

A Million Person Study Innovation: Evaluating Cognitive Impairment and other Morbidity
Outcomes from Chronic Radiation Exposure Through Linkages with the Centers for Medicaid
and Medicare Services Assessment and Claims Data

Supplemental File

Supplemental TABLE 1
Description of CMS Data Files and Key Variables Available for Analyses

Study objective/measure	Data variable(s)	CMS data file(s) available
Examine whether radiation exposure is associated with greater risk of disease incidence and prevalence	Enrollment, demographic and eligibility information (e.g., race, date of birth, sex, Medicare status, Parts A/B/C/D enrollment); Diagnosis codes and dates of services to identify initial diagnosis date of multiple diseases, including dementia, Alzheimer's, Parkinson's, motor neuron disease, cardiovascular disease and other conditions; fill dates for medications that may indicate presence of a disease (e.g., levodopa for Parkinson's disease)	MBSF base and segment files; MedPAR (ss/l/s/snf), hospice, home health, outpatient, carrier, and Part D
Examine whether radiation exposure is associated with greater risk of cognitive impairment, functional impairment, depression, and other behavioral and neurological conditions	Enrollment, demographic and eligibility information (e.g., race, date of birth, sex, Medicare status, Parts A/B/C/D enrollment); Mental, cognitive and functional assessment questions from users of nursing home and home health services	MBSF base and segment files; OASIS, MDS. Parts A/B/D claims will also be used to describe resident characteristics and service utilization

Notes. MBSF = Master Beneficiary Summary File; MedPAR = Medicare Provider Analysis and Review; ss/l/s/snf = short stay/long stay/skilled nursing facility; OASIS = Outcome and Assessment Information Set; MDS = Minimum Data Set.

Supplemental TABLE 2
Existing CMS Algorithms to Identify Chronic Conditions within Claims Data as Early as 1999

Acute Myocardial Infarction
 Alzheimer's Disease
 Anemia
 Asthma
 Atrial Fibrillation and Flutter
 Benign Prostatic Hyperplasia
 Cancer, Breast
 Cancer, Endometrial
 Cancer, Lung
 Cancer, Prostate
 Cancer, Urologic (Kidney, Renal Pelvis, and Ureter)
 Cataract
 Chronic Kidney Disease
 Chronic Obstructive Pulmonary Disease
 Depression, Bipolar, or Other Depressive Mood Disorders
 Diabetes
 Glaucoma
 Heart Failure and Non-Ischemic Heart Disease
 Hip/Pelvic Fracture
 Hyperlipidemia
 Hypertension
 Ischemic Heart Disease
 Non-Alzheimer's Dementia
 Osteoporosis With or Without Pathological Fracture
 Parkinson's Disease and Secondary Parkinsonism
 Pneumonia, All-cause
 Rheumatoid Arthritis/Osteoarthritis
 Stroke/Transient Ischemic Attack

Supplemental TABLE 3
Other Chronic Health, Mental Health, and Potentially Disabling Conditions Available in CMS as early as 1999

ADHD, Conduct Disorders, and Hyperkinetic Syndrome
Alcohol Use Disorders
Anxiety Disorders
Autism Spectrum Disorders
Bipolar Disorder
Cerebral Palsy
Cystic Fibrosis and Other Metabolic Developmental Disorders
Depressive Disorders
Epilepsy
Fibromyalgia and Chronic Pain and Fatigue
Hepatitis (A, B, C, D, E, acute, chronic, unspecified)
HIV/AIDS
Intellectual Disabilities and Related Conditions
Learning Disabilities
Leukemias and Lymphomas
Liver Disease, Cirrhosis, and Other Liver Conditions (except Viral Hepatitis)
Migraine and Chronic Headache
Mobility Impairments
Multiple Sclerosis and Transverse Myelitis
Muscular Dystrophy
Obesity
Opioid Use Disorder
Peripheral Vascular Disease
Personality Disorders
Post-Traumatic Stress Disorder
Pressure and Chronic Ulcers
Schizophrenia
Sensory – Blindness and Visual Impairment
Sensory – Deafness and Hearing Impairment
Sickle Cell Disease
Spina Bifida and Other Congenital Anomalies of the Nervous System
Spinal Cord Injury
Tobacco Use
Traumatic Brain Injury

Supplemental TABLE 4**CMS Data Files (n=23) and Years of Linkage Coverage for 26 MPS Radiation Worker Cohorts**

CMS file name	Linkage year(s)
Master Beneficiary Summary file (A/B/C/D)	1999-2019
MBSF Chronic Conditions Segment (27)	1999-2019
MBSF Chronic Conditions Segment (30)	2017-2019
MBSF Other Chronic and Potentially Disabling Conditions Segment	1999-2019
MedPAR (Inpatient/Skilled nursing facility)	1999-2019
Outpatient (FFS) RIF – Research Identifiable Files	1999-2019
Hospice RIF – Research Identifiable Files	1999-2019
Home Health (FFS) RIF – Research Identifiable Files	1999-2019
Carrier (FFS) RIF – Research Identifiable Files	1999-2019
Plan Characteristics File	2006-2019
Part D event data	2006-2019
Part D Prescriber Characteristics file	2006-2019
Part D Formulary file	2010-2019
Part D Drug Characteristics file	2006-2019
Part D Plan Election Type Beneficiary Summary file	2007-2019
100% MDS 2.0 (from CCW)	1999-Q3 2010
100% MDS 3.0 (from CCW)	Q4 2010 - 2011
100% MDS 3.0 (from CMS)	2012-2019
100% OASIS (from CCW)	1999-2011
100% OASIS (from CMS)	2012-2019

Notes. CMS = Centers for Medicare & Medicaid Services; MBSF = Master Beneficiary Summary File; MedPAR = Medicare Provider Analysis and Review; OASIS = Outcome and Assessment Information Set; MDS = Minimum Data Set; CCW = chronic condition warehouse.