MILLIMAN REPORT

Costs Associated with COVID-19 Testing in New York's Commercial Health Insurance Market

Estimated July through December 2020 Costs

July 2020

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Table of Contents

Executive Summary

COVID-19 has created much uncertainty in the health insurance market for many reasons. Government agencies and payers are looking to estimate the impact of COVID-19 in a variety of categories that include, but are not limited to, COVID-19 treatment costs, the costs of deferred care offset by the return of some of that care over time, and the overall impact on chronic disease management. As most states move through reopening phases, costs associated with COVID-19 testing have emerged as an important consideration. However, despite the depth of conversation on the need for COVID-19 testing, little agreement exists on the frequency and type of testing necessary to ensure the safety of citizens, including the early identification of local increases in infections. At this point, there are still more unknowns than knowns. Many factors will affect the frequency and total cost of COVID-19 testing through the end of 2020, including public health official guidelines, community infection rates, school-based and occupation-based requirements, geographic proximity, testing capacity, and immunity status of the population.

The New York Health Plan Association (NYHPA) and New York State Conference of Blue Cross & Blue Shield Plans (Blues Conference) engaged Milliman, Inc. (Milliman) to estimate healthcare costs associated with COVID-19 testing ("testing costs") in the state of New York during the second half of calendar year (CY) 2020 and to identify factors influencing testing utilization for the commercial health insurance market. In addition to costs related directly to the COVID-19 test and its administration, testing costs, for the purpose of this report, may also include services provided during the COVID-19 testing encounter to determine the clinical appropriateness of a COVID-19 test, differentiate among potential diagnoses, and provide outpatient treatment.

Milliman conducted a survey of NYHPA and Blues Conference members to obtain cost estimates associated with COVID-19 testing as well as the site-of-service where the testing was performed in New York's commercial health insurance market. Based on the survey, the 25th to 75th percentile range for active disease testing (molecular or antigen) was $59 to $82 per test, which was consistent with expectations for commercial plans when compared to the published Medicare reimbursement rates.

Various federal, state, and local government policies have resulted in a patchwork of guidance on who should be tested and how the testing may be funded (through insurance plans, governmental agencies, self-pay, or directly by employers). Additionally, as of July 10, the New York State Education Department has not yet released guidance related to the reopening of schools in the fall and many employers and employer organizations are still determining their requirements for testing of employees. COVID-19 testing protocols are likely to be important for many New York employers. Based on U.S. Census Bureau survey data, we estimate approximately 60% of New York's workforce covered by commercial health insurance is employed in moderate or high-risk occupations based on risk stratifications published by the U.S. Department of Labor Occupational Safety and Health Administration (OSHA).

Considering the impact of reopening requirements, testing capacity, testing innovation, age, occupational risk, future infection rates, and other factors, testing costs in the second half of CY 2020 are highly uncertain and are likely to significantly vary by month, by site-of-service for testing, and for segments of the commercially insured population. For example, additional testing may be needed to differentiate among influenza, the common cold, and COVID-19 in the fourth quarter of the year.

Based on the scenarios illustrated in this report, the potential testing costs in the second half of calendar year 2020 for New York's commercially insured residents[*] (approximately 9 million persons) is estimated to be between $0.6 billion and $2.9 billion, funded through a combination of state and federal funding, health insurers, and employers.

[*] Fully insured individual and group coverage, as well as self-funded employer plans.

The following key assumptions are associated with our low and high testing cost estimates:

- **Low cost estimate**. If COVID-19 transmission remains low and testing utilization decreases from June 2020 levels, the per member per month (PMPM) testing costs are estimated to be approximately $12, based on 60 tests per 1,000 residents per month.
- **High cost estimate (back-to-work testing)**. In a scenario where each New York resident receives two tests in the second half of the year (equivalent to 333 tests per 1,000 residents per month), the estimated PMPM cost is approximately $55 (to the extent a greater share of lab-only testing occurs under this scenario, our cost estimate is reduced to $48 PMPM). This scenario is associated with increases in virus transmission and additional occupation-based or school-based testing needed prior to persons returning to work or the classroom.

The above scenarios assume that approximately 20% of New York residents receive a $50 antibody test in the second half of 2020 (contributing $1.50 per covered life to monthly testing costs), which is included in the monthly testing cost estimate. To the extent COVID-19 immunity can be established based on an antibody test, actual costs may exceed this estimate.

Please note that the COVID-19 testing costs presented in this report reflect the amount paid by all payers, which consist of tested individuals, health insurers, employers, and federal and state agencies. Although most public discussions about how to pay for COVID-19 testing include multiple sources, the share of testing that will be paid by commercial insurance coverage is unknown and dependent upon state insurance coverage requirements, available federal funding, and other factors described in this report. If all of the testing costs, including tests for screening for health and safety in the workplace that the federal government has indicated are not the responsibility of insurers, were paid for by insurers for the commercially insured population, then the total testing costs are estimated to be equivalent to between 2% and 9% of average monthly per capita commercial premium rates. Our cost estimates do not consider testing costs for Medicaid, the Essential Plan, Child Health Plus, Medicare, or uninsured populations. Additionally, these cost estimates do not include individuals residing outside of New York but covered by New York commercial health insurance.

The cost estimates provided above are based on data collected from NYHPA and Blues Conference members, reflecting reported testing cost (i.e., cost per test and associated costs) and testing site (e.g., lab, office visit, emergency room). The costs were validated for reasonableness through a review of third party sources and proprietary data. It is possible that the government-funded testing cost varies materially from testing costs for commercially insured persons. Our scenarios are predicated on a number of assumptions that will only be known as experience emerges. As more definitive guidance is developed, impacting factors change, or test costs change, cost estimates for our illustrative scenarios will also shift.

Introduction

The New York Health Plan Association (NYHPA) and the New York State Conference of Blue Cross & Blue Shield Plans (Blues Conference) engaged Milliman, Inc. (Milliman) to estimate COVID-19 testing costs (“testing costs”) in the state of New York during calendar year 2020. For this report, testing costs include expenditures related directly to the COVID-19 test and its administration, and may also include services provided during the COVID-19 testing encounter to determine the clinical appropriateness of a COVID-19 test, differentiate among potential diagnoses, and provide outpatient treatment. For example, if a test is administered during an office visit, testing costs are assumed to also include charges for the office visit. The testing cost estimates shown in this paper are not applicable to nationwide or state-specific estimates outside of New York. Testing costs may be significantly impacted by many factors that include but are not limited to the introduction of a vaccine, occupational testing requirements, and policy changes. As of July 2020, COVID-19 testing capacity continues to increase and guidance on who should be tested is evolving. The testing cost range presented in this paper reflects multiple scenarios based on current capacity and assumptions for future testing frequency.

This paper provides the following COVID-19 information and analyses:

- Types of COVID-19 tests and purpose and per test costs
- Summary of COVID-19 test development and innovation
- Test funding sources and commercial health insurance coverage requirements

- Factors influencing testing utilization
- Estimated second half CY 2020 testing costs

Types of COVID-19 tests and purpose

As of July 1, 2020, three types of tests were available for COVID-19 testing. Molecular and antigen tests both detect active disease and antibody tests detect recent or past infection.[1,2] The molecular tests are by far, the most common, with over 150 authorized manufacturers for molecular tests as of July 18 through the Emergency Use Authorization (EUA) for COVID-19 testing of the U.S. Food and Drug Administration (FDA). There were also 30 antibody tests and two antigen tests authorized through the EUA.[*] [1,3] At the time of publication, no molecular, antibody, or antigen tests are fully FDA-approved.

Positive test results for molecular tests are generally considered to confirm active disease but negative tests may need to be repeated in order to be confirmatory (an individual's viral disease may not have progressed enough at the time of testing to be detected).[2] Antigen tests have a higher false negative rate than most polymerase chain reaction (PCR) tests, but results can generally be obtained more quickly.[2,6] Similarly, positive antibody tests also confirm recent or past disease but negative tests are not considered confirmatory.[2] The length of time antibodies remain present and/or confer immunity is unknown and currently undergoing study.[7,8]

Testing costs

The cost of tests varies among testing types. A survey of NYHPA and Blues Conference members was conducted to obtain COVID-19-related testing costs incurred by the members in New York's commercial health insurance markets through May 2020. Eight health plans responded to the survey with their experience. Figure 1 reflects the range of costs incurred by NYHPA and Blues Conference members as well as the Medicare reimbursement rate for COVID-19 tests categorized by test type. The codes describe where the test was developed—i.e., by the Centers for Disease Control and Prevention (CDC) versus a non-CDC entity—the analysis methodology, and what is being tested.

FIGURE 1: NYHPA AND BLUES CONFERENCE COSTS AND MEDICARE REIMBURSEMENT RATES FOR LABORATORY TESTS ASSOCIATED WITH COVID-19

Test Type	Test Cost†	Medicare Reimbursement (approximate dollars)[9,10]
Molecular	$59 - $82	U0001 - $36 U0002 - $51 U0003 - $100 U0004 - $100 87635 - $51
Antigen	Unable to determine	U0002 - $51
Antibody	$26 - $62	86328 - $45 86769 - $42
Sample Collection	Unable to determine	$23 - $25 C9803, 99211, G2023, G2024

† The testing costs in the surveys were consistent with expectations for commercial plans with respect to the Medicare reimbursement for each of the Healthcare Common Procedure Coding System (HCPCS) codes and represent the 25th-75th percentile range.

[*] An EUA provides a mechanism by which manufacturers and developers can design, develop, and sell non-FDA-approved or -reviewed medications and medical devices to assist in providing care to the population during an emergency.[1] Products sold under an initial authorization have little to no oversight or review by the FDA. After its initial EUA testing policy on February 29, the FDA has issued additional guidance to improve oversight and remove inaccurate tests from the market.[1,4,5]

Modeling assumptions for other costs associated with testing were also based on the health plan survey. Testing costs for lab only services include administration and specimen collection of the tests (which is not included in the $59 to $82 testing cost range). Costs at other sites of service include services provided during the COVID-19 testing encounter to determine the clinical appropriateness of a COVID-19 test, differentiate among potential diagnoses, and provide outpatient treatment. Appendix 2 illustrates the modeling assumptions for other costs by site of service.

COVID-19 test development and innovation

The costs in Figure 1 are representative of the average testing cost through May. The average cost from the survey was $65, which is similar to the testing cost assumptions used by the Society of Actuaries in its calendar year 2021 COVID-19 impact forecast model.[11] However, new tests developed may result in changes to the average cost depending on the test type. Recently, the FDA authorized the first next generation sequencing (NGS) test for diagnosing COVID-19. This test also allows for genomic sequencing of the virus so that it may be better understood.[12] Additionally, the FDA released guidance on June 16 regarding testing via pooled samples in order to conduct broader testing in asymptomatic individuals versus the targeted testing currently in use, which may reduce the cost per test but increase testing volume.[13] In addition to new technologies, it is anticipated that the FDA will continue to work with manufacturers that are developing point-of-care (POC) tests, as these tests may improve patient access by allowing for both sample collection and analysis to take place outside of a traditional laboratory setting.[14] The POC testing for active disease includes nasal swabs or saliva testing and for antibody testing includes samples obtained from a finger prick. The likelihood of widespread availability of POC tests for diagnosis or antibody detection in 2020 is small. However, at-home testing kits that require the sample to be mailed to a designated lab are available.[15]

As of June 2020, available antibody tests can determine whether an individual had previously been infected with COVID-19 but cannot assess whether a person is immune from future infection. However, this testing limitation may change in the near future. The Mayo Clinic launched a semiquantitative antibody test on June 11, which detects neutralizing antibodies.[16] Neutralizing antibodies are a subtype of antibodies that confer continued immunity should a patient be exposed again. To the extent the level of neutralizing antibodies needed to confer immunity is established based on future research, the Mayo Clinic's test may be able to accurately assess whether a person is immune should future COVID-19 exposures occur.

Funding and coverage requirements for COVID-19 testing

COVID-19 TESTING CATEGORIES

Testing for other viral illnesses, such as influenza, is nearly always limited to symptomatic testing because most individuals are symptomatic and transmission occurs primarily in the symptomatic phase of illness. However, to control the community transmission of COVID-19 (due to it being highly transmissible from asymptomatic or pre-symptomatic individuals) as well as to determine the prevalence of prior infections, it is necessary for COVID-19 testing to be much broader in scope.

Recent guidance from the CDC outlines five categories for SARS-CoV-2 Testing:[17]

1. Testing individuals with signs or symptoms consistent with COVID-19
2. Testing to determine resolution of infection, i.e., test-based strategy for discontinuation of transmission-based precautions, healthcare personnel (HCP) return to work, and discontinuation of home isolation
3. Testing asymptomatic individuals without known or suspected exposure to SARS-CoV-2 for early identification in special settings (e.g., back to work or school testing)
4. Testing asymptomatic individuals with recent known or suspected exposure to SARS-CoV-2 to control transmission
5. Public health surveillance for SARS-CoV-2

As the CDC guidance has indicated, "Generally, viral testing for SARS-CoV-2 is considered to be diagnostic when conducted among individuals with symptoms consistent with COVID-19 or among asymptomatic individuals with known or suspected recent exposure to SARS-CoV-2 to control transmission, or to determine resolution of infection. Testing is

considered to be surveillance when conducted among asymptomatic individuals without known or suspected exposure to SARS-CoV-2 for early identification, or to detect transmission hot spots or characterize disease trends."[17]

While COVID-19 testing in March and April 2020 was likely diagnostic testing primarily targeted toward symptomatic persons due to lack of testing capacity, the second half of CY 2020 is expected to look different.[18] Testing capacity has improved, allowing for surveillance, symptomatic, asymptomatic, and occupational-related testing. Additionally, in June 2020 New York City recommended that *all* persons be tested for COVID-19.[19] Figure 2 summarizes the types of COVID-19 testing defined in CY 2020 by the CDC.

FIGURE 2: SUMMARY OF COVID-19 TESTING CATEGORIES[17]

	Description	Site-of-Service	Example
 SYMPTOMATIC	▪ Individuals symptomatic for COVID-19 ▪ Referrals after a screen from school, work, or via another venue ▪ Validation of non-COVID-19 illness to return to school or work	▪ Physician-ordered lab visit ▪ Provider-administered test ▪ Emergency room visit	▪ Individual exhibits symptoms such as fever, chills, difficulty breathing, etc. ▪ Individual with confirmed disease is retested prior to return to school or work
 SCHOOL OR EMPLOYER REQUIRED	▪ Schools or businesses require students or employees to validate COVID-19 free status before returning ▪ Occupational organizations may suggest certain professions receive regular COVID-19 tests	▪ Home kit sent by employer or school ▪ On-site symptom screening or testing ▪ Employer-directed testing by provider (doctor, lab, pharmacy)	Prior to resuming competition in July in Orlando, the NBA will test all players and essential staff every two days in the two weeks preceding travel to Orlando
 CURIOUS ABOUT STATUS OR ASYMPTOMATIC	Asymptomatic individuals with recent known or suspected exposure to SARS-CoV-2 to control transmission or without known or suspected exposure when intended for early identification in special settings	▪ Consumer directly purchased lab test ▪ Consumer requests non-medically necessary antibody test	Individuals attending protests or are otherwise in a place where other COVID-19 positive individuals are present and choose to get tested to check their status
 SURVEILLANCE, RESEARCH, OR GOVERNMENT REQUIRED	▪ A federal, state, or municipal public health organization requires testing before reopening, or requires testing at a specified frequency ▪ Random community member testing	▪ Home or community site ▪ Public health entity-directed testing by provider (doctor, lab, pharmacy)	In New York, all nursing home employees will be tested at least once per week

FUNDING SOURCES FOR COVID-19 TESTING

The funding for COVID-19 testing is likely to come from a variety of sources, including federal, state, and local government agencies, commercial insurers, employers, other private sector organizations, and individuals self-paying for the tests. The state of New York has received over $1.5 billion in federal funding to increase testing capacity with approximately $800 million going to New York City and over $700 million going to the rest of the state.[20] This funding has been used to expand capacity and conduct testing to determine exposure rate, among other uses.[20] However, federal funding will not cover all of the testing occurring.[21,22,23]

The New York State Department of Health (NYSDOH) advises that testing occurring at a state-run lab will be provided at no cost to the individual, but labs run by other organizations such as private labs, medical practices, and pharmacies may have a fee and individuals should contact the site and their insurers prior to having the test performed to determine whether they will be charged a fee for the test.[24] Additionally, the NYSDOH has revised testing guidance over time to increase the number of individuals recommended for testing, and the guidance was recently updated to include individuals attending any recent protests across the state.[25] Note that the division of overall testing utilization between state-run labs and labs run by other organizations is not publicly known as of June 2020. Therefore, there is a high degree of uncertainty regarding the proportion of testing being funded via public funds, public and private health insurance, and other sources.

COMMERCIAL HEALTH INSURANCE COVERAGE REQUIREMENTS

New federal laws dictate COVID-19-related testing that is deemed as "medically appropriate" by a person's attending healthcare provider must be covered by commercial health insurance plans.[26] The federal Families First Coronavirus Response Act (FFCRA), as amended by the Coronavirus Aid, Relief, and Economic Security (CARES) Act, requires group health plans and health insurance issuers offering group or individual health insurance coverage to provide coverage without any cost sharing, prior authorization, or medical management requirements for testing products and the administration of those products that detect or diagnose COVID-19 from March 18, 2020, until the end of the declared emergency.[27,28] Grandfathered health plans, as defined under section 1251(e) of the Patient Protection and Affordable Care Act (PPACA), must also implement this requirement.[26]

Items and services that must be covered include molecular, antigen, and antibody tests, and the number of tests an individual receives cannot be limited by health plans and issuers.[26,29] Because the CDC encourages clinicians to test for other causes of respiratory illness (such as influenza or pneumonia), the cost-free COVID-19 testing requirement has been broadly construed to include these tests and other services necessary to determine the need for COVID-19 testing.[29] For example, where medically appropriate, tests for influenza along with associated office, urgent care, or emergency room (ER) visits must also be covered.[29]

In providing coverage of COVID-19 testing, plans must defer to the treatment decisions of the individual's healthcare provider. Guidance issued jointly by the Departments of Labor, Health and Human Services, and Treasury (Departments) clarified that testing coverage is required "when medically appropriate for the individual, as determined by the individual's attending healthcare provider in accordance with accepted standards of current medical practice."[26] This means that health insurance plans are not permitted to establish coverage criteria; this decision is left wholly to the clinical judgment of the treating healthcare provider.

The Departments put out further guidance on June 23 on testing situations where insurers do and do not have to provide coverage:[29]

> Regarding the definition of an attending healthcare provider, the Departments stated, "A health care provider need not be directly responsible for providing care to the patient to be considered an attending provider, as long as the provider makes an individualized clinical assessment to determine whether the test is medically appropriate for the individual in accordance with current accepted standards of medical practice."
>
> With regard to coverage for COVID-19 testing for surveillance or employment purposes, the guidance stated, "Clinical decisions about testing are made by the individual's attending health care provider and may include testing of individuals with signs or symptoms compatible with COVID-19, as well as asymptomatic individuals with known or suspected recent exposure to SARS-CoV-2, that is determined to be medically appropriate by the individual's health care provider, consulting CDC guidelines as appropriate. ***However, testing conducted to screen for general workplace health and safety (such as employee "return to work" programs), for public health surveillance for SARS-CoV-2, or for any other purpose not primarily intended for individualized diagnosis or treatment of COVID-19 or another health condition is beyond the scope of section 6001 of the FFCRA***."

STATE TESTING GUIDANCE

In addition to the federal requirements for COVID-19 testing, the state of New York has introduced several mandates for testing through executive orders and agency guidance. The legislature also passed a new law prior to its recess granting the governor additional executive order authorities.[30] Several of these executive orders are intended to expand the range of medical providers who may order a COVID-19 test. The executive orders shown in Figure 3 have implications on COVID-19 testing.

FIGURE 3: SUMMARY OF GOVERNOR CUOMO EXECUTIVE ORDERS RELATED TO COVID-19 TESTING

Executive Order Number	Summary
202.24[31]	Authorizes licensed pharmacists to order and administer FDA-authorized Clinical Laboratory Improvement Amendments (CLIA)-waivered COVID-19 tests to individuals suspected of being infected with COVID-19 Designates licensed pharmacists as qualified healthcare professionals for the purpose of directing limited service laboratory to test for COVID-19 or its antibodies Extended by Executive Orders 202.32 and 202.44 now until July 21[32,33]
202.30[34]	Requires nursing homes and adult care facilities, including all adult homes, enriched housing programs, and assisted living residences, to test or make arrangements for the testing of all personnel for COVID-19, twice per week, pursuant to a plan developed by the facility administrator and filed with the NYSDOH Does not allow hospitals to discharge a patient to a nursing home, without first performing a diagnostic test for COVID-19 and obtaining a negative result[32,35]
202.32[32]	Physicians may order FDA-authorized COVID-19 tests for patients without otherwise having a prior physician-patient relationship Executive Order 202.44 extended this provision until July 21[33]
202.40[36]	Modifies Executive Order No. 202.30 so that all nursing homes and all adult care facilities, which are located in regions that have reached Phase II of reopening, must test or make arrangements for the testing of all personnel for COVID-19 once per week

In addition to Governor Cuomo's executive orders, state government agencies have issued guidance for COVID-19 testing. The Department of Financial Services (DFS) issued two Circular Letters providing additional guidance for insurance issuers to comply with Executive Order 202.24 and Executive Order 202.30. Circular Letter No.12 directs issuers to provide both in-network and out-of-network coverage for COVID-19 testing without cost sharing at pharmacies, consistent with the requirements of Executive Order 202.24.[37] Circular Letter No. 11 directs issuers to provide in-network and out-of-network coverage for COVID-19 testing for twice-weekly testing of nursing home and adult care facility personnel without cost sharing to comply with Executive Order 202.30.[38]

SUMMARY OF TESTING COVERAGE REQUIREMENTS FOR COMMERCIAL HEALTH INSURANCE PLANS

Federal law and guidance is clear that insurers must cover testing when a healthcare provider deems it medically appropriate, on a case-by-case basis. However, a state may exercise its powers to enact additional laws or guidance mandating requirements that are more stringent than and do not prevent application of federal requirements.[29] The state of New York has exercised these powers through executive orders and supporting agency guidance, such as the Circular Letters mentioned above. While new guidance from the federal government provides clarification that workplace screenings and public surveillance testing are not required to be covered by private health insurance under FFCRA, Circular Letter No. 11, which directs insurers to pay for nursing home staff tests, applies a more expansive testing coverage requirement to New York's private health insurance industry. Note that, while Employee Retirement Income Security Act of 1974 (ERISA) plans (self-funded group insurance plans) are exempted from these requirements, Circular Letter No. 11 indicates third-party administrators (TPAs) in the state are "strongly encouraged to apply the provisions" required for fully insured business.

Factors influencing testing utilization

Although policy decisions have significant influence on COVID-19 testing utilization, other factors are also important. Notably, the need for widespread COVID-19 testing is likely to continue until an effective vaccine is widely available, which may be available by the end of 2020.[37] In addition to the potential for a resurgence in COVID-19 infections occurring in the second half of CY 2020, utilization may be driven by occupational guidance and local or state government COVID-19 surveillance directives. On a national level, some public health experts have indicated weekly testing needs to increase from 3 million to 30 million to safely reopen schools and businesses.[39] As evident by the state and local mandates and recommendations discussed above, public officials have made large-scale COVID-19 testing a major element of the state's strategy to track, contain, and reduce the number of future COVID-19 infections.

Testing utilization, both per capita volume and type, may vary significantly in New York relative to other parts of the United States. Based on CDC data as of July 10, 2020, the number of confirmed COVID-19 infections per capita in New York City was approximately three times greater than experienced in the United States outside of New York state.[40] For New York state, excluding New York City, the per capita infection rate was approximately two times greater.[40] Figure 4 highlights the key factors that may influence COVID-19 testing during the second half of 2020. A more complete discussion of the key factors can be found in the Appendix.

FIGURE 4: KEY FACTORS INFLUENCING COVID-19 TESTING JULY-DECEMBER 2020

AGE	▪ Children were approximately one-sixth as likely to be tested when compared to adults, but schools were closed for much of the spring (and summer)[43] ▪ Adults received nearly equal testing across all age groups[43]
TESTING CAPACITY AND REOPENING STATUS	▪ Reopening required 30 tests per 1,000 residents, with May having an average of 60 tests/1,000 residents[41, 42] ▪ Testing capacity continues to increase, with testing of 100 tests/1,000 residents in June[42]
INDUSTRY/ OCCUPATION	▪ OSHA released guidance based on exposure risk: high, medium, and low[44] ▪ NYSDOH also released testing guidance and requirements for certain occupations[45]
IMMUNITY OF PREVIOUSLY INFECTED INDIVIDUALS	▪ The degree and length of immunity after having COVID-19 is currently unknown ▪ The value of antibody testing in the future is dependent upon the level of immunity
SEASONALITY OF VIRAL ILLNESS	▪ Influenza, pneumonia, and common cold will increase in the fall and winter, likely resulting in increased visits and testing[46]

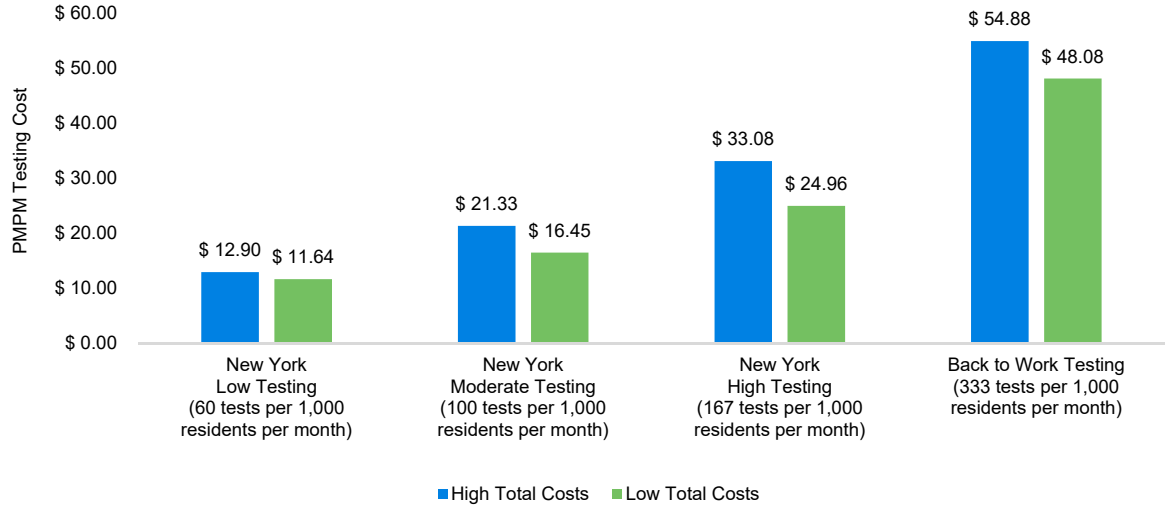
CY 2020 COVID-19 testing PMPM costs

As discussed in the previous section, COVID-19 testing utilization for a commercially insured population will be influenced by a number of factors and may particularly vary with an insured population's industry mix. Based on our review of New York state's past and current testing rates, testing scenarios for the second half of the year were developed (the basis for these scenarios is discussed further in the Appendix of this report). Figure 5 provides the estimated costs (across all payers) related to COVID-19 testing for four illustrative scenarios for New York residents who are covered under commercial insurance coverage.

- In addition to costs related directly to the COVID-19 test and its administration, testing costs, for the purpose of this report, may also include services provided during the COVID-19 testing encounter to determine the clinical appropriateness of a COVID-19 test, differentiate among potential diagnoses, and provide outpatient treatment.
- Cost estimates were based on summarized utilization and cost experience for COVID-19 testing and other associated services reported by NYHPA and Blues Conference members through May 2020. Claims experience was provided by site-of-service (office visit, urgent care, outpatient hospital clinic, drive-through testing, primary care, lab-only, and telehealth visit). Reported costs were validated for reasonableness by reviewing third party sources and proprietary data and models. Our final modeling assumptions reflect smoothing and rounding of reported cost amounts.
- In addition to the testing frequency scenarios, cost estimates were developed for "low site-of-service" and "high site-of-service" utilization assumptions. The low site-of-service costs reflect a greater share of testing done in the lab (rather than through an office or emergency room visit). The share of lab-only testing is assumed to increase with overall testing utilization.
- Monthly COVID-19 testing costs are unlikely to be consistent and will reflect the levels of COVID-19 transmission, societal activity, prior exposure status, and the presence of similar illnesses throughout New York state.
- The full development of the testing cost estimates is illustrated in the Appendix of this report.

The scenarios below are intended to provide reasonable cost scenarios that reflect our review of the information discussed in this report. Actual testing costs for segments of New York's commercially insured population will vary based on the factors discussed in this report (as well as other unknown variables and considerations).

FIGURE 5: ESTIMATED JULY THROUGH DECEMBER 2020 PMPM ALL-PAYER COSTS ASSOCIATED WITH COVID-19 TESTING FOR COMMERCIALLY INSURED NEW YORK RESIDENTS



* Antibody testing is assumed to be consistent across all scenarios. It is based on the New York requirement of 30 tests per 1,000 residents per month for a region as one of the initial requirements for reopening the region.[47]

TESTING FREQUENCY SCENARIOS:

- **New York Low Testing:** This scenario assumes a COVID-19 testing level appropriate for businesses to reopen and testing only symptomatic individuals during non-flu season. The May testing rate, approximately 60 tests per 1,000 New York residents, is used as the basis for this scenario.
- **New York Moderate:** This scenario assumes a COVID-19 testing level increase from the Low Testing scenario, accounting for additional disease testing due to increased transmission or differentiation testing for similarly presenting illnesses. The June testing rate, approximately 100 tests per 1,000 New York residents, is used as the basis for this scenario.
- **New York High Testing:** This scenario assumes a high or widespread COVID-19 testing level due to a resurgence of COVID-19 infections in New York. This scenario assumes the average New Yorker will receive two COVID-19 tests per year, resulting in approximately 167 tests per 1,000 residents per month.
- **Back-to-Work Testing:** This scenario assumes that occupational testing is occurring and is based on a tiered system for testing frequency, where high-risk occupations are tested monthly, medium-risk occupations are tested twice a year, and low-risk occupations are tested once a year. This scenario reflects approximately 333 tests per 1,000 New Yorkers per month, which will require increased testing capacity relative to June rates.

The PMPM costs associated with COVID-19 testing are estimated to be between approximately $12 and $55 based on the illustrative scenarios above. Assuming there are approximately 8.9 million commercially insured New York residents, the aggregated range of costs associated with the four illustrated COVID-19 testing scenarios is from $0.6 billion to $2.9 billion for the July through December 2020 time period. Our estimates exclude non-New York residents who are covered by a New York group health plan. The aggregate cost ranges also exclude New York residents with other insurance (such as Medicaid, Medicare, and Basic Health Program plans).

When looking at testing costs as they relate to health insurance premiums, the average commercial health insurance premium in New York is approximately $620 per month.[*] To the extent COVID-19 testing is entirely covered by commercial health insurance coverage, average testing costs may equate to approximately 2% to 9% of the expected earned premium for the scenarios illustrated. However, as discussed in the Executive Summary above, it is likely that the actual experience will be distributed across a number of funding sources.

As an illustration of potential variance by industry, Figure 6 depicts estimated costs to fulfill state mandated testing for personal care service workers and nursing facility employees.

- As previously discussed, Executive Order 202.40 mandated weekly testing of employees working in long-term care facilities (approximately 4.3 tests per month).
- Personal care service workers are required to be tested through a diagnostic test every 14 days while the region is in Phase III of the state's reopening (assume 2.0 tests per month).[48]

[*] Based on the CY 2019 Supplemental Healthcare Exhibits for the state of New York, reflecting individual, small group, and large group markets. CY 2019 costs trended to CY 2020 using a 5% trend assumption.

FIGURE 6: ESTIMATED MONTHLY ALL-PAYER COSTS ASSOCIATED WITH COVID-19 FOR SELECT HIGH-RISK OCCUPATIONS

COVID-19 TESTING SCENARIOS FOR INDUSTRIES WITH STATE-MANDATED TESTING REQUIREMENTS

Estimated Per Member Per Month Cost by Test Type and Frequency

Testing for Active Disease			Testing Frequency	
Site of Service	Cost Description	Unit Cost	Personal Care Service Workers (2 tests per month)	Nursing Facility Level Testing[34] (weekly testing of workers)
Lab	Testing Costs	$ 65.00	$ 130.00	$ 281.67
	Other Costs	$ 45.00	$ 90.00	$ 195.00
	Total Costs	$ 110.00	$ 220.00	$ 476.67

Notes:

1. Other costs include administration and specimen collection of the tests.
2. Testing cost reflect nursing home employees only. Other spouses and dependents covered under employer coverage (who are not personal care service or nursing home workers) are likely to have significantly less testing costs than the illustrated values.

For the industries illustrated in Figure 6, monthly testing costs may equate to one-third to two-thirds of average commercial health insurance PMPM premium costs. However, because testing for these industries would be considered employer-based screening, testing costs would not be required to be covered by private health insurance under federal law. Additionally, it is possible actual testing costs are lower if payers are able to negotiate lower prices with a laboratory as result of the high frequency of required testing or if pooled testing is used. To the extent "pooled" testing is employed; it may also lower testing costs.[49] To the extent state mandates are updated, testing cost estimates for these industries would need to be updated.

Limitations and caveats

The services provided for this project were performed under the contract between Milliman and the NYHPA dated November 1, 2010, and the signed contract between Milliman and the Blues Conference dated May 27, 2020, and under the signed engagement dated June 11, 2020.

The information contained in this report has been prepared by Milliman exclusively for the use or benefit of NYHPA and the Blues Conference to illustrate potential COVID-19 testing costs in the state of New York during CY 2020 for commercially insured populations. The data and information presented may not be appropriate for any other purpose. Any user of the data must possess a certain level of expertise in actuarial science and healthcare modeling so as not to misinterpret the information presented in this report.

Milliman's draft work product may not be provided to third parties without Milliman's prior written consent. Any distribution of this report should be in its entirety. Milliman makes no representations or warranties regarding the contents of this letter to third parties. Likewise, third parties are instructed that they are to place no reliance upon this report prepared for NYHPA and the Blues Conference by Milliman that would result in the creation of any duty or liability under any theory of law by Milliman or its employees to third parties. Other parties receiving this report must rely upon their own experts for advice appropriate to their own specific needs.

Differences between our projections and actual amounts depend on the extent to which future experience conforms to the assumptions made for this analysis. It is certain that actual experience will not conform exactly to the assumptions used in this analysis. Actual amounts will differ from projected amounts to the extent that actual experience deviates from expected experience. Our estimates rely on a number of key assumptions that are subject to extreme uncertainty given the limited experience available at this time related to COVID-19 as well as developing testing and treatment protocols. These assumptions include the overall confirmed infection rate for the community, assumed infection rates by age and gender, COVID-19 immunity for previously infected persons, costs for COVID-19 tests that have yet to be developed or approved, and testing utilization. The assumptions supporting the conclusions outlined in this paper are based on a combination of publicly available data and Milliman’s proprietary claims data and research, representing our best estimates as of the date of publication. Many of these assumptions will likely change over the coming months as COVID-19 experience manifests.

Scientific knowledge of these items is incomplete and new data on the spread of COVID-19 in the state of New York is constantly emerging. In addition, actions taken by governmental authorities, the general public, and healthcare systems related to the COVID-19 pandemic are rapidly changing and will impact testing utilization. Due to developing information related to the pandemic, any analysis is subject to substantially greater than usual levels of uncertainty.

Guidelines issued by the American Academy of Actuaries require actuaries to include their professional qualifications in all actuarial communications. The authors of this report who are actuaries are members of the American Academy of Actuaries and meet the qualification standards for performing the analyses contained herein.

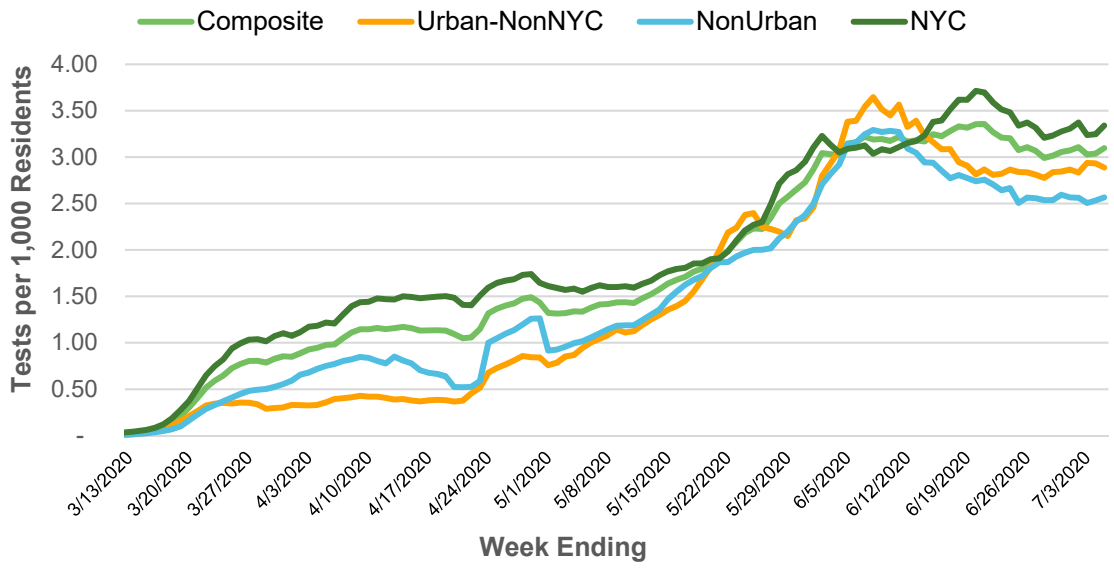
Appendix 1: Key factors influencing COVID-19 testing

KEY FACTORS INFLUENCING COVID-19 TESTING

Testing capacity and reopen metrics

The NYSDOH reported that as of July 8, 2020, approximately 400,000 positive tests occurred in the 4.5 million COVID-19 tests administered, meaning that approximately 9% of all individuals tested in New York state tested positive for COVID-19.[50] Additionally, the COVID-19 testing capacity in New York continues to increase. As part of the state's reopening policy for each region of the state, testing capacity must be at least 30 tests per 1,000 residents per month within a region.[47] The average testing in May 2020 was approximately 60 tests per 1,000 residents per month.[50] Figure 7 depicts the daily number of COVID-19 tests performed over the past three months in New York calculated using a seven-day rolling average.

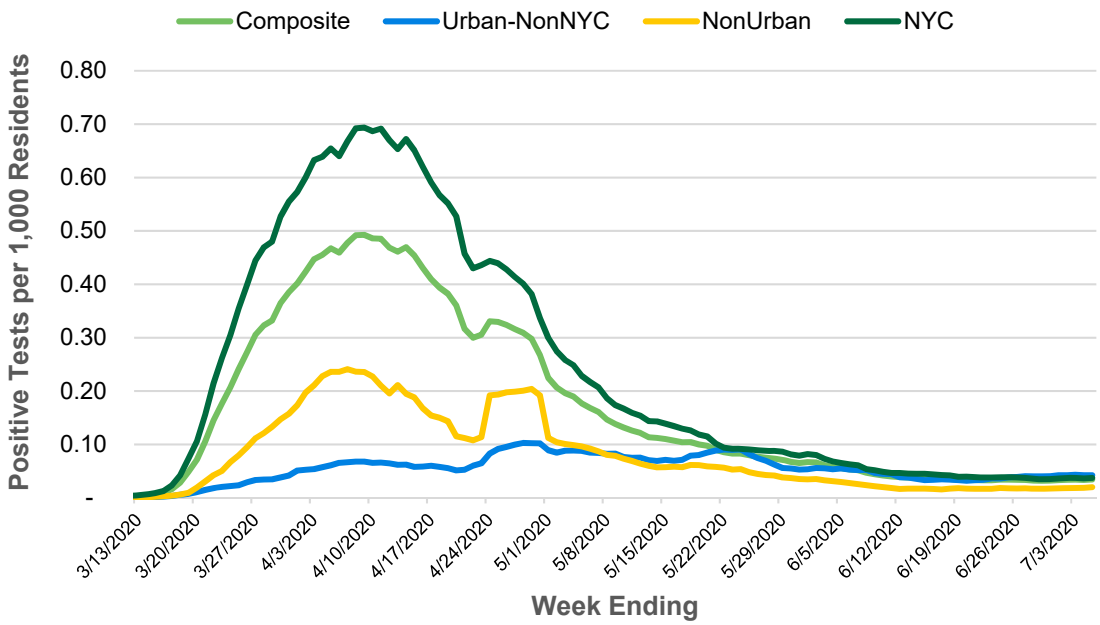
FIGURE 7: NEW YORK STATE COVID-19 DAILY TESTING RATE PER 1,000 RESIDENTS, 7-DAY ROLLING AVERAGE



As illustrated in Figure 7, there was significantly higher per capita testing in New York City in comparison to other parts of the state when testing capacity was low. The per capita testing rate across all geographic regions in New York began to converge as testing capacity expanded, suggesting that testing utilization on a per capita basis may not vary significantly across regions of the state.

As illustrated in Figure 8, positive COVID-19 tests in New York peaked in early April, when New York City was the epicenter of the COVID-19 pandemic in the United States. As testing continued to increase through June 2020 the number of positive tests per capita fell. As of July 10, 2020, New York state's COVID-19 testing positivity rate was only 1.07%, ranking it the fourth-lowest state. New York also has the highest per capita testing rate of any state in the nation.[51] The governor of New York, Andrew Cuomo, has stated that "the single most important thing we can do to combat and contain the novel coronavirus is to test for it."[52] Strong state government support for testing, illustrated as broad qualifications for testing, has demonstrated a high use of testing thus far, once testing capacity was no longer an issue.[52] It may be assumed that as long as capacity is not an issue, New York will continue to have high per capita testing rates.

FIGURE 8: NEW YORK STATE COVID-19 POSITIVE TESTS PER 1,000 PERSONS, 7-DAY ROLLING AVERAGE



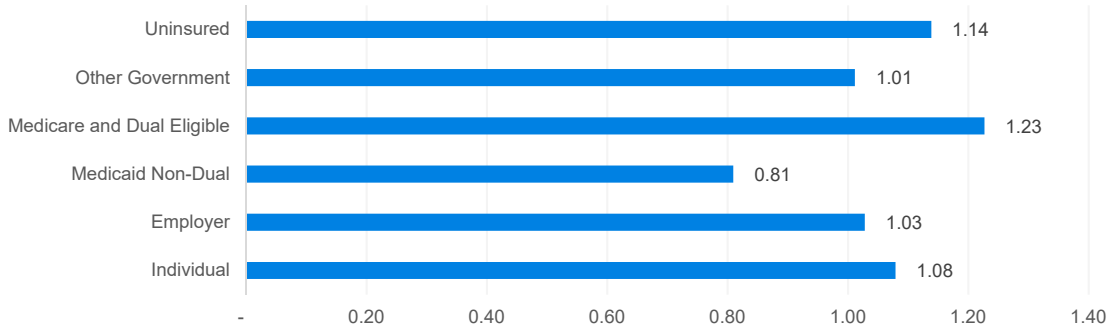
Age

The national CDC COVID-19 testing data from public and commercial laboratories, representing approximately 17 million tests reported as of July 2, 2020, indicates that children and adults had different rates of COVID-19 testing. Children were approximately one-sixth as likely to be tested when compared to adults.[†53] Among adults, testing prevalence was relatively stable across age groups. The low degree of testing among children (ages 0 to 17) may be attributable to a greater share of children remaining asymptomatic relative to adults infected with COVID-19.[43] However, schools have been shut down since the beginning of the pandemic, which likely limited the spread of COVID-19 among children. To the extent children return to school in the fall of 2020, testing rates among children may increase significantly either due to back-to-school requirements or transmission of infections.

Utilizing national CDC COVID-19 testing utilization relativities by age group, Figure 9 estimates COVID-19 testing utilization relativities for New Yorkers covered in each health insurance market. For example, we estimate utilization by New Yorkers covered by Medicare (dual-eligible with Medicaid or not) will be 23% higher than the statewide per capita utilization rate. For the commercial health insurance market population (employer and individual), testing is estimated to be slightly above the statewide per capita rates. As the individual market has a lower proportion of children, relative testing utilization (without considering other confounding factors) is estimated to be approximately 5% higher compared to the employer market and 8% higher than the total population per capita testing rate. Because national testing utilization data is used, actual New York testing relativities will vary from these relativities to an unknown degree.

† Data on New York-specific COVID-19 testing by age group was not publicly available.

FIGURE 9: ESTIMATED RELATIVE COVID-19 TESTING UTILIZATION BY INSURANCE MARKET, STATE OF NEW YORK



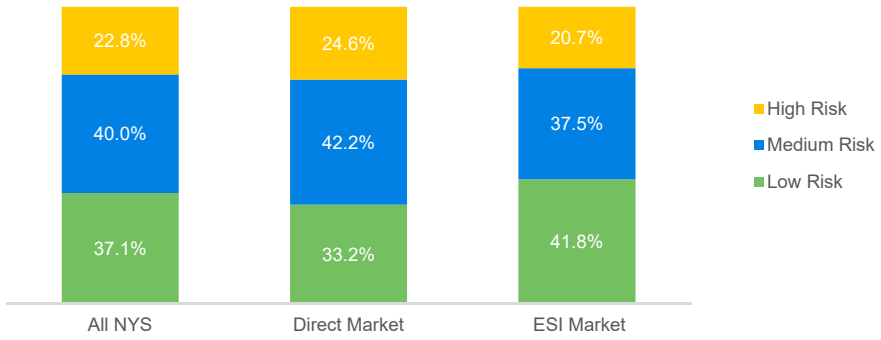
Note: New York insurance market enrollment by age group estimated using publicly available data, including American Community Survey, Centers for Medicare and Medicaid Services (CMS) Medicaid and Medicare eligibility reports, and CMS commercial medical loss ratio data. Testing rates by age group are based on national data published by the CDC. The national testing rates by age group were applied to the New York census data to develop estimated testing utilization for each insurance market.

Industry/occupation

Certain occupations may require or encourage individuals to take certain precautions as a result of the COVID-19 pandemic.[54,55] At the employer level, asymptomatic COVID-19 testing requirements in CY 2020 may range from weekly testing for every employee (as required for nursing home employees) to minimal testing utilization for employers whose employees remain in work-from-home environments through the duration of CY 2020.

As previously discussed, the NYSDOH has released COVID-19 testing requirements for certain occupations. Additionally, OSHA has released guidance on preparing workplaces for COVID-19.[44] This guidance classifies occupations based on their exposure risks to COVID-19 into the following risk categories: high, medium, and low.[44] Individuals at greater risk of coming into contact with COVID-19 as a result of their occupations may be more likely to get tested than individuals in other occupations. To provide an understanding of COVID-19 risk levels among workers covered by commercial health insurance, Figure 10 illustrates the estimated distribution of COVID-19 occupation risk (as defined by the CDC) for workers receiving insurance coverage through the individual (direct) or employer-sponsored insurance (ESI) markets.

FIGURE 10: OCCUPATIONAL COVID-19 RISK OF POPULATION COVERED BY COMMERCIAL HEALTH INSURANCE



Source: CY 2018 American Community Survey (ACS) census data was used to estimate health insurance coverage for New York's labor force. The ACS data was supplemented by the Current Population Survey (CPS) data to further stratify employees covered by commercial insurance by industry and COVID-19 risk level. To the extent the ACS data did not contain an occupation code for a worker, the observation was excluded from our analysis. The CY 2018 ACS data contained an occupation code from approximately 11.5 million New Yorkers, with approximately 0.8 million with direct (individual market) coverage and approximately 6.9 million with group coverage. We assigned each occupation code to a risk level based on OSHA's occupational exposure risk levels; individual employer risk levels within each industry are likely to vary based on a multitude of factors.

- **High exposure risk** are occupations with a high probability of exposing workers to COVID-19, such as medical practitioners, healthcare delivery and support staff, medical transport workers, postmortem workers, and food preparation and restaurant staff.
- **Medium exposure risk** are occupations that require frequent or close contact with people who may have COVID-19 or with the general public. These occupations do not allow their workers to social distance themselves from the public and include transportation workers, custodial personnel, construction workers, educators, and workers in high-volume retail settings.
- **Low exposure risk** are occupations that do not require contact with people known to be, or suspected of being, infected with COVID-19 nor do they require frequent close contact with the general public.

As illustrated by Figure 10, workers receiving health insurance through the direct individual health insurance market are slightly more likely be employed in a medium- or high-risk occupation (approximately 67%) relative to workers covered by employer-sponsored insurance (approximately 58%). As a result, individuals in the direct market may be more likely to receive a COVID-19 test strictly based on occupation.

Immunity of previously infected individuals

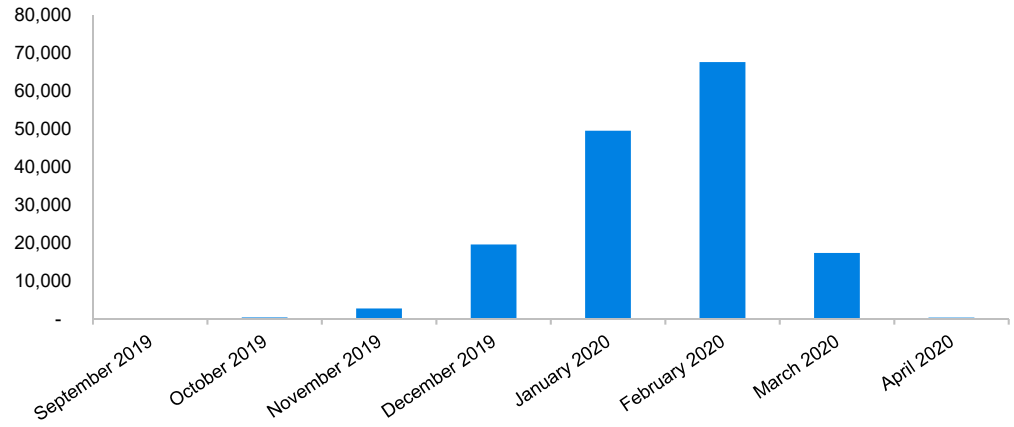
Based on past history of coronaviruses, the cause of the common cold, we know that immunity fades over time allowing individuals to experience the common cold periodically.[56,57] We may learn that changes in the ribonucleic acid (RNA) structure allow for individuals to be reinfected by COVID-19 regardless of antibody level or the level of antibodies necessary for prolonged immunity.[58,59]

While the degree of immunity among persons recovered from COVID-19 is currently being studied, this uncertainty may lessen the value of antibody testing. It may not be an accurate predictor of an individual's or population's resistance to reinfection in the future. If studies find that a high degree of immunity does persist among previously infected persons, antibody or other testing may be of great value in the second half of CY 2020 as it would assist policy makers in assessing the spread of the disease and the population's exposure to COVID-19.[60]

Seasonality of viral illnesses

Influenza and pneumonia may present similarly to COVID-19.[46] They also have higher transmission during the winter months for a number of reasons, including that more activities are indoors, schools are in session, and due to weather-related factors. In order to differentiate between the conditions, COVID-19 and influenza testing may increase during the winter months. Additionally, individuals who previously did not seek influenza testing may seek testing in the second half of 2020 due to the COVID-19 pandemic. Figure 11 displays the New York 2019-2020 influenza season as based on positive test results.[46] The months affected were similar to those in previous years. However, determinations of school openings and the ability or lack of ability to social distance may also play a role in the spread of these other conditions. These factors will affect testing rates.

FIGURE 11. STATE OF NEW YORK MONTHLY POSITIVE INFLUENZA RESULTS, 2019-2020 FLU SEASON



Due to the similarities of symptoms between these viral or lower respiratory illnesses, additional primary care utilization may be seen in order for a patient to differentiate between conditions and receive a confirmatory diagnosis. Prior to COVID-19, a person experiencing mild flu-like symptoms may have self-treated with over-the-counter (OTC) medications and refrained from visiting a healthcare provider.

Appendix 2: Development of testing cost scenarios

New York Health Association and New York State Conference of Blue Cross & Blue Shield Plans

COVID-19 Testing Scenarios

Estimated Per Member Per Month (PMPM) Cost by Test Type, Site of Service, and Frequency

Testing for Active Disease			**Testing Frequency†**			
			Estimated PMPM Testing Cost by Scenario and Site-of-Service Utilization			
Site of Service	Cost Descriptions	Unit Cost	New York Low Testing (60 tests per 1,000 residents per month)	New York Moderate Testing (100 tests per 1,000 residents per month)	New York High Testing (167 tests per 1,000 residents per month)	Back-to-Work Testing (333 tests per 1,000 residents per month)
Average Testing	Cost by Site of Service					
Lab	Testing Costs	$ 65.00	$ 3.89	$ 6.50	$ 10.83	$ 21.67
	Other Costs	$ 45.00	$ 2.69	$ 4.50	$ 7.50	$ 15.00
	Total Costs	$ 110.00	$ 6.58	$ 11.00	$ 18.33	$ 36.67
Office Visit	Testing Costs	$ 65.00	$ 3.89	$ 6.50	$ 10.83	$ 21.67
	Other Costs	$ 220.00	$ 13.16	$ 22.00	$ 36.67	$ 73.33
	Total Costs	$ 285.00	$ 17.05	$ 28.50	$ 47.50	$ 95.00
ER	Testing Costs	$ 65.00	$ 3.89	$ 6.50	$ 10.83	$ 21.67
	Other Costs	$ 1,190.00	$ 71.20	$ 119.00	$ 198.33	$ 396.67
	Total Costs	$ 1,255.00	$ 75.09	$ 125.50	$ 209.17	$ 418.33
Other	Testing Costs	$ 75.00	$ 4.49	$ 7.50	$ 12.50	$ 25.00
	Other Costs	$ 55.00	$ 3.29	$ 5.50	$ 9.17	$ 18.33
	Total Costs	$ 130.00	$ 7.78	$ 13.00	$ 21.67	$ 43.33
High Site of Service	Site of Service Utilization Distribution					
Scenario	Lab		60%	60%	65%	78%
	Office Visit		25%	30%	25%	15%
	ER		3%	3%	3%	2%
	Other		12%	7%	7%	5%
	Weighted Composite PMPM Costs					
	Testing		$ 3.96	$ 6.57	$ 10.95	$ 21.83
	Other		$ 7.44	$ 13.26	$ 20.63	$ 31.55
	Total		$ 11.40	$ 19.83	$ 31.58	$ 53.38

New York Health Association and New York State Conference of Blue Cross & Blue Shield Plans

COVID-19 Testing Scenarios

Estimated Per Member Per Month (PMPM) Cost by Test Type, Site of Service, and Frequency

Testing for Active Disease			**Testing Frequency†**			
			Estimated PMPM Testing Cost by Scenario and Site-of-Service Utilization			
Site of Service	Cost Descriptions	Unit Cost	New York Low Testing (60 tests per 1,000 residents per month)	New York Moderate Testing (100 tests per 1,000 residents per month)	New York High Testing (167 tests per 1,000 residents per month)	Back-to-Work Testing (333 tests per 1,000 residents per month)
Low Site of Service	Site of Service Utilization Distribution					
Scenario	Lab		70%	75%	80%	85%
	Office Visit		20%	15%	10%	10%
	ER		2%	1%	1%	1%
	Other		8%	9%	9%	4%
	Weighted Composite PMPM Costs					
	Testing		$ 3.94	$ 6.59	$ 10.98	$ 21.80
	Other		$ 6.20	$ 8.36	$ 12.48	$ 24.78
	Total		$ 10.14	$ 14.95	$ 23.46	$ 46.58
Antibody Testing	**Testing Costs***	**$ 50.00**	**$ 1.50**	**$ 1.50**	**$ 1.50**	**$ 1.50**
Estimated Testing Cost	**High Total Costs**		**$ 12.90**	**$ 21.33**	**$ 33.08**	**$ 54.88**
	Low Total Costs		**$ 11.64**	**$ 16.45**	**$ 24.96**	**$ 48.08**

* Antibody testing is assumed to be consistent across all scenarios, based on 30 residents per 1,000 receiving a test each month.
†Testing Frequency Scenarios:

- **New York Low Testing:** This scenario assumes a COVID-19 testing level appropriate for businesses to reopen and testing only symptomatic individuals during non-flu season. The May testing rate, approximately 60 tests per 1,000 New York residents, is used as the basis for this scenario.
- **New York Moderate:** This scenario assumes a COVID-19 testing level increase from the "Low Testing" scenario accounting for additional disease testing due to increased transmission or differentiation testing for similarly presenting illnesses. The June testing rate, approximately 100 tests per 1,000 New York residents, is used as the basis for this scenario.
- **New York High Testing:** This scenario assumes a high or widespread COVID-19 testing level due to a resurgence of COVID-19 infections in New York. This scenario assumes the average New York resident will receive two COVID-19 tests per year, resulting in approximately 167 tests per 1,000 residents per month.
- **Back-to-Work Testing:** This scenario assumes that occupational testing is occurring and is based on a tiered system for testing frequency, where high-risk occupations are tested monthly, medium-risk occupations are tested twice a year, and low-risk occupations are tested once a year. This scenario reflects approximately 333 tests per 1,000 New York residents per month, which will require increased testing capacity relative to June rates.

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