



Using Data & Information Systems in Partnered Research

Session 3:

GECDAC* CURATED & VALUE-ADDED DATA INFRASTRUCTURE

March 15th, 2022

Orna Intrator, PhD; Winifred Scott, MPH; Bruce Kinosian, MD

*Geriatrics & Extended Care Data Analysis Center



Using Data & Information Systems in Partnered Research Cyberseminar Series

Third Tuesday of the month | 12:00 - 1:00 PM ET

Presentations from the field focusing on VA data use in quality improvement and operations-research partnerships.

Sessions cover...

- Use of VA data and information systems in QUERI Projects and Partnered Evaluation Initiatives
- Operational data resources and QI-related data
- Challenges in using and managing multiple data sources
- VA resources to support data use
- Experiences working within operations/research partnerships

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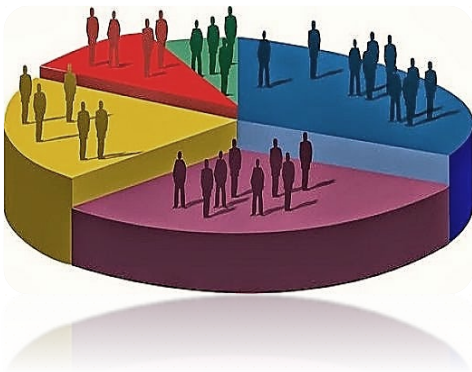
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Poll #1:

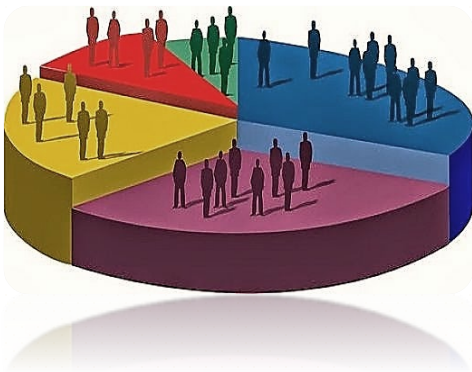
*What is your primary **role** in projects using VA data?*



- Investigator, PI, Co-I
- Statistician, methodologist, biostatistician
- Data manager, analyst, or programmer
- Project coordinator
- Other – please describe via the chat function

Poll #2:

How many years of experience working with VA data?



- None – I'm brand new to this!
- One year or less
- More than 1, less than 3 years
- At least 3, less than 7 years
- At least 7, less than 10 years
- 10 years or more



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*Geriatrics & Extended Care Data Analysis Center (GECDAC)

Purpose of This Presentation

- **GECDAC has curated data and assembled and produced important measures related to health care provision to older population and population of Veterans needing long-term services & support.**
- **This presentation aims to share what we have learned during 10 years of operation.**
- **This information can facilitate clinicians, scientists and staff that need information on health care and services for aging Veterans.**

Outline

- What is GECDAC (Geriatrics & Extended Care Data Analysis Center)?
- GEC continuum of vulnerability
- Data acquired by GECDAC from VA and Centers for Medicare & Medicaid Services (CMS)
- Pulling together patient histories with the Residential History File (RHF)
- Risk and frailty measures
- The GECDAC Core Files (GCF)
- Sharing Data
- Summary
- Bonus Slides
 - List of Acronyms
 - The GEC Explorer data visualization tool



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Geriatrics and Extended Care Data Analysis Center

The Geriatric & Extended Care Data & Analysis Center (GECDAC) collects and analyzes population-based data about Geriatrics and Extended Care (GEC) programs and services, and provides evidence-based information to facilitate continuous quality improvement. GECDAC also facilitates and provides support to the cadre of affiliated research clinicians, scientists and their staff that engage in research about healthcare and services for aging Veterans.

For questions or to contact GECDAC, please e-mail VHA.GECDAC



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GECDAC Sharing Data



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GECDAC Website:
www.va.gov/GERIATRICS/Geriatrics_and_Extended_Care_Data_Analysis_Center.asp

GECDAC Email:
GECDAC@VA.gov

Service and Products

Last updated: April 4, 2020

Veteran programs and services

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In crisis? Talk to someone now

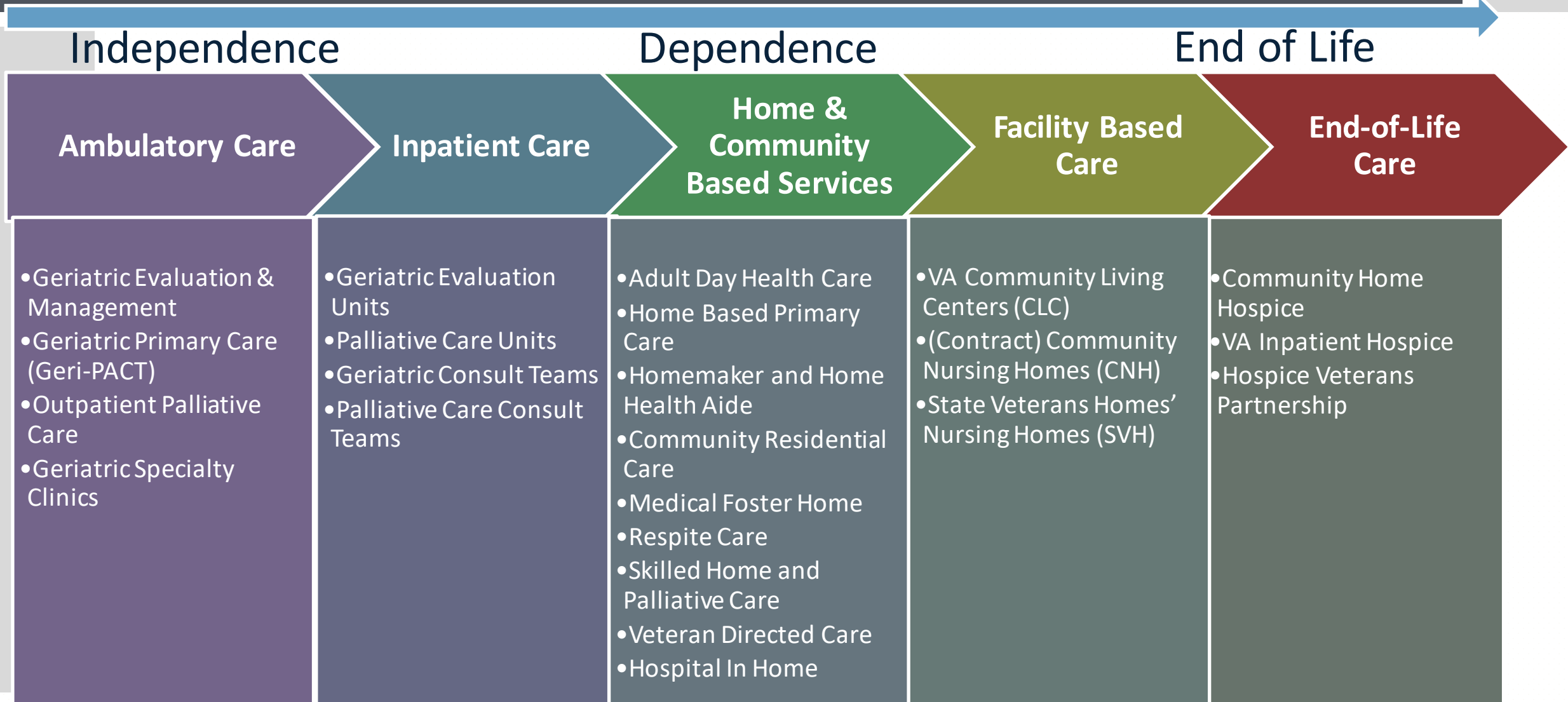
[Veterans Crisis Line](#)

Get answers

GECDAC SERVICES

- Data for Leadership and VA Field Offices by using data from CDW, GEC, CMS, and other sources
- Extracting databases from Health Factors
- Sharing value added data
- Program Evaluation
- Measure & Risk Score Development/Validation/ Application/ Dissemination
- Some recognized data products:
 - GEC Cohort Report, GECDAC Core Files (GCF), GEC Explorer
 - Residential History File (RHF)
 - JEN Frailty Index (JFI), HNHR for HBPC expansion

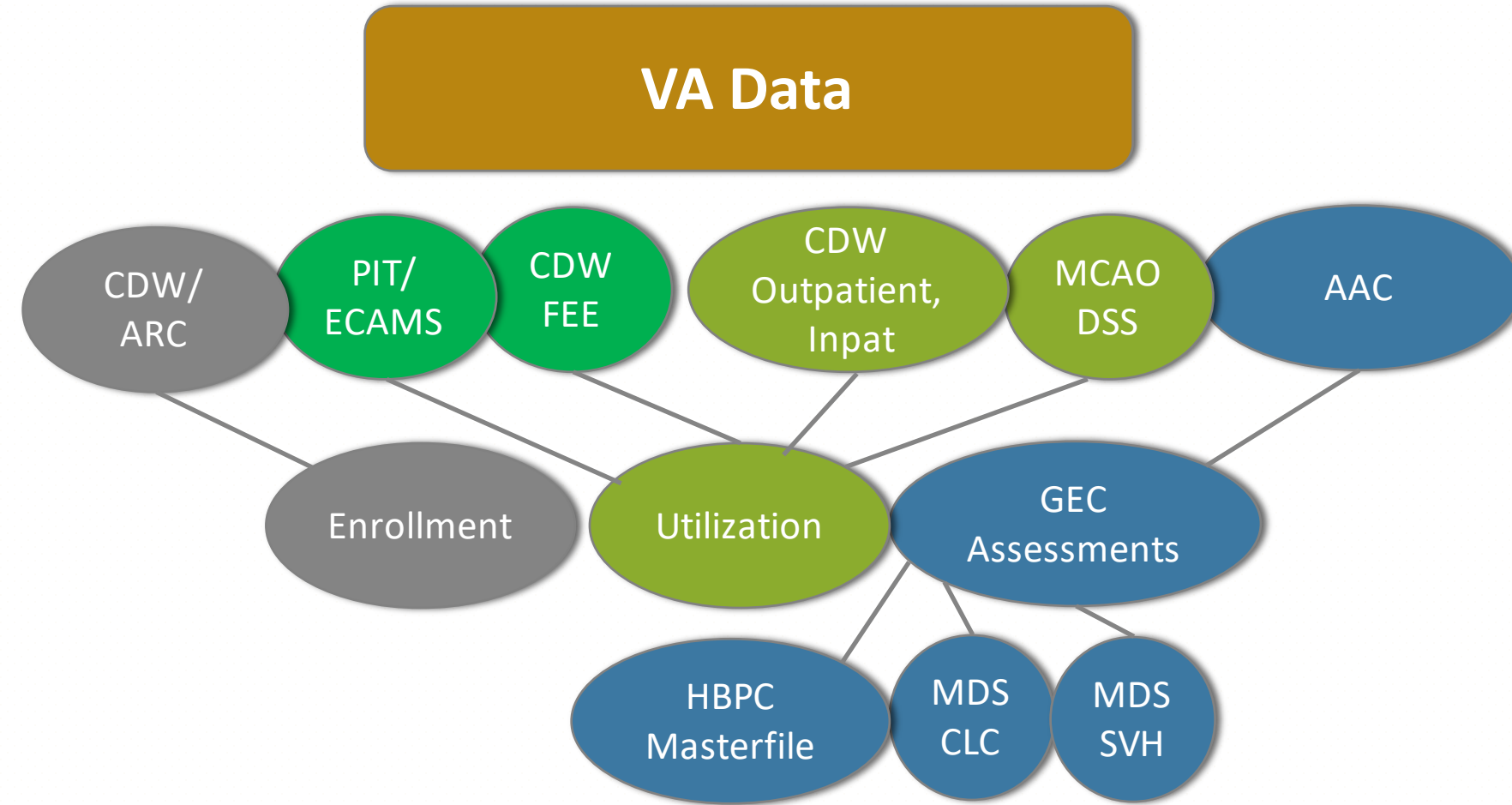
GEC Continuum of Vulnerability



Sources of GEC-Related Data Acquired by GECDAC

		VA-Provided	Purchased (VA-Paid)	CMS (Medicare/Medicaid)
	Institutional	Community Living Center (CLC) Respite Inpatient Hospice Hospice in CLC GEM Inpatient	Community Nursing Home (CNH) State Veterans Home (SVH) Respite Hospice in CNH	Skilled Nursing Facility Nursing Home Hospice
	Non-Institutional	Home-Based Primary Care (HBPC) Medical Foster Home GeriPACT Other Geriatric Clinic Comprehensive Geriatric Evaluation Dementia Clinic Hospice Referrals/Palliative Care Adult Day Health Care Hospital at Home Etc.	Hospice Homemaker/Home Health Aide Purchased Skilled Home Care Respite Adult Day Health Care Veteran-Directed Care Program of All-Inclusive Care for the Elderly (PACE) Purchased PACE Etc.	Hospice Home Health Services Program of All-Inclusive Care for the Elderly (PACE)

GEC Utilization: VA Data



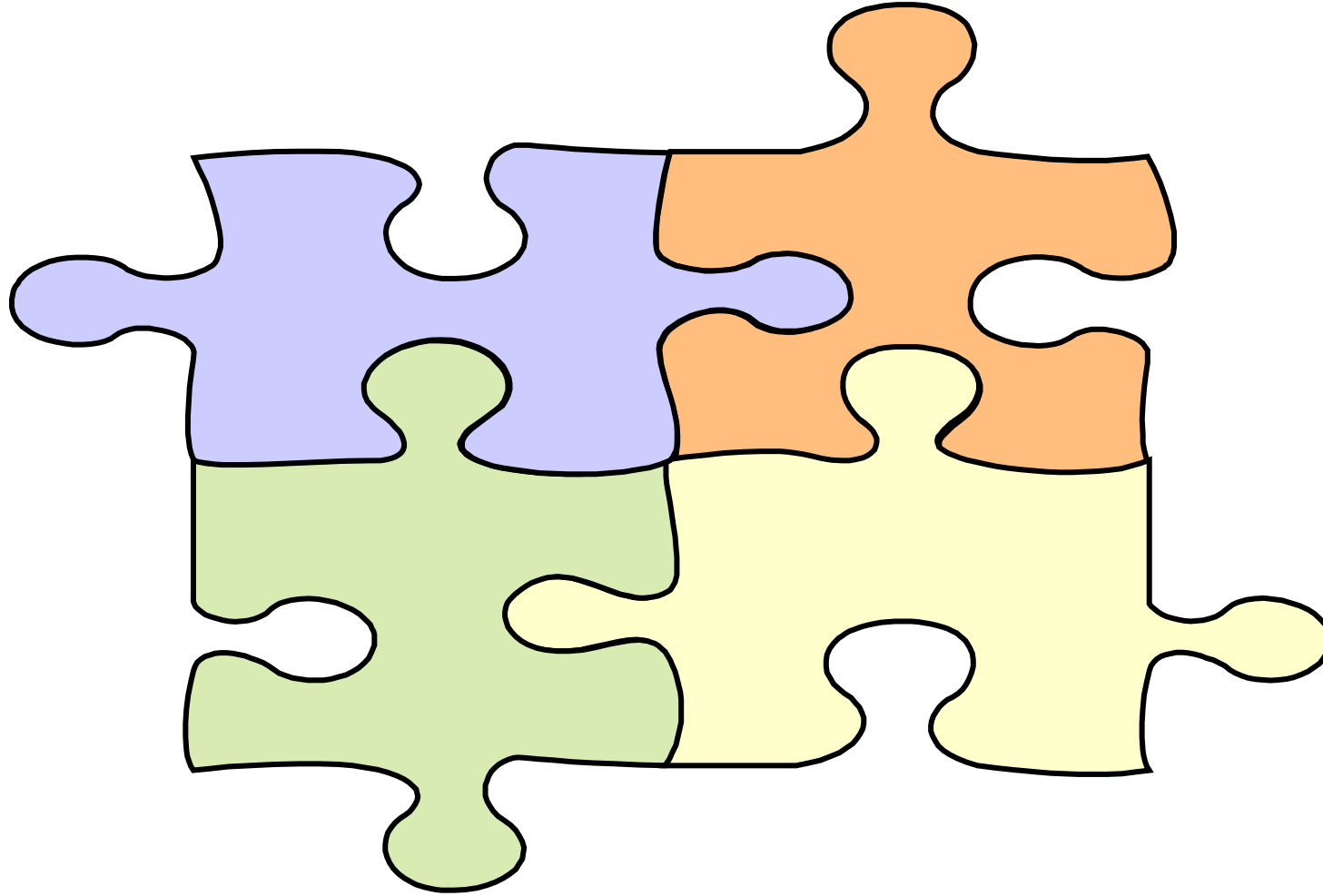
Minimum Data Set (MDS)

- CMS requirement to assess all residents in NH facilities certified to participate in Medicare or Medicaid (regardless of payer)
- Separate datasets available for CMS (including Contract Nursing Homes (CNH)), Community Living Centers (CLC), State Veteran Home nursing homes (SVH)
 - Veterans may receive NH care through VA CLCs or SVHs, or from a CNH, which may or may not be paid for by VA
- Assessments conducted at admission, discharge, quarterly, and change in status
- Conducted by staff, typically an RN or someone familiar with the resident
- Assess: cognition, ADL, mood, behavior, treatments, diagnoses...

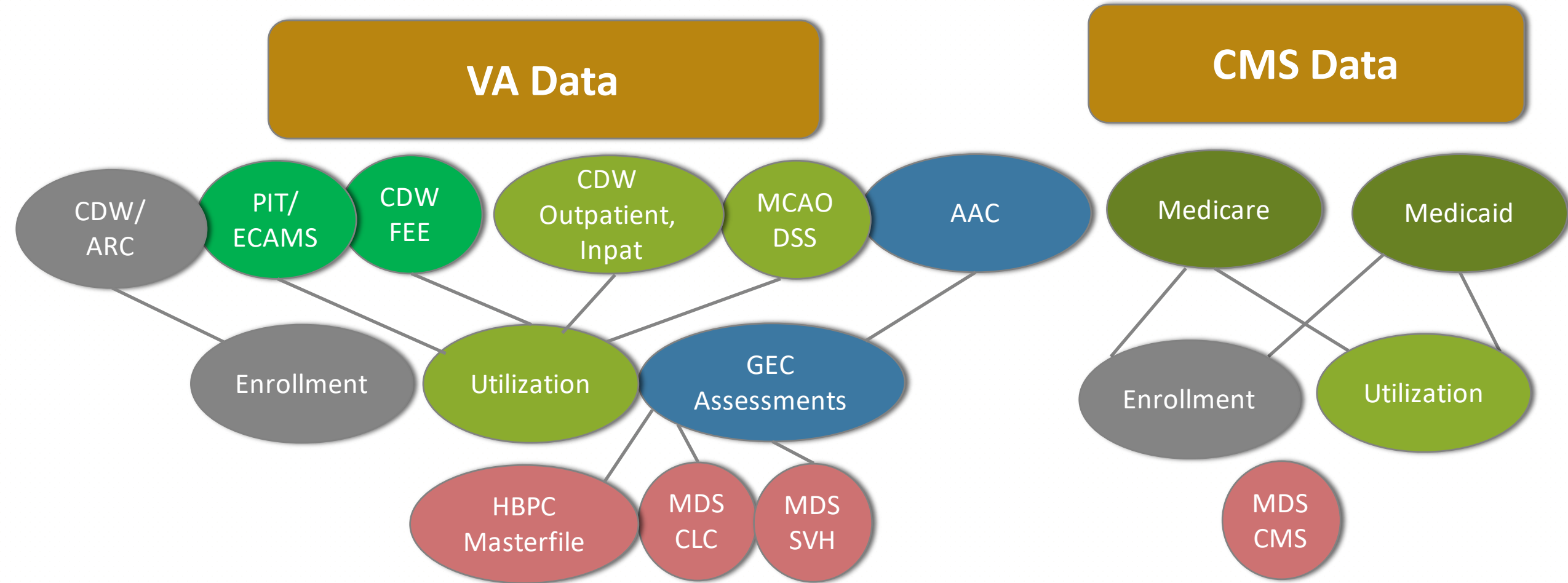
Home-Based Primary Care (HBPC) Master File

- Master File records dates of HBPC enrollment/discharge. Data entered by HBPC field staff
 - Records applications rejected/ withdrawn (reason provided).
- Includes Veterans receiving care in Medical Foster Home
- More accurate than CDW encounter data:
 - In FY2019: 55,735 veterans were enrolled in HBPC and had 1+ HBPC visits.
 - 1,206 were enrolled but had no visits and 18,354 had visits but were not enrolled.
- Additional variables:
 - Demographics – age, race, marital status, usual living arrangement
 - Functional Status – vision, hearing, mobility, communication, bowel/bladder continence, cognition (disorientation/ memory impairment)
 - Activities of Daily Life – bathing, dressing, using toilet, transferring, eating, walking
 - Caregiver limitations, behavior problems, mood, adaptive tasks

The RHF is a Puzzle Algorithm: Combines Data



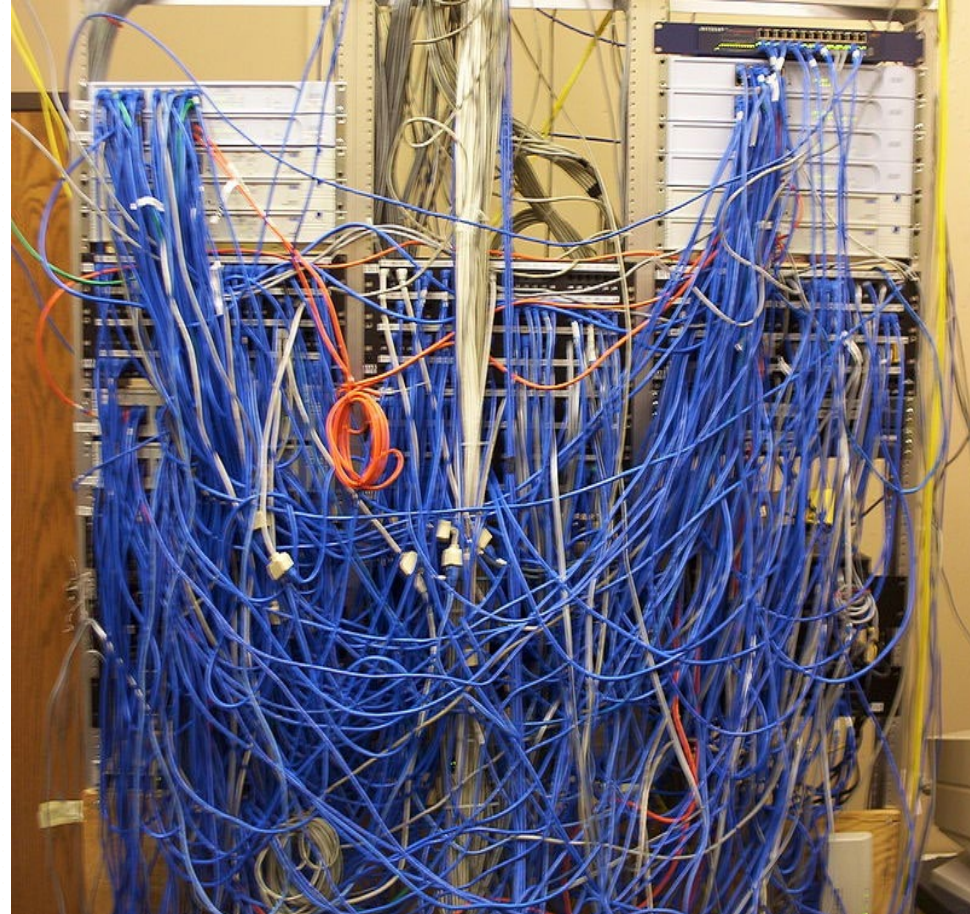
GEC Utilization: VA and CMS Data



Identifying Hospice Use By Veterans

	Data Sources	How to Identify	#Veterans FY2019
VA Inpatient Hospice	CDW Inpatient	Medical Service, Ward Specialty, Bedsection	6,440
Hospice in CLC	CDW Inpatient	Treating Specialty	15,978
Purchased Hospice	CDW FEE, PIT, ECAMS	Various	8,302
Medicare Hospice in Community	Medicare Claims	Medicare Hospice claims	205,286
Medicare Hospice in Nursing Home	Medicare Claims, MDS	Medicare Hospice claims, MDS identifying days in NH	52,384

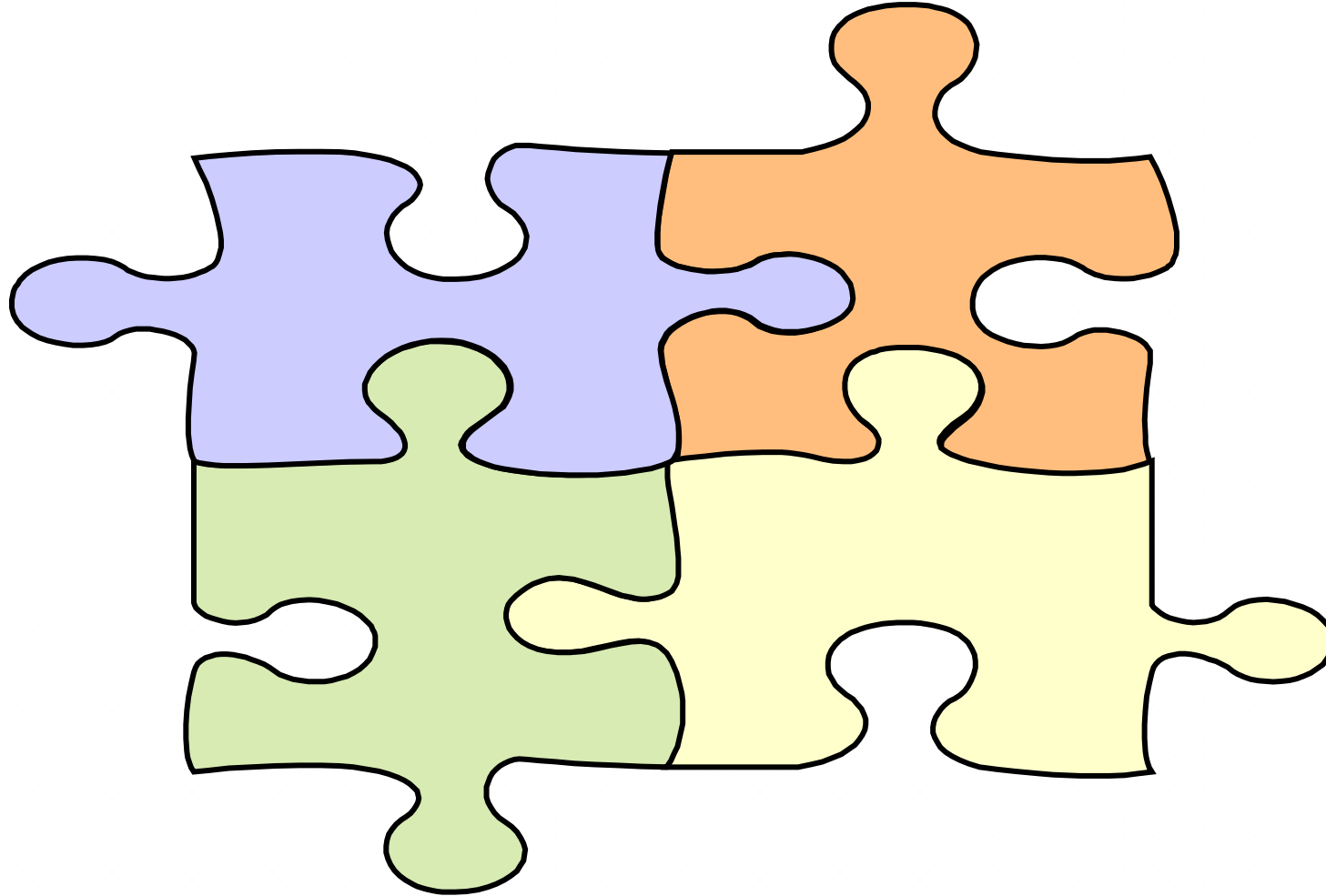
What A Mess!!



THIS IS WHAT WE WANT TO GET TO...



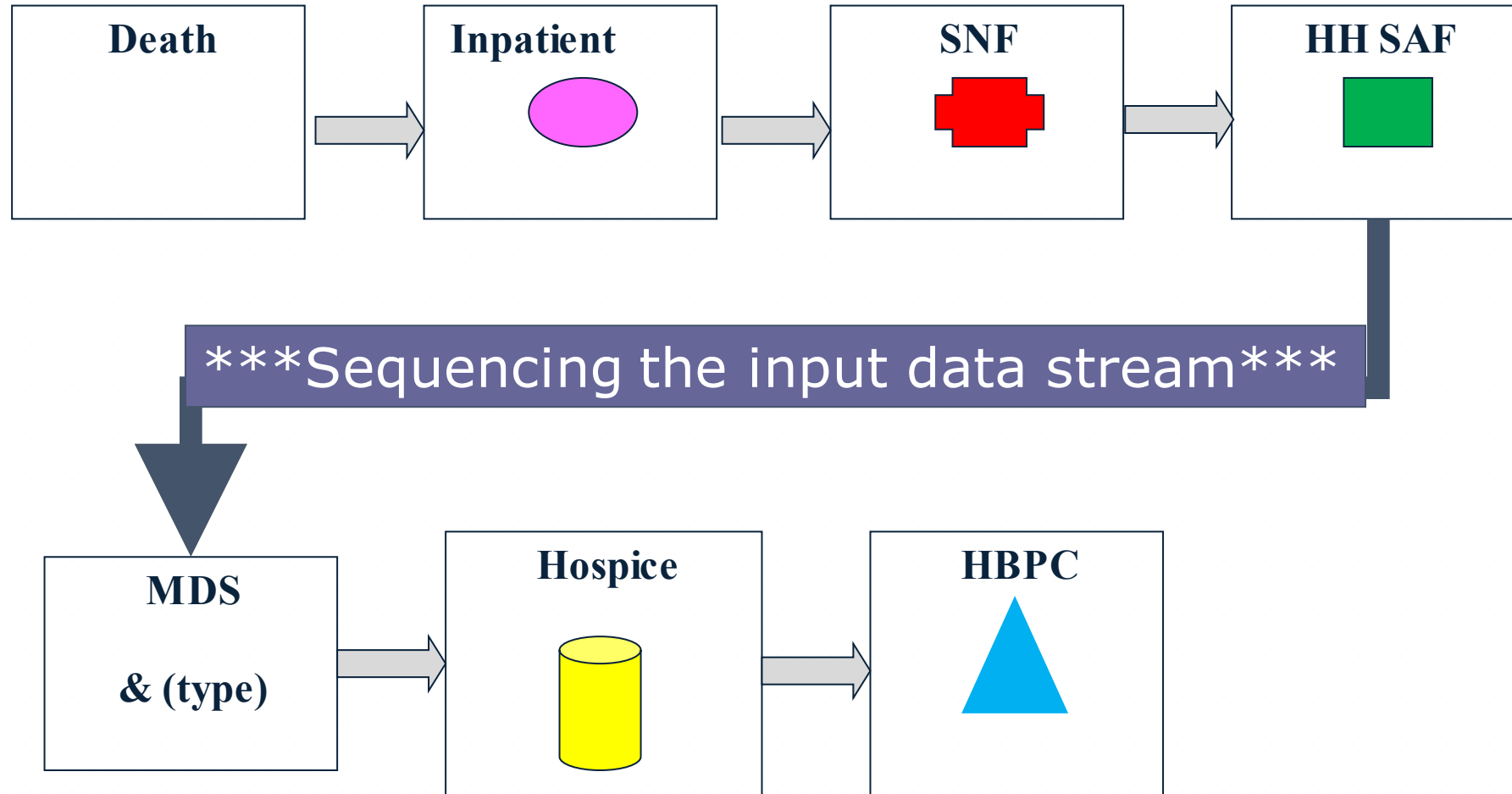
The RHF is a Puzzle Algorithm: Combines Data










GECDAC Residential History File (RHF)

- Uses data from VA-provided/purchased, Medicare, Medicaid, and MDS to provide a daily summary of an individual's health service utilization and location of care
 - Includes acute inpatient, NH, hospice, ED/observation, HBPC, Home-Health Care, domiciliary care
- All VA users, 2010 to December 2021, updated about quarterly
- RHF is composed of 3 main tables:
 - SEG – all the inputs, standardized
 - EPB – “Episodelets” of contiguous days with the same mix of services and providers; it is identified by the person identifier and from/thru dates
 - EPC – All segments pertaining to each episodelet (scrssn, from, thru)
- On-going evolution as data sources change and care definitions are refined

RHF Standardized Inputs (Segments)



An Example of One Patient Month in the RHF*

S	M	T	W	Th	F	S
HBPC Admission February	1 HBPC MF	2 HBPC MF 	3 HBPC MF	4 HBPC MF 	5 HBPC MF	6 HBPC MF
7 HBPC MF	8 HBPC MF	9 HBPC MF 	10 Inp ED HBPC MF	11 Inp ED HBPC MF	12 CLC HBPC MF 	13 CLC HBPC MF
14 CLC HBPC MF	15 CLC HBPC MF	16 CLC HBPC MF	17 CLC HBPC MF	18 Hospice CLC HBPC MF 	19 Hospice CLC HBPC MF	20 Hospice CLC HBPC MF
21 Hospice CLC HBPC MF	22 Hospice CLC HBPC MF	23 Hospice CLC HBPC MF 	24 Post Death	25 Post Death 	26 Post Death	27 Post Death
28 Post Death	29 Post Death	30 Post Death	31 Post Death			



Death



HBPC Visits

1A

MDS
Admission

2P

MDS 7-Day
Assessment

8D

MDS
Discharge

*Made-up example
of what actual episodelets
might look like.

Residential History EPB File*

Person ID	From Date	Thru Date	Date of Death	Location/ Service 1	Location/ Service 2	Location/ Service 3
123	1/1/2010	3/3/2010	4/20/2015	00. GAP		
123	3/4/2010	3/6/2010	4/20/2015	01. INP VA		
123	3/7/2010	4/1/2015	4/20/2015	05. CLC		
123	4/2/2015	4/4/2015	4/20/2015	01. INP VA	05. CLC	
123	4/5/2015	4/20/2015	4/20/2015	04. HOSPICE VA		
123	4/21/2015	9/30/2021	4/20/2015	98. POST DEATH EXTRACT		
456	6/1/2018	7/30/2018		08. HBPC		
456	7/31/2018	8/14/2018		01. INP VA FEE	08. HBPC	
456	8/15/2018	9/15/2018		03. SNF MDCR		
456	9/16/2018	9/16/2018		07. VA ED	03. SNF MDCR	
456	9/17/2018	9/20/2018		01. INP VA FEE		
456	9/21/2018	9/30/2021		00. GAP		

**This table is a simplified example of the RHF EPB data structure and presents some of the main fields/variables*

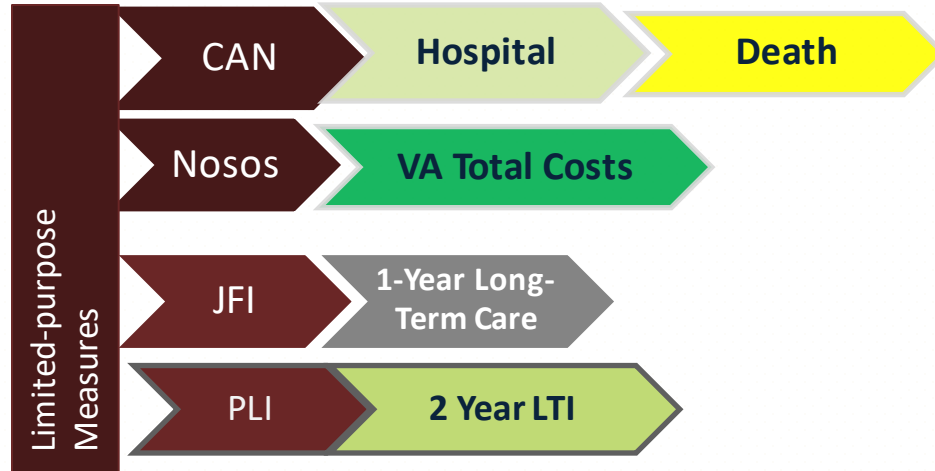
Some RHF Applications

- Identifying site of death
- Identifying long-term institutionalization
- Identifying likely CLC location at the onset of COVID-19 infection
- Identification of Medicare hospice in nursing homes

Value-Added Data

- Value added MDS from CLCs, SVHs and civilian (community) NHs
 - *Activities of Daily Living (ADL) scores*
 - *Resource Utilization Groups (RUGS)*
 - *Identification if the MDS assessment was for a long-stayer or short stayer*
- Value added Home Based Primary Care (HBPC) Masterfile
 - *Activities of Daily Living (ADL) scores*

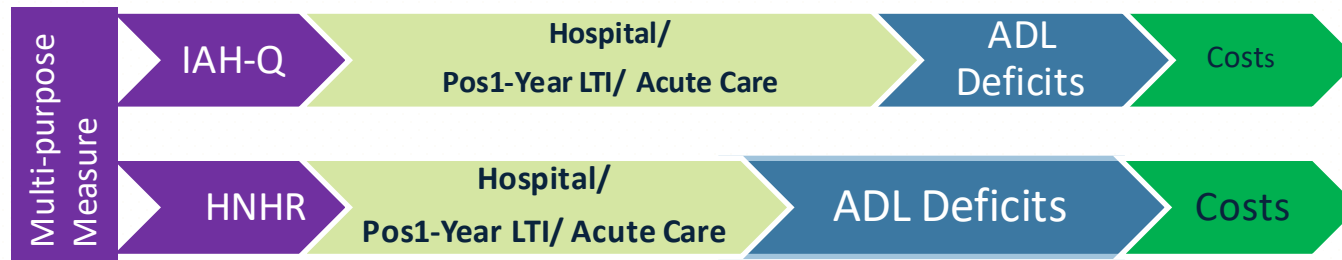
Current VA Risk Scores



Risk model based

Correlates:

- Cost
- Hospitalization
- Death
- LTI



Population Classification based

JEN Frailty Index (JFI)

- JEN Frailty Index comprises 13 diagnosis domains representing multimorbid clusters with high LTI risk.
 - Cancer, Chronic Medical Disease, Dementia, Chronic Mental Illness, Minor Ambulatory Limitations, Severe Ambulatory Limitations, Pneumonia, Renal Disorders, Self-Care Impairment, Sensory Disorders, Syncope, Other Systemic Disorders, Chronic Developmental Disability
- Proprietary algorithm developed by Westat (formerly JEN Associates)
 - GECDAC holds a 10-year license to produce JFI scores within VA
- Calculated monthly using diagnoses from prior 12 months
- 2010 to present, all VA users
- **Two versions, VA-only and combined VA+Medicare**

Independence at Home (IAH-Q)

- Independence at Home: Medicare program modeled after VA's HBPC
- Medicare Eligibility criteria: 2+ chronic conditions, need assistance with 2+ ADLs, 1+ acute admission in the prior 12 months, received post-acute services in the prior 12 months
- IAH-Q is the VA version of the Medicare eligibility criteria, replacing the ADL requirement with the requirement that JFI be greater than 5.
- **Uses combined VA+Medicare data.**
- Calculated monthly, 2010 to present (with a time lag), all VA users

High Need High Risk (HNHR)

- Originally developed as a tool to identify candidates for HBPC
- Criteria: JFI>5, veteran, not deceased, no HBPC enrollment in prior year, not currently residing in NH, 1+ acute admissions in prior year, not ESRD, no hospice/palliative/MFH in prior year
- HNHR selection score further prioritizes candidates
 - Based on age, ACSC, JFI, HCC/MHCC categories, Ambulatory Care Sensitive Conditions, spinal cord injury
- **Uses VA data only**
- Calculated monthly using data from prior 12 months
- 2010 to present, all VA users

Predicted Long-Term Institutionalization (PLI)

- Computed on all Veterans who are not Long-Term Institutionalized (~1.1%) and not receiving hospice care (0.9%).
- Two versions
 - **Research Version** – calculated annually, starting in FY2014 through FY2020
 - **Production Version** – modified research version to take advantage of as much data as possible for current/very recent time point. Calculated quarterly (now available: May 2021, August 2021, December 2021)
- *Score and Risk Tier*
 - *Score is the predicted probability based on the research or production version weights and data*
 - *Risk tiers = high, moderate, low, identifying 3.8%, 5.6%, 89.5% of users*

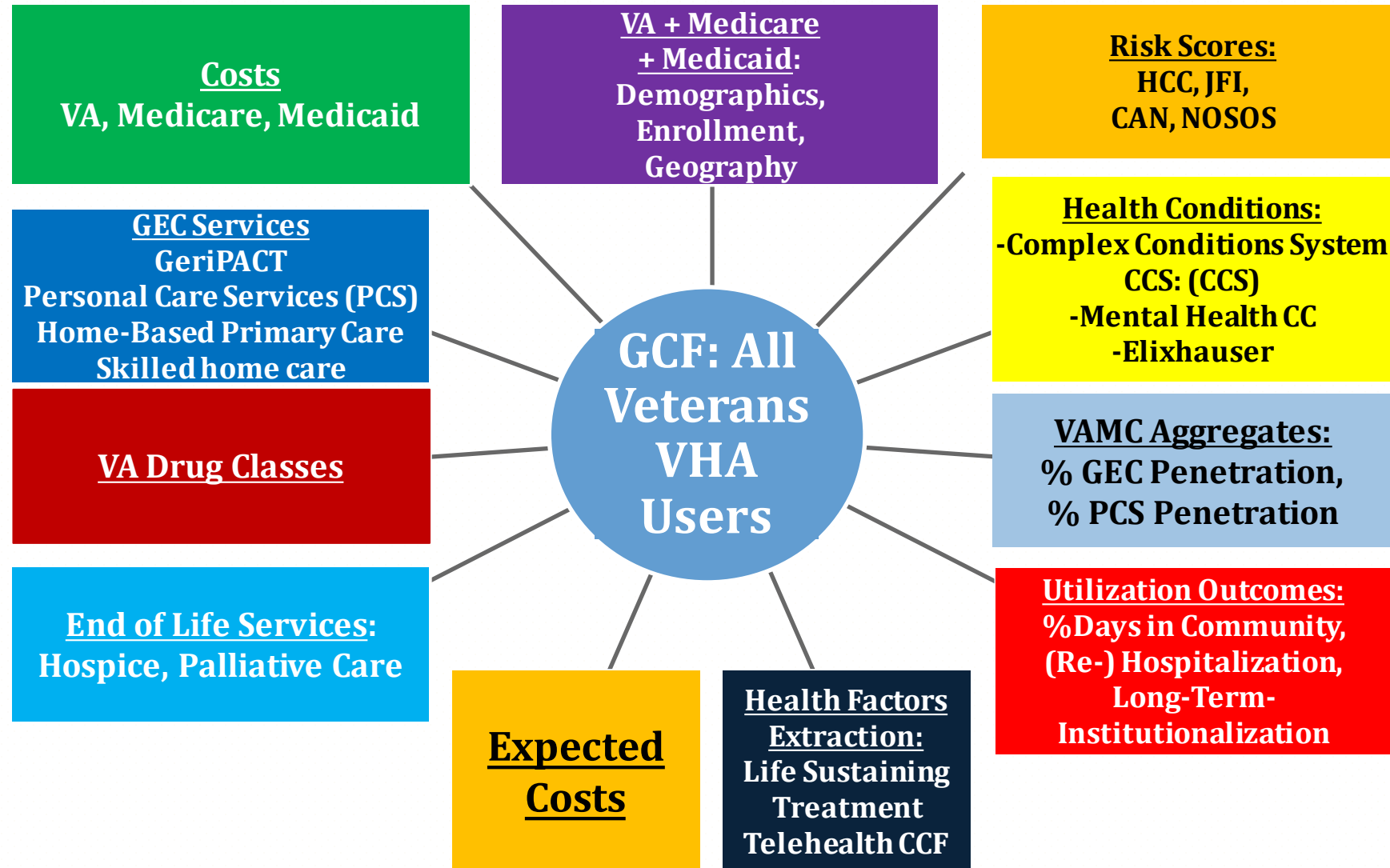
HCC and MHCC Indicators and Score

- HCC: Hierarchical Clinical Conditions
- HCC score using CMS V21 (PACE) risk adjustment model
 - 174 HCC condition indicators
 - V24 model will be available soon
- MHCC: A series of 87 mental health indicators used for Nosos
- Calculated annually, using fiscal year diagnoses
- 2010 to present, all VA users
- **Two versions, VA-only and combined VA and Medicare**

Geri-Nosos

- Similar to standard Nosos scores but:
 - uses blended VA+Medicare diagnoses
 - Adds JFI
- Calculated annually
- 2010 to present, all VA users
- New improved version coming soon
 - Calibrated on specific geriatric populations such as HBPC
 - Using HCC V24 score
 - Additional HCC variables from V24

PULLING TOGETHER: GECDAC Core Files (GCF)



Sharing Data Products

- GECDAC shares with operations and research groups
- GECDAC Provides Documentation
 - VIREC Researcher's Notebook 12: Identifying CLC Stays
 - Contact GECDAC for:
 - GCF Guidebook
 - RHF Guidebook (coming soon)
 - Tutorials (GEC Explorer, RHF)

Requesting Access to GECDAC Data Products

- Blended/ Multi-Source Data: Designation by VA's Medicare/ Medicaid Analysis Center (MAC) that blending the data cannot be traced back to the source data and are to be used in aggregate (not clinically)
 - Variables: JFI, IAH-Q, HCC score, PLI, Geri-Nosos, PLI (not for clinical use)
 - Research: Request through DART
 - Operations: Obtain VA National Data Service (NDS) approval through ePAS

- Products using VA and Medicare data (not considered “blended/ multi-source”)
 - Research: Contact GECDAC through VIREC/CMS
 - Operations: Contact GECDAC through MAC

Requesting Access to GEC Owned Data

- MDS from CLCs and SVHs and HBPC Masterfile
- Requires GEC Program Office Data Access Approval (PODAA)
- Available as annual fiscal-year files and current fiscal-year monthly updates
- Data Access
 - Research: via DART
 - Operations: from GEC via VSSC (MDS) and GECDAC (Masterfile)

Take Home from GECDAC

- Health Services Research work regarding care of older population requires understanding of GEC Continuum of Vulnerability and community partners
- Plethora of data sources, and they need to be integrated; GECDAC has made this possible
- Measuring risk in population is key – GECDAC creates risk measures
- Having created the resources for operations, GECDAC created data processes to share its integrated data products
- GECDAC always interested in curating new data, measures and methods from researchers/ others

THANK YOU!
Questions?



CONTACT INFORMATION

GECDAC@VA.Gov

URL:

[https://www.va.gov/GERIATRICS/Geriatics and
Extended Care Data Analysis Center.asp](https://www.va.gov/GERIATRICS/Geriatics_and_Extended_Care_Data_Analysis_Center.asp)



**Geriatrics & Extended Care
Data & Analysis Center**





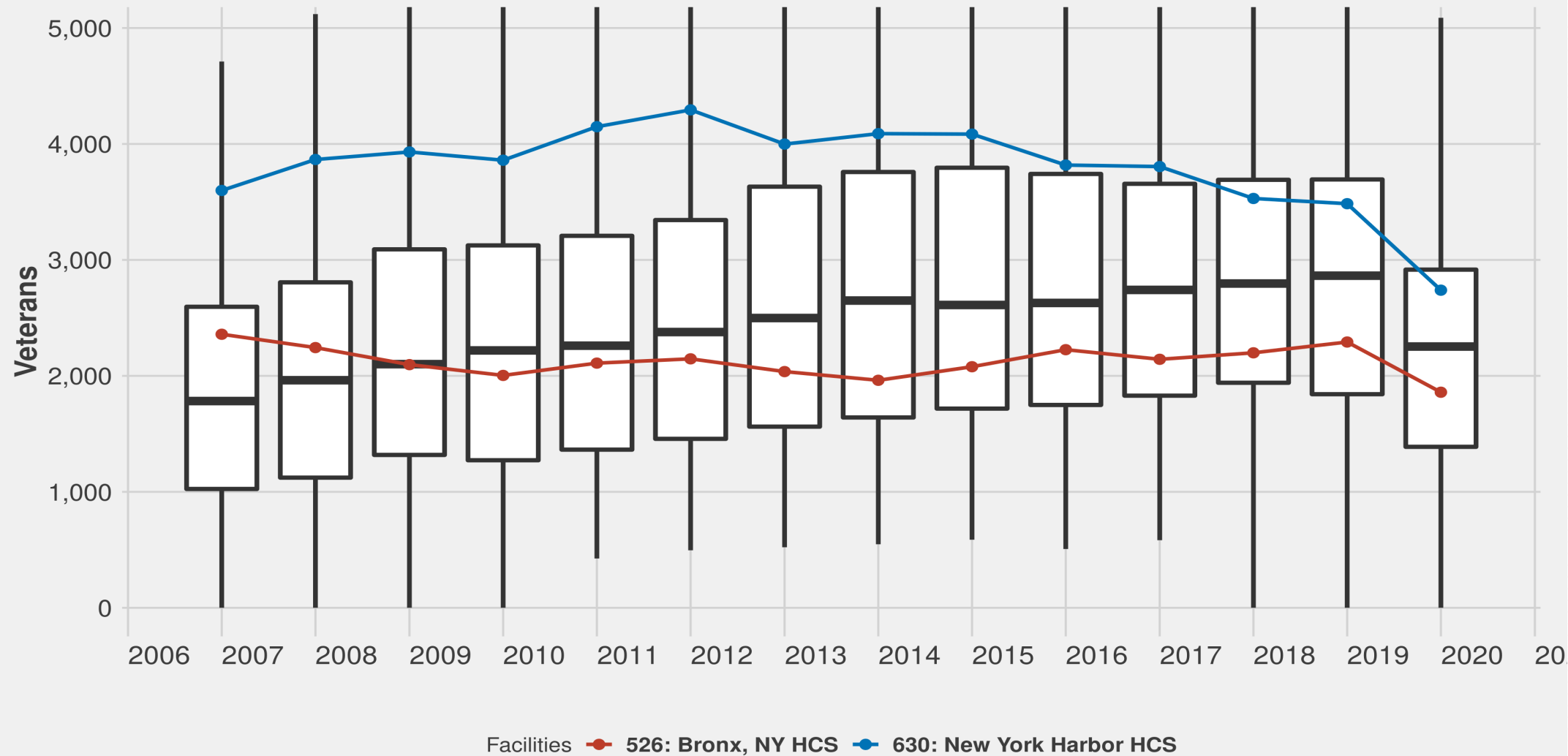
Presentation
BONUS SLIDES

List of Acronyms

Acronym	Full Name	Type	Acronym	Full Name	Type
AAC	Austin Automation Center	Data System	MCAO	Managerial Cost Accounting Office	VA Office
ADL	Activity of Daily Living	Measure			Assessment
ARC	Allocation Resource Center	VA Office	MDS	Minimum Data Set	Instrument
CDW	Corporate Data Warehouse	Data System	NDS	National Data Service	VA Office
CLC	Community Living Center	GEC Program	PACE	Program for All-inclusive Care of the Elderly	National Program
CMS	Center for Medicare & Medicaid Services	Federal Office	PIT	Program Integrity Tool	Data System
CNH	Contract Community Nursing Home	GEC Program	RHF	Residential History File	Value-Added Data
DSS	Decision Support System	Measure	RN	Registered Nurse	Term
ECAMS	Electronic Claims Administration System	Data System	VA	Department of Veterans Affairs	Federal Office
ED	Emergency Department	Medical Service	VIReC	VA Information Resource	Resource Center
GCF	GECDAC Core Files	Value-Added Data			
GEC	Geriatrics & Extended Care	VA Office			
GECDAC	Geriatrics & Extended Care Data Analysis Center	Resource Center			
HBPC	Home-Based Primary Care	GEC Program			
HERC	Health Economics Resource Center	Resource Center			
HNHR	High-Need/ High-Risk	Measure			
HSPC	Hospice	National Program			
IAH	Independence-At-Home	Medicare Demonstration			
IAH-Q	Independence-At-Home Qualification	Measure			
Inpat	Inpatient	Medical Service			

GEC Explorer Data Visualization

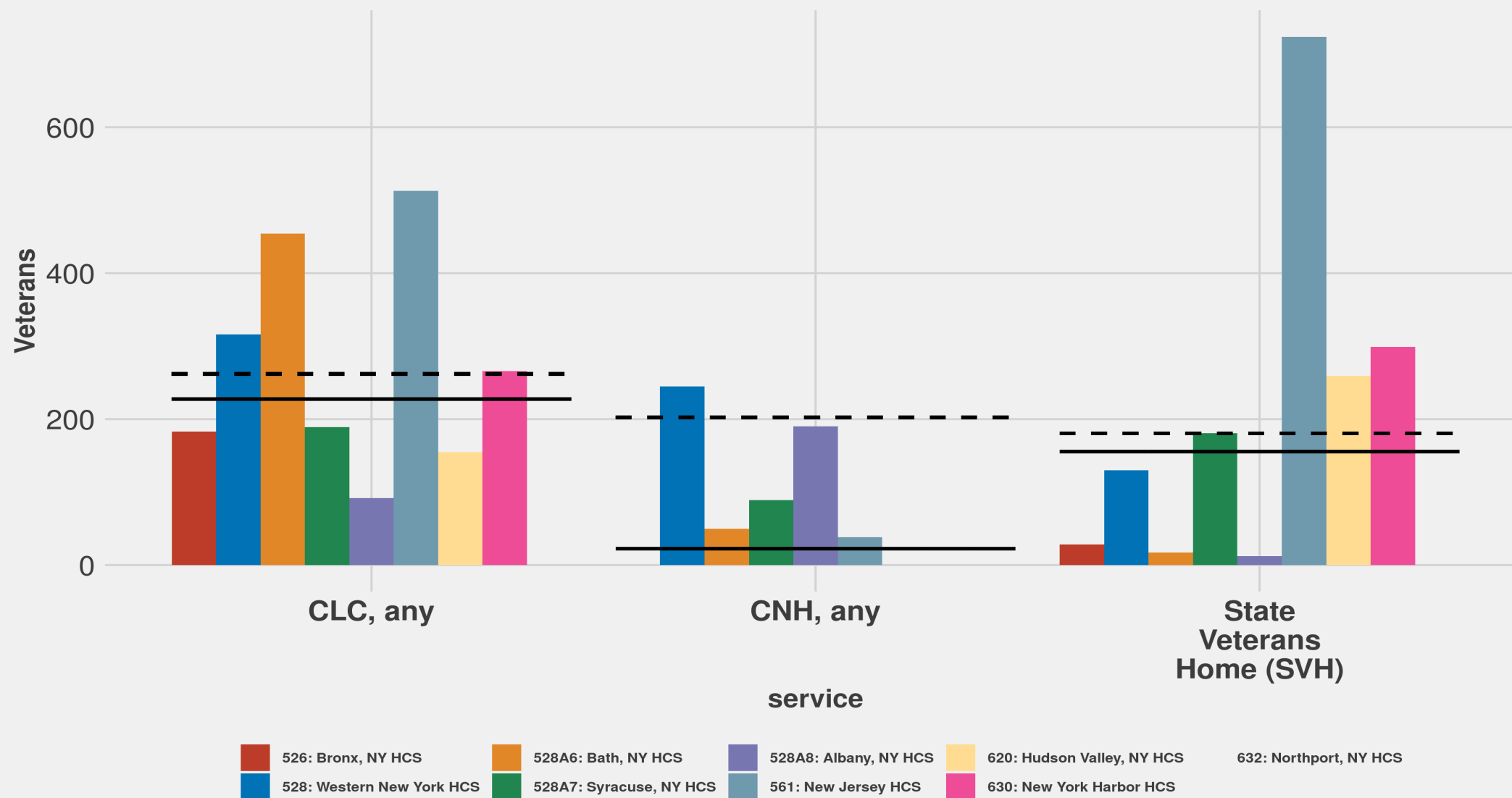
- Addressing needs of GEC in VISNs
- Web-based Data Visualization
 - Per VA Parent Station (currently 139) and fiscal year (currently 2007-2020)
 - Comparisons to national and Veteran Integrated Service Network (VISN) benchmarks
 - Filters:
 - Age groups (<65, 65-74, 75-84, >=85)
 - Priority status (P1A, P1B, P4, Other)
 - Dementia (yes, no)
 - JEN Frailty Index categories (low 0-2, medium 3-5, high 6-8, very high 9+)
 - HNHR: none, <2, 2+
 - CAN Scores
 - Types of figures: over-time boxplots, compare up to 9 stations, 2-variable scatterplot



Boxplot over all VAMCs for each year. Outliers are excluded unless in selected center or VISN. Aggregate data. Lines show values for the selected Facilities.
Data curation and analysis by GECDAC.

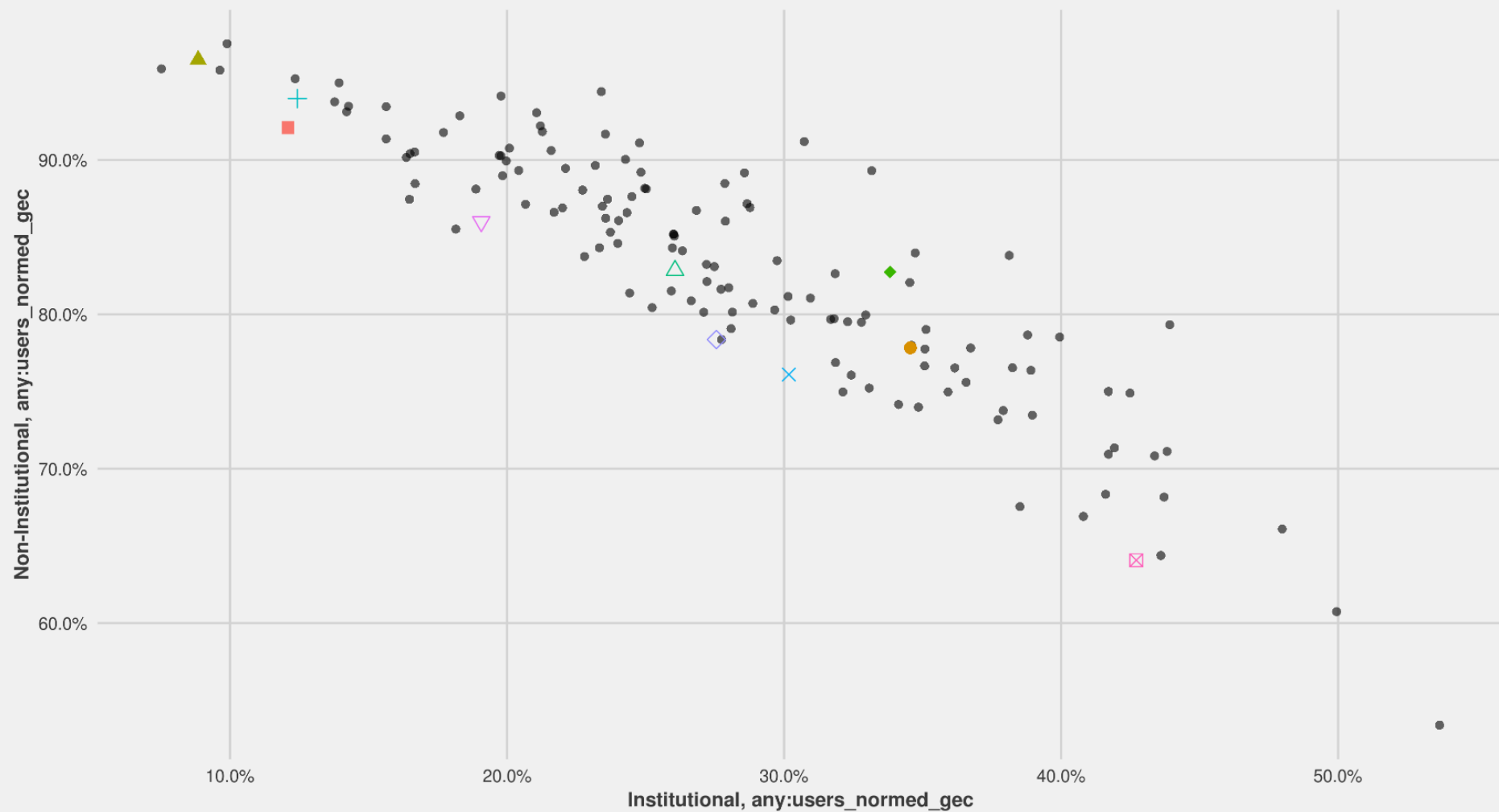
Veterans for Selected Population and Centers, 2019

Including VISN (solid line) and National (dashed) Medians



Data curation and analysis by GECDAC.

VAMC selected data scatter for FY: 2017



- | | | | | |
|-----------------------------|------------------------------|---------------------------|------------------------------|----------------------------|
| ■ 526: Bronx, NY HCS | ▲ 528A5: Canandaigua, NY HCS | △ 528A7: Syracuse, NY HCS | × 561: New Jersey HCS | ▽ 630: New York Harbor HCS |
| ● 528: Western New York HCS | ◆ 528A6: Bath, NY HCS | + 528A8: Albany, NY HCS | ◇ 620: Hudson Valley, NY HCS | ⊠ 632: Northport, NY HCS |

Data curation and analysis by GECDAC.

GEC-Related Risk Measures

- JEN Frailty Index (JFI)
 - The JFI is a risk score that uses recorded diagnoses to measure the risk of long-term care admissions. GECDAC holds a license from Westat (formerly JEN Associates) to produce JFI scores within VA
- Independence At Home qualification (IAH-Q)
 - 2+ chronic conditions + need assistance with 2+ activities of daily living (ADLs) + have had a non-elective hospital admission within the last 12 months + received post-acute services that generated a post-acute care assessment. Identifies 6% of population at high risk of utilization, spending, and LTI.
- High-Need High-Risk (HNHR)
 - GECDAC developed a risk measure to identify Veterans who meet the Independence At Home qualification using only VA data
- Predicted Long-Term Institutionalization (PLI)
 - GECDAC risk measure to predict 2-year risk of LTI
 - PLI-Tiers: High, Medium, Low
- Hierarchical Clinical Condition (HCC) Scores and indicators
 - Used for capitating Medicare Advantage programs
- Mental-Health Clinical Conditions (MHCC) indicators
 - 87 mental health conditions curated by
- Geri-Nosos
 - VA Nosos with Medicare diagnoses, Calibrated to GEC populations
 - Concurrent model version for program evaluation.



Partnered Research
BONUS SLIDES

Resources for *VA Data Users*

Quick Guide: Resources for Using VA Data

<https://vaww.virec.research.va.gov/Toolkit/QG-Resources-for-Using-VA-Data.pdf>
(VA Intranet)

VA Information Resource Center (VIReC)

<https://vaww.virec.research.va.gov/Index.htm> (VA Intranet)

VIReC Cyberseminars

<https://www.virec.research.va.gov/Resources/Cyberseminars.asp>

VHA Data Portal

<https://vaww.vhadataportal.med.va.gov/Home.aspx> (VA Intranet)

VA Informatics and Computing
Infrastructure (VINCI)

<https://vaww.vinci.med.va.gov/vincicentral/> (VA Intranet)

Health Economics Resource Center (HERC)

<https://vaww.herc.research.va.gov> (VA Intranet)

Corporate Data Warehouse (CDW)

<https://vaww.cdw.va.gov/Pages/CDWHome.aspx> (VA Intranet)

Center for Evaluation and Implementation
Resources (CEIR):

<https://www.queri.research.va.gov/ceir/default.cfm>



Questions about using VA Data?

HSRData Listserv

- Community knowledge sharing
- ~1,400 VA data users
- Researchers, operations, data stewards, managers
- Subscribe by visiting
<https://vaww.virec.research.va.gov/Support/HSRData-L.htm> (VA Intranet)

VIReC HelpDesk

- Individualized support



virec@va.gov