

## American College of Preventive Medicine Conference | February 2016

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## Objective:

To examine the relationship between mentally and physically unhealthy days and adherence to three classes of maintenance medications

## Methods

- **Study design:** Cross-sectional survey
- **Data sources:**
  - Administrative insurance claims data from Humana Inc.
    - Medical and pharmacy claims and enrollment data
  - Voice Activated Technology (VAT) survey data
    - Administered via phone, computer-operated
    - Data collection November 24 to December 24, 2014
    - 166,000+ respondents across the United States
    - Included 2 Healthy Days questions
    - Weighted to standardize the respondent profile to that of the entire plan population as of September 30, 2014

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## Inclusion Criteria

- Continuous medical and pharmacy insurance enrollment in 2013 and 2014
- ≥65 years of age on January 1, 2013
- Healthy Days VAT survey respondent in 2014
- Filled at least 2 prescriptions for 1 of 3 medication classes in both years
  - Oral diabetes medication
  - Angiotensin converting enzyme inhibitor *OR* angiotensin receptor blocker
  - Statin
- Index date = date of 1st prescription in the calendar year

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## Measuring Medication Adherence

- **Medication adherence:**
  - PDC = Count of days covered by medication divided by total days eligible from index date to end of the year
  - Adherence defined as proportion of days covered (PDC) ≥80%



**STEPHEN**  
35 years old; diabetes

Index date: 1/15/2013  
11 refills, 30 tablets each  
Total days prescribed medication = 330  
Total days from index date to end of the year = 350  
No gaps between last pill from previous refill and first pill from subsequent refill  
**PDC = 330/350 or 94%**

- Calculated for 2013 and 2014, individually
- 2 prescriptions required in each year
- Prescription refills are a **proxy for medication consumption**

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## Methods

- **Outcome:**
  - Mean difference in physically and mentally unhealthy days between adherent and non-adherent individuals by year
- **Analyses:**
  - Relationship between medication adherence and mentally and physically unhealthy days was assessed using ordinary least-squares regression, while accounting for survey design
  - Adjusted for the following covariates:
    - Age
    - Gender
    - Rurality – Rural Urban Commuting Area (RUCA) designation
    - Dual eligibility status
    - Provider payment relationship with Humana (fee-for-service vs. capitated)
    - Mean total CMS premium from 2013 (Medicare Parts A, B, and D)

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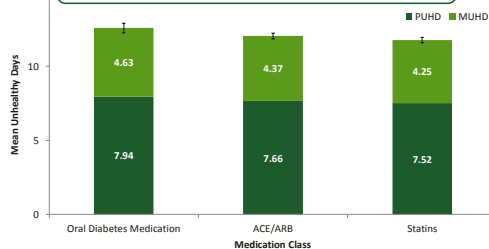
## Results

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### Unhealthy Days over 2013-2014, Regardless of Medication Adherence

There were approximately 7 physically unhealthy days and 4 mentally unhealthy days reported for all individuals studied over two years.



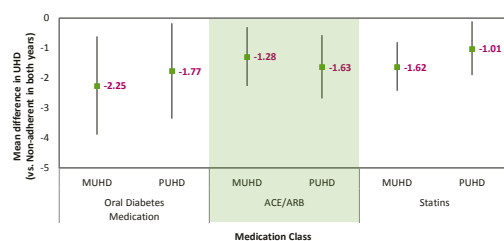
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Error bars show 95% confidence interval for total unhealthy days estimate  
PUHD, physically unhealthy days; MUHD, mentally unhealthy days

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### Differences in Unhealthy Days: Adherent vs. Non-adherent

In adjusted analyses, individuals adherent to medications in both 2013 and 2014 had significantly fewer unhealthy days than those non-adherent in both years

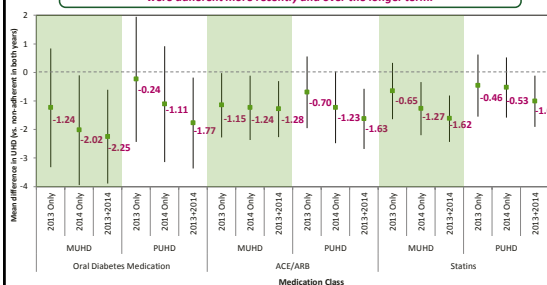


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\*All results significant (p<0.05), controlling for age, gender, rurality, dual eligibility, provider payment relationship and mean total CMS 2013 premiums. ACE, angiotensin converting enzyme inhibitor; ARB, angiotensin receptor blocker; MUHD, mentally unhealthy days; PUHD, physically unhealthy days  
Adherence defined as PDC >80%

### Differences in Unhealthy Days: Adherent vs. Non-adherent by Years

There was a trend towards greater reductions in unhealthy days when individuals were adherent more recently and over the longer term.



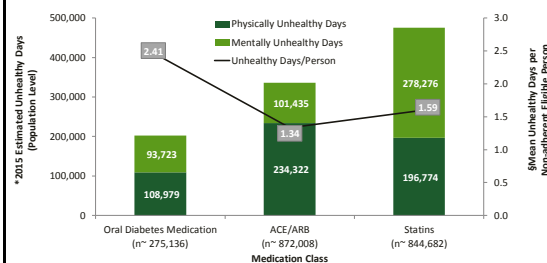
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\*Adjusted for age, gender, rurality, provider payment relationship and mean total CMS 2013 premiums. ACE, angiotensin converting enzyme inhibitor; ARB, angiotensin receptor blocker; MUHD, mentally unhealthy days; PUHD, physically unhealthy days  
Adherence defined as PDC >80%

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### 2015 Projected Unhealthy Days

Extrapolation of 2014 sample data to 2015 population numbers projects that non-adherence to statins is associated with the most unhealthy days; however, people taking oral diabetes medications may have a higher burden of unhealthy days per non-adherent person.



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\*Projected based on 2014 sample data, accounting for yearly membership growth.  
§Eligible = taking a medication in that class in both 2013 and 2014, projected from 2014 sample data  
ACE, angiotensin converting enzyme inhibitor; ARB, angiotensin receptor blocker  
Adherence defined as PDC >80%

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### Limitations

- While PDC indicates medication availability for a period of time, it does not equate to medication consumption.
- Healthy Days survey data are subject to response and recall bias.
- Weighting may not fully account for differences between responders and non-responders in the population.
- Results were subject to limitations inherent in all claims databases, such as coding errors, missing and miscoded data, and fixed variables.
- The cross-sectional design of this study limits us from inferring any temporal or causal relationship between the variables.
- This study utilized data from a population of older individuals insured by a single health plan and geographically concentrated in the southern US, and may not be generalizable to other populations.

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After adjusting for confounders, adherence to maintenance medications over 2 years was associated with improved physical and mental quality of life.



Consistent adherence was optimal: physically unhealthy days were significantly lower only when the individual was adherent in both 2013 and 2014.



Strategies to improve medication adherence to three therapeutic classes may help reduce unhealthy days, especially for patients on oral diabetes medications.

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