

Nursing Home Reporting of Major Injury Falls for Patient Safety Measurement on Nursing Home Compare

Prachi Sanghavi
Assistant Professor
Department of Public Health Sciences
University of Chicago

October 27, 2020

Outline

- 1 What is Nursing Home Compare?
- 2 Research objective: Assess accuracy of MDS reporting
- 3 Data: Medicare claims & MDS
- 4 Analysis & results: Reporting rates, disparities, & correlations
- 5 Conclusions & policy implications

Outline

- 1 What is Nursing Home Compare?
- 2 Research objective: Assess accuracy of MDS reporting
- 3 Data: Medicare claims & MDS
- 4 Analysis & results: Reporting rates, disparities, & correlations
- 5 Conclusions & policy implications

CMS Nursing Home Compare's Five-Star Rating System

Nursing Home Search Results

Viewing 1 - 20 of 55 results

Nursing home information	Overall Rating	Health Inspections	Staffing	Quality measures	Distance
A.G. RHODES HOME WESLEY WOODS 1819 CLIFTON ROAD, N.E. ATLANTA, GA 30329 (404) 315-0900	☆☆●●	☆☆●●●	☆☆●●●	☆☆☆☆	0.8 Miles
BUDD TERRACE AT WESLEY WOODS 1833 CLIFTON ROAD, NE ATLANTA, GA 30329 (404) 728-6500	☆☆☆☆●	☆☆☆☆●	☆☆●●●	☆☆☆☆	0.9 Miles
PRUITTHEALTH - VIRGINIA PARK 1000 BRIARCLIFF ROAD NE ATLANTA, GA 30306 (404) 875-6456	☆☆●●●	☆☆●●●	☆☆●●●	☆☆●●●	1.9 Miles

A.G. RHODES HOME WESLEY WOODS ☆☆☆● ☆☆☆●● ☆☆☆●● ☆☆☆☆ 0.8 Miles
 1819 CLIFTON ROAD, N.E.
 ATLANTA, GA 30329
 (404) 315-0900
 Average Below Average Below Average Much Above Average

BUDD TERRACE AT WESLEY WOODS ☆☆☆☆● ☆☆☆☆● ☆☆☆●● ☆☆☆☆ 0.9 Miles
 1833 CLIFTON ROAD, NE
 ATLANTA, GA 30329
 (404) 728-6500
 Above Average Average Below Average Much Above Average

PRUITTHEALTH - VIRGINIA PARK ☆☆☆●● ☆☆☆●● ☆☆☆●● ☆☆☆●● 1.9 Miles
 1000 BRIARCLIFF ROAD NE
 ATLANTA, GA 30306
 (404) 875-6456
 Much Below Average Below Average Much Below Average Much Below Average

	A.G. RHODES HOME WESLEY WOODS	GEORGIA AVERAGE
Long-stay quality of resident care	☆☆☆☆☆ Much Above Average	
Measures used to calculate the star rating - Long-stay residents		
Number of hospitalizations per 1,000 long-stay resident days. <i>Lower numbers are better.</i>	1.40	1.78
Number of outpatient emergency department visits per 1,000 long-stay resident days. <i>Lower numbers are better.</i>	0.50	1.04
Percentage of long-stay residents who got an antipsychotic medication. <i>Lower percentages are better.</i>	11.8%	18.1%
Percentage of long-stay residents experiencing one or more falls with major injury. <i>Lower percentages are better.</i>	0.5%	3.1%
Percentage of long-stay high-risk residents with pressure ulcers. <i>Lower percentages are better.</i>	2.2%	9.1%
Percentage of long-stay residents with a urinary tract infection. <i>Lower percentages are better.</i>	2.3%	3.4%

"All the News
That's Fit to Print"

The New York Times

Late Edition

Today, mostly sunny; cooler; high 53.
Tonight, clear, chilly; low 43. Tomorrow, sunny start, cloudier afternoon, possible showers; high 56. Rain at night. Weather map is on Page B8.

BUSINESS

Five-Star Nursing Homes

In 2011, Ken Chandler brought his elderly mother to a nursing home that had Medicare's seal of approval, a five-star rating. After a series of troubling events there, Mr. Chandler now feels misled.

By Kassie Bracken and Taige Jensen

OPINION

Is That Really a Five-Star Nursing Home?

Under a revised system, consumers will be able to get more accurate ratings.

By The Editorial Board

BUSINESS

Medicare Star Ratings Allow Nursing Homes to Game the System

Medicare's five-year-old rating system to help families select nursing homes relies on unverified, incomplete and often misleading data.

By Katie Thomas

OPINION

When Five-Star Care Is Substandard

Medicare's rating system masks serious and potentially dangerous deficiencies at many nursing homes.

By The Editorial Board

BUSINESS

Medicare Revises Nursing Home Rating System

The Centers for Medicare and Medicaid Services acknowledged that its five-star rating system needed work, given that it relies heavily on self-reporting.

By Katie Thomas

Resident _____

Identifier _____

Date _____

MINIMUM DATA SET (MDS) - Version 3.0

RESIDENT ASSESSMENT AND CARE SCREENING

Nursing Home Comprehensive (NC) Item Set

Section A	Identification Information
A0050. Type of Record	
Enter Code <input style="width: 40px; height: 20px;" type="text"/>	<ol style="list-style-type: none"> 1. Add new record → Continue to A0100, Facility Provider Numbers 2. Modify existing record → Continue to A0100, Facility Provider Numbers 3. Inactivate existing record → Skip to X0150, Type of Provider
A0100. Facility Provider Numbers	
	<p>A. National Provider Identifier (NPI):</p> <p>B. CMS Certification Number (CCN):</p> <p>C. State Provider Number:</p>
A0200. Type of Provider	
Enter Code <input style="width: 40px; height: 20px;" type="text"/>	<p>Type of provider</p> <ol style="list-style-type: none"> 1. Nursing home (SNF/NF) 2. Swing Bed
A0310. Type of Assessment	
Enter Code <input style="width: 40px; height: 20px;" type="text"/>	<p>A. Federal OBRA Reason for Assessment</p> <ol style="list-style-type: none"> 01. Admission assessment (required by day 14) 02. Quarterly review assessment 03. Annual assessment 04. Significant change in status assessment 05. Significant correction to prior comprehensive assessment 06. Significant correction to prior quarterly assessment 99. None of the above

Resident _____

Identifier _____

Date _____

Section J**Health Conditions****J1700. Fall History on Admission/Entry or Reentry**

Complete only if A0310A = 01 or A0310E = 1

Enter Code <input type="checkbox"/>	A. Did the resident have a fall any time in the last month prior to admission/entry or reentry? 0. No 1. Yes 9. Unable to determine
Enter Code <input type="checkbox"/>	B. Did the resident have a fall any time in the last 2-6 months prior to admission/entry or reentry? 0. No 1. Yes 9. Unable to determine
Enter Code <input type="checkbox"/>	C. Did the resident have any fracture related to a fall in the 6 months prior to admission/entry or reentry? 0. No 1. Yes 9. Unable to determine

J1800. Any Falls Since Admission/Entry or Reentry or Prior Assessment (OBRA or Scheduled PPS), whichever is more recent

Enter Code <input type="checkbox"/>	Has the resident had any falls since admission/entry or reentry or the prior assessment (OBRA or Scheduled PPS), whichever is more recent? 0. No → Skip to K0100, Swallowing Disorder 1. Yes → Continue to J1900, Number of Falls Since Admission/Entry or Reentry or Prior Assessment (OBRA or Scheduled PPS)
--	---

J1900. Number of Falls Since Admission/Entry or Reentry or Prior Assessment (OBRA or Scheduled PPS), whichever is more recent

↓ Enter Codes in Boxes							
Coding: 0. None 1. One 2. Two or more	<table border="1"> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>A. No injury - no evidence of any injury is noted on physical assessment by the nurse or primary care clinician; no complaints of pain or injury by the resident; no change in the resident's behavior is noted after the fall</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>B. Injury (except major) - skin tears, abrasions, lacerations, superficial bruises, hematomas and sprains; or any fall-related injury that causes the resident to complain of pain</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>C. Major injury - bone fractures, joint dislocations, closed head injuries with altered consciousness, subdural hematoma</td> </tr> </table>	<input type="checkbox"/>	A. No injury - no evidence of any injury is noted on physical assessment by the nurse or primary care clinician; no complaints of pain or injury by the resident; no change in the resident's behavior is noted after the fall	<input type="checkbox"/>	B. Injury (except major) - skin tears, abrasions, lacerations, superficial bruises, hematomas and sprains; or any fall-related injury that causes the resident to complain of pain	<input type="checkbox"/>	C. Major injury - bone fractures, joint dislocations, closed head injuries with altered consciousness, subdural hematoma
<input type="checkbox"/>	A. No injury - no evidence of any injury is noted on physical assessment by the nurse or primary care clinician; no complaints of pain or injury by the resident; no change in the resident's behavior is noted after the fall						
<input type="checkbox"/>	B. Injury (except major) - skin tears, abrasions, lacerations, superficial bruises, hematomas and sprains; or any fall-related injury that causes the resident to complain of pain						
<input type="checkbox"/>	C. Major injury - bone fractures, joint dislocations, closed head injuries with altered consciousness, subdural hematoma						

Discrepancies with other measures

- Investigations over the past decades by HHS OIG and US GAO have found discrepancies between MDS and other sources
 - Only state and federal offices with oversight responsibilities have compared patient-level MDS records with other patient-level data sources, typically medical records
 - In 2014 audit, CMS compared MDS assessments with patients medical records in 25 volunteer nursing homes for up to 10 patients per home. For falls, 26% of reviewed MDS assessments disagreed with the medical record as to whether the patient sustained a fall-related major injury. These studies, conducted in a handful of sites, based denominators on the MDS rather than a validation source, and therefore may have entirely missed cases unreported by the MDS.
- Limited academic work similarly finds discrepancies
 - In an analysis of FFS Medicare beneficiaries, Neuman et al. were unable to estimate consistent associations between readmission or death risk and MDS-based measures

Outline

- 1 What is Nursing Home Compare?
- 2 **Research objective: Assess accuracy of MDS reporting**
- 3 Data: Medicare claims & MDS
- 4 Analysis & results: Reporting rates, disparities, & correlations
- 5 Conclusions & policy implications

General research question

How accurately do nursing homes report major injury falls on the MDS?

Sanghavi P, Pan S, Caudry D. Assessment of nursing home reporting of major injury falls for quality measurement on Nursing Home Compare. Health Services Research 2019;55(2):201-210.

Resident _____

Identifier _____

Date _____

Section J**Health Conditions****J1700. Fall History on Admission/Entry or Reentry**

Complete only if A0310A = 01 or A0310E = 1

Enter Code <input type="checkbox"/>	A. Did the resident have a fall any time in the last month prior to admission/entry or reentry? 0. No 1. Yes 9. Unable to determine
Enter Code <input type="checkbox"/>	B. Did the resident have a fall any time in the last 2-6 months prior to admission/entry or reentry? 0. No 1. Yes 9. Unable to determine
Enter Code <input type="checkbox"/>	C. Did the resident have any fracture related to a fall in the 6 months prior to admission/entry or reentry? 0. No 1. Yes 9. Unable to determine

J1800. Any Falls Since Admission/Entry or Reentry or Prior Assessment (OBRA or Scheduled PPS), whichever is more recent

Enter Code <input type="checkbox"/>	Has the resident had any falls since admission/entry or reentry or the prior assessment (OBRA or Scheduled PPS), whichever is more recent? 0. No → Skip to K0100, Swallowing Disorder 1. Yes → Continue to J1900, Number of Falls Since Admission/Entry or Reentry or Prior Assessment (OBRA or Scheduled PPS)
--	---

J1900. Number of Falls Since Admission/Entry or Reentry or Prior Assessment (OBRA or Scheduled PPS), whichever is more recent

↓ Enter Codes in Boxes							
Coding: 0. None 1. One 2. Two or more	<table border="1"> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>A. No injury - no evidence of any injury is noted on physical assessment by the nurse or primary care clinician; no complaints of pain or injury by the resident; no change in the resident's behavior is noted after the fall</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>B. Injury (except major) - skin tears, abrasions, lacerations, superficial bruises, hematomas and sprains; or any fall-related injury that causes the resident to complain of pain</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>C. Major injury - bone fractures, joint dislocations, closed head injuries with altered consciousness, subdural hematoma</td> </tr> </table>	<input type="checkbox"/>	A. No injury - no evidence of any injury is noted on physical assessment by the nurse or primary care clinician; no complaints of pain or injury by the resident; no change in the resident's behavior is noted after the fall	<input type="checkbox"/>	B. Injury (except major) - skin tears, abrasions, lacerations, superficial bruises, hematomas and sprains; or any fall-related injury that causes the resident to complain of pain	<input type="checkbox"/>	C. Major injury - bone fractures, joint dislocations, closed head injuries with altered consciousness, subdural hematoma
<input type="checkbox"/>	A. No injury - no evidence of any injury is noted on physical assessment by the nurse or primary care clinician; no complaints of pain or injury by the resident; no change in the resident's behavior is noted after the fall						
<input type="checkbox"/>	B. Injury (except major) - skin tears, abrasions, lacerations, superficial bruises, hematomas and sprains; or any fall-related injury that causes the resident to complain of pain						
<input type="checkbox"/>	C. Major injury - bone fractures, joint dislocations, closed head injuries with altered consciousness, subdural hematoma						

Why focus on falls?

- Leading cause of death among older adults
- Can lead to physical and psychological morbidity when not fatal
- Often preventable and so an important measure of patient safety
- Likely easier to identify and record than other conditions

Validation source: Medicare FFS claims

We cannot identify all falls but we can identify a pool of falls that we expect nursing homes to have reported on the MDS by identifying:

- 1 Patients who were admitted to the hospital with specific injuries
- 2 Patients that came to the hospital from a nursing home or went to a nursing home after hospital discharge

Specific research questions

- 1 How accurately do nursing homes report claims-identified major injury falls on the MDS?
- 2 To what extent does reporting vary by race?
- 3 How well do nursing home claims-based fall rates correlate with MDS-based NHC measures?

Outline

- 1 What is Nursing Home Compare?
- 2 Research objective: Assess accuracy of MDS reporting
- 3 Data: Medicare claims & MDS**
- 4 Analysis & results: Reporting rates, disparities, & correlations
- 5 Conclusions & policy implications

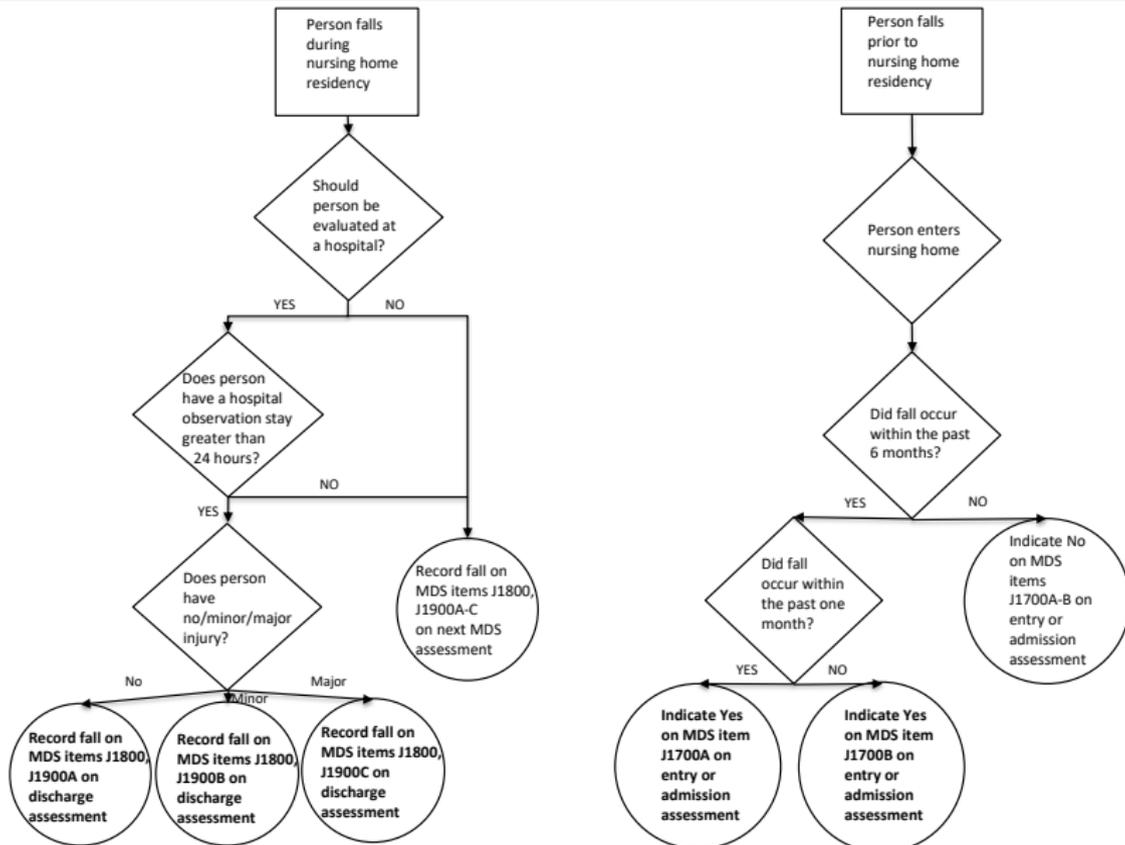
Medicare claims, MDS, and other sources

- 2011-2015 100% Medicare FFS beneficiaries
 - Hospital admission claims (diagnoses, admission/discharge dates)
 - Enrollment & demographic information from beneficiary summary files (age, sex, race, etc.)
- 2011-2015 100% MDS assessments
 - Entry/admission, discharge, & regular assessments (completed at least every 92 days for each resident)
- CASPER and LTCfocus
 - Facility characteristics (ownership type, residents counts)
- Nursing Home Compare measures
 - Overall five-star rating
 - Quality five-star rating
 - Major injury falls measure

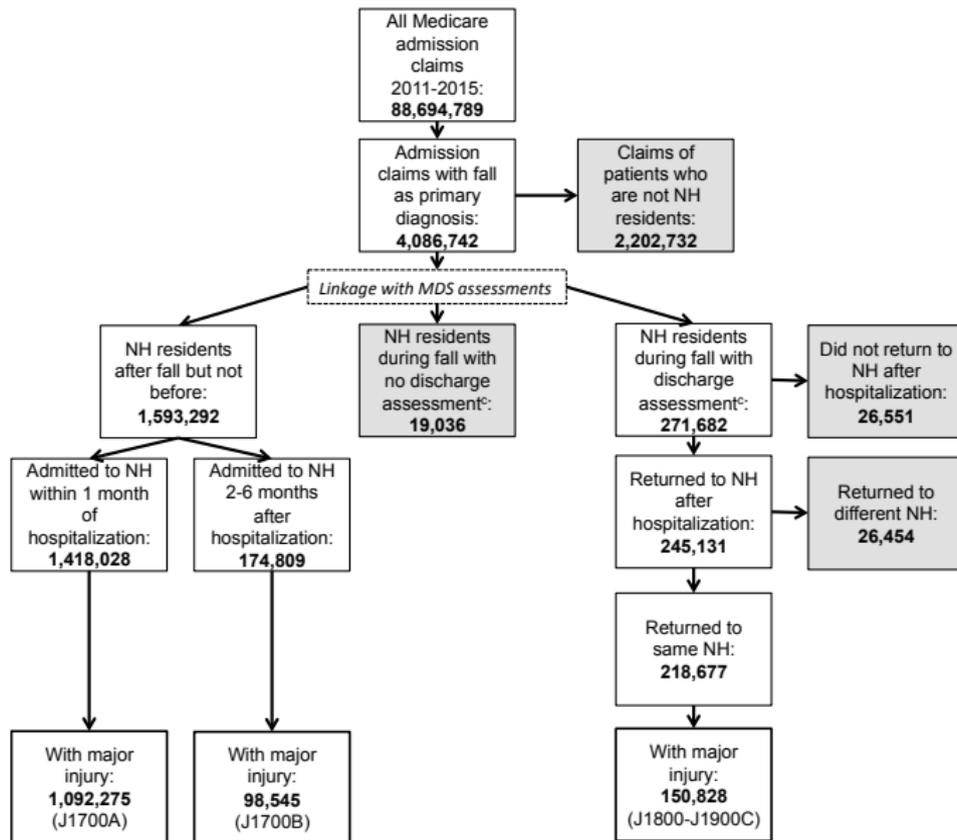
Outline

- 1 What is Nursing Home Compare?
- 2 Research objective: Assess accuracy of MDS reporting
- 3 Data: Medicare claims & MDS
- 4 Analysis & results: Reporting rates, disparities, & correlations**
- 5 Conclusions & policy implications

MDS reporting process for falls



Linkage of admission claims with MDS assessments



Identifying accidental falls in claims

- ICD9-CM external cause codes E880-E888, excluding E887 in admitting or primary diagnosis code fields or primary external cause code field
- In the years of our data, reporting of external cause codes is high, at about 90% for all injury cases

Constructed variables

- Individual level:
 - **Dual**: Dual status if full dual in the month of their hospital admission
 - **Short-stay (vs long-stay)**: Short-stay residents are those whose stays would have been covered by Medicare, which can be up to 100 days and can be identified via a PPS 5-day assessment
 - **Major injury (MDS definition)**: Falls with a secondary diagnosis code for conditions identified in the MDS definition for major injury, namely bone fractures, joint dislocations, closed head injuries with altered consciousness, and subdural hematomas
 - **New injury severity scores (NISS)**
 - **Charlson/Elixhauser comorbidity scores**
- Nursing home level:
 - **Size**: Tertiles by the total registered resident counts at the time of the CASPER report, with breaks at 65 and 105 residents
 - **Duals**: Proportion of residents who are duals
 - **Race**: Proportion of residents that fall within each race category

National reporting rates of major injury falls

Number of major injury falls in item denominator				Fall item	Percent of major injury falls reported (25 th , 75 th percentile)			
Short-stay		Long-stay			Short-stay		Long-stay	
White	Non-white	White	Non-white		White	Non-white	White	Non-white
804,742	85,246	173,032	29,255	J1700A	94.8 (92.3, 100.0)	91.6 (91.7, 100.0)	94.0 (93.3, 100.0)	90.9 (97.6, 100.0)
65,222	10,925	18,385	4,013	J1700B	41.8 (8.3, 66.7)	33.2 (0.0, 66.7)	44.4 (0.0, 100.0)	33.2 (0.0, 100.0)
45,617	6,310	87,043	11,858	J1800	67.8 (50.0, 100.0)	62.6 (0.0, 100.0)	82.8 (71.4, 100.0)	76.1 (60.0, 100.0)
				J1900A	17.4 (0.0, 33.3)	18.9 (0.0, 33.3)	23.5 (0.0, 33.3)	23.1 (0.0, 50.0)
				J1900B	18.0 (0.0, 30.0)	19.2 (0.0, 25.0)	21.0 (0.0, 33.3)	21.8 (0.0, 33.33)
				J1900C	48.6 (22.2, 80.0)	37.4 (0.0, 100.0)	64.5 (46.7, 87.5)	51.3 (0.0, 100)

Item	Question
J1700A	Did the resident have a fall any time in the last month prior to admission/entry or reentry?
J1700B	Did the resident have a fall any time in the last 2-6 months prior to admission/entry or reentry?
J1800	Has the resident had any falls since admission/entry or reentry or the prior assessment, whichever is more recent?
J1900A	No injury - no evidence of any injury is noted on physical assessment by the nurse or primary care clinician; no complaints of pain or injury by the resident; no change in the resident's behavior is noted after the fall
J1900B	Injury (except major) - skin tears, abrasions, lacerations, superficial bruises, hematomas and sprains; or any fall-related injury that causes the resident to complain of pain.
J1900C	Major injury - bone fractures, joint dislocations, closed head injuries with altered consciousness, subdural hematoma

Modeling reporting characteristics of patients & homes

$$J1900C_Reported_{in} = \alpha_n + \pi_t + X'_{in}\beta + Y'_n\gamma$$
$$\alpha_n \sim N(0, \sigma^2)$$

- Linear multilevel model with nursing home random effects, year fixed effects, individual-level covariates, and nursing home-level covariates
- Logistic model has similar results
- Disaggregated within- and between-nursing home effects of race so that coefficients can be directly interpreted
- Separate models for short- and long-stay populations

Modeling reporting characteristics of patients & homes

		Short-stay	Long-stay
Patient characteristics			
Race	White (Ref)		
	Asian	-0.058**	-0.041*
	Black	-0.042***	-0.037***
	Hispanic	-0.029*	-0.015
	Other	-0.001	0.006
Nursing home characteristics			
Claims-based fall rate		-0.066	0.005
Ownership type	For-profit (Ref)		
	Government	0.048***	0.066***
	Non-profit	0.010	0.031***
	Other	0.006	0.023
Provider size	Large (Ref)		
	Medium	0.026***	0.018***
	Small	0.036***	0.028***
Between NH race association	Asian	-0.271***	-0.217***
	Black	-0.251***	-0.290***
	Hispanic	-0.278***	-0.267***
	Other	-0.022	0.059

- Additional covariates: female, age splines, new injury severity score, disability status, dual status, comorbidity score, NH dual, region, year
- Interpretation of patient-level race black: On average, being black rather than white is associated with a 4.2 percentage point lower probability of a major injury fall being reported on J1900C, controlling for nursing home-level race mix.
- Interpretation of nursing home-level race black: Holding constant patient race, increasing the proportion of black residents from 0 to 1 is associated with a 25.1 percentage point lower probability of a major injury fall being reported on J1900C.

Correlations between 2014 claims-based fall rates and NHC

	Percent of NHs with 4 or 5 star ratings		NH average ratings		
	Overall rating	Quality measure rating	Overall rating	Quality measure rating	MDS 3.0 Major injury falls measure (N013.01)
Quintiles of claims-based fall rates, means, 10 th , 90 th percentiles					
6.0 (4.5, 8.1)	53.3	75.4	3.40	4.03	4.14
3.6 (3.1, 4.2)	51.5	78.2	3.36	4.11	3.55
2.6 (2.2, 2.9)	50.4	80.5	3.35	4.16	3.25
1.8 (1.5, 2.1)	48.8	77.1	3.29	4.08	3.13
1.1 (0.7, 1.4)	47.0	81.9	3.21	4.22	2.65
Correlation coefficients between claims-based fall rates and measure			0.046	-0.048	0.223

Less falls



Notes:

- NH=nursing home
- Claims-based fall rates are the number of major injury falls identified in Medicare Provider Analysis and Review (MedPAR) per 100 registered residents in each nursing home in year 2014.
- On NHC, the overall rating is based on a nursing home's ratings for health inspections, quality measures (QMs), and staffing, while the quality rating is based on only the 16 physical and clinical QMs. The NHC MDS 3.0 measure (N013.01) is the percent of long-stay residents experiencing one or more falls with major injury.

Outline

- 1 What is Nursing Home Compare?
- 2 Research objective: Assess accuracy of MDS reporting
- 3 Data: Medicare claims & MDS
- 4 Analysis & results: Reporting rates, disparities, & correlations
- 5 Conclusions & policy implications**

Conclusions

- Overall
 - Substantial underreporting on the specific MDS item used by NHC
 - Reporting rates substantially lower for Asians, blacks, Hispanics compared with whites, both within and between nursing homes
- Interesting observations
 - Counting reporting on additional assessments did not help
 - Reporting rate for items where nursing homes rely on secondary sources is higher than for items where resident is in their care
 - Severity classification may be issue, but opportunities to report/correct
 - Poor correlation between claims-based fall rates and MDS-based fall rates suggests not only underreporting but that MDS-based rates may not be informative for comparing nursing homes

Policy implications

- Underreporting could have multiple sources, including administrative challenges and incentive structures
- Waiting to act in order to understand these sources not appropriate
- Next steps:
 - Create alternate measures, based on sources like claims, to supplement or replace the falls MDS-based measure
 - Other MDS-based measures should be assessed as well
 - Can use model-based approaches to correct MDS reporting rates and possibly for automatic and targeted auditing

Thank you!

I have no conflicts of interest relevant to this work. This work was supported by AHRQ R01HS026957.