

# Changes in Use of Low-Value Services During the COVID-19 Pandemic

Mahnum Shahzad, BA; Zirui Song, MD, PhD; Michael E. Chernew, PhD; and A. Mark Fendrick, MD

**T**he COVID-19 pandemic disrupted many aspects of health care delivery. In both outpatient and emergency settings, large declines in utilization were documented in the early months of the pandemic,<sup>1-9</sup> with the volume of services rebounding toward pre-pandemic levels in the third quarter of 2020. To date, much of the focus has been on delayed or forgone high-value services, such as cancer screenings,<sup>10</sup> care for stroke and myocardial infarction,<sup>11</sup> and medications for chronic conditions,<sup>12,13</sup> which could potentially result in long-term negative health consequences.

However, the ways in which the COVID-19 pandemic may have affected the use of low-value services, relative to high-value services, remain poorly understood. Low-value care in the United States accounted for approximately 10% to 20% of total health care spending before the pandemic and has proven difficult to reduce.<sup>14</sup> Some have hypothesized that the pandemic-related care disruptions and recovery could reduce low-value spending and substitute such spending with, on average, higher-value spending,<sup>15-19</sup> but there has been no empirical work evaluating those predictions. To address this gap in knowledge, we compared changes in the use of sentinel low-value services with changes in use of comparable high-value services over the course of the pandemic. Our results shed light on how clinical value is inculcated into physician and consumer decision-making and on the role of 1-time disruptions in changing or failing to change low-value care usage.

We analyzed a subset of services with a D grade from the US Preventive Services Task Force (USPSTF). A grade of D is assigned to a service when “there is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits”<sup>20</sup> and the USPSTF discourages use of the service. Grade D services, therefore, are among the most rigorously developed low-value services to target for reduction. Of the 19 services with a D rating from the USPSTF, 6 were commonly used by the commercially insured population and reliably identifiable in the claims data (**eAppendix Table 1** [eAppendix available at [ajmc.com](http://ajmc.com)]). The remaining D-graded services were excluded for the following reasons: (1) lack of coding specificity (eg, pancreatic cancer screening), (2) the patient population addressed by the D grade was difficult to

## ABSTRACT

The COVID-19 pandemic led to a significant disruption, then recovery, of health care services use. Prior research has not examined the relative rates of resumption of high-value and low-value care. We examined the use of 6 common low-value services that received a D grade from the US Preventive Services Task Force compared with clinically comparable high-value services in a large commercially insured population nationwide from before the pandemic to April 1, 2021. We found that, overall, low-value services and high-value services were disrupted similarly. In aggregate, low-value care declined to 56.2% and high-value care to 53.2% in the initial month of the pandemic (April 2020) relative to baseline (number of visits in 2019 normalized by relevant enrolled population), then rebounded to 83.1% of baseline for low-value services and 95.0% of baseline for high-value services by January 2021. Substantial heterogeneity appeared across clinical contexts, such as prostate cancer screening for men 70 years and older rebounding to 111.8% of baseline and asymptomatic chronic obstructive pulmonary disease screening remaining at 38.5% of baseline in January 2021. This suggests that although, on average, resuming lower-value services may have been perceived to be a lesser priority by providers and patients, the pandemic may have had heterogeneous effects on consumer and provider decision-making along the dimension of clinical value. This enhances our understanding of how disruptions affect the relationship between clinical value and usage of different services and suggests the need for more targeted interventions to reduce low-value care.

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identify from claims (eg, women who are not at increased risk of breast cancer), or (3) the service was rarely identified in the data set (eg, cervical cancer screening for female patients younger than 21 years or testicular cancer screening for male patients).

To understand how changes in volume attributable to the pandemic may have differed by clinical value, utilization of each of the 6 low-value services was compared with use of services of relatively higher clinical value that required similar resources and patient time to complete (Table). For example, in 2 service pairs, blood tests that do not require a separate clinic visit were compared (eg, prostate specific-antigen [PSA] screening after age 70 years [low value] was compared with hepatitis C virus screening after age 70 years [high value]). One pair compared services that are routinely performed during a clinic visit (eg, asymptomatic bacteriuria testing [low value] was compared with serum cholesterol testing and hemoglobin A<sub>1c</sub> [HbA<sub>1c</sub>] testing [high value]). Another pair compared prescription medications (eg, hormone replacement therapy [low value] and statins [high value]). An additional pair compared services that necessitated a specific clinic visit

(eg, chronic obstructive pulmonary disease [COPD] screening for asymptomatic individuals [low value] was compared with lung cancer screening [high value]). Diagnosis codes for low-value and high-value services can be found in the eAppendix.

### TAKEAWAY POINTS

We found that, overall, low-value services and high-value services were disrupted similarly during COVID-19, but low-value services rebounded, on average, more slowly than their high-value counterparts.

- ▶ In aggregate, low-value care declined to 56.2% and high-value care to 53.2% in the initial month of the pandemic (April 2020) relative to their 2019 baseline.
- ▶ In aggregate, low-value care rebounded to 83.1% of baseline, whereas high-value care rebounded to 95.0% of baseline by January 2021.
- ▶ Substantial heterogeneity exists across services, suggesting that the pandemic may have had heterogeneous effects on consumer and provider decision-making along the dimension of clinical value.

### METHODS

We used deidentified claims data spanning January 2019 through March 2021 from the OptumLabs Data Warehouse, which includes medical and pharmacy claims for commercial and Medicare Advantage

**TABLE.** Number of Encounters and Normalized Encounters for LV and HV Services

	Number of monthly visits in 2019 Q1	Number of visits in April 2020	April 2020 volume / mean monthly volume in 2019 Q1 × 100	Number of visits in January 2021	January 2021 volume / mean monthly volume in 2019 Q1 × 100
<b>Category 1: No or modest decline during COVID-19</b>					
Bacterial vaginosis screening (low-risk pregnancy) (LV)	1.3	1.2	89.5	1.3	95.5
Low-risk pregnancy visits (HV)	4.9	4.3	87.3	4.5	92.3
Hormone replacement therapy (LV)	3.4	3.1	92.2	2.8	84.0
Statins (HV)	23.4	23.4	100.1	21.4	91.3
<b>Category 2: Decline during COVID-19 with robust rebound</b>					
Prostate cancer screening: ≥ 70 years (LV)	9.0	3.9	43.9	10.3	111.8
Hepatitis B and C screening: ≥ 70 years (HV)	0.19	0.09	46.5	0.19	99.5
Cholesterol test: ≥ 70 years (HV)	4.3	1.5	34.0	3.19	73.6
HbA <sub>1c</sub> test: ≥ 70 years (HV)	52.8	23.8	44.9	54.0	102.2
<b>Category 3: Decline during COVID-19 with slower rebound</b>					
Asymptomatic bacteriuria screening (LV)	4.8	2.7	55.4	4.3	89.6
HIV testing (HV)	3.0	1.3	44.1	2.8	93.8
Cholesterol test (HV)	24.5	8.6	35.1	24.1	98.3
HbA <sub>1c</sub> test (HV)	15.9	6.2	39.6	16.1	101.4
Herpes screening (LV)	0.76	0.3	39.6	0.6	79.3
Hepatitis B and C testing (HV)	0.12	0.05	43.6	0.12	96.7
<b>Category 4: Decline during COVID-19 with no rebound</b>					
Asymptomatic COPD screening (LV)	5.2	0.8	16.5	2.0	38.5
Lung cancer screening (HV)	0.67	0.4	57.0	0.69	101.3

COPD, chronic obstructive pulmonary disease; HbA<sub>1c</sub>, hemoglobin A<sub>1c</sub>; HV, high value; LV, low value; Q, quarter.

\*Number of visits are normalized by number of 1000 enrollees in that month in the case of all services except hormone replacement therapy and statins, which are normalized by number of 1000 prescription claims.

## TRENDS FROM THE FIELD

enrollees representing a mixture of geographical regions across the United States. We measured monthly utilization in terms of unique patient encounters for each service from January 1, 2019, to April 1, 2021. In our main specification, we normalized the number of observed encounters by the relevant enrolled population (eg, for prostate cancer screening for patients 70 years and older, we divide the number of encounters by number of men 70 years and older who were enrolled during the month) to ensure that our results were not driven by changes in the age or gender composition of enrollees. Changes in utilization were measured relative to baseline utilization during the first quarter of 2019 to allow for comparisons between services to be standardized to a prepandemic month and not driven by endogenous differences in levels during the pandemic.

We also compared volumes of our low-value services with overall trends in the volume of medical activity in the delivery system, represented by unique patient visits for all services. We excluded telemedicine from this count of visits because our set of low-value services, with the exception of prescription drugs, require an in-person visit to a health facility, and thus all in-person visits were a more suitable comparison group. The Harvard Medical School institutional review board deemed this study exempt from review, owing to the use of deidentified data.

## RESULTS

Weighting all low-value services equally, our results show that enrollment-adjusted volume of low-value services decreased to 56.2% of 2019 baseline volume in April 2020. By January 2021, the volume of low-value services had rebounded to 83.1% of its 2019 baseline. This is in comparison with all enrollment-adjusted nontelemedicine visits that fell to 63.1% of 2019 volumes in April 2020 and rebounded to 104.1% in January 2021, or equally weighted high-value services that fell to 53.2% of 2019 volume in April 2020 and rebounded to 95.0% in January 2021.

We decomposed the aggregate results into 4 categories: (1) services that were mostly unaffected by COVID-19, (2) services that experienced a decline followed by a robust rebound comparable with high-value services, (3) services that experienced a decline followed by a slower rebound than high-value services, and (4) services that declined but have not experienced a rebound. The first category included services for which we observed limited or no decline in utilization attributable to COVID-19. This set of services included bacterial vaginosis screening and hormone replacement therapy, which both remained above 84% of monthly 2019 first-quarter volumes in April 2020 and in January 2021. The second included services whose volume declined because of COVID-19 but showed a robust rebound similar to their high-value counterparts. This category included prostate cancer screenings, which rebounded to 111.8% of 2019 volume by January 2021, a stronger rebound than that of comparable higher-value services of HbA<sub>1c</sub> testing, hepatitis B and C screening, and cholesterol testing for individuals 70 years and older, which had rebound volumes of 102.2%, 99.5%, and

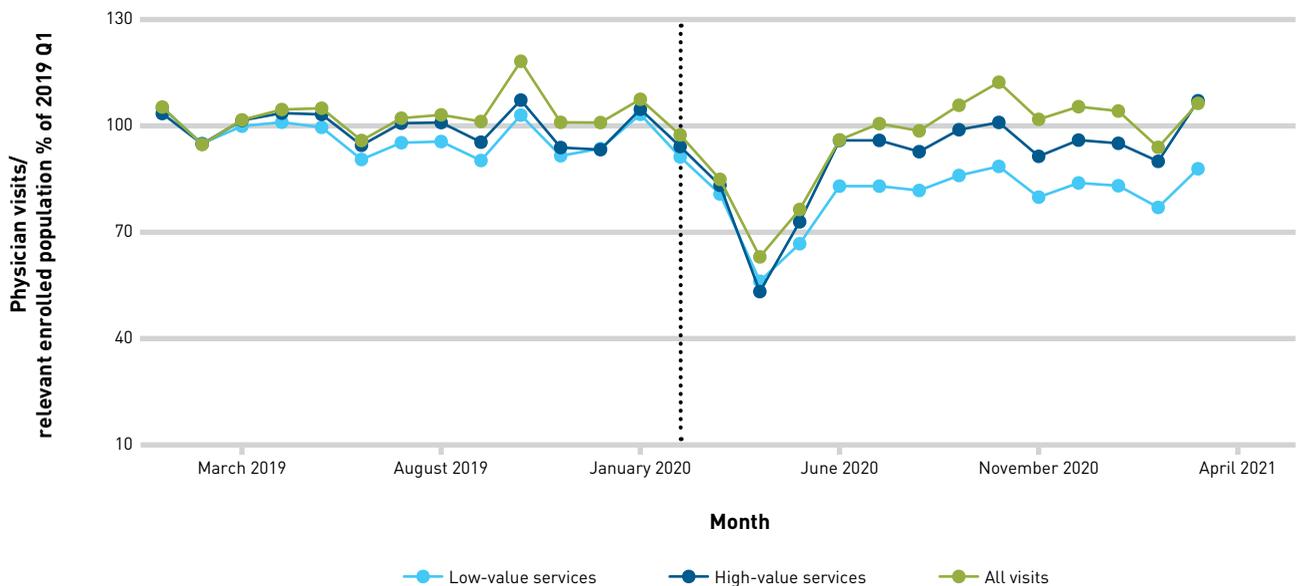
73.6% of 2019 volume, respectively. The third category contained services for which a pandemic-associated decline was observed and the rebound was slower than that of comparable higher-value services. Asymptomatic bacteriuria testing and herpes screening are in this category. These low-value services have rebounded in volume over time, although the rates of rebound for asymptomatic bacteriuria testing remained below those of comparable services, such as cholesterol testing, HIV testing, and HbA<sub>1c</sub> testing, and herpes screening lagged behind testing for hepatitis B and C. Finally, the fourth category contained services whose utilization declined during the pandemic and has not rebounded substantially. COPD screening declined by nearly 80% compared with the baseline volume in January 2020, which is twice the magnitude of decline for lung cancer screening or all nontelemedicine visits in our data. The decline was sustained with levels 60% below baseline 2019 levels, even in the first quarter of 2021.

## DISCUSSION

Although our results may not be causal, they document a sharp decline in most low-value services at the onset of the COVID-19 pandemic, with magnitudes generally similar to changes in utilization of comparison higher-value services. The rebound of these low-value services, however, was not uniform. Of the 4 low-value services that experienced a sharp decline, most exhibited a slower rebound than comparable higher-value services and slower rebound relative to all health care visits. As the [Figure](#) shows, when weighting each of the low-value and high-value services equally to create aggregate indices, the index of lower-value services rebounded slower than the index of high-value services. This suggests that resuming lower-value services may have been perceived to be a lesser priority by providers and patients as health care encounters rebounded during the later months of the pandemic. At the same time, robust rebound in some low-value health care services suggests that other factors may also play an important role in this type of decision-making. Our results show that, although low-value care did, on average, rebound to a lower degree, there is significant heterogeneity across services. This would suggest that health systems would need interventions that are more targeted than a 1-time disruption to reduce usage of low-value services. Furthermore, because the heterogeneity in services may be driven by idiosyncratic factors unrelated to perceived value, our results should be coupled with robust qualitative analyses to further elucidate how providers and patients made decisions about service provision and usage, respectively, and consequently what policies need to be designed to better align this behavior with value.

### Limitations

Our study has several limitations. First, data were limited to 12 months from the start of the pandemic, and some of the patterns observed may not persist in the future. However, most claims-based studies of health care use during the pandemic have yet to contain 12 months of postpandemic data. Second, as this is a “Trends from

**FIGURE.** Low-Value and High-Value Services and All In-person Visits Normalized by Relevant Enrolled Population

Q, quarter.

the Field” paper, we did not attempt to isolate specific clinical mechanisms or explanations for the observed changes in utilization. Although the initial drop-off in utilization was likely because of patients forgoing nonurgent care and outpatient providers reducing access,<sup>21</sup> why some low-value services rebounded more than others is likely explained by clinical factors specific to the service. For example, the drop-off in COPD screening may have persisted because COPD screening requires patients to perform lung maneuvers without a mask that are particularly high risk for providers during COVID-19. In contrast, blood tests such as the PSA screening can be done with the patient masked. Thus, this paper does not establish a causal link between value and patterns of care during the pandemic. Other factors that may be associated with changing utilization patterns for these services may be unrelated to clinical value. In fact, the heterogeneity of results with respect to value suggests that this is the case and, as a result, stakeholders interested in improving the value of care must better understand the diverse drivers of utilization. Third, the analyses focused on commercially insured populations who are younger and likely of higher socioeconomic status than the general US population and may differ from other populations, such as those covered under Medicaid or traditional Medicare.

## CONCLUSIONS

To our knowledge, this is the first large-scale claims-based analysis comparing changes in the volume of high-value and low-value services during the COVID-19 pandemic and its recovery. The finding

that multiple low-value services rebounded slower than comparable high-value services suggests that the pandemic may have had heterogeneous effects on consumer and provider decision-making along the dimension of clinical value. Whether such clinically nuanced effects are largely transient or whether they persist to help nudge the delivery system toward higher value remains to be seen. Given that some low-value services had a robust rebound, there is a need for interventions that more clearly target low-value care as opposed to blunt disruptions such as the pandemic to reduce these types of low-value care. ■

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## TRENDS FROM THE FIELD

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**Authorship Information:** Concept and design (MS, ZS, MEC, AMF); acquisition of data (MS, MEC); analysis and interpretation of data (MS, ZS, MEC, AMF); drafting of the manuscript (MS); critical revision of the manuscript for important intellectual content (MS, ZS, MEC, AMF); statistical analysis (MS, ZS); obtaining funding (ZS); and supervision (ZS, MEC, AMF).

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eAppendix Table 1:

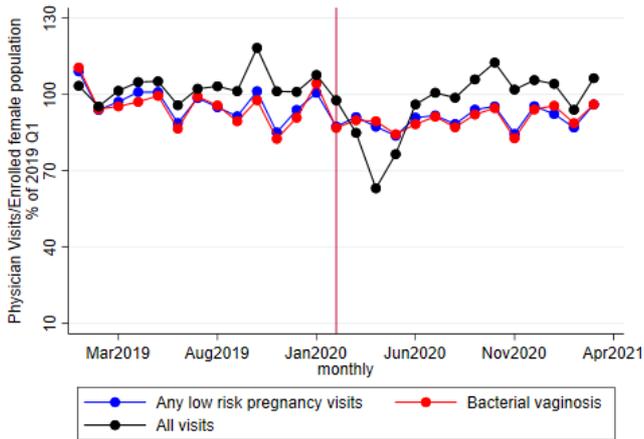
Topic Name	Identification
<p>Bacterial Vaginosis in Pregnant Persons to Prevent Preterm Delivery: Screening (Applied to women who are not at increased risk for preterm delivery)</p>	<p>Extract commercial members with a CPT code for 87798 or 87511 and the following ICD codes: <b>Z3400, Z3401, Z3402, Z3403, Z3490, Z3491, Z3492, Z3493, Z36</b></p>
<p>Asymptomatic Bacteriuria in Adults: Screening (Has a D-rating for non-pregnant persons)</p>	<p>Extract commercial and Medicare members with a CPT code for 87086. Remove individuals with concurrent diagnosis for dysuria and urinary frequency (R300, R350)</p>
<p>Cervical Cancer: Screening (Has a D-rating for women younger than 21 years)</p>	<p>Extract commercial members with a diagnosis code of Z12.4. Retain only individuals with age&lt;21</p>
<p>Hormone Therapy in Postmenopausal Women: Primary Prevention of Chronic Conditions</p>	<p>Extract commercial and Medicare pharmacy claims for hormone replacement therapy as identified by generic and brand names of FDA approved drugs in this category. Restrict to age&gt;50.</p>
<p>Genital Herpes Infection: Serologic Screening</p>	<p>Extract commercial members with a CPT code for 86695, 86696. Remove individuals with concurrent diagnosis for herpes simplex infection (B00) or pain(R52).</p>
<p>Chronic Obstructive Pulmonary Disease: Screening</p>	<p>Extract commercial and Medicare members with a CPT code for 94010, 94011, 94012, 94013, 94014, 94015, 94016, 94060, 94070, 94150, 94200, 94375, 94450, 94452, 94453, 94610, 94617, 94618, 94619, 94621, 94640, 94642, 94644, 94645, 94660, 94662, 94664, 94667, 94668, 94669, 94680, 94681, 94690, 94726, 94727, 94728, 94729, 94760, 94761, 94762, 94774, 94775, 94776, 94777, 94780, 94781 or 94799. Remove individuals with concurrent diagnosis for COPD (J41, J42, J43, J44), asthma (J45) and dyspnea (R060).</p>
<p>Prostate Cancer</p>	<p>Extract claims for male commercial and Medicare members with a CPT code G0103</p>

Source: [USPSTF website](#), published recommendations sorted by D rating, as of March 10, 2021

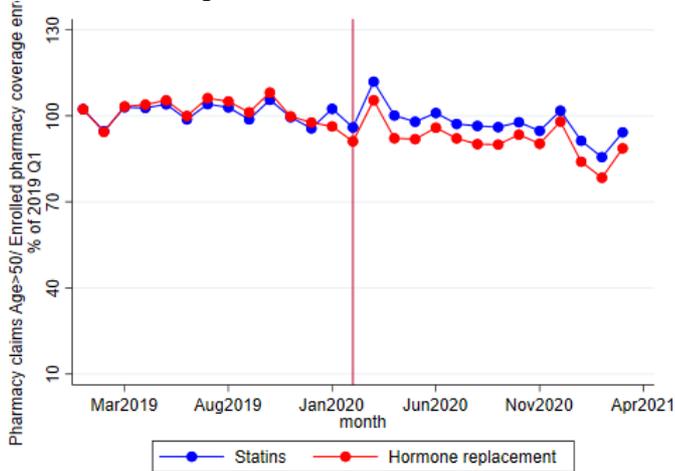
eAppendix Table 2: Comparable high value services

Topic	Identification
Any low-risk pregnancy visit	Extract commercial members with the following ICD codes: Z3400, Z3401, Z3402, Z3403, Z3490, Z3491, Z3492, Z3493, or Z36
Hgb A1c	Extract commercial members with a CPT code for 83036 or 83021
Cholesterol	Extract commercial members with a CPT code for 80061, 82465, 83718, or 84478
HIV test	Extract commercial members with a CPT code for 86701, 86702, 86703, 86689, G0435, 87534, 87535, 87536, 87537, G0432, G0433, 87389, 87390, 87391, 87538, or 87539
Cervical cancer screening for 21-64	Extract commercial members with a diagnosis code of Z12.4. Retain only individuals with age>21
Statins	Extract commercial and Medicare pharmacy claims for statins as identified by generic and brand names of FDA approved drugs in this category. Restrict to age>50.
Hepatitis B and/or C	Extract commercial members with a CPT code for 87431 or 87522
Lung cancer screening	Extract commercial members with a CPT code for 71271, 71250, or G0297

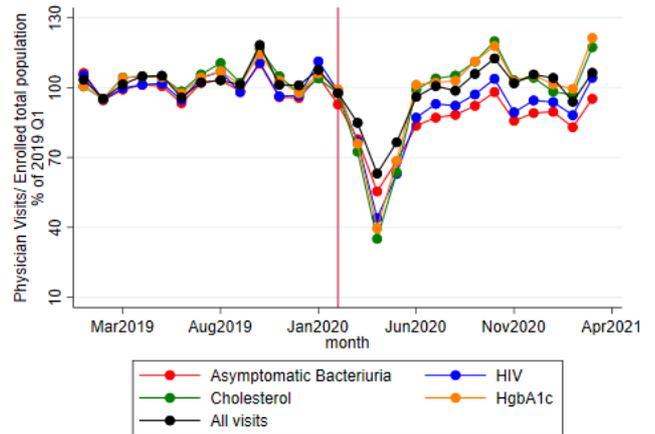
- 1) No or modest decline during COVID-19  
 a. Bacterial vaginosis testing for low risk pregnancies



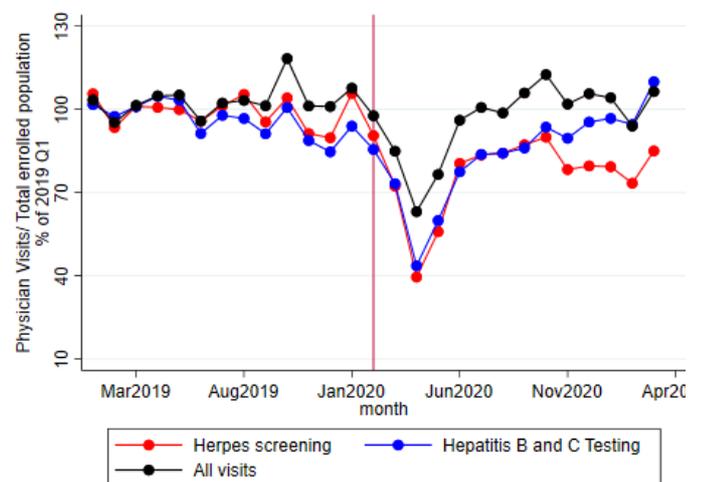
- b. Hormone replacement therapy for post-menopausal women



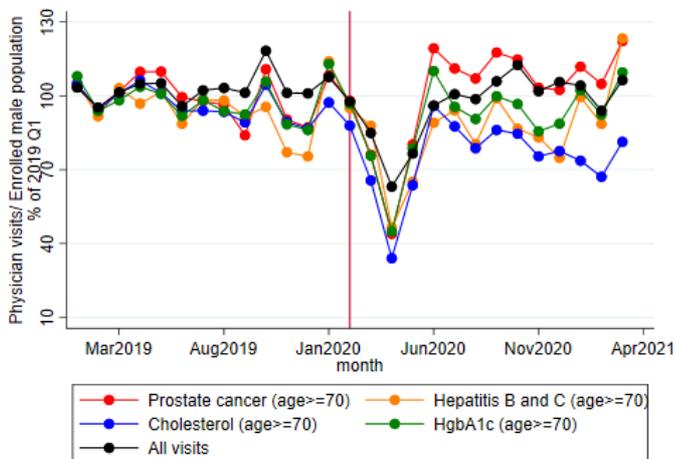
- 3) Decline during COVID with slower rebound  
 a. Asymptomatic bacteriuria testing



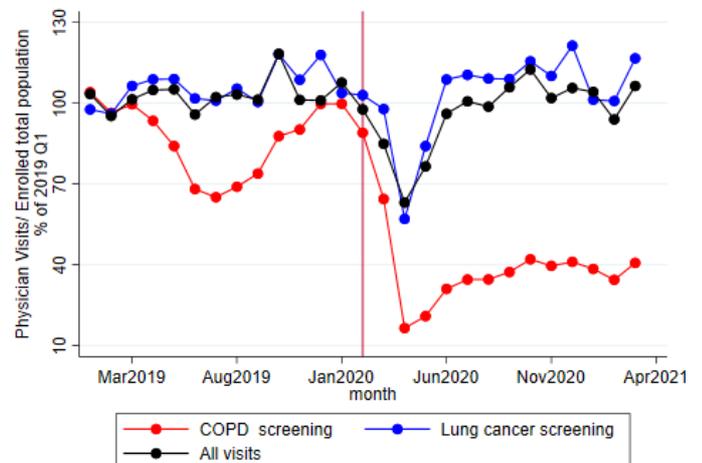
- b. Herpes screening



- 2) Decline during COVID with robust rebound  
 a. Prostate cancer screenings for males over 70



- 4) Decline during COVID with no rebound  
 a. Asymptomatic COPD screening



Notes: Red lines denote low-value services of interest for all sub-figures. Black lines denote all visits for all sub-figures except hormone replacement therapy which is not compared to all visits since we do not require prescription fills to be accompanied by a patient visit.