COVID-19 Weekly Trend Insights

Data Week Ending 6/5/2020
Compiled on 6/19/2020
Executive Summary

Since our last insight report was published, global cases have increased by 27%.

Through patient activity observed for diagnosis, testing, exposure or symptoms of COVID-19 infection, PRA/SHS is tracking about 3.6M patients, with just over 519k diagnosed during the time period Feb 4, 2020 to Jun 11, 2020. Chronic co-morbidity trends have remained consistent.

This week’s report digs deeper into what we are learning about the COVID-19 Patient Cohort.

- At the start of the pandemic, a higher proportion of diagnosed Covid-19 patients were older, male, and mainly received a diagnosis at an inpatient hospital setting.
- Recently, Covid-19 patients have been relatively younger, female, and diagnoses have been received across multiple places of service (doctor office being the highest, followed by hospital outpatient).
- 95% of overall Covid-19 diagnosed and hospitalized patients had an inpatient stay of less than 21 days, longer Inpatient stays are most frequently observed with ventilator use. Ventilator usage was seen more often in males (60%)
- Covid-19 diagnosed patients with ventilator usage that died had mean or median age at 6 years older than overall hospitalized patients; regardless of ventilator use or those that died. (71 vs. 65 years)

COVID Treatment Alert: DEXAMETHASONE. A UK study indicates an anti-inflammatory steroid treatment, could save hospitalized patients. Rx data not yet showing activity uptick, but we anticipate an increase in coming weeks.

COVID-19 in the News & Latest Trends

This week’s deep dive, look further into Oncology market trends with views into four additional cancers profiled (Acute Lymphocytic Leukemia (ALL), Chronic Lymphocytic Leukemia (CLL), Non-Hodgkin Lymphoma (NHL), Acute Myeloid Leukemia (AML))

- 4.4% of patients with COVID-19 had a cancer diagnosis within the past 5 years prior to their Covid-19 and 2.6% within 1 year.
- Bone marrow biopsies increased above average in recent weeks as a bolus of patients are making up for putting off biopsies due to ‘non-essential’ surgery status during pandemic
- Breast cancer has displayed the largest decline in screening rates as well as newly diagnosed patients, while new to brand patient volume demonstrates more stability
- The rate of patients initiating therapy for infused products has remained largely unchanged from 2019 levels.
- Volumes declined in several key brands used to treat solid tumors, such as Keytruda and Afinitor, compared to last year. The newly launched drug, Lynparza, has continued to grow.
- During height of COVID stay at home orders, immune checkpoint inhibitors (MABs) had the greatest decline in infused solid tumor treatment, likely due to common respiratory-related adverse effects that are associated with these drugs
- Proteasome inhibitors and immune response markets MAB saw the most significant decline in use during the peak COVID19 period compared to prior year figures for the treatment of hematologic malignancies.
- Several key oral brands, such as Ninlaro for the treatment of Multiple Myeloma, increased in volume during the COVID outbreak compared to same time last year, indicating patients were opting for therapies that would reduce need for office visits.
While most other disease areas had a decline in Telemedicine usage, disease of the blood and endocrine system and nutritional/metabolic disease are continuing to increase.

Office visit volume trends seem to have stabilized at ~30% below pre-COVID-19 levels. Telemedicine usage continues to steadily decline with week ending 6/5/2020.

Telemedicine Usage for Medicaid patients remains more than 20 times higher than 2019 levels.

Use of telemedicine by Commercial and Medicare patients increased significantly but has declined in recent weeks, likely because mandates on reimbursement and waiving of fees were only temporary during the pandemic.

Looking at key specialties, Cardiology has returned to normal pre-COVID levels. Both Immunology and Anti-virals have not yet recovered. (Immunology: NRx= down 8%, TRx = down 4%, Anti-virals: NRx= down 10%, TRx= down 6%)

With unemployment continuing to rise into June 2020, elective therapy markets continue to experience slow recovery as patients weigh their options.

NATIONAL TRENDS: Total prescription activity has stabilized at ~6-7% below 2019 thresholds in recent weeks as the COVID-19 pandemic continues into June. New prescription uptick continues to display even slower recovery rates.

National Trends: Retail TRx continues to report at -6% below prior year volumes. Mail Order has resumed normal reporting thresholds following the week of the Memorial Day holiday.
COVID-19: Current Events & Latest Trends

- COVID-19: Current Events
- COVID-19 Patient Monitoring
- COVID-19: Update on Potential Treatments
June 4th
Las Vegas embarks on one of the most epidemiologically complex reopening experiments when it opened in a limited capacity at 12:01 AM. Gov. Steve Sisolak says he is confident that "every precaution possible" has been taken to ensure that the famed resorts can both serve guests and protect public health. Dealers and players are separated by Plexiglas, dice are doused in sanitizer after every throw, and guests, encouraged to wear masks, are subject to mandatory temperature checks.

Sources:
- https://www.fiercepharma.com/marketing/abbvie-pfizer-novartis-and-other-pharma-air-tv-ads-to-offer-covid-19-thank-you-s-and?mkt_tok=eyJpIjoiWkdKbU1qUmxabUUwTURkayIsInQiOiJmZ0FxNkw3Mkk1WDF4YXliYmFwRGMTbiQlQ0FzQkVja3dRajBkbWNxa3dBa1B3aWljbXVoUzVFVjZV

June 3rd
Pharma companies like Abbvie, Novartis and Sunovion joined the broader thank you-themed TV ad trend that many brands have adopted. Marketers from Google and McDonald’s to Dove and Glad are airing assistance and donations to commercials expressing appreciation and pledging help. Pfizer, Amgen and Johnson & Johnson all created TV ads with messages of gratitude to people helping in the fight against COVID-19.

June 11th
The Department of Labor stated more than 1.5 million Americans filed new state unemployment claims last week – the lowest number since the crisis began, but far above normal levels. A further 700,000 workers who were self-employed or otherwise ineligible for state jobless benefits filed new claims for Pandemic Unemployment Assistance, a federal aid program.

June 17th
Florida, Texas and Arizona set records for new COVID-19 cases, and more than a dozen other states are also reporting big jumps in the number of cases as much of the country reopens after months of quarantine. This is attributed to recent protests and Memorial Day celebrations.

June 11th
Stocks suffered their sharpest daily decline in three months as grim economic forecasts and a worrisome uptick in new coronavirus cases rattled investors’ confidence. The S&P 500 fell nearly 6 percent, and the Dow Jones industrial average fell by nearly 7 percent. Oil prices also tanked, reflecting the sudden unease that swept across financial markets.
Global cases continue to rise as COVID-19 cases surge in Latin American countries. Brazil & Mexico have yet to “flatten the curve” for confirmed cases.

Since our last COVID-19 insight report on June 5th, global cases have increased by approximately 1.8 million or 27%.

Global recovered cases reached over 3.2 million, increasing by nearly 59%.

### COVID-19 INSIGHTS

#### Confirmed Cases Worldwide

- **Confirmed Cases**: 8,461,295
- **Deaths**: 453,068
- **Recovered**: 3,228,591

### Source:

[https://www.theguardian.com/world/2020/may/07/coronavirus-world-map-which-countries-have-the-most-cases-and-deaths](https://www.theguardian.com/world/2020/may/07/coronavirus-world-map-which-countries-have-the-most-cases-and-deaths)
As state re-openings continue, confirmed cases of COVID-19 increased by over 339,000 from June 4th to June 19th, representing an increase of roughly 18%.

Since the last Insights Report, Florida and Texas both observed an increase of 46% in confirmed cases (the most among any top 10 state).

New York & New Jersey continue observed single digit growth in confirmed cases (lowest among top 10), decreasing new cases nearly in half compare to the previous report.

<table>
<thead>
<tr>
<th>State/Territory</th>
<th>Tests</th>
<th>Test % Change</th>
<th>Confirmed Cases</th>
<th>Case % Change</th>
<th>Deaths</th>
<th>Death % Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York</td>
<td>3,179,660</td>
<td>43%</td>
<td>385,760</td>
<td>3%</td>
<td>24,661</td>
<td>2%</td>
</tr>
<tr>
<td>New Jersey</td>
<td>1,171,734</td>
<td>40%</td>
<td>168,107</td>
<td>4%</td>
<td>12,800</td>
<td>8%</td>
</tr>
<tr>
<td>California</td>
<td>3,074,530</td>
<td>44%</td>
<td>161,099</td>
<td>37%</td>
<td>5,290</td>
<td>21%</td>
</tr>
<tr>
<td>Illinois</td>
<td>1,284,693</td>
<td>34%</td>
<td>135,639</td>
<td>10%</td>
<td>6,718</td>
<td>20%</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>741,260</td>
<td>20%</td>
<td>106,422</td>
<td>5%</td>
<td>7,770</td>
<td>9%</td>
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<tr>
<td>Texas</td>
<td>1,407,741</td>
<td>40%</td>
<td>99,851</td>
<td>46%</td>
<td>2,105</td>
<td>21%</td>
</tr>
<tr>
<td>Florida</td>
<td>1,512,769</td>
<td>40%</td>
<td>85,926</td>
<td>46%</td>
<td>3,154</td>
<td>19%</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>624,068</td>
<td>31%</td>
<td>80,236</td>
<td>8%</td>
<td>6,361</td>
<td>11%</td>
</tr>
<tr>
<td>Michigan</td>
<td>850,186</td>
<td>43%</td>
<td>66,798</td>
<td>15%</td>
<td>6,061</td>
<td>9%</td>
</tr>
<tr>
<td>Maryland</td>
<td>447,608</td>
<td>37%</td>
<td>63,229</td>
<td>15%</td>
<td>3,016</td>
<td>14%</td>
</tr>
</tbody>
</table>

COVID-19 Infection Trends

Through patient activity observed for diagnosis, testing, exposure or symptoms of COVID-19 infection, PRA/SHS is tracking about 3.6M patients, with just over 519k diagnosed during the time period Feb 4, 2020 to Jun 11, 2020.

COVID-19 INCEPITIVE PATIENT DEMOGRAPHICS BY SEGMENT

3,649,932 UNIQUE PATIENTS
PATIENTS WITH COVID-19 CLAIMS FEB 02, 2020 - JUN 11, 2020

<table>
<thead>
<tr>
<th>DIAGNOSIS</th>
<th>TESTED (COVID-19)</th>
<th>EXPOSED</th>
<th>TESTED (COVID-19 COMPLICATIONS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>519,505</td>
<td>2,222,669</td>
<td>2,225,321</td>
<td>71,594</td>
</tr>
</tbody>
</table>

NEW PATIENTS BY FIRST DIAGNOSIS OR TEST DATE

Caveats:

- Due to expected lag in claim submissions to payers, trends for metrics such as patient volumes by all demographic and other attributes are expected to change on a rolling 8 to 10 weeks period.
- PRA is using guidance provided by CDC and CMS, to classify patients as diagnosed, tested, exposed, symptomatic and exposed or tested. Patients could be reported in multiple status categories based on claims captured and mapped to status.
Total Diagnosed Patients Captured During the COVID-19 Pandemic

- PRA is tracking 519,505 COVID-19 patients during the time period Feb 4, 2020 to Jun 11, 2020.
- Amongst the COVID-19 diagnosed patients
  - 62% of the diagnosed patients are 50 years or older
  - Median age is 56
  - 32% of the diagnosed patients had at least one record of inpatient care for their diagnosis.

Caveats: Due to expected lag in claim submission to payers, trends for metrics such as patient volumes by all demographic and other attributes are expected to change on a rolling 8 to 10 weeks period.
Diagnosis Distributions of COVID-19 Diagnosed Patients

Caveats: Due to expected lag in claim submission to payers, trends for metrics such as patient volumes by all demographic and other attributes are expected to change on a rolling 8 to 10 weeks period.

- Hypertension, hyperlipidemia and T2DM were the most common chronic comorbidities observed in patients diagnosed with COVID-19 infections.
- Acute infection symptoms and diagnoses captured within a month prior to or on date of first COVID-19 infection included acute respiratory failure with hypoxia, cough, shortness of breath, acute kidney failure, hypoxemia, and sepsis.

**Acute - Up to 1 month before/after first Cov-19 diagnosis date**

- OTHER VIRAL PNEUMONIA: 28%
- COUGH: 26%
- SHORTNESS OF BREATH: 20%
- ACUTE RESPIRATORY FAILURE WITH HYPOXIA: 19%
- PNEUMONIA, UNSPECIFIED ORGANISM: 15%
- ACUTE KIDNEY FAILURE: 13%
- HYPOXEMIA: 12%
- SEPSIS, UNSPECIFIED ORGANISM: 12%
- ACUTE UPPER RESPIRATORY INFECTION: 9%
- VIRAL INFECTION: 9%
- SEPSIS: 9%
- HYPO-OSMOLALITY AND HYponATREMIA: 9%
- CHEST PAIN: 6%
- UTI: 6%
- HYPOKALEMIA: 5%
- FATIGUE: 5%
- DIARRHEA: 5%

**Acute - Same day as first Cov-19 diagnosis date**

- OTHER VIRAL PNEUMONIA: 27%
- COUGH: 16%
- ACUTE RESPIRATORY FAILURE WITH HYPOXIA: 16%
- SHORTNESS OF BREATH: 14%
- ACUTE KIDNEY FAILURE: 9%
- PNEUMONIA, UNSPECIFIED ORGANISM: 9%
- SEPSIS: 6%
- HYPOXEMIA: 6%

**Chronic - Up to 1 year before Cov-19 diagnosis**

- GENERAL OR SPECIFIED PAIN: 47%
- HYPERTENSION: 41%
- HYPERLIPIDEMIA: 29%
- DIABETES MELLITUS - TYPE II: 25%
- ANEMIA: 18%
- GERD: 16%
- OBESITY: 15%
- VITAMIN DEFICIENCY: 14%
- DEPRESSION: 13%
- ANXIETY: 13%
- OSTEOARTHRITIS: 12%
- HYPOTHYROIDISM: 11%
- CHRONIC KIDNEY DISEASE (CKD): 10%
- CAD: 10%
- HYPERCHOLESTEROLEMIA: 8%
- NICOTINE DEPENDENCE: 8%
- COPD: 8%
- ASTHMA: 7%
- HEART FAILURE: 7%
- SLEEP APNEA: 7%
- DYSPHAGIA: 6%
- DIABETIC NEUROPATHY: 5%
- ATRIAL FIBRILLATION: 5%

Data Period: Feb 4, 2020 to June 11, 2020

PRA US patient longitudinally linked medical and hospital claims data, raw patient volumes
COVID-19 Infection Trends: Changing Demographics & Locations of Care

At the start of the pandemic, higher proportions of diagnosed COVID-19 patients were older, male, and mainly received a diagnosis at an inpatient hospital setting. Recently, COVID-19 patients have been relatively younger, female, and diagnoses have been received across multiple places of service (doctor office being the highest).

Caveats: Due to expected lag in claim submissions to payers, trends for metrics such as patient volumes by all demographic and other attributes are expected to change on a rolling 8 to 10 weeks period.
Overview of Hospital Stay Patterns for Diagnosed COVID-19 Patients (Observed in Real World Data)

Data Period: Feb 4th, 2020 to May 2nd, 2020

<table>
<thead>
<tr>
<th>Patient Category</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitalized Covid-19 patients</td>
<td>68,242</td>
</tr>
<tr>
<td>Hospitalized Covid-19 patients with ventilator usage</td>
<td>9,134</td>
</tr>
<tr>
<td>Hospitalized Covid-19 patients with ventilator usage and death discharge status</td>
<td>4,912</td>
</tr>
</tbody>
</table>

Overall hospitalized patients include patients with or without ventilator use, and with or without discharge status of death.

- 95% of overall Covid-19 diagnosed and hospitalized patients had an inpatient stay of less than 21 days
- Inpatient stay of 21 days or longer was observed more frequently in hospitalized Covid-19 diagnosed patients with ventilator use
Overview of Hospital Stay Patterns for Diagnosed COVID-19 Patients with Ventilator Use

**Data Period:** Feb 4, 2020 to May 2, 2020

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</tr>
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</table>

Amongst hospitalized Covid-19 patients with ventilator use, the majority were male patients.

- **Hospitalized Covid-19 patients:** 46% female, 54% male
- **Hospitalized Covid-19 patients with ventilator usage:** 40% female, 60% male
- **Hospitalized Covid-19 patients with ventilator usage and death discharge status:** 37% female, 63% male

Covid-19 diagnosed patients with ventilator usage that died were about 6 years older than overall hospitalized patients.

- **Hospitalized Covid-19 patients:** Median Age 65, Mean Age 64
- **Hospitalized Covid-19 patients with ventilator usage:** Median Age 67, Mean Age 66
- **Hospitalized Covid-19 patients with ventilator usage and death discharge status:** Median Age 71, Mean Age 70

The length of hospital stay were highest for patients with ventilator use.

- **Hospitalized Covid-19 patients:** Median Stay 6, Mean Stay 7.5
- **Hospitalized Covid-19 patients with ventilator usage:** Median Stay 10, Mean Stay 12
- **Hospitalized Covid-19 patients with ventilator usage and death discharge status:** Median Stay 8, Mean Stay 9.5

- PRA evaluated patients diagnosed with Covid-19 infection and hospitalized across patient groups: overall hospitalized patients, patients with ventilator use, and patients with ventilator use and discharge status of death. Overall hospitalized patients include patients with or without ventilator use, with or without discharge status of death.
Overview of Hospital Stay Patterns for Diagnosed COVID-19 with Death Discharge Status

Data Period: Feb 4, 2020 to May 2, 2020

| Hospitalized Covid-19 patients | N = 68,242 |
| Hospitalized Covid-19 patients with death discharge status | N = 8,316 |

Amongst hospitalized Covid-19 patients that died, majority were male patients

| Hospitalized Covid-19 patients | % Female Patients | % Male Patients |
| Hospitalized Covid-19 patients with death discharge status | 41% | 59% |

Hospitalized Covid-19 patients that died had a higher average age

| Hospitalized Covid-19 patients | Median Age | Mean Age |
| Hospitalized Covid-19 patients with death discharge status | 65 | 64 |

Hospitalized Covid-19 patients that died had a slightly higher mean and median duration of stay

| Hospitalized Covid-19 patients | Median Stay | Mean Stay |
| Hospitalized Covid-19 patients with death discharge status | 75 | 73 |

- PRA evaluated patients diagnosed with Covid-19 infection and hospitalized across patient groups: overall hospitalized patients, patients with ventilator use, and patients with ventilator use and discharge status of death. Overall hospitalized patients include patients with or without ventilator use, with or without discharge status of death.
A UK trial showed that Dexamethasone, an anti-inflammatory steroid treatment, could save hospitalized patients with COVID-19 (the first internationally to do so) [6/16/2020].

- Researchers funded by the U.K. government said Dexamethasone lowered the risk of death in COVID-19 patients on ventilators or oxygen by 35% and 20% respectively.
- In England, the top-line results were enough to convince the National Health Service (NHS) to approve Dexamethasone for use in all COVID-19 patients requiring ventilation.
- The World Health Organization vowed to update its clinical guidance on treating the coronavirus to incorporate the new data on the steroid.

- As of week ending 6/5/2020, Dexamethasone has not shown significant recovery since dropping in prescription volume after peak activity was reached on 3/6/2020.
- Given its groundbreaking status as a proven treatment and endorsement by the NHS and WHO, an uptick in reporting is anticipated beginning with week ending 6/19/2020.

Sources:
March

• **Week Ending March 20th:**
  • With the Trump administration touting antimalarials as “game changers” and news of potential supply shortages, lupus patients scrambled to fill their medications.

• **March 30th:**
  • FDA authorizes anti-malarials for emergency use despite limited evidence as a viable COVID-19 treatment.

April / May

• **April 7th:**
  • The CDC removed Hydroxychloroquine as a recommended therapy for COVID-19.

• **April 22nd:**
  • A U.S. VA study found that severe COVID-19 patients treated with hydroxychloroquine alone or in combination with azithromycin showed “no evidence” of reduced risk of death or mechanical ventilation.

June

• **June 4th:**
  • The New England Journal of Medicine published a study showing the drug did not fend off infection in those exposed to COVID-19.

• **June 15th:**
  • The U.S. FDA revoked emergency use authorization (EUA) for hydroxychloroquine to treat COVID-19, calling it ineffective and risky.
  • The U.S. is reportedly stuck with 66 million doses of hydroxychloroquine in the national stockpile.

• **June 1st:**
  • The WHO halted the trial arm studying hydroxychloroquine.

• **June 15th:**
  • The FDA warned that taking the drug in combination with Gilead’s antiviral Remdesivir to treat the virus could hurt the latter’s performance.

• **June 17th:**
  • Brazilian health officials blasted the FDA’s call to revoke approval for hydroxychloroquine in coronavirus patients, saying the studies cited in the decision “cannot be used as examples for Brazil or the rest of the world.”

Sources:
Hydroxychloroquine takes another hit in failed small-scale COVID-19 study
https://www.fiercepharma.com/pharma/coronavirus-tracker
Cancer Screenings, Diagnoses, & Treatments
COVID-19 diagnosed patients with observed cancer diagnosis within 5 years

Of the 519,505 observed patients with a confirmed diagnosis, 4.4% of patients had a cancer diagnosis within 5 years prior to their Covid-19 diagnosis and 2.6% within 1 year prior.

4.4% of COVID-19 diagnosed patients also had a cancer diagnosis within 5 years prior to COVID-19 diagnosis

N=22,686

Breakdown by Tumor Type

- Prostate Cancer: 22%
- Breast Cancer: 19%
- Non-Hodgkins Lymphoma (NHL): 7%
- Lung Cancer: 6%
- Leukemia: 6%
- Colorectal Cancer (CRC): 6%
- Bladder Cancer: 5%
- Gynecological Cancer: 4%
- Multiple Myeloma: 4%
- Renal Cancer: 4%

2.6% of COVID-19 diagnosed patients also had a cancer diagnosis within 1 year prior to COVID-19 diagnosis

N=13,217

Breakdown by Tumor Type

- Prostate Cancer: 20%
- Breast Cancer: 18%
- Lung Cancer: 8%
- Leukemia: 7%
- Non-Hodgkins Lymphoma (NHL): 7%
- Colorectal Cancer (CRC): 6%
- Multiple Myeloma: 5%
- Bladder Cancer: 5%
- Gynecological Cancer: 4%
- Renal Cancer: 3%
Oncology specific screenings yielded significant declines during the peak COVID-19 pandemic period with signs of bounce back beginning in late April.

**Hematological Malignancy Screening Rates**

- Bone marrow biopsies increased above average in recent weeks as bolus of patients are making up for putting off biopsies due to ‘non-essential’ surgery status during pandemic.

**Solid Tumor Type Screening Rates**

- Breast and Prostate Screening tests were most impacted as patients weighed the risks of COVID-19 exposure vs. performing routine health maintenance.

**Oncology Markets of Interest:**

- **Hematological Malignancies (Blood Cancers):** Chronic & Acute Myeloid Leukemia (CML & AML), Multiple Myeloma (MM), Chronic & Acute Lymphocytic Leukemia (CLL & ALL)
- **Solid Tumors:** Breast, Non-Small Cell Lung Cancer (NSCLC), Pancreatic, Prostate

Index = Current Week vs. 12 Week Rolling
Average (from the same time period in 2019)
Screening Rate = # of tests ordered and includes both surgical and lab procedures.
While diagnostic screenings have started to return to normal, newly diagnosed patient counts are still declining and may take longer to rebound due to lags in labs reporting results or delays in scheduling physician follow-ups.

**Oncology Markets of Interest:**
- **Hematological Malignancies (Blood Cancers):** Chronic & Acute Myeloid Leukemia (CML & AML), Multiple Myeloma (MM), Acute Lymphocytic Leukemia (ALL), Non-Hodgkin Lymphoma (NHL)
- **Solid Tumors:** Breast, Non-Small Cell Lung Cancer (NSCLC), Pancreatic, Prostate

Index = Current Week vs. 12 Week Rolling Average (from the same time period in 2019)
Note: some tumor types have a small diagnosed patient population, which can cause fluctuations in trend reporting

- Pancreatic cancer and AML declined the least, likely due to the severity of the disease.
- Breast cancer has displayed the largest decline in relation to the observation of overall decreases in screening rates.
Oncology patient visits with HCPs during the pandemic varied greatly by tumor type. The severity of disease and likelihood of acute episodes appears to be a major contributing factor.

**Oncology Markets of Interest:**
- **Hematological Malignancies (Blood Cancers):** Chronic & Acute Myeloid Leukemia (CML & AML), Multiple Myeloma (MM), Acute Lymphocytic Leukemia (ALL), Non-Hodgkin Lymphoma (NHL)
- **Solid Tumors:** Breast, Non-Small Cell Lung Cancer (NSCLC), Pancreatic, Prostate

*Office visits excludes telemedicine and home health visits*

**Solid Tumor Office Visits**
- Index = Current Week vs. 12 Week Rolling Average (from the same time period in 2019)
- Cancers prone to acute episodes, such as Pancreatic Cancer, declined the least.
- Breast & Prostate Cancers experienced the greatest decline in office visits.

**Hem. Malignancy Office Visits**
- Cancers prone to acute episodes, such as ALL & AML, declined the least.
Despite lower screening and diagnosis rates during the COVID-19 pandemic, the rate of patients initiating therapy for infused products has remained largely unchanged from 2019 levels.

**New to Brand Patients**

Infused Brands

- **CML** is the only cancer type to show a significant decline in patients initiating therapy with infused products, decreasing 50% from 2019 levels by the end of March, likely to avoid further compromising immune system.
- Since then, the rate of new patient starts on CML infused products has returned to near 2019 levels.
- All other tumor types showed little or no decrease for the new to brand patient starts and, contrary to expectations, have actually increased significantly since mid-April.

**Oncoology Markets of Interest:**

- **Hematological Malignancies (Blood Cancers):** Chronic & Acute Myeloid Leukemia (CML & AML), Multiple Myeloma (MM), Acute & Chronic Lymphocytic Leukemia (ALL & CLL)
- **Solid Tumors:** Breast, Non-Small Cell Lung Cancer (NSCLC), Pancreatic, Prostate

New to Brand Patients: Based on 12-month lookback index vs. 12 week average from the same time in 2019
During height of COVID stay at home orders, immune checkpoint inhibitors (MABs) had the greatest decline in infused solid tumor treatment, likely due to common respiratory-related adverse effects that are associated with these drugs.

Solid Tumor Type: New to Brand Rx Patients
% Change in Top Infused Drug Classes from This Time Last Year

During COVID restrictions, the greatest decline was observed in IMMUNE CHECKPOINT INHIBITORS MAB, with a decline of 43%.

Oncology Markets of Interest:
- Solid Tumors: Breast, Non-Small Cell Lung Cancer (NSCLC), Pancreatic, Prostate

Index = COVID Era 2020 vs. Same Time Period in 2019
Pre-COVID: Jan 01 - Mar 20; Peak COVID: Mar 21 - May 18; Post-COVID Restrictions: May 19 - Jun 12
New to Brand Patients: Based on 12-month lookback
During the peak COVID-19 period, proteasome inhibitors and immune response markets MAB saw the most significant decline. However, Growth Factor Inhibitors MAB have been declining significantly in recent weeks.

### Hematological Malignancies: New to Brand Rx Patients

<table>
<thead>
<tr>
<th>% Change in Top Infused Drug Classes from This Time Last Year</th>
</tr>
</thead>
</table>

#### PROTEASOME INHIBITORS
i.e. bortezomib, carfilzomib

<table>
<thead>
<tr>
<th>Pre-COVID</th>
<th>COVID</th>
<th>Post-COVID Restrictions</th>
</tr>
</thead>
<tbody>
<tr>
<td>-27%</td>
<td>26%</td>
<td></td>
</tr>
</tbody>
</table>

#### IMMUNE RESPONSE MARKETS MAB
i.e. daratumumab, rituximab

<table>
<thead>
<tr>
<th>Pre-COVID</th>
<th>COVID</th>
<th>Post-COVID Restrictions</th>
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#### PYRIMIDINE ANALOGS
i.e. decitabine, cytarbine

<table>
<thead>
<tr>
<th>Pre-COVID</th>
<th>COVID</th>
<th>Post-COVID Restrictions</th>
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<tbody>
<tr>
<td>-13%</td>
<td>34%</td>
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</table>

#### GROWTH FACTOR INHIBITORS MAB
i.e. bevacizumab, trastuzumab

<table>
<thead>
<tr>
<th>Pre-COVID</th>
<th>COVID</th>
<th>Post-COVID Restrictions</th>
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<tr>
<td>-43%</td>
<td>14%</td>
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### Oncology Markets of Interest:
- **Hematological Malignancies (Blood Cancers):** Chronic & Acute Myeloid Leukemia (CML & AML), Multiple Myeloma (MM), Chronic & Acute Lymphocytic Leukemia (CLL & ALL)

Index = COVID Era 2020 vs. Same Time Period in 2019

Pre-COVID: Jan 01 – Mar 20; Peak COVID: Mar 21 – May 18; Post-COVID Restrictions: May 19 – Jun 12

New to Brand Patients: Based on 12-month lookback
Despite the ‘stockpiling’ phenomenon occurring pre-COVID across markets, volume declined in several key brands, such as Keytruda and Afinitor, compared to last year.

Solid Tumor Types: New to Brand Rx Patients
% Change in Top Prescribed Brands from This Time Last Year

Tagrisso
ALECENSA
Keytruda

NSCLC

-100% -50% 0% 50% 100% 150%

Pre-COVID  COVID  Post-COVID Restrictions

Lynparza
Abraxane
Xeloda

PANCREATIC

-100% -50% 0% 50% 100% 150%

Pre-COVID  COVID  Post-COVID Restrictions

Recently launched brand, Lynparza, continued to grow in COVID era

Ibrance
Versenio
Afinitor

BREAST

-100% -50% 0% 50% 100% 150%

Pre-COVID  COVID  Post-COVID Restrictions

Xtandi
Zytiga
Erleada

PROSTATE

-100% -50% 0% 50% 100% 150%

Pre-COVID  COVID  Post-COVID Restrictions

Index = COVID Era 2020 vs. Same Time Period in 2019
Pre-COVID: Jan 01 – Mar 20; COVID: Mar 21 – May 18; Post-COVID Restrictions: May 19 – Jun 12
New to Brand Patients: Based on 12-month lookback
Several key oral brands increased in volume during COVID outbreak compared to same time last year, indicating patients were opting for therapies that would reduce need for office visits.

### Hematological Malignancies: New to Brand Rx Patients

% Change in Top Prescribed Brands from This Time Last Year

#### CML
- BOSULIF
- TASIGNA
- SPRYCEL

Brand share change was the least volatile in CML.

#### MM
- REVLIMID
- NINLARO
- VENCLEXTA

#### AML
- XOSPATA
- RYDAPT
- IDHIFA

#### ALL
- SPRYCEL
- PURIXAN
- ICLUSIG

HCPs have cited switching patients to oral regimens, such as Ninlaro, during pandemic to avoid frequent office visits.

**Oncology Markets of Interest:**
- **Hematological Malignancies (Blood Cancers):** Acute & Chronic Myeloid Leukemia (AML & CML), Multiple Myeloma (MM), Acute Lymphocytic Leukemia (ALL)

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Index = COVID Era 2020 vs. Same Time Period in 2019

Pre-COVID: Jan 01 - Mar 20; COVID: Mar 21 - May 18; Post-COVID Restrictions: May 19 - Jun 12

New to Brand Patients: Based on 12-month lookback
General Market Pulse

- Telemedicine & Care Delivery Trends
- High Value Market + Select Elective Therapy Monitoring
- National / Channel / Pay Type Summaries
Despite a dip in office visits over the week of Memorial Day, trends seem to have stabilized at ~30% below pre-COVID-19 levels. Telemedicine usage continues to decline with week ending 6/5/2020.
• While telemedicine visits remain above 2019 levels, they have started to level off or decline from the COVID-19 peak for most diagnoses.

• One notable exception is disease of the blood and endocrine, nutritional and metabolic disease, which continues to increase.

• Telemedicine use for patients with diseases of the circulatory system has declined 50% from the high in the week of May 1.

Index = Current Week vs. 12 Week Rolling Average (from the same time period in 2019)
Office Visits: Diagnosis

- Office visits have been gradually increasing from their lowest point during the week of March 27.
- The one notable exception is diseases of the respiratory system which bottomed out during the week of April 17 and has improved only slightly since then.

Index = Current Week vs. 12 Week Rolling Average (from the same time period in 2019)

### Office Visits by Diagnosis

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<tbody>
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<td>CERTAIN INFECTIOUS AND PARASITIC DISEASES</td>
<td>1.13</td>
<td>1.11</td>
<td>0.96</td>
<td>0.97</td>
<td>1.03</td>
<td>0.96</td>
<td>0.79</td>
<td>0.73</td>
<td>0.54</td>
<td>0.53</td>
<td>0.51</td>
<td>0.67</td>
<td>0.59</td>
<td>0.63</td>
<td>0.66</td>
<td>0.64</td>
<td>0.79</td>
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<td>DISEASES OF THE BLOOD AND BLOOD-FORMING ORGANS AND CERTAIN DISORDERS INVOLVING THE IMMUNE MECHANISM</td>
<td>1.06</td>
<td>1.08</td>
<td>0.97</td>
<td>1.01</td>
<td>0.99</td>
<td>0.91</td>
<td>0.72</td>
<td>0.47</td>
<td>0.52</td>
<td>0.49</td>
<td>0.49</td>
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<td>0.85</td>
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<td>DISEASES OF THE CIRCULATORY SYSTEM</td>
<td>1.62</td>
<td>1.01</td>
<td>0.94</td>
<td>0.94</td>
<td>0.94</td>
<td>0.88</td>
<td>0.68</td>
<td>0.44</td>
<td>0.47</td>
<td>0.47</td>
<td>0.50</td>
<td>0.59</td>
<td>0.63</td>
<td>0.69</td>
<td>0.76</td>
<td>0.84</td>
<td>0.80</td>
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<td>0.87</td>
<td>0.94</td>
<td>0.96</td>
<td>0.86</td>
<td>0.66</td>
<td>0.44</td>
<td>0.48</td>
<td>0.50</td>
<td>0.55</td>
<td>0.63</td>
<td>0.67</td>
<td>0.69</td>
<td>0.79</td>
<td>0.85</td>
<td>0.88</td>
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<td>0.90</td>
<td>0.72</td>
<td>0.51</td>
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<td>0.59</td>
<td>0.67</td>
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<td>0.97</td>
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<td>0.72</td>
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<td>0.59</td>
<td>0.70</td>
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<td>0.17</td>
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<td>ENDOCRINE, NUTRITIONAL AND METABOLIC DISEASES</td>
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<td>1.02</td>
<td>0.94</td>
<td>0.89</td>
<td>0.85</td>
<td>0.88</td>
<td>0.74</td>
<td>0.44</td>
<td>0.46</td>
<td>0.46</td>
<td>0.52</td>
<td>0.62</td>
<td>0.69</td>
<td>0.78</td>
<td>0.86</td>
<td>0.84</td>
<td>0.83</td>
<td>1.05</td>
</tr>
<tr>
<td>MENTAL AND BEHAVIORAL DISORDERS</td>
<td>1.12</td>
<td>1.30</td>
<td>1.02</td>
<td>0.95</td>
<td>1.03</td>
<td>0.94</td>
<td>0.83</td>
<td>0.79</td>
<td>0.88</td>
<td>0.89</td>
<td>0.95</td>
<td>1.01</td>
<td>1.07</td>
<td>1.04</td>
<td>1.01</td>
<td>1.03</td>
<td>1.19</td>
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<tr>
<td>NEOPLASMS</td>
<td>1.68</td>
<td>1.06</td>
<td>0.95</td>
<td>0.99</td>
<td>0.98</td>
<td>0.93</td>
<td>0.72</td>
<td>0.47</td>
<td>0.52</td>
<td>0.48</td>
<td>0.51</td>
<td>0.60</td>
<td>0.62</td>
<td>0.72</td>
<td>0.64</td>
<td>0.95</td>
<td>0.94</td>
<td>1.15</td>
</tr>
<tr>
<td>PREGNANCY, CHILDBIRTH AND THE Puerperium</td>
<td>1.62</td>
<td>1.34</td>
<td>0.94</td>
<td>0.88</td>
<td>1.05</td>
<td>0.93</td>
<td>0.94</td>
<td>1.03</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>0.98</td>
<td>0.95</td>
<td>1.01</td>
<td>1.01</td>
<td>1.05</td>
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</tr>
</tbody>
</table>
Office Visits: Payment Type

- Use of telemedicine for Medicaid patients initially increased by a factor of 25 and has remained more than 20 time 2019 levels.
- Telemedicine use by Cash patients initially increased dramatically, but has since declined substantially.
- Use of telemedicine by Commercial and Medicare patients increased significantly but has declined in recent weeks, likely because mandates on reimbursement and waiving of fees was only temporary during pandemic.
- Office visits for Cash patients were down over 60% from 2019 level and but have increased slightly in recent weeks. This may be due, at least in part, to increased unemployment.
- Office visit for all other payment types have recovered to near pre-COVID levels from the low point in the week of March 27, with Medicare showing the greatest recovery.

Index = Current Week vs. 12 Week Rolling Average (from the same time period in 2019)
ANTI-VIRALS: Although new & total prescription trends continue to recover with week ending 6/5/2020, they are still reporting -10% and -6% below prior year thresholds respectively.

- Overall antiviral activity continued to report -6% below last year’s thresholds as of week ending 6/5/2020.
CARDIOLOGY: Total prescription activity for Cardiology is officially on par with prior year reporting thresholds as of week ending 6/5/2020. New prescription uptick is still ~1% down compared to 2019.

- New prescription activity peaked with week ending 3/20/2020 following the federal government's declaration of a state of emergency the week of March 14th.
IMMUNOLOGY: Both new & total immunology prescriptions are still reporting -8% and -4% below 2019 volumes respectively as of week ending 6/5/2020.

Data Week 23: June 5th, 2020
**RESPIRATORY THERAPY:** New and total prescription activity for respiratory therapies are still reporting below 2019 thresholds with minimal uptick since week ending 5/1/2020.

Respiratory thresholds have consistently trended -6% below 2019 thresholds since May 1st.

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**DATA WEEK 23: JUNE 5TH, 2020**

**NRx/TRx % CHANGE COMPARED TO PRIOR YEAR**

Symphony Health
A PRA Health Sciences Company

Confidential 35
COVID-19 INSIGHTS

Market Summary: Average Days Supply

• The average days supply for Antivirals increased approximately around the same time states went into lockdown.

Average days supply has remained stable in recent weeks for key markets.
Elective Therapies Continue to Report Below Prior Year Thresholds

- With unemployment continuing to rise into June 2020, elective therapy markets continue to experience slow recovery as patients weigh their options.

- New prescription uptick is still significantly down compared to 2020 for all markets of interest.
NATIONAL TRENDS: Total prescription activity has stabilized at ~6-7% below 2019 thresholds in recent weeks as the COVID-19 pandemic continues into June. New prescription uptick continues to display even slower recovery rates.
NATIONAL TRENDS: Patient reliance on Assistance Programs continues to report at 19% above prior year thresholds.

- PAID = Approved prescriptions taken home by the patient
- REJECTED = Prescription claims rejected by the payer
- ABANDONED = Prescription claims not taken home by the patient
NATIONAL TRENDS: Retail TRx continues to report at -6% below prior year volumes. Mail Order has resumed normal reporting thresholds following the week of the Memorial Day holiday.