Table 1. Nursing home characteristics, as defined from MDS, Nursing Home Compare, LTC Focus, Medicare claims and enrollment data, and other administrative data sources, for LINKAGE: data dictionary

Variable Name	Variable Definition	Source Data (year)
Facility characteristics		
FOR_PROFIT	= 1 if facility is for-profit = 0 otherwise	Nursing Home Compare (2024)
TOT_BEDS	Number of federally certified beds	Nursing Home Compare (2024)
NRESID_ALL	Number of residents present on the 1st Thursday in April	MDS (2022)
NRESID_MCARE	Number of residents present on the 1st Thursday in April who were enrolled in Medicare	MDS (2022) and MBSF (2022)
N_D_RESID	Number of residents present on the 1st Thursday in April who had dementia	MDS (2022) and Medicare FFS and Medicare Advantage inpatient, SNF, outpatient, home health, hospice, and carrier files (2022)
N_D_RESID_MCARE	Number of residents present on the 1st Thursday in April who had dementia and were enrolled in Medicare	MDS (2022), MBSF (2022), and Medicare FFS and Medicare Advantage inpatient, SNF, outpatient, home health, hospice, and carrier files (2022)
N_D_MCARE_RESYRS	Number of resident years among residents with dementia enrolled in Medicare in the facility. This is the denominator for several service use-related measures, including measures of the number of inpatient days and ED visits per resident year and number of inpatient days and ED visits that were potentially avoidable per resident year among Medicare-enrolled residents with dementia.	MDS (2022), MBSF (2022), and Medicare FFS and Medicare Advantage inpatient, SNF, outpatient, home health, hospice, and carrier files (2022)
N_D_MCARE_PTD_LGSTY_RESYRS	Number of long-stay resident years in the facility among Medicare-covered residents with dementia who were enrolled in Part D (these reflect the number of resident-years in the facility not paid (at least in part) by Medicare and when we could observe Part D prescription fills). This is the denominator for the Part D-related measures (for example, the number of claims	MDS (2022), MBSF (2022), and Medicare FFS and Medicare Advantage inpatient, SNF,

Variable Name	Variable Definition	Source Data (year)
	(prescription fills) for antibiotics per long-stay resident year) among Medicare-enrolled, long-stay residents with dementia.	outpatient, home health, hospice, and carrier files (2022
N_D_ADMSN_FROM_HOSP	The number of facility admissions from acute care hospitals among residents with dementia. This is the denominator for the service use measure that describes the facility's rehospitalization rate.	MDS (2022)
ALZUNIT	= 1 if the facility has an Alzheimer's disease special care unit = 0 if the facility does not have an Alzheimer's disease special care unit = . if it is unknown whether the facility has an Alzheimer's disease special care unit (applies to facilities in Alaska and the District of Columbia and any other facilities that were not found in LTC Focus)	LTC Focus (2022)
HOSP_BASED	= 1 if the facility is hospital-based = 0 if the facility is not hospital-based	Nursing Home Compare (2024)
MULTIFAC	= 1 if the facility is part of a chain = 0 if the facility is not part of a chain	Nursing Home Compare (2024)
ADM_PER_BED	Number of admissions per bed	MDS (2022) and Nursing Home Compare (2022)
OCCPCT	Occupancy rate on the first Thursday in April 2022	MDS (2022) and Nursing Home Compare (2022)
PAYMCAID	Percentage of facility residents whose primary support is Medicaid. This variable will contain missing values for facilities in Alaska, District of Columbia, and any other facilities not found in LTC Focus	LTC Focus (2022)
RUCA	Primary rural-urban commuting area (RUCA) code of the facility: 1 = Metropolitan area core: primary flow within an urbanized area (UA) 2 = Metropolitan area high community: primary flow 30% or more to a UA 3 = Metropolitan area low commuting: primary flow 10% to 30% to a UA 4 = Micropolitan area core: primary flow within an urban cluster of 10,000 to 49,999 (large UC) 5 = Micropolitan high commuting: primary flow 30% or more to a large UC 6 = Micropolitan low commuting: primary flow 10% to 30% to a large UC 7 = Small town core: primary flow within an urban cluster of 2,500 to 9,999 (small UC) 8 = Small town high community: primary flow 30% or more to a small UC 9 = Small town low commuting: primary flow 10% to 30% to a small UC 10 = Rural areas: primary flow to a tract outside a UA or UC	Nursing Home Compare (2024); U.S. Department of Agriculture data for RUCA codes (2010)

Variable Name	Variable Definition	Source Data (year)
	99 = Not coded: Census tract has zero population and no rural-urban identifier information	
RURAL	= 1 if the clinician's main practice address is assigned to RUCA = {7 – 10} = 0 otherwise	Nursing Home Compare (2024) for address USDA for RUCA codes
Resident demographics and Medicare enrollment characteristics		
Among residents WITH DEMENTIA in the facility on the first Thursday in April (April 7, 2022)		
AVG_AGE_D	Mean age of all residents with dementia in the facility	MDS (2022) and Medicare FFS and Medicare Advantage inpatient, SNF, outpatient, home health, hospice, and carrier files (2022)
AGE_CAT_D	Age distribution of residents with dementia in the facility: 1 = less than 65 years 2 = 65 to 69 3 = 70 to 74 4 = 75 to 79 5 = 80 to 84 6 = 85 and older	MDS (2022) and Medicare FFS and Medicare Advantage inpatient, SNF, outpatient, home health, hospice, and carrier files (2022)
NUM_D_FEMALE	Number of residents with dementia in the facility who are female	MDS (2022) and Medicare FFS and Medicare Advantage inpatient, SNF, outpatient, home health, hospice, and carrier files (2022)
NUM_D_BLACK	Number of residents with dementia in the facility who are non-Hispanic Black	MDS (2022) and Medicare FFS and Medicare Advantage inpatient, SNF, outpatient, home health, hospice, and carrier files (2022)
NUM_D_HISPANIC	Number of residents with dementia in the facility who are Hispanic	MDS (2022) and Medicare FFS and Medicare Advantage inpatient, SNF, outpatient, home health, hospice, and carrier files (2022)
NUM_D_WHITE	Number of residents with dementia in the facility who are non-Hispanic White	MDS (2022) and Medicare FFS and Medicare Advantage inpatient, SNF, outpatient, home health, hospice, and carrier files (2022)

Variable Name	Variable Definition	Source Data (year)
NUM_D_DUAL	Number of Medicare residents with dementia in the facility who were dually eligible for Medicare or Medicaid (full or partial) in April 2022	MDS (2022) and Medicare FFS and Medicare Advantage inpatient, SNF, outpatient, home health, hospice, and carrier files (2022) and MBSF (2022)
NUM_D_LIS	Number of Medicare residents with dementia in the facility who were eligible for a Part D low-income drug subsidy in April 2022	MDS (2022) and Medicare FFS and Medicare Advantage inpatient, SNF, outpatient, home health, hospice, and carrier files (2022) and MBSF (2022)
NUM_D_DUALORLIS	Number of Medicare residents with dementia in the facility who were dually eligible for Medicare and Medicaid in at least one month of the year or who were eligible for a part D low-income drug subsidy in April 2022	MDS (2022) and Medicare FFS and Medicare Advantage inpatient, SNF, outpatient, home health, hospice, and carrier files (2022) and MBSF (2022)
NUM_D_MA_ENRLD	Number of Medicare residents with dementia in the facility who were enrolled in Medicare Advantage in April 2022	MDS (2022) and Medicare FFS and Medicare Advantage inpatient, SNF, outpatient, home health, hospice, and carrier files (2022) and MBSF (2022)
NUM_D_PARTD	Number of Medicare residents with dementia in the facility who were enrolled in Part D in April 2022	MDS (2022) and Medicare FFS and Medicare Advantage inpatient, SNF, outpatient, home health, hospice, and carrier files (2022) and MBSF (2022)
Among ALL RESIDENTS (with and without dementia) in the facility on the first Thursday in April (April 7, 2022)		
AVG_AGE_ALL	Mean age of all residents in the facility	MDS (2022)
AGE_CAT_ALL	Age distribution of all residents in the facility: 1 = less than 65 years 2 = 65 to 69 3 = 70 to 74 4 = 75 to 79 5 = 80 to 84 6 = 85 and older	MDS (2022)

Variable Name	Variable Definition	Source Data (year)
NUM_ALL_FEMALE	Number of residents in the facility who are female	MDS (2022)
NUM_ALL_BLACK	Number of residents in the facility who are non-Hispanic Black	MDS (2022)
NUM_ALL_HISPANIC	Number of residents in the facility who are Hispanic	MDS (2022)
NUM_ALL_WHITE	Number of residents in the facility who are non-Hispanic White	MDS (2022)
NUM_ALL_DUAL	Number of Medicare residents in the facility who were dually eligible for Medicare or Medicaid (full or partial) in April 2022	MDS (2022) and MBSF (2022)
NUM_ALL_LIS	Number of Medicare residents in the facility who were eligible for a Part D low-income drug subsidy in April 2022	MDS (2022) and MBSF (2022)
NUM_ALL_DUALORLIS	Number of Medicare residents in the facility who were dually eligible for Medicare and Medicaid in at least one month of the year or who were eligible for a part D low-income drug subsidy in April 2022	MDS (2022) and MBSF (2022)
NUM_ALL_MA_ENRLD	Number of Medicare residents in the facility who were enrolled in Medicare Advantage in April 2022	MDS (2022) and MBSF (2022)
NUM_ALL_PARTD	Number of Medicare residents in the facility who were enrolled in Part D in April 2022	MDS (2022) and MBSF (2022)
Clinical characteristics of residents with dementia in the facility on the first Thursday in April (April 7, 2022)		
NUM_D_HIGH_CFS	Number or residents with dementia in the facility with a Cognitive Function Score (CFS) of 4 (severe cognitive impairment)[a]	MDS (2022)
NUM_D_MID_CFS	Number or residents with dementia in the facility with a Cognitive Function Score (CFS) of 2 or 3 (moderate cognitive impairment) [a]	MDS (2022)
NUM_D_LOW_CFS	Number or residents with dementia in the facility with a Cognitive Function Score (CFS) of 1 (mild cognitive impairment) [a]	MDS (2022)
NUM_D_BEDFAST	Number or residents with dementia in the facility who are bedfast	MDS (2022)
NUM_D_CATH	Number of residents with dementia in the facility who have a catheter	MDS (2022)
NUM_D_FALL	Number of residents with dementia in the facility who have fallen since admission or prior assessment	MDS (2022)
NUM_D_INCNT_BLDR	Number of residents with dementia in the facility who are bladder incontinent	MDS (2022)
NUM_D_INCNT_BWL	Number of residents with dementia in the facility who are bowel incontinent	MDS (2022)
NUM_D_LOWCARE	Number of residents with dementia in the facility who were low care, according to the broad definition	MDS (2022)
NUM_D_PAIN_SELF	Number of residents with dementia in the facility who self-reported pain	MDS (2022)
NUM_D_PAIN_STAFF	Number of residents with dementia in the facility for whom staff indicated they had pain	MDS (2022)

Variable Name	Variable Definition	Source Data (year)
NUM_D_PAIN_TOT	Number of residents with dementia in the facility who had pain (either self- or staff-reported)	MDS (2022)
HCC_D_MEAN	Mean HCC score among residents with dementia enrolled in Medicare (fee-for-service or Medicare Advantage) in the facility	Medicare FFS and Medicare Advantage inpatient, SNF, hospice, home health, outpatient, and carrier claims (2022); Publicly available HCC software
MORT_RISK_SCR_D_MEAN	Mean risk of mortality score (range: 1 to 39 with 1 being least and 39 being highest risk of mortality) based on age, physical impairment (deficits in activities or daily living), and conditions (see Table 1 of Thomas et al)[b]	MDS (2022)
NUM_CANCER_D	Number of residents with dementia in the facility with a diagnosis of cancer	MDS (2022)
NUM_D_ANEMIA	Number of residents with dementia in the facility with a diagnosis of anemia	MDS (2022)
NUM_D_DYSRHTHMIA	Number of residents with dementia in the facility with a diagnosis of dysrhythmia	MDS (2022)
NUM_D_CAD	Number of residents with dementia in the facility with a diagnosis of coronary artery disease	MDS (2022)
NUM_D_DVT	Number of residents with dementia in the facility with a diagnosis of deep vein thrombosis	MDS (2022)
NUM_D_HRT_FAILR	Number of residents with dementia in the facility with a diagnosis of heart failure	MDS (2022)
NUM_D_HYPERT	Number of residents with dementia in the facility with a diagnosis of hypertension	MDS (2022)
NUM_D_HYPOTNSN	Number of residents with dementia in the facility with a diagnosis of hypotension	MDS (2022)
NUM_D_PVD	Number of residents with dementia in the facility with a diagnosis of peripheral vascular disease	MDS (2022)
NUM_D_CRRHS	Number of residents with dementia in the facility with a diagnosis of cirrhosis	MDS (2022)
NUM_D_GERD	Number of residents with dementia in the facility with a diagnosis of gastroesophageal reflux disease	MDS (2022)
NUM_D_ULCRTV_CLTS	Number of residents with dementia in the facility with a diagnosis of ulcerative colitis	MDS (2022)
NUM_D_BPH	Number of residents with dementia in the facility with a diagnosis of benign prostatic hyperplasia	MDS (2022)
NUM_D_ESRD	Number of residents with dementia in the facility with a diagnosis of end stage renal disease	MDS (2022)
NUM_D_NRGNC_BLADR	Number of residents with dementia in the facility with a diagnosis of neurogenic bladder	MDS (2022)
NUM_D_OBSTRCT_URPTHY	Number of residents with dementia in the facility with a diagnosis of obstructive uropathy	MDS (2022)
NUM_D_MDRO	Number of residents with dementia in the facility with a diagnosis of multi-drug resistant organism	MDS (2022)
NUM_D_PNEU	Number of residents with dementia in the facility with a diagnosis of pneumonia	MDS (2022)
NUM_D_SPTCMIA	Number of residents with dementia in the facility with a diagnosis of septicemia	MDS (2022)

Variable Name	Variable Definition	Source Data (year)
NUM_D_TB	Number of residents with dementia in the facility with a diagnosis of tuberculosis	MDS (2022)
NUM_D_UT	Number of residents with dementia in the facility with a diagnosis of urinary tract infection	MDS (2022)
NUM_D_VRL_HPT	Number of residents with dementia in the facility with a diagnosis of viral hepatitis	MDS (2022)
NUM_D_WND_INFCTN	Number of residents with dementia in the facility with a diagnosis of wound infection	MDS (2022)
NUM_D_DM	Number of residents with dementia in the facility with a diagnosis of diabetes	MDS (2022)
NUM_D_HYPONATREMIA	Number of residents with dementia in the facility with a diagnosis of hyponatremia	MDS (2022)
NUM_D_HYPERKALEMIA	Number of residents with dementia in the facility with a diagnosis of hyperkalemia	MDS (2022)
NUM_D_HYPERLPD	Number of residents with dementia in the facility with a diagnosis of hyperlipidemia	MDS (2022)
NUM_D_THYRD	Number of residents with dementia in the facility with a diagnosis of thyroid disorder (e.g., hypothyroidism, hyperthyroidism, and Hashimoto's thyroiditis)	MDS (2022)
NUM_D_ARTHRTS	Number of residents with dementia in the facility with a diagnosis of arthritis (e.g., degenerative joint disease (DJD), osteoarthritis, and rheumatoid arthritis (RA))	MDS (2022)
NUM_D_OSTPRS	Number of residents with dementia in the facility with a diagnosis of osteoporosis	MDS (2022)
NUM_D_HIP_FRCTR	Number of residents with dementia in the facility with a diagnosis of hip fracture	MDS (2022)
NUM_D_OTHR_FRCTR	Number of residents with dementia in the facility with a diagnosis of other fractures	MDS (2022)
NUM_D_ALZHMR	Number of residents with dementia in the facility with a diagnosis of Alzheimer's disease	MDS (2022)
NUM_D_APHASIA	Number of residents with dementia in the facility with a diagnosis of aphasia	MDS (2022)
NUM_D_CRBRL_PLSY	Number of residents with dementia in the facility with a diagnosis of cerebral palsy	MDS (2022)
NUM_D_STRK	Number of residents with dementia in the facility with a diagnosis of stroke	MDS (2022)
NUM_D_DMNT	Number of residents with dementia in the facility with a diagnosis of non-Alzheimer's dementia	MDS (2022)
NUM_D_HEMIPLG	Number of residents with dementia in the facility with a diagnosis of hemiplegia	MDS (2022)
NUM_D_PARAPLG	Number of residents with dementia in the facility with a diagnosis of paraplegia	MDS (2022)
NUM_D_QUADPLG	Number of residents with dementia in the facility with a diagnosis of quadriplegia	MDS (2022)
NUM_D_MS	Number of residents with dementia in the facility with a diagnosis of multiple sclerosis	MDS (2022)
NUM_D_HNTGTN	Number of residents with dementia in the facility with a diagnosis of Huntington's disease	MDS (2022)
NUM_D_PRKNSN	Number of residents with dementia in the facility with a diagnosis of Parkinson's disease	MDS (2022)
NUM_D_TOURT	Number of residents with dementia in the facility with a diagnosis of Tourette's syndrome	MDS (2022)
NUM_D_SZRE	Number of residents with dementia in the facility with a diagnosis of seizure disorder or epilepsy	MDS (2022)
NUM_D_TBI	Number of residents with dementia in the facility with a diagnosis of traumatic brain injury	MDS (2022)

Variable Name	Variable Definition	Source Data (year)
NUM_D_MALNTRTN	Number of residents with dementia in the facility with a diagnosis of malnutrition	MDS (2022)
NUM_D_ANXTY	Number of residents with dementia in the facility with a diagnosis of anxiety disorder	MDS (2022)
NUM_D_DPRSN	Number of residents with dementia in the facility with a diagnosis of depression (other than bipolar)	MDS (2022)
NUM_D_MNC_DRPSN	Number of residents with dementia in the facility with a diagnosis of manic depression (bipolar disease)	MDS (2022)
NUM_D_PSYCHTC	Number of residents with dementia in the facility with a diagnosis of psychotic disorder	MDS (2022)
NUM_D_SCHZ	Number of residents with dementia in the facility with a diagnosis of schizophrenia (schizoaffective and schizophreniform disorders)	MDS (2022)
NUM_D_PTSD	Number of residents with dementia in the facility with a diagnosis of post-traumatic stress disorder	MDS (2022)
NUM_D_ASTHMA	Number of residents with dementia in the facility with a diagnosis of asthma	MDS (2022)
NUM_D_RSPRTRY_FAILR	Number of residents with dementia in the facility with a diagnosis of respiratory failure	MDS (2022)
NUM_D_CTRCT	Number of residents with dementia in the facility with a diagnosis of cataract, glaucoma, or macular degeneration	MDS (2022)
Service use among Medicare residents with dementia		
Parts A and B-related service use (beneficiaries with dementia found in 2022 FFS and MA data)		
TOT_D_ACUTE_IP_DAYS	Number of inpatient days from the nursing home per resident year, calculated as the number of days in an inpatient setting from the facility divided by the number of resident years in the facility.	MDS (2022) and Medicare FFS and MA inpatient claims (2022)
TOT_D_ED_VISITS	Number of ED visits from the nursing home per resident year, calculated as the number of ED visits (either outpatient or that led to an inpatient stay) from the facility divided by the number of resident years in the facility	MDS (2022) and Medicare FFS and MA inpatient and outpatient claims (2022)
TOT_D_PAH_IP_DAYS	Number of inpatient days from the nursing home that were potentially avoidable per resident year, calculated as the number of days in an inpatient setting from the facility that were for potentially avoidable stays divided by the number of resident years in the facility	MDS (2022) and Medicare FFS and MA inpatient claims (2022)
TOT_D_PAH_ED_VISITS_D	Number of ED visits from the nursing home that were potentially avoidable per resident year, calculated as the number of ED visits (either outpatient or that led to an inpatient stay) from the facility that were for potentially avoidable visits divided by the number of resident years in the facility	MDS (2022) and Medicare FFS and MA inpatient and outpatient claims (2022)
REHOSP_D_RATE	The number of facility admissions from acute care hospitals that resulted in a readmission to a hospital	MDS (2022)

Variable Name	Variable Definition	Source Data (year)
Part D-related service use among beneficiaries with dementia with long-stays		
TOTCLMS_D_OPIODS	Among long-stay residents with dementia in the facility, the total number of claims for opioids	MDS (2022) and Part D claims (2022)
TOTDAYS_D_OPIOIDS	Among long-stay residents with dementia in the facility, total number of days' supply for opioids	MDS (2022) and Part D claims (2022)
TOTCLMS_D_ANTIBIO	Among long-stay residents with dementia in the facility, total number of claims for antibiotics	MDS (2022) and Part D claims (2022)
TOTDAYS_D_ANTIBIO	Among long-stay residents with dementia in the facility, total number of days' supply for antibiotics	MDS (2022) and Part D claims (2022)
TOTCLMS_D_ANTIPSY	Among long-stay residents with dementia in the facility, total number of claims for antipsychotics	MDS (2022) and Part D claims (2022)
TOTDAYS_D_ANTIPSY	Among residents with dementia in the facility, total number of days' supply for antipsychotics	MDS (2022) and Part D claims (2022)
TOTCLMS_D_ANTIDEP	Among long-stay residents with dementia in the facility, total number of claims for antidepressants	MDS (2022) and Part D claims (2022)
TOTDAYS_D_ANTIDEP	Among long-stay residents with dementia in the facility, total number of days' supply for antidepressants	MDS (2022) and Part D claims (2022)
TOTCLMS_D_BENZO	Among long-stay residents with dementia in the facility, total number of claims for benzodiazepines / Z-drugs	MDS (2022) and Part D claims (2022)
TOTDAYS_D_BENZO	Among long-stay residents with dementia in the facility, total number of days' supply for benzodiazepines / Z-drugs	MDS (2022) and Part D claims (2022)
TOTCLMS_D_ANTISEI	Among long-stay residents with dementia in the facility, total number of claims for antiseizure medications	MDS (2022) and Part D claims (2022)
TOTDAYS_D_ANTISEI	Among long-stay residents with dementia in the facility, total number of days' supply for antiseizure medications	MDS (2022) and Part D claims (2022)

Variable Name	Variable Definition	Source Data (year)
TOTCLMS_D_CHOLMEM	Among long-stay residents with dementia in the facility, total number of claims for cholinesterase inhibitors or memantine	MDS (2022) and Part D claims (2022)
TOTDAYS_D_CHOLMEM	Among long-stay residents with dementia in the facility, total number of days' supply for cholinesterase inhibitor or memantine	MDS (2022) and Part D claims (2022)
TOTCLMS_D_ANTICHOL	Among long-stay residents with dementia in the facility, total number of claims for a strongly anticholinergic medication	MDS (2022) and Part D claims (2022)
TOTDAYS_D_ANTICHOL	Among long-stay residents with dementia in the facility, total number of days' supply for a strongly anticholinergic medication	MDS (2022) and Part D claims (2022)

[a] Thomas KS et al. The Minimum Data Set 3.0 Cognitive Function Scale. Medical Care 2017, vol 55 (9): e68-e72. Available at: https://journals.lww.com/lww-medicalcare/pages/articleviewer.aspx?year=2017&issue=09000&article=00011&type=Fulltext

[b] Thomas, KS et al. Development and Validation of the Nursing Home Minimum Data Set 3.0 Mortality Risk Score (MRS3). J Gerontol A Biol Sci Med Sci 2019, vol 74; (2): 219-225. Available at: https://pubmed.ncbi.nlm.nih.gov/29514187/
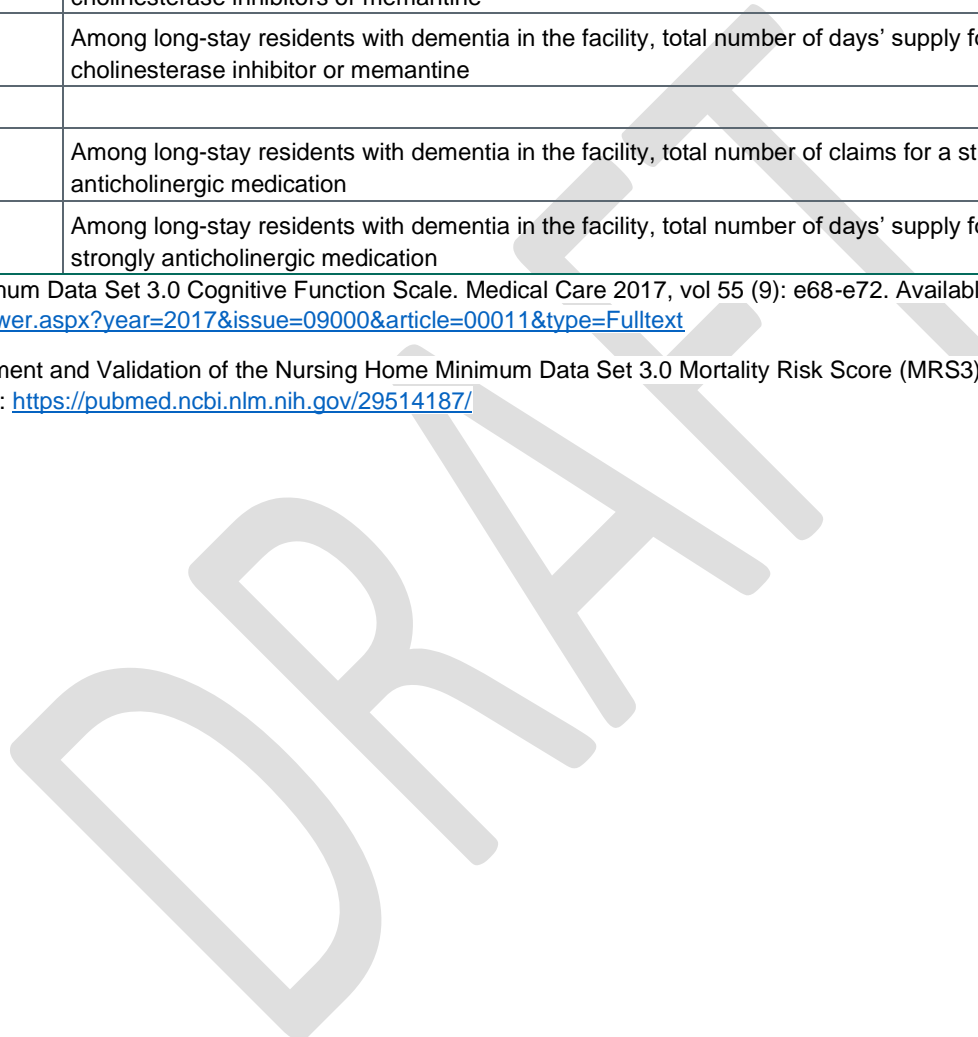
Change log of edits to data dictionary

Date	Description of edit(s)