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VALIDATING MDS DATA FROM VA NURSING HOME CARE UNITS: COMPARING MDS DATA WITH PAF AND NPCD SOURCES

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1.0 Introduction

During fiscal year 2001, VA fully implemented the collection of health and functional status data for VA nursing home patients using the Minimum Data Set (MDS) Version 2.0 instrument developed by the Centers for Medicare and Medicaid Services (CMS).[1] Prior to that time, VA used a VA-developed instrument - the Patient Assessment Instrument - to collect a smaller set of somewhat similar data stored in the Patient Assessment File (PAF). The MDS instrument was initially designed for use in community nursing homes; the first version was fielded in 1991.

Nursing home patient (or resident) assessment data provide the foundation for quality monitoring, case mix adjustment, and outcomes research in both community and VA nursing facilities. The adoption of the MDS 2.0 as the patient assessment instrument in VA holds the promise of more detailed data for application to VA research questions as well as data that, for the first time, could be easily comparable to resident assessment data collected in community nursing facilities.

Both in its original development and in its subsequent revision, the MDS has undergone extensive validation [Hawes 1997]. Some validation studies use the concept of inter-rater reliability, where MDS assessments conducted by different nurses are compared [Morris 1990, Morris 1997, Hawes 1995]. Other studies validate MDS items by comparing individual items or summary scores derived from several of them to data or summary scores available from other sources or assessments [Morris 1994, Hartmaier 1994, Frederikson 1996, Gambassi 1998, Snowden 1999]. Validation of MDS cognition assessment has been one domain of considerable research, with several studies comparing the MDS' cognitive performance scale with other summary measures of cognition [Morris 1994, Frederikson 1996, Snowden 1999, Gruber-Baldini 2000]. Another study [Fries 2001] developed and validated an MDS pain scale, which consists of MDS items found to be most predictive of the Visual Analogue Scale (VAS), a self-reported measure of pain [Herr 1993]. Few studies address the validity of MDS assessments conducted in a non-research setting. Thus, less is known about the validity of MDS assessments as they are completed by facility nurses under normal operating conditions [Stineman 2000].

This research project (Validating MDS Data From VA Nursing Home Care Units - SDR 03-211-2) is the first attempt to validate the MDS for the VA patient population. The goals of this project are to:

1. Evaluate the internal consistency of VA MDS data, checking different items on the same assessment and checking longitudinally across assessments for the same patient.
2. Evaluate the comparability of VA MDS data relative to PAF data from prior years and other VA administrative data.
3. Compare basic MDS-based quality indicators constructed from VA MDS data to the same measures constructed from MDS data collected from community nursing home facilities.

[1] See CMS website http://www.cms.hhs.gov/quality/mds20/default.asp? for MDS 2.0 manuals and forms.

This Data Brief is the second of three written to address the goals listed above. Specifically, this Data Brief evaluates the comparability of VA MDS data with other VA data. We approach this issue in two ways, first comparing MDS quality-related elements to PAF assessment data and then comparing MDS diagnostic data to National Patient Care Database (NPCD) diagnostic data. In doing so, we address two questions about VA nursing facility MDS assessments taken during the first few years after adoption: (1) Is the coding for quality-related items on the MDS comparable to that on the PAF? and (2) is the diagnostic information on the MDS consistent with that in the NPCD? Both questions are relevant to researchers considering using MDS data. The first question addresses the issue of consistency across instruments. If coding patterns differ substantially between the MDS and the PAF then one cannot compare results obtained prior to FY2001 (when the PAF was used) to those obtained after FY2001 (when the MDS was used). The second question addresses the issue of completeness. If the NPCD contains a substantial amount of diagnostic information that differs from that found on the MDS, then researchers using MDS diagnoses ought to consider supplementing their data with the NPCD.

Fundamentally, we are comparing MDS data to that from other sources. There are several reasons to expect the data from the MDS to differ in some way from that obtained elsewhere. First, in general the MDS defines its elements with wording or emphasis that differs from that of other sources like the PAF. Second, the period of time MDS assessment nurses are asked to consider when completing the MDS (the look back period) differs from that of other sources in most cases. Third, the structure of the MDS permits a different amount of data on a given topic than other sources. For example, using the MDS, one can code for up to 43 disease groups (clusters of ICD-9 codes) whereas the NPCD records provide up to five ICD-9 codes associated with a nursing home stay. Finally, even in cases where the definition (wording), time period (look back) and data volume are the same, the *process* of completing the MDS differs from that of other assessments or data sources. For instance, in contrast to the PAF, the MDS is completed on a patient-specific schedule following process guidelines specific to the instrument. It is likely that the process used to complete the assessment influences its content significantly.

These reasons explain the main conclusion we draw from the analyses presented in this Data Brief: the data on the MDS is different from that found on the PAF or the NPCD. The differences are sufficiently large that simple comparisons of MDS items or statistics generated from them to similar ones from the PAF are not likely to be meaningful. Also, one should not assume that diagnostic information from the MDS is similar to that from the NPCD.

The remainder of this Data Brief is organized as follows. Data sources and construction of analytic files are described in Section 2.0. Sections 3.0 and 4.0 present comparisons of MDS data to PAF data and MDS data to NPCD data, respectively. Conclusions are drawn in Section 5.0.

2.0 Data

2.1 Data for Comparison of Quality-Related Item Coding Rates

Our comparison of rates for coding of quality-related items are based on data from two sources: (1) all PAF assessments collected in VA nursing facilities during the fiscal years 1998 through 2000 and (2) all MDS assessments collected in VA nursing facilities during the fiscal years 2001 through 2004 (up to December of 2003). To compute rates of coding for various ADLs (eating,

mobility, transferring, toileting) and non-ADL conditions (dehydration, ulcers, urinary tract infections) we grouped assessments according to six-month windows centered on April and October of each year. That is, each calendar year is composed of two windows, January-June (centered on April) and July-December (centered on October). Assessments dated in January-June of a given year are grouped into the April-centered window and those dated July-December are grouped into the October-centered window. This was done to make the timing of MDS-based rates conform as closely as possible to the timing of PAF-based rates. The PAF was administered semi-annually in April and October while the MDS is administered throughout the year on a patient-specific schedule. Table 2.1 below provides the number and percent of total assessments in each of the six-month windows.

Table 2.1: Number and Percent of Assessments by Six-Month Date Window		
PAF		
Date Window	**Number**	**Percent of Total**
1/98-6/98	32,166	19.4%
7/98-12/98	32,295	19.5%
1/99-6/99	29,268	17.7%
7/99-12/99	31,713	19.2%
1/00-6/00	20,573	12.4%
7/00-12/00	19,578	11.8%
TOTAL	165,593	100%
MDS		
1/01-6/01	18,809	15.3%
7/01-12/01	19,499	15.9%
1/02-6/02	19,569	16.0%
7/02-12/02	20,418	16.7%
1/03-6/03	21,880	17.8%
7/03-12/03	22,377	18.3%
TOTAL	122,552	100%

Not all MDS records could be used for each analysis of ADL and non-ADL items. For each analysis, a small proportion of MDS records had missing data. Table 2.2 reports the number and percent of total MDS records with missing data for each analysis. Note that in all cases the percent missing is under 1 percent, and it is usually under 0.5 percent.

Table 2.2: Number and Percent of MDS Records with Missing Data by Analysis		
Analysis	**Number**	**Percent of Total MDS Records**
Eating ADL	257	0.2%
Mobility ADL	399	0.3%
Transferring ADL	134	0.1%
Toileting ADL	958	0.8%
Dehydration	4	0.0%
Ulcers	306	0.3%
Urinary Tract Infection	3	0.0%

2.2 Data for Diagnoses Comparison

Our comparison of diagnostic information from the MDS and NPCD is based on data from two sources: (1) all MDS records from fiscal years 2001 through 2004 (May) and (2) NPCD data from the same time period. Construction of the analytic file followed six steps:

1. Begin with NPCD nursing home bed section data, deleting duplicate records and overlapped bed section stay records (remaining N = 210,130).
2. Link each bed section stay to each MDS assessment taken during that stay. Drop records with no MDS assessments (remaining N = 209,950).
3. Drop records linked to quarterly MDS assessments because they do not have diagnosis data (remaining N = 112,385).
4. Gather all diagnosis data from all MDS assessments associated with a given stay; delete multiple records for a given stay (remaining N = 87,042).
5. Delete records with no NPCD and no MDS diagnosis data (remaining N = 86,248).
6. Keep records with discharge date in FY2001-2004 (remaining N = 83,922).

3.0 Comparison of Coding Rates of Quality-Related Elements from MDS and PAF

In this section we compare the rates of prevalence of quality-related elements from MDS and PAF assessments. The quality-related elements we compare include ADL (eating, mobility, transferring, toileting) and non-ADL (dehydration, pressure ulcers, urinary tract infections) items. While the MDS and the PAF both measure these resident characteristics, they do so in different ways so that single items on the PAF are not always comparable to single items on the MDS. Instead, a single item on the PAF often relates to multiple items on the MDS. In such cases meaningful comparison requires a crosswalk between a PAF item and a combination of MDS items.

In the following subsections, we describe the construction of crosswalks of PAF items to MDS data elements relating to the ADL and non-ADL items listed above. We use each crosswalk to compute coding prevalence rates from the MDS and PAF and compare these over time. Our main results from this analysis are:

- Coding rates for all ADLs changed substantially upon adoption of the MDS. The rate of coding for the least dependent level of assistance went up for all ADL items. For all but one ADL (mobility), the rate of coding for the most dependent level of assistance went down.
- Except for ulcers, coding rates for non-ADLs changed substantially upon adoption of the MDS.

3.1 Methods

Our approach to creating the crosswalk began with a close reading of the PAF and MDS assessments and related documentation (Centers for Medicare & Medicaid Services, 2004; Veterans Health Administration, 2004; Department of Veterans Affairs, 2004). Using these sources, for each PAF item we identified the MDS items that were related. We then combined MDS items to approximate the PAF definition for each quality-related element to be studied.

Refinements to the crosswalk were made as the analysis progressed, in consultation with a nurse experienced with both assessments. Our final crosswalk is the one that minimized the observed difference across instruments, while maintaining clinical consistency.

We encountered three main challenges in creating a crosswalk between PAF and MDS items. First, as mentioned, each PAF item relates to several MDS items, which in combination do not exactly mimic the target PAF item. For example, the eating ADL item found on the PAF (item number 39) combines ideas that are found in multiple MDS items: (i) the degree of supervision or assistance needed in eating conventionally, (ii) the need for tube feeding, and (iii) the need for parenteral feeding. The MDS item G1hA codes for the degree of supervision or assistance needed in eating *both* conventionally *and* by other means (e.g. tube). To determine if a resident assessed with the MDS requires tube or parenteral feeding, one must examine two other MDS items, K5a (parenteral feeding checkbox) and K5b (tube feeding checkbox). A similar lack of one-to-one mapping between PAF and MDS items was found for many of the quality-related elements covered in this Data Brief.

The second challenge in developing a PAF-MDS crosswalk is that the two assessments have different look back periods. Most MDS items have a seven-day look back period. For example, the MDS manual instructs MDS coders to code for ADL self-performance over all shifts during the seven days prior to assessment. In contrast, the look back period for PAF ADL items is four weeks. This difference in look back periods necessarily contributes to a difference in coding patterns; however, there is little that can be done either to quantify the contribution the look back period makes to differences in coding patterns or to reconcile them.

The third main challenge in developing a crosswalk is that MDS codes are often at a finer scale than PAF codes. For example, the PAF eating ADL has four codes for degree of supervision or help with conventional eating while the MDS eating ADL item, G1hA, has five codes. We resolved the problem of mapping multiple MDS codes to single PAF codes by clinical logic combined with trial and error to produce the closest possible match in rates across instruments.

Finally, the process of completing MDS assessments necessarily differs from that of completing PAF assessments. Since MDS assessments are taken on a patient-specific schedule, fewer are done at any one time, perhaps permitting more time and care to be taken with each one. On the other hand, the MDS is considerably longer than the PAF (over 600 items for a full-length MDS, 56 items for a PAF), which makes it more onerous to complete. The MDS and PAF both have their own protocols for completion with different instructions on how to interpret item wording (see Centers for Medicare and Medicaid Services, 2004 and Veterans Health Administration, 2004). Some facilities assign specific nurses exclusively to the task of completing MDS assessments, a practice that ought to promote accuracy and consistency (relative to the PAF), while others do not.

Our analysis below consists of line graphs of prevalence rates of crosswalked data elements in PAF data from FY1998-FY2001 and MDS data from FY2001-FY2004 (ending in December 2003). Rates were computed by grouping assessments according to six-month windows centered on April and October of each year, as described previously. A rate is computed using the assessments in each window yielding two rates per year. Given the data available, we were able to compute six rates for each instrument.

3.2 ADLs

There are four ADL items on the PAF: eating (item number 39), mobility (item number 40), transferring (item number 41), and toileting (item number 42). In each of the subsections that follow, we discuss these in turn, describing our final crosswalk and providing a comparison of prevalence rates across PAF and MDS instruments. We emphasize that the crosswalk we present is the best one we obtained (in terms of matching PAF and MDS rates) after consideration of many variations, which are not described here.

3.2.1 Eating

The eating PAF item and the associated MDS crosswalk are described in Table 3.1. Because the PAF eating ADL codes combine information related to levels of assistance and to tube or parenteral feeding, four MDS variables must be referenced in the crosswalk. The MDS variables referenced in the crosswalk are defined in Table 3.2.

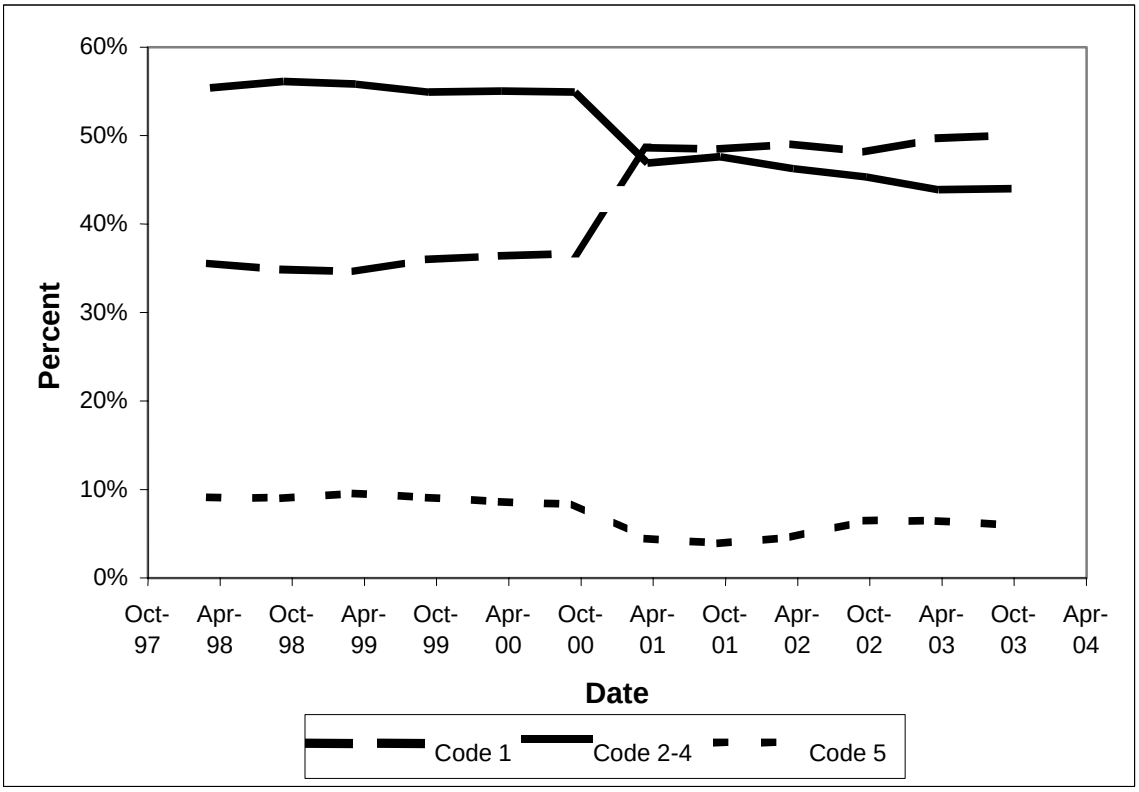
Table 3.1. Codes for levels of dependence in eating ADL, PAF/PAT and MDS

PAF/PAT Codes			MDS crosswalk
Eating (EAT39) = process of getting food from receptacle into body	1	Feeds self without supervision or physical assistance. May use adaptive equipment.	G1hA = 0 and K6a≠3 or 4
	2	Requires intermittent supervision (verbal encouragement/guidance) and/or minimal physical assistance with minor parts of eating.	G1hA = 1 or 2 and K6a≠3 or 4
	3	Requires continual help (encouragement/teaching/physical assistance) with eating or meal will not be completed.	G1hA = 3 and K6a≠3 or 4
	4	Totally fed by hand; patient does not manually participate (includes syringe feeding).	G1hA = 4 and K6a≠3 or 4
	5	Tube or parenteral feeding for primary intake of food (not just for supplemental nourishment).	K5a or K5b and K6a =3 or 4

Table 3.2. MDS variables used in crosswalk of eating ADL

MDS Codes		
G1hA = How resident eats and drinks, including intake by other means (e.g., tube)	0	Independent. Staff help/oversight 2 or fewer times.
	1	Supervision. Oversight/encouragement/cueing, 3+ times, physical assistance 2 or fewer times.
	2	Limited assistance. Non weight-bearing physical help 3+ times, weight-bearing support two or fewer times.
	3	Extensive assistance. Weight-bearing support 3+ times OR full staff performance 3+ times for part of activity.
	4	Total dependence. Full staff performance for entire activity all the time.
	8	Activity did not occur.
K5a = Parenteral/IV nutrition (checkbox)		
K5b = Tube feeding (checkbox)		
K6a = Proportion of total calories by parenteral or tube feeding	0	None.
	1	1% to 25%
	2	26% to 50%
	3	51% to 75%
	4	76% to 100%

Figure 3.1. Prevalence of crosswalked eating ADL codes across study periods



April 2001 was the first study period to rely on MDS data. Prior periods relied on PAF data. Months on the horizontal axis are the midpoints of six-month windows used to group assessments for rate calculation. Code 1 is the least dependent, code 5 is the most dependent.

Figure 3.1 shows that prevalence rates of the least dependent eating ADL code (code1) increased sharply from about 35 percent to about 50 percent when the instrument was changed between the October 2000 window and April 2001 window (marked with a vertical line in Figure 3.1). Conversely, prevalence rates of the most dependent code (code 5) declined sharply from about 9 percent to about 5 percent, although this rate again increased somewhat in later periods. In general, the figure indicates that VA nursing home residents were recorded as less dependent in eating following the adoption of the MDS. Note that this does not imply that the residents actually became less dependent in eating after the adoption of the MDS. Rather, the patterns of coding changed with the change in instrument. One reason for this coding pattern change is that the two assessments do not ask the same types of questions about eating using the same language, as is clear from the fact that use of multiple MDS items in the crosswalk was required.

3.2.2 Mobility

The mobility PAF item and MDS crosswalk are described in Table 3.3. Like the eating crosswalk of the previous sections, multiple MDS items (here, seven) are used in the crosswalk. The mobility crosswalk is the most complex because the MDS codes mobility in five different ways. The MDS makes distinctions between different forms of mobility: changing position in

bed (G1aA), walking in room (G1cA), walking in corridor (G1dA), movement between room and adjacent corridor (G1eA), and movement on/off unit (G1fA). Because the PAF does not make these distinctions, our crosswalk collapses them in mapping from MDS to PAF. To represent this mapping in a compact form we use curly braces, { }, to denote "or.". That is {A,B} means "A or B" and {A,B,C} means "A or B or C." Thus, the second row of Table 3.3 indicates the crosswalk for PAF mobility code 2: G1{c,d}A = 1. This is shorthand for (G1cA = 1 or G1dA = 1). The MDS variables used in Table 3.3 are defined in Table 3.4.

Table 3.3. Codes for levels of dependence in mobility ADL, PAF/PAT and MDS

PAF/PAT Codes			MDS crosswalk
Mobility (40) = how the patient moves about	1	Walks with no supervision or human assistance. May require mechanical device, but not a wheelchair.	G1{c,d}A = 0 & exclude (G1{e,f}A = 0 & G5b)
	2	Walks with intermittent supervision (verbal cueing and observation). May require human assistance for difficult parts of walking.	G1{c,d}A = 1
	3	Walks with constant one-to-one supervision and/or constant physical assistance.	G1{c,d}A = 2,3
	4	Wheels with no supervision or assistance, except for difficult maneuvers. May be able to walk, but generally does not move.	(G1{e,f}A = 0 & G5b) or G1{c,d}A = 4
	5	Is wheeled, chairfast, or bedfast. Relies on someone else to move about, if at all.	(G1{a,c,d}A = 8 or G1{e,f}A = 4,8) or G6a)

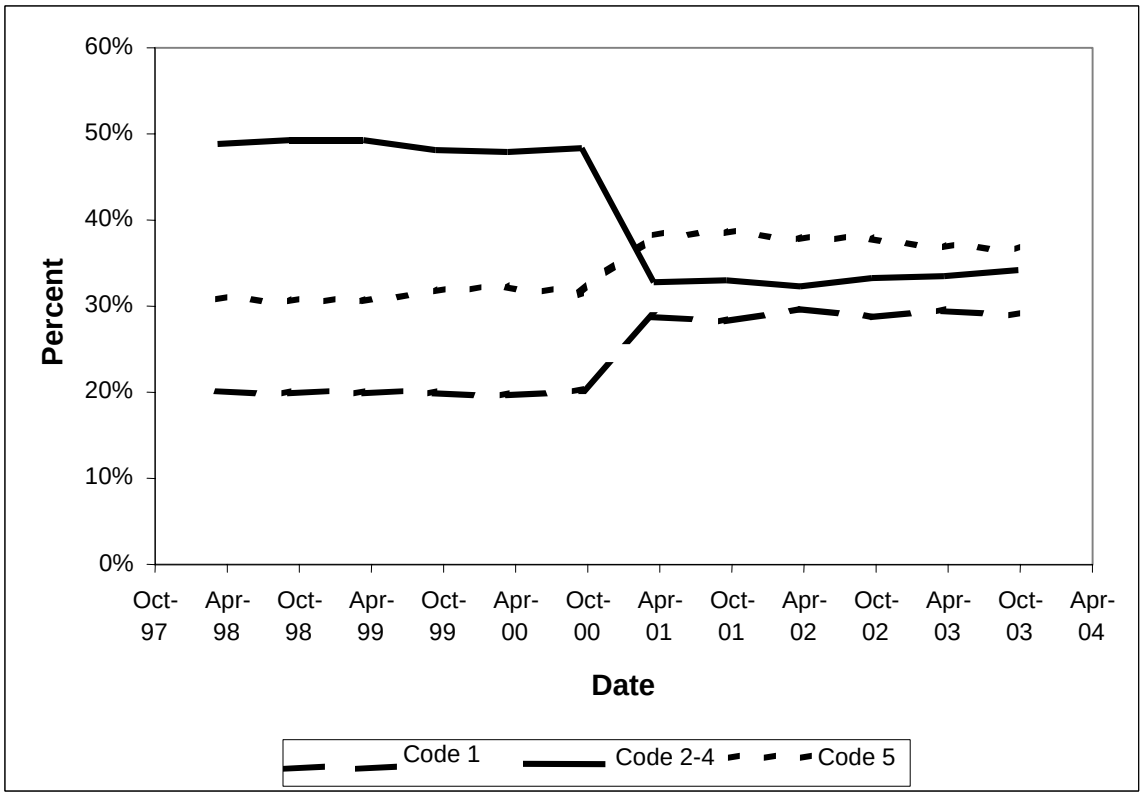
Note: The notation {X,Y} = Z means X=Z or Y=Z and {A,B,C} means A or B or C.

Table 3.4. MDS variables used in crosswalk of mobility ADL		
MDS Codes		
G1aA = How resident moves to/from lying position, turns side to side, and positions body in bed	0	Independent. Staff help/oversight 2 or fewer times.
	1	Supervision. Oversight/encouragement/cueing, 3+ times, physical assistance 2 or fewer times.
	2	Limited assistance. Non weight-bearing physical help 3+ times, weight-bearing support two or fewer times.
	3	Extensive assistance. Weight-bearing support 3+ times OR full staff performance 3+ times for part of activity.
	4	Total dependence. Full staff performance for entire activity all the time.
	8	Activity did not occur.
G1cA = How resident walks between locations in room	0	Independent. Staff help/oversight 2 or fewer times.
	1	Supervision. Oversight/encouragement/cueing, 3+ times, physical assistance 2 or fewer times.
	2	Limited assistance. Non weight-bearing physical help 3+ times, weight-bearing support two or fewer times.
	3	Extensive assistance. Weight-bearing support 3+ times OR full staff performance 3+ times for part of activity.
	4	Total dependence. Full staff performance for entire activity all the time.
	8	Activity did not occur.
G1dA = How resident walks in corridor on unit	0	Independent. Staff help/oversight 2 or fewer times.
	1	Supervision. Oversight/encouragement/cueing, 3+ times, physical assistance 2 or fewer times.
	2	Limited assistance. Non weight-bearing physical help 3+ times, weight-bearing support two or fewer times.
	3	Extensive assistance. Weight-bearing support 3+ times OR full staff performance 3+ times for part of activity.
	4	Total dependence. Full staff performance for entire activity all the time.
	8	Activity did not occur.
G1eA = How resident moves between locations in room and adjacent corridor on same floor.	0	Independent. Staff help/oversight 2 or fewer times.
	1	Supervision. Oversight/encouragement/cueing, 3+ times, physical assistance 2 or fewer times.
	2	Limited assistance. Non weight-bearing physical help 3+ times, weight-bearing support two or fewer times.
	3	Extensive assistance. Weight-bearing support 3+ times OR full staff performance 3+ times for part of activity.
	4	Total dependence. Full staff performance for entire activity all the time.
	8	Activity did not occur.
G1fA = How resident moves to/from off-unit locations or distant areas.	0	Independent. Staff help/oversight 2 or fewer times.
	1	Supervision. Oversight/encouragement/cueing, 3+ times, physical assistance 2 or fewer times.
	2	Limited assistance. Non weight-bearing physical help 3+ times, weight-bearing support two or fewer times.
	3	Extensive assistance. Weight-bearing support 3+ times OR full staff performance 3+ times for part of activity.
	4	Total dependence. Full staff performance for entire activity all the time.
	8	Activity did not occur.
G5b = Wheeled self (checkbox)		
G6a = Bedfast all or most of time (checkbox)		

Figure 3.2 shows that prevalence rates of the least dependent mobility ADL code (code 1) increased from about 20 percent to almost 30 percent with the change from the PAF to the MDS.

Similarly, prevalence rates of the most dependent mobility ADL code (code 5) increased from about 30 percent to almost 40 percent. Thus, VA nursing home residents were more likely to be recorded at one extreme or the other (independent or fully dependent) following adoption of the MDS. Again, this change in coding patterns reflects a change in instrument, not necessarily a change in resident characteristics. The difference between PAF and MDS coding rates for mobility is likely due to the difference in language and number of items used to code for mobility on the two assessments, posing challenges to construction of an exact crosswalk.

Figure 3.2. Prevalence of crosswalked mobility ADL codes across study periods



Note that April 2001 was the first study period to rely on MDS data. Prior periods relied on PAF/PAT data. Months on the horizontal axis are the midpoints of six-month windows used to group assessments for rate calculation. Code 1 is the least dependent, code 5 is the most dependent.

3.2.3 Transferring

The crosswalk for transferring is the simplest of the ADL crosswalks as there is almost a one-to-one correspondence in the PAF transfer item and coding of the MDS item G1bA. The differences between the two are in the precise wording of the code definitions (see Tables 3.5 and 3.6) and in the number of codes (four for PAF and five for MDS).

Table 3.5. Codes for levels of dependence in transferring ADL, PAF/PAT and MDS

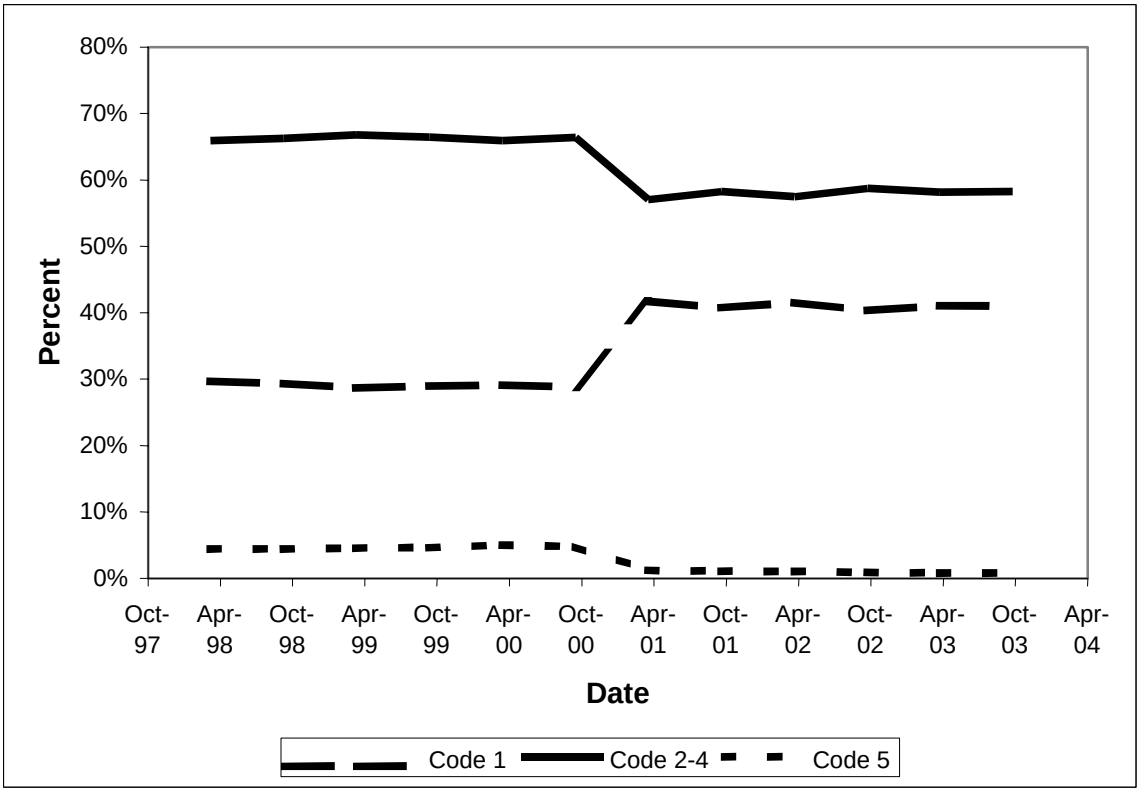
PAF/PAT Codes			MDS crosswalk
Transfer (41) = process of moving between positions, to/from bed, chair, standing.(exclude transfers to/from bath and toilet)	1	Requires no supervision or physical assistance to complete necessary transfers. May use equipment, such as railings, trapezes.	G1bA=0
	2	Requires intermediate supervision (that is, verbal cueing, guidance) and/or physical assistance for difficult maneuvers only.	G1bA=1
	3	Requires one person to provide constant guidance, and/or physical assistance. Patient participations in transfer.	G1bA=2 or 3
	4	Requires two people to provide constant supervision and/or physically lift. May need lifting equipment.	G1bA=4
	5	Cannot and is not gotten out of bed.	G1bA=8

Table 3.6. MDS variables used in crosswalk of transferring ADL

MDS Codes		
G1bA = How resident moves between surfaces (bed, chair, wheelchair, standing)	0	Independent. Staff help/oversight 2 or fewer times.
	1	Supervision. Oversight/encouragement/cueing, 3+ times, physical assistance 2 or fewer times.
	2	Limited assistance. Non weight-bearing physical help 3+ times, weight-bearing support two or fewer times.
	3	Extensive assistance. Weight-bearing support 3+ times OR full staff performance 3+ times for part of activity.
	4	Total dependence. Full staff performance for entire activity all the time.
	8	Activity did not occur.

Figure 3.3 shows that prevalence rates of the least dependent transferring ADL (code 1) increased from about 30 percent to about 40 percent with the change from the PAF to the MDS. The prevalence rates for the most dependent transferring ADL decreased from about 5 percent to almost 0 percent. In general, the figure shows that VA nursing home residents were more likely to be coded as less dependent in transferring following adoption of the MDS (reflecting the instrument change, not actual changes in resident characteristics). The difference between PAF and MDS rates is likely due to definitional differences, as is clear from Tables 3.5 and 3.6.

Figure 3.3. Prevalence of crosswalked transferring ADL codes across study periods



Note that April 2001 was the first study period to rely on MDS data. Prior periods relied on PAF/PAT data. Months on the horizontal axis are the midpoints of six-month windows used to group assessments for rate calculation. Code 1 is the least dependent, code 5 is the most dependent.

3.2.4 Toileting

The toileting PAF item and associated MDS crosswalk are described in Tables 3.7 and 3.8. The main difference between the PAF and MDS with respect to toileting is that the former combines bladder continence, bowel continence, and transferring to/from toilet into one item while the latter divides them into several.

Table 3.7. Codes for levels of dependence in toileting ADL, PAF/PAT and MDS

PAF/PAT Codes			MDS crosswalk
Toileting (42) = process of getting to and from a toilet, transferring on and off toilet, cleansing self, and adjusting clothes.	1	Requires no supervision or physical assistance. May require special equipment, such as raised toilet or grab bars.	G1iA = 0 & exclude continent=0
	2	Requires intermittent supervision for safety or encouragement; or minor physical assistance (e.g., adjusting clothes, washing hands).	G1iA= 1, 2 & exclude continent=0
	3	Continent of bowel and bladder. Requires constant supervision/physical assistance with major or all parts of task for completion.	G1iA = 3, 4 and continent=1
	4	Incontinent of bowel and/or bladder (60 percent of time) and is not taken to a toilet.	continent=0 and (G1iA=0,1,2 or H3a=0)
	5	Incontinent of bowel and/or bladder (60 percent of time), but is taken to a toilet every two to four hours during the day and as needed at night.	(continent=0 and exclude G1iA=0,1,2) and H3a=1

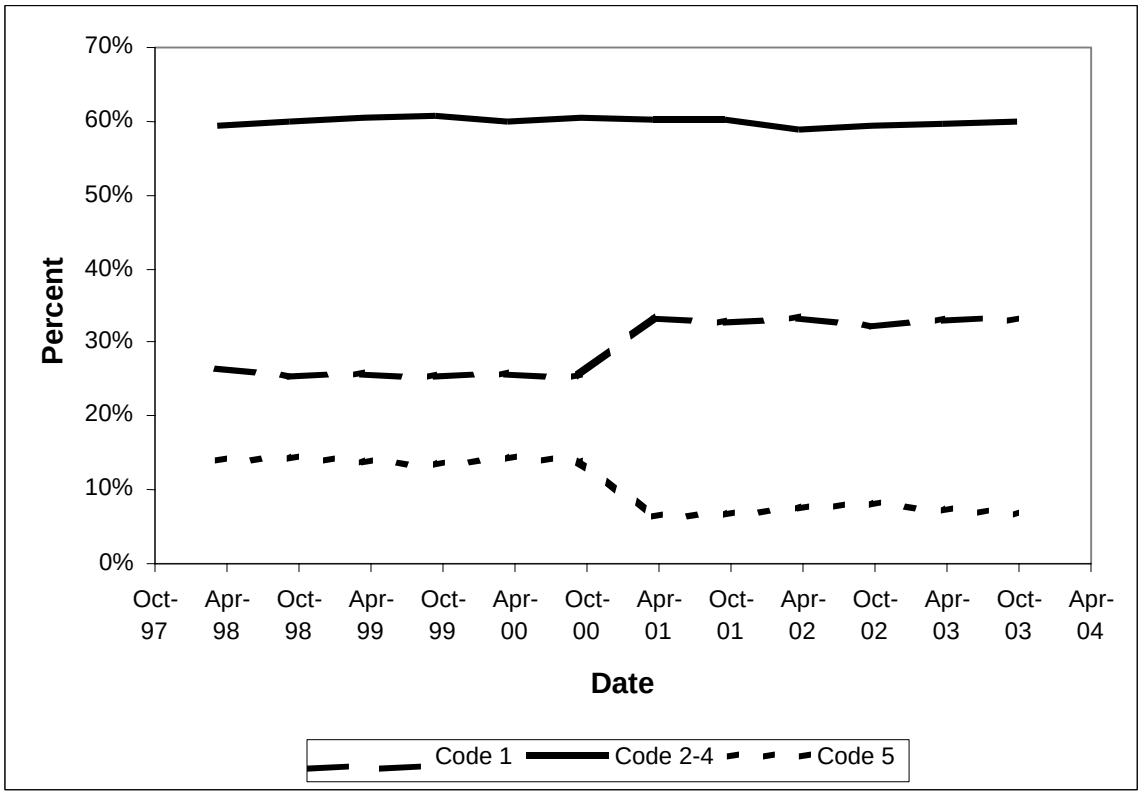
Note: continent = 0 when (H1a = 3,4 or H1b = 3,4); continent = 1 when (H1a = 0, 1, 2 and H1b = 0, 1, 2).

Table 3.8. MDS variables used in crosswalk of toileting ADL

MDS Codes		
G1iA = How resident uses the toilet room; transfer on/off, cleanses, changes pad, etc.	0	Independent. Staff help/oversight 2 or fewer times.
	1	Supervision. Oversight/encouragement/cueing, 3+ times, physical assistance 2 or fewer times.
	2	Limited assistance. Non weight-bearing physical help 3+ times, weight-bearing support two or fewer times.
	3	Extensive assistance. Weight-bearing support 3+ times OR full staff performance 3+ times for part of activity.
	4	Total dependence. Full staff performance for entire activity all the time.
	8	Activity did not occur.
H1a = Control of bowel movement, with appliance or bowel continence programs, if employed.	0	Continent—Complete control [includes use ostomy device that does not leak stool].
	1	Usually continent—incontinent episodes less than weekly.
	2	Occasionally incontinent—once a week.
	3	Frequently incontinent—2-3 times a week.
	4	Incontinent—all (or almost all) of the time.
H1b = Control of urinary bladder function with appliances or continence programs, if employed.	0	Continent—Complete control [includes use of indwelling urinary catheter that does not leak urine].
	1	Usually continent—incontinent episodes once a week or less.
	2	Occasionally incontinent—2 or more times a week but not daily.
	3	Frequently incontinent—tended to be incontinent daily, but some control present (e.g., on day shift).
	4	Incontinent—had inadequate control bladder, multiple daily episodes
H3a = Any scheduled toileting plan (checkbox)		

Figure 3.4 shows an increase in prevalence rates of the least dependent toileting ADL code (code 1) from about 25 percent to about 35 percent. Conversely, prevalence rates of the most dependent toileting ADL code (code 5) decreased from about 15 percent to about 5 percent. Thus VA nursing home residents were more likely to be coded as less dependent in toileting following adoption of the MDS (reflecting a change in instrument, not resident characteristics). Once again, toileting is coded in different ways using different numbers of items on the PAF and the MDS, which likely accounts for the differences in coding rates.

Figure 3.4. Prevalence of crosswalked toileting ADL codes across study periods



Note that April 2001 was the first study period to rely on MDS data. Prior periods relied on PAF/PAT data. Months on the horizontal axis are the midpoints of six-month windows used to group assessments for rate calculation. Code 1 is the least dependent, code 5 is the most dependent.

3.3 Non-ADL Items

Three non-ADL items are considered in this section: dehydration, ulcers, and urinary tract infections.

3.3.1 Dehydration

The crosswalk for dehydration is very simple since both the PAF and the MDS have a dehydration checkbox item. However, the definitions differ between the instruments: the PAF defines dehydration as "excessive loss of body fluids requiring immediate medical treatment and ADL care" while the MDS has a very lengthy (nearly three-page) definition, covering many

possible signs (see Centers for Medicare & Medicaid Services, 2004). This difference (and others, like the look back period) may explain the change in prevalence of coding for dehydration for VA nursing home residents upon adoption of the MDS, shown in Figure 3.5. The rate of coding for dehydration dropped from about 5 percent to about 1.5 percent when the MDS was adopted. There is no reason to believe that actual rates of dehydration changed so this change in coding pattern reflects the change in instrument.

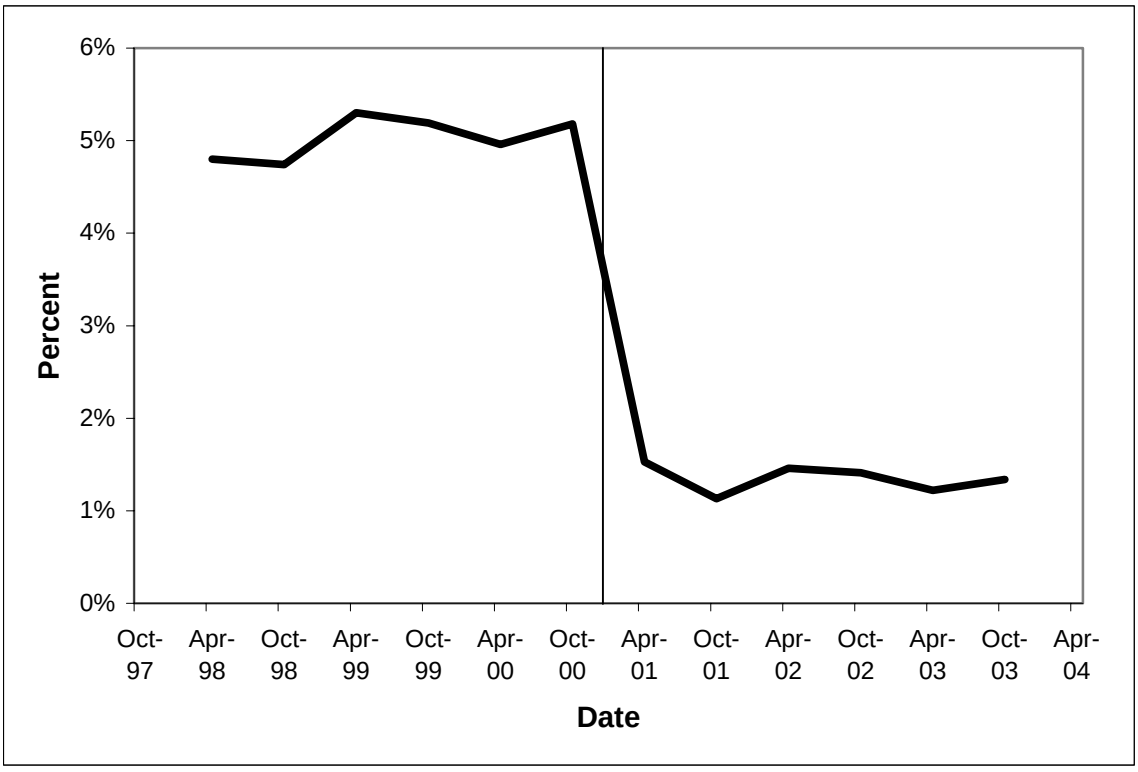
Table 3.9. Codes for dehydration, PAF/PAT and MDS

PAF/PAT Codes	MDS crosswalk
Dehydration (24) = Excessive loss of body fluids requiring immediate medical treatment and ADL care.	J1c

Table 3.10. MDS variables used in crosswalk of dehydration

MDS Codes
J1c = Dehydrated; output exceeds input (checkbox)

Figure 3.5. Prevalence of crosswalked dehydration across study periods



Note that April 2001 was the first study period to rely on MDS data. Prior periods relied on PAF/PAT data. Months on the horizontal axis are the midpoints of six-month windows used to group assessments for rate calculation.

3.3.2 Ulcers

The PAF and the MDS both have items for pressure ulcers and stasis ulcers. The MDS uses a five-point scale for both types of ulcers (Table 3.12), while the PAF uses a five point scale for the former but only a check box for the latter. In our crosswalk, we have mapped severe pressure ulcer from the MDS (defined as M2a > 2) to severe pressure ulcer on the PAF (item 22 coded as greater than 2). We have mapped any stasis ulcer on the MDS (M2b > 0) to stasis ulcer checked on the PAF (see Table 3.11).

Table 3.11. Codes for ulcers, PAF/PAT and MDS

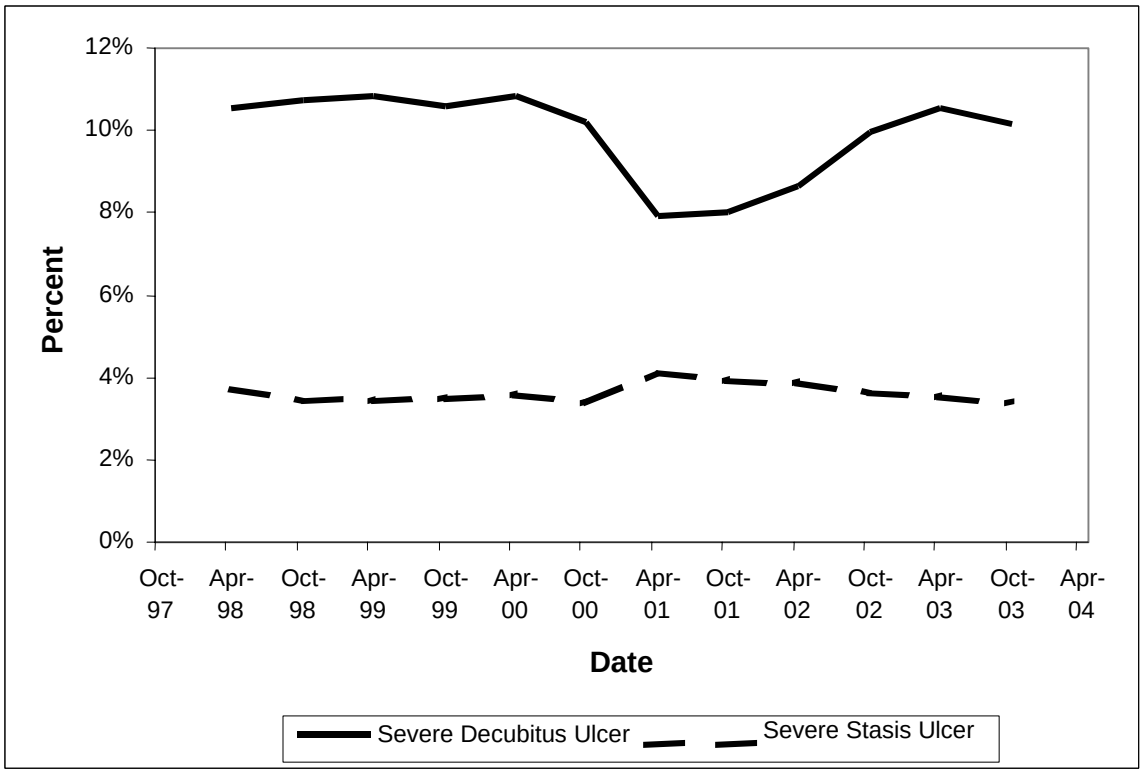
PAF/PAT Codes	MDS crosswalk
Severe pressure ulcer: decubitus level (22) > 2	M2a > 2
Stasis ulcer (26) checked	M2b > 0

Table 3.12. MDS variables used in crosswalk of ulcers

MDS Codes		
M2a = Pressure ulcer—any lesion caused by pressure resulting in damage of underlying tissue	0	None
	1	Stage 1: A persistent area of skin redness (without a break in the skin) that does not disappear when pressure is relieved.
	2	Stage 2: A partial thickness loss of skin layers that presents clinically as an abrasion, blister, or shallow crater.
	3	Stage 3: A full thickness of skin is lost, exposing the subcutaneous tissues—presents as a deep crater with or without undermining adjacent tissue.
	4	Stage 4: A full thickness of skin and subcutaneous tissue is lost, exposing muscle or bone.
M2b = Stasis ulcer—open lesion caused by poor circulation in the lower extremities	0	None
	1	Stage 1: A persistent area of skin redness (without a break in the skin) that does not disappear when pressure is relieved.
	2	Stage 2: A partial thickness loss of skin layers that presents clinically as an abrasion, blister, or shallow crater.
	3	Stage 3: A full thickness of skin is lost, exposing the subcutaneous tissues—presents as a deep crater with or without undermining adjacent tissue.
	4	Stage 4: A full thickness of skin and subcutaneous tissue is lost, exposing muscle or bone.

Using the crosswalk just described, the rates for stasis ulcer are consistent across instruments. The rate for severe decubitus ulcer changes abruptly with change in instrument, from about 10 percent (under PAF) to about 8 percent (under MDS). The MDS rate grows over time, however, reaching 10 percent by the end of the study period. Given that the look back periods for ulcers differ between the instruments (4 weeks for PAF and 7 days for MDS), it is likely that the observed similarity of prevalence rates for coding of ulcers across instruments is coincidental.

Figure 3.6. Prevalence of crosswalked ulcers across study periods



Note that April 2001 was the first study period to rely on MDS data. Prior periods relied on PAF/PAT data. Months on the horizontal axis are the midpoints of six-month windows used to group assessments for rate calculation.

3.3.3 Urinary Tract Infection

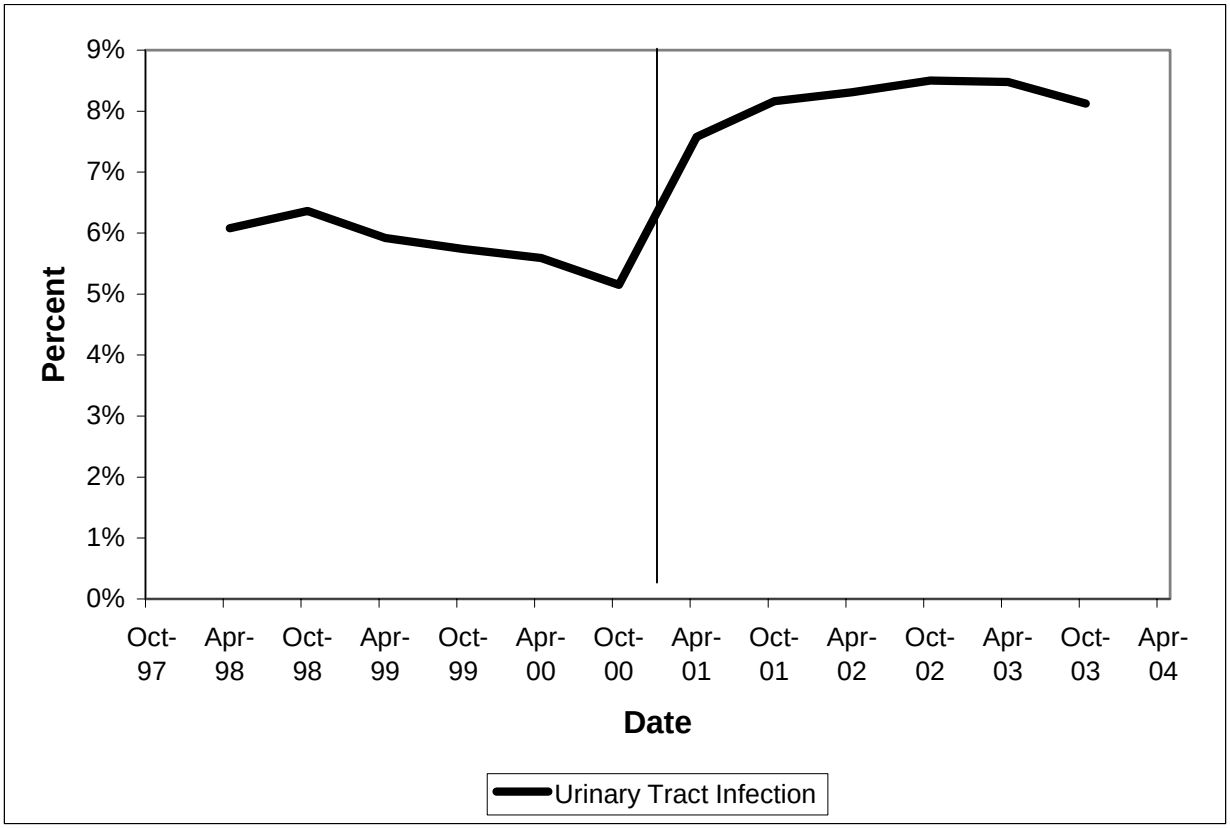
The crosswalk for urinary tract infection (UTI) is very simple since both the PAF and the MDS have a UTI checkbox item. The definitions of UTI seem to be the same between the instruments and have a similar look back period, four weeks for the PAF and 30 days for the MDS (Tables 3.13 and 3.14). Despite this, there is considerable change in prevalence of coding of UTI among VA nursing home residents upon adoption of the MDS, shown in Figure 3.7. The rate of coding of for UTI increased from about 5 percent to about 8 percent when the MDS was adopted (Figure 3.7). This change might be due to differences in the process of completing MDS versus PAF assessments and is not likely due to changes in resident characteristics.

Table 3.13. Codes for UTI, PAF/PAT and MDS

PAF/PAT Codes	MDS crosswalk
Urinary tract infection (33)	I2j

Table 3.14. MDS variables used in crosswalk of UTI
MDS Codes
I2j = urinary tract infection in last 30 days (checkbox)

Figure 3.7. Prevalence of crosswalked urinary tract infection across study periods



Note that April 2001 was the first study period to rely on MDS data. Prior periods relied on PAF/PAT data. Months on the horizontal axis are the midpoints of six-month windows used to group assessments for rate calculation.

4.0 Comparison of Diagnoses from MDS and NPCD

Both the MDS and the NPCD code diagnostic information. A fundamental question for researchers wishing to work with diagnoses is, from which dataset should diagnoses be extracted? That is, which is a better source or are they redundant or complementary? In this section we compare the diagnosis data obtained from MDS records to that obtained from NPCD for the same patient during the same stay and address these questions. Our main conclusion is that the MDS provides a considerable amount of information on diagnoses not found in the NPCD. One shortcoming of the MDS with respect to diagnoses is that it does not provide ICD-9 codes. While only a small amount of additional information on diagnoses not found on the MDS is in the NPCD, it is still quite valuable because it does include ICD-9 codes.

4.1 Methods

We extracted principal diagnosis codes from VA inpatient encounters for nursing home care unit patients in FY2001-2004 (through May). We grouped these diagnoses into 56 categories designed to match the MDS disease diagnosis categories (MDS Section I) as done in our own previous work (Center for Health Quality, Outcomes & Economic Research, 2003) and in work by Rosen et al. (2000).

For each matched MDS-NPCD record (see Section 2.2 for a description of the construction of the matched dataset), we counted the number of unique disease groups coded in either source. We then computed, for each MDS-NPCD record, the number of unique disease groups coded in the MDS but not NPCD, the number coded in NPCD and not MDS and the number coded in both, all as fractions of the total number of unique disease groups coded. These statistics averaged over years or VISNs are reported in the next section.

4.2 Results

Table 4.1 shows the contribution made to the total number of unique disease groups by MDS and NPCD. We found that almost one-third of the unique disease groups were found in both the NPCD and MDS data. This was stable over time. Most of the unique disease groups were found only on the MDS and the proportion grew over time (from a mean of 53 percent in 2001 to a mean of 60 percent in 2004). A small proportion of unique disease groups were contributed by the NPCD and this proportion fell over time (from a mean of 14 percent in 2001 to 9 percent in 2004).

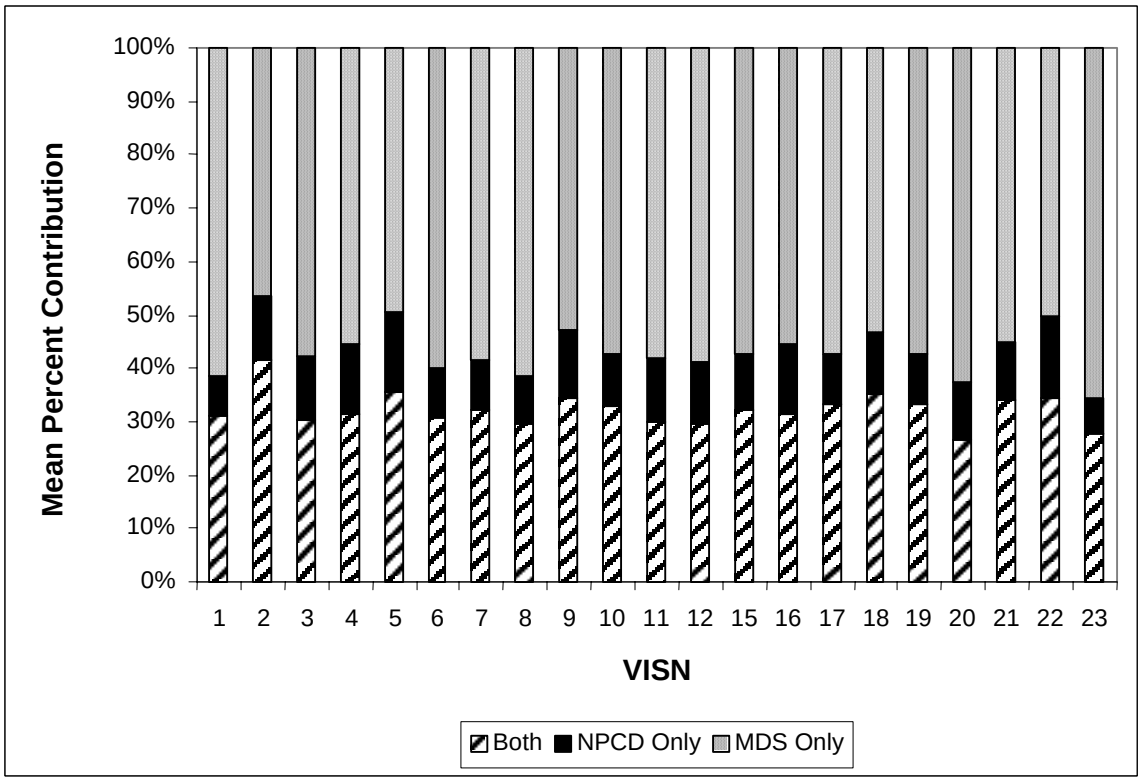
Table 4.1: Mean and Median Percent Unique Disease Groups by Source and Year

Year	Source		
	MDS Only	**NPCD Only**	**Both**
FY2001 (N = 15,304)			
Mean Percent	52.7%	14.3%	33.0%
Median Percent	50.0%	0.00%	28.6%
FY2002 (N = 21,294)			
Mean Percent	55.8%	11.5%	32.7%
Median Percent	60.0%	0.00%	28.6%
FY2003 (N = 24,497)			
Mean Percent	57.9%	10.1%	32.0%
Median Percent	60.0%	0.00%	28.6%
FY2004[(a)] (N = 22,845)			
Mean Percent	60.1%	8.77%	31.1%
Median Percent	67.7%	0.00%	27.3%
All Yrs (N = 83,922)			
Mean Percent	57.0%	10.8%	32.1%
Median Percent	60.0%	0.00%	28.6%

(a) FY2004 data available through May, 2004.

Figure 4.1 shows by VISN the mean percent of unique disease groups contributed by the MDS and the NPCD. While there is some variation by VISN, most are quite close to the overall averages (57 percent from the MDS, 11 percent from the NPCD, and 32 percent from both).

Figure 4.1. Mean Percent Unique Disease Groups by Source and VISN



The above results show that the MDS data provides more diagnostic information than the NPCD. A necessary condition for this is that there is more space available on the MDS for coding diagnosis groups than in the NPCD. The former can code up to 43 diagnosis groups while the latter can code only five. However, as mentioned, ICD-9 codes are not available on the MDS but are in NPCD.

5.0 Conclusion

From the analyses presented in this Data Brief, we can draw two strong conclusions: (1) the coding of quality-related elements on the MDS differs substantially from the coding on the PAF and (2) the diagnostic data found on the MDS is different in its volume and specificity than that found in NPCD.

In comparing the MDS to the PAF on specific quality-related elements, we found that coding rates for all ADLs changed substantially upon adoption of the MDS. The rate of coding for the least dependent level of assistance went up for all ADL items, relative to the rate of coding on the PAF. For all but one ADL (mobility), the rate of coding for the most dependent level of assistance went down. Except for ulcers, coding rates for the non-ADL items studied (dehydration, ulcers, urinary tract infections) changed substantially upon adoption of the MDS.

Since changes in coding patterns for both ADL and non-ADL items were so abrupt and coincided in time with the change in instrument, it is not reasonable to associate them with changes in resident characteristics. These results strongly suggest that the PAF and MDS instruments are sufficiently different that researchers cannot meaningfully compare rates of coding across the two instruments. Put simply, the two instruments measure different, though related, things.

In comparing diagnostic data available on the MDS to that available from NPCD, we found that the MDS provided more diagnostic data and that the overlap between the two (the number of diagnostic groups in common) was about 30 percent. Additionally, the specificity of the data differed: the MDS does not provide ICD-9 codes while NPCD does. These results lead to the recommendation that researchers using the MDS to study diagnoses should consider supplementing their research with NPCD data.

It is worth noting that the next version of the MDS (Version 3.0) is under development. While MDS 3.0 will be similar in many respects to the version currently in use (MDS 2.0), differences in definitions and wording on some items may significantly affect the rate of coding for certain items.

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