable, invalid, or variations of these categories such as presumed positive or presumed negative. DOMO accepts the test results as submitted but categorizes them into positive, negative, inconclusive, indeterminable, or invalid. The uploaded data is then posted to the dashboard. As previously stated, the dashboard converts large amounts of data into one format and compresses it to enable the reader to interpret it. The objective of the dashboard is to display the information in a way that allows the user to understand complex relationships in the data. The dashboard allows State officials to track the number of cases, monitor the progression of COVID-19, and report important COVID-19 data to all Iowans.

As previously stated, the State began tracking PCR test results in March 2020. According to IDPH officials, the State started tracking antigen tests when the results were first reported to IDPH. Based

on the DOMO database we downloaded, antigen tests were first reported in June 2020 and test results were first shown on the dashboard in August 2020. The test results and other COVID-19 statistics are reported on various dashboards within the State’s website. From March 2020 through May 17, 2021, the dashboards were updated daily, and some information was updated multiple times each day. According to State officials, as of May 17, 2021 a full replacement of the data in IDSS is sent to DOMO every four hours. As a result, any changes made in IDSS, such as a spelling correction or a typo in a data field, are corrected when the file is uploaded to the DOMO database.

According to State officials, DOMO helps identify where there are multiple tests for the same person on the same day. According to State officials, prior to the data being reported on the State’s dashboard, staff performs case investigative work which includes de-duplicating the data when multiple versions of the same case are identified. IDPH staff also stated, data cleaning is an ongoing process. State officials also reported to de-duplicate the total tests to an individual level, there are two instances where duplicate data is removed when it comes to testing and case determination:

- Tests are de-duplicated to create a single record per individual per day. This is based on the individual IDSS identification number and the date.
- Cases (determination after a test of which there could be multiple):
  - The first positive test found for an individual creates a positive case record regardless of the date and type of test. (e.g., a positive test is found on 02/02/2021 and a negative test is found 02/03/2021. In this event the negative test on 02/03/21 would still count as a test on 02/03/21 but would not impact the case classification for the individual that was made on 02/02/21. According to State officials, all test results remain in IDSS/DOMO and are not deleted.)
  - If only negative cases are found, then the most recent negative test is accepted regardless of whether it was a PCR test or an antigen test.

According to State officials, all non-positive and non-negative test results are grouped into an “Inconclusive” category within the DOMO mapping file. As a result, the total tests reported include positive, negative, and the inconclusive tests. The State’s website also includes the inconclusive test results because it is updated as the dashboards pull the data in real time from the DOMO database.

The date field being used in the visualizations (and used in the logic to determine positive/negative dates) is determined as follows. The Lab Collection date is used unless a date was not included, or there is an input error, such as the wrong year. If this occurs, then the Lab received date is used. If the Lab received date field does not include a date or there is a data error, then the Lab result date is used.

- Lab Collection Date
- Lab Received Date
- Lab Result Date
- Event Reported to IDPH date

As previously stated, the date for a positive COVID individual is the first date a positive test is seen, and the date for a negative individual is the most recent negative test date.

Prior to being published on the Public dashboards, data and visualizations go through a two-step review/approval process. The first step is the review/approval of any business rules/logic applied to the data, and the second step is the review/approval of the dashboard visualizations and presentation. Both reviews and approvals/sign-off are conducted by the Functional Leads (subject-matter experts), Director, and Incident Command. **Table 2** summarizes each dashboard reported on the State’s website as of January 4, 2021.

**Table 2**

<b>Dashboard</b>	<b>Overview of Information Reported on the Dashboard</b>
Summary Statistics	Individuals tested, individuals positive, total recovered, total deaths, underlying cause deaths, contributing factor deaths, and summary totals by county for each of the previously stated categories.
Positive Case Analysis	The latest COVID-19 case information including total tests and individuals tested reported separately for PCR and antigen tests, including negative and positive tests. In addition, a positive case analysis for the past 14 days is presented for total tests and individuals tested including PCR and antigen tests combined. For individuals tested, the percentage of positive cases for the past 7 days is also reported.
% Positive Analysis Schools	Percent positive analysis including the past 14-day average positivity rates by county and corresponding school districts.
Hospitalization Analysis	Current hospitalization data such as number of patients hospitalized by primary versus secondary diagnosis and by age group.
Long-Term Care (LTC)	Reports current outbreak information such as number of facilities with current outbreaks, positive cases, recovered, and total resident deaths. In addition, positive cases by county, by facility and related statistics.
Regional Medical Coordination Center (RMCC)	Most current hospital data by RMCC region such as total patients hospitalized, in ICU, admitted in last 24 hours, bed availability, and ventilators available. There were six RMCC's set up across the State to help local health officials deal with the pandemic and help provide a region-wide assessment of the situation. The centers will also help with equipment and other hospital care.
Test Iowa Assessments	The number of Test Iowa assessments that have been completed. Also, assessments by county and distribution by age and gender.
Serology Testing	Serology tests completed including individuals tested, individuals positive, individuals negative, and percentage individuals positive. Serology tests look for antibodies in your blood to determine if you had a past infection with the virus that causes COVID-19.
Outcome Analysis Recovered	COVID-19 cases resulting in recovery including total recovered and recovered cases by county. Also, includes related statistics such as age and gender.
Outcome Analysis Deaths	COVID-19 cases resulting in death including total deaths and reported deaths by county. Also, includes related statistics such as age and gender.

**Schedule 1** includes a summary of data reported on each of the State's dashboards and how it relates to the DOMO database fields as of February 19, 2021. The **Schedule** also specifies the data from DOMO to which we had access for purposes of this review. It also specifies which data fields we requested access but were not provided and those we did not request. During the course of our review, changes were made to the information presented on the dashboards. These changes are discussed in more detail later in this report.

According to State Officials, if an individual test result is reported as negative and the individual subsequently tests negative multiple times, the latest negative test date is used for the "individual tested" analysis. If an individual tests negative and subsequently tests positive, the first positive test result and date is used for the "individual tested" analysis. If an individual tests positive multiple times, the first positive test result/date is used for the "individual tested" analysis. Because the Delta variant was confirmed to have arrived in Iowa on May 4, 2021, these results primarily include non-Delta variant virus strains.

Prior to December 4, 2020, the State Dashboard reported the positivity rate using an "Individual over Individual" method. The State's use of the "Individual over Individual" method correlates to

the CDC's "Person over Person" method for calculating the positivity rate. The State Dashboard reported the positivity rate for individuals separately for PCR tests and antigen tests, and also reported the positivity rate for total individuals including the combined total PCR tests and the antigen tests.

From December 4, 2020 through the morning of February 19, 2021, the State Dashboard discontinued reporting the positivity rate for individuals separately for PCR tests and antigen tests. Instead, the State Dashboard reported the positivity rate for total individuals tested and total tests including the combined total PCR and antigen tests. In addition, on December 4, 2020, the State began reporting the positivity rate using the "Test over Test" method [total positive tests/(total positive + total negative tests)] for the past 14 and 7 days.

Beginning on the afternoon of February 19, 2021 through May 17, 2021, the State discontinued reporting the positivity rate for total individuals tested and only reported the positivity rate for total tests, including the combined total PCR and antigen tests.

As of the afternoon of February 19, 2021 the State's Positive Case Analysis Dashboard page includes the following:

- Total and individual PCR test results.
- Total and individual antigen test results.
- A graphical representation of the total tests, negative tests, positive tests and positivity rate by day.
- The "Past 14-day Average" and the "Past 7-day Average."
- Positive tests during the last 7 days by county.
- Positive tests during the last 7 days by age group.

Prior to the afternoon of February 19, 2021, the State's Positive Case Analysis Dashboard included the following:

- The number of individuals tested for both PCR and antigen tests.
- A graphical representation of the total number of individuals tested, negative tests, positive tests and positivity rate.
- Positive cases by county.
- Percent positive cases by pre-existing condition, age group, sex, race and ethnic background.
- There was also a dashboard for "% Positive Analysis – Public Schools."

On the afternoon of February 19, 2021, the State made significant changes to the dashboard, including:

- Removing the total number of tests by individual, total number of individuals positive and total recovered from the summary statistics section. Information remaining in the summary statistics section included the total number of tests, total positive, total deaths, underlying cause of death, contributing factor, and a breakdown of these categories by county.
- Since December 4, 2020, the positive case analysis section has reported total tests, total negative tests, and total positive tests in addition to the number of individuals tested, individuals tested negative, and individuals tested positive. Also, the State reported the positivity rates based on total tests and individuals tested. However, on the afternoon of February 19, 2021, the State dropped the reporting of the percent positive rate based on individuals and only reported the percent positive rate based on



total tests. The positivity rate based on individuals tested was reported as 7.1% and the positivity rate based on total tests was reported as 4.5%.

- The percentage positive analysis for schools and the outcome analysis recovered dashboards were dropped from the State's website.

A more detailed summary of changes made to the State's dashboard are discussed later in this report.

## **Objectives, Scope and Methodology**

### **Objectives**

Our review was conducted to evaluate the integrity of the data reported on the State's COVID-19 Dashboard and determine if the State reported the 18 data elements required under the CARES Act as of August 1, 2020.

A national task force (Task Force) consisting of staff from several state audit organizations developed a set of broad audit objectives to evaluate data collection, reporting and monitoring of COVID-19 cases to provide a consistent evaluation for individual and collective state assessments of virus mitigation efforts based on its data analytic tools. The Task Force is organized and led by the Delaware State Auditor. We joined the Task Force and included its procedures in our review of Iowa's collection and presentation of COVID-19 Data. While we participated in the joint Task Force and filed a copy of our final report with other Task Force members, we did not share any Iowa data or information with other participants other than this public report.

### **Scope and Methodology**

We reviewed the COVID-19 data collected by the State of Iowa for the period March 1, 2020 through May 17, 2021 and the manner in which it was presented. As part of our review, we requested access to IDSS information maintained by IDPH. Based on discussions with IDPH officials, the data we requested could not easily be parsed out from other data in the IDSS system in a timely manner or in a way which would be easily used for evaluation purposes. As a result, we agreed to use the COVID-19 data available on the DOMO dashboard for our testing procedures because the IDSS data is uploaded to DOMO. However, we also traced 29 cases reported in the DOMO database to entries in IDSS to ensure the data reported in the DOMO database agreed to the information in IDSS.

IDPH provided us access to the database files uploaded to DOMO. The database is used by DOMO to update the Dashboards. In order to analyze the data, we downloaded the data from the database on selected days and times. We tried to download the data in the morning after the Dashboard was updated. Because the database was updated at least daily and, in many cases several times a day, the data changes and will not agree from day to day as new data is uploaded.

The objectives of our review included determining if the data recorded in IDSS agreed with data recorded in DOMO. The objectives also included determining if the positivity rates could be recalculated using the available data to determine the accuracy of the information publicly provided by IDPH. Specifically, we:

- evaluated changes in and comparison of information reported within the State's website,
- compared the data recorded in the DOMO database to the data recorded in IDSS,
- determined the timeliness of the DOMO data and identification of data issues, and
- calculated positivity rates based on DOMO data and compared calculated rates to positivity rates reported on the State's website.

## Data Collection and Testing

As previously stated, we compared the National Data Quality COVID-19 procedures regarding data collection to the procedures performed by the State. **Table 3** summarizes the comparisons performed for the period April 1, 2020 through May 17, 2021.

**Table 3**

National Data Quality COVID-19 Collection Procedures / Questions	States Response / Data Collected
Did the COVID-19 testing data collected include:	
<ul style="list-style-type: none"> <li>• test type (e.g., PCR or antigen),</li> </ul>	Data for the type of test (PCR and antigen) is collected
<ul style="list-style-type: none"> <li>• test results,</li> </ul>	Test results are reported to IDPH through IDSS.
<ul style="list-style-type: none"> <li>• case information (e.g., gender, race, age, ethnicity, location, exposure source, etc.),</li> </ul>	Gender, race, birth date, ethnicity, resident city, resident county, address, phone, exposure setting name (location) are collected.
<ul style="list-style-type: none"> <li>• case classifications (e.g., confirmed and probable cases), and</li> </ul>	Confirmed and probable positive and negative results are reported. Inconclusive, indeterminable, and invalid results are also reported and included in IDSS but not included on the State Dashboard.
<ul style="list-style-type: none"> <li>• outcome (e.g., recoveries and deaths)?</li> </ul>	Event status, event outcome, event date of death, and recoveries are collected and reported.
Did the COVID-19 treatment data collected include:	
<ul style="list-style-type: none"> <li>• availability of ICU beds,</li> </ul>	Total ICU beds available was collected from RMCC hospital data reported to IDPH.
<ul style="list-style-type: none"> <li>• availability of ventilators, and</li> </ul>	Total ventilators available was collected from RMCC hospital data reported to IDPH.
<ul style="list-style-type: none"> <li>• patient health status (e.g., hospitalizations, ICU admissions and/or patients with underlying conditions)?</li> </ul>	Number of individuals hospitalized, admitted to the ICU, and pre-existing conditions, such as chronic lung disease, cardiovascular disease, etc. are collected.
How frequently did the State collect data for each variable?	<p>Testing data was collected daily from all Iowa health care providers and public, private, and hospital laboratories performing COVID-19 testing. Data is reported electronically through IDSS or faxed if a facility does not have electronic capabilities.</p> <p>Treatment data, such as hospitalized, admitted ICU, pre-existing conditions availability of ICU beds, ventilators, and patient health status is collected by IDPH from RMCC's daily, or as made available.</p>

We did not review the sample collection (testing) procedures at the various test locations or the manner in which the tests were submitted to and handled by the labs. Our review was limited to analyzing the results reported to the State by the labs and recorded in the DOMO Database. As a result, we are unable to ensure the results of all tests administered were properly reported to IDPH.

As previously stated, we downloaded the DOMO database data fields made available to us for the period March 2020 through May 17, 2021. Also as previously stated, the State launched "Test Iowa" on April 21, 2020. In order to receive a test, individuals completed a questionnaire online and, if they qualified, they were provided a date and time for their test. According to State officials, all "Test Iowa" tests included the name of the State Epidemiologist, Dr. Caitlin Pedati, as the ordering physician. IDPH officials reported standing orders are commonly used to ensure access to testing during public health emergencies.

According to State officials, Dr. Pedati’s name is also used by other labs for tests performed by IDPH not related to Test Iowa. In addition, Dr. Pedati’s name is also shown for some antigen tests, which are not part of Test Iowa. Because Dr. Pedati’s name is also used for non-Test Iowa tests and tests from non-Test Iowa sites are also processed by the State Hygienic lab, we were unable to easily determine the number of tests and the results related to Test Iowa.

When we reviewed the test result field, we determined there were several terms for positive, negative, and inconclusive test results. The test result field sometimes included the description “See Interpretation & Numeric Result”. According to State officials, the test result shown in this field is used to classify the test result. Based on this statement, we used the classification described in the related “Lab Interpretation” field to classify the test result as positive, negative, or inconclusive. **Table 4** lists the terms used in these fields and how we classified them in order to query the data.

**Table 4**

Lab Result Field Description	AOS Classification
Confirmed Positive	Positive
Detected	Positive
Positive	Positive
Presumptive Positive	Positive
COVID-19 Not Detected	Negative
Negative	Negative
Not Detected	Negative
Presumptive Negative	Negative
Inconclusive	Inconclusive
Indeterminate	Inconclusive
Invalid	Inconclusive

Based on the classifications defined in **Table 4**, we queried the DOMO database for the period March 2020 through May 17, 2021. **Table 5** summarizes the results of our query based on information recorded in DOMO at the time we downloaded the data.

**Table 5**

Description	Positive	Negative	Inconclusive	Total
PCR	334,490	2,862,142	15,394	3,212,026
Antigen	71,171	1,713,294	215	1,784,680
Total All	405,661	4,575,436	15,609	4,996,706

As illustrated by the **Table**, 3,212,026, or 64.3%, of the total tests recorded in the DOMO database were PCR tests. The remaining 1,784,680, or 35.7%, were antigen tests. Of the test results, PCR tests accounted for 82.5 % of the positive tests and 62.6% of the negative tests. In addition, a total of 15,609 tests were reported as inconclusive in the DOMO database. Although inconclusive tests are included in the DOMO database, they are not reported as a separate category on the State’s website. The inconclusive, indeterminable, and invalid results are included in the “Total Tests” and “Individuals Tested” on the website for both PCR and antigen tests.

Because inconclusive tests are only 0.3% of the total population, the overall impact on the State’s positivity rate would be negligible if they were included in the total number of tests when calculating the State’s positivity rate. Specifically, if all 15,609 inconclusive tests were positive, the percent of positive results within the total population tested would increase from 8.12% to 8.43%.

## Data Integrity

### DOMO Database Compared to IDSS

As previously stated, all test results, including “Test Iowa” results, are required to be reported to IDPH through IDSS. Once recorded in IDSS, the data is uploaded to the DOMO database. According to IDPH staff:

“At the end of 2020, case investigation work was transitioned to occur from within IDSS to within the DOMO system, where it now occurs. The DOMO system was used to build a more flexible, accessible option for the increasing volume of cases. The current procedure is the test results are received into IDSS and transferred to Domo [sic] with the exception of Test Iowa results which are already in Domo [sic].”

IDPH staff also reported:

“Assessment of reporting data is done in a variety of ways by both information management and CADE staff depending on the reporting mechanism (electronic lab reporting vs fax, etc.). Assessments are ongoing and when quality issues are identified, laboratory, CADE, and information management staff work together to correct them. If an entity refuses, counsel and support is sought from the AG’s office.”

The assessments are completed by CADE to determine whether the test data is correct and complete. Quality issues identified by CADE include concerns such as incorrect collection or lab dates, missing data fields, and incorrect birth date.

In July 2020 we requested access to COVID-19 data recorded in IDSS. IDPH denied our request based on the amount of time necessary for staff to redact private patient demographic and disease information and the amount of data. In addition, IDPH staff stated it would take time to download the data from IDSS into a format which we could use to analyze the data and would require IDPH staff to be pulled away from other pandemic responsibilities. After further discussions with IDPH staff, we agreed to use the data uploaded to the DOMO database.

Starting in July 2020, we frequently communicated with the State official assigned by the Governor’s Office as our only point of contact to arrive at a solution for obtaining the COVID-19 data needed for our analysis. However, the State official was slow to respond to our requests. Specifically, we initially requested access to IDSS on July 10, 2020. Our request was denied, but after following several administrative procedures, we were granted access during the first week of October to the database IDPH provided to DOMO in place of access to IDSS.

After receiving access to the database, additional information was needed to analyze the information in it and we requested that information in early October. However, we did not receive definitions and other needed information until December 10, 2020. By the end of January, we had questions to discuss with IDPH regarding the analysis we performed and those questions were provided to IDPH on February 5, 2021. Responses were not received until March 24, 2021. Responses to additional questions provided to IDPH officials on May 27, 2021 were not provided until July 30, 2021. According to IDPH officials, untimely responses to our requests and inquiries were a result of staffing limitations. As illustrated in IPDH’s response in **Appendix C**, leadership level individuals were focused on their work on responses to COVID-19. The individual first assigned to report to our inquiries, who was not a public health or medical professional, is no longer employed by the State of Iowa.

On October 1, 2020, State officials provided us access to a limited number of data fields within the DOMO database. The data fields we requested did not include any private information such as name, address, social security numbers, or other personal identifying information. IDPH officials

reported social security numbers are not collected with the tests reported and are not captured in IDSS or DOMO. We were provided the following DOMO database fields.

Case Number	Lab Name	Lab Test Type	Event Health Care Provider:
Case Birth Date	Lab Collection Date	Lab Test Result	Facility Name
Case Race	Lab Received Date	Lab Interpretation	Title
Case Ethnicity	Lab Result Date	Date Event Reported to IDPH	First Name
			Last Name

During October 2020 we also requested and received from a State official a listing of all the data fields that were available to be extracted from IDSS/DOMO. On October 26, 2020 and again in November 2020, we submitted a request to State officials for selected additional data fields and their definitions. For example, we requested access to the county and school district fields so we could calculate and compare positivity rates based on the data include in the DOMO database to the data reported on the State’s website. These fields were used by County and School officials for decision making. We did not request any fields with personally identifiable information. However, we were not provided access to the fields we requested or provided a reason why we were not provided access.

On December 9, 2020, a State official provided us definitions of the additional data fields requested, but we were not provided access to the additional fields in the DOMO database. As previously stated, **Schedule 1** includes a brief summary of data reported on each of the State’s dashboards and how it relates to the DOMO database fields we were provided access to and to those we were not provided access to by State officials. After further discussions with IDPH officials, they agreed to provide us the assistance needed to compare case data recorded in DOMO to the case data reported in IDSS. The official assigned by the Governor to be our primary contact for this engagement left the State’s employment on June 3, 2021.

During a meeting held with IDPH staff on May 17, 2021, IDPH staff provided access to IDSS in order to compare selected case data recorded in the DOMO database to the data recorded in IDSS. For the 29 cases selected, we compared the following fields:

- Case Number – This field is unique to the individual and is assigned when an individual first registers for a COVID test. This case number is used anytime the individual is subsequently tested.
- Birth Date
- Lab Collection Date – Date the sample is taken.
- Lab Test Type – This field shows if the test was a PCR or antigen test.
- Lab Result 1 - This field showed if the test result was positive, negative, or inconclusive. If the Lab Results 1 field included the notation “See interpretation & Numeric Result,” we compared the Lab Interpretation field result which also showed if the test was positive, negative, or inconclusive.

We did not provide information or case numbers to IDPH staff prior to the meeting on May 17, 2021. During the meeting, we read a case number to IDPH staff who then looked up the case data in IDSS and shared the case data screen with us. The selected cases covered both PCR and antigen tests; positive, negative, and inconclusive tests; various labs, including the State Hygienic lab; and various lab collection dates for the period March 2020 through May 17, 2021. The case data provided by IDPH on the data screen for the 29 cases. did not include any personal identifiable information such as social security numbers, names, or addresses.

For the 29 cases selected we did not identify any discrepancies between the data recorded in the DOMO database and the data recorded in IDSS for the data fields listed above. The case screens shared by IDPH also listed all the tests for the case number selected including PCR and antigen tests.

## Data Analysis

On May 17, 2021, we also downloaded selected data fields from the DOMO database for the period March 1, 2020 through May 17, 2021. Using an Audit Command Language (ACL) program we ran queries on the various data fields to recalculate the results reported by the State. The program also allowed us to summarize data for selected data fields so only specific information recorded in the field can be evaluated such as type of test, test result, or lab. Using these functions, we extracted certain data elements and evaluated the completeness of the data. **Schedule 2** lists the CDC data element, the concern identified, and the results of our analysis for the period ended December 31, 2020 with data downloaded on January 14, 2021.

**Demographic elements** - Birthdate, race, and ethnicity are data elements used to evaluate the spread of COVID-19 within various demographic groups. These data elements may help health officials determine if there are any groups with a higher risk of COVID -19 spreading faster which allows health officials to focus mitigation and treatment efforts. However, while the information is requested on various forms, the individual completing the forms and taking a COVID-19 test is not required to answer or provide demographic information.

As shown by **Schedule 2**, some of the necessary demographic elements were not reported for Test Iowa and Non-Test Iowa results as of December 31, 2020. The basic demographic data is completed by the individual completing the assessment/registration form used to register for a test. The **Schedule** shows the following:

- A birthdate was not reported for 1,264 tests and 469 birthdates were after 12/31/20.
- The individual's race was not reported for 1,596,104 tests or 45% of the 3,546,461 total tests recorded in DOMO as of December 31, 2020.
- The individual's ethnicity was not reported for 1,752,528 tests, or 49%, of the total tests.

As previously stated, the CARES Act requires that as of August 1, 2020, laboratory testing data include 18 data elements in the data reported. The 18 data elements must be reported by labs to IDPH and to the CDC. As previously stated, the reporting of demographic information is based on the individual providing the information. Test sites, labs, and IDPH cannot force an individual to provide this information. However, without this demographic information IDPH may not properly identify and focus mitigation efforts and treatment efforts for the higher risk groups.

**Positivity Rate** – As previously stated, the State originally calculated the positivity rate based on individuals tested and not total tests reported. On December 4, 2020 the State began reporting the positivity rate based on the total number of tests.

During our review of the data provided, we determined a large number of individuals were tested multiple times. According to State Officials, individuals who are tested multiple times include first responders, educators, athletes who participate in various sports including high school through professional sports, and those who may just want to be tested.

According to State officials, there are two instances where duplicate test data is removed when it comes to testing and case determination:

- Tests are de-duplicated to create a single record per individual per day. This is based on the individual's IDSS identification number and the date.
- Cases (determination after a test of which there could be multiple):
  - The first positive test found for an individual creates a positive case record regardless of the date and type of test. (As previously stated, if a positive test was

recorded on 02/02/21 and a negative test was recorded on 02/03/21, the negative test on 02/03/21 would still count as a test on 02/03/21 but would not impact the case classification for the individual that was made on 02/02/21. According to State officials, all test results remain in IDSS/DOMO and are not deleted.)

- If only negative cases are found, then the most recent negative test is accepted regardless of type (PCR vs. antigen). According to IDPH officials, “We deduplicate on the day and the individual – i.e., if someone takes six tests in one day, we count that as one test. If they were to take six tests across six days, then we would count 6 total tests. This was done as in the data we would see the same test shown twice, but with a different lab name associated to the test record. The only exception is if they test positive 90 days from the last time they test positive – then we shift the date to the latest positive date. Also, if they first test positive and then test negative (i.e., a false negative), we still retain the first positive test.”
- According to IDPH officials, “The only time that an antigen test is not included is when it is overruled by a PCR test. If a person takes both a PCR and an antigen test, the results of the PCR test become the final results based on the testing date.”

As previously stated, we compared the test results recorded in the DOMO Database to the results recorded in IDSS and did not identify any variances for the cases tested. Based on this, we queried the DOMO database to determine the total number of positive and negative test results for both PCR and antigen testing. **Schedule 3** shows this comparison.

As illustrated by the **Schedule**, DOMO includes more tests than reported on the State’s dashboard, specifically, 5,204 more PCR tests and 20,619 more antigen tests. Because DOMO is constantly updated and we downloaded the DOMO data after we downloaded the data from the State’s dashboard, additional tests may have been recorded in DOMO. The State’s dashboard is updated daily and, as a result, would not include these additional tests until the next update. Even though the number of cases varied between DOMO and the State’s Dashboard, the difference in the positivity rate was only 0.08% which is not material.

We also queried the DOMO database for the period of March 1, 2020 through May 17, 2021 based on case number to determine the number of individuals tested. If a case number included a PCR and antigen test, it was listed once under each test type. Also, for this query, if a case number was listed more than once under PCR or antigen, it was included as a negative case if there were no positive results and as a positive case if at any point there was a positive test result. **Schedule 3** also includes this comparison. In total, the **Schedule** illustrates DOMO included 41 more tests than the information included in the State’s dashboard.

We recalculated a positivity rate for selected days based on the DOMO data and compared the calculated rate to the rate reported on the State’s dashboard. Also, we had previously documented certain positive case analyses reported by the State for several days in December 2020, February 2021 and on May 17, 2021, so we used the positivity rates reported on those dates for comparison to our recalculated past 7-day average and past 14-day average positivity rates.

This comparison begins with December 4, 2020, the date the State began reporting the positivity rate based on the total number of tests. Because the State did not report the past 7-day average positivity rate for total tests until the afternoon of February 19, 2021, we were only able to compare the State’s past 14-day average positivity rates to our recalculated positivity rates for the data we downloaded on December 4, 2020 through December 14, 2020, and February 9, 2021. For February 19, 23, and 24, 2021, and May 17, 2021, we were able to compare the positivity rates reported to our recalculated positivity rates for both the past 7-day and 14-day average. The State rounds the 7-day and 14-day positivity rates to the nearest tenth of a percent, such as 8.1%.

**Table 6** summarizes the comparison of our calculated past 7-day average, as applicable, and past 14-day average positivity rate to the positivity rates reported by the State on the positive case analysis dashboard.

Lab Date	Past 7-day Average			Past 14-day Average		
	AOS Calculation*	State Dashboard	Difference	AOS Calculation*	State Dashboard	Difference
12/04/20	11.3%	n.a.	n.a.	11.3%	11.8%	-0.5%
12/05/20	11.0%	n.a.	n.a.	11.1%	11.5%	-0.4%
12/06/20	10.8%	n.a.	n.a.	11.0%	11.3%	-0.3%
12/07/20	10.6%	n.a.	n.a.	10.9%	11.3%	-0.4%
12/08/20	10.0%	n.a.	n.a.	10.7%	11.2%	-0.5%
12/09/20	9.5%	n.a.	n.a.	10.5%	10.7%	-0.2%
12/10/20	9.3%	n.a.	n.a.	10.6%	10.9%	-0.3%
12/11/20	9.1%	n.a.	n.a.	10.2%	10.6%	-0.4%
12/12/20	8.9%	n.a.	n.a.	10.0%	10.3%	-0.3%
12/13/20	8.8%	n.a.	n.a.	9.8%	10.2%	-0.4%
12/14/20	8.8%	n.a.	n.a.	9.7%	10.1%	-0.4%
02/09/21	4.9%	n.a.	n.a.	5.4%	5.5%	-0.1%
02/19/21	4.1%	3.9%	0.2%	4.4%	4.5%	-0.1%
02/23/21	4.0%	4.2%	-0.2%	4.2%	4.3%	-0.1%
02/24/21	4.1%	4.0%	0.1%	4.1%	4.1%	0.0%
05/17/21	3.0%	2.9%	0.1%	3.3%	3.3%	0.0%

\* - Excluding inconclusive tests.

As demonstrated by the **Table**, our calculations of the reported positivity rates either agree with or are within 0.5% of the positivity rates reported by the State. **Schedule 4** includes a more detailed summary of our positivity rate analysis and comparison.

Because our comparison in the **Schedule** begins with December 4, 2020, we included the prior 14 days' data for November 20, 2020 through December 3, 2020 to illustrate the information used in the recalculation of the 14-day positivity rate. As noted in the **Table** and **Schedule**, our recalculation of the positivity rate excluded inconclusive test results. **Table 7** illustrates how we calculated the 14-day positivity rate for December 4, 2020.

Description	Amounts
Total positive PCR and antigen test results for 11/20/20 through 12/03/20	35,671
Divided by:	
Total positive and negative PCR and antigen test results for 11/20/20 through 12/03/20	314,604
Calculated positivity rate	11.3%

The method for recalculating the past 7-day positivity rate is the same as the past 14-day positivity rate recalculation, with the exception of the number of days.

In addition to the comparisons summarized in **Table 7** and **Schedule 4**, we judgmentally selected 27 other days from March 28, 2020 through May 15, 2021 for which we recalculated the positivity rates and compared them to the positivity rates reported by the State in the “% Positive Tests by Day” chart. To obtain the State’s positivity rate for the selected days, we hovered over the “% Positive Tests by Day” chart and noted the rates for the additional selected days.



It is important to note the percentages reported on the State’s “% Positive Tests by Day” chart are rounded to the nearest whole number. For example, if the percentage is actually 12.4% the amount reported in the chart is rounded down to 12%. Based on the comparison of our calculated positivity rates to the positivity rates reported by the State, we did not identify any significant differences. Our calculated rates either agreed with rates on the chart or were within the range of plus or minus 0.5%.

**Reporting test results** – According to IDPH officials, they report a positive or negative result based on the date the sample is collected (Test Date). Because the positivity rate is based on the data reported by the labs, it is critical to have test results reported as soon as possible after the test sample is collected. The DOMO database includes the collection, lab received, and lab result date.

**Schedule 2** includes information about these fields from March 1, 2020 through December 31, 2020. As shown by the **Schedule**, there were 478 tests which did not include the collection date field. We also determined there were 199 tests with a collection date prior to March 1, 2020. For these 199 tests, the dates ranged from September of 1920 to February 2020. We also identified 13 tests with collections dates after December 31, 2020, including 1 in October 3030. Because this date was not reported or reported incorrectly, IDPH could not post the test result on the actual date collected. According to State officials, cascading logic is used to identify the date used for each test. Collection date is used most often, but if that field is missing or is clearly incorrect then staff move through the following fields until a date is found to be used. Collection date – Received date – Result date – Event Reported to IDPH. Because of the small number of errors, it is unlikely the States’ positivity rate would have been significantly affected based on the number of tests.

The **Schedule** also illustrates a result date was not entered for 3,756 cases. There were also 114 cases where the result date was prior to March 2020 and 8,999 with a result date after December 2020. Because it takes several days to process a test, it is not unreasonable for many of the tests at the end of December to have a test result date in early January 2021.

The DOMO database also included an “Event Reported to IDPH Date” field. We determined in many cases the date in this field was prior to the collection, lab, and lab result date. When we asked State officials about this, they reported the field in DOMO uses the cascading logic (Collection date – Received date – Result date – Event Reported to IDPH). The “Event Reported to IDPH” field in IDSS is the date the first result was reported to IDPH for the case. Because the field was not the actual date the sample was collected (collection date) we did not use this field in our review.

Each testing location has its own forms for an individual to complete when they request a COVID-19 test. It is up to the individual to complete the form correctly and completely. IDPH cannot dictate how someone should report where they live or other data elements to a provider/lab ordering a test. IDPH can only require the information be transmitted to IDSS.

In addition, we were unable to verify certain data points reported in the Percent Positive Analysis related to Schools, Long Term Care, Outcome Analysis Recovered, and Outcome Analysis Deaths dashboards because State officials did not provide the additional DOMO dashboard data fields we requested, such as county, long term care facility, event outcome, and event date of death. We also were unable to verify whether the data reported in the Hospitalization and RMCC dashboards is accurate because we did not request access to the hospitalization and related data submitted by RMCCs to the State.

**Data Changes** – During the period of our fieldwork, it was observed that test data reported on the State’s Dashboard changed days and even weeks after the actual date of the test. To understand why the data changed, it is necessary to briefly review how the State records the data on the website. Specifically, it is necessary to understand:

1. Test date – This is the date an individual is tested. This is the date the State uses to report if the individual tested positive or negative for COVID-19.

2. Lab date – This is the date the test sample is sent to a lab. Labs can be at the testing location, in-state, or out-of-state. The amount of time between the test date and the lab date will not be consistent for all labs or even for all samples sent to the same lab.
3. Result date – This is the date the sample is tested and a result generated by the lab. Once the result is determined by the lab, the lab is to immediately report it to IDPH.

According to State officials, results are posted to the State’s website based on the date of the test because it represents the date the individual was either positive or negative for COVID-19. State officials also stated, because it takes time for labs to report the test result, the number of cases reported on a day will continue to change for several days after the initial test date. For example, if 500 people are tested on August 1, 2020, the website may show the varying numbers of positive tests for that date in the days following August 1. Specifically, the results may vary as follows:

- August 1: The website shows test results for 100 people that were reported to IDPH as tested on August 1. It is likely these tests were performed at a location with an on-site lab that was able to report the results the same day.
- August 3: The website shows test results for 350 people, composed of the 100 originally reported and 250 more that were reported to IDPH on August 3 as tested on August 1. The 250 individuals were potentially tested at sites that sent the test sample to in-state labs that analyzed them on August 3.
- August 7: The website shows test results for 525 people, composed of the 100 reported on August 1, the 250 reported on August 3, and 175 more reported to IDPH on August 7 as tested on August 1. The 175 individuals were potentially tested at sites that sent the sample to out of state labs and/or labs that were slower in processing test results.

According to State Officials, when testing first began, it took up to a week to get test results back. The large number of tests submitted to the labs and the available testing equipment factored into the extended processing time. As more testing equipment was obtained by the labs, the time to process a test gradually decreased in 2020 to approximately 2 to 3 days from the date of the test to the result being reported to IDPH. Since early 2021, the average time to get test results has been 1 day.

Using the data fields we were provided access to, we compared the “Test Date”, Lab Date”, “Test Result Date”, and the “Date reported to IDPH” fields to determine the average time between the test date and the date it was reported to IDPH for in-state and out of state labs.

As previously stated, based on our review of “Event Reported to IDPH Date” field, we noted the date was often before the Lab result date. When we sorted the data by case number the “Event Reported to IDPH Date is the date the individual was first reported to IDPH. CADE maintains staff that work to identify and correct these kinds of quality issues as the reports are made. During the COVID-19 response, in addition to one primary staff person, CADE increased staffing by four additional positions and used portions of the approximately 100-person internal case investigation team to temporarily support this work as needed.

According to IDPH officials, “CADE also works with IDPH information management staff to address some kinds of errors when they are reported in systematic ways from a particular provider, such as a lab that consistently makes a formatting error that needs to be corrected. And when needed, we seek support from the AAG (*Assistant Attorney General*) if a reporter is found to be non-compliant. In Domo, we also have some logic applied to data to catch real-world logic issues – i.e. if a lab result date comes through with a date set to the future (i.e. typo in the year). We have also set up proactive alerts in the data to notify Domo and CADE staff when data is received with logic mismatches.”

According to IDPH officials, “IDPH CADE staff doesn’t re-write report dates but rather provides corrections to records as indicated. If a record is corrected in IDSS, the previous record is not kept. This is separate from the kinds of corrective reports a laboratory might need to issue and those records would be kept by the laboratory. Throughout all DOMO data processing, we are not re-

writing any IDSS data, or pushing data back to IDSS. At any given moment, you can look in DOMO to view IDSS data (raw) without modification.” IDPH officials also reported corrections made in DOMO are not reloaded into IDSS, but corrections made in IDSS are loaded into DOMO.

## Data Reporting State Dashboard

As previously stated, IDPH requires all Iowa health care providers and public, private, and hospital laboratories to immediately report all positive and negative COVID-19 results.

We reviewed the COVID-19 data reported on the State’s website to address the reporting procedures developed by the Task Force and determined whether IDPH requires labs to report the 18 data elements and the specific contact information for the patient and the ordering provider in accordance with the CDC requirements. **Table 8** briefly summarizes the results of our review of the State’s reporting of COVID-19 data.

**Table 8**

National Data Quality COVID-19 Reporting Procedures / Questions	Response and/or Data Reported
Did the State identify entities performing testing?	Testing is performed at Test Iowa drive-thru sites, local health care providers, sites at Walgreens and Hy-Vee stores, and various other locations.
What guidance did the State provide to entities performing COVID-19 testing for reporting results?	The State issued mandatory reporting orders requiring immediate reporting of all positive and negative results and other guidance to entities performing COVID-19 testing, such as antigen testing guidance.
Was the data collected and reported adequate for monitoring purposes and was the data reported timely?	The types of data collected and reported is adequate for monitoring purposes. Data reported, such as the number of positive and negative tests, recoveries, deaths, and hospitalizations is generally timely. However, we identified some timeliness and other data issues discussed in this report.
How did the State differentiate between positive COVID-19 tests and positive COVID-19 antibody (serology) tests in reporting?	For positive COVID-19 tests, the State reports positive PCR tests and the positive Antigen tests separately, and as a combined total in the Positive Case Analysis dashboard of the State’s website.  The State reports positive COVID-19 antibody tests separately in the Serology Testing Dashboard of the State’s website.

As previously stated, the CDC required 18 data elements to be collected and reported. We compared the 18 data elements required to be collected to those collected and reported by the State. Because we were not able to not access IDSS, we relied on a list of the IDSS fields provided by State officials and discussions with IDPH staff.

We compared the list of IDSS’ fields to the required reporting elements and other required reporting items and determined 15 of the 18 CDC required data elements are included in IDSS. However, it is not apparent if the device identifier, performing facility zip code, and date the test was ordered are in IDSS. According to IDPH officials, “all reported data is collected, but only data that is needed for investigations was added to the IDSS data fields. Regardless of whether the data is included as an IDSS data field, all collected data elements are reported to the federal level. So for example if the performing facility zip code is reported to IDPH, it was reported to federal partners.”

In addition, we identified 5 of the 6 demographic data elements required to be collected and reported are included in the list of IDSS data fields; however, the ordering providers phone number is not included in the list provided to us. IDPH officials report there is an IDSS data field for ordering providers’ phone numbers.

In addition, we determined whether the labs reported to IDPH in IDSS the data elements required by the CDC and whether and what data elements are uploaded to DOMO and reported on the State's website. **Schedule 5** presents a summary of CDC required data elements reported by labs to IDSS, uploaded to DOMO, and reported on the State's website.

**Conclusion** – The State did not fully comply with the CDC's requirement regarding reporting of the 18 data elements and the demographic data elements because it did not collect and record data in IDSS for 3 of the 18 data elements and 1 of the 6 demographic data elements.

**State Dashboard Updates / Concerns** - Since April 2020, the State has periodically updated its Dashboard. Examples of some of the new information reported on the State's Dashboard from April 2020 through February 2021 include:

- April 14, 2020 – As previously stated, the State released an update to the website located at [coronavirus.iowa.gov](https://coronavirus.iowa.gov). The new data dashboards on the website include cases, deaths, and tests conducted in each county.

The State also began providing demographic information that was not previously provided as well as Iowa's epidemiological curve. An epidemiological curve is a statistical chart used in epidemiology to visualize the onset of a disease outbreak. It can help with the identification of the mode of transmission of the disease. It can also show the disease's magnitude, whether cases are clustered or if there are individual case outliers, its trend over time, and its incubation period.

- August 2020 – In response to questions regarding if the State was backdating information, State officials reported the State receives notice of reportable diseases through electronic laboratory messages from local hospitals, which means they are formatted as they come from the local hospitals into the State's servers. The system that receives reports of acute infectious diseases is called IDSS, the Iowa Disease Surveillance System. As previously stated, the State reports the result of a test based on the collection date. Because it may take several days for the test results to be reported, the result reported for a specific day may increase several days later as more results are reported to IDPH for the specified date.

State officials also reported IDSS is over 15 years old and was a custom-built piece of software formatted by information management staff for diseases and issues relevant to that time period. Unfortunately, it was not designed to manage the volume and needs associated with a modern global pandemic. When IDSS was used to track COVID-19 testing data, it was assigning all results associated with one patient to that one patient, but it wasn't updating the "Event Reported to IDPH date" when people were tested multiple times. The date of the first reported COVID-19 result (regardless of the result) was being posted on the public facing website instead of the date of the first positive result or the date of the latest negative result. It was not until late July 2020, as the pandemic progressed and testing expanded, that it became apparent that the logic must be updated to account for the significant number of patients being tested multiple times. When this was recognized by a CADE epidemiologist, CADE and information management staff worked together with the Governor's Office and DOMO staff to evaluate the issue and implement the corrective action of migrating data to DOMO in mid-August.

- August 28, 2020 – The State began reporting positive and negative antigen test results following a steadily increasing volume of the rapid-result tests across the State.
- October 16, 2020 – A system optimization was implemented on October 16, which removed the limitation of the number of records that can be associated with an individual from the IDSS query transmitted to DOMO. The optimization ensures that as individuals obtain additional COVID tests, all of their testing records are transmitted to DOMO.
- December 4, 2020 – The State updated the dashboard to report total tests, including a breakdown of the negative and positive tests for PCR and antigen tests. Prior to

December 4, the State only reported on the Positive Case Analysis dashboard the number of individuals tested and the related number of negative and positive test results.

In addition, prior to December 4, the State only reported the percent positive cases average based on individuals tested in the past 14 days. On December 4, the State added to the dashboard the percent positive cases average for individuals tested in the past 7 days. The State also added to the dashboard the 14-day average percent positive cases for all tests.

- December 7, 2020 – IDPH announced a change in the way deaths attributed to COVID-19 were reported to better align with national and State reporting. The new methodology was based on the CDC’s cause-of-death coding. Under this new methodology, a case must be coded by CDC as the underlying cause of death or a contributing factor to death. Coding is based on the registered death record completed by the health care provider. The new methodology adjusted the number of deaths attributed to COVID-19. IDPH officials provided a memo dated December 7, 2020, which showed the number of deaths reported under the previous methodology was 2,721 and increased to 2,898 under the new methodology.
- December 8, 2020 – The State added underlying cause of death and contributing factor for death data to the Summary Statistics dashboard.
- January 8, 2021 – The Long-Term Care (LTC) dashboard was changed to reflect individuals who had died as a result of COVID-19 using the new methodology announced on December 7. LTC deaths had been and continued to be included in the overall COVID-19 death total using the new method; however, this change was not yet reflected in the LTC dashboard. Effective January 8, the total LTC resident deaths reported on the LTC dashboard included the number of resident deaths for all facilities since March 2020. In addition, the State later added to the LTC dashboard the number of positive cases for the past 14 days for facilities having current outbreaks.
- February 19, 2021 – Effective February 19, the State stopped providing two of the ten dashboards, including % Positive Analysis Schools and Outcome Analysis Recovered.

**Table 9** provides examples of the changes made by the State made to its COVID-19 website.

<b>Dashboard Name</b>	<b>Reported Prior to February 19</b>	<b>Reported Effective February 19</b>
<b>Summary Statistics</b>	Individuals Tested	Total Tests
	Individuals Positive	Total Positive Tests
	Total Recovered	Dropped total recovered
<b>Positive Case Analysis</b>	% Individuals Positive and % Positive Total Tests	Dropped % Individuals Positive and only reports % Positive Total Tests
<b>% Positive Analysis – Public School District Summary</b>	% Positive Cases by County for the past 14-day average was reported. Click on a school district name and the relevant % positive cases would be displayed.	The dashboard was dropped from the website.
<b>Outcome Analysis - Recovered</b>	Total recovered cases by County including cases by age group, sex, ethnicity, race, and pre-existing condition.	The dashboard was dropped from the website.

Prior to the changes made on February 19, 2021, the focus of the State’s analysis was on the number of individuals tested, and the individual positivity rate was at 7.1% for the past 14 days

and 5.1% for the past 7 days. In addition, the percentage positive total tests was reported at 4.5% for the past 14 days. After the changes were made, the percentage individuals positive was dropped from the dashboard and only the percentage total positive tests was reported at 4.5% for the past 14 days and 3.9% for the past 7 days.

Prior to February 19, 2021, the State’s website included ten dashboards. We judgmentally selected and compared certain January 4, 2021 data elements reported on the State’s website for consistency across the dashboards. We compared the data elements within each dashboard and to inter-related dashboards reported on the State’s website. **Table 10** summarizes the results of our comparison of data reported on the various dashboards of the State’s website.

**Table 10**

<b>Dashboard</b>	<b>Results of the Comparison of Data within the State’s Website</b>
Summary Statistics	The summary total data reported agrees with related downloads of data available within the dashboard and the amounts agree with or are within several tests of the related data reported in other dashboards.
Positive Case Analysis	The individuals tested and positive data agrees with similar data reported in the Summary Statistics dashboard.
% Positive Analysis Schools	The percent positive rate by county for the past 14 days data reported agrees with the positive case last 14 days by county reported in the Positive Case Analysis dashboard. However, the remaining information in this dashboard is unique and is not comparable to the other dashboards.
Hospitalization Analysis	Data reported in this dashboard is unique and is not comparable to the other dashboards.
Long-Term Care	Data reported in this dashboard is unique. Comparable data from other dashboards agrees within this dashboard, including the current outbreaks, individuals positive, and individuals recovered presented in total and in the total cases associated with an outbreak table.
RMCC	Certain data reported in this dashboard is comparable to and agrees with the hospital data included in the Summary Statistics dashboard.
Outcome Analysis Recovered	The total recovered amount agrees with the total recovered amount reported in the Summary Statistics dashboard.
Outcome Analysis Deaths	The total deaths, underlying cause deaths, and contributing factor deaths amounts agrees with the comparable data reported in the Summary Statistics dashboard.
Serology Testing (Antibody Testing)	Serology Testing data is unique, so it is not comparable to the other dashboards.
Test Iowa Assessments	Test Iowa Assessments data is not comparable to the other dashboards because the data is unique to the testing assessment process rather than the testing results.

As demonstrated by the **Table**, the data reported by the State in the Summary Statistics, Positive Case Analysis, Percent Positive Analysis Schools, Long-Term Care, Outcome Analysis Recovered, and Outcome Analysis Deaths dashboards is comparable and agrees with similar information reported within the dashboards and between inter-related dashboards. For example, the following information agrees within and/or between dashboards as of January 4, 2021.

- Summary Statistics – The 1,365,707 individuals tested, 284,861 individuals positive, 244,620 recovered, 3,946 deaths, 3,621 underlying cause deaths, and 325 contributing factor deaths agree with the summary statistics by county totals and with the related data downloads available within the dashboard.
- Positive Case Analysis – The total individuals tested and total individuals positive agree with the same totals reported on the Summary Statistics dashboard. In addition, based on the individuals tested and individuals positive data downloads from the Summary

Statistics dashboard, we were able to recalculate the reported positivity rates of 13.3% for the past 14 days and 12.0% for the past 7 days.

- RMCC – The 571 individuals hospitalized, 117 patients in ICU, 60 individuals admitted to the hospital in the last 24 hours, 897 ventilators available, and 55 patients on ventilators agree with the comparable data reported in the Summary Statistics dashboard.

Although data reported in the dashboards generally agree, we were unable to verify whether the data is accurate. For example, the data reported in the Summary Statistics, Positive Case Analysis, and Percent Positive Analysis Schools dashboards is reasonably comparable within and between inter-related dashboards, but we are unable to verify the data to its source information.

We did not verify certain information to its source documentation, such as the number of individuals hospitalized, patients in ICU, individuals admitted to the hospital, and patients on ventilators because we did not request the data reported to IDPH by the RMCCs. We also were unable to verify the number of deaths.

Based on a review of the State's website, we determined there was limited data available for download. The data which may be downloaded from the State's website is included on the Summary Statistics dashboard of the State's website. As of December 14, 2020, the downloadable data includes:

- number of individuals tested,
- number of individuals who tested positive,
- number of total individuals who recovered,
- number of total deaths,
- underlying cause of deaths,
- contributing factors of deaths, and
- summary statistics including the previously stated categories by County.

The downloadable data for individuals tested, individuals positive, total recovered, total deaths, underlying cause of deaths, and contributing factor deaths includes the daily total and 14-day rolling total for each day from March 1, 2020 through the current date. The downloadable data for the summary statistics by County includes the cumulative total to date for each of these categories.

As previously stated, effective the afternoon of February 19, 2021, the State removed from Summary Statistics dashboard of the State's website the total tests by individual, total individuals positive and total recovered from the summary statistics section. From the afternoon of February 19, 2021 forward, the summary statistics section includes the total tests, total positive, total deaths, underlying cause of death, contributing factor, and summary information by county for the fields listed. The downloadable data for the summary statistics by County includes the cumulative total to date for each of the previously stated categories.

Although the data reported on the other dashboards of the State's website, such as the Positive Case Analysis, Percent Positive Analysis Schools, Long Term Care, and Hospitalization dashboards is valuable and informative regarding the status and impact of COVID-19 in the State, the data is not downloadable on those dashboards. While the data reported on the other dashboards may be saved by printing the information to an Adobe.pdf file and/or capturing the information through use of an application such as the Snipping Tool, it is a cumbersome process to put the information into a format that can be electronically analyzed.

In addition, if an entity or individual desires to track changes in positivity rates reported by the State by county over the past 7 or 14 days, they would need to record or otherwise capture the information each day.

According to State officials, updates and optimization to data are performed as needed and incorporate input or needs from the Governor's Office, information management and CADE. Additionally, the IDPH State Epidemiologist and Deputy State Epidemiologist constantly review data procedures in Iowa and hold discussions with local and other state and federal partners. Recommendations for improvements or adjustments in approach have been made during the course of IDPH's response to the pandemic as new technology, test types, and information about the virus becomes available. Recommendations are provided to IDPH leadership and then to Governor's Office staff as appropriate.

Based on our review of the data and discussion with IDPH staff, data presented on the State's dashboards frequently changed based on when the labs report the results of a test to IDPH. As previously stated, test results are posted based on the day the test was administered. In some cases, a test sample can be evaluated, and a result known and reported to IDPH the same day. In other cases, the sample is sent to various labs to be analyzed. In these cases, it may take a day or more for the lab to run the sample through the testing process and report the result back to IDPH.

We selected five days to determine the number of days between the date of the test and the date a result was reported by the lab. Based on a review of data for selected days, we determined the majority of the results were reported to IDPH by the processing lab within three days of the test being administered. **Schedule 6** shows the five days selected and the number of days it took from the date of the test to the lab reporting a result.

Using September 8, 2020 as an example, the **Schedule** shows 2,931 results, or 14.83% of the 19,770 PCR tests administered on that date were reported to IDPH the same day as the test. The following day, 10,128 additional results, or 51.23% of the total PCR tests administered on September 8 were reported to IDPH. If an individual were to look at the results posted on September 8, 2020 they would see 2,931 tests were reported. However, on September 9, 2020 they would see a total of 13,059 tests reported for September 8, 2020.

We reviewed the data reported on the State's dashboard on selected dates. Based on our review, we determined the data reported for positives and negatives did not foot to the total reported on the dashboard. **Schedule 7** demonstrates this. According to IDPH officials, the variances identified in **Schedule 7** are the number of inconclusive, indeterminate, and invalid tests on the dates specified as of the date the data was pulled. Those categories of tests were included in the totals, but not in the negative or positive numbers shown on the website.

Opportunities exist for the State to make improvements to its website for the purpose of enhancing transparency and accountability. It is important comprehensive data be readily available to the public and various entities for purposes of analysis and decision-making. Data tracking and trend analysis would be facilitated by allowing download of certain comprehensive data from the State's website including data from March 1, 2020 through the current date, such as:

- Number of positive cases and the past 7-day average positivity rates by county,
- Number of positive cases and the past 14-day average positivity rates by county,
- Long Term Care outbreak positive cases and deaths by county for each day from March 1, 2020 through the current date,
- Number of positive cases by School District, and
- Hospital data summary information by Regional Medical Coordination Center, such as the COVID-19 patient summary including hospitalized patients, patients in ICU, and admitted in the last 24 hours; total ICU and inpatient bed availability, and total patients on ventilators and ventilators available.



## Items for Further Consideration

As a result of our review, we identified the following items for further consideration by officials of the Iowa Department of Public Health in addressing the ongoing response to the emergence of new COVID-19 variants and potential future pandemics or similar situations where data is provided to the public.

- Discuss with officials from schools, long-term care facilities, hospitals, other medical facilities, county health departments, colleges and universities, and other entities what types of data and information would be helpful to them for decision-making and the format in which the data can most efficiently be presented to them to allow for their analysis in a timely manner.
- Publicly report on the State's dashboard/website of the most significant items identified as necessary for officials of the entities polled. For example, consider adding the Public School District and Long-Term Care Outbreak data dashboards back to the State's website and determine if additional dashboards are required to address identified needs.
- For purposes of analyses and to enhance decision-making, allow data from the dashboards to be readily downloadable.
- Data reported on the State's dashboard/website should be clearly defined and when changes are made to how the data is reported, the changes should be clearly disclosed (for example, which positivity rate formula is being used). Transparency is critical. When changes are made to the State's website, explanations of what changed and why should be clearly disclosed.
- When methodologies for reportable data, such as positivity rates, are revised and/or added, an explanation of what changed and why should be clearly disclosed. In addition, sufficient information to allow for comparisons with between the previous and revised methodologies should be provided if possible.
- Consider allowing authorized officials access to the deidentified underlying data for their entity. For example, the Superintendent of a Community School District should have access to the deidentified underlying data for their District in order to make informed decisions.
- Work with the Legislature and other parties to evaluate the need to replace IDSS and other legacy systems used by IDPH to collect, manage, and report data with current technology that offers increased flexibility, improved data management capabilities, and enhanced reporting tools which are necessary to ensure data can be evaluated quickly and efficiently and reported in a manner that is easily understood by parties who use the information to make decisions.

Although these suggestions are based on our review of the information reported by IDPH for the COVID-19 pandemic, similar considerations by IDPH or other State officials may be appropriate when dealing with pandemics or any other natural disaster where citizens' health is at risk.

## IDPH Response

After completion of our testing and obtaining responses from IDPH officials to specific inquiries which are included throughout this report, we provided a copy of the completed report to IDPH officials for their review. Their overall response to the report is included in **Appendix C**.

## **Schedules**

**Schedule 1**

Report on a Review of the  
State's COVID-19 Dashboard  
Administered by the Iowa Department of Public Health

State Dashboard and DOMO Fields  
For the Period March 1, 2020 through May 17, 2021

State Dashboard / Brief Summary of Data Reported	Access to Comparable DOMO Dashboard Data or Other Information
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**Summary Statistics:**

Individuals Tested	Granted access to all test data by case number. De-duplication is required to get to the individual level.
Individuals Positive	Granted access to all test data by case number. De-duplication is required to get to the individual level.
Total Recovered	No. Access to event outcome was requested but not granted.
Total Deaths	No. Access to event date of death was requested but not granted.
Underlying Cause Deaths	Not requested.
Contributing Factor Deaths	Not requested.
Summary Statistics by County	No. Access to county name was requested but not granted.

**Positive Case Analysis:**

<b>PCR</b>	
Total Tests	Granted access to all test data by case number which include the test result field.
Total Negative Tests	Granted access to all test data by case number. Data needed to be queried based on test result field.
Total Positive Tests	Granted access to all test data by case number. Data needed to be queried based on test result field.
Individuals Tested	Granted access to all test data by case number. De-duplication is required to get to the individual level.
Individuals Negative	Granted access to all test data by case number. De-duplication is required to get to the individual level and queried by test result.
Individuals Positive	Granted access to all test data by case number. De-duplication is required to get to the individual level and queried by test result.
<b>Antigen</b>	
Total Tests	Granted access to all test data by case number which include the lab test type.
Total Negative Tests	Granted access to all test data by case number. Data needed to be queried based on test result field.
Total Positive Tests	Granted access to all test data by case number. Data needed to be queried based on test result field.
Individuals Tested	Granted access to all test data by case number. De-duplication is required to get to the individual level and queried by test result.
Individuals Negative	Granted access to all test data by case number. De-duplication is required to get to the individual level and queried by test result.
Individuals Positive	Granted access to all test data by case number. De-duplication is required to get to the individual level and queried by test result.
<b>Total (PCR and Antigen combined)</b>	
Total Tests	Granted access to all test data by case number which include the lab test type.
Total Negative Tests	Granted access to all test data by case number. Data needed to be queried based on test result field.
Total Positive Tests	Granted access to all test data by case number. Data needed to be queried based on test result field.
Individuals Tested	Granted access to all test data by case number. De-duplication is required to get to the individual level and queried by test result.
Individuals Negative	Granted access to all test data by case number. De-duplication is required to get to the individual level and queried by test result.
Individuals Positive	Granted access to all test data by case number. De-duplication is required to get to the individual level and queried by test result.

Report on a Review of the  
State's COVID-19 Dashboard  
Administered by the Iowa Department of Public Health

State Dashboard and DOMO Fields  
For the Period March 1, 2020 through May 17, 2021

State Dashboard / Brief Summary of Data Reported	Access to Comparable DOMO Dashboard Data or Other Information
<b>Individual Positive Cases</b>	
Positive Cases by County last 7 days and last 14 days, including:	
Total Positive Cases for Each County	No. Access to county name was requested but not granted.
Positive Cases Symptomatic vs. Asymptomatic	Not requested.
Positive Cases by Age Group	Granted access to all test data by case number. Data needed to be queried based on birthdate field.
Positive Cases by Sex	Not requested.
Positive Cases by Race	Granted access to all test data by case number. Data needed to be queried based on race field.
Positive Cases by Ethnicity	Granted access to all test data by case number. Data needed to be queried based on ethnicity field.
<b>Total Positive Cases by Pre-Existing Condition</b>	
Pre-Existing Condition	Not requested.
No Pre-Existing Condition	Not requested.
Pre-Existing Condition Unknown	Not requested.
Pre-Existing Condition by Age Group	Not requested.
Pre-Existing Condition by Occupation	Not requested.
<b>% Positive Analysis - Public Schools:</b>	
Public School Districts (#Buildings & #Counties)	No. School district name and building list and county name were requested but not provided.
% Positive Cases by County (Past 14 Day Average)	No. Access to county name was requested but not granted.
% Positive (Past 14 Day Average) County Map	No. Access to county name was requested but not granted.
<b>Hospitalization Analysis Dashboard:</b>	
COVID-19 Hospitalized Patients by Diagnosis Type	No. Access to event hospitalized was requested but not provided. Did not request diagnosis type.
Patients Hospitalized with COVID-19 Primary vs. Secondary Diagnosis	No. Access to event hospitalized was requested but not provided. Did not request diagnosis type.
Age Group Summary	No. Access to event hospitalized was requested but not provided.
Current Confirmed COVID-19 Hospitalizations by Age Group	No. Access to event hospitalized was requested but not provided.
Confirmed New COVID-19 Hospitalizations by Age Group	No. Access to event hospitalized was requested but not provided. Did not request diagnosis type.

**Schedule 1**

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State Dashboard and DOMO Fields  
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State Dashboard / Brief Summary of Data Reported	Access to Comparable DOMO Dashboard Data or Other Information
<b><u>Long Term Care Facilities Dashboard:</u></b>	
Long Term Care Outbreaks	No. Access to event long term care facility name was requested but not granted.
Current Outbreaks	No. Access to event long term care facility name was requested but not granted.
Individuals Positive	No. Access to event long term care facility name was requested but not granted.
Total Recovered	No. Access to event outcome was requested but not granted.
Total Deaths	No. Access to event date of death was requested but not granted.
Positive Cases Totals and by County Map	No. Access to county name was requested but not granted.
Positive Cases by County by Facility Table	No. Access to county name was requested but not granted.
Positive Cases Symptomatic vs. Asymptomatic	Not requested.
Positive Cases by Race	No. Access to event long term care facility name was requested but not granted.
Positive Cases by Ethnicity	No. Access to event long term care facility name was requested but not granted.
Positive Case by Gender	Not requested.
Positive Cases Table including Polk County	No. Access to county name was requested but not granted.
<b><u>Regional Medical Coordination Center Dashboard:</u></b>	
Hospital Data Summary (RMCC)	Not requested.
RMCC Map	Not requested.
<b><u>COVID-19 Patient Summary:</u></b>	
COVID-19 Hospitalized Patients	No. Access to event hospitalized was requested but not provided.
COVID-19 Patients in ICU	No. Access to case admitted to ICU was requested but not provided.
COVID-19 Admitted in the Last 24 Hours	Not requested.
<b><u>Total Bed Availability:</u></b>	
Total Inpatient Beds Available	Not requested.
Percent of Total Inpatient Beds Available	Not requested.
Total ICU Beds Available	Not requested.
<b><u>Total Ventilators Available:</u></b>	
Total Ventilators Available	Not requested.
Percent of Total Ventilators Available	Not requested.
Total COVID-19 Patients on Ventilators	Not requested.

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State Dashboard / Brief Summary of Data Reported	Access to Comparable DOMO Dashboard Data or Other Information
<b>Outcome Analysis Recovered Dashboard:</b>	
Outcome Analysis - Recovered	No. Access to event outcome was requested but not granted.
Total Recovered	No. Access to event outcome was requested but not granted.
Recovered Cases by County	No. Access to the event outcome and county name were requested but not granted.
Total Recovered Chart	No. Access to event outcome was requested but not granted.
Recovered Cases by Age Group	No. Access to birth date was granted, but access to event outcome was not granted.
Recovered Cases by Sex	Not requested.
Recovered Cases by Ethnicity	No. Access to event outcome was requested but not granted.
Recovered Cases by Race	No. Access to event outcome was requested but not granted.
Total Recovered by Pre-Existing Condition	No. Pre-existing condition information was not requested.
Percent of Recovered Cases by Pre-Existing Condition	No. Pre-existing condition information was not requested.
Pre-Existing Condition by Age Group	No. Pre-existing condition information was not requested.
Pre-Existing Condition by Occupation	No. Pre-existing condition information was not requested.
<b>Outcome Analysis Deaths Dashboard:</b>	
Outcome Analysis - Deaths	No. Access to the event date of death data field was requested but not granted.
Total Deaths	No. Access to the event date of death data field was requested but not granted.
Underlying Cause Deaths	Not requested.
Contributing Factor Deaths	Not requested.
Deaths by Age Group	Not requested.
Deaths by Sex	Not requested.
Deaths by Ethnicity	No. Access to the event date of death data field was requested but not granted.
Deaths by Race	No. Access to the event date of death data field was requested but not granted.
Total Deaths by Pre-Existing Condition	No. Pre-existing condition information was not requested.
Percent of Deaths by Pre-Existing Condition	No. Pre-existing condition information was not requested.
Pre-Existing Condition by Age Group	No. Pre-existing condition information was not requested.
Pre-Existing Condition by Occupation	No. Pre-existing condition information was not requested.

**Schedule 1**

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State Dashboard and DOMO Fields  
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State Dashboard / Brief Summary of Data Reported	Access to Comparable DOMO Dashboard Data or Other Information
<b>Serology Testing Dashboard (aka Antibody Testing):</b>	
Serology	Not requested.
Individuals Tested	Not requested.
Individuals Negative	Not requested.
Individuals Positive	Not requested.
% Individuals Positive	Not requested.
Individuals Positive by County	Not requested.
<b>Test Iowa Assessments Dashboard:</b>	
Test Iowa Status	Not requested.
Summary Statistics	Not requested.
Completed Assessments	Not requested.
Distribution by Age	Not requested.
Distribution by Gender	Not requested.
Assessments by County	Not requested.

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Data Element Results  
For the Period March 1, 2020 through May 17, 2021

CDC Data Element	Concern identified	Test Iowa			Non-Test Iowa			Total		
		PCR	Antigen	Total	PCR	Antigen	Total	PCR	Antigen	Total
Birthdate	No Birthdate Reported	306	-	306	700	258	958	1,006	258	1,264
Birthdate	Birthdate was after 12/31/20	-	-	-	359	110	469	359	110	469
Case Race	Not reported	484,295	45,380	529,675	723,384	343,045	1,066,429	1,207,679	388,425	1,596,104
Case Ethnicity	Not reported	483,164	44,744	527,908	855,377	369,243	1,224,620	1,338,541	413,987	1,752,528
Lab Name	Not reported	17	12	29	413	278	691	430	290	720
Collection Date	Not reported	8	8	16	440	22	462	448	30	478
Collection Date	Date reported is prior to 03/01/20	5	4	9	89	101	190	94	105	199
Collection Date	Date reported is after 12/31/20	-	-	-	-	13	13	-	13	13
Result Date	Not reported	45	47	92	220	3,444	3,664	265	3,491	3,756
Result Date	Date reported is prior to 03/01/20	-	4	4	17	93	110	17	97	114
Result Date	Result date is after 12/21/20	2,297	33	2,330	6,369	300	6,669	8,666	333	8,999
Result Date	Date reported is after 01/14/21~	-	5	5	36	41	77	36	46	82
Received Date	Not reported	51	54	105	609	3,556	4,165	660	3,610	4,270
Received Date	Date reported is prior to 03/01/20	6	5	11	85	93	178	91	98	189
Received Date	Date reported is after 01/14/21~	-	-	-	11	13	24	11	13	24

~ - 01/14/21 was used to allow for shipping of samples for tests.



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Data Comparison  
For the Period March 1, 2020 through May 17, 2021

<b>Description</b>	<b>PCR</b>			<b>Total Positivity Rate</b>
	<b>Positive</b>	<b>Negative</b>	<b>Total</b>	
Total per State Dashboard	330,980	2,845,467	3,191,428	10.37%
Total per DOMO Database	334,490	2,862,142	3,196,632	10.46%
Variance	(3,510)	(16,675)	(5,204)	
Individuals per State Dashboard	304,726	1,144,269	1,451,441	
Unique case numbers per DOMO Database	##	##	##	
Variance				

## - Not available

<b>Antigen</b>				<b>Total</b>			
<b>Positive</b>	<b>Negative</b>	<b>Total</b>	<b>Total Positivity Rate</b>	<b>Positive</b>	<b>Negative</b>	<b>Total</b>	<b>Total Positivity Rate</b>
68,575	1,695,104	1,763,846	3.89%	399,555	4,540,571	4,955,274	8.06%
71,171	1,713,294	1,784,465	3.99%	405,661	4,575,436	4,981,097	8.14%
(2,596)	(18,190)	(20,619)		(6,106)	(34,865)	(25,823)	
64,715	225,750	290,473		369,441	1,370,019	1,741,914	
##	##	##		##	##	1,741,955	
						(41)	-0.0024%

Report on a Review of the  
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Positivity Rate Analysis  
For the Period March 1, 2020 through May 17, 2021

Lab Date	PCR Tests per DOMO data~		Antigen Tests per DOMO data~		Total Tests per DOMO data~		
	Negative	Positive	Negative	Positive	Negative	Positive	Total
11/20/20	15,998	3,062	12,028	822	28,026	3,884	31,910
11/21/20	5,898	1,036	2,288	387	8,186	1,423	9,609
11/22/20	4,497	882	3,064	400	7,561	1,282	8,843
11/23/20	20,018	3,510	21,219	1,254	41,237	4,764	46,001
11/24/20	14,332	2,528	11,177	753	25,509	3,281	28,790
11/25/20	11,435	2,195	14,716	771	26,151	2,966	29,117
11/26/20	1,840	314	2,869	166	4,709	480	5,189
11/27/20	9,673	2,100	11,204	668	20,877	2,768	23,645
11/28/20	4,094	917	1,967	298	6,061	1,215	7,276
11/29/20	4,255	779	1,495	282	5,750	1,061	6,811
11/30/20	15,896	3,305	19,249	1,140	35,145	4,445	39,590
12/01/20	13,729	2,472	11,115	658	24,844	3,130	27,974
12/02/20	11,003	1,980	5,695	525	16,698	2,505	19,203
12/03/20	11,190	1,836	16,989	631	28,179	2,467	30,646
12/04/20	10,896	1,647	10,634	539	21,530	2,186	23,716 ^
12/05/20	3,970	672	1,626	232	5,596	904	6,500
12/06/20	3,811	487	1,558	217	5,369	704	6,073
12/07/20	15,564	2,469	18,727	815	34,291	3,284	37,575
12/08/20	12,550	1,700	11,304	545	23,854	2,245	26,099
12/09/20	9,570	1,518	5,191	392	14,761	1,910	16,671
12/10/20	10,370	1,434	17,239	600	27,609	2,034	29,643
12/11/20	9,433	1,335	9,872	424	19,305	1,759	21,064
12/12/20	3,439	382	1,430	198	4,869	580	5,449
12/13/20	3,859	445	1,443	223	5,302	668	5,970
12/14/20	13,762	2,007	18,092	813	31,854	2,820	34,674



Report on a Review of the  
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Positivity Rate Analysis  
For the Period March 1, 2020 through May 17, 2021

Lab Date	PCR Tests per DOMO data~		Antigen Tests per DOMO data~		Total Tests per DOMO data~		
	Negative	Positive	Negative	Positive	Negative	Positive	Total
02/09/21	8,839	628	10,260	216	19,099	844	19,943
02/19/21	5,832	444	6,707	147	12,539	591	13,130
02/23/21	9,087	494	9,223	169	18,310	663	18,973
02/24/21	7,228	468	4,932	152	12,160	620	12,780
05/17/21	54	1	6	-	60	1	61

Note: The comparison of our recalculated positivity rates to the 7 and 14 Day Average rates reported by the State on the positive case analysis dashboard begins on 12/04/20 because that is the date the State began reporting total tests, related rates, and statistics on the website. The comparison includes selected dates through 05/17/21 for which we documented the positivity rates reported on the website. Once 7 or 14 days have passed from the report date, such detailed information is no longer available on the website.

~ - Obtained by auditor using ACL queries.

n.a. - Past 7 day positivity rate is not applicable because the State did not begin reporting this rate for total tests until the afternoon of 02/19/21.

^ - Our recalculation of the Past 7 Day Average positivity rate is calculated excluding inconclusive tests. For example, for 12/04/20, the 11.3% Past 7 Day positivity rate equals the sum of total positive PCR and Antigen tests for 11/27/20 through 12/03/20 (17,591) divided by the sum of the combined total positive and negative PCR and Antigen tests for 11/27/2020 through 12/03/20 (155,145).

\* - Our recalculation of the Past 14 Day Average positivity rate is calculated excluding inconclusive tests. For example, for 12/04/20 the 11.3% Past 14 Day positivity rate equals the sum of total positive PCR and Antigen tests for 11/20/20 through 12/03/2020 (35,671) divided by the sum of the combined total positive and negative PCR and Antigen tests for 11/20/20 through 12/03/20 (314,604).

Past 7 Day Average			Past 14 Day Average		
AOS Recalculation^	State Dashboard	Difference	AOS Recalculation*	State Dashboard	Difference
4.9%	n.a.	n.a.	5.4%	5.5%	-0.1%
4.1%	3.9%	0.2%	4.4%	4.5%	-0.1%
4.0%	4.2%	-0.2%	4.2%	4.3%	-0.1%
4.1%	4.0%	0.1%	4.1%	4.1%	0.0%
3.0%	2.9%	0.1%	3.3%	3.3%	0.0%

**Report on a Review of the  
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Report on a Review of the  
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CDC Data Elements  
For the Period March 1, 2020 through May 17, 2021

Data Elements required by the CDC	IDSS	DOMO	State's Website
<b>18 Required Elements</b>			
1. Test ordered	X	X	n
2. Device Identifier	^	^	n
3. Test result	X	X	n
4. Test Result date (date format)	X	X	n
5. Accession #/Specimen ID	X	X	n
6. Patient age	X*	X*	T
7. Patient race	X	X	T
8. Patient ethnicity	X	X	T
9. Patient sex	X	X	T
10. Patient residence zip code	X	X	T
11. Patient residence county	X	X	T
12. Ordering provider name	X	X	n
13. Ordering provider zip	X	X	n
14. Performing facility name and/or CLIA number, if known	X	X	n
15. Performing facility zip code	^	^	n
16. Specimen Source	X	X	n
17. Date test ordered (date format)	^	^	n
18. Date specimen collected (date format)	X	X	n
<b>Demographic data elements to be collected and reported to state or local public health departments</b>			
1. Patient name (Last name, First name, Middle Initial)	X	X	n
2. Patient street address	X	X	n
3. Patient phone number with area code	X	X	n
4. Patient date of birth	X	X	n
5. Ordering provider address	X	X	n
6. Ordering provider phone number	^	^	n

X - CDC required data element is reported by labs to IDSS and uploaded to DOMO.

\* - Age may be calculated because case birth date is included in IDSS and DOMO.

^ - Data field is not included or not apparent in the IDSS and DOMO data fields made available to our office.

T - Data is reported as combined total amounts only. No personal identifiable information is reported on the State's website.

n - Not reported. The information is personal identifiable information or not needed for public disclosure.



**Schedule 6**

Report on a Review of the  
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Number of Days from Test to Lab  
For the Period March 1, 2020 through May 17, 2021

Number of Days from Test to Reported	Date Selected for Testing (PCR Only)									
	09/08/20	Percent of Tests Reported	11/30/20	Percent of Tests Reported	01/18/21	Percent of Tests Reported	03/22/21	Percent of Tests Reported	05/03/21	Percent of Tests Reported
0	2,931.00	14.83%	4,404.00	20.21%	4,801.00	34.87%	4,499.00	37.62%	4,395.00	43.44%
1	10,128.00	51.23%	11,223.00	51.51%	3,917.00	28.45%	5,291.00	44.25%	4,053.00	40.06%
2	4,051.00	20.49%	5,016.00	23.02%	3,087.00	22.42%	1,641.00	13.72%	1,398.00	13.82%
3	2,084.00	10.54%	917.00	4.21%	1,884.00	13.68%	445.00	3.72%	141.00	1.39%
4	398.00	2.01%	193.00	0.89%	31.00	0.23%	26.00	0.22%	125.00	1.24%
5	61.00	0.31%	6.00	0.03%	35.00	0.25%	11.00	0.09%	3.00	0.03%
6	81.00	0.41%	8.00	0.04%	4.00	0.03%	-	0.00%	-	0.00%
7	12.00	0.06%	5.00	0.02%	3.00	0.02%	1.00	0.01%	-	0.00%
8	15.00	0.08%	6.00	0.03%	1.00	0.01%	41.00	0.34%	-	0.00%
9	2.00	0.01%	5.00	0.02%	-	0.00%	-	0.00%	2.00	0.02%
10	-	0.00%	-	0.00%	1.00	0.01%	-	0.00%	-	0.00%
11	1.00	0.01%	-	0.00%	-	0.00%	-	0.00%	-	0.00%
12	-	0.00%	-	0.00%	-	0.00%	3.00	0.03%	-	0.00%
13	1.00	0.01%	-	0.00%	-	0.00%	-	0.00%	-	0.00%
14	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%
15	1.00	0.01%	-	0.00%	-	0.00%	-	0.00%	-	0.00%
16-19	1.00	0.01%	-	0.00%	-	0.00%	-	0.00%	-	0.00%

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Number of Days from Test to Lab  
For the Period March 1, 2020 through May 17, 2021

Number of Days from Test to Reported	Date Selected for Testing (PCR Only)									
	09/08/20	Percent of Tests Reported	11/30/20	Percent of Tests Reported	01/18/21	Percent of Tests Reported	03/22/21	Percent of Tests Reported	05/03/21	Percent of Tests Reported
20-29	1.00	0.01%	-	0.00%	1.00	0.01%	-	0.00%	-	0.00%
30-39	-	0.00%	-	0.00%	2.00	0.01%	-	0.00%	-	0.00%
40-49	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%
50+	2.00	0.01%	3.00	0.01%	1.00	0.01%	-	0.00%	-	0.00%
Total	19,770.00	100.00%	21,786.00	100.00%	13,768.00	100.00%	11,958.00	100.00%	10,117.00	100.00%

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Dashboard Footing Errors  
For the Period March 1, 2020 through May 17, 2021

Date	Test Type	Total Tests			Variance
		Positive	Negative	Calculated Total	
10/30/20	PCR				
	Antigen				
	Total				
	Total as reported on dashboard				
11/19/20	PCR				
	Antigen				
	Total				
	Total as reported on dashboard				
11/21/20	PCR				
	Antigen				
	Total				
	Total as reported on dashboard				
11/23/20	PCR				
	Antigen				
	Total				
	Total as reported on dashboard				
11/25/20	PCR				
	Antigen				
	Total				
	Total as reported on dashboard				
11/27/20	PCR				
	Antigen				
	Total				
	Total as reported on dashboard				
11/29/20	PCR				
	Antigen				
	Total				
	Total as reported on dashboard				

<b>Individuals Tested</b>				
<b>Positive</b>	<b>Negative</b>	<b>Calculated Total</b>	<b>As Reported</b>	<b>Variance</b>
116,781	766,726	883,507	885,175	(1,668)
7,667	71,074	78,741	78,741	-
124,448	837,800	962,248	963,916	(1,668)
			<u>963,916</u>	
177,493	832,234	1,009,727	1,011,732	(2,005)
21,181	100,978	122,159	122,159	-
198,674	933,212	1,131,886	1,133,891	(2,005)
			<u>1,133,891</u>	
184,096	841,279	1,025,375	1,027,422	(2,047)
22,564	103,824	126,388	126,388	-
206,660	945,103	1,151,763	1,153,810	(2,047)
			<u>1,153,810</u>	
188,603	848,539	1,037,142	1,039,201	(2,059)
23,119	105,180	128,299	128,299	-
211,722	953,719	1,165,441	1,167,512	(2,059)
			<u>1,167,512</u>	
193,839	855,768	1,049,607	1,051,660	(2,053)
25,108	109,077	134,185	134,185	-
218,947	964,845	1,183,792	1,185,845	(2,053)
			<u>1,185,861</u>	
197,740	861,982	1,059,722	1,061,808	(2,086)
25,804	110,133	135,937	135,937	-
223,544	972,115	1,195,659	1,197,773	(2,086)
			<u>1,197,773</u>	
201,109	866,303	1,067,412	1,069,539	(2,127)
26,687	111,795	138,482	138,482	-
227,796	978,098	1,205,894	1,208,021	(2,127)
			<u>1,208,055</u>	

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Dashboard Footing Errors  
For the Period March 1, 2020 through May 17, 2021

Date	Test Type	Total Tests				
		Positive	Negative	Calculated Total	As Reported	Variance
12/01/20	PCR					
	Antigen					
	Total					
	Total as reported on dashboard					
12/03/20	PCR					
	Antigen					
	Total					
	Total as reported on dashboard					
12/04/20	PCR	227,353	1,717,429	1,944,782	1,954,694	(9,912)
	Antigen	31,828	547,715	579,543	579,638	(95)
	Total	259,181	2,265,144	2,524,325	2,534,332	(10,007)
	Total as reported on dashboard				2,534,332	
12/09/20	PCR	234,407	1,762,231	1,996,638	2,006,820	(10,182)
	Antigen	34,554	602,011	636,565	636,665	(100)
	Total	268,961	2,364,242	2,633,203	2,643,485	(10,282)
	Total as reported on dashboard				2,643,485	
12/14/20	PCR	241,179	1,804,756	2,045,935	2,056,390	(10,455)
	Antigen	36,546	640,854	677,400	677,505	(105)
	Total	277,725	2,445,610	2,723,335	2,733,895	(10,560)
	Total as reported on dashboard				2,733,895	
01/04/21	PCR	262,653	1,968,195	2,230,848	2,242,198	(11,350)
	Antigen	45,102	828,576	873,678	873,790	(112)
	Total	307,755	2,796,771	3,104,526	3,115,988	(11,462)
	Total as reported on dashboard				3,115,988	
02/19/21	PCR	299,903	2,331,858	2,631,761	2,645,939	(14,178)
	Antigen	58,448	1,227,615	1,286,063	1,286,204	(141)
	Total	358,351	3,559,473	3,917,824	3,932,143	(14,319)
	Total as reported on dashboard				3,932,143	

<b>Individuals Tested</b>				
<b>Positive</b>	<b>Negative</b>	<b>Calculated Total</b>	<b>As Reported</b>	<b>Variance</b>
203,240	869,629	1,072,869	1,074,987	(2,118)
27,662	112,992	140,654	140,654	-
230,902	982,621	1,213,523	1,215,675	(2,118)
			<u>1,215,675</u>	
207,573	875,261	1,082,834	1,085,000	(2,166)
29,219	115,318	144,537	144,537	-
236,792	990,579	1,227,371	1,229,537	(2,166)
			<u>1,229,582</u>	
209,910	879,198	1,089,108	1,091,299	(2,191)
29,783	116,040	145,823	145,823	-
239,693	995,238	1,234,931	1,237,170	(2,191)
			<u>1,237,170</u>	
216,404	890,611	1,107,015	1,109,209	(2,194)
32,378	120,258	152,636	152,636	-
248,782	1,010,869	1,259,651	1,261,845	(2,194)
			<u>1,261,909</u>	
222,625	901,989	1,124,614	1,126,839	(2,225)
34,288	123,719	158,007	158,007	-
256,913	1,025,708	1,282,621	1,284,911	(2,225)
			<u>1,284,911</u>	
242,523	936,676	1,179,199	1,181,441	(2,242)
42,338	141,856	184,194	184,194	-
284,861	1,078,532	1,363,393	1,365,707	(2,242)
			<u>1,365,707</u>	
276,534	1,020,449	1,296,983	1,299,357	(2,374)
55,089	179,525	234,614	234,614	-
331,623	1,199,974	1,531,597	1,534,374	(2,374)
			<u>1,534,374</u>	

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Report on a Review of the  
State's COVID-19 Dashboard  
Administered by the Iowa Department of Public Health

Dashboard Footing Errors  
For the Period March 1, 2020 through May 17, 2021

<b>Date</b>	<b>Test Type</b>	<b>Total Tests</b>				
		<b>Positive</b>	<b>Negative</b>	<b>Calculated Total</b>	<b>As Reported</b>	<b>Variance</b>
02/24/21	PCR	301,885	2,358,894	2,660,779	2,675,102	(14,323)
	Antigen	59,180	1,260,479	1,319,659	1,319,802	(143)
	Total	361,065	3,619,373	3,980,438	3,994,904	(14,466)
	Total as reported on dashboard				<u>3,994,904</u>	

NOTE: The State began reporting total tests, related rates, and statistics on the dashboard on 12/04/20.

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<b>Individuals Tested</b>				
<b>Positive</b>	<b>Negative</b>	<b>Calculated Total</b>	<b>As Reported</b>	<b>Variance</b>
278,333	1,027,065	1,305,398	1,307,771	(2,373)
55,771	182,904	238,675	238,675	-
334,104	1,209,969	1,544,073	-	(2,373)
			Not reported	




Report on a Review of the  
States COVID-19 Dashboard  
Administered by the Iowa Department of Public Health

Staff

This review was performed by:

James S. Cunningham, CPA, Director  
Mark Moglestad, CPA, Senior

  
Annette K. Campbell, CPA  
Deputy Auditor of State

## **Appendices**

Report on a Review of the  
States COVID-19 Dashboard  
Administered by the Iowa Department of Public Health

Mandatory Reporting, March 19, 2020



**Iowa Department of Public Health**  
**Protecting and Improving the Health of Iowans**

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Gerd W. Clabaugh, MPA  
Director

Kim Reynolds  
Governor

Adam Gregg  
Lt. Governor

RESCIND THE MARCH 5, 2020 TEMPORARY NOVEL CORONAVIRUS DISEASE 2019 (COVID-19)  
MANDATORY REPORTING REQUIREMENT AND REPLACE WITH THE FOLLOWING ORDER:

To: Healthcare Providers and Laboratorians

From: Gerd Clabaugh, Director of the Iowa Department of Public Health and  
Caitlin Pedati, MD, MPH Medical Director/State Epidemiologist

Re: Designation of **positive and negative** Coronavirus Disease 2019 (COVID-19) laboratory results  
as immediately electronically reportable.

Date Issued: March 19, 2020

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Pursuant to 641 Iowa Administrative Code 1.3 (139A), I, as the director of the Iowa Department of Public Health, temporarily designate **positive and negative** results for Coronavirus Disease 2019 (COVID-19) testing as reportable in Iowa. This designation will begin on March 19, 2020 and remain in place until December 31, 2020.

All Iowa health care providers and public, private, and hospital laboratories are required to immediately report all positive and negative Coronavirus Disease 2019 (COVID-19) testing results to the department. Reports must be made electronically through the Iowa Disease Surveillance System (IDSS) when a facility has electronic transmission capabilities, otherwise reports can be faxed to 515-281-5698.

  
\_\_\_\_\_  
IDPH DIRECTOR

3-19-20  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
IDPH MEDICAL DIRECTOR

3/19/20  
\_\_\_\_\_  
Date

IOWA DEPARTMENT OF PUBLIC HEALTH  
Lucas State Office Building

Report on a Review of the  
States COVID-19 Dashboard  
Administered by the Iowa Department of Public Health

Data Elements

**COVID-19 Pandemic Response, Laboratory Data Reporting: CARES Act Section 18115**

**Required Data Elements beginning August 1, 2020 and updated January 8, 2021**

The following data elements must be collected and reported for SARS-CoV-2 (COVID-19) laboratory tests, for the transmission of complete laboratory testing data to the CDC or the Secretary's designee. (Note: additional data elements may be requested at a future date.)

1. Test ordered – use harmonized Logical Observation Identifiers Names and Codes (LOINC) codes provided by CDC
2. Device Identifier
3. Test result –use appropriate Logical Observation Identifiers Names and Codes (LOINC) and Systematized Nomenclature of Medicine Clinical Terms (SNOMED-CT) codes, as defined by the Laboratory In Vitro Diagnostics (LIVD) Test Code Mapping for SARS-CoV-2 Tests provided by CDC
4. Test Result date (date format)
5. Accession #/Specimen ID
6. Patient age
7. Patient race
8. Patient ethnicity
9. Patient sex
10. Patient residence zip code
11. Patient residence county
12. Ordering provider name and NPI (as applicable)
13. Ordering provider zip
14. Performing facility name and/or CLIA number, if known
15. Performing facility zip code
16. Specimen Source - use appropriate LOINC, SNOMED-CT, or SPM4 codes, or equivalently detailed alternative codes
17. Date test ordered (date format)
18. Date specimen collected (date format)

The following additional demographic data elements should also be collected and reported to state or local public health departments, but this data will not be collected by the CDC or the Secretary's designee. State and local privacy standards apply to the collection of these data elements. (Note: additional data elements may be requested by state, local or federal health departments at any time.)

1. Patient name (Last name, First name, Middle Initial)
2. Patient street address
3. Patient phone number with area code
4. Patient date of birth
5. Ordering provider address
6. Ordering provider phone number

In order to meet this requirement, any person or entity ordering a diagnostic or serologic test, collecting a specimen, or performing a test should make every reasonable effort to collect complete demographic information and should include such data when ordering a laboratory test to enable the entities performing the test to report this data to state and local public health departments. When information is not available, ordering health care providers (or their designees), laboratories performing SARS-CoV-2 and associated tests, and State Public Health departments should consider leveraging resources like state or regional HIEs and National Health Information Networks (HIN) to obtain missing, required information. These exchanges and networks have significant capacity to identify missing information as they typically work with a wide range of health care provider EHR generated data, as well as a broader array of admit, discharge, and transfer feeds from local or regional stakeholders.

Source: COVID-19 Pandemic Response, Laboratory Data Reporting: CARES Act Section 18115, dated January 8, 2021 located at <https://www.hhs.gov/sites/default/files/covid-19-laboratory-data-reporting-guidance.pdf>.

Report on a Review of the  
States COVID-19 Dashboard  
Administered by the Iowa Department of Public Health

IDPH Response



Protecting and Improving  
the Health of Iowans

Kim Reynolds, Governor

Adam Gregg, Lt. Governor

Kelly Garcia, Interim Director

January 10, 2022

Auditor Sand,

Thank you for the opportunity to review this report. You will see several sections where our team made notes or provided responses to the questions you had raised. Should you wish to discuss these, we are happy to accommodate. We have included a document responsive to a question raised in the report related to a reporting change made last December regarding the way we track and report deaths attributed to COVID-19.

Your report is focused on data collection and reporting. The pandemic demanded that we both maintain a functioning data collection system and evaluate this data in real time. Data that provide perspective on national and statewide trends, as well as micro level details into the activity of the COVID-19 virus. We have relied on this data to drive decision making at the national, state and local level and we know Iowans have relied on it to make decisions in their own lives. Though we are committed to public reporting of public health data, the goal of public health data collection is to impact behaviors and drive individual and collective action.

Technology, no matter how sophisticated, will never solve for the truth that public health data, is not without error. These data points are collected by hand, entered by humans, public health and health care professionals. As data cleaning and validation occur, these data are subject to change and that is to be expected. The demand for detailed explanation of data flaws or changes (to media or our data consumers) has been time consuming and has, at times, pulled crucial staff away from their role in supporting the COVID-19 response.

As we have shared from the beginning, our IT systems have struggled to keep up. Our ability to respond to the next public health emergency requires that we invest significantly in our IT and data systems. It's for this reason, that we are actively working to replace our IDSS system using federal COVID response funds and are evaluating the functionality of nearly all of our systems. We have convened conversations with our statewide hospital partners focusing on how we can better respond to the current public health emergency as well as be better prepared for the future.

I want to acknowledge the resources necessary to respond to the requests of the AOS over the course of the past year and a half. Leadership level individuals were required to shift focus from their work on COVID-19 response to prioritize a significant number of hours on AOS inquiries. We appreciate that this report recognizes our team's heroic efforts of the last two years and validates the principle that guides the work we do, protecting the health of Iowans. From our epi teams who work to validate and analyze public health data, our IM team who manage and control the flow of data, to our partnership with the State Hygienic Lab, the report shows an incredibly complex system functioning as it should.

As we welcome 2022, we are grateful to the hundreds of thousands of Iowans who have chosen to get vaccinated against COVID-19. We remain committed to working alongside our federal and local partners as we respond to the ever-evolving COVID-19 virus.

Sincerely,

A handwritten signature in black ink that reads "Kelly Garcia". The signature is written in a cursive, flowing style.

Kelly Garcia, IDPH Director