(eg, mask quality, unobserved characteristics of wearer). Shifts worn, hours worn, and donnings/doffings are likely correlated: because of the low number of failures, multivariable adjustment was not performed. This study was designed to detect mask failure based on qualitative fit testing. Failed fit tests may not necessarily result in increased rates of infection.

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Admissions to Veterans Affairs Hospitals for Emergency Conditions During the COVID-19 Pandemic

Anecdotal reports suggest hospitalizations, including for emergency conditions and elective procedures, have declined during the coronavirus disease 2019 (COVID-19) pandemic.[1] Reduced hospitalizations for conditions requiring timely treatment may have significant public health consequences.

The Department of Veterans Affairs (VA) is the largest health system in the US. The VA has ensured continuously available treatment for emergency conditions and canceled elective procedures during the COVID-19 pandemic.[2] This study evaluated changes in the number of admissions to VA hospitals overall and for 6 common emergency conditions during the pandemic.

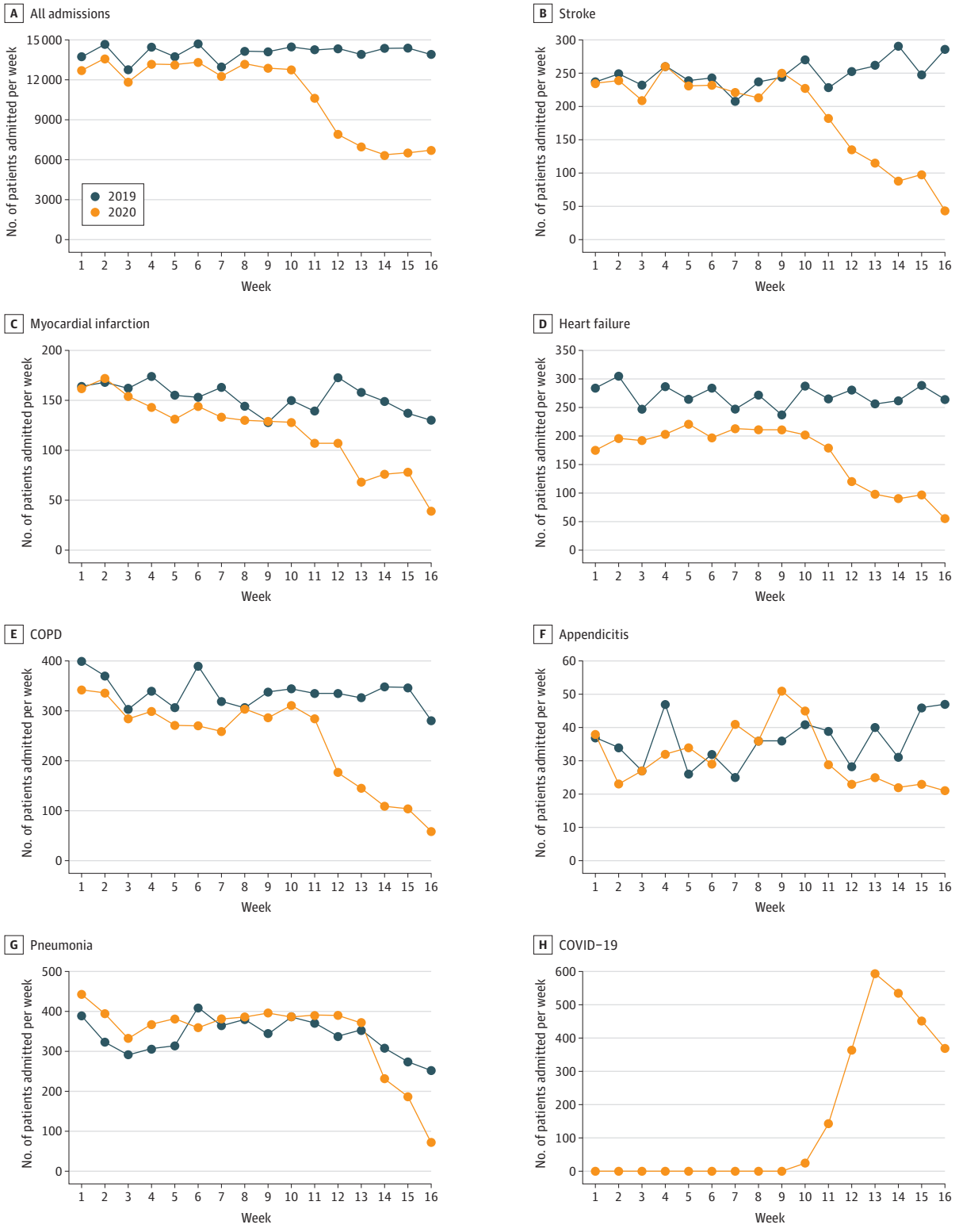
Methods | We analyzed data from the VA's Corporate Data Warehouse, a national repository of electronic health records from visits to any VA facility.[3] We describe trends in VA hospitalizations overall, for 6 common emergency conditions, and for COVID-19 during the first 16 weeks of 2019 and 2020 among a previously established cohort of adults enrolled in VA care between 2008 and 2018. We compared the number and demographic characteristics of patients hospitalized during weeks 5 to 10 (January 29 to March 10) and weeks 11 to 16 (March 11 to April 21) of 2020 overall, among demographic subgroups, and by *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision* (*ICD-10*) principal diagnosis codes I60-I69 for stroke, I21-I22 for myocardial infarction, I50 for heart failure, J44 for chronic obstructive pulmonary disease (COPD), K35-K37 for appendicitis, and J10-J18 for pneumonia. Incidence rate ratios (IRRs) comparing daily hospitalization counts during weeks 11 to 16 of 2020 vs January 1, 2019, through week 10 of 2020 were estimated using Poisson regressions that adjusted for seasonal variation and secular trends with week-of-year and year fixed effects.

Analyses were performed using Stata version 15 (StataCorp). The institutional review board at VA New York Harbor Healthcare System approved this study and waived patient informed consent.

Results | The number of patients in our cohort admitted to VA inpatient facilities decreased from 77 624 in weeks 5 to 10 of 2020 to 45 155 in weeks 11 to 16, a reduction of 41.9% (IRR, 0.57; 95% CI, 0.51-0.64) (**Figure** and **Table**). The mean age was 66.6 years (SD, 14.0 years), with 93.5% men, 69.0% white, and 24.6% black. The characteristics and case severity of patients admitted during weeks 5 to 10 vs weeks 11 to 16 of 2020 were similar (Table).

The number of patients admitted in weeks 5 to 10 vs weeks 11 to 16 of 2020 with a principal diagnosis of stroke decreased from 1375 to 661 (−51.9%; IRR, 0.44; 95% CI, 0.33-0.59), for myocardial infarction from 795 to 475 (−40.3%; IRR, 0.59; 95% CI, 0.50-0.69), for COPD from 1701 to 877 (−48.4%; IRR, 0.51; 95% CI, 0.38-0.68), for heart failure from 1255 to 639 (−49.1%; IRR, 0.53; 95% CI, 0.42-0.67), and for appendicitis from 236 to 134 (−56.7%; IRR, 0.56; 95% CI, 0.45-0.70). In contrast, the number of patients admitted overall and for each condition did not decline during the same period of 2019. For pneumonia, admissions decreased during weeks 11 to 16 by −13.7% in 2019 and by −28.3% in 2020 (IRR, 0.79; 95% CI, 0.65-0.95); when excluding patients who tested positive for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), pneumonia admissions decreased by −45.7% in 2020 (IRR, 0.61; 95% CI, 0.49-0.77).

Figure. Trends in the Number of Patients Admitted to Veterans Affairs Inpatient Facilities in 2019 and 2020



We used the *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision* (*ICD-10*) codes for the principal diagnosis. See the Methods section for codes. The 2482 admitted patients who tested positive for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2; 99% determined by nasopharyngeal swabs) were considered to have coronavirus disease 2019 (COVID-19); their most common principal diagnoses included 614 for emergency use (*ICD-10* U07.1, activated at the VA for COVID-19 on April 1, 2020); 474, *ICD-10* code not listed; 344, viral pneumonia, not elsewhere classified (*ICD-10* J12); 237, other sepsis (*ICD-10* A41); and 168, respiratory failure, not elsewhere classified (*ICD-10* J96).

Table. Characteristics of Patients Admitted to Veterans Affairs Inpatient Facilities During Weeks 5 Through 10 vs Weeks 11 Through 16 of 2020

Characteristics	No. (%) of patients		Difference in No. of patients admitted (% change)	Incidence rate ratio (95% CI)[a]
	January 29-March 10, weeks 5-10	March 11-April 21, weeks 11-16		
Overall	77 624	45 115	−32 509 (−41.9)	0.57 (0.51-0.64)
Sex				
Women	4897 (6.3)	2769 (6.1)	−2128 (−43.5)	0.57 (0.50-0.65)
Men	72 757 (93.7)	42 346 (93.9)	−30 411 (−41.8)	0.57 (0.51-0.64)
Age, y				
18-39	4837 (6.2)	2833 (6.3)	−2004 (−41.4)	0.60 (0.52-0.68)
40-59	14 603 (18.8)	8724 (19.3)	−5879 (−40.3)	0.60 (0.53-0.69)
60-79	47 124 (60.7)	27 209 (60.3)	−19 915 (−42.3)	0.56 (0.51-0.64)
≥80	11 060 (14.3)	6349 (14.1)	−4711 (−42.6)	0.56 (0.51-0.62)
Race/ethnicity[b]				
American Indian/ Alaska Native	562 (0.7)	391 (0.9)	−171 (−30.4)	0.67 (0.58-0.77)
Asian	390 (0.5)	244 (0.5)	−146 (−37.4)	0.73 (0.63-0.85)
Black or African American	18 631 (24.0)	11 594 (25.7)	−7037 (−37.8)	0.62 (0.56-0.69)
Native Hawaiian or other Pacific Islander	606 (0.8)	365 (0.8)	−241 (−39.8)	0.57 (0.47-0.69)
White	54 193 (69.8)	30 617 (67.8)	−23 576 (−43.5)	0.56 (0.49-0.63)
Other	3242 (4.2)	1904 (4.2)	−1338 (−41.3)	0.57 (0.51-0.65)
Hispanic/Latino	5004 (6.5)	2963 (6.6)	−2041 (−40.8)	0.57 (0.51-0.67)
Married	32 240 (41.5)	17 624 (39.1)	−14 616 (−45.3)	0.54 (0.47-0.61)
Hospitalizations				
Stroke	1375 (1.7)	661 (1.5)	−714 (−51.9)	0.44 (0.33-0.59)
Myocardial infarction	795 (1.0)	475 (1.1)	−320 (−40.3)	0.59 (0.50-0.69)
Heart failure	1255 (1.6)	639 (1.2)	−616 (−49.1)	0.53 (0.42-0.67)
COPD	1701 (2.2)	877 (1.9)	−824 (−48.4)	0.51 (0.38-0.68)
Appendicitis	236 (0.3)	134 (0.3)	−102 (−56.7)	0.56 (0.45-0.70)
Pneumonia				
With SARS-CoV-2	2290 (3.0)	1641 (3.6)	−649 (−28.3)	0.79 (0.65-0.95)
Without SARS-CoV-2	2289 (2.9)	1244 (2.8)	−1045 (−45.7)	0.61 (0.49-0.77)
Case severity[c]				
In-hospital death	149 (2.1)	90 (2.2)		
Length of stay, mean (SD), d[d]	5.0 (2.8)	5.0 (2.8)		
MS-DRG weight, mean (SD)[e]	1.6 (1.1)	1.6 (1.2)		
No. of comorbidities, mean (SD)	28.7 (12.4)	28.9 (12.8)		
≥1 Procedure	1323 (17.4)	654 (16.4)		

Abbreviations: COPD, chronic obstructive pulmonary disease; MS-DRG, medical severity diagnosis related group; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

[a] Estimated using a Poisson regression model with the dependent variable the daily count of hospitalizations and independent variable exposure to the timing of the pandemic (a binary variable equal to 1 during weeks 11-16 of 2020 and equal to 0 otherwise), with adjustment for seasonality using a week-of-year fixed effect and for secular trends using a year fixed effect. Huber-White standard errors were clustered at the week-year level.

[b] Self-reported and defined by participants; data were used to compare demographic characteristics across exposure groups and over time. Other includes more than 1 race, unknown by patient, declined to answer, or missing.

[c] Case severity measures were calculated for stroke, myocardial infarction, heart failure, COPD, appendicitis, and pneumonia excluding admissions of patients testing positive for SARS-CoV-2 (398 for principal diagnosis of pneumonia; 20 for COPD; 15 for heart failure; 9 for stroke; 6 for myocardial infarction; and 1 for appendicitis).

[d] The mean length of stay is the mean length of stay for admissions in each MS-DRG. Admissions are categorized on the principal diagnosis, up to 25 additional diagnoses, up to 25 procedures performed during the stay, and in some cases age, sex, and discharge status of the patient.

[e] MS-DRG weights represent the average resources required to care for cases in that particular MS-DRG, relative to the average resources used to treat cases in all MS-DRGs.

Among patients admitted during weeks 11 to 16 of 2020, 2458 tested positive for SARS-CoV-2 vs 26 during weeks 5 to 10.

Discussion | Between March 11 and April 21, 2020, 42% fewer patients were admitted to VA inpatient facilities compared with the preceding 6 weeks, including for conditions generally requiring emergency treatment. The percentage decrease in admissions for conditions generally requiring emergency treatment was greater or similar in magnitude to the decrease in admissions overall and is unlikely to be attributable to declines in elective surgeries or disease incidence related to reduced stress or lower exposure to other pathogens or pollution. Rather, many patients may be avoiding hospitals to minimize risk of SARS-CoV-2 infection.

Limitations of this study include the VA population, which may not be generalizable, and use of a cohort first enrolling in VA care prior to 2019. However, comparatively few patients first enrolled later. Furthermore, the clinical consequences of decreased hospitalizations remain unknown and warrant longer-term studies using out-of-hospital mortality data. Nevertheless, the reduction in admissions observed should raise serious concerns about the well-being and health outcomes of patients who are not receiving inpatient care for conditions that require emergency treatment.

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Concept and design: All authors.
Acquisition, analysis, or interpretation of data: Baum.
Drafting of the manuscript: Baum.
Critical revision of the manuscript for important intellectual content: All authors.
Statistical analysis: Baum.
Administrative, technical, or material support: Schwartz.
Supervision: Schwartz.

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Divergence in Timing and Magnitude of Testosterone Levels Between Male and Female Youths

Data on testosterone levels in children and adolescents segregated by sex are scarce and based on convenience samples or assays with limited sensitivity and accuracy. Such data would be useful in evaluating children with pubertal or androgen disorders and dichotomizing male and female youths participating in sport. Thus, we analyzed the timing of the onset and magnitude of the divergence in testosterone in youths aged 6 to 20 years by sex using a highly accurate assay.

Methods | Testosterone concentrations from separate cohorts of male and female youths collected during 2 periods of the National Health and Nutrition Examination Survey (NHANES; 2013-2014 and 2015-2016) were pooled into 1 data set for analyses. Briefly, NHANES uses a multistage probability design to randomly sample US residents from all 50 states. The overall response rate in the 2 data collection cycles was 70.4% in youths, and 80% of those responders elected to participate in the collection of biospecimens for testosterone analyses. All procedures accessed public, deidentified information and did not require ethical review as determined by the Mayo Clinic Institutional Review Board.

As described previously,[1] testosterone was quantified via isotope dilution liquid chromatography tandem mass spectrometry, which demonstrates a broad analytical measurement range (0.75-1400 ng/dL), excellent precision across a wide range (<3% coefficient of variation) and high accuracy (−0.7% mean bias for a 2-year period), confirmed using reference materials from the National Institute for Standards and Technology.

Full factorial analysis of variance was used to examine the change in testosterone concentration from ages 6 to 20 years by sex, focusing on the age of divergence of testosterone and the overlap at the extremes. Two-tailed post hoc analyses (Scheffe test) were used to test for differences between pairs with Bonferroni-corrected P values ($P < .025$). For all other analyses, significance was determined at $P < .05$. All analyses were performed with R software, version 3.4.2 (R Foundation).

Results | The data set included 4495 youth samples—2293 male and 2202 female—with diverse racial representation including Hispanic (36%), white (26.6%), black (23.0%), Asian (8.8%), and multiracial (6.1%). No statistical differences of race (effects or interactions) were noted.

The median testosterone concentration increased for female youths from age 6 to 20 years from 2.4 ng/dL to 29.5 ng/dL ($P < .001$), with a plateau beginning at age 14 years (**Table**). Over the same age range, the median testosterone concentration increased considerably more for male youths compared with female youths (age × sex; $P < .001$), from 1.9 ng/dL at age 6 years to 516 ng/dL at age 20 years ($P < .001$), with a plateau beginning at age 17 years. Testosterone concentration was not different between the sexes from age 6 to 10 years; however, male youths had greater testosterone concentrations than female youths from age 11 to 20 years (**Figure**).

Among youths aged 12 years or older, there was no overlap of the interquartile range of testosterone between male and female youths. After cessation of the age-related increase in testosterone for female youths (at 14 years), there was an intersection of testosterone concentration distributions between the lowest (first) percentile of male youths and the uppermost (99th) percentile of female youths (≥100 ng/dL), which includes 8 of 949 samples (<1%) for female youths.

Discussion | These data demonstrated the following: (1) the sex-related divergence of testosterone initiated at 11 years of age on average; (2) clear and distinct distributions of serum testosterone between the sexes after 11 years of age; and (3) the distribution of testosterone within male youths was much larger in magnitude and spread than the distribution of testosterone within female youths. At the population level, serum testosterone created a clear dichotomy between male and female youths, and the presented age-adjusted distributions may be useful in evaluation of pubertal and androgenic disorders in youths.

A testosterone value of 100 ng/dL distinctly separated the sexes with minimal overlap, which may have broad implications for athletic competition, as serum testosterone has been demonstrated to be strongly associated with sex differences in athletic performance.[2,3] Potential testosterone thresholds for eligibility in sports may need to be adjusted based on further information on outliers and direction of error accepted.