



Temporal Trends in Medication Utilization Among Hospitalized COVID-19 Patients in the United States

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Introduction

Real-world data (RWD) allow observation of trends and changes in COVID-19 prescription patterns

Objective

Describe treatment trends for hospitalized COVID-19 patients in the United States

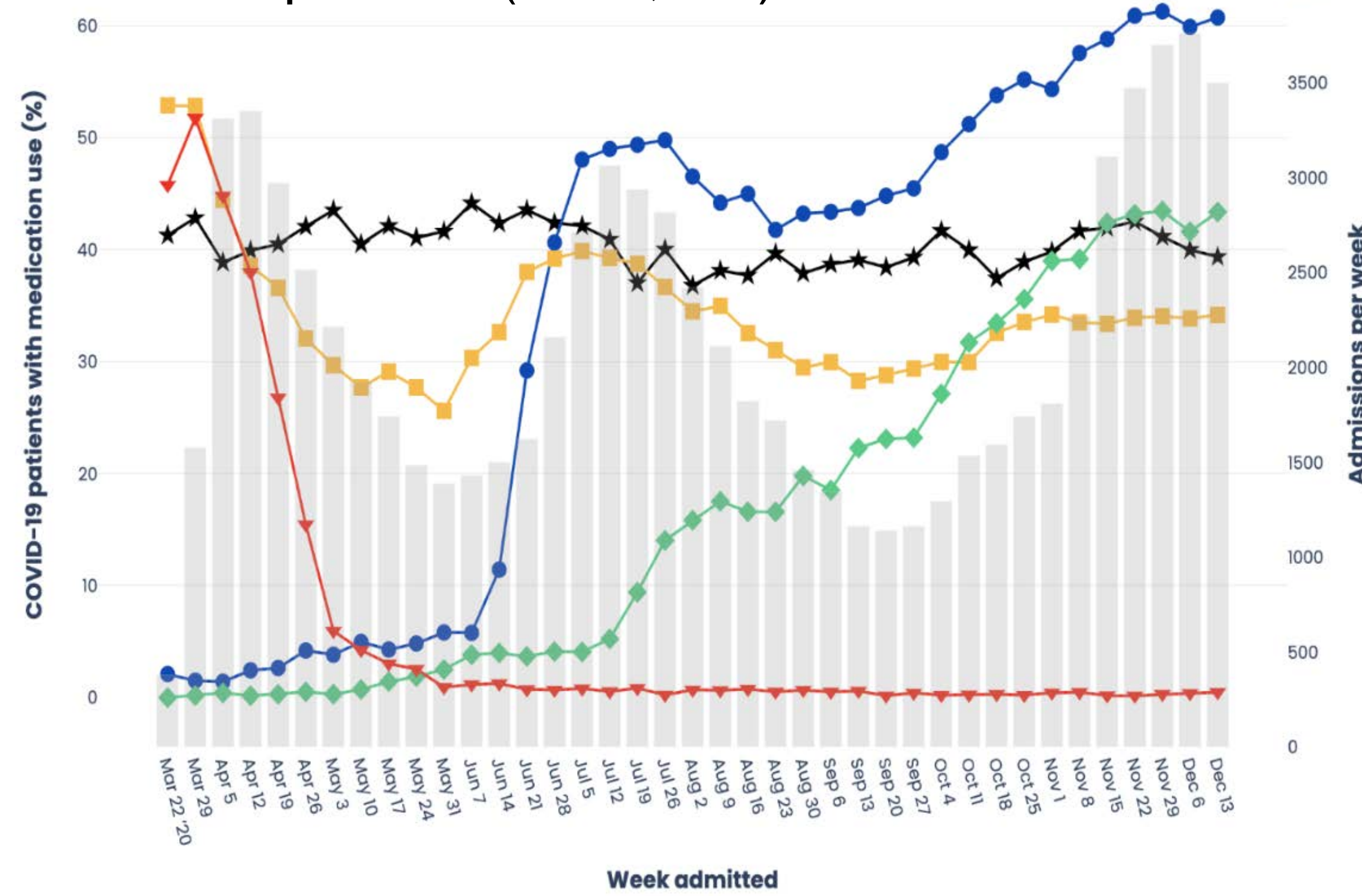
Materials and Methods

- Patients hospitalized with COVID-19 identified using HealthVerity claims and Chargemaster data (March-December 2020). HealthVerity includes de-identified data from major payer types (commercial, Medicaid, and Medicare) from all US states and territories.
- Percent of patients newly treated (90 day new user washout) with therapies of interest during the first week of the hospital stay
- Trends by calendar week of admission, overall and by COVID-19 severity (requirement for invasive mechanical ventilation [IMV] or supplementary oxygen [O2] using a simplified version of the modified WHO score. Admissions without evidence of respiratory support requirements classified as "Admissions without requirement for O2/IMV")
- All analyses conducted using the Aetion Evidence Platform® (2021).

Results

Among the 85,970 patients (87,128 admissions) included, the most commonly used treatments were **azithromycin** (42.2%) and **hydroxychloroquine** (39.2%) early in the pandemic (March/April 2020), and **dexamethasone** (59.6%) and **remdesivir** (42.1%) later on (November/December 2020) [Figure 1].

Figure 1. Medication usage among hospitalized COVID-19 patients (n=85,970)



Medication [average use and trend ↑ ↓ →]

- Acetaminophen 40.4% →
- Dexamethasone 36.6% ↑
- Azithromycin 34.6% →
- Remdesivir 18.2% ↑
- Hydroxychloroquine 6.7% ↓

Notes to the figures

Calendar dates on x-axis are the end dates of each calendar week (e.g., the first week spans March 15-March 22). Trends for late December were excluded from plots as data are incomplete. Acetaminophen trend shown as control, to test for fluctuations driven by data artifacts rather than changes in real-world prescribing patterns. Some patients contribute data to both non-O2/IMV and O2/IMV plots, due to >1 COVID-related admission with different respiratory support requirements.

Conclusions

- Considerable temporal shift in prescribing trends in hospitalized COVID-19 patients, with **remdesivir** and **dexamethasone** surpassing **hydroxychloroquine** use following publication of emerging scientific data and FDA regulatory actions.
- Immediate and substantial increase in **dexamethasone** use followed publication of the RECOVERY trial results.
- Trends may also have been influenced by factors such as physician experience with disease management, access to medications, guidelines, and perceived efficacy/safety relative to other treatment options.

- **Azithromycin** use declined from March (52.8%) to May (25.6%) before stabilizing at ~35% weekly use in August.
- **Hydroxychloroquine** treatment declined sharply after peak use in March (51.8%), with <1% use from July-December [Figure 1]. FDA revoked its Emergency Use Authorization (EUA) on June 15, 2020.¹
- **Dexamethasone** use increased sharply from June (5.8%) to July (48.1%), a trend consistent for both levels of severity [Figures 2-3]. The results of the UK RECOVERY trial results were published in mid-June.²
- **Remdesivir** use increased in early July among patients requiring IMV/O2, with use exceeding 10% by mid-July, while uptake in patients not requiring IMV/O2 lagged, exceeding 10% by October [Figures 2-3]. The EUA was originally issued on May 1, 2020.³

Figure 2. Usage of medications among hospitalized COVID-19 patients during admissions WITHOUT requirement for supplemental oxygen or ventilation (n=31,427)

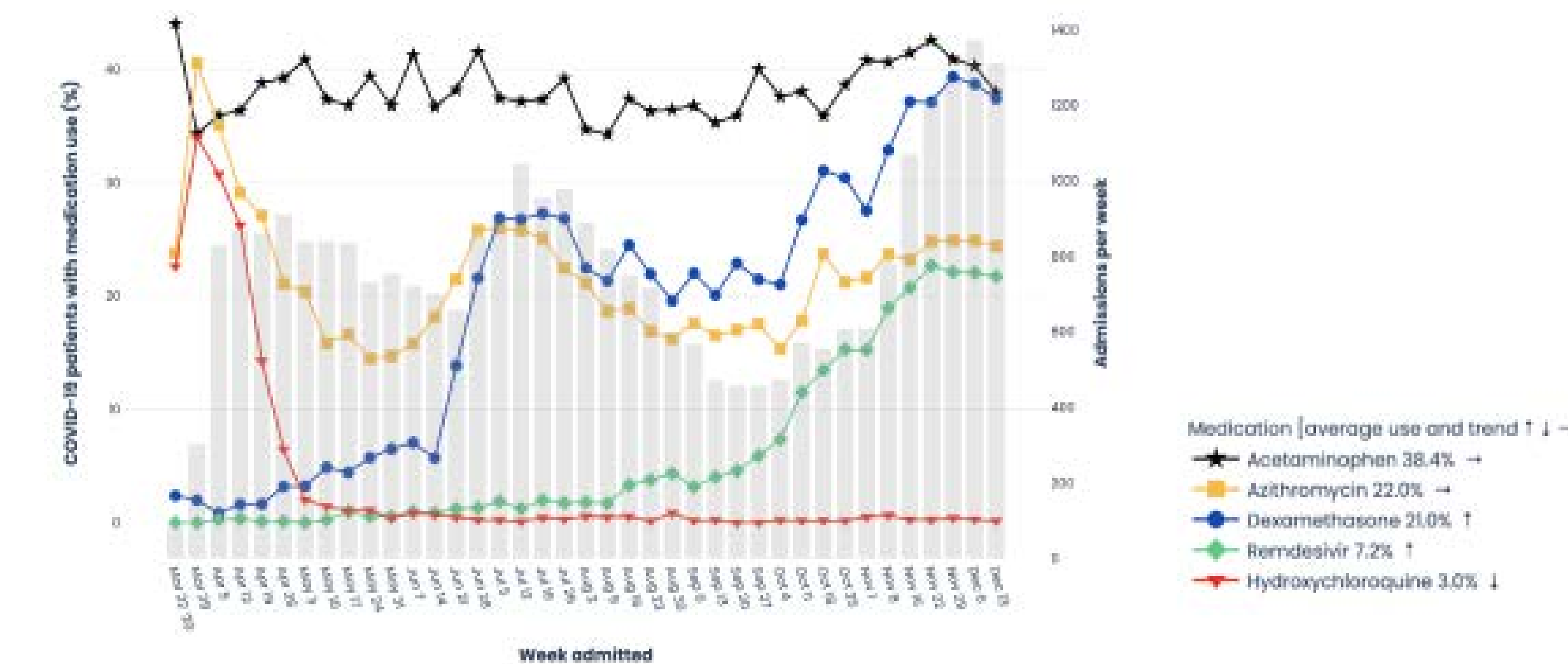
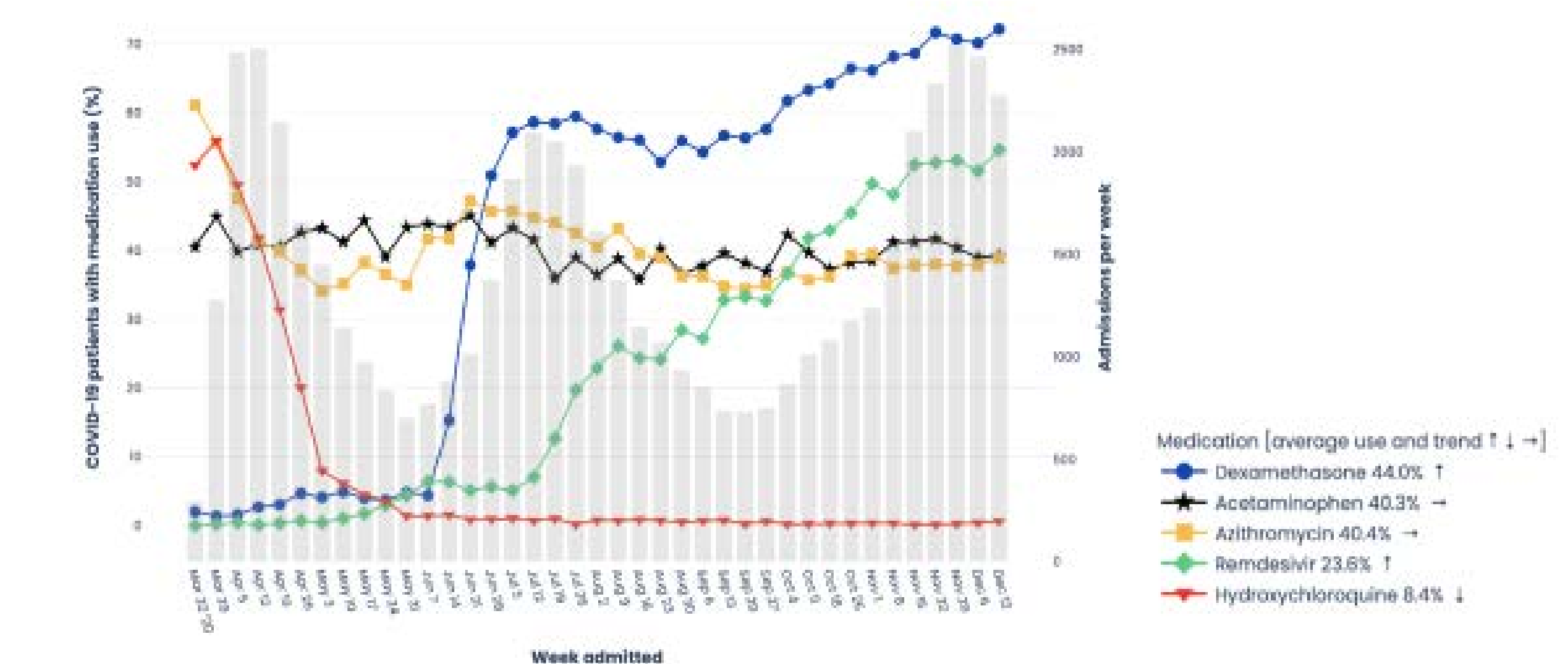


Figure 3. Usage of medications among hospitalized COVID-19 patients during admissions with requirement for supplemental oxygen or ventilation (n=56,859)



References: 1. Revocation of the EUA for Hydroxychloroquine Sulfate and Chloroquine Phosphate Letter. Accessed on April 22, 2021 at <https://www.fda.gov/media/138945/download>; 2. Low-cost dexamethasone reduces death by up to one third in hospitalised patients with severe respiratory complications of COVID-19. Accessed on April 22, 2021 at <https://www.recoverytrial.net/news/low-cost-dexamethasone-reduces-death-by-up-to-one-third-in-hospitalised-patients-with-severe-respiratory-complications-of-covid-19>; 3. Coronavirus (COVID-19) Update: FDA Issues Emergency Use Authorization for Potential COVID-19 Treatment Accessed on April 22, 2021 at <https://www.fda.gov/news-events/press-announcements/coronavirus-covid-19-update-fda-issues-emergency-use-authorization-potential-covid-19-treatment>