



## VIReC Database & Methods Cyberseminar Series



### Session 3

# Measuring Veterans' Medicare Healthcare Use

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*Technical Director*

*VA/CMS Data for Research Project*

*VA Information Resource Center*

February 3, 2020



## *Today's objective*

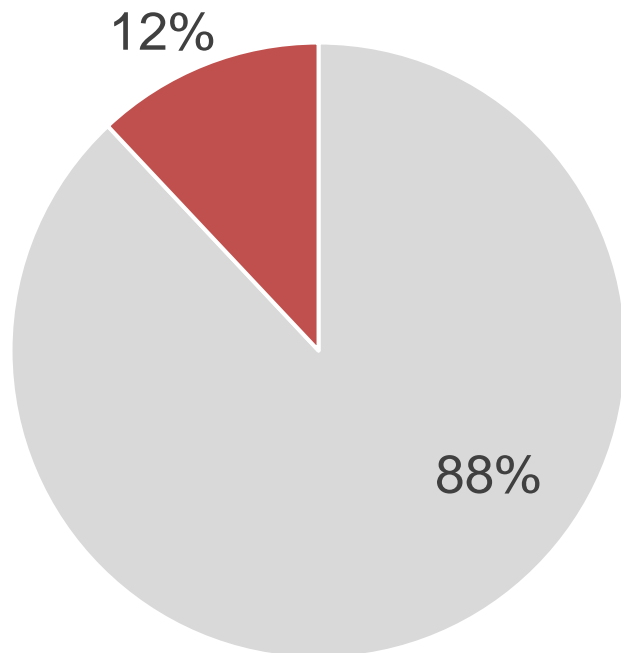
*demonstrate how researchers can obtain  
information on Veterans' healthcare use  
received through Medicare*

# Veterans' Enrollment in Medicare

*Percent of VHA Enrollees in Medicare in September 2016*

**Veterans age <65**

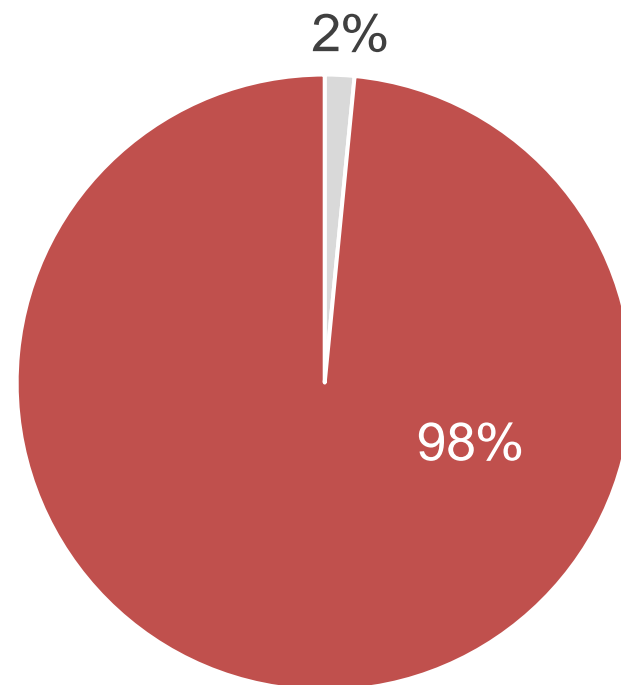
*N = 4.9 million*



 **VHA only**

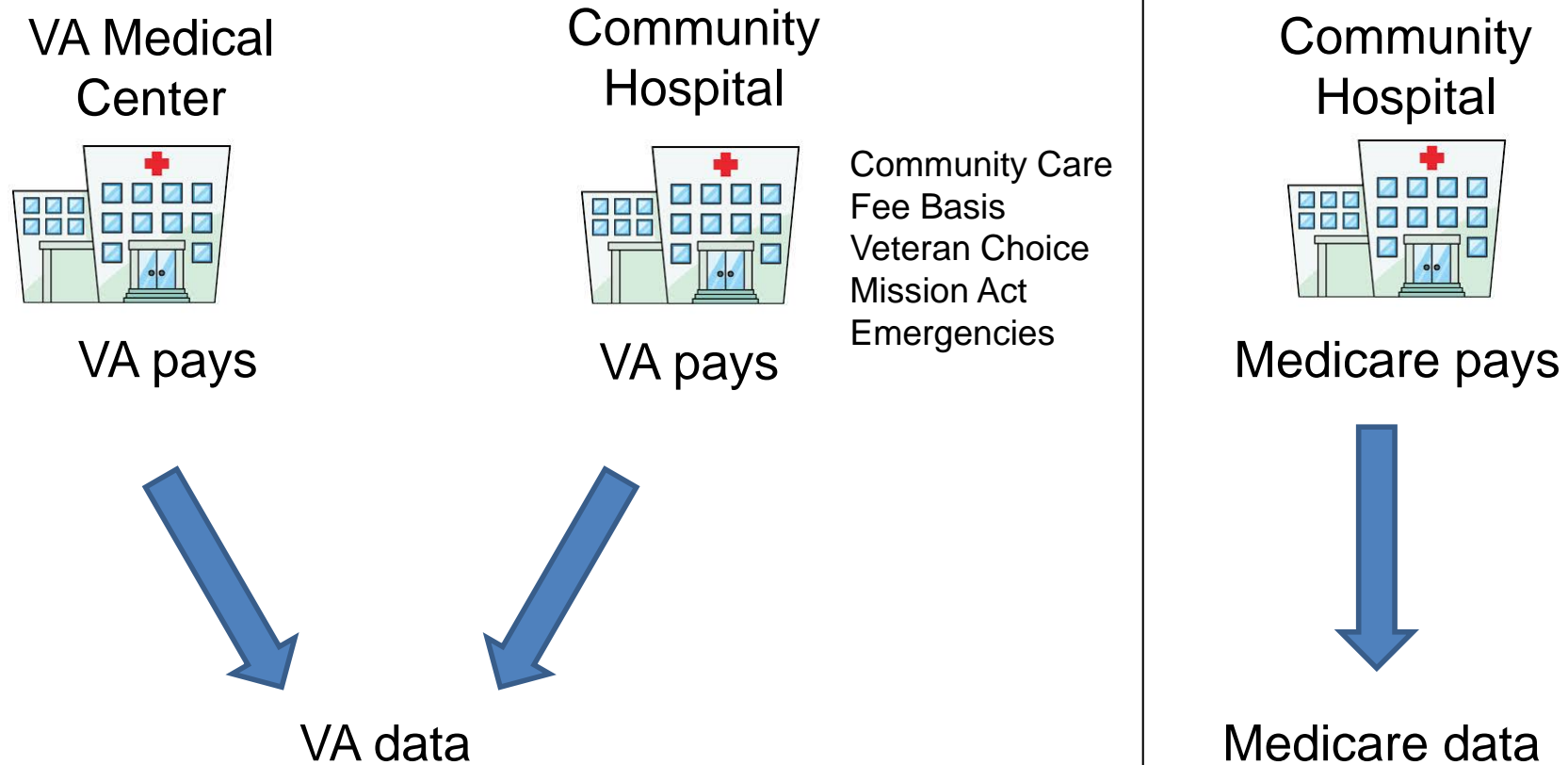
**Veterans age 65+**

*N = 4.7 million*



 **VHA + Medicare**

# Where's the data?



# Poll Question #1

**What is your role in research and/or quality improvement?**

- Investigator, PI, Co-Investigator
- Data manager, analyst, or programmer
- Project coordinator
- Other – please describe via the Q&A function

## Poll Question #2

**Rate your experience with & knowledge of Medicare data**

- None
- Little
- Some
- Moderate
- Expert



# Session roadmap

- Medicare 101
- Types of Medicare Data
- Using Medicare Data in Research
- Research Examples
- Data Access and Assistance

# Session roadmap

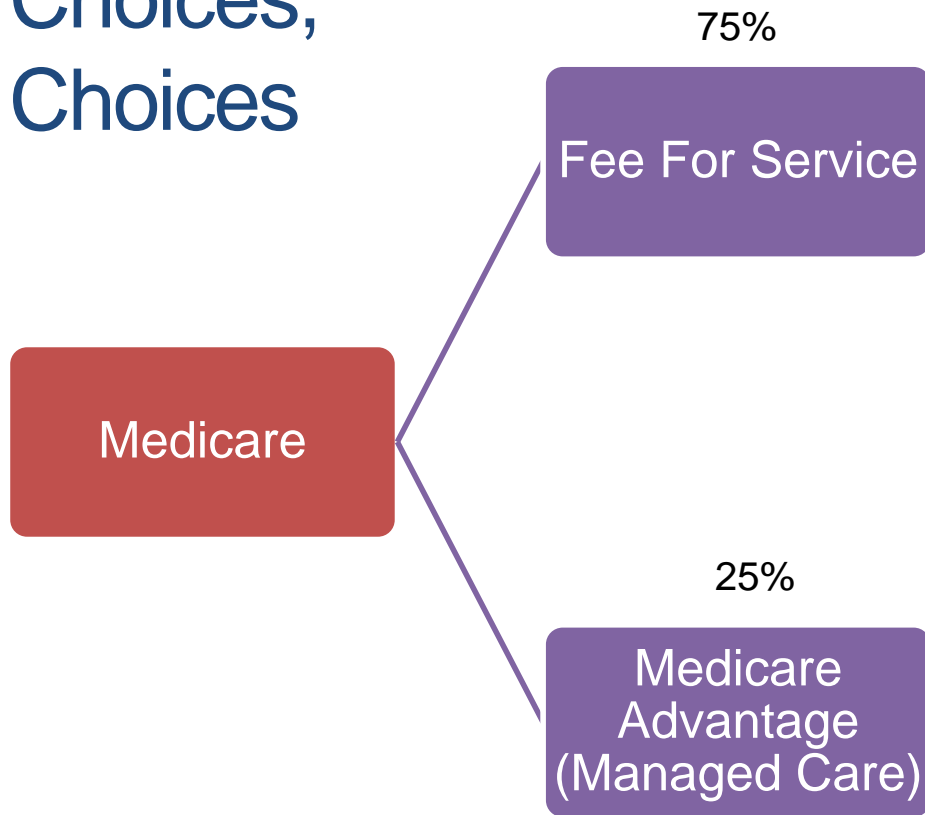
- **Medicare 101**
- Types of Medicare Data
- Using Medicare Data in Research
- Research Examples
- Data Access and Assistance



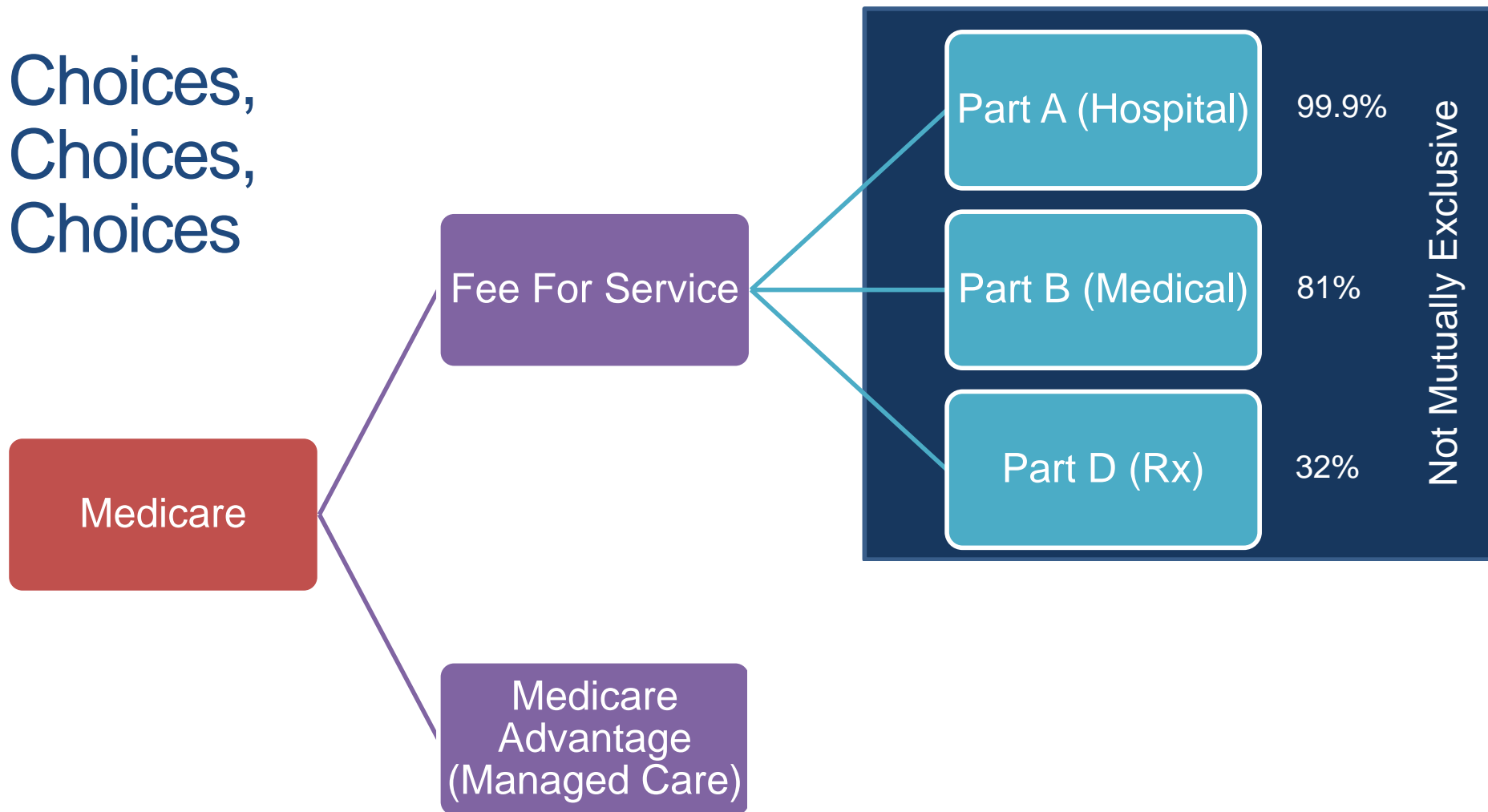
# Medicare Eligibility

- Who is eligible for Medicare?
  - Almost everyone over age 65
  - Some disabled individuals
  - Patients with End Stage Renal Disease
- Eligibility not dependent on
  - Income
  - Other health insurance
  - VHA coverage

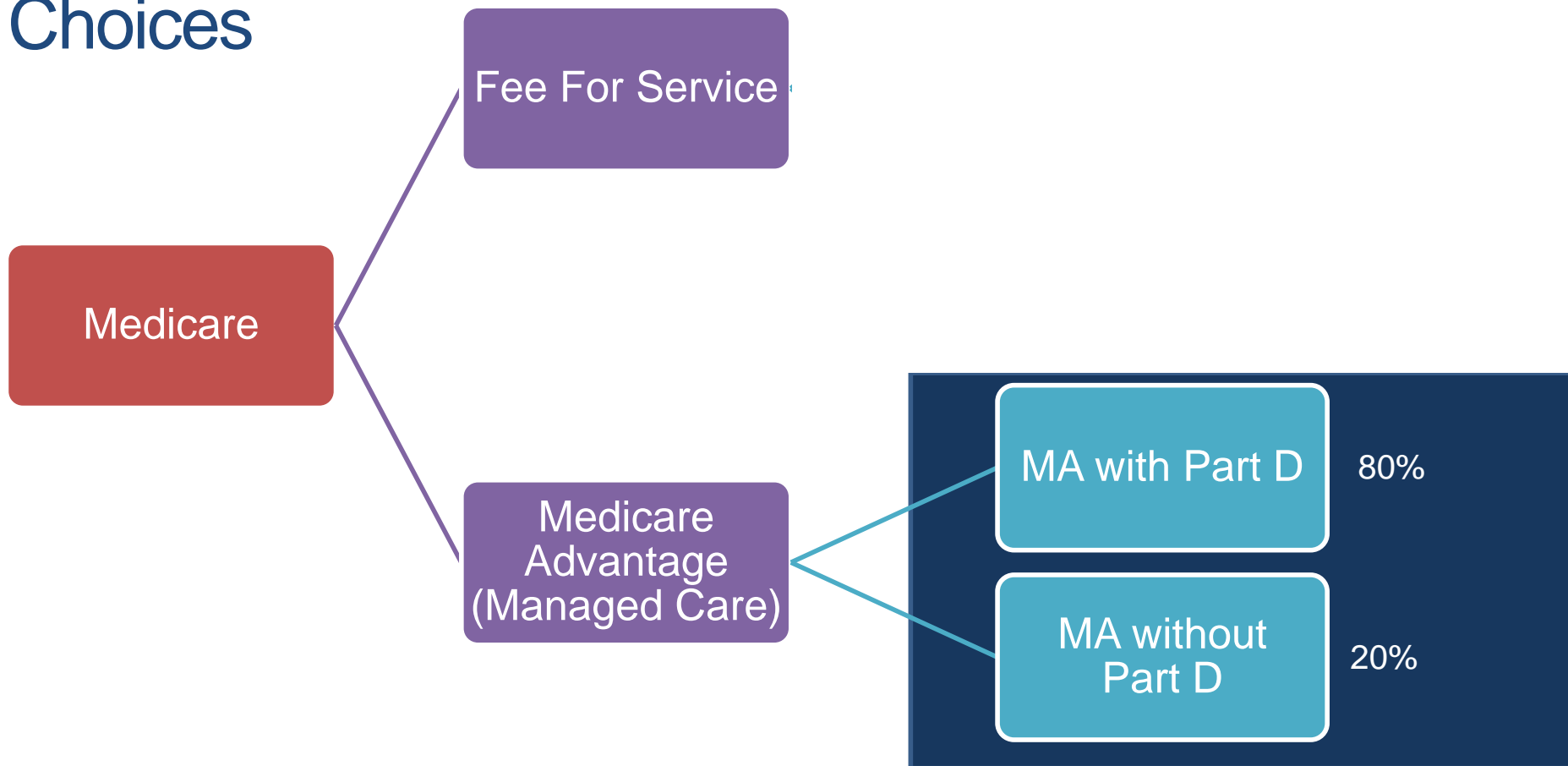
Choices,  
Choices,  
Choices



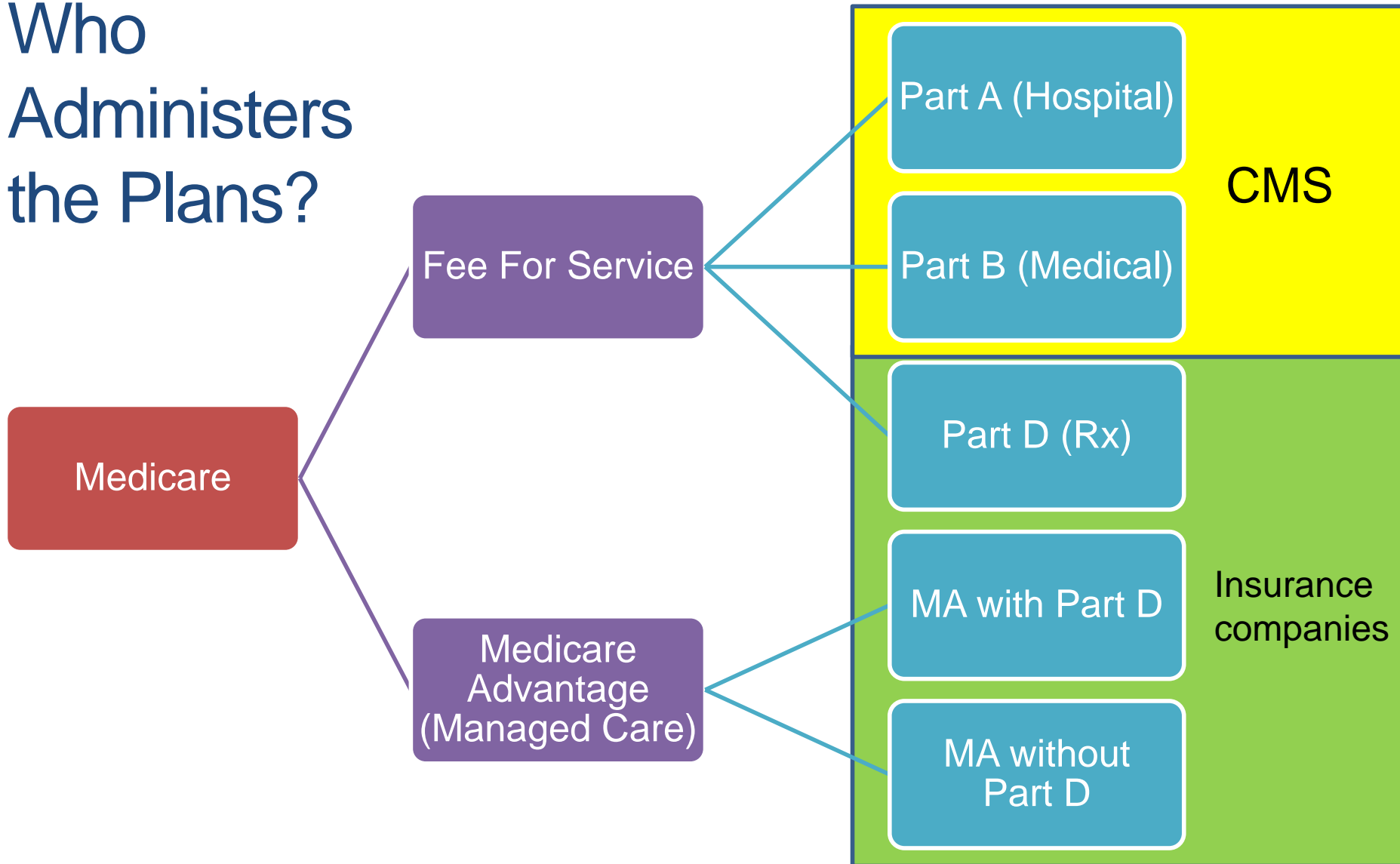
# Choices, Choices, Choices



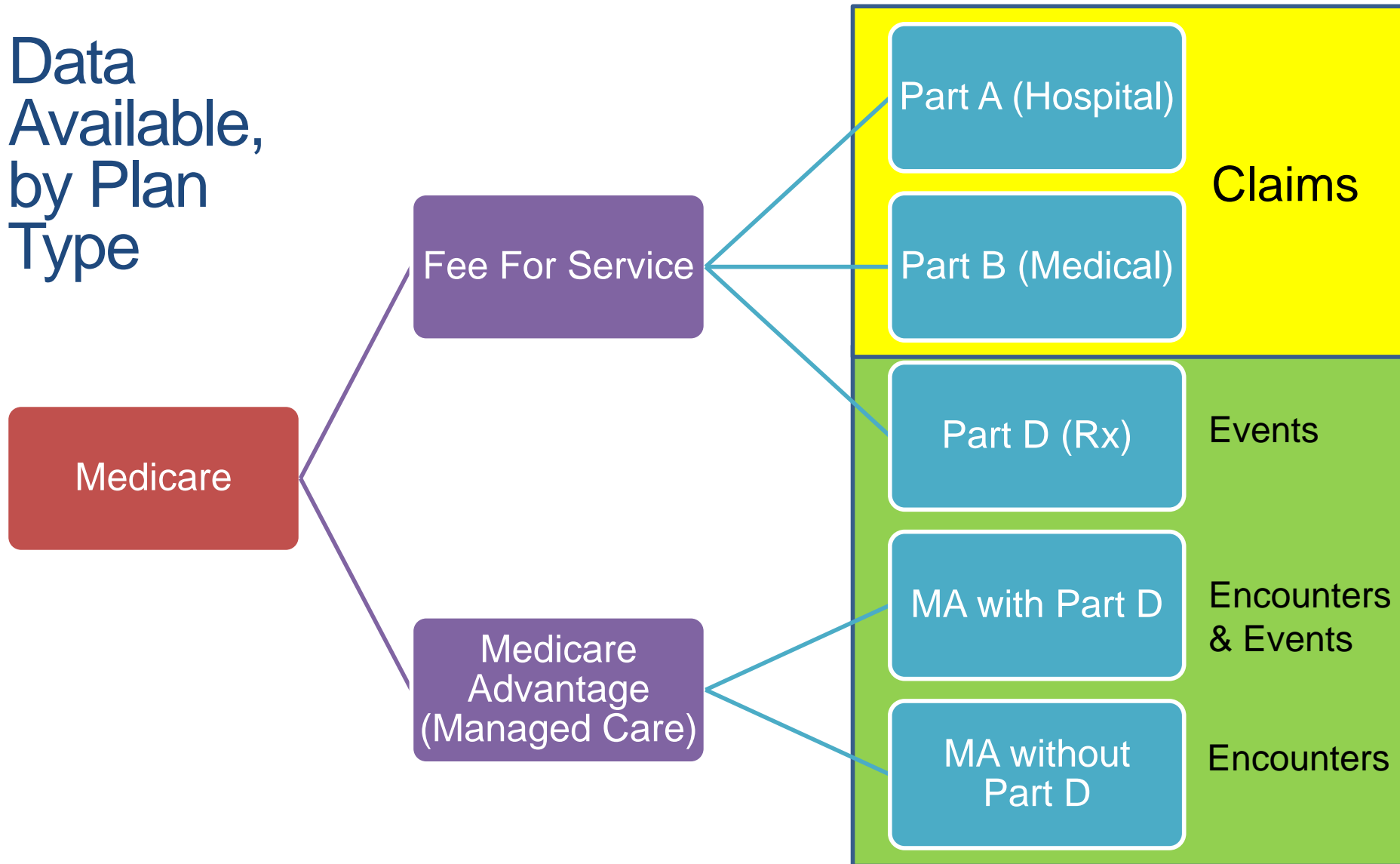
# Choices, Choices, Choices



# Who Administers the Plans?



# Data Available, by Plan Type



# Session roadmap

- ✓ Medicare 101
- **Types of Medicare Data**
- Using Medicare Data in Research
- Research Examples
- Data Access and Assistance

# Types of Medicare Data

- Enrollment & Demographics
- Claims & Stay level file
- Part D events
- Annual Summary files
- Medicare Advantage
  - Encounter
  - HEDIS



# Types of Medicare Data

- Enrollment & Demographics
- Claims & Stay level file
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  - HEDIS

# Enrollment & Demographic File

- One record per person, per calendar year
- Actual name varies by year
  - Denominator (1997-2008)
  - Beneficiary Summary (2009-10)
  - Master Beneficiary Summary File: Base (2011- )

# Contents of Enrollment & Demographic File

- Contains Monthly indicators for
  - Parts A, B, D
  - Medicare Advantage
  - Medicaid
- Demographics
  - Sex, date of birth, date of death
  - Race/ethnicity
  - State, County, ZIP
  - Does NOT contain
    - Education, marital status, income

# EDB Extracts

- Extracts of Medicare's Enrollment Database (EDB)
- Cumulative files; updated annually
  - Vital Status
  - Parts A & B Entitlement & Enrollment History
  - Group Health Organization
  - Incarceration History
  - Primary Payer

# Types of Medicare Data

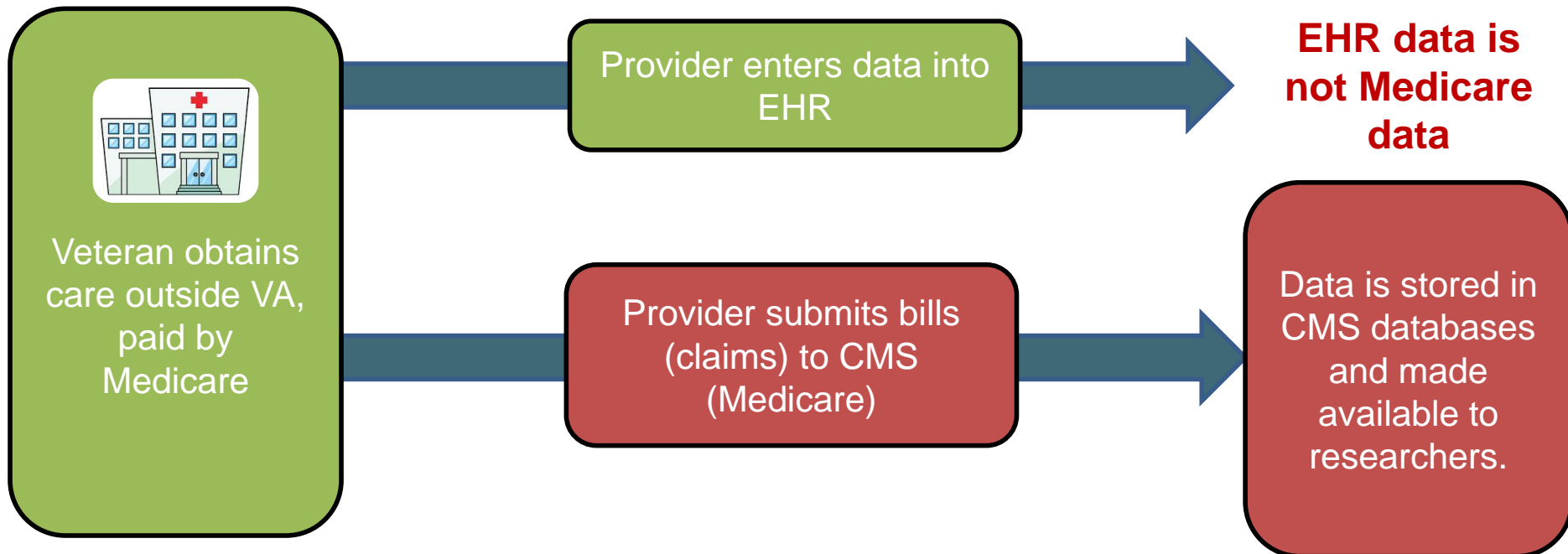
- Enrollment & Demographics
- Claims & Stay level file
- Part D events
- Annual Summary files
- Medicare Advantage
  - HEDIS
  - Encounter

# Source of VA and Medicare Data

## VA Data Flow



## Medicare FFS Data Flow



Type of Provider → Type of Bill → Type of Data

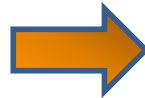
## Institutional



Hospital or  
nursing  
facility



Home health agency  
or hospice



**CMS 1450/  
UB-04**



**Part A or B**

## 5 Institutional Files

Inpatient  
Skilled Nursing  
Home Health  
Hospice  
Outpatient

## Non-Institutional



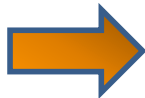
Clinical  
laboratories



Individual  
physicians,  
chiropractors,  
other providers



Physician  
groups



**CMS 1500**



**Part B**

## 2 Non-Institutional Files

Carrier  
Durable Medical Equipment



Medical  
Suppliers



Ambulances

# What types of information are included on a Medicare claims?

## COMPLETE DATA

Social Security Number  
Dates of service  
Provider & place of service  
Costs  
Procedure codes\*  
Diagnosis codes\*

## NO or INCOMPLETE DATA

Clinical data (Lab Results, Vital Signs, Symptoms)  
Services not itemized (bundled services)

\*When needed for billing



# What does a claim represent?

## 1 claim = multiple visits

- Multiple visits to same provider, for same purpose in short time period
  - Physical therapy
  - Dialysis
  - Home healthcare

## 1 claim = 1 visit

- Acute inpatient stay
- Office visits

## Multiple claims = 1 visit

- Emergency room visits (hospital + physician)
- Long stays, especially in Skilled Nursing Facilities

# Inpatient & Skilled Nursing Facility Files

- Inpatient
  - 90% short-term (acute) hospitals
  - Rehab, psych, other long-term hospitals
- Skilled Nursing Facility (SNF)
  - Skilled nursing and rehabilitation care
  - Does not include custodial care
- Includes facility charges and payments
- A stay may involve one or multiple claims

## Example: Single stay with multiple claims

Stay	Claims	
Admit: July 10 Discharge: August 8	Claim 1	From July 10 Thru July 31
	Claim 2	From August 1 Thru August 8

# MedPAR Stay-Level File

- Created from Inpatient and SNF claims
- Claims are “rolled up” to the stay level
  - Eliminates need for researchers to do this manually
- Includes some stays from Medicare Advantage enrollees
- Variables
  - Many stay-level summary variables
  - Doesn't have all variables from IP/SNF files (e.g. physician's NPI)
  - Only diagnosis and procedures codes from last IP/SNF claim

# Hospice & Home Health Agency Files

- Hospice
  - End-of-life care provided by hospice agencies
  - Care at home (80-90%) or as inpatient
- Home Health Agency
  - Skilled nursing
  - Physical/occupational/speech therapy
  - Home health aide

# Outpatient File

- Types of facilities
  - Hospital (87%)
  - Dialysis facilities, rural health clinics, federally qualified health centers, mental health centers, rehab centers
- Types of services
  - Laboratory
  - Radiology
  - Physical therapy
  - Dialysis
  - Emergency room
- Includes facility charges and payments

# Carrier File

- Previously known as Physician/Supplier File
- Includes:
  - Physician services
    - Outpatient setting: Office visits, procedures
    - Inpatient settings: Consultations, services in hospitals & nursing facilities
    - Emergency room
  - Ambulance providers
  - Clinical laboratories

# Durable Medical Equipment File

## Includes:

- Wheelchairs and hospital beds
- Prosthetics and orthotics
- Oxygen equipment and supplies
- Diabetic testing supplies
- Drugs (limited coverage) provided in outpatient setting



# Types of Medicare Data

- Enrollment & Demographics
- Claims & Stay level file
- **Part D events**
- Annual Summary files
- Medicare Advantage
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  - HEDIS

## Part D Events

- Part D is administered by insurance companies
- Claims for drugs paid by insurance companies, not CMS
- Insurance companies submit data to CMS on all prescription fills
- Includes Part D events from all plans
  - Stand alone plans and Medicare Advantage plans

## Part D Data for Research Use

- Prescription Drug Event (PDE), can be linked to characteristics of the:
  - Drug
  - Pharmacy
  - Prescriber
  - Plan
- Slim File is subset of PDE data, includes
  - Drug Characteristics

PDE is not readily available  
for VA research

Slim File is more easily  
available for VA research

# Types of Medicare Data

- Enrollment & Demographics
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# What are the Annual Summary Files?

- Variables created by CMS, based on the FFS claims
- One record per person, per calendar year
- Two types of summary data
  1. Cost and Use
    - Medicare and Beneficiary payments
    - Number of “events”
  2. Chronic Conditions
    - Uses standard definitions for chronic conditions
    - Disease flags & diagnosis date

## Where to find annual summary data?

Types of variables	1999-2010	2011- forward
Cost and Use	Beneficiary Annual Summary File (BASF)	MBSF: Cost and Use
Chronic Condition (common in Medicare population)		MBSF: Chronic Conditions
Disabilities & Other Chronic Conditions (common in Medicare- Medicaid dually enrolled population)	N/A	MBSF: Other Chronic or Potentially Disabling Conditions

MBSF = Master Beneficiary Summary File

# Types of Medicare Data

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# Medicare Advantage Encounter Data

- Utilization for beneficiaries in managed care plans
- Data submitted to CMS by insurance companies
- Data structure and files types are similar to claims files, except:
  - No hospice file
  - No cost variables
  - Includes chart review records
- Limitations
  - Only 1 year currently available (CY 2015)
  - Best practices & pitfalls unknown



# HEDIS

## Healthcare Effectiveness Data and Information Set

- Tool used by health plans to measure quality of care
- Can be used to approximate amount and types of utilization
  - One record per person, per plan, per calendar year
- Examples
  - Received eye exam?
  - Number of hospitalizations, length of stay
- Limitations
  - No dates, diagnosis or procedure codes, provider info
  - More limited assistance for researchers

# Session roadmap

- ✓ Medicare 101
- ✓ Types of Medicare Data
- **Using Medicare Data in Research**
- Research Examples
- Data Access and Assistance

# Commonly used data elements & measures

- Procedures
- Diagnoses
- Costs
- Inpatient Stays
- Outpatient Visits



# Procedures

Two types of procedure codes in Medicare claims data

1. ICD-9 & ICD-10 procedure/surgery codes
  - MedPAR and Inpatient files
  
2. Healthcare Common Procedure Coding System (HCPCS)
  - CPT procedure codes + CMS developed codes
  - CMS developed codes are alpha-numeric
  - Outpatient, home health, carrier, DME files

# Diagnoses

- Medicare claims data contain ICD-9/ICD-10 diagnosis codes
  - No diagnosis codes in Part D data
- Inpatient/MedPAR claims include Diagnostic Related Group (DRG)

# Using Procedures & Diagnoses in Research

- Inclusion or exclusion criteria
- Outcome measure
- Risk adjustment
  - Comorbidity index

# Costs

- Charges submitted to Medicare
- Payments made to providers by
  - Medicare
  - Beneficiaries (deductibles & co-payments)
  - Primary payers
- Claims do not include payments made by secondary payers



# Inpatient Stay: Common Measures

- Number of stays
- Length of stay
- Readmissions



# Identifying Inpatient Stays

Inpatient care are provided by institutional providers.  
(And often non-institutional providers too)

Types of Providers	Examples	Dataset
Institutional	Hospitals	Inpatient or MedPAR files
Non-institutional	Physicians	Carrier file

# What File(s) Should I use when Studying Inpatient Stays?

Choose **MedPAR**  
when studying:

- Number of stays
- Length of stay
- Total payments

Choose **Inpatient**  
when studying:

- Detailed charges
- Physicians' NPI
- All diagnosis & procedure codes

Add **Carrier** when  
studying:

- Consults
- All procedures

## Inpatient Stays: VA vs. Medicare

### VA Facility

- Acute care
- Rehab

### Medicare

- Acute care facility
- Rehab care facility

# Outpatient Visits: Common Measures

- Number of visits
- Type of visits

# Identifying Outpatient Services

Outpatient services may be provided by both institutional and non-institutional providers.

Types of Providers	Examples	Dataset
Institutional	Hospitals	Outpatient File
Non-institutional	Physicians	Carrier File

# What File(s) Should I use when Studying Outpatient Events?

In most cases, use both

Use **Outpatient**  
when studying:

- Services provided in a facility

Use **Carrier**  
when studying:

- Physician services

Add **Home Health**  
when studying:

- Services that could be provided at home, like physical therapy

Some events will have claims in both files

# Outpatient Visits: VA vs. Medicare

## VA (same day)

- Primary care
- Specialist
- Therapy

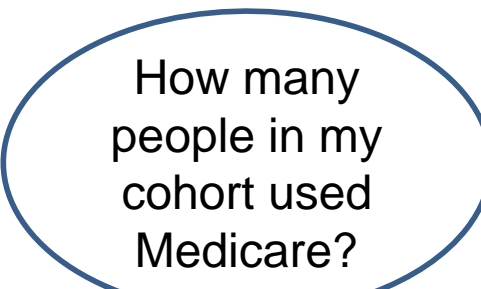
## Medicare

- Primary care
- Specialist
- Therapy


# Are annual summary files right for me?

## Pros

- Easy to work with, small files



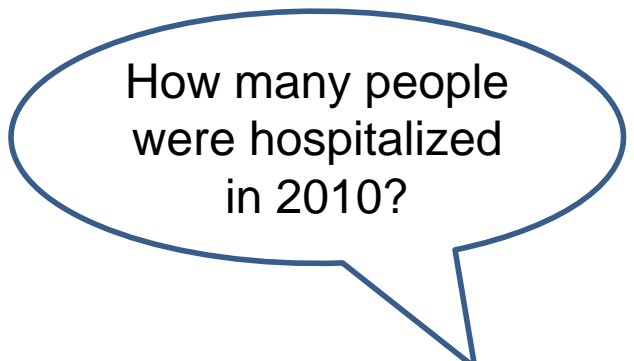
How many people in my cohort used Medicare?



Who has been diagnosed with lung cancer?

## Cons

- Summarized by calendar year, not fiscal year
- Doesn't itemize all types of events/conditions
- Uses CMS's definitions



How many people were hospitalized in 2010?



# Session roadmap

- ✓ Medicare 101
- ✓ Types of Medicare Data
- ✓ Using Medicare Data in Research
- **Research Examples**
- Data Access and Assistance

# Common Ways Medicare Data are used in VA Research

## Compare groups of users

- VA users
- Medicare users
- “Dual” users

Add Medicare data  
for more complete  
healthcare utilization  
or health status

## Example 1

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Done N, et al. Guideline-concordant initiation of oral anticoagulant therapy for stroke prevention in older veterans with atrial fibrillation eligible for Medicare Part D. Health Serv Res. 2019; 54:128-138.

# Overview (Done, 2019)

## **Objective**

To characterize the rate of guideline concordant initiation of oral anticoagulation (OAC) among Veterans with atrial fibrillation (AF) and high stroke risk

## **Cohort**

- Veterans enrolled in Medicare FFS, age 66+
- Initially diagnosed with AF in VHA during FY12-15
- No OAC prior to AF diagnosis
- N=6,619

# Methods (Done, 2019)

## **Data Sources**

- VA CDW
- Medicare MBSF, MedPAR, Inpatient, Outpatient, Carrier, Part D

## **Used VA and Medicare data to**

- Identify AF diagnosis
- Identify prescriptions for OAC
- Calculate stroke risk score, bleeding risk score
- Calculate Elixhauser comorbidity score
- Define 2 groups – with and without Part D

## Selected Results (Done, 2019)

Characteristic	VHA only N = 5,330	VHA + enrolled in Part D N = 1,289
Age	75.4 years	76.6 years
VHA priority group		
1	25.1%	10.2%
2-6	45.0%	63.1%
7-8	26.2%	22.3%
Missing	3.6%	4.4%
Medicaid eligible	0.5%	26.8%
Stroke risk score	3.2	3.2
ATRIA bleeding risk score	2.0	2.1

## Example 2

---

Radomski T, et al. Use of a medication-based risk adjustment index to predict mortality among veterans dually enrolled in VA and Medicare. Healthcare. 2019 Dec; 7(4).

# Overview (Radomski, 2019)

## **Objective**

Compare the accuracy of a medication-based risk adjustment index (RxRisk-VM) to diagnostic claims-based indices for predicting mortality

## **Cohort**

- Veterans dually enrolled in VHA & Medicare FFS & Part D
- Had opioid prescription during CY 2012
- N=271,184



# Methods (Radomski, 2019)

## Data Sources

- VA CDW
- VA PBM
- Medicare Denominator/MBSF, MedPAR, Carrier, Outpatient, Home Health, Hospice
- Medicare Part D & DME

## Used VA and Medicare data to capture

- ICD-9 diagnosis codes for risk adjustment scores
- Outpatient prescriptions for risk adjustment scores
- Death dates

## Selected Results (Radomski, 2019)

Comorbidity Index Score	Dual Users		
	VA records only	Medicare records only	All records (combined)
RxRisk-VM	6.1	6.9	10.7
RxRisk-V	5.9	5.9	9.9
Charlson (Deyo)	1.6	2.7	3.2
Elixhauser (van Walraven)	1.4	4.3	5.0
Gagne	0.9	2.1	2.6

# Session roadmap

- ✓ Medicare 101
- ✓ Types of Medicare Data
- ✓ Using Medicare Data in Research
- ✓ Research Examples
- **Data Access and Assistance**



VA/CMS DATA



FOR RESEARCH

- The data steward for Centers for Medicare & Medicaid Services (CMS) data used for VA research
- Distributing data from to VA approved projects since 2003
- Providing assistance to VA research projects using CMS data
- No cost to VA researchers

# Requesting Medicare data

- Pre-Request Consultation
- Request Process and Forms
- Data Descriptions and Documentation

[vaww.virec.research.va.gov/Index-VACMS.htm](http://vaww.virec.research.va.gov/Index-VACMS.htm) (VA intranet only))

The screenshot shows the VIREC INTRANET homepage. The header features the VIREC logo and the word 'INTRANET'. A search bar is located in the top right corner. The main content area is titled 'VA INFORMATION RESOURCE CENTER (VIREC)' and 'VA/CMS Data Standard Request Packet Overview'. It provides an overview of the request process and includes a table with project types and their corresponding request packets. A sidebar on the right lists general resources, and a left sidebar contains navigation links.

**VA INFORMATION RESOURCE CENTER (VIREC)**

**VA/CMS Data Standard Request Packet**

**Overview**

This page outlines the documents and approvals required for the [standard request](#) process for both initial and subsequent requests for VA/CMS data.

Projects that...	Use
Are requesting VA/CMS data for the first time	<a href="#">Initial Request Packet</a>
Have already submitted an initial request packet and are requesting additional data	<a href="#">Subsequent Request Packet</a>

**Initial Request Packet**

The Initial Request Packet is required for projects requesting access to VA/CMS data for the first time. When projects are engaged in research at multiple sites, each project site that will access the VA/CMS data is required to submit the Initial Request Packet. All projects must submit the following:

1. [Project Information and Authorization Form](#) signed by the Principal Investigator (PI) and approved by the PI's supervisor and the local facility Associate Chief of Staff for Research (ACOS-R).
2. [Data Security Compliance Form](#) signed by the PI and the Information Security Officer (ISO) at the VHA facility where research is being conducted, and if different, the ISO at the VHA facility where the VA/CMS data will be stored. If the data will be stored on VINCI, the ISO's signature is not required.
3. [VA/CMS Rules of Behavior \(ROB\) Agreement](#) signed by the PI and each project staff member who will have access to the VA/CMS data
4. Data Description Form(s) pre-reviewed by VIREC then signed by the PI and approved by the local Privacy Officer (PO) or central IRB Privacy Officer. Projects may submit one or more of the following data description forms for their project:
  - [VA/CMS Data for Veterans Only](#)
  - [VA/CMS Data for Veterans and Non-Veterans](#)
  - [VA/CMS Non-Repository Data](#)

**General Resources**

- VA/CMS Repository Data
- Non-Repository Data
- Provider Data
- Cohorts & Identifiers
- Requests
- Current Data Users

**Navigation Links:**

- VIREC Home
- VA/CMS Home
- About Us
- Updates
- Publications
- Education
- FAQs
- Help

# Other VIREC Resources

## HSRData Listserv

- Community knowledge sharing
- ~1,500 VA data users
- Researchers, operations, data stewards, managers

- Subscribe by visiting  
<https://vaww.virec.research.va.gov/Support/HSRData-L.htm> (VA Intranet)



## HelpDesk

- Individualized support



[virec@va.gov](mailto:virec@va.gov)

(708) 202-2413



- Field office of Office of the Assistant Deputy Under Secretary for Health for Policy and Planning
- Data steward for CMS (Medicare) data used for VHA operations
  - VHA Program Offices
  - Quality Improvement/Quality Assurance
- [vaww.va.gov/medicareanalysis/](http://vaww.va.gov/medicareanalysis/) (VA intranet only)

- CMS contractor based at the University of Minnesota
- Provides free assistance and training to researchers using CMS data
  - Help desk
  - Knowledge base
  - Webinars
  - In-person workshops
- [www.resdac.org](http://www.resdac.org)



## Chronic Conditions Data Warehouse

*Your source for national CMS Medicare and Medicaid research data*

- Source of most CMS data that VA receives
- Documentation
  - Data dictionaries
  - Summary tables
  - User guides & technical guides
  - White papers & presentations
- [www.ccwdata.org](http://www.ccwdata.org)

# Contact information

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708-202-2413



**Next session:  
March 2<sup>nd</sup> at 1 pm Eastern**



**Database & Methods Cyberseminar Series**

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# **Meet VIREC: The Researcher's Guide to VA Data**

**Maria Souden and Jenifer Stelmack**

Register at

[https://www.hsrd.research.va.gov/cyberseminars/  
catalog-upcoming-session.cfm?UID=3696](https://www.hsrd.research.va.gov/cyberseminars/catalog-upcoming-session.cfm?UID=3696)