komodohealth™

RESEARCH BRIEF:

Routine Chronic Disease Screenings and Oncology Biomarker Tests Plummet During COVID-19

HbA1c Tests and Lipid Panels Down Approximately 65% since March 19, Critical Monitoring and Biomarker Tests for Leukemia and Multiple Myeloma Down Roughly 20%

KEY FINDINGS

- Routine disease management and preventive screenings have declined significantly in the weeks following widespread shelter-in-place guidelines throughout the U.S., with the most significant declines seen in cervical cytology screening (-68.2%), cholesterol/lipid panels (-66.6%), and hemoglobin A1c tests (-64.7%).
- Critical cancer tests have also declined during this period. This includes CA-125 monitoring for ovarian cancer (-33.8%), beta-2-microglobulin (B2M) marker testing for multiple myeloma patients (-21.7), BCR-ABL tests used to confirm a chronic myeloid leukemia diagnosis (-19.5%), and CA-15-3 monitoring for breast cancer treatment and disease recurrence (-17.4%).
- Sharpest declines have occurred in COVID-19 "hotspots" such as New York, where HbA1c tests have declined 82.6% over the past few weeks. In Manhattan, HbA1c tests are down more than 90% from average levels prior to COVID-19. In Massachusetts, lipid panels are down 80.5%, and in California, cervical cytology screening is down 76.3%.

EXECUTIVE SUMMARY:

On March 19, 2020, Governor Gavin Newsom issued the order to make California the first state in the U.S. to implement a state-wide shelter-in-place order in an effort to stunt the spread of the novel coronavirus (COVID-19). Similar orders soon followed across the country, with an estimated 316 million people in 42 states still being asked to stay home as of April 20, 2020.

The aggressive social distancing measures have helped to "bend the curve" in the spread of COVID-19. Some of the hardest- and earliest-hit regions of the country are now starting to see the number of COVID-19-related deaths and hospitalizations slow.

The country is also starting to see ripple effects of the pandemic resulting from an overtaxed healthcare system that has spent the last several weeks consumed by COVID-19 cases, while people with non-urgent medical needs were advised to stay home.

In order to provide a more granular look at the impact of COVID-19 on deferral or delay of care for non-COVID-19-related conditions, we have tracked the two-year trend in facility-based screening volume for a range of common preventive screenings and cancer tests. Tracking real-world patient data across each state and county in the U.S., and evaluating screening frequency for the 11 weeks prior to March 19 and the four weeks following March 19 for both 2019 and 2020, we were able to chart the impact of COVID-19 on lab test volume for several categories of tests that took place in inpatient and outpatient settings.

The research found significant declines in volume across all tests examined: Cervical cytology screening (-68.2%), cholesterol/lipid panels (-66.6%), HbA1c tests (-64.7%), CA-125 monitoring for ovarian cancer (-33.8%), beta-2-microglobulin (B2M) marker testing for multiple myeloma (-21.7), BCR-ABL leukemia tests (-19.5%), and CA-15-3 breast cancer monitoring (-17.4%).

The findings may have significant implications for future morbidity and mortality if delayed tests and screenings generate a wave of poor outcomes in the months to come.

METHODOLOGY:

This research leveraged Komodo's Healthcare Map to evaluate the patient journeys associated with 320 million individuals in the U.S. The Healthcare Map was used to evaluate and report testing volumes for cervical cytology screenings, cholesterol/lipid panels, HbA1c tests, CA-125 tests for ovarian cancer monitoring, B2M marker testing for multiple myeloma, BCR-ABL leukemia tests, and CA-15-3 tests for recurrent breast cancer treatment and disease recurrence.

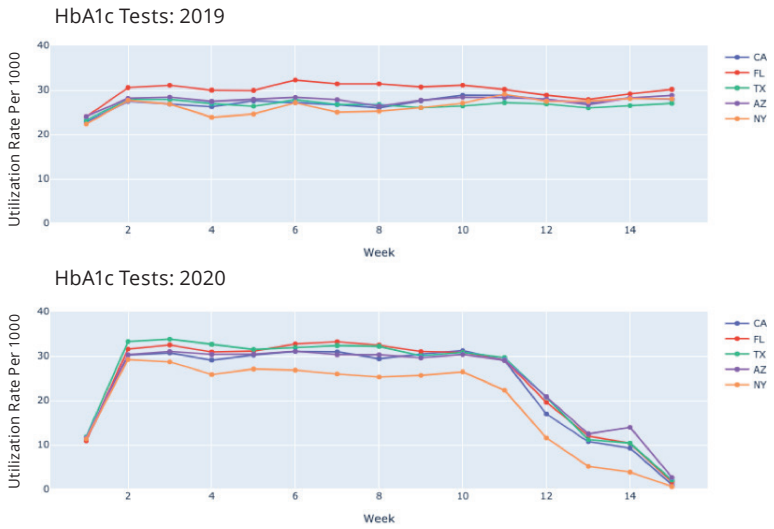
The total number of screening encounters were tracked on a statewide and county-level basis throughout the U.S. for the 11 weeks prior to March 19 and the four weeks following March 19 for both 2019 and 2020. The total volume of screening was then compared to the two time periods for each test and region. To quantify the daily utilization rate for each test, the unique patients seen each day was divided by the total number of unique patients seen for that test in 2019. This rate was then translated to match a standard actuarial figure of tests per 1000 patients in the total population.

We attempted to control for common non-clinical sources of variation including lags in data processing and ingestion from point-of-testing to Komodo's Healthcare Map.

RESULTS:

Routine Screenings Decline Sharply During COVID-19: Routine disease management and preventive screenings have declined significantly in the weeks following widespread shelter-in-place guidelines throughout the U.S., with the most significant declines seen in cervical cytology screening (-68.2%), cholesterol/lipid panels (-66.6%), and HbA1c tests (-64.7%).

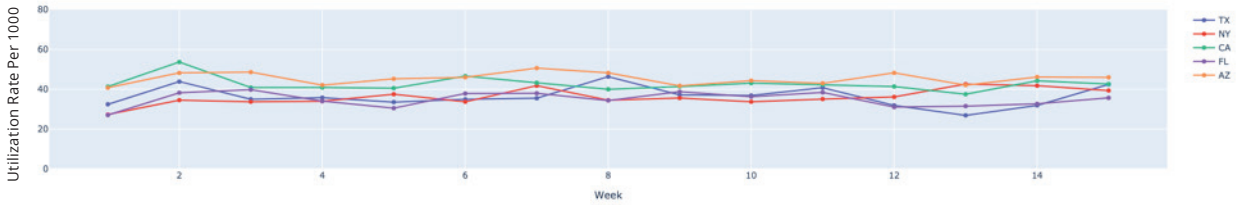
The charts below depict the trendline in HbA1c tests, a common screening and monitoring test for people with diabetes, for the first 15 weeks of 2019 compared to the first 15 weeks of 2020, across California, Florida, Texas, Arizona, and New York. While the timing of shelter-in-place orders varied in different states, a sharp drop-off in testing activity can be seen beginning at week 11 of 2020.



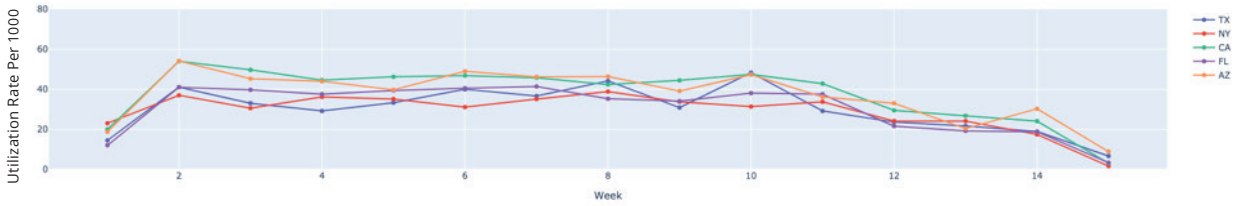
Crucial Cancer Monitoring and Biomarker Testing Put on Hold: Critical tests for oncology biomarkers and cancer recurrence have also declined during this period. This includes CA-125 monitoring of ovarian cancer progression (-33.8%), B2M marker testing for multiple myeloma (-21.7), BCR-ABL tests for leukemia (-19.5%), and CA-15-3 level testing for breast cancer treatment and disease recurrence (-17.4%).

The charts below depict the trendline in CA-15-3 protein level testing for breast cancer treatment and disease recurrence, comparing the first 15 weeks of 2019 to the first 15 weeks of 2020 across California, Florida, Texas, Arizona, and New York. This test is for monitoring response to breast cancer treatment and disease recurrence.

Breast Cancer Monitoring Tests: 2019



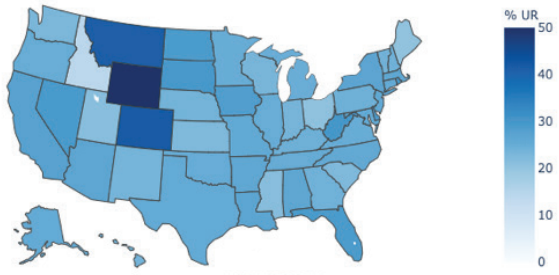
Breast Cancer Monitoring Tests: 2020



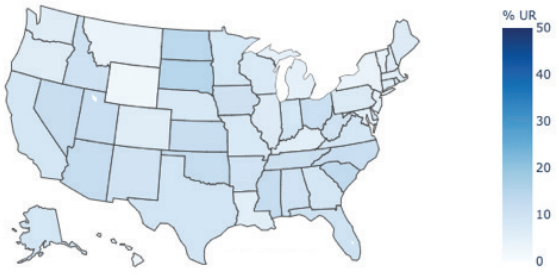
COVID-19 Hotspots Hit Hardest: When examining the data on a regional basis, the sharpest declines in screening have occurred in COVID-19 "hotspots" such as New York, where HbA1c tests have declined 82.6% over the past few weeks. In Manhattan, HbA1c tests are down more than 90% from average levels prior to COVID-19. In Massachusetts, lipid panels are down 80.5%, and in California, cervical cytology screening is down 76.3%.

The chart below depicts the volume of cholesterol screening tests on a state-by-state basis for the 14th week of 2019 versus 2020. The near absence of screening activity in New York, Massachusetts, Michigan, and Louisiana is noteworthy.

Weekly utilization rate per 1000: cholesterol tests
Week 14 of 2019



Weekly utilization rate per 1000: cholesterol tests
Week 14 of 2020



CONCLUSIONS:

COVID-19 has caused massive disruption to healthcare, one that will reverberate for months and years to come. As we begin to rebuild and put in place post-COVID-19 recovery and remediation efforts, it will be critical to identify unintentional gaps in care that were created by the pandemic. Countless anecdotal examples of deferred, delayed or altogether ignored care for cancer, chronic conditions, trauma, and preventive screenings abound. It is essential that we measure these with analytical rigor to understand the full extent of these gaps in care on national public health.

This research scratches the surface of the type of insights that are possible to uncover with comprehensive, real-time patient data. More research is required to evaluate the full scope of these declines in important screening tests on chronic disease management and overall healthcare outcomes. Komodo Health is also exploring how these trends will impact access to care, morbidity and mortality, and the financial impact of deferred care during the pandemic. We believe learnings from this type of research will be useful in planning for responses to future pandemics.

AUTHORS:

Arif Nathoo, M.D., Co-Founder and Chief Executive Officer, Komodo Health

Ivy Weng, M.D., Medical Director, Komodo Health

Jeremy Kim, Data Scientist, Komodo Health

Andrea Ortuno, Data Scientist, Komodo Health