



# Medicare Savings and Reductions in Rehospitalizations Associated with Home Health Use

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Avalere Health LLC

# Table of Contents

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- Introduction
- Overall Findings
- Study Methodology
- Appendix: Detailed Study Methodology, Specific Findings, and Study Limitations

# Introduction

- The Partnership for Quality Home Healthcare commissioned Avalere Health in February 2011 to evaluate the impact of post-hospital home health use on Medicare spending and hospital readmissions.
- The purpose of the study is to quantify the impact of post-acute care home health use, by comparing Medicare spending and readmissions for chronically ill beneficiaries who receive home health care\* after a hospitalization with Medicare spending and readmissions for comparable beneficiaries who use other post-acute care services\*\* after a hospitalization.

\* Home health care after a hospital visit is covered under the Part A Medicare benefit. It consists of part-time, medically necessary skilled care (nursing, physical therapy, occupational therapy, and speech-language pathology) that is ordered by a physician. Source: CMS, Home Health Quality Initiative: <http://www.cms.gov/HomeHealthQualityInits/>

\*\* Services from long-term acute care hospitals (LTACHs), inpatient rehabilitation or skilled nursing facilities (IRFs or SNFs), or hospices



# Overall Findings



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# Home Health Users Had Lower Medicare Part A Costs and Fewer Rehospitalizations

- We compared beneficiaries with post-hospital home health use to beneficiaries who received other post-hospital/post-acute care (PAC) services for the following conditions – diabetes, chronic obstructive pulmonary disease (COPD), and CHF (congestive heart failure).
- The study examined total Medicare Part A spending\* after the initial hospital visit, including costs associated with readmissions, over the course of twelve calendar quarters, from October 2006 – September 2009.
  - » We divided the twelve quarters into two separate periods of six quarters each, to observe the trend (if any) over time.
- **Medicare Part A spending after the initial hospitalization for patients with diabetes, COPD, or CHF who received home health services in the same quarter as the initial hospitalization was lower than Part A spending for similar patients who received other post-acute care services** in that initial quarter, and the difference increased over time. This result is statistically significant across all severity of illness categories (that is, for a wide range of patients with these diagnoses).
  - » The differences in post-hospital Medicare Part A spending are generally largest for the most severely ill -- i.e., those with a severity of illness (SOI) score of 4.
- **Diabetes, COPD and CHF patients who received home health services were less likely to be rehospitalized than similar patients who received other PAC services\*\***

\* Includes Part B home health payments but no other Part B payments

\*\* The rehospitalization results were not statistically significant for all categories

# Home Health Users Had Lower Medicare Part A Costs

Home health use was associated with a \$2.81 billion reduction in post-hospitalization Medicare Part A spending over the 2006-2009 period. That is, Medicare Part A spending on these home health users was \$2.81 billion less than it would have been if they had received other PAC services. This estimate controls for differences in beneficiaries' age, sex, race, urban/rural location, condition, severity of illness, dual-eligible status, and hospice utilization.\*

## Savings Per Beneficiary\*\*

Time Period 1: October 2006 – March 2008      Time Period 2: April 2008 – September 2009

Diabetes	\$6,281 – \$12,267	Diabetes	\$7,383 – \$9,225
COPD	\$6,098 – \$11,928	COPD	\$7,106 – \$11,441
CHF	\$5,020 – \$7,879	CHF	\$5,514 – \$8,883

\* The extent of risk adjustment is still limited

\*\* Savings vary by severity of illness level

# Detailed Impact Analysis

- Use of home health care after the initial hospital visit was associated with a \$2.81 billion reduction in Medicare Part A spending over the 2006-2009 period. If the beneficiaries who received other PAC services after the initial hospitalization had used home health instead, Medicare Part A spending over the 2006-2009 period could have been further reduced by \$2.07 billion. We arrived at this estimate by applying the per-beneficiary savings associated with home health use to the cases with other PAC services.
- Home health use after the initial hospital visit is associated with an estimated 20,426 fewer hospital readmissions – avoiding these readmissions saved Medicare an estimated \$670 million over the 2006-2009 period.\*
- In addition, if the beneficiaries who received other PAC services after the initial hospitalization had used home health instead, an estimated 14,239 readmissions could have been avoided.

Category of Analysis	Result
Reduction in post-hospital Medicare Part A spending from 2006 to 2009 associated with use of home health	\$2.81 billion
Potential reduction in post-hospital Medicare Part A spending from 2006 to 2009 if beneficiaries who received other PAC services had used home health care instead	\$2.07 billion
Decline in hospital readmissions over 2006-2009 period associated with use of home health care	20,426
Reduction in Medicare spending over 2006-2009 period from 20,426 fewer readmissions	\$670 million
Potential reduction in readmissions over 2006-2009 period, if beneficiaries who received other PAC services had used home health care instead	14,239
Potential further reduction in Medicare spending over 2006-2009 period from fewer readmissions, if beneficiaries who received other PAC services had used home health care instead	\$485 million

\* The \$670 million reduction is a component of the \$2.81 billion in total savings

# Methodology\*

## Study Design

- Avalere compared users of post-acute care home health to users of other PAC services on three outcome measures: total post-hospital Medicare Part A\*\* payments, readmission rates, and Medicare Part A payments associated with readmissions.
- Study was conducted using Medicare Standard Analytic Files (SAFs) for 2006-2009.

## Population

- Restricted to Medicare fee-for-service beneficiaries with a hospital primary or secondary diagnosis of diabetes, COPD, or CHF
- The post-hospital home health users are defined as beneficiaries with home health utilization in the same quarter as the initial hospital stay during the study period.
- The comparison group consists of beneficiaries who received PAC services other than home health (i.e., services from a skilled nursing facility, long-term care hospital, inpatient rehabilitation facility, or hospice) during the same quarter as the initial hospitalization.

\* Please see Appendix for a more detailed description of the methodology  
\*\* Includes Part B home health payments but no other Part B payments

# Methodology (continued)

## Propensity Score Matching

- Avalere conducted a propensity score matching analysis that controlled for certain factors including:
  - » Condition and SOI\*, age, sex, race, dual-eligible status, urban or rural location, and hospice utilization\*\*
- For the propensity score analysis, we matched post-acute care home health users with users of other PAC services who were comparable with regard to these variables, and limited the analysis to that population. By excluding users of other PAC services who were not comparable to home health users on these variables, we attempted to isolate the effect that home health use alone has on the outcomes of interest (total post-hospital Medicare Part A spending, readmission rates, and readmissions-related spending) separate from the effects of other factors that directly affect both home health use and those outcomes.

\*The SOI metric rates a patient's level of severity on a scale of 1-4 (the higher the score, the more severely ill the patient). SOI is based on the patient's hospital procedures and diagnosis codes and is produced by running these data through the APR-DRG grouper. Results are presented by SOI because patients with higher SOI scores are more clinically complex than patients with the same conditions but lower SOI scores.

\*\* The degree of risk adjustment is still limited



# Appendix: Detailed Study Methodology, Specific Findings, and Study Limitations



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# Study Methodology

- Study Sample
  - » Sample consisted of Medicare beneficiaries with a primary or secondary diagnosis of diabetes, COPD, or CHF who utilized PAC services
  - » ICD-9-CM codes were identified by a technical advisory panel and supplemented by codes used in the CMS Chronic Condition Warehouse and other codes identified by an Avalere internal coding team.
- Definition of Post-Acute Care Home Health Users
  - » Beneficiaries with a home health claim in the same quarter as the initial hospitalization – these beneficiaries may have subsequently received services in another PAC setting
  - » The Medicare claims data sets we used (the SAFs) include quarters of service but not dates of service. For purposes of this analysis, we assumed that the initial hospital stay preceded the home health or other PAC utilization in that quarter
- Definition of other PAC Users
  - » Beneficiaries with other PAC (SNF, IRF, LTACH, or hospice) but no home health utilization during the same quarter as the initial hospitalization

## Study Methodology (continued)

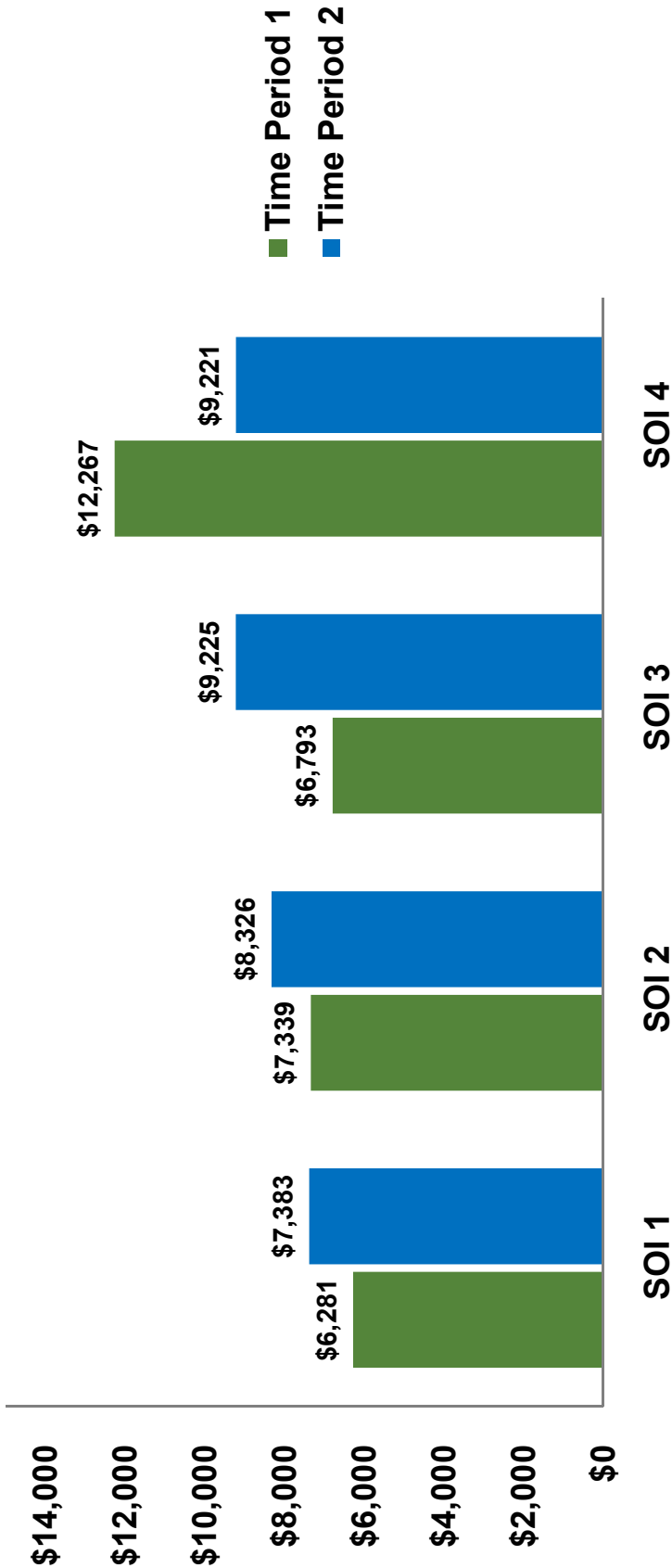
- Definition of Post-Hospital Period
  - » The post-hospital period begins with the quarter in which the initial hospitalization occurred and ends with the first subsequent quarter with no hospital or PAC utilization.
- Definition of Post-Hospital Costs
  - » All Medicare Part A costs\* incurred after the initial hospitalization — the cost of the initial hospital stay was excluded
- Statistical Analysis
  - » Estimated post-hospital Part A costs, including readmissions costs, through a propensity score matching analysis, one for each condition and SOI.
  - » Employed a propensity score matching model to limit the potential effects of factors that affect both the likelihood of home health use and the outcome variables (i.e., total Medicare spending, readmission rates, and readmissions-related spending).
  - » Model included the following risk-adjustment variables: age, sex, race, dual-eligibility status, urban/rural location, and hospice utilization.

\* Includes Part B home health payments but no other Part B payments

## Study Methodology (continued)

- Calculation of Reduction in Medicare Part A Spending
  - » Multiplied the estimated difference in post-hospital spending for home health as opposed to other PAC users, for each chronic condition/SOI combination (e.g., beneficiaries with a diagnosis of diabetes and an SOI of 2), by the number of cases in that category for home health users and other PAC users.
- Calculation of Reductions in Readmissions and Readmissions-related Spending
  - » Calculated the average readmission rate for each chronic condition/SOI combination, for home health users and other PAC users. To calculate reduced readmissions associated with home health, multiplied the difference in the readmission rates by the number of home health users in each chronic condition/SOI category. To calculate the potential reduction in readmissions for other PAC users, multiplied the difference in rates by the number of other PAC users in each chronic condition/SOI category.
  - » To determine the total reduction in Medicare spending associated with readmissions, multiplied the estimated difference in readmissions-related spending for each chronic condition/SOI score combination by the number of cases in that category for home health and other PAC users.

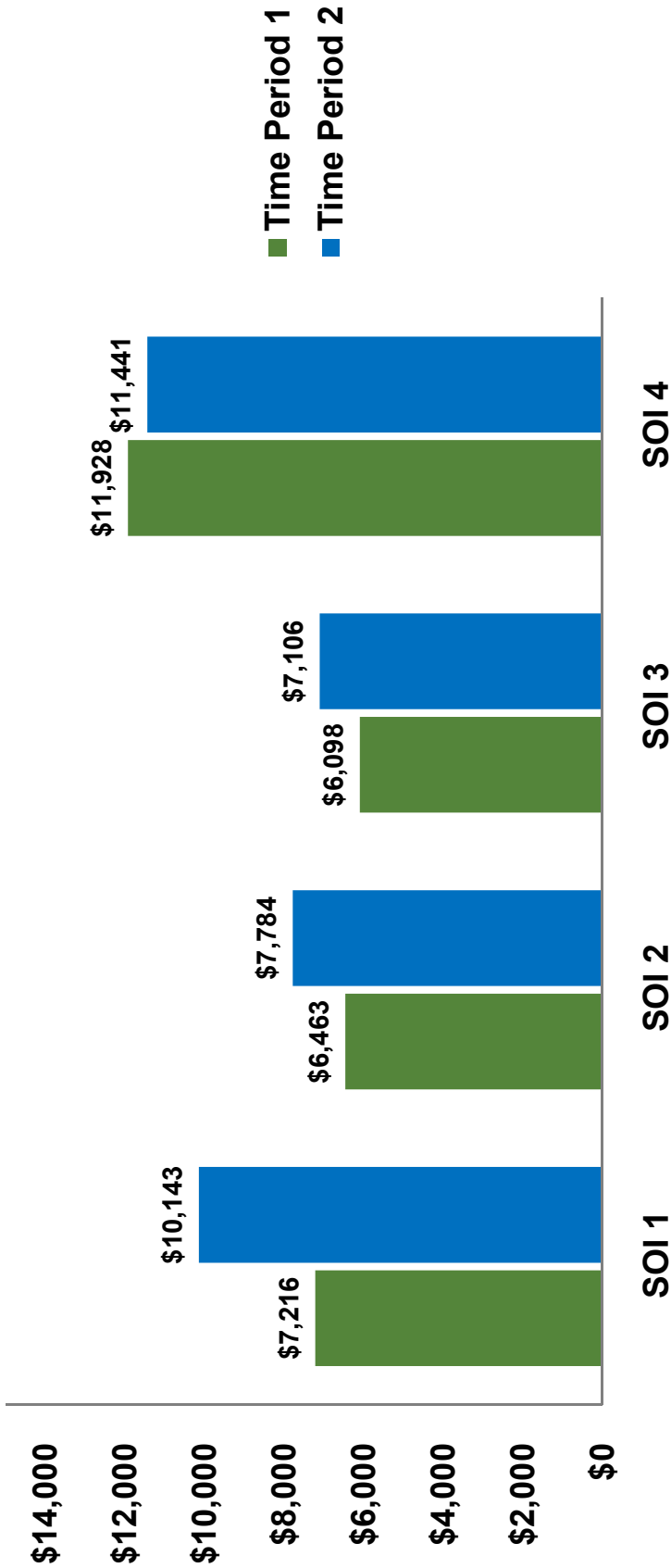
# Medicare Part A Savings from Home Health Use, per Beneficiary with Diabetes



An SOI score of 1 is least clinically severe and an SOI score of 4 is most clinically severe  
 Time Period 1 is October 2006 – March 2008; Time Period 2 is April 2008 – September 2009

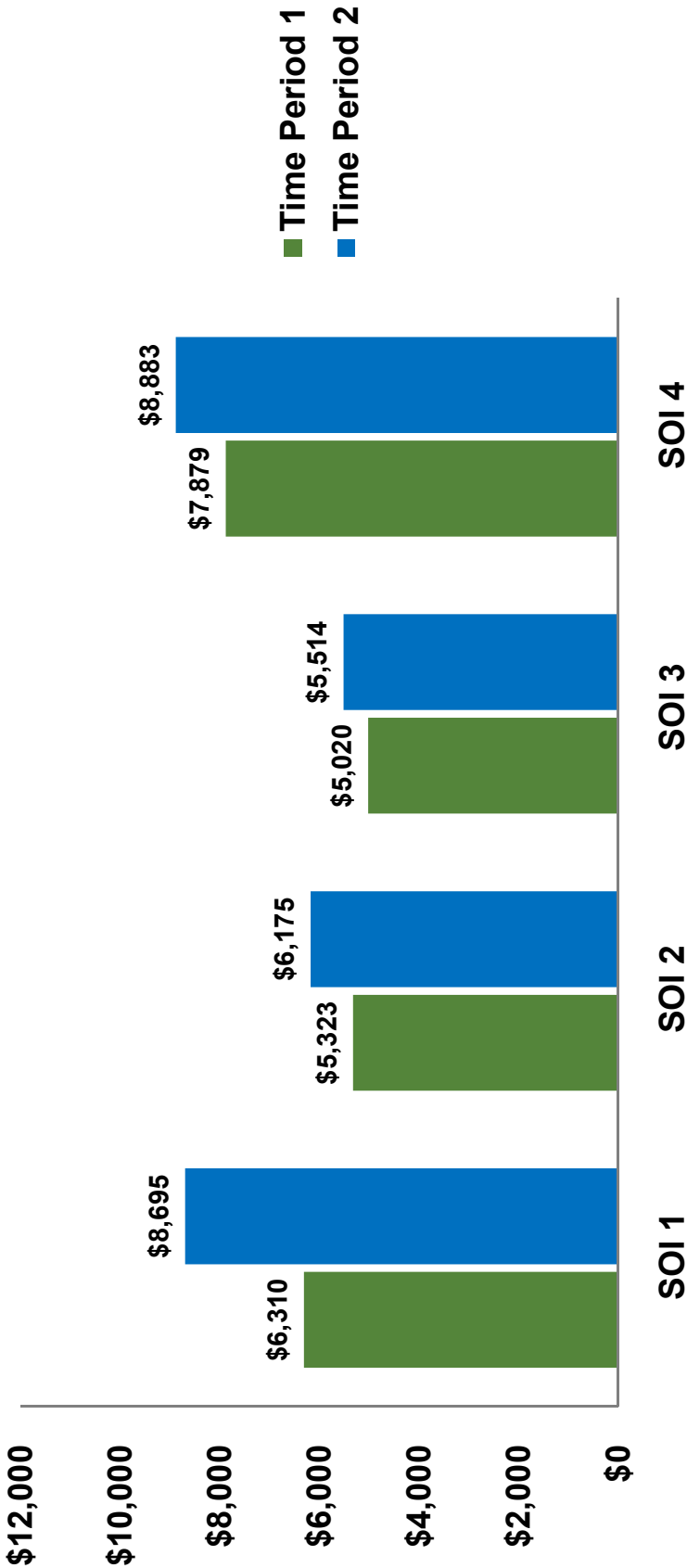


# Medicare Part A Savings from Home Health Use, per Beneficiary with COPD



Time Period 1 is October 2006 – March 2008; Time Period 2 is April 2008 – September 2009

# Medicare Part A Savings from Home Health Use, per Beneficiary with CHF

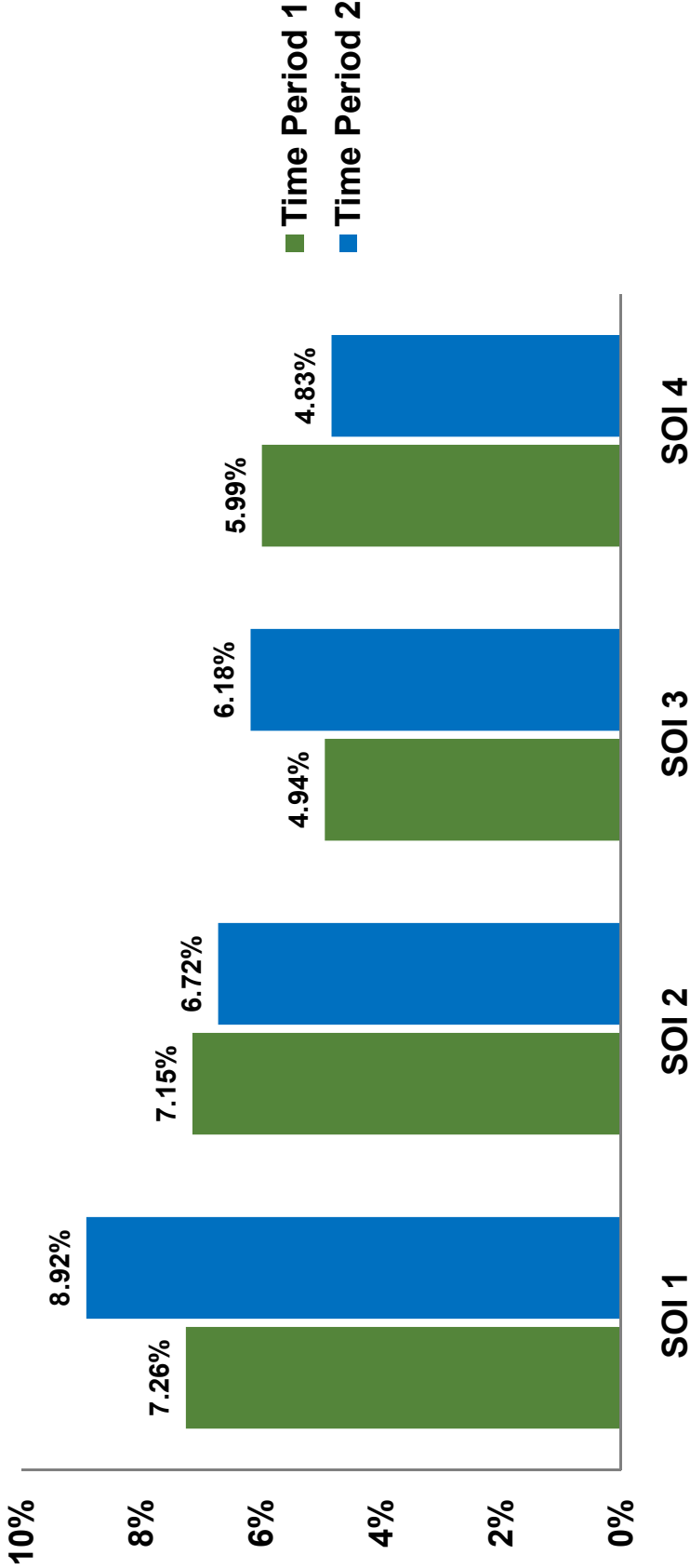


Time Period 1 is October 2006 – March 2008; Time Period 2 is April 2008 – September 2009



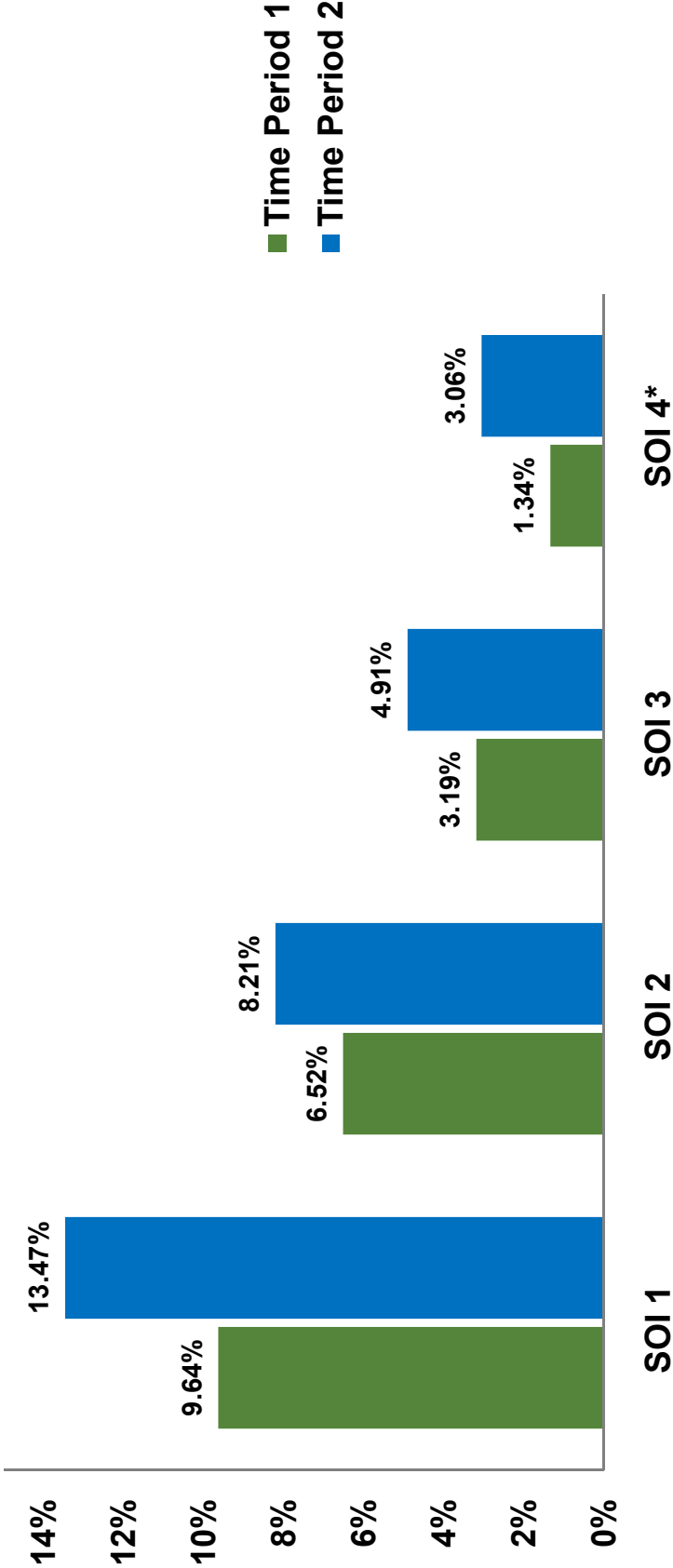
# Reduction in Readmission Rates Associated with Home Health Use, for Beneficiaries with Diabetes

Difference in Readmission Rates for Post-acute Care Home Health and other PAC Users, by SOI



# Reduction in Readmission Rates Associated with Home Health Use, for Beneficiaries with COPD

Difference in Readmission Rates for Post-acute Care Home Health and other PAC Users, by SOI



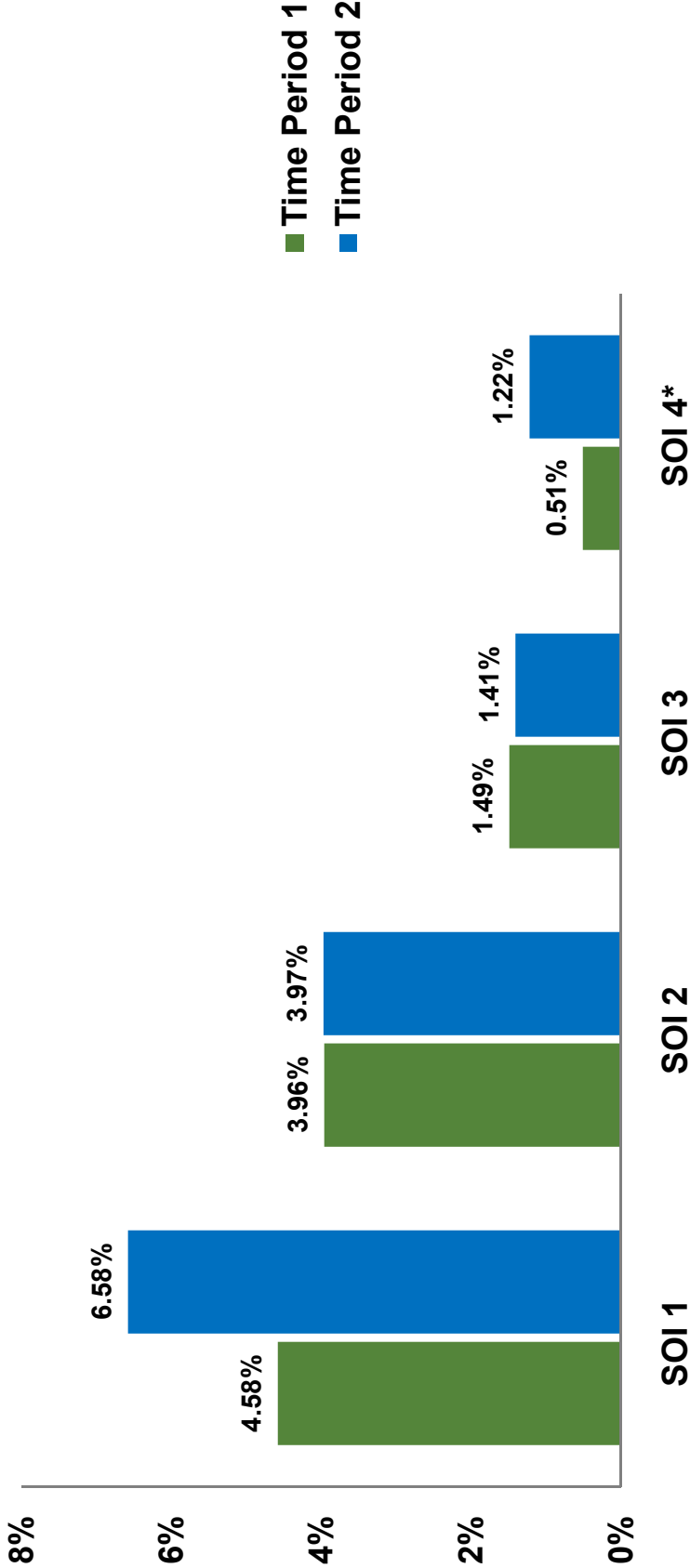
Time Period 1 is October 2006 – March 2008; Time Period 2 is April 2008 – September 2009

\* Not statistically significant for time period 1



# Reduction in Readmission Rates Associated with Home Health Use, for Beneficiaries with CHF

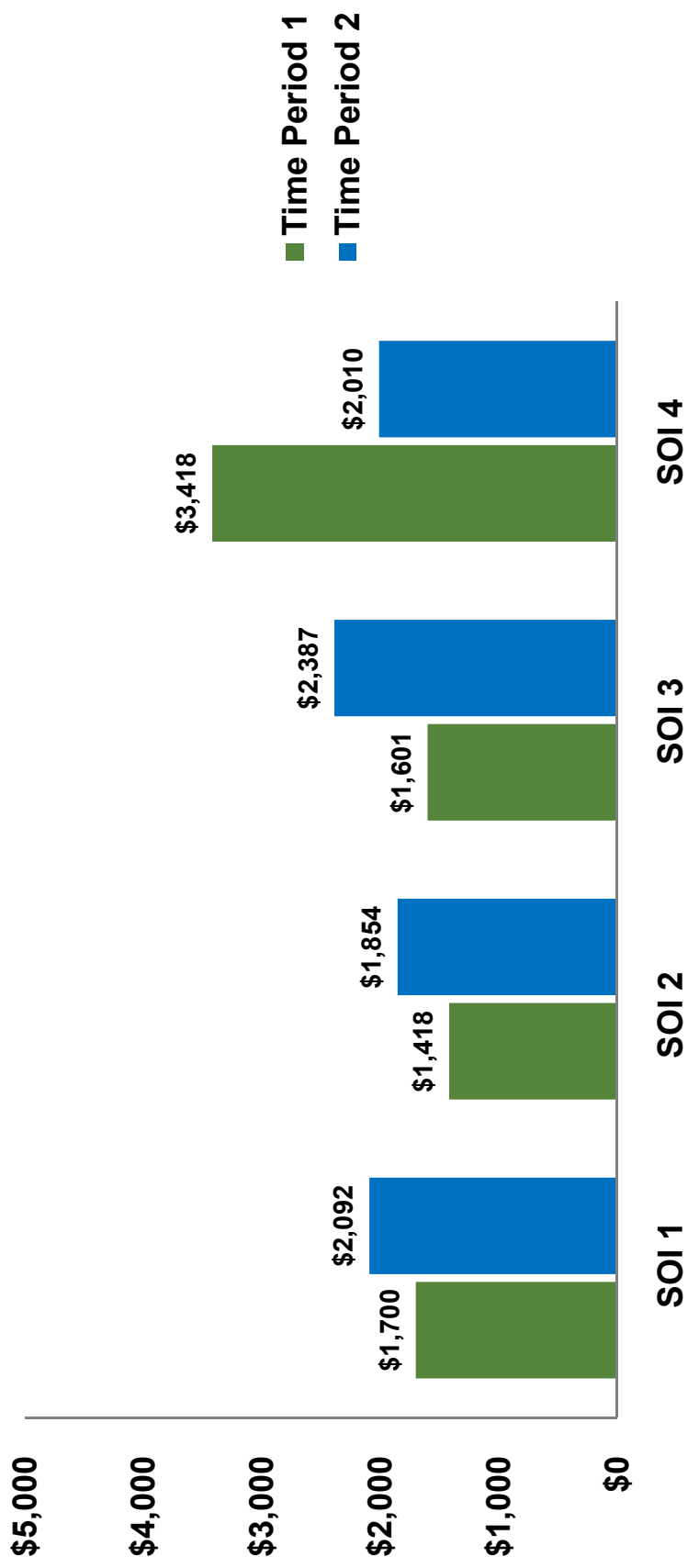
Difference in Readmission Rates for Post-acute Care Home Health and other PAC Users, by SOI



Time Period 1 is October 2006 – March 2008; Time Period 2 is April 2008 – September 2009

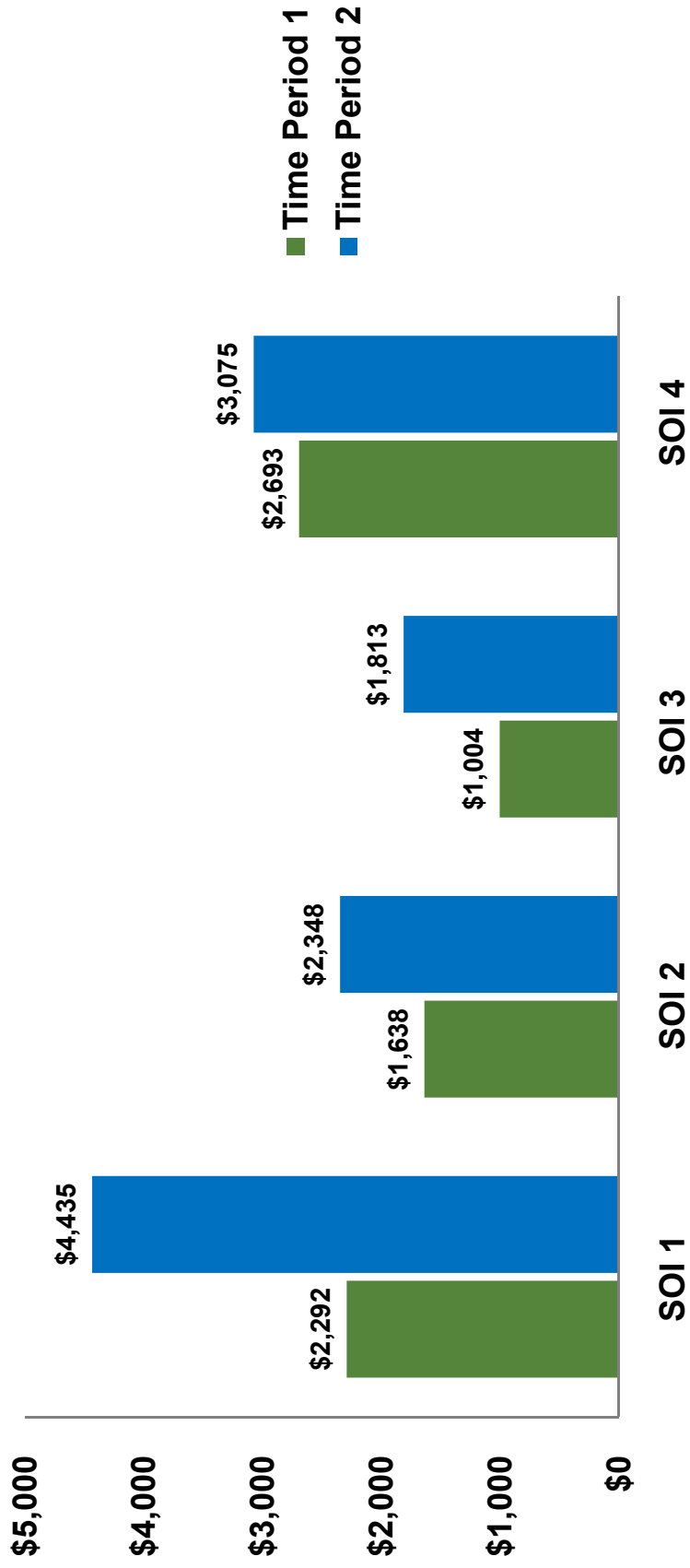
\* Not statistically significant for time period 1 or 2

# Savings from Reduction in Medicare Readmissions-Related Spending, per Beneficiary with Diabetes Who Used Home Health

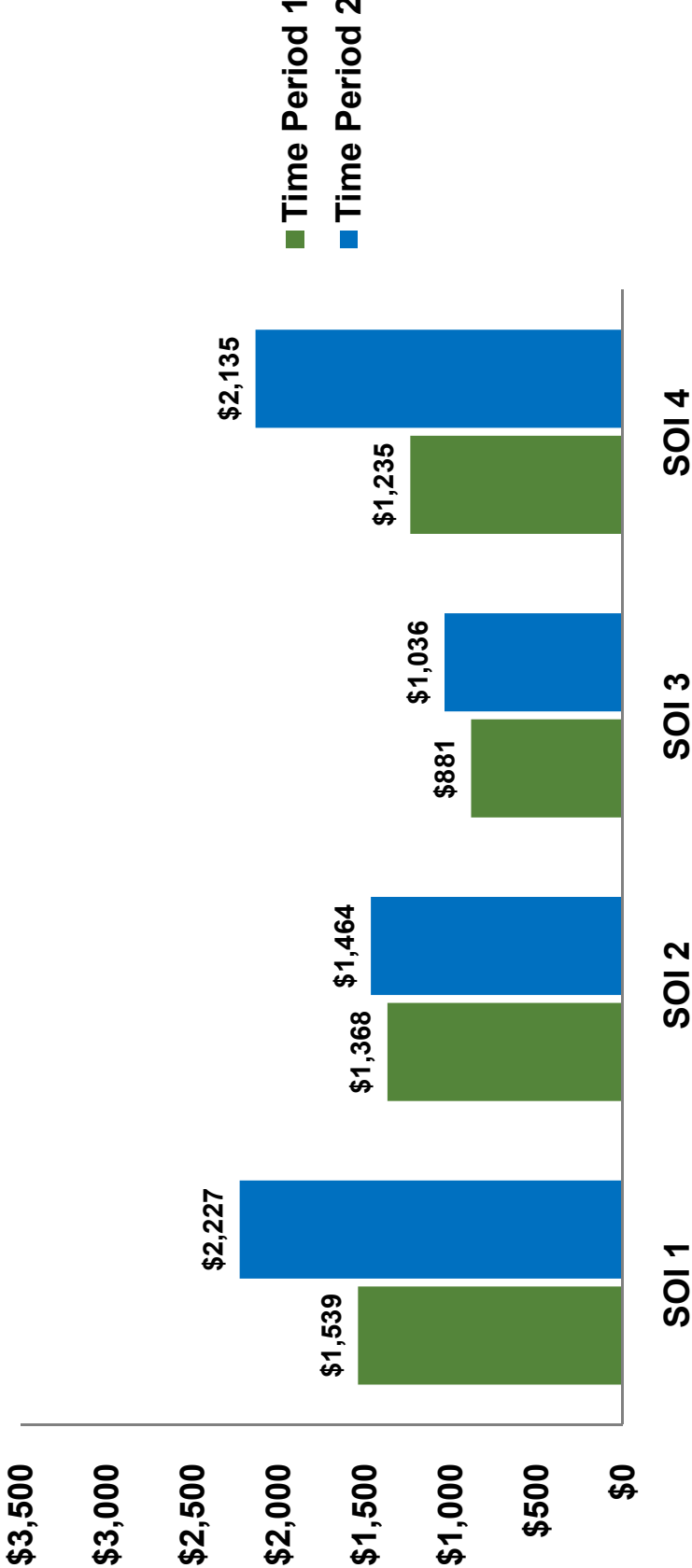


Time Period 1 is October 2006 – March 2008; Time Period 2 is April 2008 – September 2009

# Savings from Reduction in Medicare Readmissions-Related Spending, per Beneficiary with COPD Who Used Home Health



# Savings from Reduction in Medicare Readmissions-Related Spending, per Beneficiary with CHF Who Used Home Health



Time Period 1 is October 2006 – March 2008; Time Period 2 is April 2008 – September 2009



# Study Limitations

- While we controlled for a number of factors to account for patient characteristics and non-random assignment to home health, we could not control for variables that were not observed in our data sets, such as functional status and caregiver status.
- Another limitation is that our data sets do not include dates of service; we assumed that in the quarter of the initial hospitalization, the hospital stay preceded home health or other PAC use. It is possible that some of the beneficiaries in our sample received PAC services, including home health, before the initial hospital stay.
- The study findings are applicable to a specific group – beneficiaries with a primary or secondary diagnosis of diabetes, COPD, or CHF who used home health or other PAC services during the 2006-2009 period. These findings cannot be extrapolated to the entire home health population, PAC population, chronically ill population, or Medicare population.
- Due to the transition from (inpatient hospital) DRGs to MS-DRGs and changes in coding practices and payment incentives, the coding of these select chronic conditions has changed over time, making it appear that case counts have declined. We chose not to expand the study population to include beneficiaries with a diagnosis of diabetes, COPD or CHT that was not the primary or secondary diagnosis, in order to avoid including Medicare payments that were driven by other conditions.