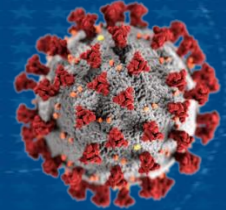


## Fact Sheet Supplement:

Trends in Cancer Detection and Management in the  
VA Health Care System during the COVID-19 Pandemic



Cooperative Studies Program Epidemiology Analytics Resource (CSPEAR)  
Cooperative Studies Program  
Office of Research and Development  
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*Cooperative Studies Program*

## Contributions

This fact sheet is the result of a joint effort of CSPEAR and VA clinical partners.

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## About CSPEAR

CSPEAR translates VA electronic health record data into brief, scientifically-reliable reports on the health status of Veterans. CSPEAR is a collaborative effort of the Cooperative Studies Program’s national network of Epidemiology Centers.

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## 1 Introduction

The coronavirus disease 2019 (COVID-19) pandemic caused widespread disruptions to cancer care. During the first wave of the pandemic in the spring of 2020, surgeries, screenings, and other in-office cancer services were deferred to mitigate the spread of disease and to reduce burden on health care systems. Cancer care delivery continues to be challenged by COVID-19 outbreaks, institutional protective measures, staffing reductions, and patient fears of becoming infected. These disruptions to care may affect cancer patients for many years.

The purpose of this fact sheet is to characterize changes in cancer detection and management during the COVID-19 pandemic among Veterans who use Veterans Affairs (VA) health care, focusing on the top 3 cancers diagnosed in VA: colorectal, lung, and prostate cancer.[1]

## 2 Methods

### 2.1 Data Source and Population

Data were pulled from multiple domains within the VA Corporate Data Warehouse (CDW), a national database that integrates Veterans Health Administration (VHA) clinical and administrative information. CDW houses patient-level data for the full range of services received by VHA health care users in the United States, Puerto Rico, Virgin Islands, American Samoa, Philippines, and Guam. CDW data are routinely extracted from VA medical centers and other data sources and consolidated into a single data model.[2]

The population includes men and women meeting the following criteria:

1. Age  $\geq 18$  and  $\leq 110$  years
2. Active users of VHA care, defined as having at least 1 inpatient visit or outpatient visit (any kind) at a VHA facility recorded in past 2 years
3. Alive at the beginning of the month of observation
4. Confirmed as Veterans (consistent Veteran statuses across and within the patient records; assigned to 1 of 8 [VA priority groups](#))
5. Records have consistent and complete numeric identifiers
6. Not labeled as a test patient

### 2.2 Outcomes

#### 2.2.1 Cancer Screening

Cancer screenings were identified using Current Procedural Terminology (CPT) and Healthcare Common Procedure Coding System (HCPCS) procedure codes (Supplementary File S2). Screening strategies recommended by VHA are reported, including:

- Colorectal cancer: colonoscopy, flexible sigmoidoscopy, fecal immunochemical testing (FIT), and guaiac-based fecal occult blood test (FOBT) [3]
- Lung cancer: low-dose computed tomography (LDCT) [4, 5]
- Prostate cancer: blood test for prostate specific antigen (PSA) [6]

Annual cross-sections were used to identify Veterans screened at any point during a given month, excluding those with a known history of the cancer being screened. For Veterans with multiple screenings in a single year, only the first observed screening was counted.

### **2.2.2 Newly-Identified Cancer Diagnoses**

Colorectal, lung, and prostate cancer diagnoses were identified using 9th and 10th revisions of International Classification of Diseases (ICD-9 and ICD-10) diagnostic codes (Supplementary File S2). Newly-identified cancer diagnoses include patients meeting the following criteria:

- a) A cancer diagnosis recorded between January 1, 2018 and August 31, 2021, evidenced by:
  - $\geq 2$  outpatient diagnosis codes with a second code within 180 days of the initial diagnosis – or –
  - $\geq 1$  inpatient diagnosis code
- b) No personal history of cancer code for the specified cancer recorded prior to date of diagnosis
- c) No diagnosis code for the specified cancer recorded prior to January 1, 2018

The date of diagnosis was determined using the first qualifying diagnostic code between January 1, 2018 and August 31, 2021 (i.e., either first inpatient diagnosis code or first outpatient diagnosis code).

### **2.2.3 Cancer Treatment Initiation**

Cancer treatments were identified among patients with a newly-identified cancer diagnosis using relevant ICD-10, CPT, and HCPCS procedure codes (Supplementary File S2). Treatment types examined include cancer-related surgery, chemotherapy, radiation therapy, and immunotherapy, including immune checkpoint inhibitors (ICI). Hormone therapy was assessed for prostate cancer patients only. Procedures recorded during a visit with no associated cancer diagnostic code were excluded.

We estimated the number and percentage of Veterans initiating cancer treatment within 180 days of the date of diagnosis. In addition, median number of days from diagnosis to first-line treatment initiation was estimated among those Veterans who initiated treatment within 180 days. Individuals who died within 180 days of diagnosis were excluded from the treatment analyses.

### **2.2.4 All-Cause Mortality**

All-cause mortality within 180 days of a new cancer diagnosis was assessed using the DeathDateTime variable from the SPatient table in CDW.

## **2.3 Analyses**

Cancer screening, diagnosis, and treatment outcomes were grouped by month and line graphs are used to show trends from January 1, 2018 to August 31, 2021. The figures mark three milestones within the time period: (1) first Veteran VA patient confirmed to have COVID-19 on March 2, 2020 [7]; (2) more than 1 million Veterans received at least 1 dose of a COVID-19 vaccination by February 1, 2021 [8]; and (3) Delta is found to be the predominant variant of SARS-CoV-2 in VA in July 2021 [9].

Outcomes observed in the months from January 1, 2020 to August 31, 2021 were compared with baseline by calculating the percentage change =  $(N_{\text{month}} - N_{\text{baseline}}) / N_{\text{baseline}}$ .  $N_{\text{baseline}}$  is defined as the mean number of outcomes in the equivalent month in 2018 and 2019.

In selected analyses, outcomes were also compared across five 3-month periods occurring pre- and post-pandemic:

- a) Start of the pandemic: March 1, 2020 – May 31, 2020
- b) 3 months preceding the start of the pandemic: December 1, 2019 – February 29, 2020
- c) 3 months subsequent to the start of the pandemic: June 1, 2020 – August 31, 2020
- d) Same 3 months in 2019: March 1, 2019 – May 31, 2019
- e) Same 3 months in 2021: March 1, 2021 – May 31, 2021

### 3 Notes

This work was conducted under the auspices of CSPEAR's operational access to VA data. This material is the result of work supported with resources and the use of facilities at the VA CSP Epidemiology Centers in Durham, NC and Seattle, WA. The contents do not represent the views of the US Department of Veterans Affairs or the US Government.

### 4 Results

#### 4.1 Demographics

**Table 1.** Age distribution of Veteran VHA users, Jan 2018 – Aug 2021

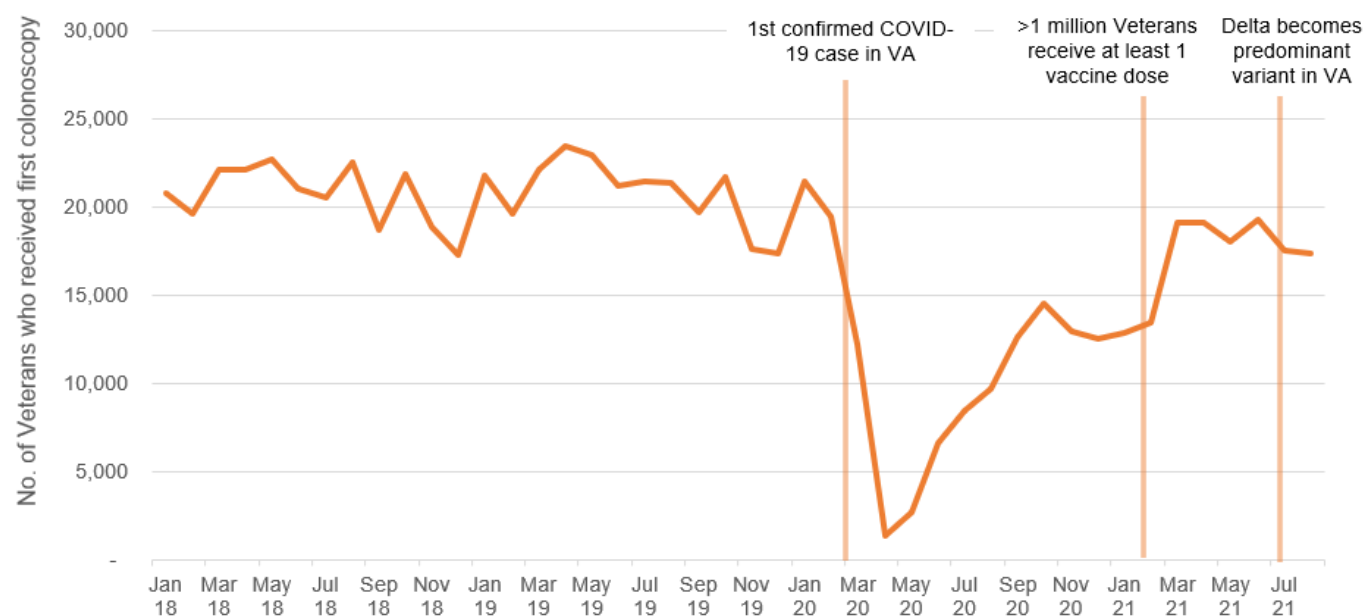
Characteristic	1/1/2018 – 12/31/2018	1/1/2019 – 12/31/2019	1/1/2020 – 12/31/2020	1/1/2021 – 8/31/2021
Age (years), median (IQR)	65 (49, 73)	66 (50, 74)	67 (50, 75)	67 (51, 75)
Age (years), n (%)				
18-34	743,816 (10.2%)	699,364 (9.3%)	646,404 (8.6%)	585,523 (7.8%)
35-49	1,124,010 (15.4%)	1,148,926 (15.3%)	1,154,739 (15.3%)	1,167,824 (15.5%)
50-64	1,698,363 (23.2%)	1,699,770 (22.7%)	1,681,068 (22.2%)	1,664,792 (22.1%)
65-74	2,136,173 (29.2%)	2,142,735 (28.6%)	2,098,611 (27.8%)	1,964,321 (26.1%)
75-84	986,278 (13.5%)	1,089,270 (14.5%)	1,202,901 (15.9%)	1,372,763 (18.2%)
85+	623,811 (8.5%)	711,410 (9.5%)	774,285 (10.2%)	769,160 (10.2%)

## 4.2 Cancer Screening

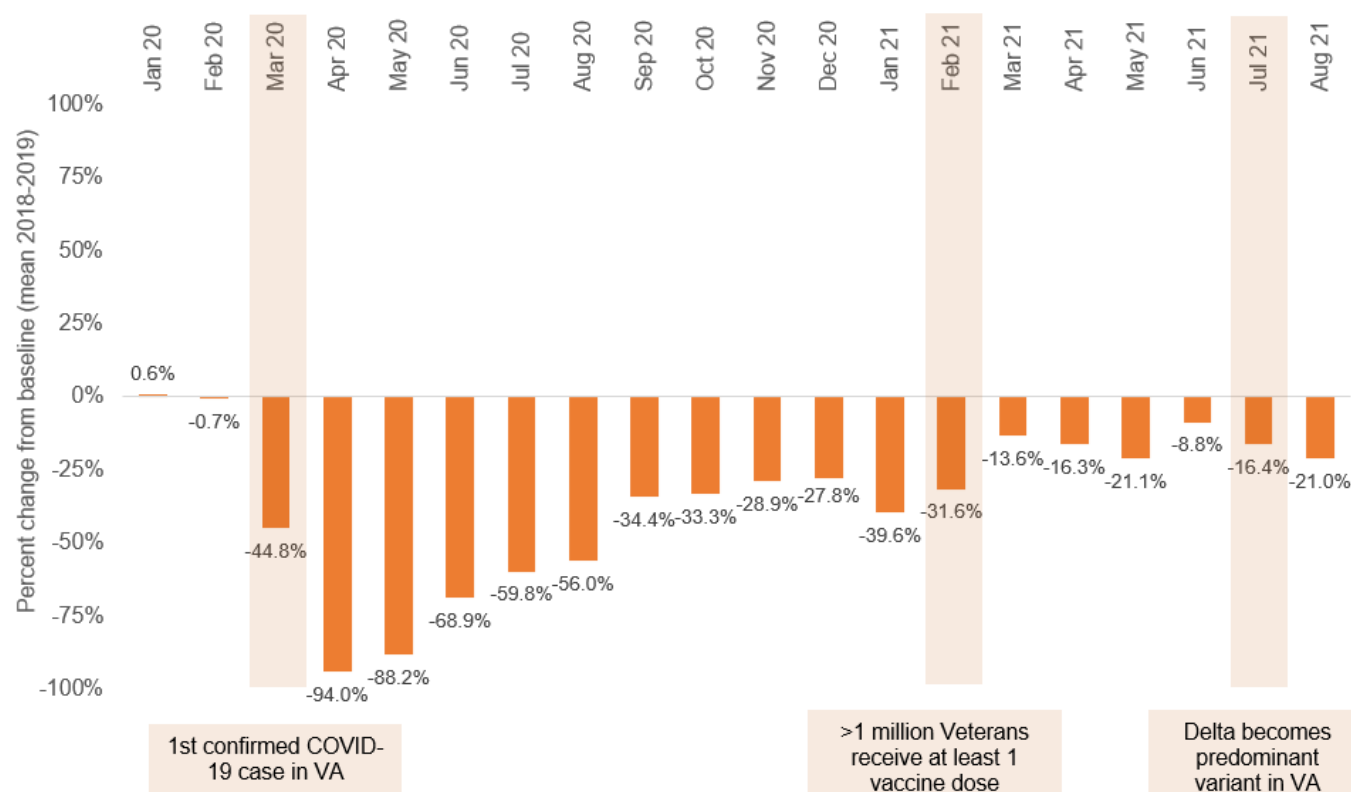
### 4.2.1 Colorectal Cancer Screening

#### 4.2.1.1 Colonoscopy

**Figure 1.** First observed colonoscopy per Veteran per year, Jan 2018 – Aug 2021

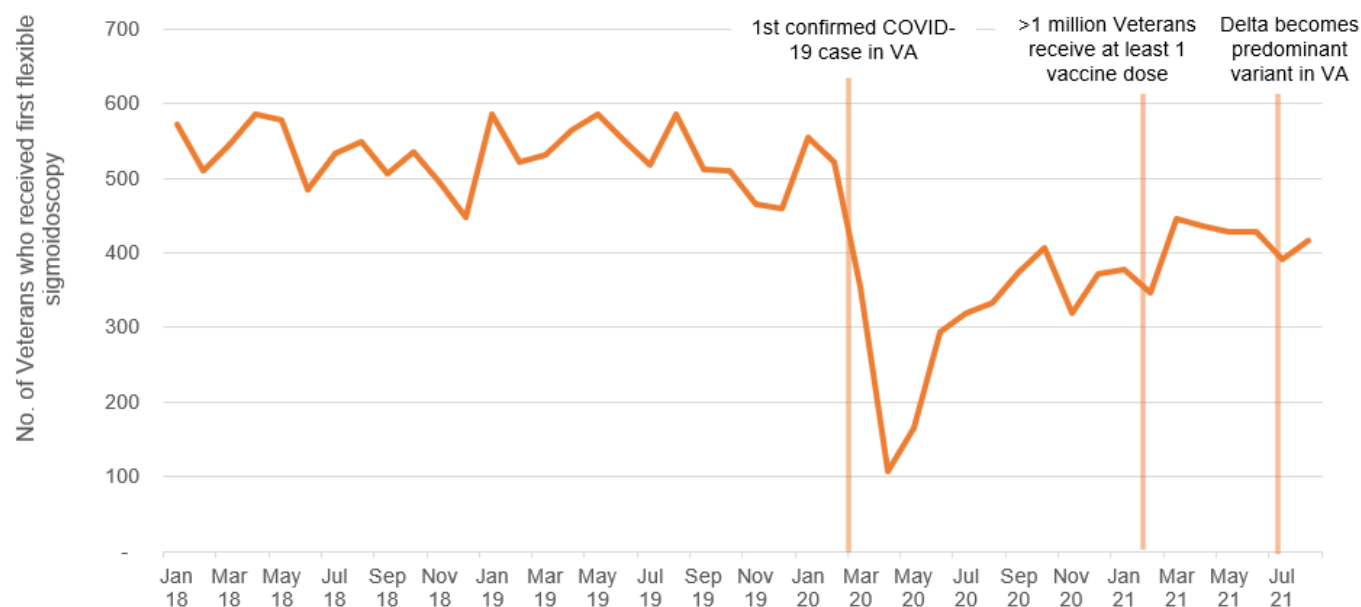


**Figure 2.** Percentage change in the number of Veterans receiving colonoscopies compared with baseline (mean number of screenings in equivalent months in 2018-2019)

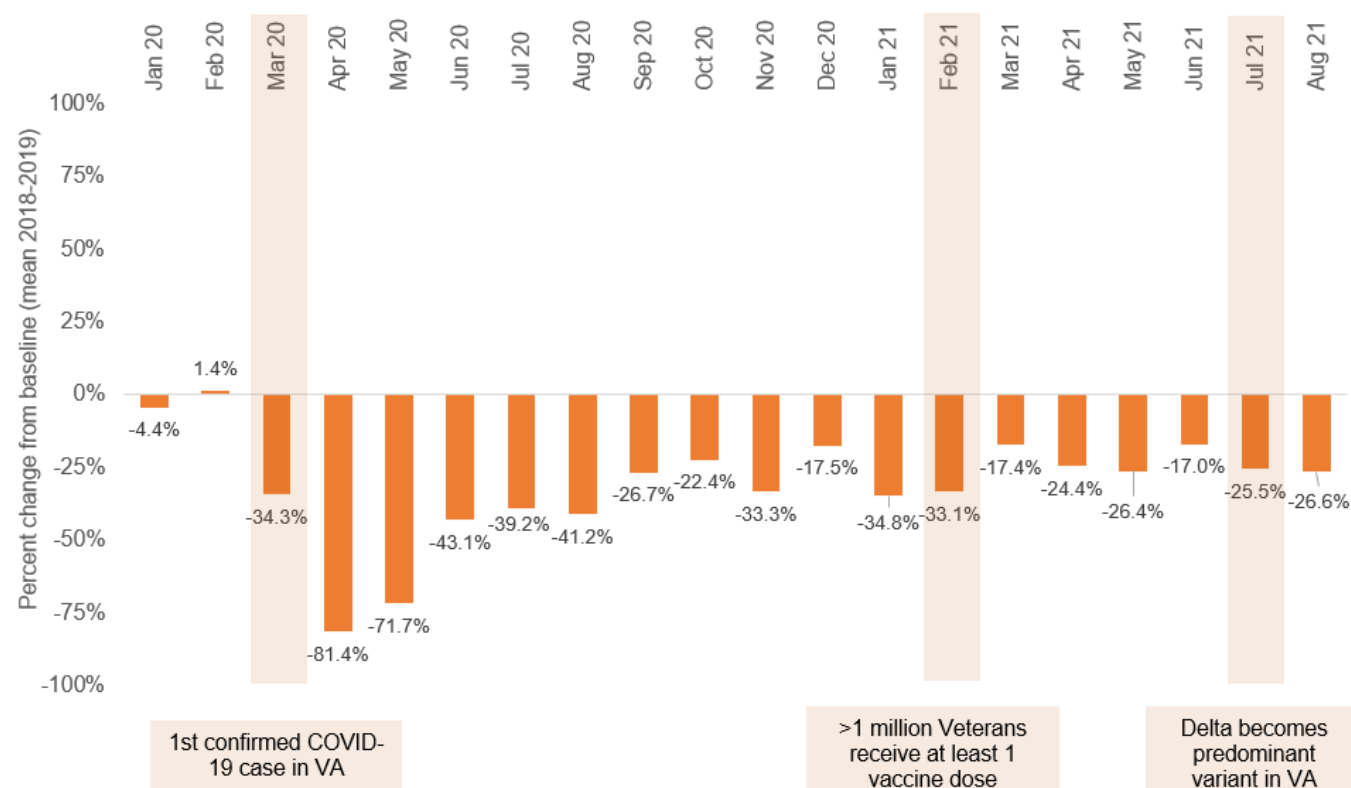


#### 4.2.1.2 Flexible sigmoidoscopy

**Figure 3.** First observed flexible sigmoidoscopy per Veteran per year, Jan 2018 – Aug 2021



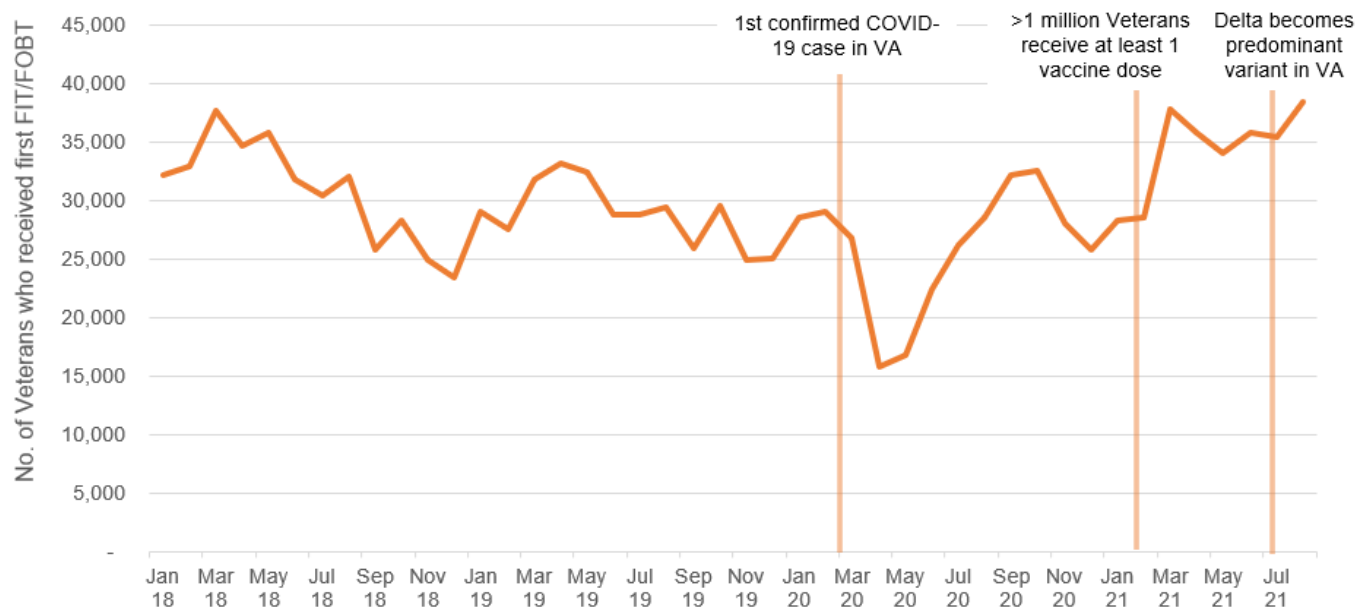
**Figure 4.** Percentage change in the number of Veterans receiving flexible sigmoidoscopy compared with baseline (mean number of screenings in equivalent months in 2018-2019)



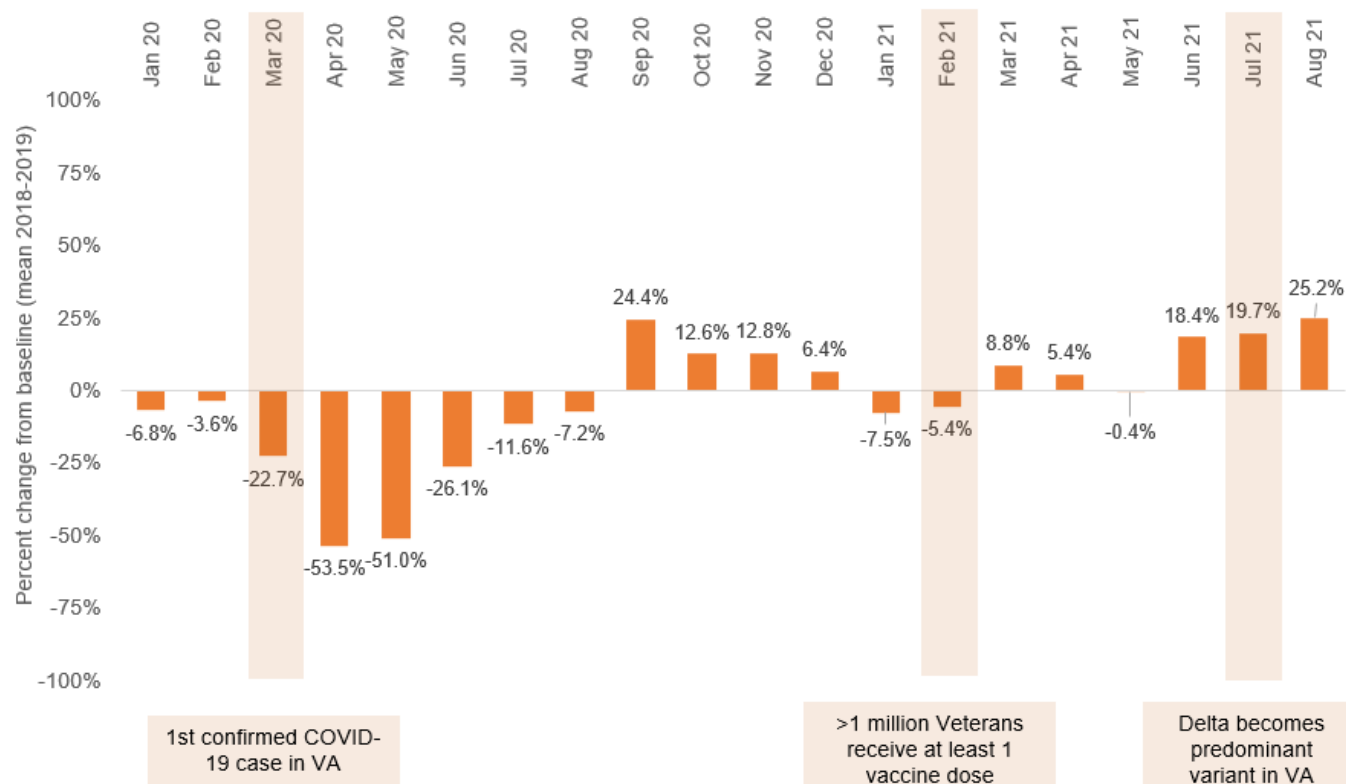


#### 4.2.1.3 Fecal immunochemical testing and guaiac-based fecal occult blood test (FIT/FOBT)

**Figure 5.** First observed FIT/FOBT per Veteran per year, Jan 2018 – Aug 2021

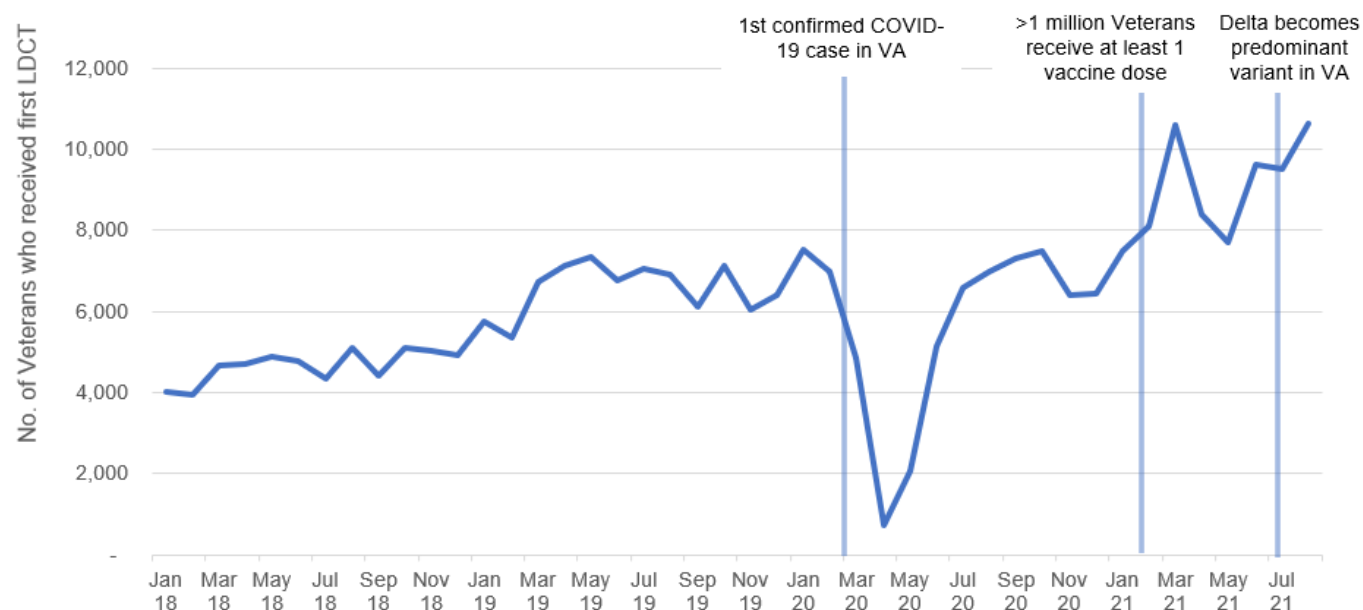


**Figure 6.** Percentage change in the number of Veterans receiving FIT/FOBT compared with baseline (mean number of screenings in equivalent months in 2018-2019)

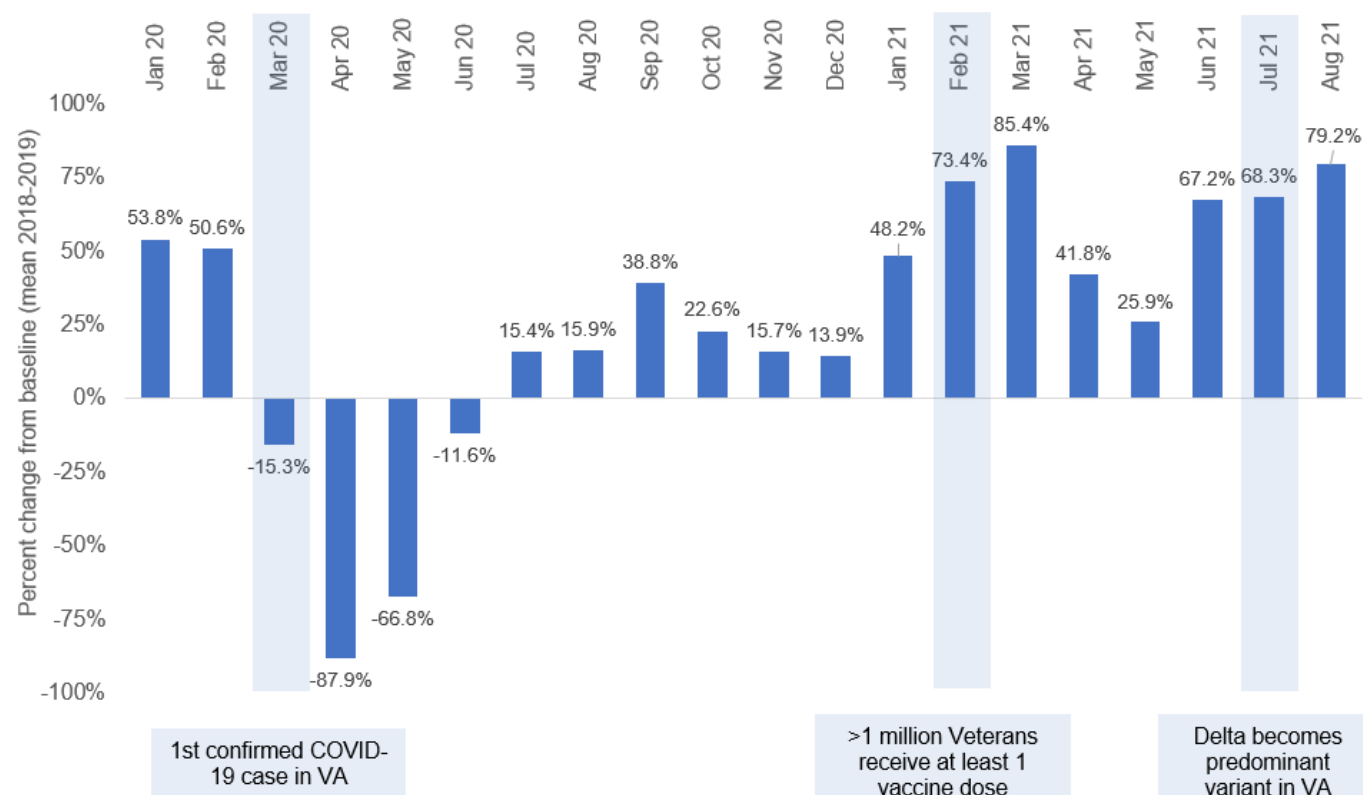


## 4.2.2 Lung Cancer Screening

**Figure 7.** First observed low-dose computed tomography (LDCT) per Veteran per year, Jan 2018 – Aug 2021

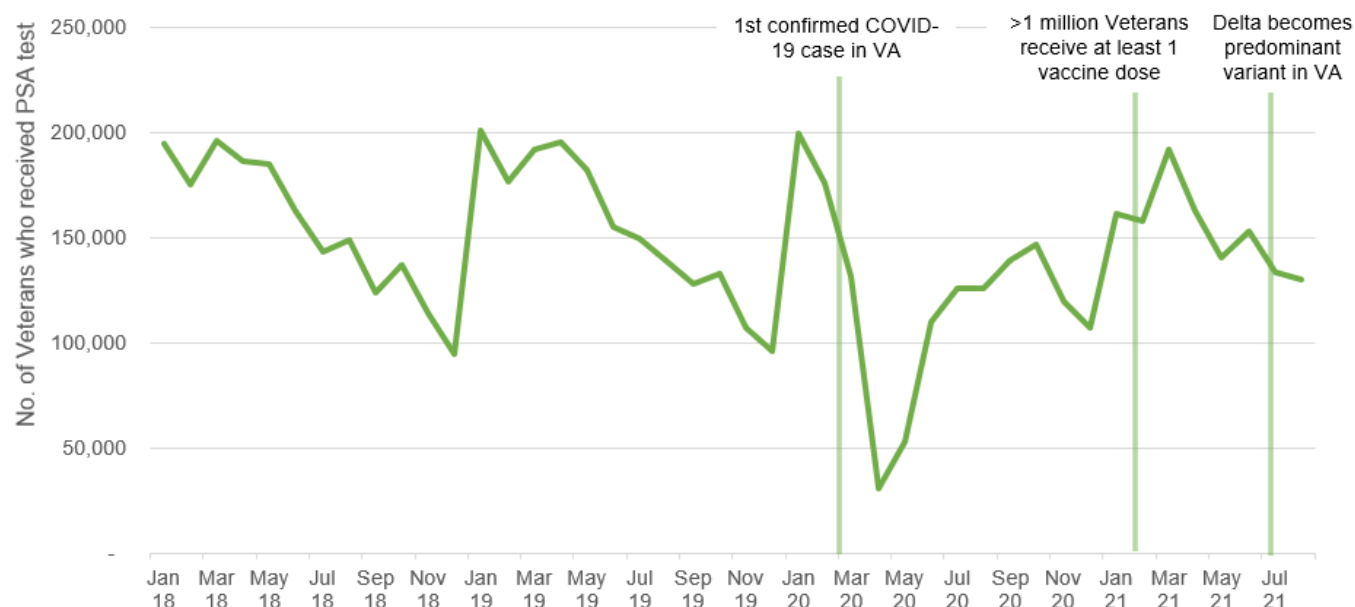


**Figure 8.** Percentage change in the number of Veterans receiving LDCT compared with baseline (mean number of screenings in equivalent months in 2018-2019)

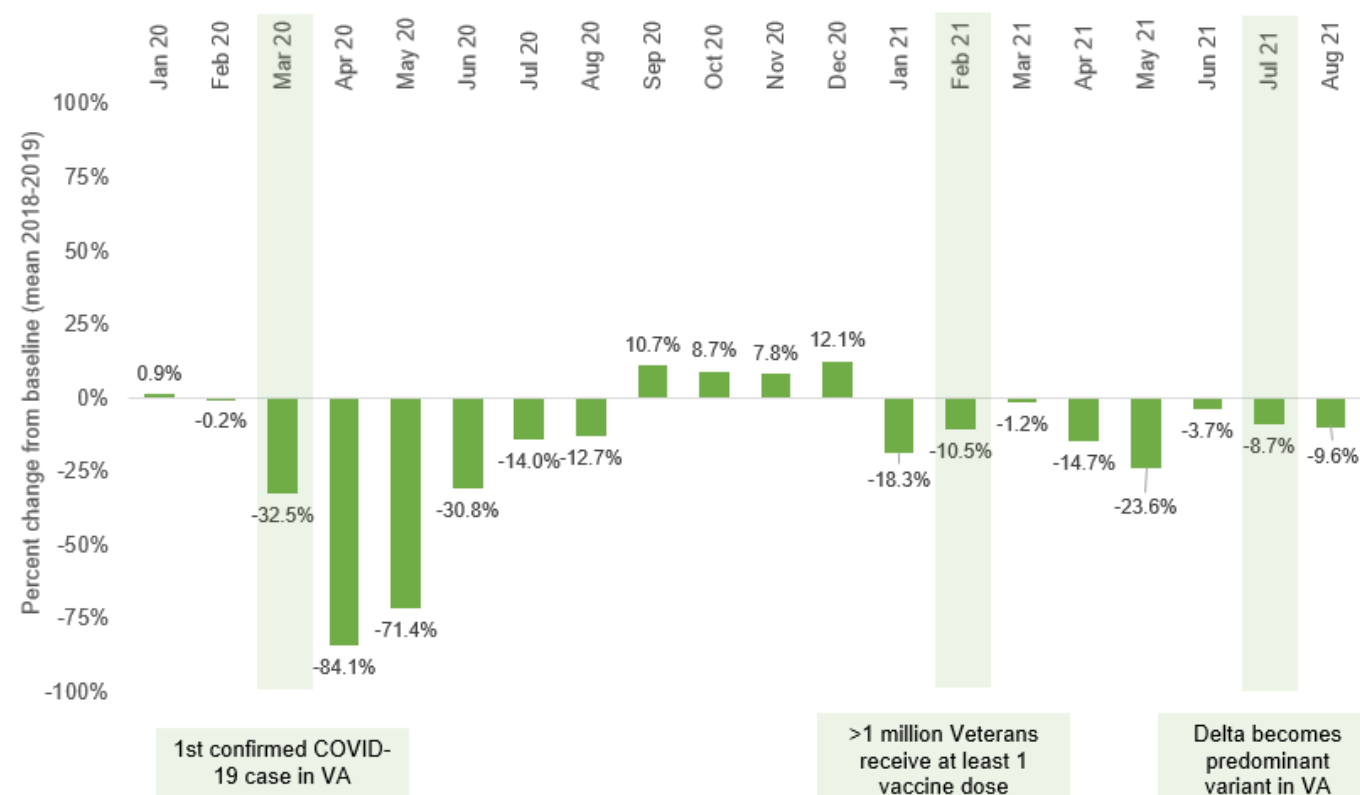


## 4.2.3 Prostate Cancer Screening

**Figure 9.** First observed prostate specific antigen (PSA) test per Veteran per year, Jan 2018 – Aug 2021

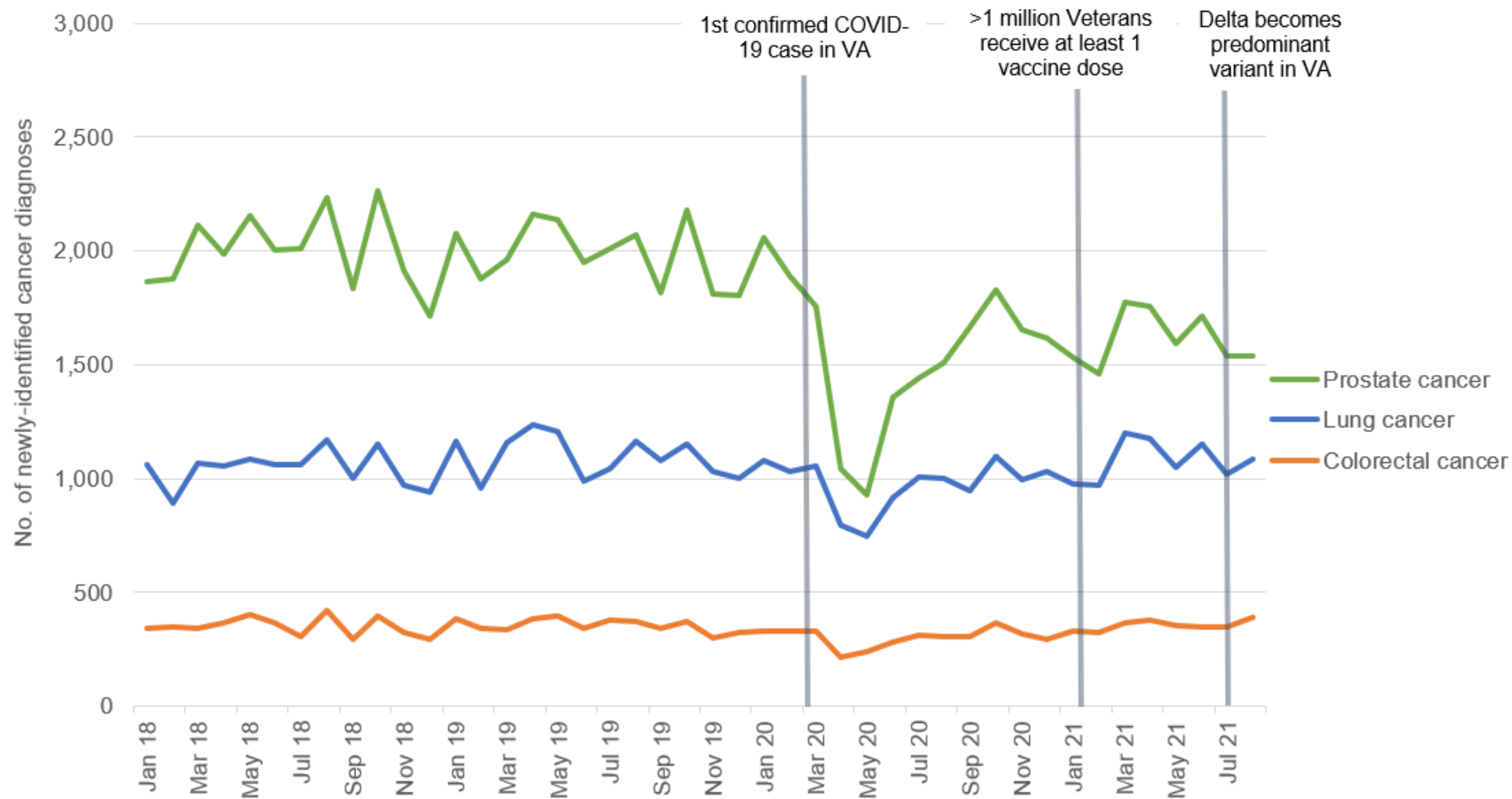


**Figure 10.** Percentage change in the number of Veterans receiving PSA testing compared with baseline (mean number of screenings in equivalent months in 2018-2019)



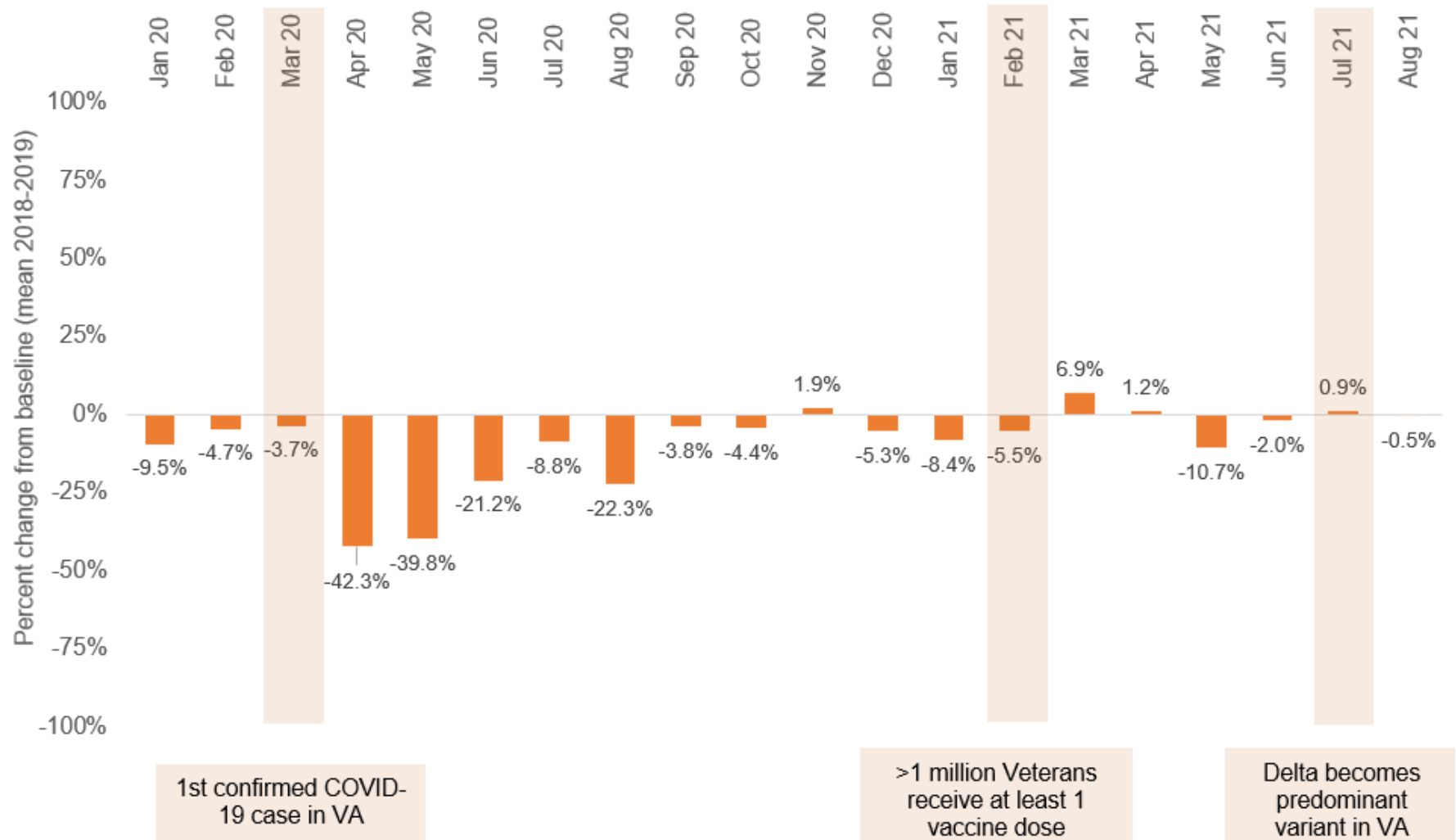
### 4.3 Newly-Identified Cancer Diagnoses

**Figure 11.** Number of patients with newly-identified cancer diagnosis among Veteran VHA users with no prior history of the specified cancer, Jan 2018 – Aug 2021\*

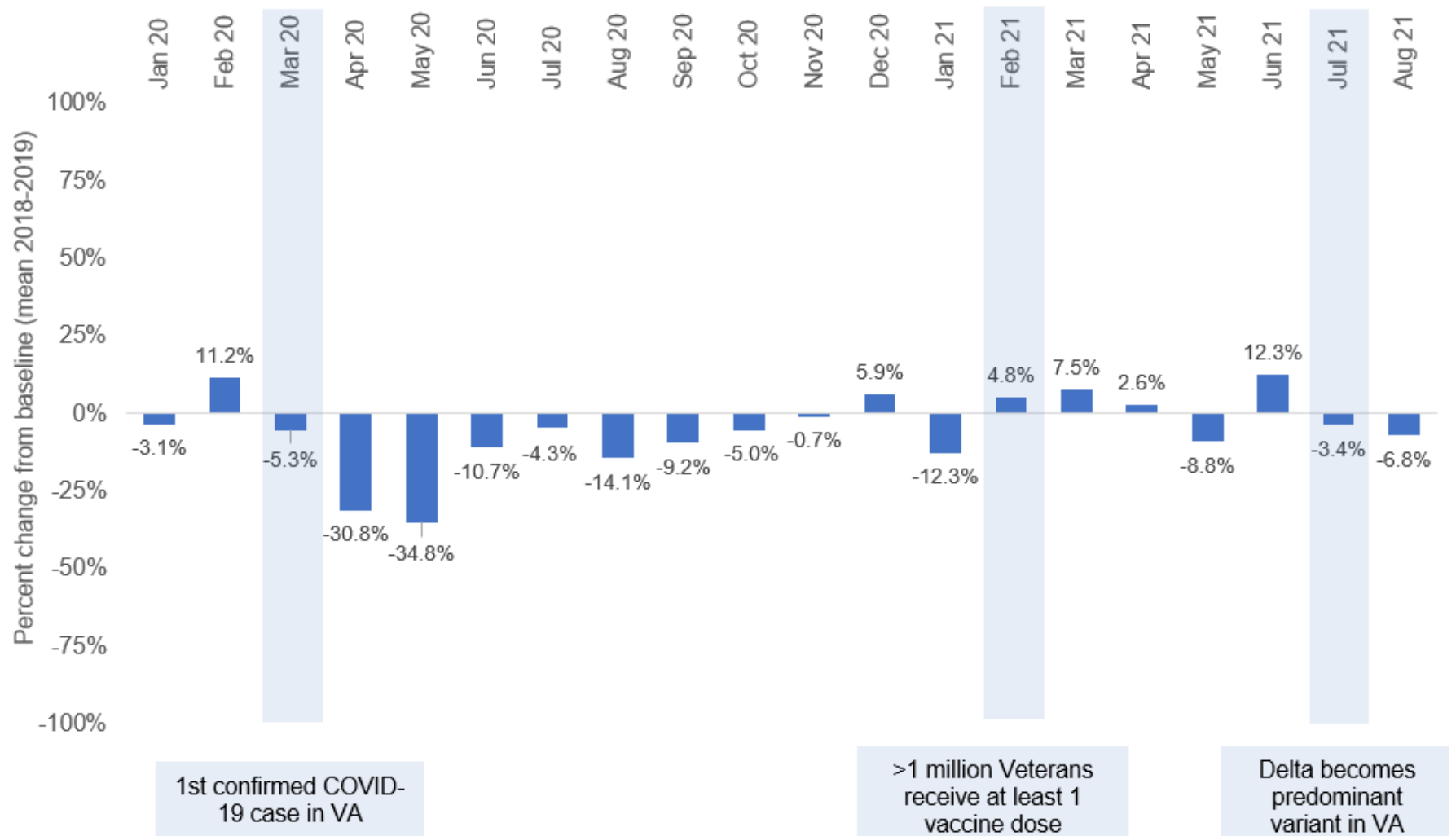


\*The number of Veterans diagnosed with cancer may be underestimated from March 2021 – August 2021 because there is not a full 180 days of follow-up needed to capture all cases who would meet the minimum of 2 outpatient diagnosis codes.

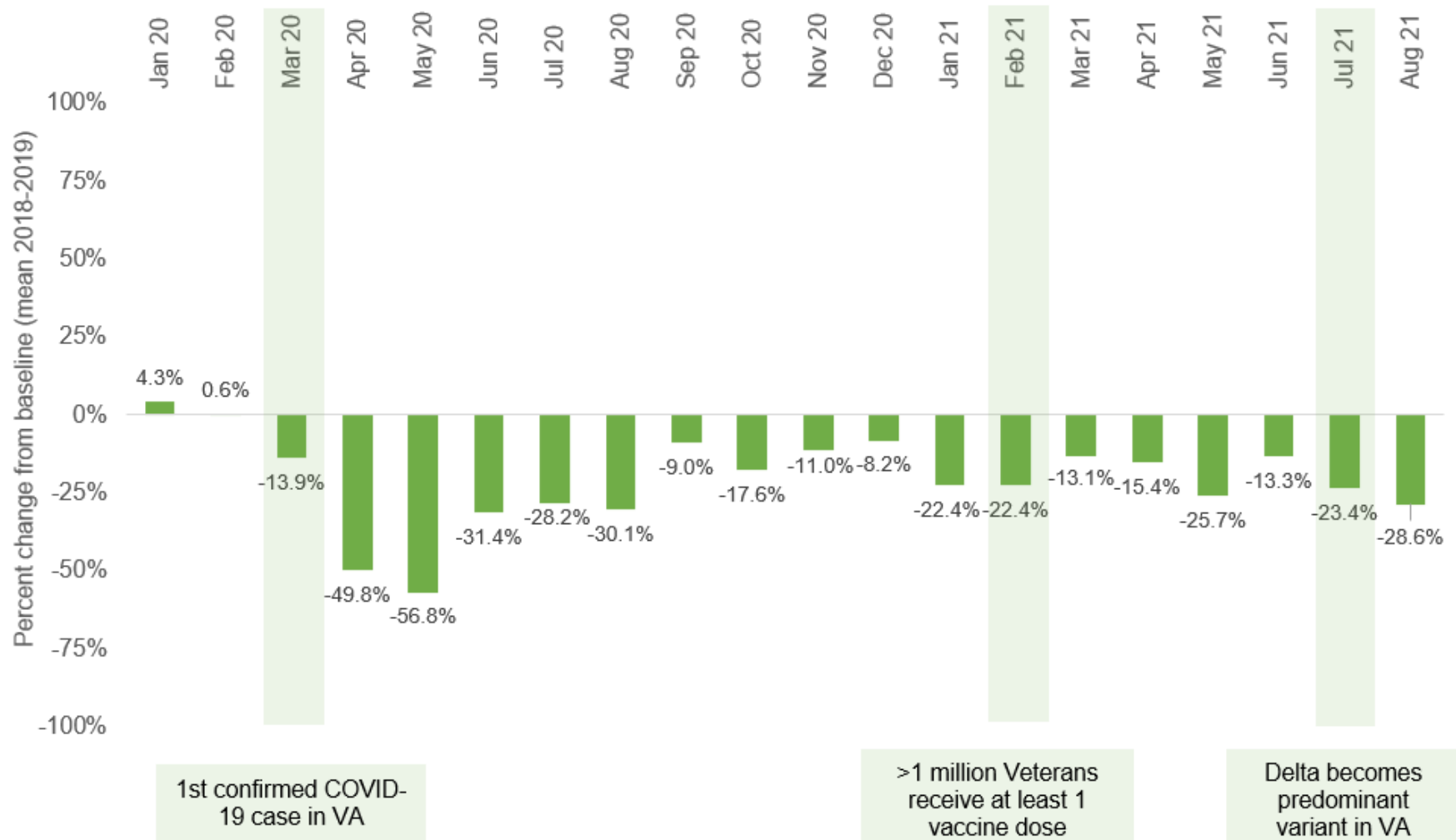
**Figure 12.** Percentage change in newly-identified colorectal cancer diagnoses among Veteran VHA users with no prior history of colorectal cancer, compared with baseline (mean of 2018-2019)



**Figure 13.** Percentage change in newly-identified lung cancer diagnoses among Veteran VHA users with no prior history of lung cancer, compared with baseline (mean of 2018-2019)



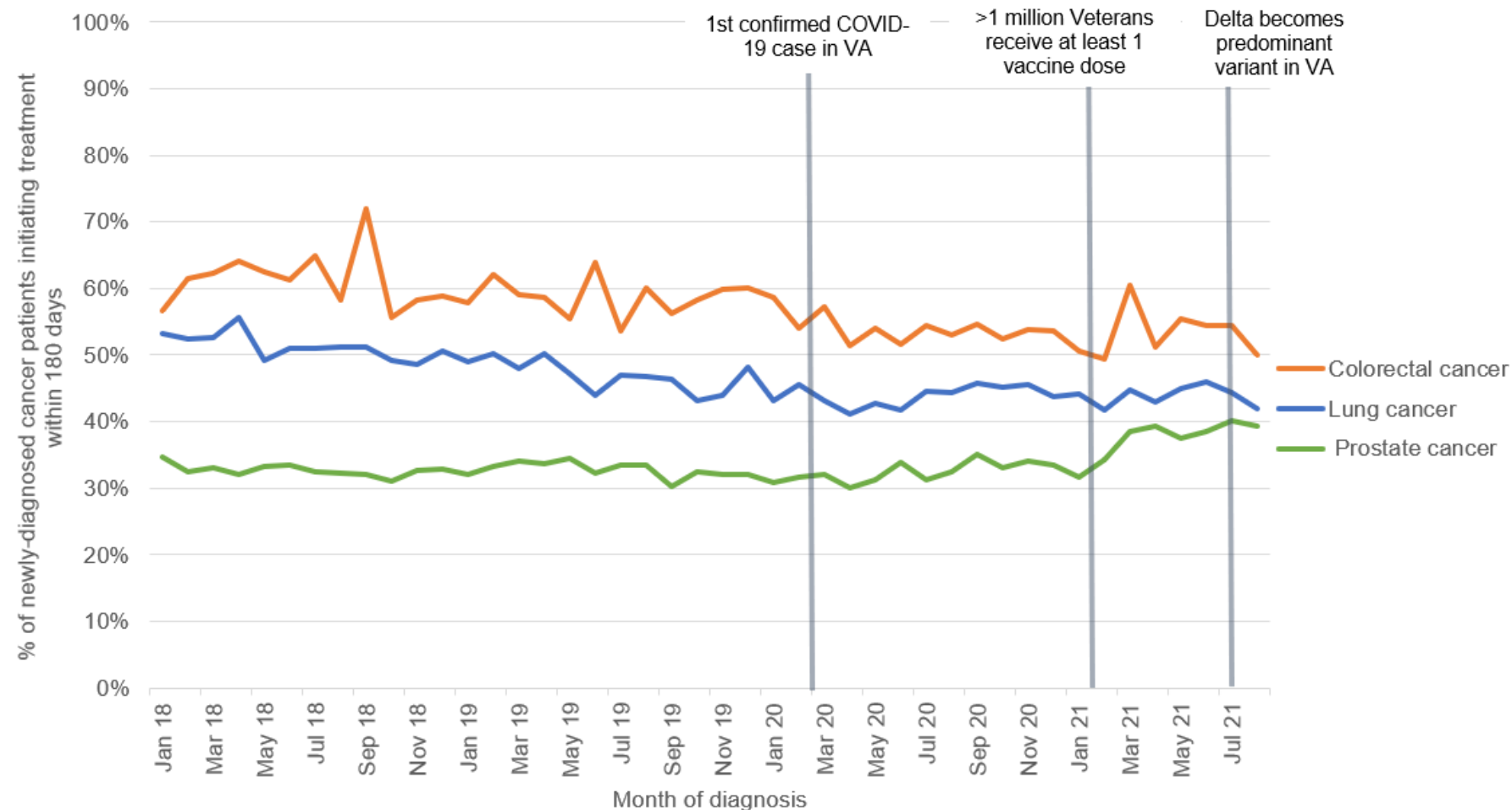
**Figure 14.** Percentage change in newly-identified prostate cancer diagnoses among Veteran VHA users with no prior history of prostate cancer, compared with baseline (mean of 2018-2019)



## 4.4 Cancer Treatment

### 4.4.1 Cancer Treatment Initiation within 180 days

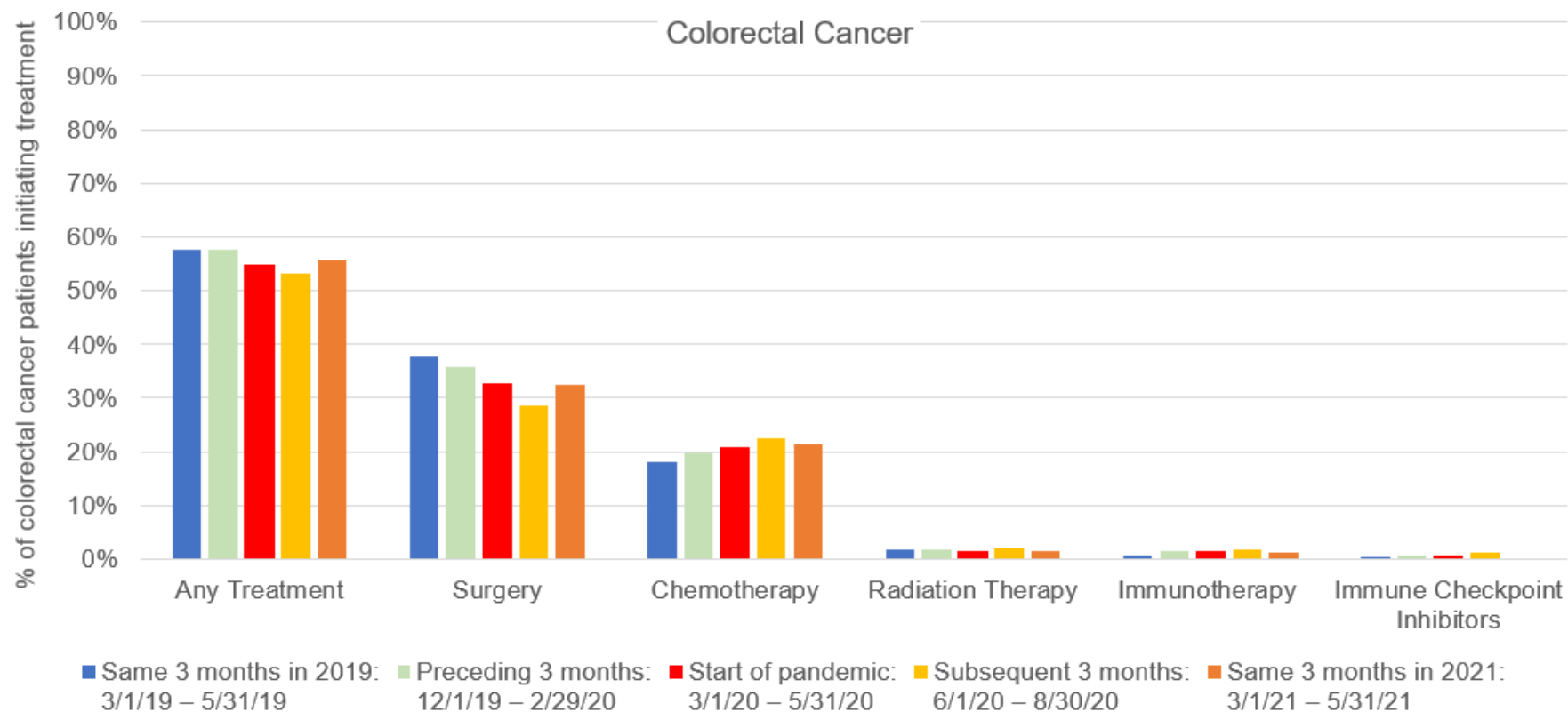
**Figure 15.** Percentage of newly-diagnosed cancer patients initiating surgery, chemotherapy, radiation therapy, immunotherapy, or hormone therapy at a VA Medical Center within 180 days, by month of diagnosis\*



\*Excludes cancer patients who died within 180 days of diagnosis with no record of having received treatment

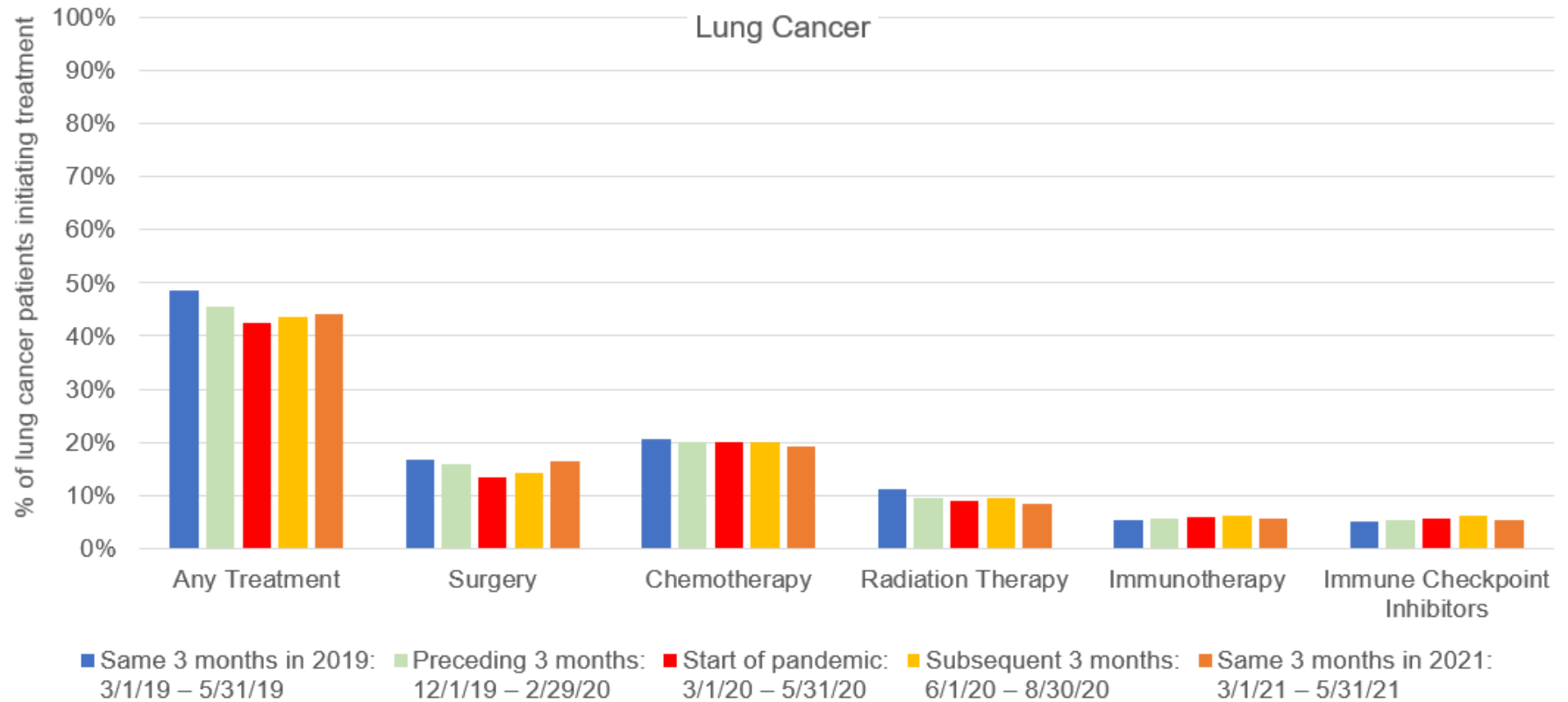


**Figure 16.** Percentage of newly-diagnosed colorectal cancer patients initiating first-line treatment at a VA Medical Center within 180 days, by time period of diagnosis



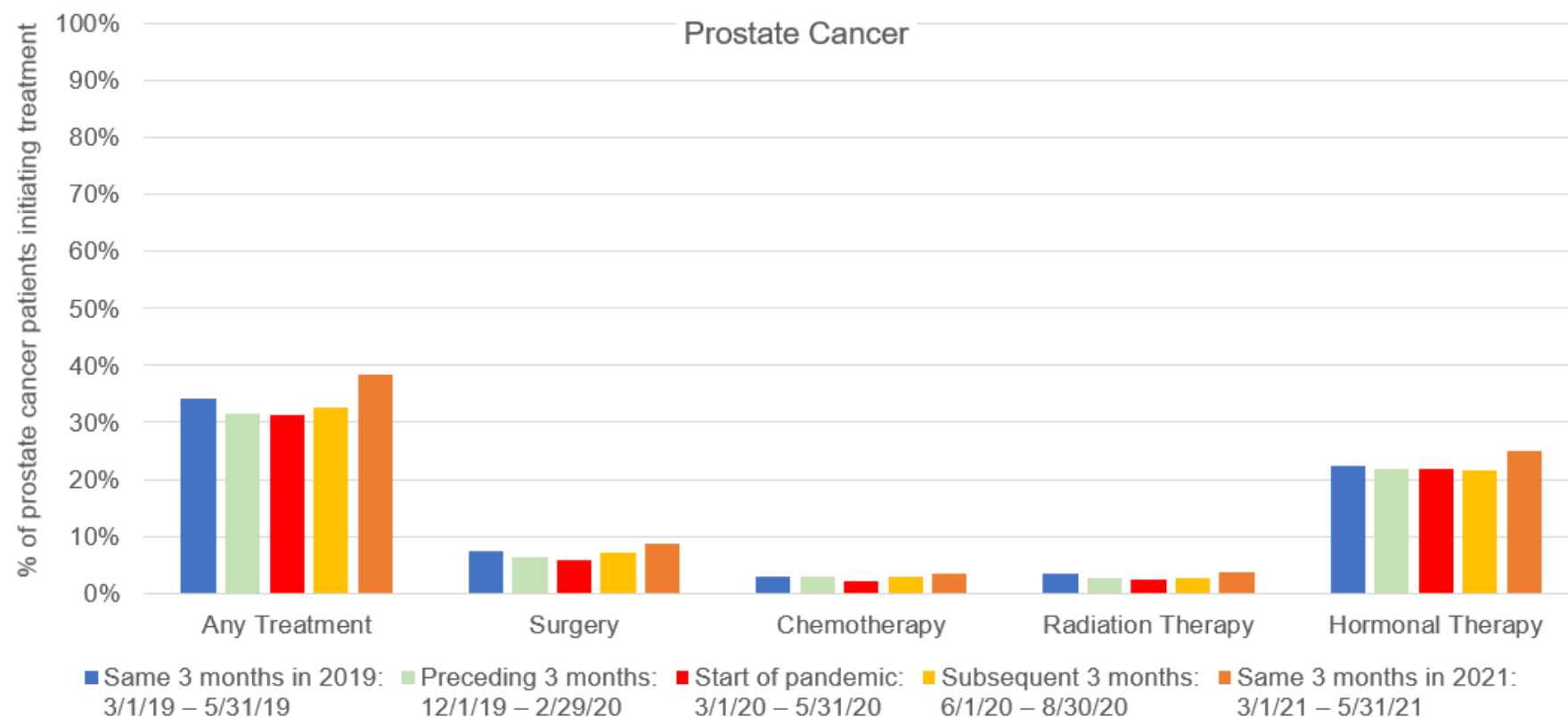
\*Excludes cancer patients who died within 180 days of diagnosis with no record of having received treatment

**Figure 17.** Percentage of newly-diagnosed lung cancer patients initiating first-line treatment at a VA Medical Center within 180 days, by time period of diagnosis



\*Excludes cancer patients who died within 180 days of diagnosis with no record of having received treatment

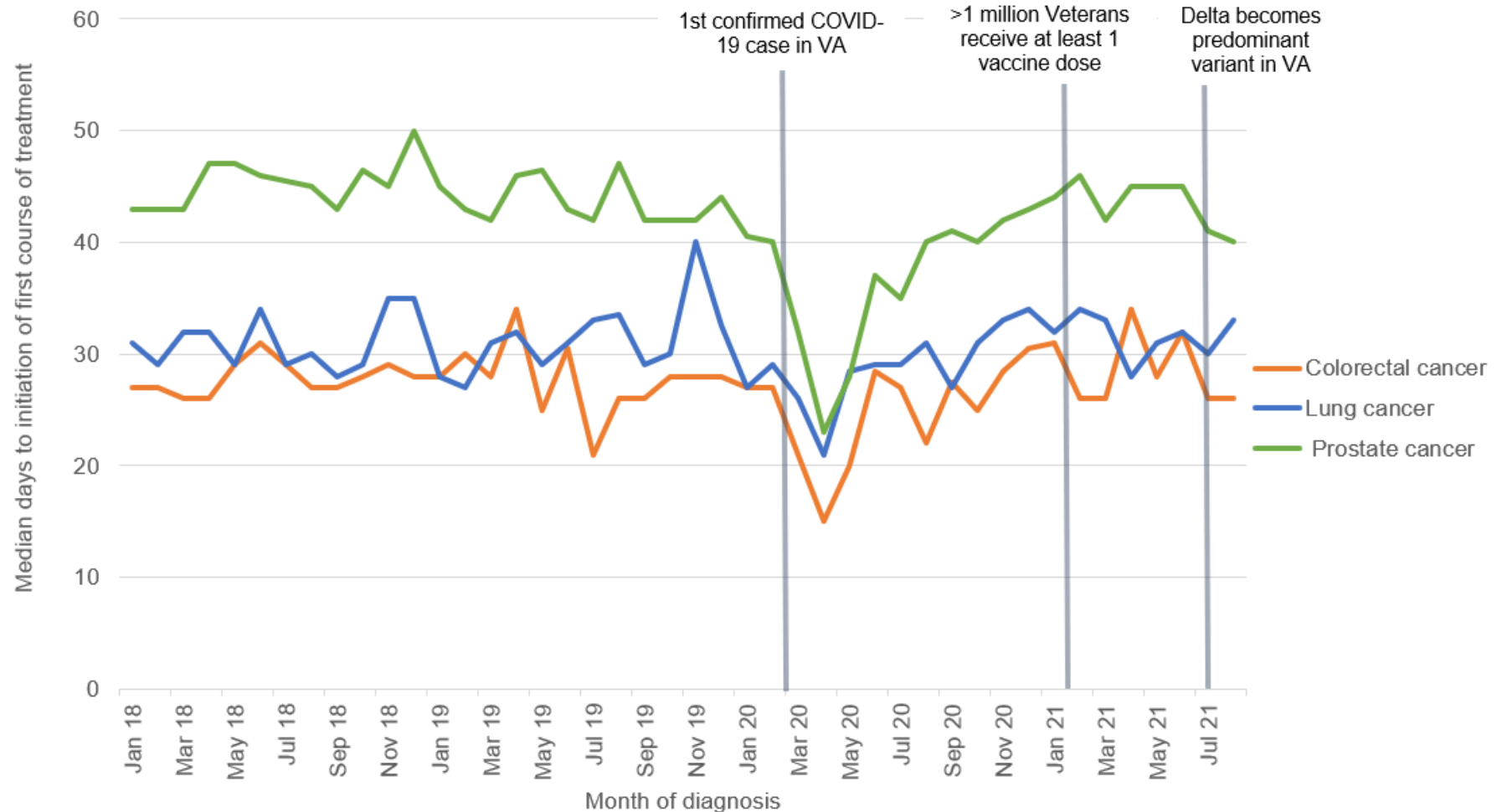
**Figure 18.** Percentage of newly-diagnosed prostate cancer patients initiating first-line treatment at a VA Medical Center within 180 days, by time period of diagnosis



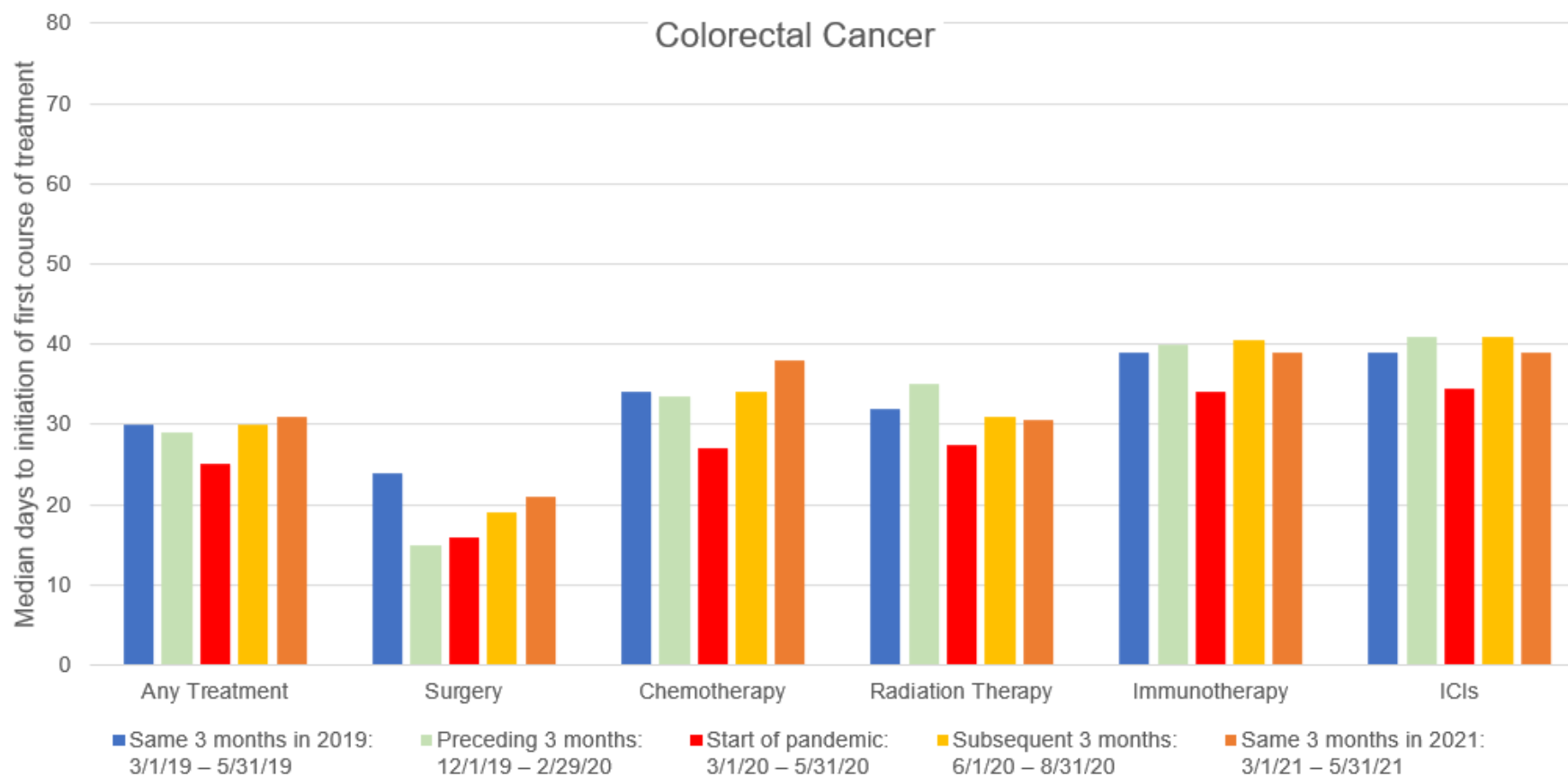
\*Excludes cancer patients who died within 180 days of diagnosis with no record of having received treatment

#### 4.4.2 Time to Treatment Initiation

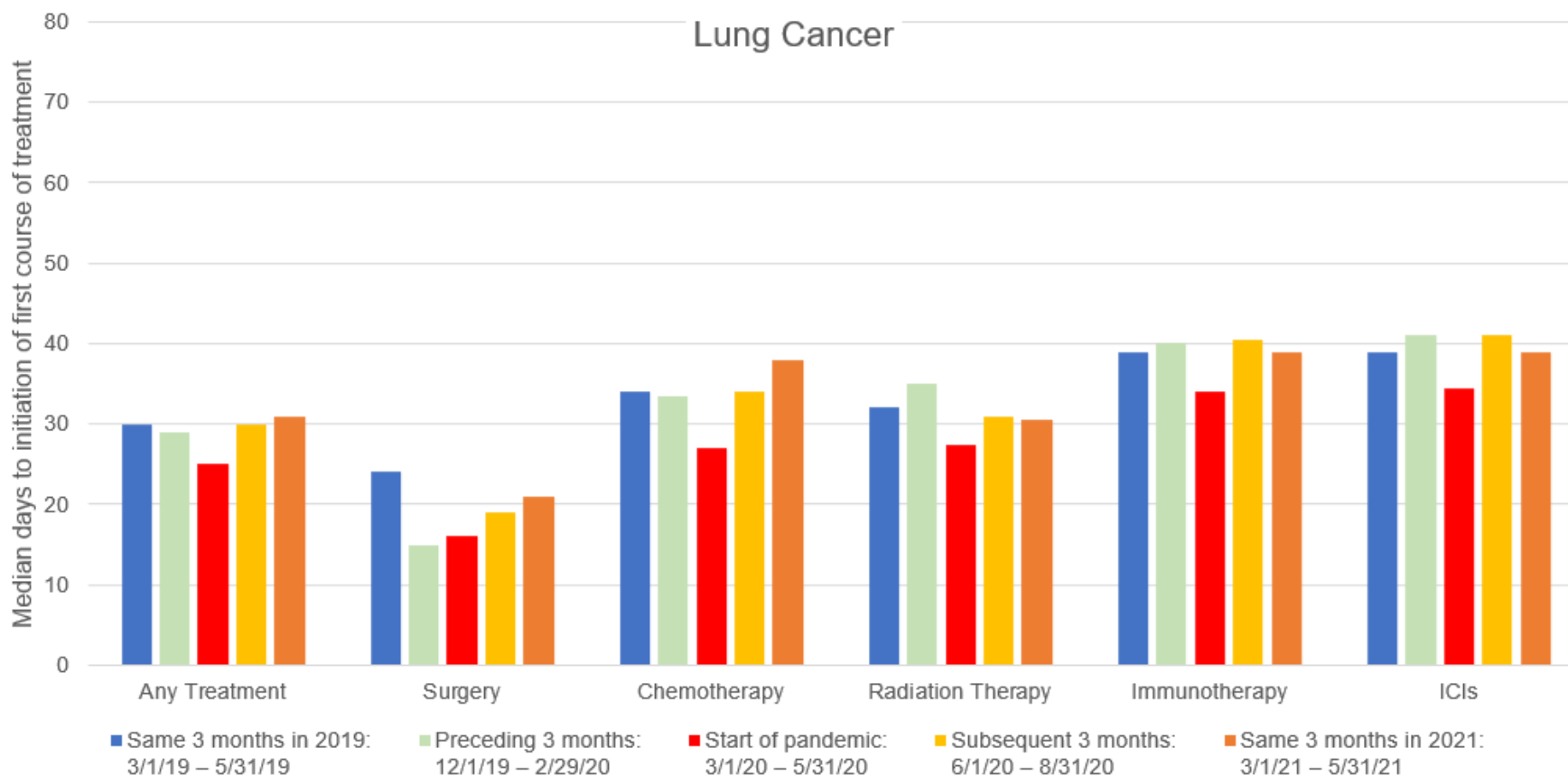
**Figure 19.** Median days to initiation of first course of cancer treatment among newly-diagnosed cancer patients treated at a VA Medical Center within 180 days, by month of diagnosis



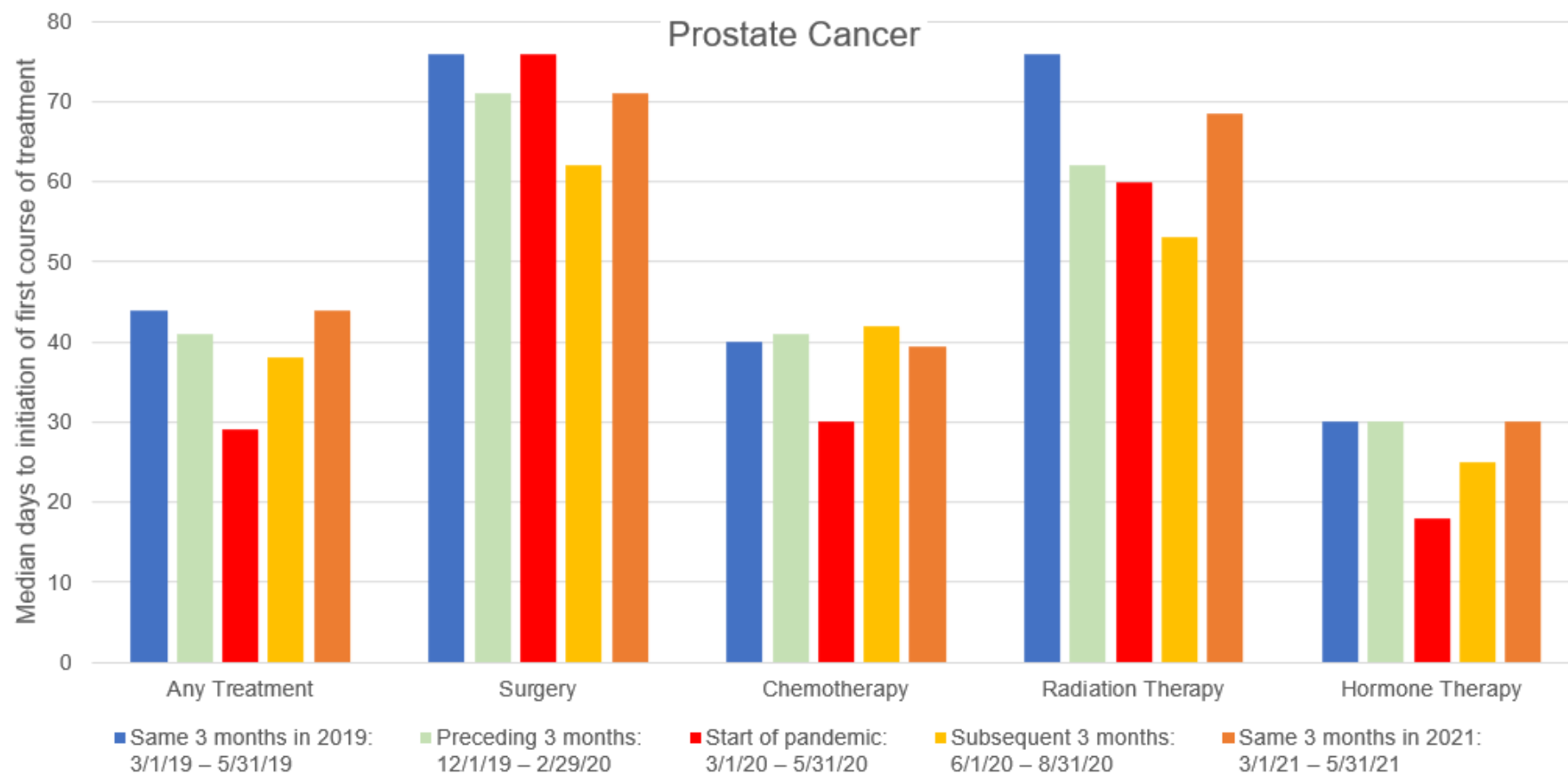
**Figure 20.** Median days to treatment initiation among newly-diagnosed colorectal cancer patients treated at a VA Medical Center within 180 days, by time period of diagnosis



**Figure 21.** Median days to treatment initiation among newly-diagnosed lung cancer patients treated at a VA Medical Center within 180 days, by time period of diagnosis

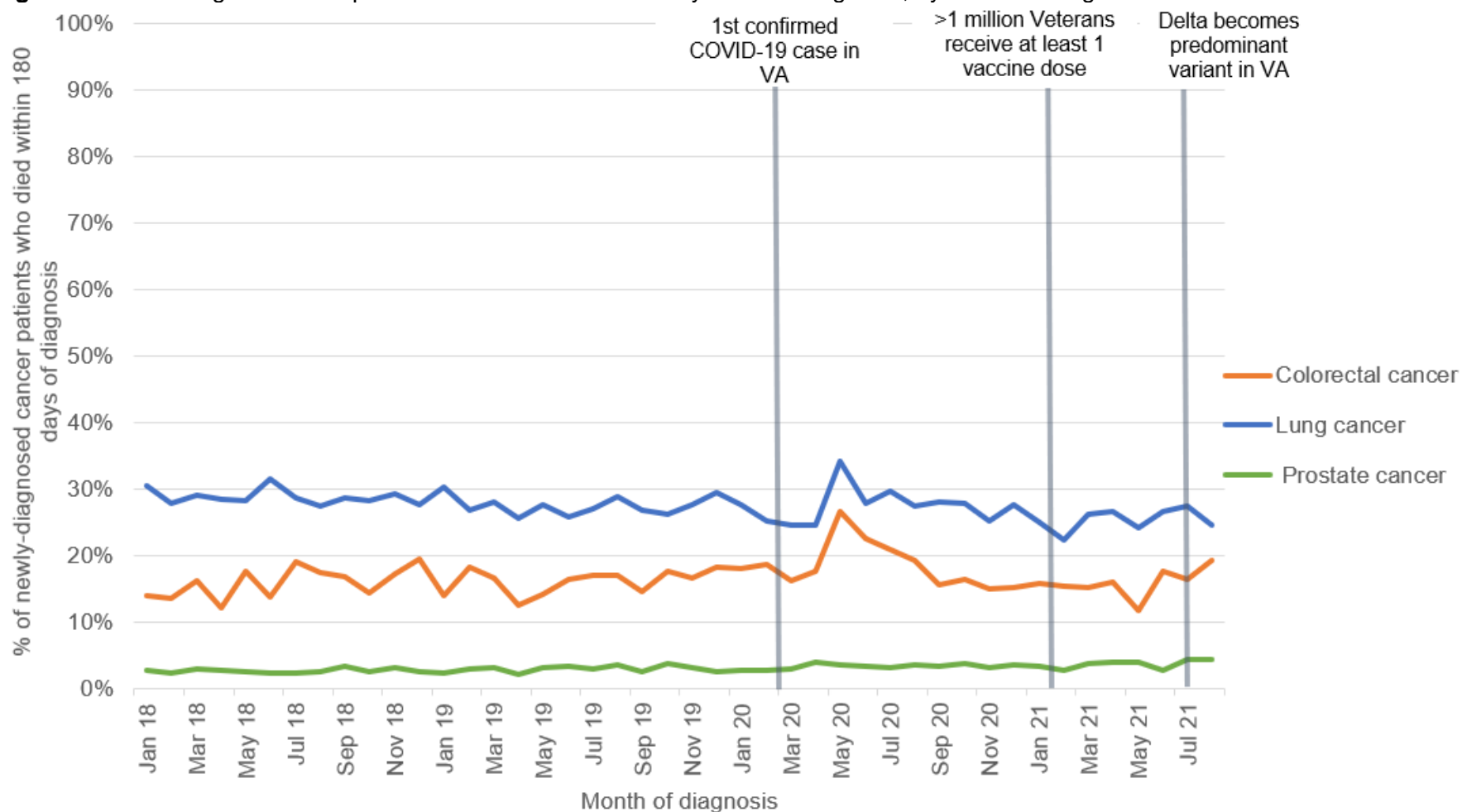


**Figure 22.** Median days to treatment initiation among newly-diagnosed prostate cancer patients treated at a VA Medical Center within 180 days, by time period of diagnosis



## 4.5 All-Cause Mortality

**Figure 23.** Percentage of cancer patients who died within 180 days of new diagnosis, by month of diagnosis



Includes deaths from any cause recorded in the CDW among all Veterans with a newly-identified cancer diagnosis in their health record. Deaths are not attributed to any cause, and thus may be due to COVID-19, cancer, or other causes.



## 5 Notes on Interpretation

- No methods were applied to adjust for potential biases, and thus, no conclusions can be drawn from these results. The analyses do not account for variations in outcomes due to confounding factors, such as seasonal variations.
- At the time of the analyses, very limited data were available on the stage and histology of cancer among Veterans in this cohort due to a lag in reporting by the VA Cancer Registry to the VA oncology raw database. These and other factors may confound summary data used to evaluate the health outcomes of this population.
- These results reflect only the procedures delivered at a VHA health care setting. Many Veterans have multiple options for their care and seek care outside the VHA health care system. This practice has likely increased with the enactment of the VA MISSION Act in June 2019, which expanded Veterans' access to outside providers. Thus, the number of cancer screening, diagnoses, and treatment procedures are likely to be underestimated.
- Multiple factors unrelated to the pandemic may contribute to patterns and trends observed. For example, increases in colorectal cancer and lung cancer screening in 2021 may be attributable in part to the expansion in the age range and other criteria recommended for screening that year [10]. Lung cancer screening rates increased steadily between 2011 and 2018 [5]. In addition, VHA currently recommends a "FIT First" strategy in which FIT is the preferred screening method for colorectal cancer [3]. Programs have been introduced recently to increase colorectal cancer screening by mailing FIT tests to Veterans' homes [11].
- Some procedures identified as screenings may have been administered as surveillance of Veterans with a history of cancer or abnormal screening results.
- Limitations inherent to the electronic health record data include variations in coding practices and diagnostic approaches, which may result in data discrepancies across facilities.
- The fact sheet presents information on Veterans using VHA health care services and are not generalizable to other US Veterans or cancer patients more broadly.

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