



# Healthcare Expenditures for Persons with ESRD

## Highlights

- Total Medicare-related expenditures for beneficiaries with ESRD rose to \$51.0B in 2019 (Figure 9.1). Between 2009 and 2019, total expenditures increased 50% in nominal (non-inflation-adjusted) dollars but by only 13.3% after adjustment for inflation (current dollars). Inflation-adjusted expenditures for beneficiaries with Medicare fee-for service (FFS) as primary payer (MPP) only and those with dual Medicare MPP and Medicaid coverage declined slightly with adjustment for inflation.
- Expenditures were consistently highest for dually eligible, lowest for Medicare FFS only, and intermediate for Medicare Advantage (MA) beneficiaries (Figure 9.2).
- Medicare FFS expenditures for beneficiaries with ESRD increased without adjustment for inflation (from \$28.0B in 2009 to \$37.3B in 2019) but were relatively stable in inflation-adjusted dollars (\$37.2B in 2009 vs. \$37.3B in 2019). ESRD expenditures accounted for 7.1-7.2% of total Medicare expenditures throughout the decade considering adjustment for inflation (Figure 9.3).
- Among incident patients with ESRD, the percentage with non-Medicare coverage remained relatively constant (Figure 9.4a). The percentage with Medicare MPP (with Medicare only or with dual Medicare and Medicaid coverage) fell, from 44.2% in 2009 to 32.6% in 2019. Conversely, the percentage of patients with MA increased from 15.0% to 24.9%, representing an increase of 66% in relative terms.
- Point prevalent patients with ESRD had greater use of Medicare-only coverage than did incident patients (31.9% versus 23.3% in 2019, respectively) and greater use of dual Medicare and Medicaid (22.3% versus 9.3% in 2019, respectively) (Figure 9.4b).
- Inflation-adjusted inpatient spending decreased from \$13.8B to \$12.2B from 2009 to 2019, while outpatient spending increased 12% from \$11.7B to \$13.1B; outpatient spending surpassed inpatient spending in 2014 to become the largest category of costs (Figure 9.5).
- In inflation-adjusted dollars, per person per year (PPPY) inpatient spending decreased from \$33,346 in 2009 to \$25,082 in 2019, a drop of approximately 25% (Figure 9.6). Inflation-adjusted PPPY outpatient spending fell less than inpatient spending, from \$30,738 in 2009 to \$28,630 in 2019, thus becoming the largest category of spending from 2012 onward.
- Although overall outpatient costs increased almost 50% between 2009 and 2019 in nominal (not adjusted for inflation) dollars, the inflation-adjusted increase was approximately one quarter as great at 11.5% (Figure 9.7). This includes a \$1.1B increase in dialysis-related costs between 2017 and 2019 that is likely due to transitional drug add-on payment adjustments (TDAPA) for calcimimetic drugs.
- Peritoneal dialysis (PD) was 22.7% less expensive than hemodialysis (HD) in 2009 and 14.3% less expensive in 2019 in inflation-adjusted terms (Figure 9.10).

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## Introduction

In 1972, Medicare eligibility was extended to persons with “irreversible kidney failure.” The Assistant Secretary for Health in the Department of Health, Education, and Welfare was informed in 1972 by his analysts that, once the ESRD program was in “steady-state,” approximately 20,000-30,000 patients would be receiving maintenance dialysis and that annual costs of the ESRD program would equilibrate at approximately \$1B (\$6.1B in 2019 dollars). However, at the end of 2019, there were over 550,000 patients receiving maintenance dialysis, representing approximately 1% of the U.S. Medicare FFS population and accounting for approximately 7.2% of Medicare FFS spending.

In this chapter, we report unadjusted and inflation-adjusted trends in Medicare-related spending for beneficiaries with ESRD between 2009 and 2019. We refer to unadjusted dollars as “unadjusted for inflation” or as “nominal” dollars, whereas inflation-adjusted dollars can be considered as current dollars (as the year on which inflation adjustment is based is 2019, or the most current year in this chapter) or constant dollars. We then examine trends in total Medicare and ESRD FFS spending as well as ESRD spending as a percentage of total Medicare spending. We next explore sources of coverage for the care of incident and prevalent patients with ESRD, followed by detailed analyses of Medicare ESRD FFS spending by type of service (inpatient, outpatient, physician/supplier, skilled nursing facility, home health agency, or hospice, and Part D). New for this year's ADR, we examine expenditures for outpatient services covered by Medicare Part B. Categories include costs related to dialysis, injectable medications, radiology, pharmacy, ambulance, laboratory/pathology, and “other” services. Other outpatient services include clinical encounters, diagnostic tests, and physical and occupational therapy, among other things. Finally, we report Medicare ESRD FFS spending by cause of hospitalization and by ESRD treatment modality.

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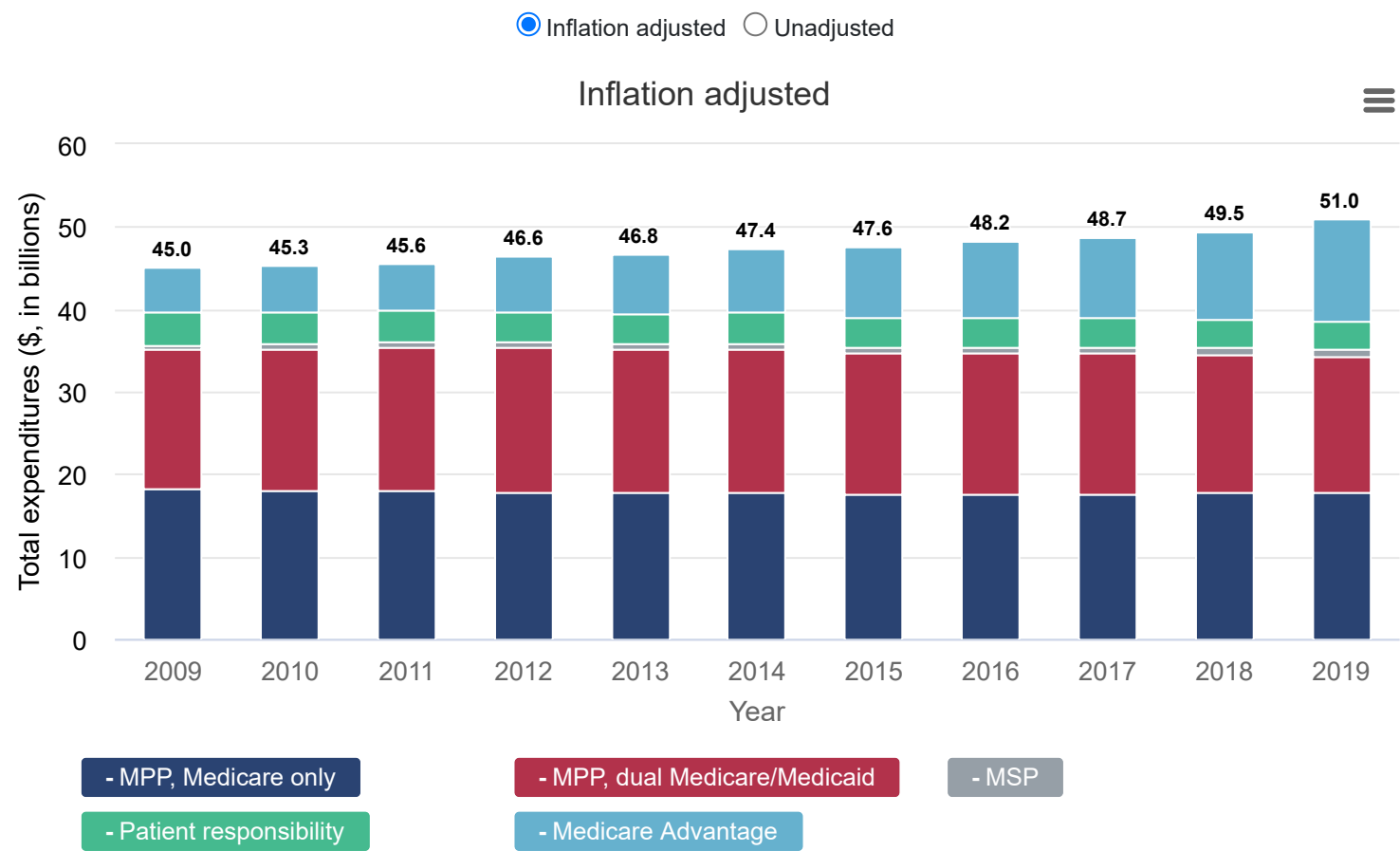
Methods

This chapter uses data primarily from the Centers for Medicare and Medicaid Services (CMS).

In this year’s ADR, we adjust for inflation in longitudinal analyses using the medical care index, a component of the Consumer Price Index ([https://data.bls.gov/timeseries/CUUR0000SAM?output\\_view=data](https://data.bls.gov/timeseries/CUUR0000SAM?output_view=data)); costs are expressed in 2019 U.S. dollars. Analyses of total Medicare expenditures for beneficiaries with ESRD include those with MPP) who have Medicare only, MPP with dual Medicare and Medicaid eligibility, Medicare as a secondary payer (MSP), and those enrolled in MA. Medicare expenditures for MA plans are estimated using the total equivalent eligible MA months determined from the USRDS payer history files (PAYHIST) multiplied by the monthly payment rates for dialysis patients published by CMS (<https://www.cms.gov/Medicare/Health-Plans/MedicareAdvtgSpecRateStats/Ratebooks-and-Supporting-Data.html>). We applied an estimated monthly payment rate for MA beneficiaries with a functioning kidney transplant, i.e., a multiplier of 0.31 relative to the monthly dialysis payment rates (<https://www.cms.gov/Medicare/Health-Plans/MedicareAdvtgSpecRateStats/Downloads/RTC-Dec2018.pdf>). When reporting cost estimates for the “patient responsibility” category, we estimate the amount as the difference between Medicare allowable and Medicare paid amounts. Costs deemed to be the patient’s responsibility may be paid by the patient, reimbursed by a secondary insurer, or may remain uncollected.

Reported Medicare ESRD expenditures for specific events or services (e.g., hospitalizations, medications) include only beneficiaries covered by traditional FFS Medicare because Medicare expenditures can be calculated from the claims submitted for payment for healthcare services provided to individuals with FFS coverage but not for individuals enrolled in MA plans. (The Medicare program pays for services provided through MA plans on a risk-adjusted, per-capita basis and not by specific claims for services.) Therefore, Part C costs are deducted to examine FFS Medicare costs for these analyses. Medicare paid expenditures for period prevalent beneficiaries with ESRD with at least 1 Medicare claim in a year include Parts A, B, and D. Unless otherwise noted, total spending estimates include beneficiaries with MPP and MSP; per person per year (PPPY) spending includes those with MPP only. When presenting total Medicare FFS inpatient spending by primary cause of hospitalization, we use definitions for cause of hospitalization as in Chapter 5.

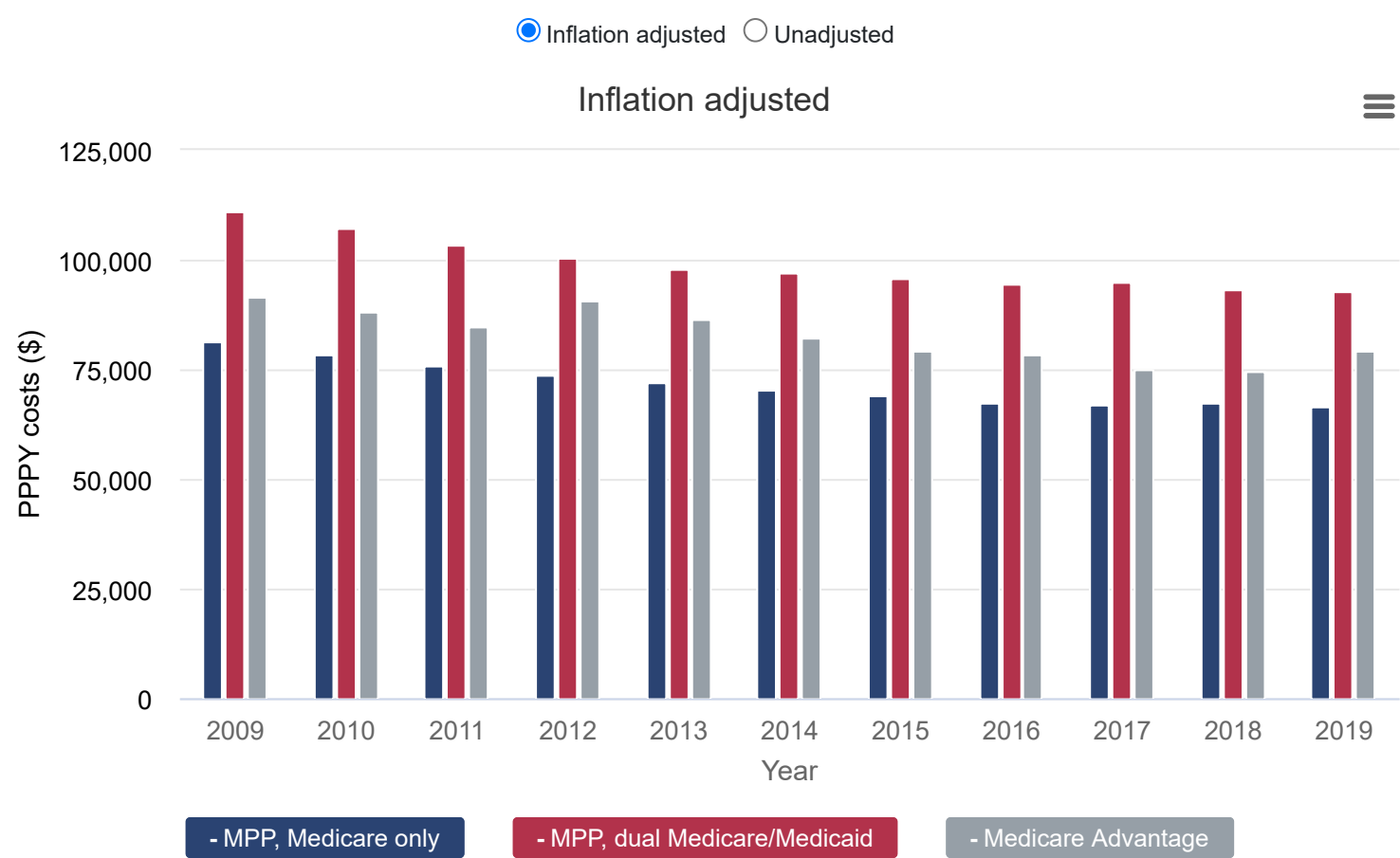
Figure 9.1 Inflation adjusted total spending for Medicare beneficiaries with ESRD, 2009-2019



Data Source: USRDS ESRD database. Period prevalent patients with ESRD with at least 1 Medicare claim in a year, 2009-2019.

Figure 9.1 displays Medicare spending for period prevalent beneficiaries with ESRD from 2009 to 2019 in unadjusted and inflation-adjusted dollars. Also shown are amounts designated as “patient responsibility” (i.e., the estimated difference between Medicare allowable and Medicare paid amounts). In unadjusted dollars, total “liabilities” (expenditures plus patient responsibilities) increased from \$34.0B in 2009 to \$51.0B in 2019. In inflation-adjusted dollars, however, total liabilities increased from \$45.0B in 2009 to \$51.0B in 2019 – 13.3% overall, or about 1.2% per annum. Even in inflation-adjusted dollars, expenditures for MA more than doubled, from \$5.4B to \$12.4B. Although unadjusted expenditures for both the MPP with Medicare only and MPP with dual Medicare and Medicaid categories increased over the decade, they both declined slightly with adjustment for inflation (from \$18.3B to \$17.8B for the former and from \$16.9B to 16.5B for the latter). Expenditures for MSP increased from \$0.5B to \$0.8B, but these expenditures were low in absolute terms. Patient responsibility costs decreased slightly.

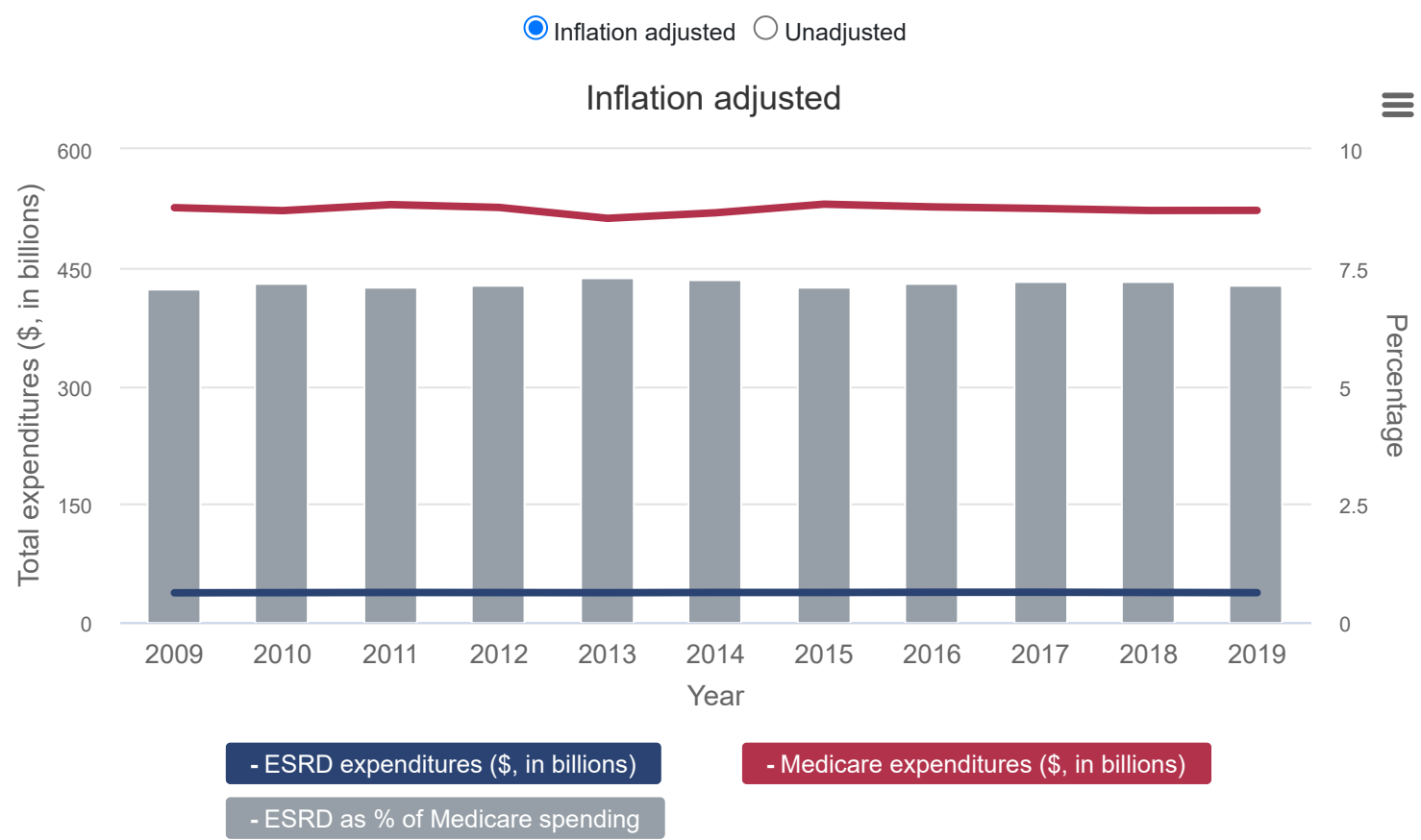
**Figure 9.2** Inflation adjusted per person per year spending in Medicare fee-for-service vs. Medicare Advantage beneficiaries with ESRD, 2009-2019



Data Source: USRDS ESRD database. Period prevalent ESRD patients with at least 1 Medicare claim in a year, 2009-2019.

Figure 9.2 shows PPPY spending for Medicare FFS-only beneficiaries, dually eligible beneficiaries with Medicare and Medicaid coverage, and Medicare Advantage enrollees with ESRD from 2009-2019. Expenditures were consistently highest for dually eligible beneficiaries, lowest for FFS only, and intermediate for MA beneficiaries. Unadjusted costs for all 3 groups increased from 2009-2019. However, the opposite was true with adjustment for inflation: expenditures for those with FFS only decreased from \$81,211 to \$66,603; for dually eligible beneficiaries from \$111,060 to \$92,686; and for MA beneficiaries from \$91,646 to \$79,316.

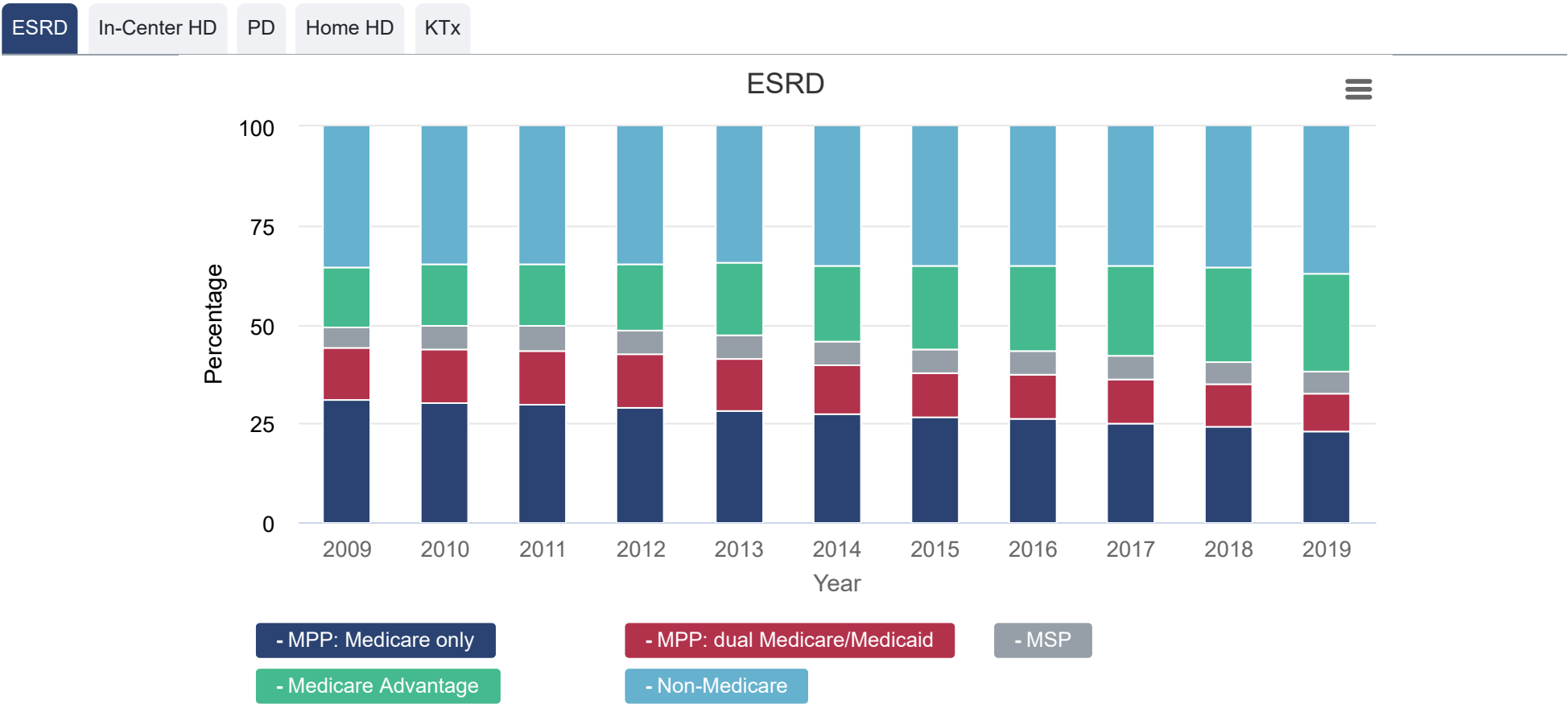
**Figure 9.3** Inflation adjusted total and ESRD spending in Medicare fee-for-service, and ESRD spending as a percentage of total Medicare spending, 2009-2019



Data Source: USRDS ESRD database. Period prevalent ESRD patients with at least 1 Medicare claim in a year, 2009-2019. Medicare FFS spending obtained from CMS Trustees Report.

Figure 9.3 shows trends in total Medicare and ESRD FFS spending (in billions of U.S. dollars), as well as the percentage of Medicare FFS spending attributable to ESRD, between 2009 and 2019, with and without adjustment for inflation. In unadjusted dollars, total FFS expenditures increased from \$396.3B in 2009 to \$522.4B in 2019. In inflation-adjusted dollars, however, expenditures did not increase (\$525.9B in 2009 and \$522.4B in 2019). (Over the same period, total U.S. gross domestic product increased from \$14.4T to \$21.3T, or 47.9% [<https://fred.stlouisfed.org/series/GDP>]). FFS expenditures for beneficiaries with ESRD followed a similar pattern as overall expenditures: they increased without adjustment for inflation (from \$28.0B in 2009 to \$37.3B in 2019) but were relatively stable in inflation-adjusted dollars (\$37.2B in 2009 vs. \$36.9B in 2019). ESRD expenditures accounted for 7.1-7.2% of total Medicare expenditures throughout the decade considering adjustment for inflation.

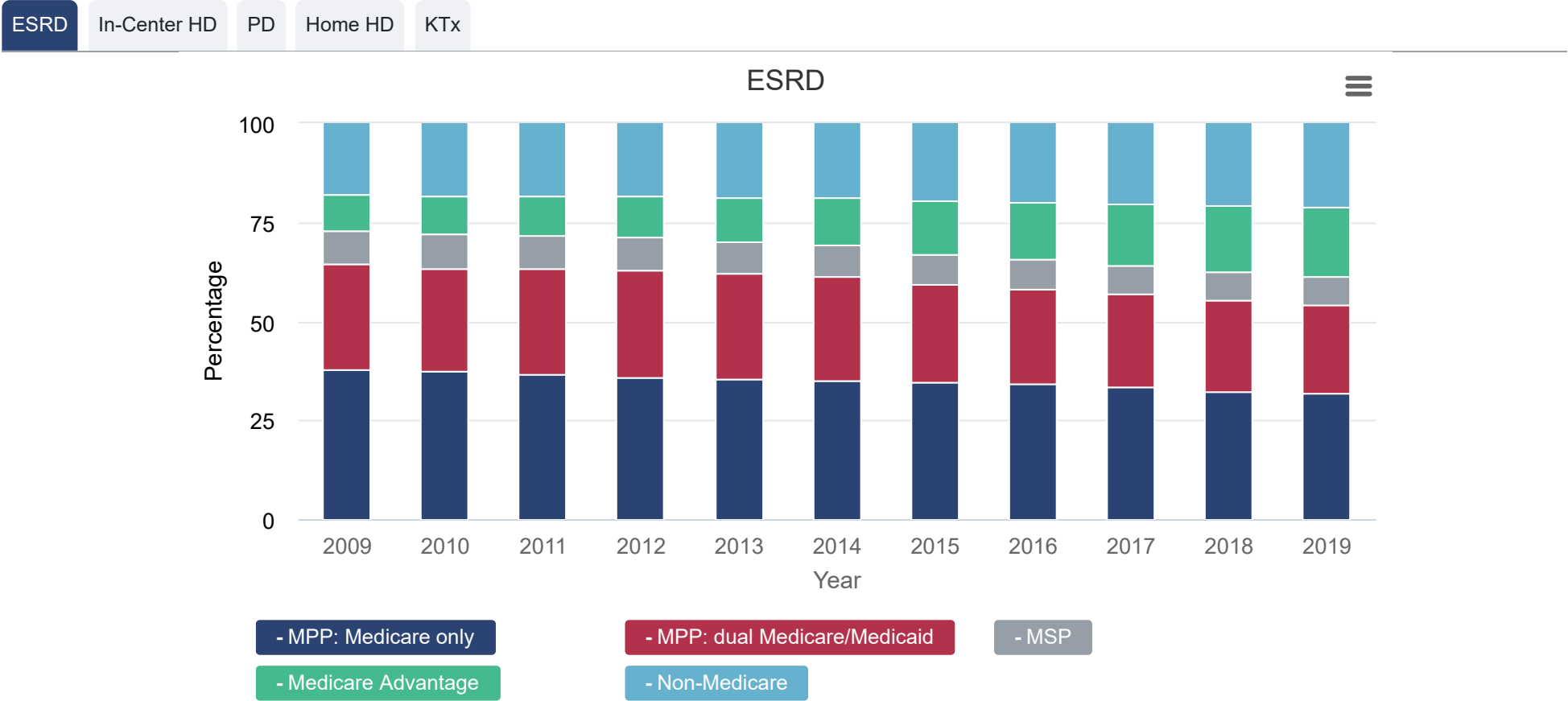
**Figure 9.4a** Sources of medical coverage for patients with incident ESRD, 2009-2019, by treatment modality



Data Source: USRDS ESRD database. Incident ESRD patients in a year, 2009-2019. Percent refers to the percent of patients in each payer category, adding up to 100% for each year's cohort.

Figure 9.4a shows trends in sources of medical coverage between 2009 and 2019 for incident patients with ESRD, overall and by ESRD treatment modality (in-center HD, home HD, PD, or kidney transplant). Among incident patients with ESRD, the percentage with non-Medicare coverage remained relatively constant, while the percentage with MPP with Medicare only fell from 31.0% to 23.3%, a decrease of 24.8% in relative terms. The percentage with MPP with dual Medicare and Medicaid coverage also fell, from 13.2% to 9.3%. However, the percentage of patients with MA increased from 15.0% to 24.9%, representing an increase of 66% in relative terms. Trends among patients receiving in-center HD were similar to overall trends in sources of medical coverage. For the home-based therapies (home HD and PD), a substantially higher percentage of patients had MSP compared with patients receiving in-center HD, and a lower percentage had non-Medicare coverage. As was the case with in-center HD, the percentage of patients using home-based therapies covered by Medicare alone decreased over time. A much greater percentage of patients receiving a kidney transplant had MSP (28.6% in 2019) compared with patients receiving in-center HD (3.6%); the percentage covered by MA, however, was relatively low among those receiving kidney transplants (8.2% in 2019).

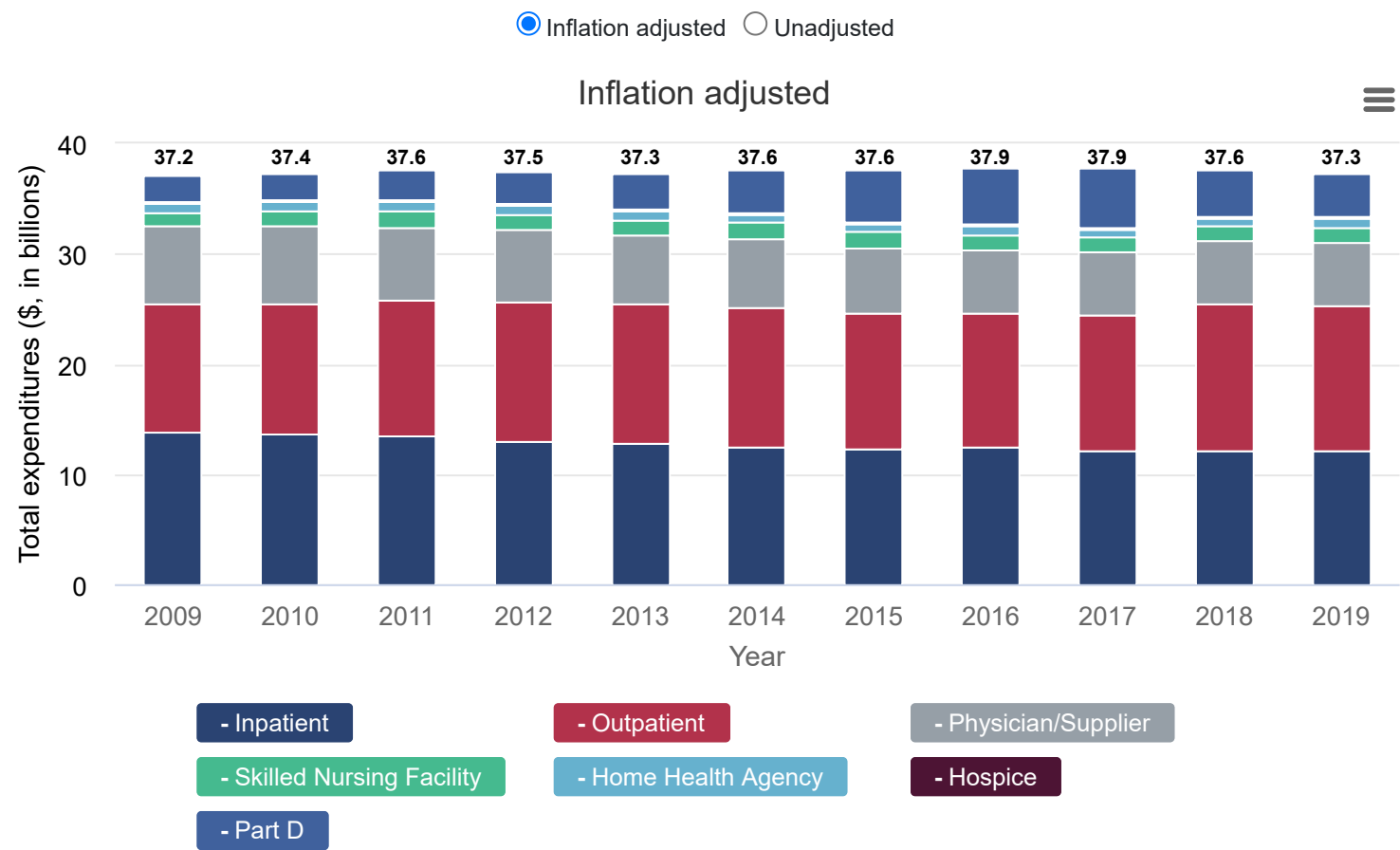
**Figure 9.4b** Sources of medical coverage for patients with prevalent ESRD, 2009-2019, by treatment modality



Data Source: USRDS ESRD database. Point prevalent ESRD patients on January 1 in a year, 2009-2019. Percent refers to the percent of patients in each payer category, adding up to 100% for each year's cohort.

Point prevalent patients with ESRD had greater use of Medicare-only coverage than did incident patients (31.9% versus 23.3% in 2019, respectively) and greater use of dual Medicare and Medicaid (22.3% versus 9.3% in 2019, respectively) (Figure 9.4b). Conversely, a much lower percentage were covered by a non-Medicare source (21.0% among point prevalent patients in 2019, compared with 37.0% among incident patients) or by Medicare Advantage (17.7% versus 24.9%). Higher percentages of patients utilizing home-based dialysis therapies had Medicare-only coverage and MSP compared with patients receiving in-center HD. Point prevalent patients with a kidney transplant were more than twice as likely to utilize non-Medicare coverage (32.9%) as patients receiving dialysis (13.8-16.1%).

**Figure 9.5** Inflation adjusted total Medicare fee-for-service spending for beneficiaries with ESRD, by type of service, 2009-2019

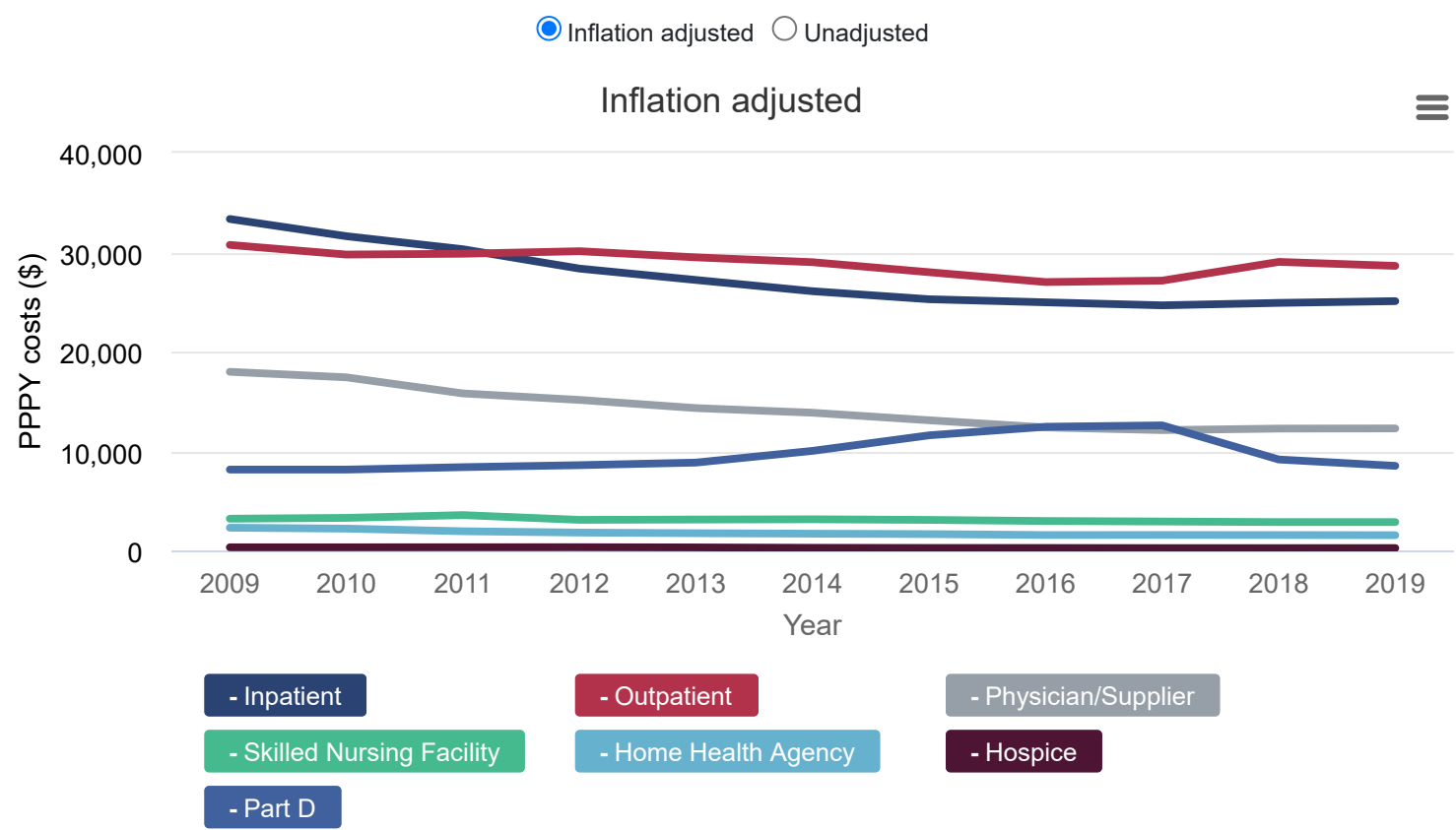


Data Source: USRDS ESRD database. Period prevalent ESRD patients with at least 1 Medicare claim in a year, 2009-2019.

Without adjustment for inflation, total inpatient spending for Medicare FFS beneficiaries with ESRD increased from \$10.4B to \$12.2B; outpatient spending increased from \$8.9B to \$13.1B (Figure 9.5). In inflation-adjusted dollars, however, inpatient spending decreased from \$13.8B to \$12.2B, while outpatient spending increased 12%, from \$11.7B to \$13.1B. Outpatient spending surpassed inpatient spending in 2014 to become the largest category of costs. Physician/supplier spending decreased from a peak of \$7.1B, in inflation-adjusted dollars, in 2010 to \$5.8B in 2019. Over the decade, there was little change in expenditures for skilled nursing facilities, home health agencies, or hospice. Part D spending more than doubled in inflation-adjusted dollars, from \$2.3B in 2009 to \$5.4B in 2017 and then decreased to \$4.0B from 2017 to 2019 (likely because calcimimetics were moved from Part D to Part B, known as the "bundle" for patients receiving dialysis).



**Figure 9.6** Inflation adjusted per person per year Medicare fee-for-service spending for beneficiaries with ESRD, by type of service, 2009-2019

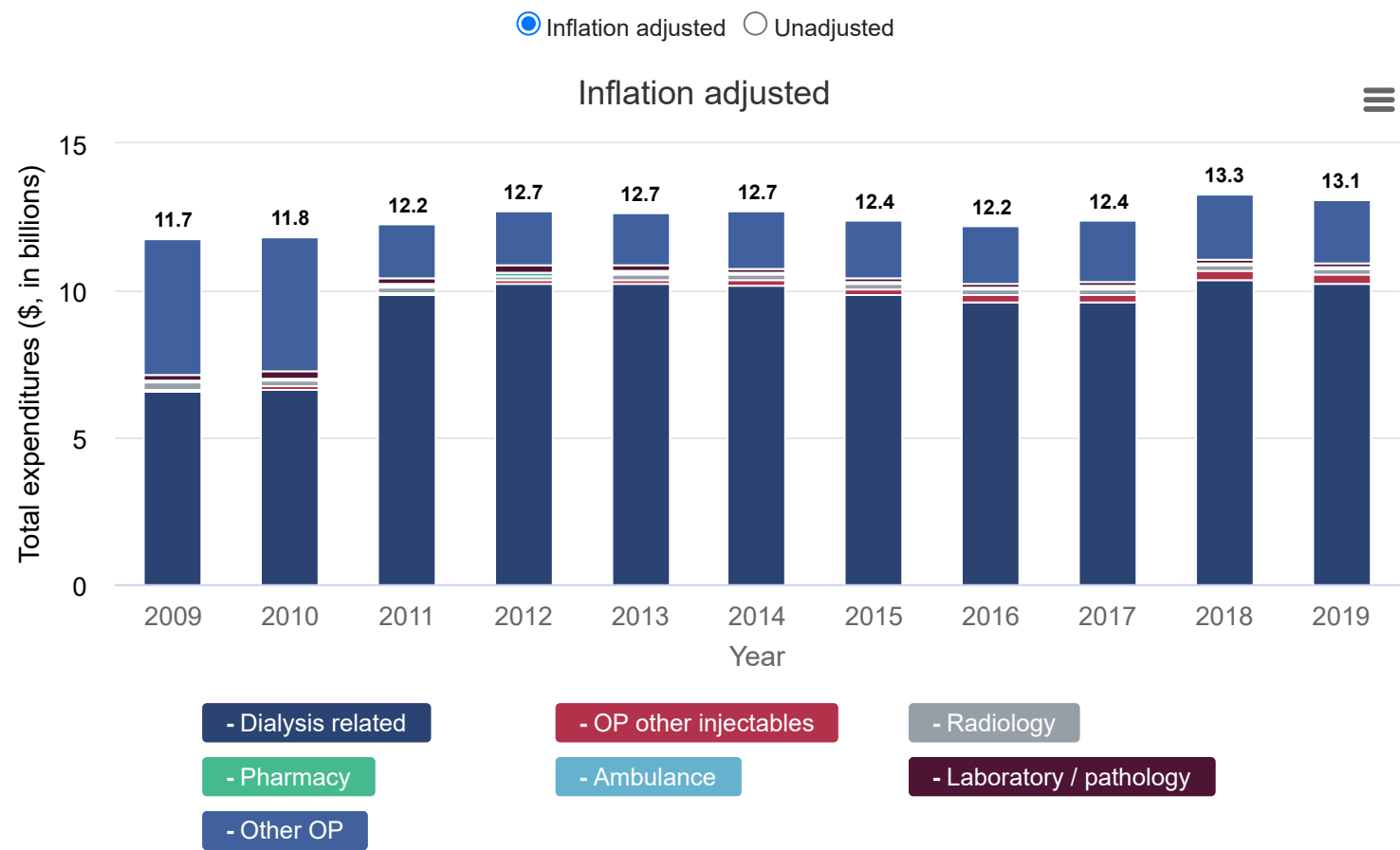


Data Source: USRDS ESRD database. Period prevalent ESRD patients with at least 1 Medicare claim in a year, 2009-2019. Part D costs are limited to beneficiaries with Parts A, B, and D coverage; other costs shown include beneficiaries with Parts A and B coverage. PPPY spending included Medicare as primary payor only.

Without adjusting for inflation, PPPY inpatient spending in Medicare FFS beneficiaries with ESRD was just over \$25,000 in 2009, decreased slightly until 2015, and then increased again to \$25,082 in 2019, nearly identical to the amount in 2009 (Figure 9.6). Outpatient spending increased from \$23,177 in 2009 to \$28,630 in 2019. In inflation-adjusted dollars, however, PPPY inpatient spending decreased from \$33,346 in 2009 to \$25,082 in 2019, a drop of approximately 25%. Inflation-adjusted PPPY outpatient spending fell less than inpatient spending, from \$30,738 in 2009 to \$28,630, thus becoming the largest category of spending from 2012 onward. Inflation-adjusted PPPY physician/supplier expenditures decreased from \$17,973 to \$12,275 over the decade. PPPY annual expenditures changed little for skilled nursing facility, home health agency, or hospice care. Inflation-adjusted Part D expenditures began at \$8135 per person per year in 2009, peaked at \$12,581 per year in 2017, and then decreased to \$8510 in 2019 (after calcimimetics were shifted to Part B for patients receiving dialysis).



**Figure 9.7** Inflation adjusted Medicare fee-for-service outpatient spending for beneficiaries receiving maintenance dialysis, 2009-2019

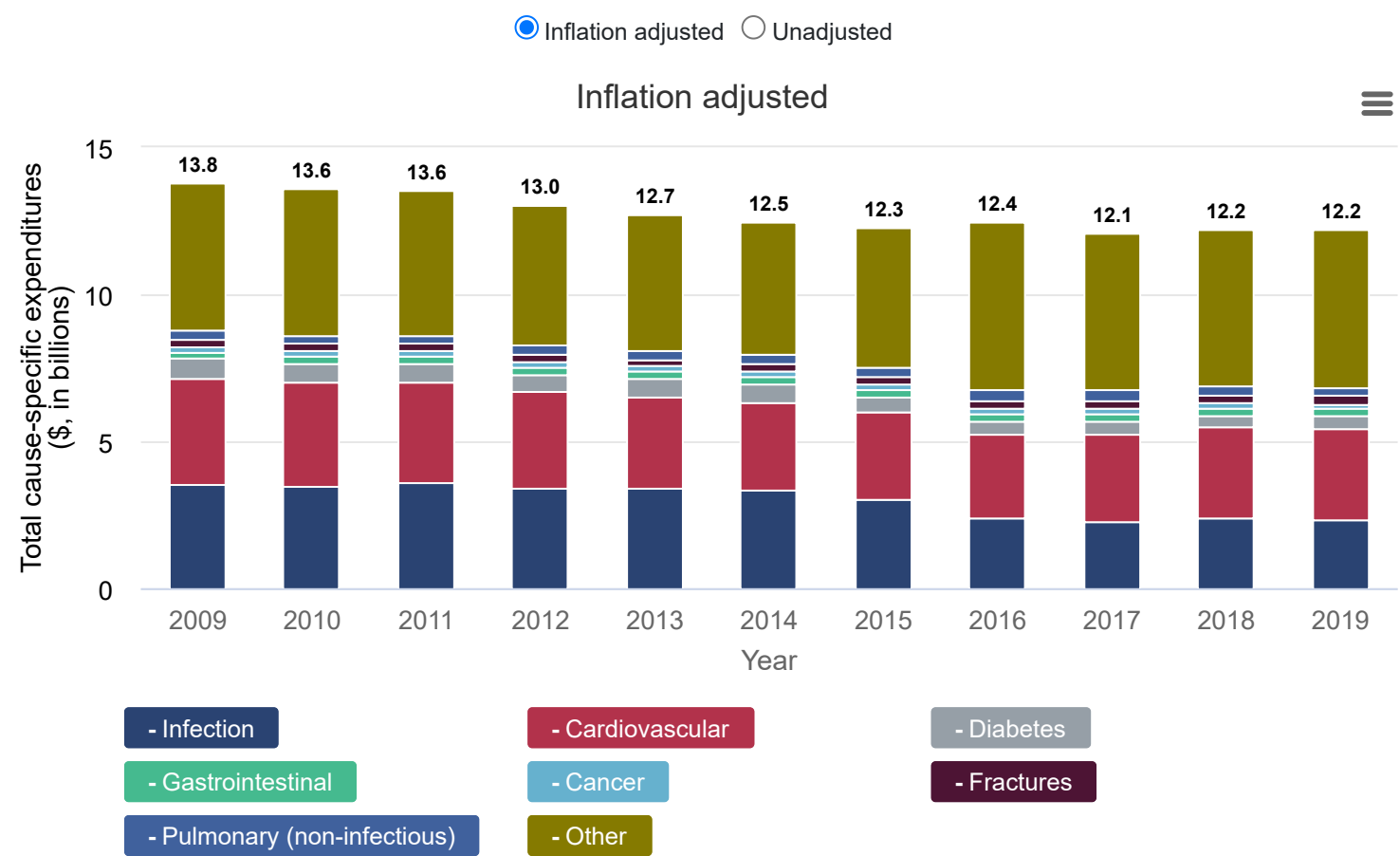


Data Source: USRDS ESRD database. Period prevalent ESRD patients receiving maintenance dialysis in a year, 2009-2019.

New in this year’s ADR, Figure 9.7 displays outpatient (Part A) spending for Medicare FFS beneficiaries by category from 2009 to 2019. Categories include costs related to dialysis, injectable medications, and radiology, pharmacy, ambulance, laboratory/pathology, and “other” services. Other outpatient services include clinical encounters, diagnostic tests, and physical and occupational therapy among other things. In addition, medications typically administered in dialysis facilities and currently included in the ESRD “bundled” Prospective Payment System (PPS) since 2011 are included in the other outpatient category. (Note that prescription medications covered under Medicare Part D are not included in this figure.)

Although overall outpatient costs increased almost 50% between 2009 and 2019 in nominal (not adjusted for inflation) dollars, the inflation-adjusted increase was approximately one quarter as great at 12%. As expected, introduction of the ESRD PPS in 2011 resulted in a substantial shift in the distribution of outpatient expenditures, with some non-dialysis related costs becoming dialysis-related costs. However, overall inflation-adjusted outpatient costs increased only 3.4% in 2011. Since 2011, dialysis-related costs account for approximately 80% of total outpatient costs (78% in 2019). Inflation-adjusted dialysis-related costs increased by \$0.6B, or 6.3% from 2017 to 2019, likely because calcimimetics were moved from Part D to Part B (known as the “bundle” for patients receiving dialysis) in 2017. Other outpatient costs make up the second-largest category (16% in 2019).

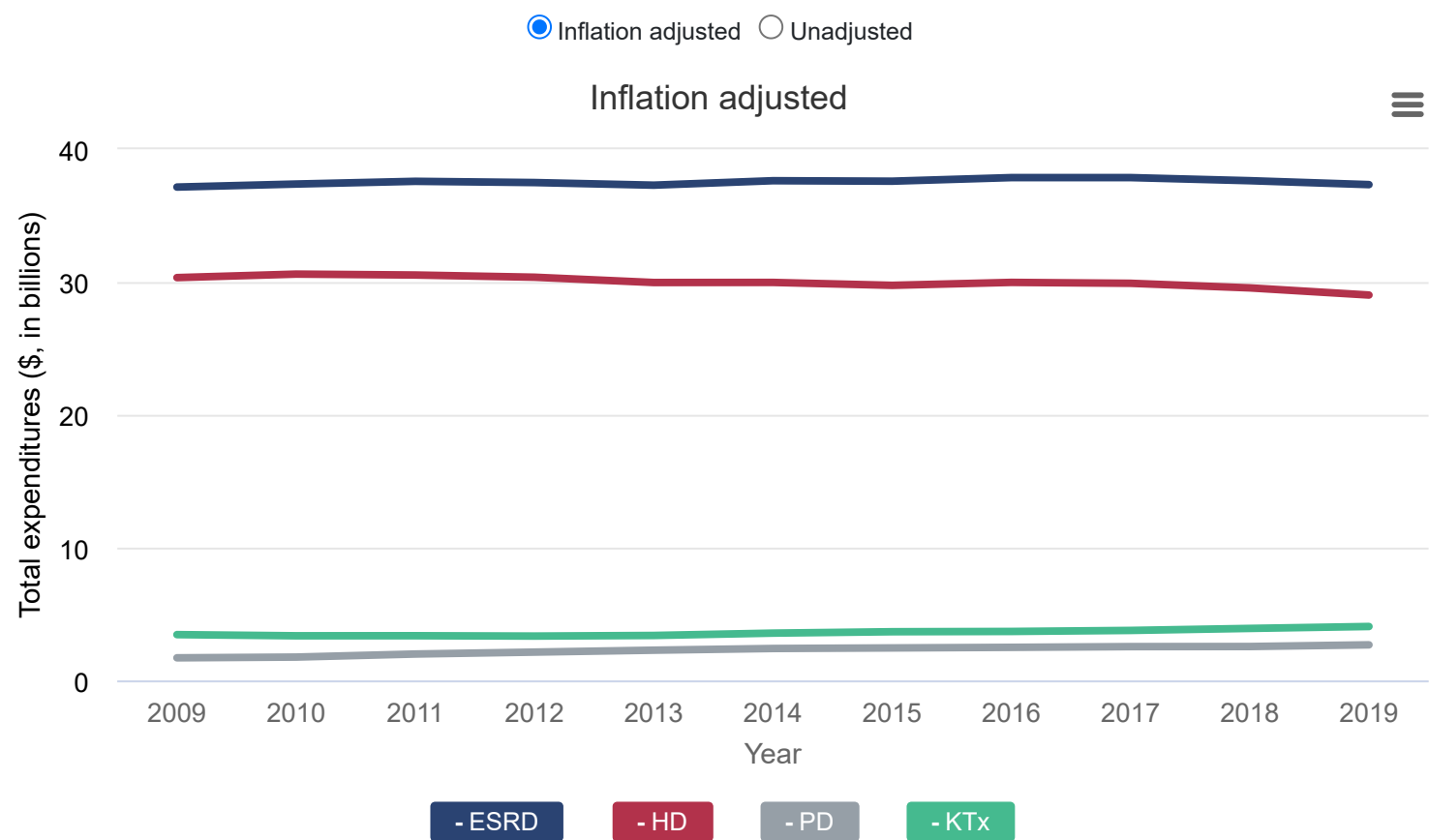
**Figure 9.8** Inflation adjusted Medicare fee-for-service cause-specific inpatient spending for beneficiaries with ESRD, overall and by cause of hospitalization, 2009-2019



Data Source: USRDS ESRD database. Period prevalent ESRD patients with a primary cause of hospitalization in a year, 2009-2019.

As for many other medical costs, inpatient spending for Medicare FFS beneficiaries with ESRD increased in nominal (not adjusted for inflation) and decreased in inflation-adjusted dollars (Figure 9.8). In 2019, inpatient spending accounted for \$12.2B. Inflation-adjusted expenditures for infection-related hospitalizations decreased from \$3.5B to \$2.3B; expenditures for cardiovascular disease-related hospitalization also decreased, from \$3.7B to \$3.1B. Since 2015, cardiovascular and infection-related hospitalizations have accounted for <50% of inpatient costs for patients with ESRD. Therefore, we examined costs of hospitalization for diabetes, gastrointestinal causes, cancer, fractures, and non-infectious pulmonary causes. None of these causes accounted for more than 5% of total inpatient costs in any year; in 2019, diabetes hospitalizations accounted for 3.6%, gastrointestinal 2.0%, cancer 1.4%, fractures 2.2%, and non-infectious pulmonary causes 2.4%.

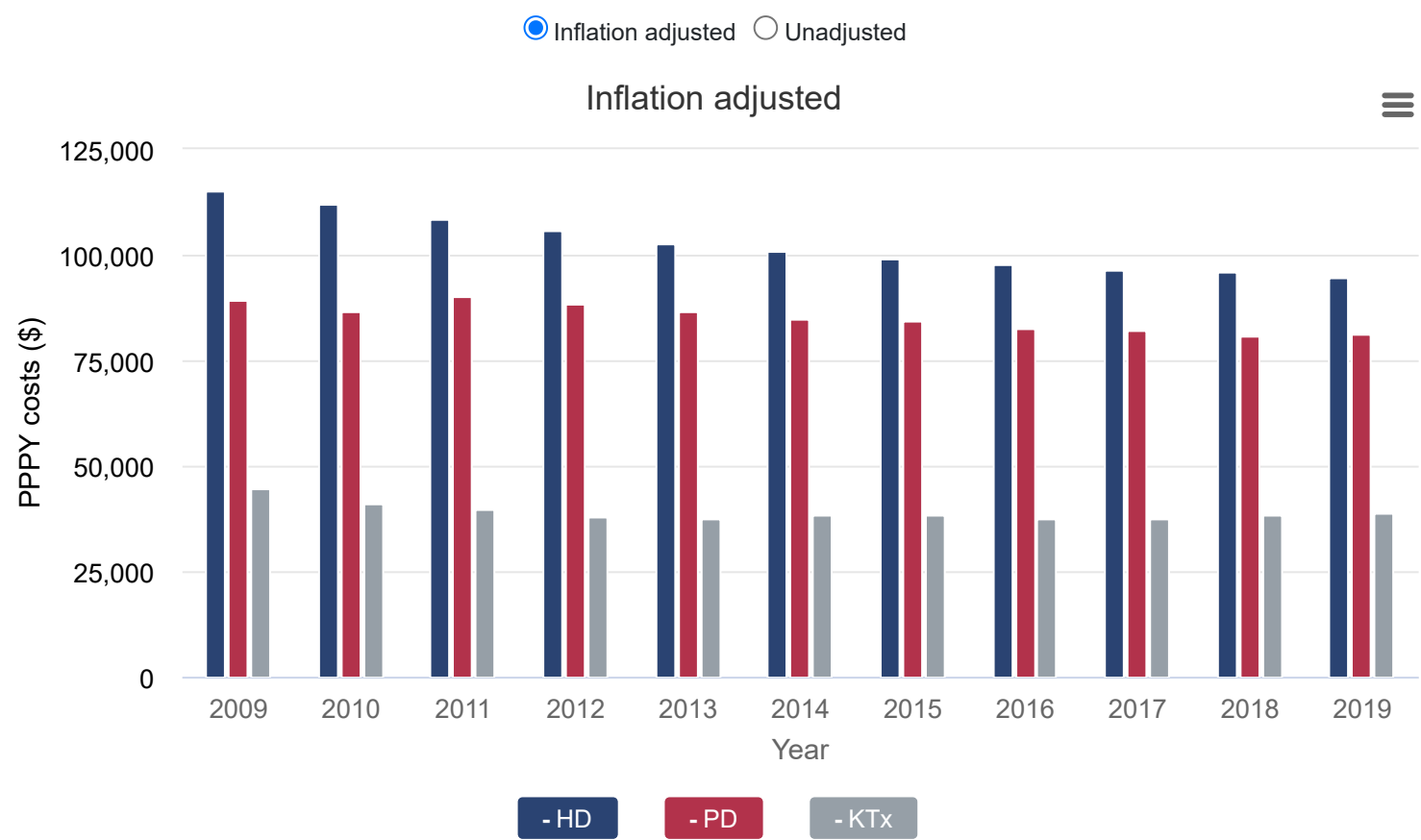
**Figure 9.9** Inflation adjusted total Medicare fee-for-service spending for beneficiaries with ESRD, by treatment modality, 2009-2019



Data Source: USRDS ESRD database. Period prevalent ESRD patients with at least 1 Medicare claim in a year, 2009-2019. Spending in the category of total included unknown dialysis type.

In nominal dollars (not adjusted for inflation), total expenditures for Medicare FFS beneficiaries with ESRD increased from \$28.0B in 2009 to \$37.3B in 2019 (Figure 9.9). Expenditures for HD, PD, and kidney transplant all increased individually as well. However, in inflation-adjusted dollars, total expenditures changed very little, from \$37.2B in 2009 to \$37.3B in 2019. Inflation-adjusted expenditures for beneficiaries receiving HD decreased slightly from \$30.3B in 2009 to \$29.0B in 2019. Expenditures for beneficiaries receiving PD increased 58.8% from \$1.7B to \$2.7B, while expenditures for beneficiaries with a kidney transplant increased by 20.6% from \$3.4B to \$4.1B.

**Figure 9.10** Inflation adjusted per person per year Medicare fee-for-service spending for beneficiaries with ESRD, by treatment modality, 2009-2019



Data Source: USRDS ESRD database. Period prevalent ESRD patients with at least 1 Medicare claim in a year, 2009-2019. PPPY spending included Medicare as primary payor only.

Without accounting for inflation, PPPY spending (from 2009 to 2019) increased from \$86,923 to \$94,608 for HD, from \$67,187 to \$81,091 for PD, and from \$33,584 to \$38,863 for kidney transplant (Figure 9.10). In inflation-adjusted dollars, however, PPPY expenditures for beneficiaries receiving HD decreased from \$115,283 in 2009 to \$94,608 in 2019, or 17.9%. PPPY expenditures decreased from \$89,108 to \$81,091 for beneficiaries receiving PD and from \$44,541 to \$38,863 for beneficiaries with a kidney transplant. As a result, the difference in inflation-adjusted PPPY costs for beneficiaries receiving HD and PD narrowed from \$26,175 in 2009 to \$13,517 in 2019. In relative terms, PD was 22.7% less expensive than HD in 2009 and 14.3% less expensive in 2019.

Summary

Total inflation-adjusted Medicare expenditures for beneficiaries with ESRD (FFS plus MA) rose steadily over the decade from 2009 to 2019 by about 1.2% per annum, from \$45.0B to \$51.0B. The largest contributor to this growth was expenditures under the MA program, where spending increased by \$7B because of a substantial increase in enrollment in MA. Inflation-adjusted MPP spending (for beneficiaries with Medicare-only and dual Medicare and Medicaid) *decreased* by \$0.9B. Total FFS spending decreased \$1.2B from \$39.7B in 2009 to \$38.5B in 2019. As a percentage of all FFS Medicare spending, spending for beneficiaries with ESRD remained relatively unchanged during this period at approximately 7.1%. Inflation-adjusted per person spending was lower in 2019 than in 2009 for beneficiaries treated with HD and PD, and for kidney transplant recipients.

There have been significant changes in sources of medical coverage among patients with ESRD over the last decade. In 2009, 44.2% of incident ESRD patients had Medicare as Primary Payer FFS coverage, and 15.0% had MA; in 2019 those percentages were 32.6% and 24.9%, respectively. Among prevalent patients, the percent with MA increased from 9.1% to 17.7% from 2009 to 2019. Additionally, in more recent years, a greater percentage of individuals who received a kidney transplant were covered by a non-Medicare source or had Medicare as Secondary Payer coverage. This suggests that well-insured patients have greater access to kidney transplantation. Whether this is an effect of insurance type itself or an indication that healthier patients are both more likely to have private insurance and to receive a kidney transplant cannot be determined from these data.

During the decade between 2009 and 2019, inflation-adjusted total expenditures for inpatient services for beneficiaries with ESRD declined (\$13.8B to \$12.2B) while those for outpatient services increased (\$11.7B to \$13.1B). Part D expenditures more than doubled between 2009 and 2019 before decreasing precipitously (by >25%) between 2017 and 2019, due mostly to a decrease in spending for calcimimetics and several other key drugs. In the cataloging of outpatient costs, these medications were not included when they were covered under Medicare Part D but were captured as dialysis-related outpatient costs in 2018 and 2019 when they were moved into the dialysis PPS bundled payment system under a transitional drug add-on payment adjustment (TDAPA). During this period, outpatient dialysis-related costs increased by \$0.6B. Dialysis-related costs account for almost 80% of overall outpatient spending for patients receiving maintenance dialysis.

Inpatient costs for hospitalizations due to infection and cardiovascular disease among beneficiaries with ESRD decreased from 2009-2019, accounting for 44.3% of total inflation-adjusted inpatient spending in 2019 compared with 52.2% in 2009. We examined expenditures for hospitalizations for other causes in this year's ADR, but none accounted for more than 5% of overall hospitalization-related costs.

Expenditures by ESRD treatment modality are important to consider as governmental initiatives designed to increase kidney transplantation and to foster use of home-based dialysis modalities are implemented. Although HD remained the most expensive treatment for ESRD in 2019 at \$94,608 per person annually (and kidney transplantation, as expected, the least expensive, at \$38,863), PPPY spending for beneficiaries receiving PD, at \$81,091 in 2019, decreased less in inflation-adjusted dollars than for those receiving HD. It is important to note that these estimates were not adjusted for comorbidities, dialysis duration, or other factors that might distinguish patients receiving HD from those receiving PD. However, these findings raise the possibility that growth in the PD population might cause a narrowing in the relative cost savings of PD over HD. If expansion of PD results in sicker, and therefore more costly, patients receiving PD, the relative cost advantage conferred by this modality over HD may continue to narrow. More complete efforts at risk-adjustment (beyond the scope of this ADR) would be required to make more informed predictions in this regard.