# HEALTHCARE RESOURCE USE AND COSTS FOR METASTATIC PROSTATE CANCER **BEFORE AND AFTER PROGRESSION TO CASTRATION RESISTANCE**

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## INTRODUCTION

- Prostate cancer (PC) is the second most common cancer in men in the United States, representing 27% of newly diagnosed cancers and estimated to be responsible for 34,700 deaths in 2023<sup>1</sup>
- While most patients will initially respond to androgen deprivation therapy (ADT) for locally advanced and metastatic prostate cancer, the majority of patients with metastatic hormone-sensitive PC (mHSPC) will inevitably develop treatment resistance and progress to metastatic castration-resistant PC (mCRPC) within an average of 18–24 months<sup>2-4</sup>
- While patients with mHSPC generally have a better prognosis compared to those with mCRPC, there is yet limited real-world evidence on differential healthcare resource use (HRU) and cost burden associated with disease progression

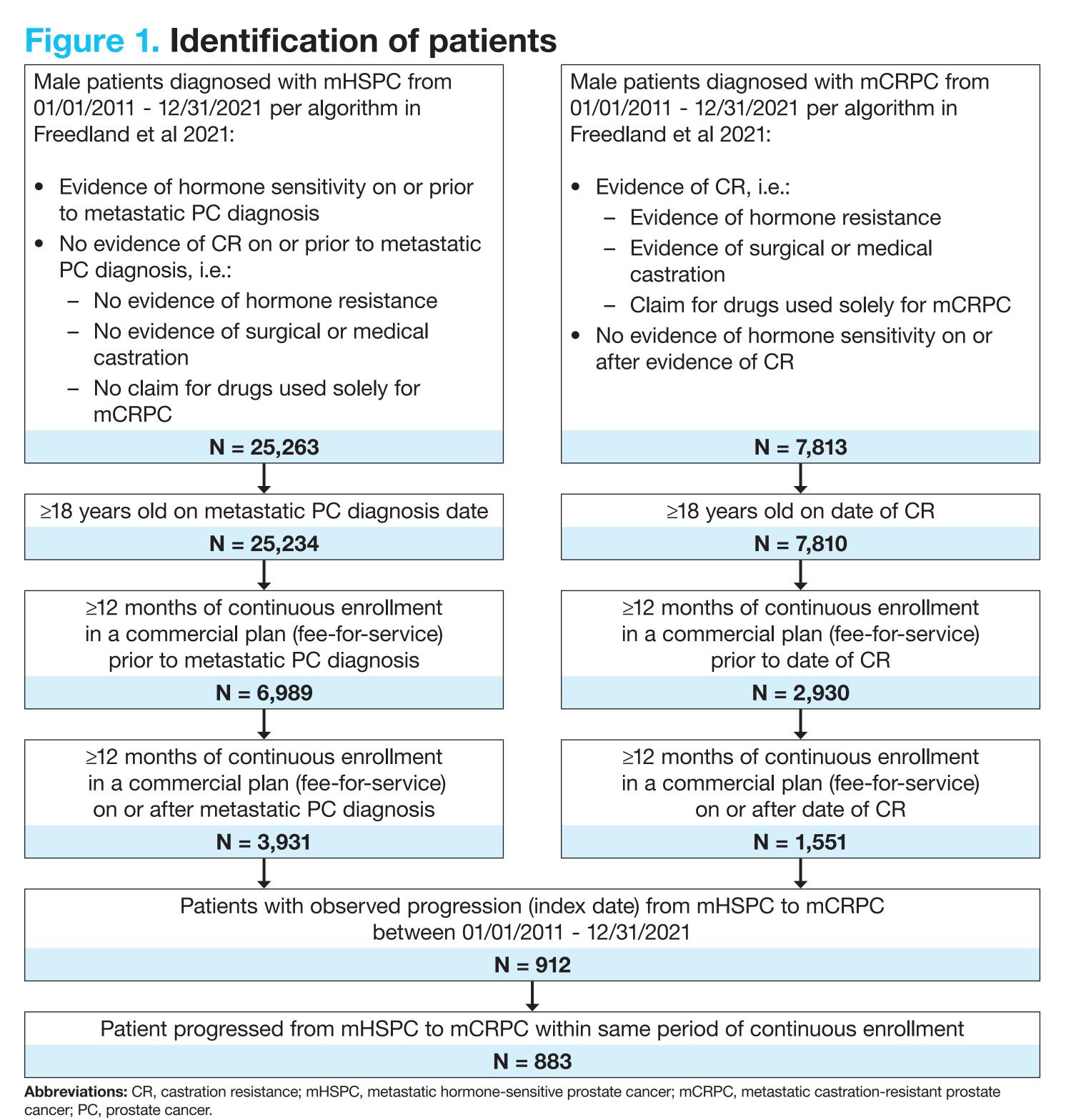
### OBJECTIVE

• To compare all-cause and PC-related HRU and healthcare costs (payer perspective) among commercially insured patients with metastatic PC before and after progression to castration resistance (CR) using a large health plan claims database

## METHODS

#### Data source and cohort selection

- Health insurance claims data from January 1, 2011 through December 31, 2021 from the IQVIA PharMetrics<sup>®</sup> Plus database were analyzed retrospectively
- Algorithms developed by Freedland et al 2021<sup>5</sup> were used to identify males with mHSPC and males with mCRPC in the data (Figure 1). Patients were subsequently included in this analysis if they met the following additional criteria:
- Progressed from mHSPC to mCRPC (index date) within the data time range (01/01/2011 - 12/31/2021)
- Progressed from mHSPC to mCRPC within the same period of continuous enrollment in a non-capitated commercial (i.e., fee-for-service) plan



### Study measures

#### Patient characteristics

- Patient characteristics including demographics and comorbidities were assessed during the 6 months before first evidence of progression to CR (index date)
- HRU
- index date (mCRPC period)
- for PC
- By site of care: inpatient (IP) admissions, emergency room (ER) visits, and outpatient (OP) visits - IP admission length of stay (LOS) was summarized only among patients who had  $\geq 1$  IP admission

#### Costs

- Costs from the payer perspective were assessed during the 6-month period before (pre-mCRPC period) and the 6-month period after the index date (mCRPC period). These included: Medical costs (i.e., IP, ER, and OP) incurred for medical services
- All-cause (any diagnosis) vs PC-related (with PC-associated diagnosis code)
- Pharmacy costs, all-cause
- Total healthcare costs (i.e., medical plus pharmacy)
- Costs were adjusted to 2022 US dollars (\$) using the medical care component of the Consumer Price Index

#### **Statistical analyses**

- Continuous variables were summarized using means and standard deviations (SDs). Categorical variables were summarized using frequency counts and proportions
- Comparisons between the pre-mCRPC and mCRPC periods were conducted using Wilcoxon signed-rank test for continuous variables and McNemar's tests for categorical variables

## RESULTS

### Patient characteristics (Table 1)

- This analysis included 883 male patients with observed progression from mHSPC to mCRPC in the data (Figure 1
- Average age at index date was 52.1 years, the majority of patients had preferred provider organization (PPO) insurance (85.7%), and most were from the South (35.1%) or the Midwest (29.7%)
- Patients in this analysis were younger than the general patient at CR likely owing to being an exclusively commercially insured cohort [and requirement of sufficient prospective data to capture the pre-/post-CR transition
- Average CCI was 5.8, with most common non-cancer CCI comorbidities being diabetes (21.2%) and liver disease (10.3%)
- Among non-CCI comorbidities, the most common was hypertension (48.9%), followed by visceral metastases (25.1%) and obesity (11.6%)

### Patient characteristics during the pre-mCRPC period

Patient characteristics, mean ± SD or n (%)	Patients with PC who progressed to mCRPC (N=883)
Demographics	
Age (years)	52.1 ± 2.3
Male	883 (100.0%)
Region	
South	310 (35.1%)
Midwest	262 (29.7%)
Northeast	157 (17.8%)
West	150 (17.0%)
Unknown	4 (0.5%)
Insurance type	
PPO	757 (85.7%)
POS	76 (8.6%)
Consumer directed health care	31 (3.5%)
Indemnity/traditional	19 (2.2%)
Comorbidities	
CCI	5.8 ± 1.9
Hypertension	431 (48.9%)
Visceral metastases	221 (25.1%)
Obesity	102 (11.6%)
Depression	80 (9.1%)
Fractures	48 (5.4%)
Falls	4 (0.5%)

- HRU was assessed during the 6-month period before (pre-mCRPC period) and the 6-month period after the
- All-cause vs PC-related HRU was identified from medical claims that had an associated diagnosis code

Abbreviations: CCI, Charlson Comorbidity Index; PC, prostate cancer; POS, point-of-service; PPO, preferred provider organization; SD, standard deviation.

#### **OP** visits

- OP visits were the greatest contributor to all-cause and PC-related HRU during the pre-mCRPC and mCRPC periods. PC-related OP visits accounted for the major share of all-cause OP visits during both pre- and post-mCRPC periods (Figure 2)
- Almost all patients had all-cause (n [%]: 881 [99.8%] vs 880 [99.7%]) and PC-related OP visits (876 [99.2%] vs 873 [98.9%]) during both the pre-mCRPC and mCRPC periods. This is expected given routine OP visits are common for patients with PC
- However, patients had significantly greater numbers of both all-cause (mean  $\pm$  SD: 21.0  $\pm$  16.0 vs 17.8 ± 12.8; P<0.001) and PC-related (15.9 ± 14.8 vs 12.4 ± 10.5; P<0.001) OP visits during the mCRPC period vs the pre-mCRPC period

#### **IP** admissions

- All-cause IP admissions occurred in 142 (16.1%) and 127 (14.4%) of patients during the pre-mCRPC and mCRPC periods, respectively
- While the average number of all-cause IP admissions was comparable between the pre-mCRPC and mCRPC periods (mean  $\pm$  SD: 0.2  $\pm$  0.5 for both periods), there was a trend towards longer LOS per IP admission in the mCRPC vs pre-mCRPC period (mean  $\pm$  SD: 10.1  $\pm$  15.4 days vs  $7.4 \pm 10.2$  days; P=0.20)
- Trends were similar for PC-related IP admissions and LOS

#### **ER** visits

- A significantly greater number of patients had a PC-related ER visit during the mCRPC period vs premCRPC period (n [%]: 116 [13.1%] vs 84 [9.5%]; P<0.01)
- Similarly, the number of PC-related ER visits was significantly greater in the mCRPC period vs premCRPC period (mean  $\pm$  SD: 0.2  $\pm$  0.8 vs 0.1  $\pm$  0.6; P<0.001)

### lealthcare costs

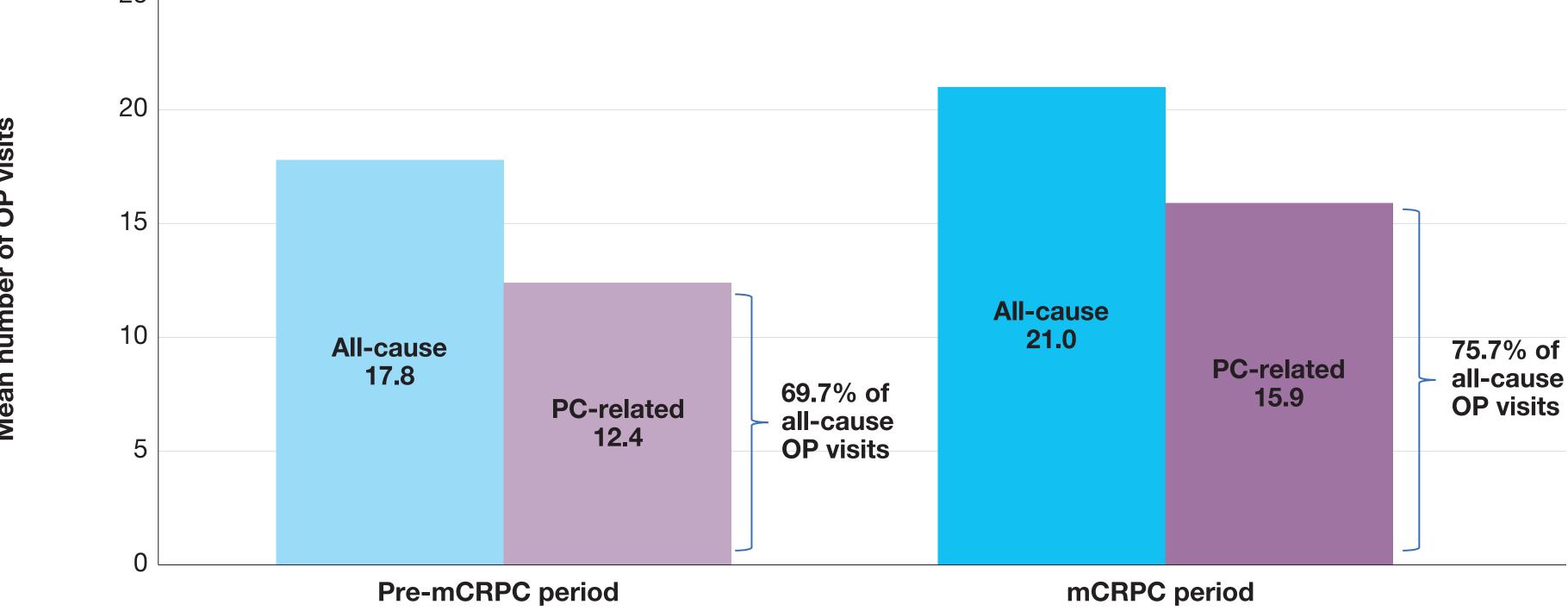
#### **Total healthcare costs (Figure 3)**

- Total all-cause healthcare costs were significantly higher ( $\$86,003 \pm \$83,661 \text{ vs} \$42,953 \pm \$55,056;$ P<0.001) in the mCRPC period vs pre-mCRPC period
- All-cause medical costs were the greatest contributor to total costs in both periods and were significantly higher in the mCRPC period vs pre-mCRPC period ( $$48,208 \pm $72,054$  vs  $$36,104 \pm$ \$51,929; P<0.001)
- Pharmacy costs were significantly higher in the mCRPC period ( $37,795 \pm 44,019$  vs \$6,849 ± \$16,277; P<0.001) and accounted for a greater proportion (nearly triple) of the total all-cause healthcare costs (43.9% in the mCRPC period vs 15.9% in the pre-mCRPC period)
- The mean difference in all-cause total healthcare costs between the mCRPC and pre-mCRPC periods was \$43,050 and was primarily driven by the increase in pharmacy costs (\$30,946)

#### Medical costs (Figure 4)

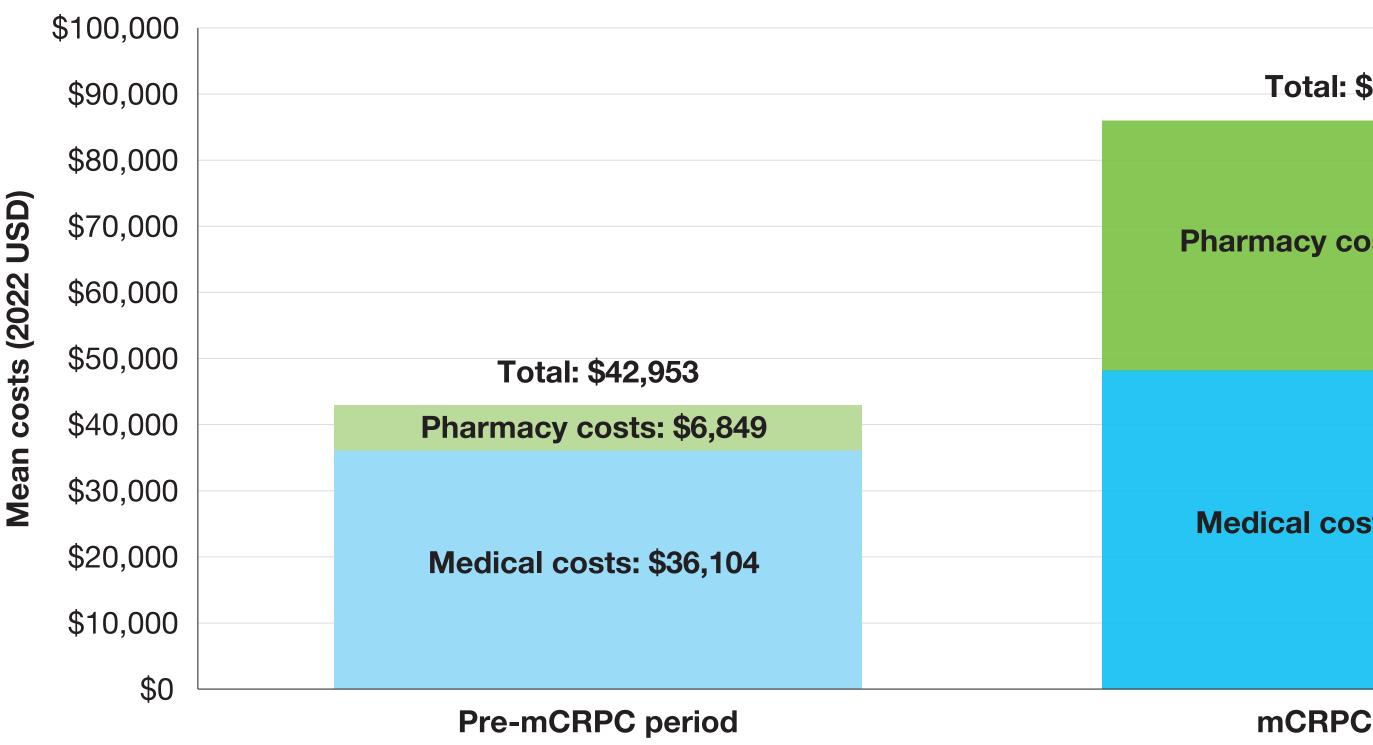
- All-cause medical costs
- OP costs were the biggest driver of all-cause medical costs in both periods and were significantly higher in the mCRPC period compared to the pre-mCRPC period (\$39,481 ± \$56,570 vs \$28,047 ± \$41,756; P<0.001). This result is consistent with the above findings as the OP visits were the greatest contributor to HRU
- The increase in OP costs (\$11,434) accounted for 94.5% of the increase in medical costs from the pre-mCRPC period to the mCRPC period (\$12,104)
- On average, IP and ER costs were numerically higher in the mCRPC period vs pre-mCRPC period (IP:  $\$7,549 \pm \$39,260 \text{ vs} \$7,209 \pm \$29,159$ ; ER:  $\$1,018 \pm \$3,803 \text{ vs} \$768 \pm \$3,802$ )
- PC-related medical costs
- PC-related medical costs accounted for over 75% of the total all-cause medical costs in the premCRPC (78.0%) and mCRPC (78.9%) periods
- PC-related medical costs were significantly higher in the mCRPC period vs pre-mCRPC period (\$38,026 ± \$57,306 vs \$28,162 ± \$42,750; p<0.001)
- PC-related OP costs were the greatest contributor to PC-related medical costs during both periods and were significantly higher in the mCRPC period vs pre-mCRPC period (\$34,296 ± \$53,973 vs \$23,873 ± \$39,867; P<0.001)
- OP costs were the greatest driver of the increase in PC-related medical costs from pre-mCRPC to mCRPC
- PC-related IP costs were significantly lower in the mCRPC period vs pre-mCRPC period (\$3,025) ± \$14,039 vs \$4,001 ± \$14,341; P<0.05)
- PC-related ER costs were significantly higher in the mCRPC period vs pre-mCRPC period (\$600 ± \$3,108 vs \$250 ± \$1,382; P<0.1)





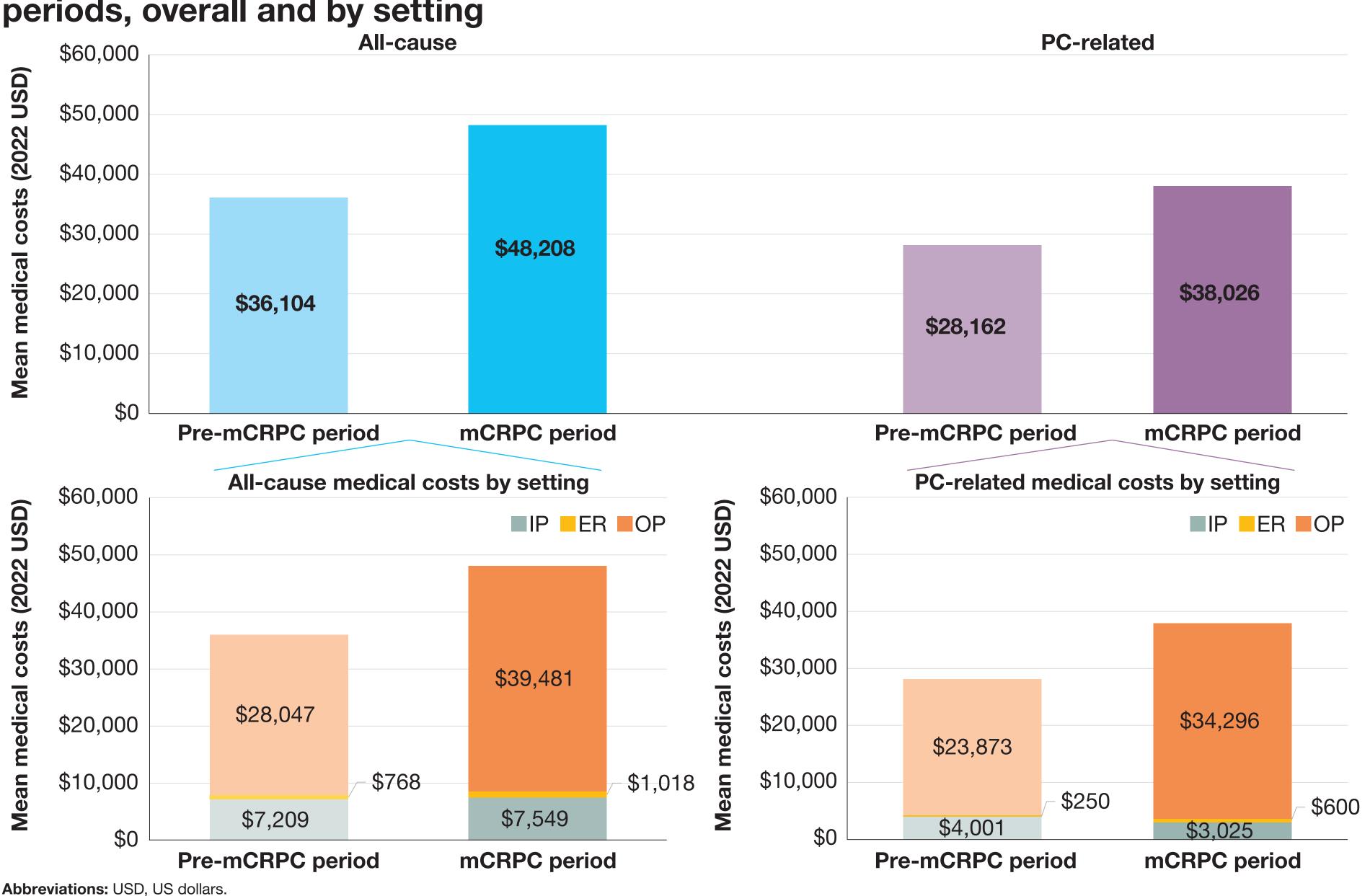
Abbreviations: OP. outpatient: PC. prostate cancer

#### igure 3. All-cause healthcare costs during the pre-mCRPC and mCRPC periods



Abbreviations: USD, US dollars.

#### Figure 4. All-cause and PC-related medical costs during the pre-mCRPC and mCRPC periods, overall and by setting



\$86,003	
osts: \$37,795	
sts: \$48,208	
C period	

## LIMITATIONS

- Diagnoses and procedures were identified via codes used for administrative billing purposes and may be subject to coding incompleteness or inaccuracies
- Clinical information without associated claims codes (i.e., laboratory results, and clinical markers of disease severity or pathology) could not be assessed in this database
- Mortality data is not observable in this data, and thus only eligible cancer survivors were included in the analysis
- These results were limited to patients with non-capitated commercial insurance in the US, and thus may not be generalizable to other patient populations

## CONCLUSIONS

- Among patients with metastatic PC, progression to CR was associated with significantly greater HRU in terms of OP visits (all-cause, PC-related) and both the number of patients with ER visits (PC-related) and the collective number of ER visits (PC-related)
- Reflective of greater HRU, progression was associated with significantly higher healthcare costs
- All-cause and PC-related medical costs increased significantly as driven by an increase in OP costs pre-vs post-progression (all-cause OP costs: \$28,047 vs \$39,481; PC-related OP costs: \$23,873 vs \$34,296)
- Pharmacy costs increased significantly and accounted for a greater proportion of total cost pre- vs post-progression (15.9% vs 43.9%)
- The study highlights the persisting unmet need for therapies with optimal risk-benefit profiles for appropriate treatment intensification to minimize HRU and cost burden overall, and especially the increase in both upon progression to mCRPC

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