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Pre-COVID-19 Retail Use and Expenditures for Drugs That Were Subsequently Used to Treat COVID-19

Yao Ding, PhD, G. Edward Miller, PhD, and Steven C. Hill, PhD

Abstract

The coronavirus pandemic is placing unprecedented strains on our healthcare system, including novel uses of medications to treat people with COVID-19. New uses may cause shortages, or price increases, that affect people who were using these drugs prior to the pandemic. The Medical Expenditure Panel Survey Household Component provides an important national resource for understanding pre-COVID-19 retail and mail order prescription drug use and expenditures that can assist policymakers as they attempt to understand and respond to changing patterns of drug use during the pandemic. We identified a list of COVID-19-relevant drugs from published sources. For each COVID-19-relevant drug, we present estimates of average annual total users, total fills, total expenditures, fills per user, and expenditures per user. We also report the average annual percentage of the population who obtained these drugs overall and by users' sociodemographic and health characteristics, including age, sex, race, Census region, insurance status, poverty status, and health status. In addition, we estimate the percent distribution of the conditions associated with each COVID-19-relevant drug at the drug fill level.

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The estimates in this report are based on the most recent data available at the time the report was written. However, selected elements of Medical Expenditure Panel Survey (MEPS) data may be revised on the basis of additional analyses, which could result in slightly different estimates from those shown here. Please check the MEPS website for the most current file releases.

Contact

Center for Financing, Access and Cost Trends
Agency for Healthcare Research and Quality
5600 Fishers Lane, Mailstop 07W41A
Rockville, MD 20857
<http://www.meps.ahrq.gov>

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Introduction

The coronavirus pandemic is placing unprecedented strains on our healthcare system, including novel uses of medications to treat people with COVID-19. New uses may cause shortages, or price increases, that affect people who were using these drugs prior to the pandemic. The Medical Expenditure Panel Survey Household Component (MEPS-HC) provides an important national resource for understanding pre-COVID-19 retail and mail order prescription drug use and expenditures. Research on pre-COVID-19 patterns of use can assist policymakers in a number of instances, including (a) in the event that COVID-19 results in new, competing demand for existing medications, (b) if new foreign or domestic supply chain disruptions limit access to preferred medicines or their substitutes, or (c) if better clinical data enable policymakers to offer guidance on which immunosuppressant or other drugs pose undue levels of risk of severe COVID-19 illness. In general, the Medical Expenditure Panel Survey (MEPS) can support estimates of outpatient drug utilization and expenditures as long as there is an adequate sample size (that is, sufficient outpatient use of the drug). Our list of COVID-19-relevant drugs was derived from several published sources¹ and was refined through conversations with subject matter experts at the Agency for Healthcare Research and Quality. Some COVID-19-relevant medications were not included in this report for one or more of the following reasons: insufficient sample sizes, the drug is administered in a doctor's office or hospital (and is not used in the outpatient setting), and the drug was not widely used until after 2018.²

The primary data for this Research Findings report are taken from the 2014–2018 MEPS Prescribed Medicines (PMED) files, which have nationally representative information on the outpatient prescribed medications obtained by individuals in the U.S. civilian noninstitutionalized population. The medications in the PMED files include all prescription fills obtained from retail, mail order, and internet pharmacies, but do not include drugs administered by providers in doctors' offices, in hospitals, or in nursing homes. We use a non-public version of the PMED data with unmasked drug names in order to have complete information on seldom-used drugs. For each COVID-19-relevant drug, we present estimates of average annual total users, total fills, total expenditures, fills per user, and expenditures per user. We also report the average annual percentage of the population who obtained these drugs overall and by users' sociodemographic and health characteristics, including

¹ See the reference section for a list of sources.

² For example, remdesivir is a treatment approved for COVID-19 by the U.S. Food and Drug Administration in 2020 that is not included in our analysis, because it is a drug that is administered intravenously.

age, sex, race, Census region, insurance status, poverty status, and health status. A unique feature of these data—compared to claims data and other survey data—is that the MEPS-HC respondents report the condition(s) for which each drug was prescribed. We use this information to present the percent distribution of conditions associated with drugs that were subsequently used to treat COVID-19.

Highlights

- Albuterol (a respiratory agent) and azithromycin (an antibiotic) were the mostly widely obtained COVID-19-relevant drugs in our study, with an average annual total of 17.2 and 14.1 million users, respectively.
- Almost 75 percent of albuterol fills were prescribed for chronic obstructive pulmonary disease (COPD) and asthma. More than half of azithromycin fills were prescribed for acute bronchitis and upper respiratory infections (39 percent) and other respiratory conditions (14.2 percent).
- Among the COVID-19-relevant drugs in our study, fentanyl (a synthetic opioid) and warfarin (a coagulation modifier) have the highest average annual fills per user at 6.0 and 5.7, respectively.
- About half of fentanyl fills were prescribed for osteoarthritis and other non-traumatic joint disorders (30.1 percent) and back problems (19.8 percent), while the majority of warfarin fills were reportedly prescribed for heart disease (42.2 percent) and other circulatory conditions of arteries, veins, and lymphatics (18.3 percent).

Findings

Totals

The left-hand panel of table 1 presents the average annual total number of people with use, total fills, and total expenditures for the COVID-19-relevant drugs included in our study. Albuterol (a respiratory agent) and azithromycin (an antibiotic) were the mostly widely obtained drugs in our study, with an average annual total of 17.2 and 14.1 million users, respectively, while fentanyl (a synthetic opioid) and dexamethasone and hydrocortisone (glucocorticoids) were the most rarely obtained retail drugs, with 0.4, 0.7, and 0.3 million users, respectively. In line with the number of users, albuterol had the highest total number of fills and total expenditures. Dexamethasone and hydrocortisone had the lowest numbers of fills, and these two drugs, along with another glucocorticoid—methylprednisolone—also had the lowest total expenditures. Despite having had the second highest number of users, azithromycin had lower total fills and total expenditures than several other drugs, while prednisone (an alternative glucocorticoid for dexamethasone) had the second highest number of fills, and clopidogrel (an antiplatelet medication) had the second highest total expenditures.

Per capita averages

The right-hand panel of table 1 presents two measures of the intensity of drug use: average annual fills (which includes initial prescription fills and refills) and expenditures per user. Fentanyl and warfarin (an anticoagulant) had the highest average annual fills per user at 6.0 and 5.7, respectively, and fentanyl and hydroxychloroquine (an antimalarial drug) had the highest average annual expenditures per user at \$972 and \$717, respectively. Three drugs—methylprednisolone, azithromycin, and oseltamivir (an antiviral)—all averaged less than 1.5 annual fills per user, and methylprednisolone and prednisone had the lowest average annual expenditures per user at \$29 and \$22, respectively.

Percentages with use by sociodemographic and health characteristics

Tables 2A and 2B present average annual estimates of the percentage of individuals who obtained at least one fill of each drug during the years of 2014–2018 by sociodemographic and health characteristics. This information is useful in gauging relative levels of use for different groups.

For albuterol (table 2A), the most widely obtained drug in this report, the percentage with use was highest among persons who were 65 and older, white or black, women, and individuals whose annual family incomes were below the federal poverty level. In terms of insurance status by age group, among individuals aged below 65, the percentage with use was highest for those with public insurance only. Among individuals aged above 65, the percentage with use was highest for those who were Medicare beneficiaries with an additional source of public insurance. There was also a strong gradient by health status with the percentage using albuterol ranging from 2.6 percent for those in excellent health to 18.2 percent for those in poor health. Patterns of use for azithromycin (table 2A), the second most widely obtained drug in this report, showed some differences. Most notably, use of azithromycin was highest among persons who were aged above 45, white, and in high- and middle-income families. In terms of insurance status by age group, among individuals younger than 65, those with private insurance had the highest prevalence of use, and among Medicare beneficiaries aged above 65, those who also had private insurance had the highest prevalence of use. The gradient by health status was also not as pronounced, with the percentage using azithromycin ranging from 3.0 percent for those in excellent health to 7.1 percent for those in poor health.

For fentanyl (table 2A) and warfarin (table 2B), the two drugs with the highest number of fills per user, the percentage with use was higher among persons who were 65 and older and white, and among those less than age 65, the percentage with use was higher among those with public insurance. Fentanyl use was higher among women, while the percentage using warfarin was higher among men. Both had strong gradients by health status with use of fentanyl ranging from 0.004 percent for those in excellent health to 1.8 percent for those in poor health, and the

percentage with use of warfarin ranging from 0.19 percent for those in excellent health to 4.3 percent for those in poor health.

Conditions

Table 3 presents the percent distribution of conditions the MEPS-HC respondents reported for which each drug was prescribed. Almost 75 percent of albuterol fills were prescribed for COPD and asthma with over 14 percent prescribed for other respiratory conditions and another 3 percent prescribed for acute bronchitis and upper respiratory infections (URIs). Azithromycin was prescribed for acute bronchitis and URIs (39 percent), other respiratory conditions (14.2 percent), influenza and infectious diseases (11.7 percent), and pneumonia (6.2 percent).

About half of fentanyl fills were prescribed for either osteoarthritis and other non-traumatic joint disorders (30.1 percent) or back problems (19.8 percent). The remaining fills were prescribed for nervous system disorders (16.5 percent) and a wide range of other conditions. The majority of warfarin fills were reportedly prescribed for heart disease (42.2 percent) or other circulatory conditions of arteries, veins, and lymphatics (18.3 percent).

Hydroxychloroquine was primarily prescribed for two categories of conditions: systemic lupus erythematosus and connective tissue disorders (43.3 percent) and osteoarthritis and other non-traumatic joint disorders (39.6 percent). For three glucocorticoids—prednisone, methylprednisolone, and hydrocortisone—about 11 to 22 percent of fills were prescribed for systemic lupus erythematosus and connective tissue disorders or osteoarthritis and other non-traumatic joint disorders.

Data Source

This Research Findings report uses pooled data from the 2014 and 2018 MEPS Full-Year Consolidated Data Files (HC-171, HC-181, HC-192, HC-201, and HC-209); non-public versions of the 2014–2018 MEPS Conditions Files (HC-170, HC-180, HC-190, HC-199, and HC-207); and non-public versions of the 2014–2018 MEPS Prescribed Medicines Files (HC-168A, HC-178A, HC-188A, HC-197A, and HC-206A). The pooled 2014–2018 MEPS-HC data has a total of 167,298 person-years of data, and 93,832 person-years of data for individuals with any drug use during the year.

Definitions

Prescription fills

MEPS household respondents report outpatient retail and mail order drugs and the number of times each drug was obtained through prescription fills or refills. We did not standardize drug fills by the quantity dispensed or by the number of days' supply.

Drug expenditures

These are the sum of all out-of-pocket spending and spending by insurers (e.g., private insurance, Medicaid, and Medicare Part D) for each prescription drug fill at the retail point of sale. Expenditures are not adjusted for manufacturer rebates. All expenditures are adjusted to 2018 dollars using the Consumer Price Index for prescription drugs.

Drugs

Drugs are defined at the level of the active ingredient(s) using a non-public, unmasked version of the Multum drug name. Albuterol is defined to include fills for albuterol, levalbuterol, and albuterol-ipratropium. Hydroxychloroquine is defined to include fills of both hydroxychloroquine and chloroquine. We include orally administered fills of the antibiotic azithromycin, but exclude fills obtained for ophthalmic use. Similarly, for the glucocorticoid drugs dexamethasone and hydrocortisone, we include orally administered fills but exclude fills obtained for topical, otic, or ophthalmic use.

Age

Respondents were asked to report the age of each family member as of the date of each interview for each round of data collection. The age variable used to create these estimates is based on the sample person's age as of the end of the year. If data were not collected at the end of the year because the sample person was out of scope (e.g., deceased or institutionalized), then age at the time of the previous round was used.

Race-ethnicity

Classification by race/ethnicity was based on information reported for each family member. First, respondents were asked if the person's main national origin or ancestry was Puerto Rican; Cuban; Mexican, Mexican-American, or Chicano; other Latin American; or other Spanish. All persons whose main national origin or ancestry was reported in one of these Hispanic groups, regardless of racial background, were classified as Hispanic. All other persons were classified according to their reported race. For this analysis, the following classification by race and ethnicity was used: Hispanic, non-Hispanic black, non-Hispanic white, and non-Hispanic other. The "other" category includes American Indian, Alaska Native, Asian or Pacific Islander, other race, and multiple races.

Poverty status

Each sampled person was classified according to the total annual income of his or her family. Possible sources of income included annual earnings from wages, salaries, bonuses, tips, and commissions; business and farm gains and losses; unemployment and workers' compensation; interest and dividends; alimony, child support, and other private cash transfers; private pensions, individual retirement account withdrawals, Social Security, and U.S. Department of Veterans Affairs payments; Supplemental Security Income and cash welfare payments from public assistance and the Temporary Assistance to Needy Families; gains or losses from

estates, trusts, partnerships, S corporations, rent, and royalties; and a small amount of "other" income. Poverty status is the ratio of family income to the corresponding federal poverty thresholds, which control for family size and age of the head of family. Categories are defined as follows:

- *Poor*: Family income below the federal poverty level
- *Low income*: Family income over the poverty level through 200 percent of the poverty level
- *Middle income*: Family income over 200 percent to 400 percent of the poverty level
- *High income*: Family income over 400 percent of the poverty level

Insurance status

Insurance coverage for individuals less than 65 years old

- *Any private*: Individuals less than 65 years old were classified as having any private health insurance coverage if they had private insurance that provided coverage for hospital and physician care (including Medigap coverage and TRICARE) at some point during the year.
- *Public only*: Individuals less than 65 years old were considered to have public-only health insurance coverage if they were not covered by private insurance or TRICARE and they were covered by Medicaid, Medicare, or other public hospital and physician coverage at some point during the year.
- *Uninsured*: Individuals less than 65 years old who did not have health insurance coverage for the entire calendar year were classified as uninsured. The uninsured were defined as people not covered by Medicaid, Medicare, TRICARE, other public hospital/physician programs, private hospital/physician insurance (including Medigap coverage). People covered only by non-comprehensive state-specific programs (e.g., Maryland Kidney Disease Program) or private single-service plans such as coverage for dental or vision care only, or coverage for accidents or specific diseases, were considered uninsured.

Insurance coverage for people 65 and older

- *Medicare and private*: Elderly adults were classified as having Medicare and any private health insurance coverage if they were covered by Medicare and had private insurance that provided coverage for hospital and physician care (including Medigap coverage and TRICARE) at some point during the year.
- *Medicare and public only*: Elderly adults were classified as having Medicare and public-only insurance if they were covered by Medicare, they were not covered by private insurance or TRICARE at any point during the year, and

they were covered by Medicaid or other public hospital and physician coverage at some point during the year.

- *Medicare only:* Elderly adults were classified as having Medicare only if they were covered by Medicare at some point during the year, but they were not covered by private insurance, TRICARE, Medicaid, or other public hospital and physician coverage at any point during the year.
- *No Medicare:* Elderly adults who reported no Medicare coverage during the year comprised a small percentage of all elderly persons (0.27 percent) and were excluded from the analysis.

Perceived health status

The MEPS household respondent was asked to rate the physical health status of each person in the family at the time of the interview according to the following categories: excellent, very good, good, fair, and poor. For persons with missing health status in a round, the response for health status at the previous round was used, if available. A small percentage of persons (0.18 percent) had a missing response for perceived physical health status.

Census region

The Census region variable is based on the location of the household at the end of the year. If missing, the most recent location available was used.

- *Northeast:* Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania
- *Midwest:* Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas
- *South:* Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma, and Texas
- *West:* Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon, California, Alaska, and Hawaii

Conditions

Household respondents report the condition(s) for which each drug was prescribed. Conditions are recorded as verbatim text and are then coded into International Classification of Diseases, Ninth Revision (ICD-9) codes and Clinical Classification Software (CCS) codes (in the 2014–2015 data) and into International Classification of Diseases, Tenth Revision (ICD-10) and CCS-Refined (CCSR) codes (in the 2016–2018 data). We report conditions that have been further aggregated from the CCS and CCSR codes to better harmonize the ICD-9 and ICD-10 coding systems. When a respondent reported a drug was prescribed for multiple conditions, one condition was selected hierarchically in the order in which the conditions are listed in table 3. Take albuterol for example: (1) asthma and COPD: albuterol fills that were prescribed for asthma or COPD; (2) other respiratory conditions: albuterol fills that

were prescribed for other respiratory conditions, but not for COPD or asthma; (3) acute bronchitis and URIs: albuterol fills that were prescribed for acute bronchitis and URIs, but not for COPD, asthma, or other respiratory conditions; (4) other category: albuterol fills that were prescribed for conditions other than (1) to (3) described above. For more information about condition codes, see https://github.com/HHS-AHRQ/MEPS/tree/master/Quick_Reference_Guides#condition-codes.

About MEPS-HC

The Medical Expenditure Panel Survey-Household Component (MEPS-HC) collects nationally representative data on healthcare use, expenditures, sources of payment, and insurance coverage for the U.S. civilian noninstitutionalized population. The MEPS-HC is cosponsored by the Agency for Healthcare Research and Quality (AHRQ) and the National Center for Health Statistics (NCHS). More information about MEPS-HC can be found on the MEPS website at <http://www.meps.ahrq.gov>.

References

For a detailed description of the MEPS-HC survey design, sample design, and methods used to minimize sources of nonsampling error, see the following publications:

Cohen, J. *Design and Methods of the Medical Expenditure Panel Survey Household Component*. MEPS Methodology Report No. 1. AHCPR Pub. No. 97-0026. July 1997. Agency for Health Care Policy and Research (AHCPR), Rockville, MD. https://meps.ahrq.gov/data_files/publications/mr1/mr1.pdf

Cohen, S. *Sample Design of the 1996 Medical Expenditure Panel Survey Household Component*. MEPS Methodology Report No. 2. AHCPR Pub. No. 97-0027. July 1997. AHCPR, Rockville, MD. https://meps.ahrq.gov/data_files/publications/mr2/mr2.pdf

Information on COVID-19-relevant medications was obtained from the following publications:

Centers for Disease Control and Prevention. *Information for Clinicians on Investigational Therapeutics for Patients with COVID-19*. Updated December 4, 2020. <https://www.cdc.gov/coronavirus/2019-ncov/hcp/therapeutic-options.html>

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<https://www.nytimes.com/2020/04/02/health/coronavirus-drug-shortages.html>

Table 1: Use of and Expenditures for COVID-19-Relevant Prescription Medicines, 2014–2018

Generic Drug Name	Drug Class	Average Annual Totals (1,000s)						Average Fills and Expenditure per User			
		Total People with Use	SE	Total Fills	SE	Total Expenditures	SE	Average Fills	SE	Average Expenditures	SE
Albuterol^	Respiratory Agent	17,207	442	56,835	1,891	4,525,098	182,163	3.30	0.06	262.99	8.03
Azithromycin	Antibiotic	14,110	409	18,688	600	489,791	33,275	1.32	0.02	34.71	2.08
Clopidogrel	Antiplatelet	4,119	160	21,078	971	1,454,434	105,757	5.12	0.11	353.11	21.36
Dexamethasone	Glucocorticoid	683	57	1,461	204	34,601	11,874*	2.14	0.22	50.67	16.52*
Fentanyl	Opioid	378	42	2,260	310	367,324	61,431	5.98	0.40	971.66	119.37
Hydrocortisone	Glucocorticoid	315	37	1,263	230	80,240	23,309	4.01	0.50	254.81	65.64
Hydroxychloroquine^	Antimalarial	1,112	79	5,523	469	797,549	88,410	4.96	0.24	716.94	61.59
Methylprednisolone	Glucocorticoid	3,156	126	4,466	241	90,315	5,008	1.42	0.06	28.62	1.24
Oseltamivir	Antiviral	3,044	148	3,788	221	636,952	40,041	1.24	0.04	209.28	8.39
Prednisone	Glucocorticoid	10,902	316	24,480	949	239,977	10,570	2.25	0.06	22.01	0.80
Warfarin	Anticoagulant	3,262	153	18,572	1,070	536,600	45,766	5.69	0.15	164.52	10.90

Source: Medical Expenditure Panel Survey, Household Component, 2014–2018.

Notes: Average annual estimates. Expenditures are adjusted to 2018 dollars using the Consumer Price Index for prescription drugs. SE = standard error.

^ Albuterol includes fills for albuterol, levalbuterol, and albuterol-ipratropium; hydroxychloroquine includes fills of both hydroxychloroquine and chloroquine.

* Indicates that the relative standard error > 30%.

Table 2A: Percentages with Use of COVID-19-Relevant Prescription Medicines by Sociodemographic and Health Characteristics, 2014–2018

Subpopulation	Albuterol [^]		Azithromycin		Clopidogrel		Dexamethasone		Fentanyl	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
ALL	5.33	0.11	4.37	0.09	1.28	0.05	0.21	0.02	0.12	0.01
Age										
0 to 18	5.85	0.19	3.38	0.15	0.001	0.001*	0.17	0.03	0.002	0.002*
19 to 44	3.24	0.12	3.93	0.14	0.06	0.01	0.12	0.02	0.05	0.01
45 to 64	6.00	0.21	5.31	0.17	1.41	0.09	0.25	0.04	0.18	0.03
65 and Older	7.91	0.27	5.29	0.23	5.59	0.22	0.41	0.06	0.33	0.06
Race-Ethnicity										
Hispanic	4.28	0.16	2.66	0.12	0.51	0.05	0.09	0.02	0.03	0.01*
White	5.66	0.14	5.49	0.13	1.60	0.07	0.28	0.03	0.16	0.02
Black	6.06	0.24	2.48	0.12	1.08	0.10	0.11	0.03	0.07	0.02
Asian and Other	4.30	0.28	2.94	0.19	0.94	0.11	0.11	0.04	0.04	0.02*
Sex										
Male	4.57	0.12	3.56	0.12	1.60	0.07	0.21	0.03	0.07	0.01
Female	6.05	0.16	5.15	0.11	0.97	0.05	0.21	0.02	0.16	0.02
Poverty Status										
Poor	7.45	0.24	3.40	0.15	1.42	0.11	0.14	0.03	0.18	0.04
Low Income	6.22	0.22	3.43	0.15	1.70	0.10	0.17	0.03	0.20	0.03
Middle Income	4.79	0.15	4.36	0.13	1.18	0.08	0.22	0.03	0.11	0.03
High Income	4.64	0.14	5.11	0.16	1.11	0.07	0.25	0.03	0.06	0.01
Insurance Status										
< 65 Years Old										
Any Private	4.31	0.11	4.78	0.12	0.41	0.03	0.21	0.02	0.06	0.01
Public Only	7.90	0.24	3.31	0.14	0.65	0.07	0.11	0.02	0.17	0.03
Uninsured	1.75	0.16	1.86	0.14	0.42	0.09	0.04	0.02*	0.02	0.01*
65 and Older ¹										
Medicare Only	7.15	0.43	4.66	0.30	5.96	0.42	0.39	0.10	0.36	0.10
Medicare and Private	7.39	0.37	6.03	0.33	5.09	0.31	0.44	0.07	0.31	0.08

Subpopulation	Albuterol [^]		Azithromycin		Clopidogrel		Dexamethasone		Fentanyl	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Medicare and Public	13.00	0.84	4.17	0.47	7.48	0.62	0.42	0.16*	0.38	0.18*
Health Status²										
Excellent	2.64	0.10	3.02	0.11	0.21	0.03	0.13	0.02	0.004	0.003*
Very Good	4.22	0.14	4.46	0.14	0.79	0.06	0.15	0.02	0.02	0.01*
Good	6.69	0.19	5.07	0.18	1.70	0.09	0.19	0.03	0.08	0.02
Fair	12.42	0.43	6.46	0.34	4.11	0.26	0.46	0.08	0.55	0.08
Poor	18.22	0.92	7.06	0.58	7.79	0.55	1.42	0.29	1.76	0.28
Region										
Northeast	5.73	0.27	4.25	0.18	1.17	0.09	0.17	0.04	0.14	0.03
Midwest	6.08	0.22	5.03	0.21	1.57	0.13	0.27	0.04	0.14	0.03
South	5.12	0.17	4.57	0.15	1.47	0.08	0.18	0.02	0.12	0.02
West	4.72	0.23	3.56	0.17	0.78	0.07	0.25	0.04	0.08	0.02

Source: Medical Expenditure Panel Survey, Household Component, 2014–2018.

Notes: Average annual estimates. SE = standard error.

[^]Albuterol includes fills for albuterol, levalbuterol, and albuterol-ipratropium.

* Indicates that the relative standard error > 30%.

¹ A small percentage (0.27%) of elderly adults who reported no Medicare coverage were not included.

² A small percentage (0.18%) of individuals with missing health status were not included.

Table 2B: Percentages with Use of COVID-19-Relevant Prescription Medicines by Sociodemographic and Health Characteristics, 2014–2018

Subpopulation	Hydrocortisone		Hydroxychloroquine [^]		Methylprednisolone		Oseltamivir		Prednisone		Warfarin	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
ALL	0.10	0.01	0.34	0.02	0.98	0.03	0.94	0.04	3.38	0.08	1.01	0.05
Age												
0 to 18	0.05	0.01	0.02	0.01*	0.14	0.03	1.65	0.11	0.95	0.07	0.005	0.003*
19 to 44	0.07	0.02	0.25	0.03	0.91	0.06	0.74	0.05	2.78	0.12	0.14	0.02
45 to 64	0.15	0.03	0.54	0.05	1.53	0.09	0.81	0.07	4.84	0.16	0.89	0.07
65 and Older	0.14	0.03	0.71	0.09	1.49	0.10	0.53	0.07	5.97	0.23	4.60	0.24
Race-Ethnicity												
Hispanic	0.07	0.02	0.22	0.03	0.48	0.05	0.93	0.11	1.66	0.09	0.32	0.04
White	0.11	0.02	0.39	0.04	1.28	0.05	1.03	0.06	4.21	0.11	1.38	0.07
Black	0.08	0.03	0.38	0.05	0.66	0.07	0.72	0.07	2.68	0.15	0.70	0.07
Asian and Other	0.08	0.04*	0.24	0.06	0.44	0.08	0.72	0.10	2.24	0.17	0.36	0.06
Sex												
Male	0.09	0.01	0.13	0.02	0.74	0.05	0.87	0.05	2.66	0.09	1.15	0.07
Female	0.10	0.02	0.55	0.04	1.20	0.05	1.01	0.05	4.06	0.12	0.87	0.06
Poverty Status												
Poor	0.07	0.02	0.30	0.05	0.49	0.06	0.76	0.08	3.04	0.15	0.79	0.07
Low Income	0.10	0.03	0.31	0.05	0.79	0.06	0.75	0.07	3.23	0.15	1.38	0.11
Middle Income	0.08	0.02	0.36	0.04	0.92	0.06	0.97	0.09	3.12	0.12	1.04	0.07
High Income	0.12	0.02	0.36	0.04	1.26	0.07	1.07	0.08	3.74	0.13	0.90	0.07
Insurance Status												
< 65 Years Old												
Any Private	0.10	0.02	0.30	0.03	1.06	0.05	1.13	0.06	3.14	0.10	0.29	0.03
Public Only	0.10	0.02	0.30	0.05	0.48	0.05	0.95	0.09	2.66	0.14	0.53	0.06
Uninsured	0.003	0.003*	0.06	0.02*	0.45	0.09	0.34	0.09	1.51	0.16	0.22	0.05
65 and Older ¹												
Medicare Only	0.14	0.04	0.78	0.17	1.46	0.16	0.46	0.09	5.70	0.37	4.80	0.40
Medicare and Private	0.14	0.04	0.73	0.12	1.61	0.15	0.60	0.10	6.28	0.32	4.72	0.35

Subpopulation	Hydrocortisone		Hydroxychloroquine [^]		Methylprednisolone		Oseltamivir		Prednisone		Warfarin	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Medicare and Public	0.11	0.06*	0.45	0.14	1.14	0.26	0.45	0.15*	5.75	0.56	4.10	0.47
Health Status²												
Excellent	0.06	0.02	0.09	0.02	0.48	0.04	0.99	0.08	1.45	0.08	0.19	0.03
Very Good	0.06	0.02	0.19	0.03	1.02	0.06	1.03	0.07	2.83	0.11	0.72	0.06
Good	0.12	0.02	0.46	0.05	1.19	0.07	0.82	0.06	4.17	0.15	1.43	0.09
Fair	0.27	0.06	1.26	0.14	1.91	0.17	0.95	0.11	8.44	0.37	3.16	0.23
Poor	0.32	0.10	1.60	0.27	1.86	0.29	0.38	0.09	11.14	0.63	4.26	0.44
Region												
Northeast	0.12	0.04	0.32	0.06	0.85	0.08	0.80	0.10	3.63	0.21	0.98	0.12
Midwest	0.04	0.01	0.35	0.05	1.07	0.08	0.90	0.09	3.80	0.15	1.38	0.10
South	0.09	0.02	0.39	0.04	1.27	0.07	1.32	0.08	3.64	0.14	0.96	0.09
West	0.15	0.02	0.28	0.05	0.52	0.05	0.49	0.07	2.41	0.13	0.79	0.06

Source: Medical Expenditure Panel Survey, Household Component, 2014–2018.

Notes: Average annual estimates. SE = standard error.

[^] Hydroxychloroquine includes fills of both hydroxychloroquine and chloroquine.

* indicates that the relative standard error > 30%.

¹ A small percentage (0.27%) of elderly adults who reported no Medicare coverage were not included.

² A small percentage (0.18%) of individuals with missing health status were not included.

Table 3: Health Conditions Associated with Outpatient Use of COVID-19-Relevant Prescription Medicines, 2014–2018

Drug	Condition Category	Average Annual Totals (1,000s)		Average Annual Percent Distribution of Fills	
		Fills	SE	Percent	SE
Albuterol [^]	Asthma and COPD ¹	42,569	1,569	74.90	0.49
	Other respiratory conditions ²	8,200	296	14.43	0.34
	Acute bronchitis and URIs ³	1,682	107	2.96	0.20
	Other	4,385	301	7.71	0.52
Azithromycin	Acute bronchitis and URIs ³	7,253	323	38.81	1.05
	Other respiratory conditions ²	2,654	147	14.20	0.64
	Influenza and infectious diseases	2,182	142	11.68	0.67
	Pneumonia	1,161	104	6.21	0.55
	Other	54,389	234	29.10	0.93
Clopidogrel	Heart disease	9,469	549	44.92	1.69
	Cerebrovascular disease	2,105	244	9.99	1.09
	Hypertension	1,827	184	8.67	0.81
	Other circulatory conditions of arteries, veins, and lymphatics ⁵	1,252	230	5.94	1.03
	Hyperlipidemia	1,235	152	5.86	0.71
	Other	5,190	318	24.62	1.36
Dexamethasone	Cancer	306	19	20.97	1.63
	Acute bronchitis and URIs ³	153	19	10.48	1.30
	Other endocrine, nutritional, and immune disorders ⁴	119	41*	8.12	2.60*
	Other	883	59	60.43	2.76
Fentanyl	Osteoarthritis and other non-traumatic joint disorders	681	115	30.13	4.15
	Back problems	448	100	19.81	3.93
	Nervous system disorders	372	40	16.46	1.71
	Other	759	76	33.59	3.01
Hydrocortisone	Other endocrine, nutritional, and immune disorders ⁴	774	154	61.32	5.61
	Systemic lupus erythematosus and connective tissue disorders	69	14	5.50	1.23

Drug	Condition Category	Average Annual Totals (1,000s)		Average Annual Percent Distribution of Fills	
		Fills	SE	Percent	SE
	Osteoarthritis and other non-traumatic joint disorders	63	8	5.00	0.88
	Other	356	39	28.18	4.31
Hydroxychloroquine^	Systemic lupus erythematosus and connective tissue disorders	2,392	248	43.32	3.08
	Osteoarthritis and other non-traumatic joint disorders	2,188	219	39.61	3.42
	Other	943	100	17.07	1.59
Methylprednisolone	Acute bronchitis and URIs ³	765	78	17.14	1.58
	Other respiratory conditions ²	539	64	12.06	1.32
	Osteoarthritis and other non-traumatic joint disorders	541	61	12.12	1.40
	Systemic lupus erythematosus and connective tissue disorders	181	43	4.06	0.99
	Other	2,439	186	54.62	2.35
Oseltamivir	Influenza	3,108	172	82.05	1.47
	Acute bronchitis and URIs ³	118	21	3.11	0.54
	Other	562	55	14.84	1.33
Prednisone	Other respiratory conditions ²	4,684	315	19.13	1.12
	Osteoarthritis and other non-traumatic joint disorders	3,834	292	15.66	1.06
	Acute bronchitis and URIs ³	2,278	161	9.31	0.65
	Systemic lupus erythematosus and connective tissue disorders	1,472	177	6.01	0.70
	Asthma and COPD ¹	1,083	128	4.42	0.43
	Other	11,128	636	45.46	1.65
Warfarin	Heart disease	7,845	571	42.24	1.86
	Other circulatory conditions of arteries, veins, and lymphatics ⁵	3,398	348	18.30	1.72
	Cerebrovascular disease	945	161	5.09	0.84
	Hypertension	724	140	3.90	0.71
	Other	5,660	500	29.92	2.14

Source: Medical Expenditure Panel Survey, Household Component, 2014–2018.

Notes: Average annual estimates. SE = standard error.

^ Albuterol includes fills for albuterol, levalbuterol, and albuterol-ipratropium; hydroxychloroquine includes fills of both hydroxychloroquine and chloroquine.

* indicates that the relative standard error > 30%.

¹ COPD: chronic obstructive pulmonary disease.

² *Other respiratory conditions* include pleurisy, pneumothorax, pulmonary collapse, respiratory failure, respiratory insufficiency, respiratory signs and symptoms, lung disease due to external agents, and other lower and upper respiratory diseases.

³ URI: upper respiratory infection.

⁴ *Other endocrine, nutritional, and immune disorders* include endocrine, nutritional, and metabolic diseases; nutritional deficiencies; malnutrition; obesity; fluid and electrolyte disorders; cystic fibrosis; pituitary disorders; gout and crystal arthropathies; autoinflammatory syndromes; and other specified and unspecified endocrine, nutritional, and metabolic disorders.

⁵ *Other circulatory conditions of arteries, veins, and lymphatics* include diseases of the circulatory system; peripheral and visceral vascular disease; arterial dissections; aortic, peripheral, and visceral artery aneurysms; aortic and peripheral arterial embolism or thrombosis; hypotension; acute and chronic phlebitis, thrombophlebitis and thromboembolism; varicose veins of lower extremity; post-thrombotic syndrome and venous insufficiency or venous hypertension; vasculitis; hemorrhoids; other specified diseases of veins and lymphatics; and other specified and unspecified circulatory disease.