*Advising the Congress on Medicare issues*

# Effects of adherence to Part D-covered drugs on Parts A and B spending

Shinobu Suzuki and Joan Sokolovsky

March 7, 2013

MEDPAC

# Motivation for the study

- Understand the relationship between medication adherence and health care spending for the Medicare population.
- Understand how the Part D benefit affects Parts A and B spending.
- Inform our thinking on the LIS cost-sharing policy.
- Understand the relationship between medication adherence and inappropriate use of medications.

# Research questions

- What is the relationship between medication adherence and medical service use for the Medicare population?
- Does the relationship between medication adherence and medical service use vary by condition and/or medication regimen?

# Study cohorts identified by condition and drug regimen

- CHF / COPD: Better adherence expected to improve health outcomes and reduce spending
  - Severe & non-severe CHF (6 condition/drug regimen cohorts)
    - ACE inhibitors (ACEi)/ARBs only
    - Beta-blockers only
    - Combination (ACEi/ARBs & beta-blockers)
  - Severe COPD (3 condition/drug regimen cohorts)
    - Long-acting beta-adrenergics (LABAs)
    - Long-acting anticholinergics (LAACs)
    - Combination (LABAs & LAACs)
- Depression: Not clear how better adherence would affect health outcomes and spending
  - antidepressants (1 condition/drug regimen cohort)

MEDPAC

Note: CHF (congestive heart failure), COPD (chronic obstructive pulmonary disease), ACE (angiotensin converting enzyme), ARBs (angiotensin receptor blockers).
Source: Acumen, LLC, analysis for MedPAC.

# Framework for study periods

- Selection period: study cohorts identified based on diagnostic codes on claims and use of designated drug therapies
- Observation period: identify the level of adherence to study medication(s)
- Outcome period: measure outcome variables (Medicare spending)

**Study periods: 2008 - 2010**

# Measuring medication adherence

- Proportion of days covered (PDC) metric
  - Defined as the # of days covered by a prescription for a given drug divided by total # of days in a measurement period
  - Ranges between 0 and 1
- PDC categories as a proxy for the level of adherence:
  - PDC ≤ 0.3 (least adherent)
  - 0.3 – 0.5
  - 0.5 – 0.8
  - PDC > 0.8 (most adherent)
- PDC metric is an imperfect measure of medication adherence
  - Only observe Rx fills, not adherence, in Part D claims

# Analytic approach

- Regression analysis used to estimate the effect of improved adherence on medical spending
  - Adjust for demographic characteristics, health status (RxHCC), and other health histories
  - Separate analysis by LIS status for each condition/drug regimen cohort
  - Outcome variables:
    - Medicare Parts A and B spending
    - Medicare spending by service category
- Effect of improved adherence is the difference between:
  - Predicted spending at the highest level of adherence (PDC > 0.8), and
  - Predicted spending at a lower level of adherence (e.g., PDC ≤ 0.3)
- Net effect = effect on medical spending + increase in drug costs

# Preliminary findings

- Medication adherence across cohorts and over time
- Effects of improved adherence on Medicare spending
- Relationship between medication adherence and Medicare spending

# Adherence varies by condition

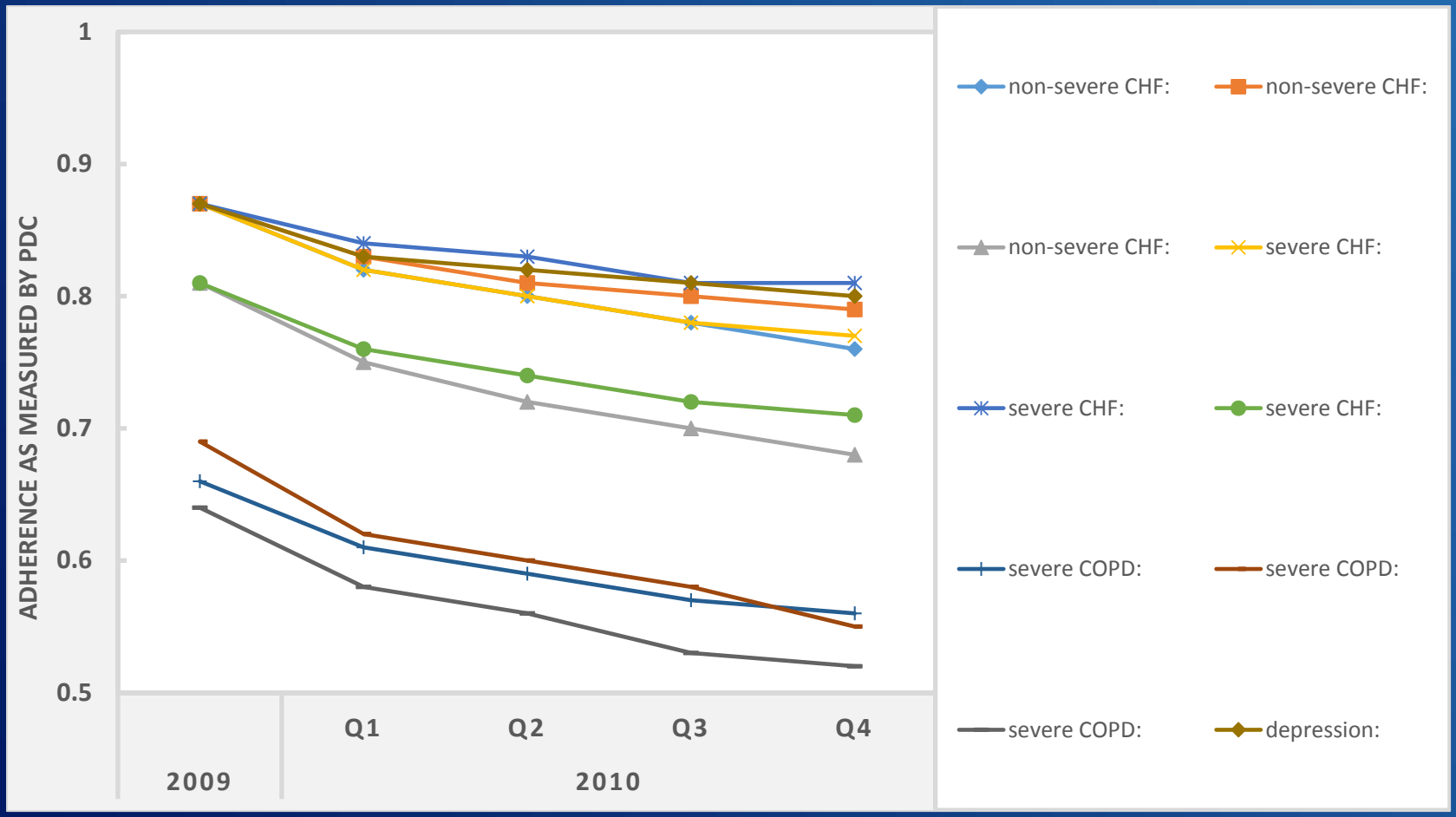
*** Data are preliminary and subject to change ***

| | Non-severe CHF | Severe CHF | Severe COPD | Depression |
|---|---|---|---|---|
| # of beneficiaries | 823,758 | 176,042 | 158,870 | 1,295,733 |
| % receiving LIS | 54% | 41% | 62% | 66% |
| Distribution by PDC category | | | | |
| ≤ 0.3 | 5% | 5% | 16% | 4% |
| > 0.3 and ≤ 0.5 | 6 | 6 | 15 | 4 |
| > 0.5 and ≤ 0.8 | 15 | 16 | 25 | 13 |
| > 0.8 | 74 | 73 | 44 | 78 |
| Mean PDC by LIS status | | | | |
| Non-LIS | 0.84 | 0.84 | 0.61 | 0.85 |
| LIS | 0.85 | 0.84 | 0.69 | 0.88 |

Note: CHF (congestive heart failure), COPD (chronic obstructive pulmonary disease), LIS (low-income subsidy), PDC (proportion of days covered).
Source: Acumen, LLC, analysis for MedPAC.

# Adherence to all study medications decline over time

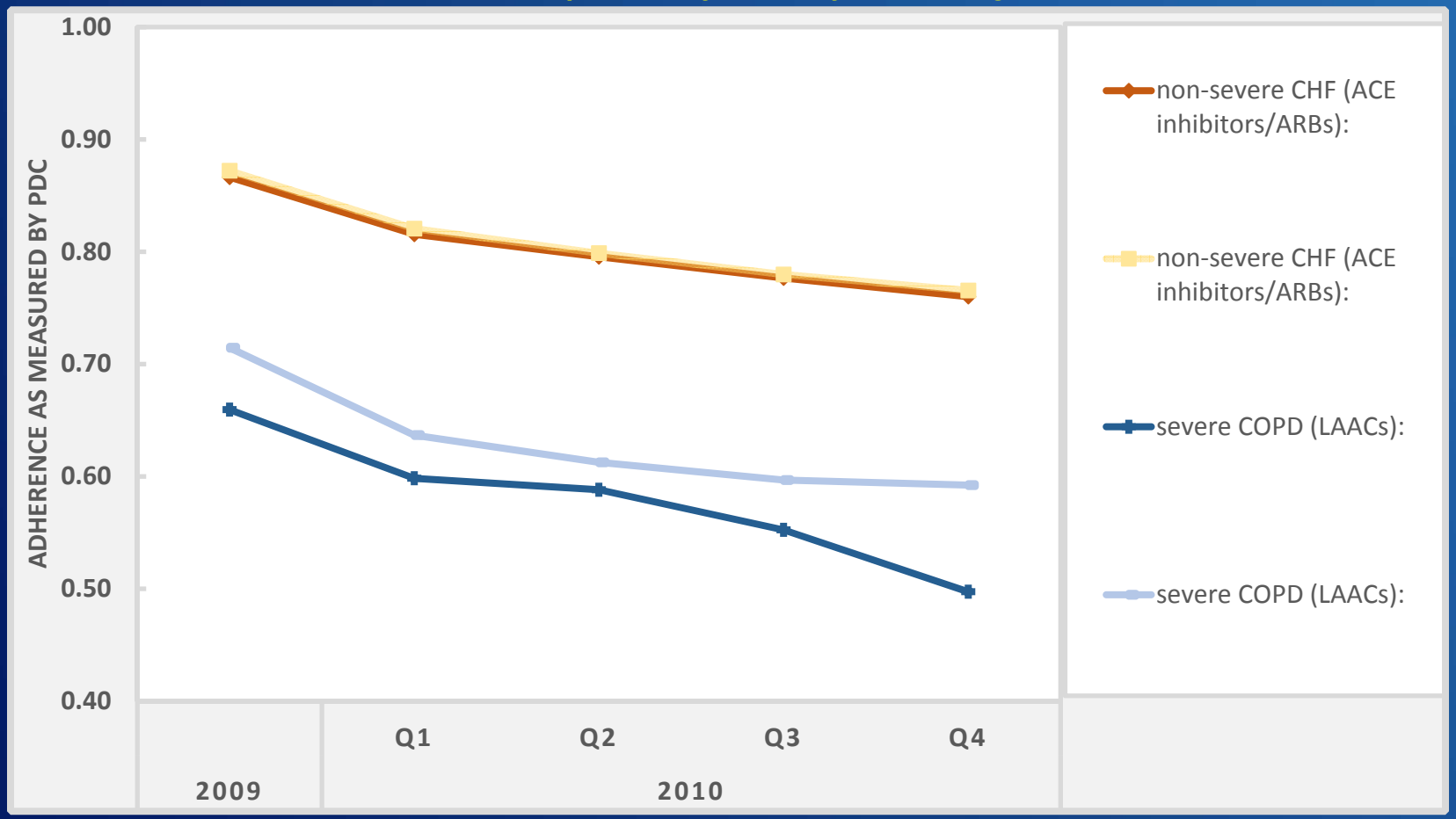
*** Data are preliminary and subject to change ***




Note: CHF (congestive heart failure), ACE (angiotensin converting enzyme), ARBs (angiotensin receptor blockers), COPD (chronic obstructive pulmonary disease), LABAs (long-acting beta-adrenergics), LAACs (long-acting anticholinergics), PDC (proportion of days covered).
Source: Acumen, LLC, analysis for MedPAC.

# Adherence decline similar for LIS and non-LIS, but steeper decline for non-LIS w/ COPD

*** Data are preliminary and subject to change ***




Note: CHF (congestive heart failure), ACE (angiotensin converting enzyme), ARBs (angiotensin receptor blockers), COPD (chronic obstructive pulmonary disease), LAACs (long-acting anticholinergics), PDC (proportion of days covered).
Source: Acumen, LLC, analysis for MedPAC.

# Estimated effects of improved adherence: from lowest (PDC≤0.3) to highest (PDC>0.8) level

***** Data are preliminary and subject to change *****

| | Total Parts A & B spending | Part D spending | Net effect on Medicare spending | |
|---|---|---|---|---|
| **Non-severe CHF (ACE inhibitors/ARBs)** | | | | |
| **Non-LIS** | -$1,046 | $136 | -$911 | * |
| **LIS** | -1,919 | 340 | -1,579 | * |
| **Severe CHF (Beta-blockers)** | | | | |
| **Non-LIS** | -1,712 | 92 | -1,620 | |
| **LIS** | 684 | 211 | 905 | |
| **Severe COPD (LABAs)** | | | | |
| **Non-LIS** | -1,602 | 789 | -813 | |
| **LIS** | -1,314 | 1,963 | 649 | |
| **Depression (antidepressants)** | | | | |
| **Non-LIS** | 119 | 246 | 365 | * |
| **LIS** | -46 | 813 | 768 | * |

MEDPAC

Note: PDC (proportion of days covered), CHF (congestive heart failure), ACE (angiotensin converting enzyme), ARBs (angiotensin receptor blockers), LIS (low-income subsidy), COPD (chronic obstructive pulmonary disease), LABAs (long-acting beta-adrenergics). *Statistically significant at the 0.05 level.
Source: Acumen, LLC, analysis for MedPAC.

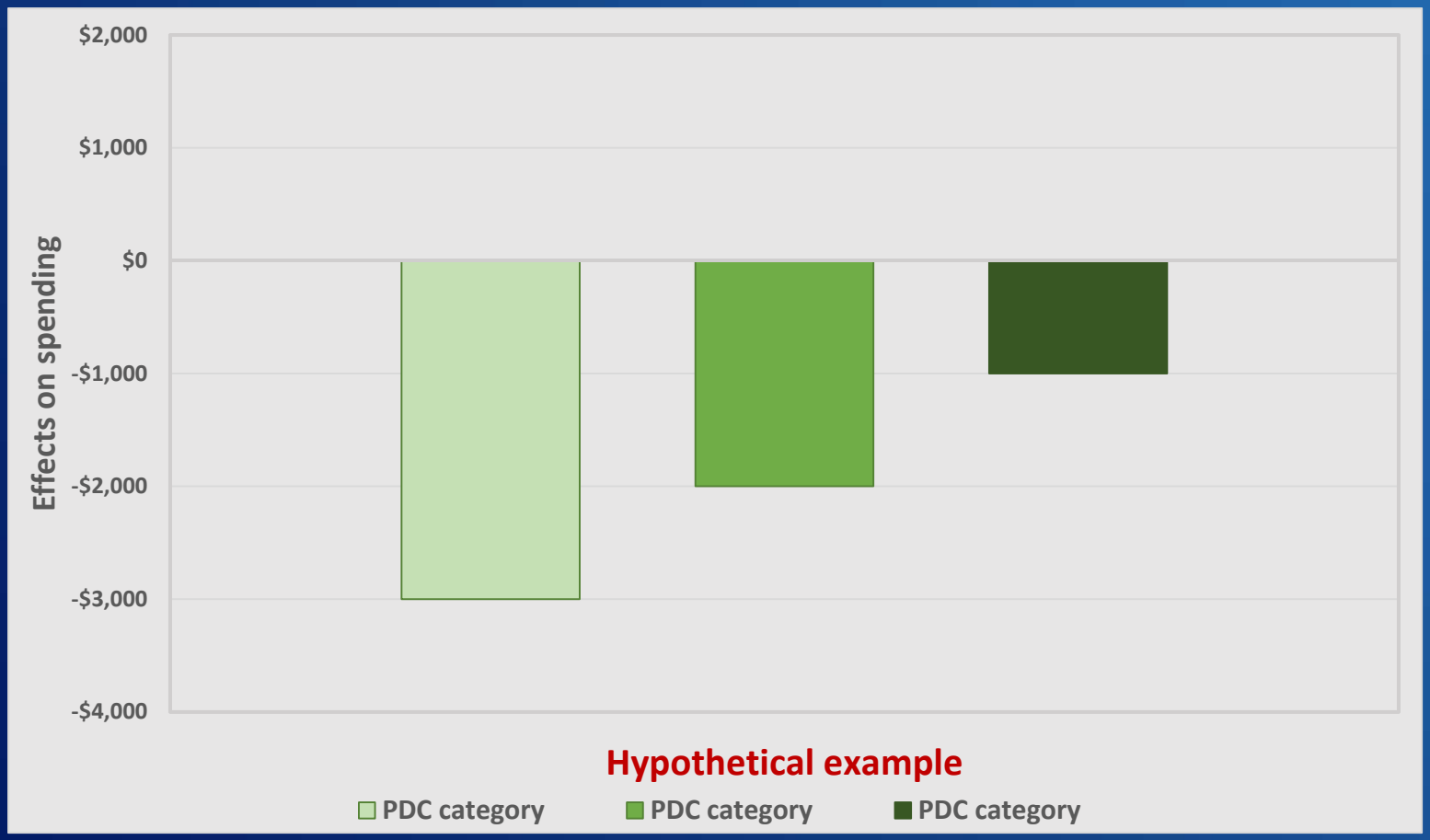
# Reductions in spending not always accounted for by effects on condition-specific costs

- CHF-specific costs accounted for over 60% of the overall effects of improved adherence for many severe CHF cohorts
- For other cohorts, condition-specific effects accounted for relatively small shares of overall effect:
  - CHF-specific costs accounted for less than 25% of the overall effects for many non-severe CHF cohorts
  - COPD-specific costs accounted for less than 1/3 of the overall effects for most COPD cohorts

# Differing effects of improved adherence by health care setting

- Reductions in inpatient hospital spending accounted for the largest share of the reduction in spending in the majority of the cohorts
- Reductions in physician services and ER visits in many cohorts
- Mixed results for other health care settings

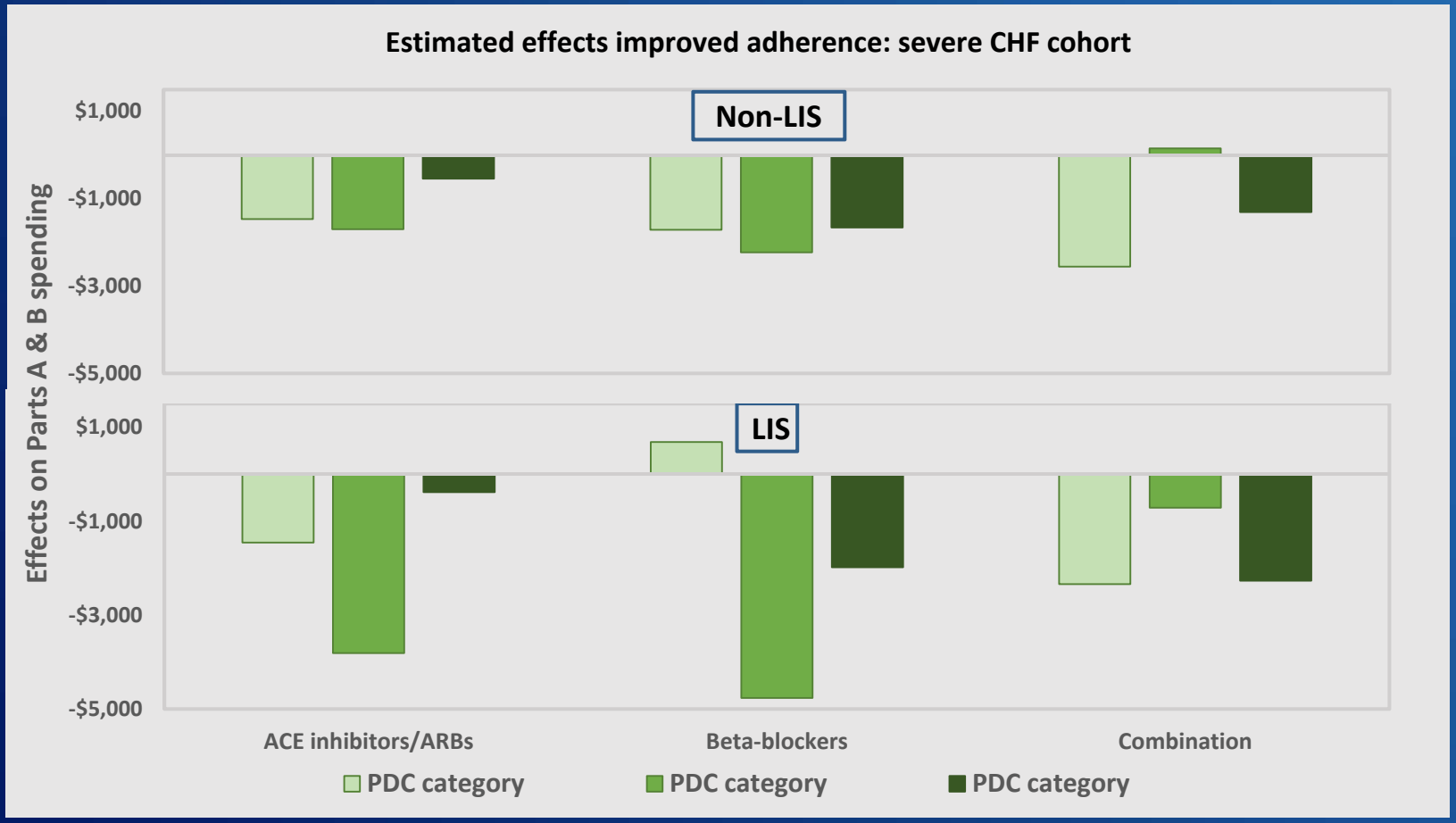
# Do greater improvements in adherence result in larger effects on spending?




MEDPAC Note: PDC (proportion of days covered).

# A greater improvement in adherence doesn't always result in a larger reduction in spending

*** Data are preliminary and subject to change ***




Note: LIS (low-income subsidy), CHF (congestive heart failure), ACE (angiotensin converting enzyme), ARBs (angiotensin receptor blockers), PDC (proportion of days covered).
Source: Acumen, LLC, analysis for MedPAC.

# Summary of findings

- Adherence to study medications:
  - Varied across conditions and drug regimen
  - Declined over time for all cohorts
- Effects of improved adherence:
  - Effects on Medicare spending varied by condition, medication regimen, and by LIS status
  - Reductions in spending were typically largest for inpatient hospital; mixed results for other services
  - Effects on condition-specific costs varied
  - A greater improvement in adherence did not always result in a larger reduction in spending

# Next step

- Limitations:
  - Our study focused on specific conditions/drug regimens, so the findings are not generalizable
  - Non-drug costs associated with improving medication adherence not factored in our analysis
  - The PDC metric is an imperfect measure of medication adherence
  - Study period not long enough to observe longer-term effects
- Future direction:
  - Analyze other conditions
  - Observe longer time period to see if effects are sustained

# Discussion questions

- Questions / comments?
- Comments on how to take this research forward?