CHALLENGES & OPPORTUNITIES IN CURATING LARGE ADMINISTRATIVE & CLINICAL DATASETS FOR RESEARCH USE

VIReC'S EFFORTS TO ADVANCE VA INFORMATICS AND RESEARCH PROJECTS

Presented by:
Maria Souden, MSI, PhD
Chandrea Culbreath, MPH, BSN, CHTS-TR

AGENDA

1. INTRODUCTION TO THE VA
2. RESEARCH IN THE VA
3. VA DATA ENVIRONMENT/EHR MODERNIZATION
4. OPPORTUNITIES AND CHALLENGES
5. VIReC'S ROLE IN THE DATA LANDSCAPE
6. PARTNERING WITH VIREC & THE VA

INTRODUCTION TO THE DEPARTMENT OF VETERANS AFFAIRS

VA | U.S. Department of Veterans Affairs

SCALING SERVICES ACROSS THREE SEPARATE ENTITIES

www.va.gov

U.S. Department of Veterans Affairs

Comprised of 3 organizations to address the unique needs of our nations Veterans

Veterans Benefit Administration

The Veterans Benefits Administration (VBA) provides a variety of benefits and services to Servicemembers, Veterans, and their families.

National Cemetery Administration

The National Cemetery Administration (NCA) provides burial services in a VA national cemetery to all members of the armed forces and Veterans who have met minimum active- duty service requirements.

Veterans Health Administration

The Veterans Health Administration is America's largest integrated health care system, providing care at 1,298 health care facilities, including 171 medical centers and 1,113 outpatient sites of care of varying complexity (VHA outpatient clinics)

Veterans Health Administration

Over the years….

- Established as a national program in 1930
- Early pioneer of the electronic health record
- Major reforms starting in 1990’s including
  - investments in electronic health record
  - shift from emphasis on inpatient and specialty care to emphasis on primary care
- Contains 9M Veterans enrolled in the VA health care system.

Evolved Healthcare Delivery Model

- Personalized Care
- Proactive and Patient-Driven
- Team-based Primary Care
- Evidence-Based
- Prevention / Population Health
- Data-Driven

Learning Healthcare System

Learning Healthcare System

"**science, informatics, incentives, and culture** are aligned for **continuous improvement and innovation**, with **best practices seamlessly embedded** in the delivery process and **new knowledge captured** as an integral byproduct of the delivery experience."

VA RESEARCH

VA | U.S. Department of Veterans Affairs

IMPROVING THE LIVES OF VETERANS AND ALL AMERICANS THROUGH HEALTH CARE DISCOVERY AND INNOVATION

www.research.va.gov

VA Office of Research & Development

Program supporting pre-clinical research to understand life processes from the ***molecular, genomic, and physiological*** levels.

Biomedical Laboratory Research and Development

Clinical Science Research and Development

Program advancing ideas along the translational pathway from scientific ***discovery to clinical application*** in order to advance the healthcare of our Veterans.

Intramural program for improving the quality of life of ***impaired and disabled*** Veterans.

Rehabilitation R&D Service

Health Services Research and Development Service (HSR&D)

Program supporting the identification, evaluation, and implementation of evidence-based strategies that ***improve the quality and safety*** of care delivered to Veterans.

Health Services Research

Evaluates the **effectiveness of clinical procedures or practices and processes of care** in the "real world."

Compares **VA outcomes, cost, and quality of care** among VA sites or between VA and non-VA providers

Evaluates **utilization patterns and costs** associated with practice patterns, interventions, policy changes, etc.

Develops and evaluates **new measures and methods** for use in health services research.

Focuses on **implementing research findings into practice.**

Looks at **variations in care** (e.g., ethnic, cultural, provider, geographic based) and their determinants

Examines **organization, management, and leadership** in health care

www.hsrd.research.va.gov

VA DATA ENVIRONMENT

VA | U.S. Department of Veterans Affairs

BIG DATA ENVIRONMENTS PULL DATA FROM A VARIETY OF SOURCES

VA data is continuously collected in the context of healthcare operations and delivery

Clinical Care (Electronic Health Record)

VA Care in the Community

Healthcare Operations, Costs, Enrollment, Utilization

Patient Generated Data

Research & Quality Improvement Data

CPRS
Computerized Patient Record System

- Front end for most data collected in clinical care and care delivery
- Provides an interface for data entry and viewing of EHR

VistA
Veterans Health Information Systems & Technology Architecture

- Backend storage of data; integrated system of software applications
- VistA “system” is actually 130 separate instances

CPRS/VistA system has been used in the VA since the 1980s and has evolved to suit Veteran-specific care with heavy local customization.

VA data is entered in CPRS and other systems and curated into various data sources. These sources are commonly used for QI, research, or informatics projects.

Corporate Data Warehouse

National repository of relational data from **the EHR** and several other VHA **clinical and administrative** systems.

VA Millennium

VA's new EHR (a commercial Cerner system) that includes a user interface and backend database for data storage analogous to VistA.

Pharmacy Benefit Management

National database containing details and extensive information about all **prescriptions** dispensed within VHA systems.

VA Medicare & Medicaid

Data acquired from the **Centers for Medicare and Medicaid Services** (CMS) and United States Renal Data System (USRDS) specific to Veterans.

Managerial Cost Accounting

Data source providing **activity-based cost information** and clinical information.

VA's New EHR System

ELECTRONIC HEALTH RECORD MODERNIZATION

- VA has begun a decade-long transition to the commercially developed Cerner EHR
- First instance of VA Millennium went live at the Mann-Grandstaff VA Medical Center (Spokane, WA) in October 2020
- Rollout is expected to continue in 2023 completing in ~2030
- New EHR = new data

OPPORTUNITIES AND CHALLENGES

VA | U.S. Department of Veterans Affairs

BALANCING DEMAND

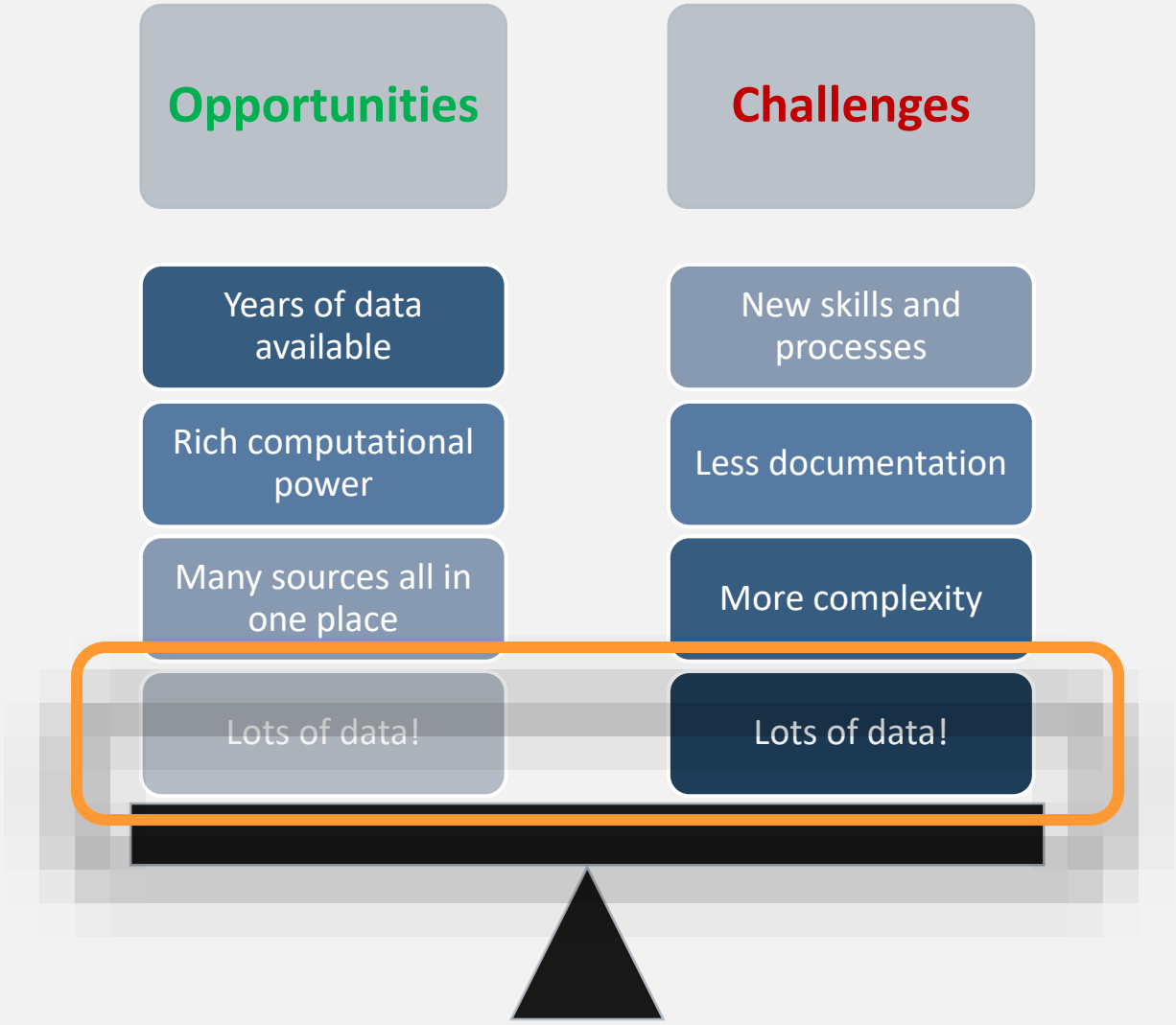
Strengths of VA Data

- Size/Volume - largest integrated healthcare system in US, with 20 years of data of longitudinal data on 24 million patients
- Breadth/Scope of data – includes clinical data, assessment tools, administrative etc.
- Timely – some data available in almost real time
- Can be linked to external data (i.e., CMS, NDI, DoD)
- Data created for VHA operations can also be used for research

Challenges & Limitations

- Data landscape can be complicated – multiple sources for similar data elements; likely to get more complicated with EHRM
- Analyses may not be generalizable to general population
  - Mostly male, sicker than average, Veteran-prevalent conditions (PTSD, mental health, traumatic brain injury, limb loss)
- Not all Veterans enrolled in VHA
- Many Veterans also receive care outside VHA
- Some data elements are less reliably available, e.g., income, education

Striking a Balance



This is where VIReC comes in…

Building a community of efficient data users

VIReC'S ROLE IN THE DATA LANDSCAPE

VA | U.S. Department of Veterans Affairs

RESEARCHER'S GUIDE TO VA DATA

www.virec.research.va.gov

VIReC is…

- one of four Health Services Research and Development Service (HSR&D) Resource Centers established in 1998 to service the VA research community.
- a key resource providing information, training and other services to support the use of VA data. We accomplish this by:
  - **Developing Education & Data Documentation Resources**
  - **Disseminating Data Knowledge**
  - **Strengthening VA Data Capacity**

About Us

The VA Information Resource Center (VIReC) supports the effective use of data by VA's analytic and informatic communities to transform Veteran health and health care as part of a learning health system.

VIReC Functions and Expertise

Continuum of initiatives supporting research data needs

Data Availability & Access Policy

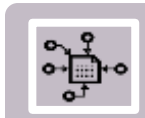
Data Knowledge & Documentation

Education & Dissemination

HelpDesk & Knowledge-Sharing

Liaisons within Data Ecosystem

Provisioning & Oversight of CMS Data


VA REDCap Data Collection & Management

How does VIReC Support Research, Informatics or other Data Needs?

VIReC assists a variety of users at different points of their project lifecycle:

- Navigate the VA Data Landscape
- Prepare to Access the Data
- Understand Data Contents and Nuances with the Data
- Stay Abreast of New Data or Updates in a Changing Data Environment

Navigate the VA Data Landscape

LOCATE RESOURCES ABOUT VA DATA

BROWSE COMMONLY USED VA DATA SOURCES

EXPLORE SPECIFIC TOPIC AREAS

VIEW PRESENTATIONS ABOUT VA DATA AND ITS USE

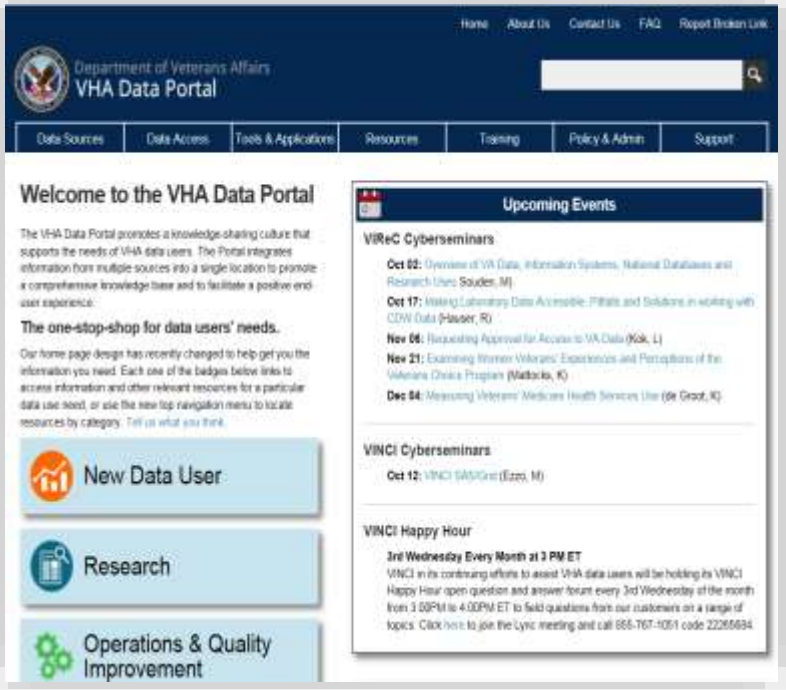
VIReC Supported Websites

www.virec.research.va.gov

- Public-facing
- VIReC overview
- Publications, Cyberseminars & events

vaww.virec.research.va.gov

- VA network only
- Resources for working with data
- News & new resources – home



vaww.vhadataportal.med.va.gov

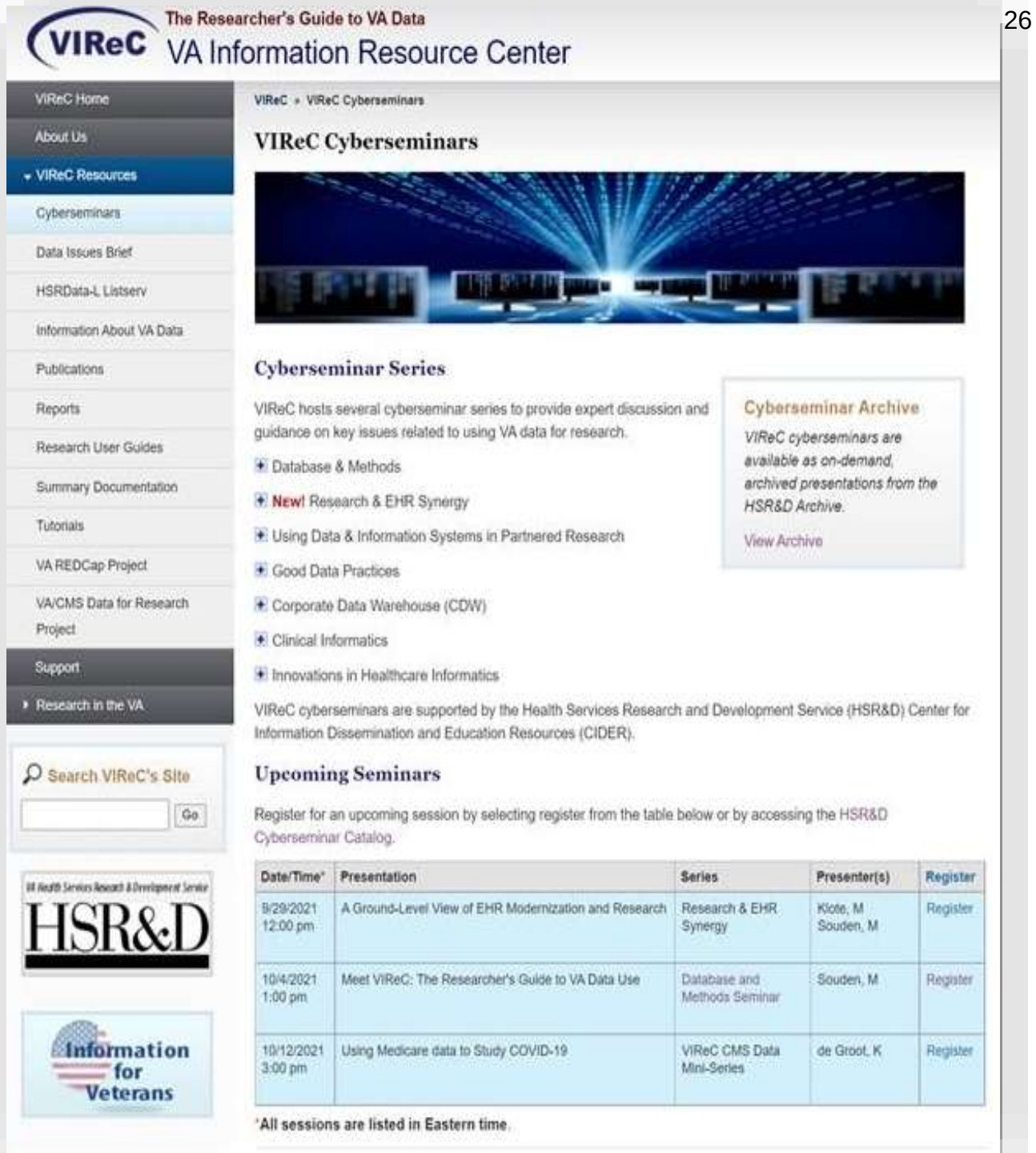
- VA network only
- Collaborative with NDS, VINCI, & HERC
- Data source & access information

Locate resources about VA data

View Presentations about VA Data and its use in Research

- Database & Methods
- Corporate Data Warehouse
- Using Data & Information Systems in Partnered Research
- Research & EHR Synergy
- Good Data Practices Miniseries
- VIReC CMS Data Miniseries

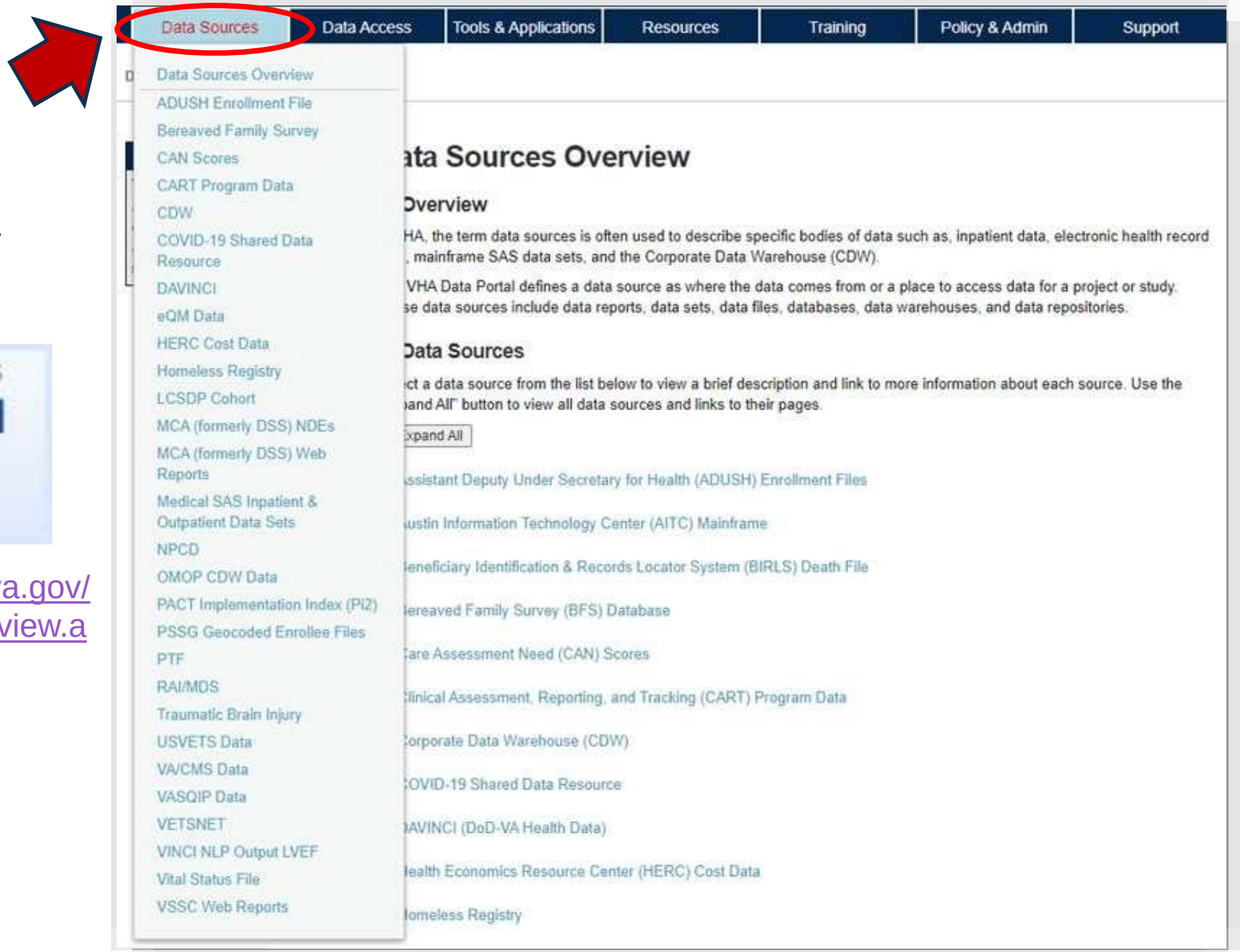
https://www.virec.research.va.gov/Resources/Cyberseminars.asp#Upcoming



Browse Commonly Used VA Data Sources

GATEWAY TO DATA RESOURCES
VHA Data Portal

http://vaww.vhadataportal.med.va.gov/DataSources/DataSourcesOverview.aspx
(VA Intranet)



Explore Specific Topic Areas

https://vaww.virec.research.va.gov/Intro/Working-with-VA-Data.htm

(VA Intranet)

Prepare to Access the Data

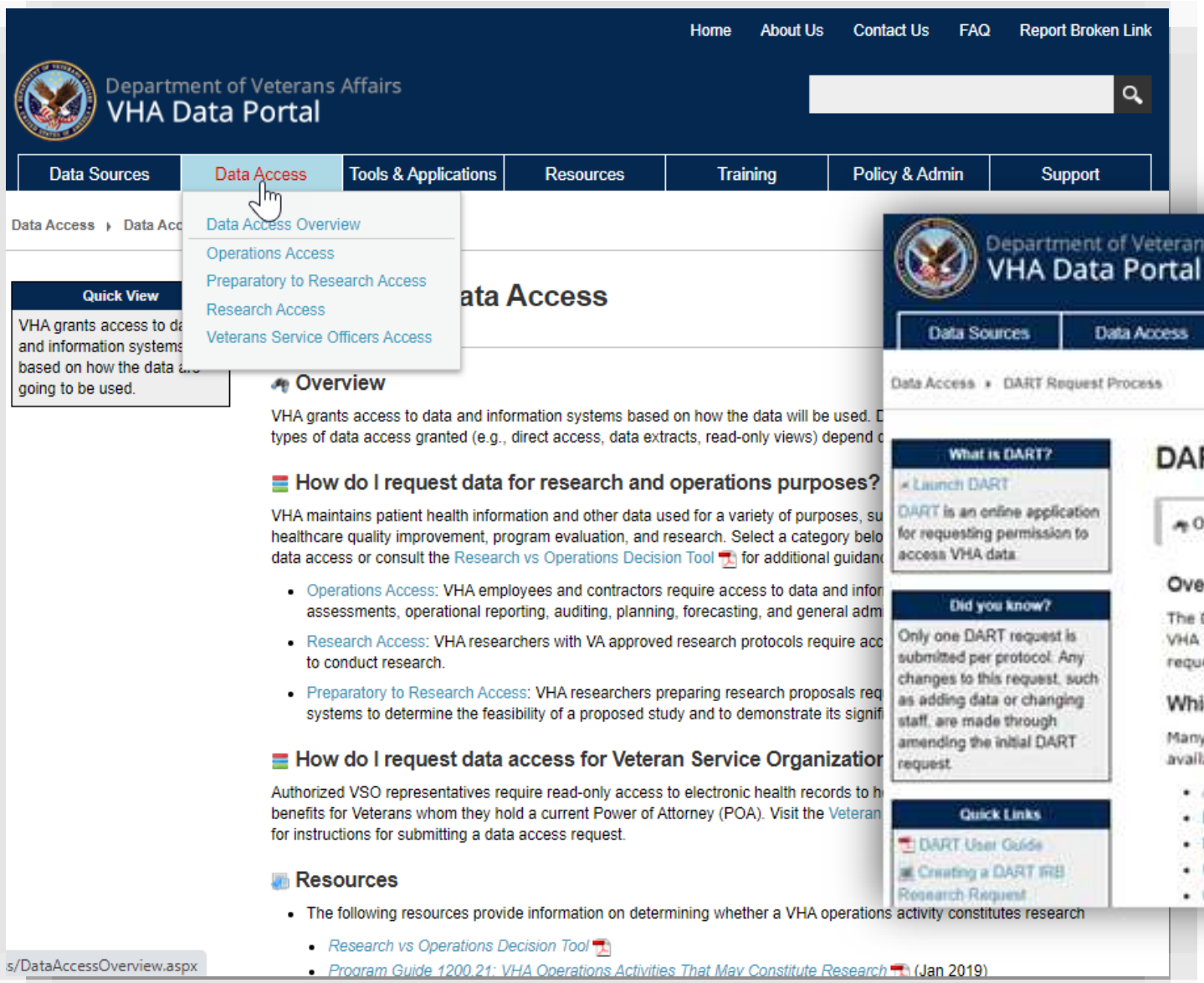
APPLY FOR ACCESS TO VA DATA

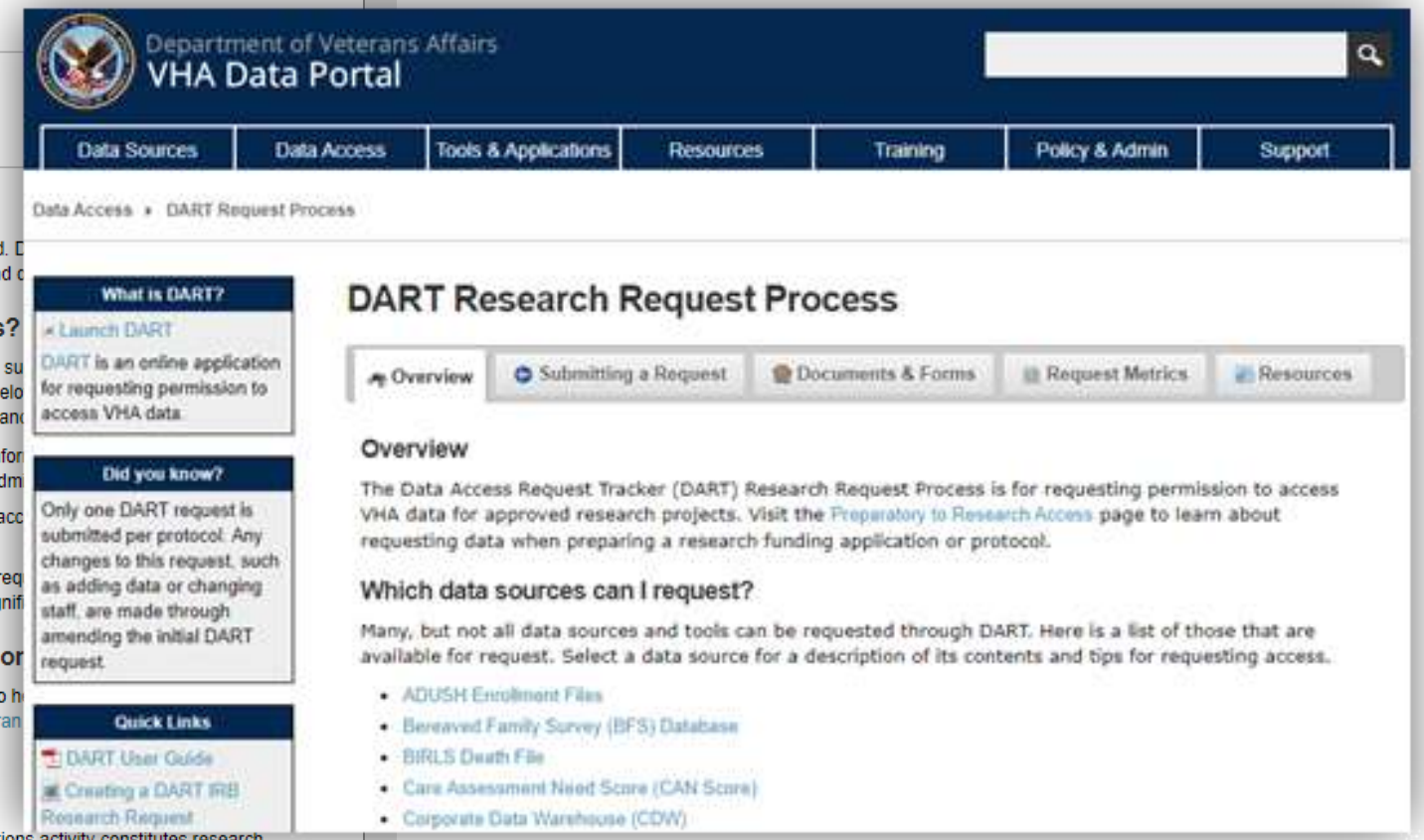
REQUEST MEDICARE & MEDICAID DATA FOR VETERANS

LEARN HOW TO WORK WITH THE CORPORATE DATA WAREHOUSE (CDW)

VA REDCAP FOR PRIMARY DATA COLLECTION & MANAGEMENT

Apply for Access to VA Data

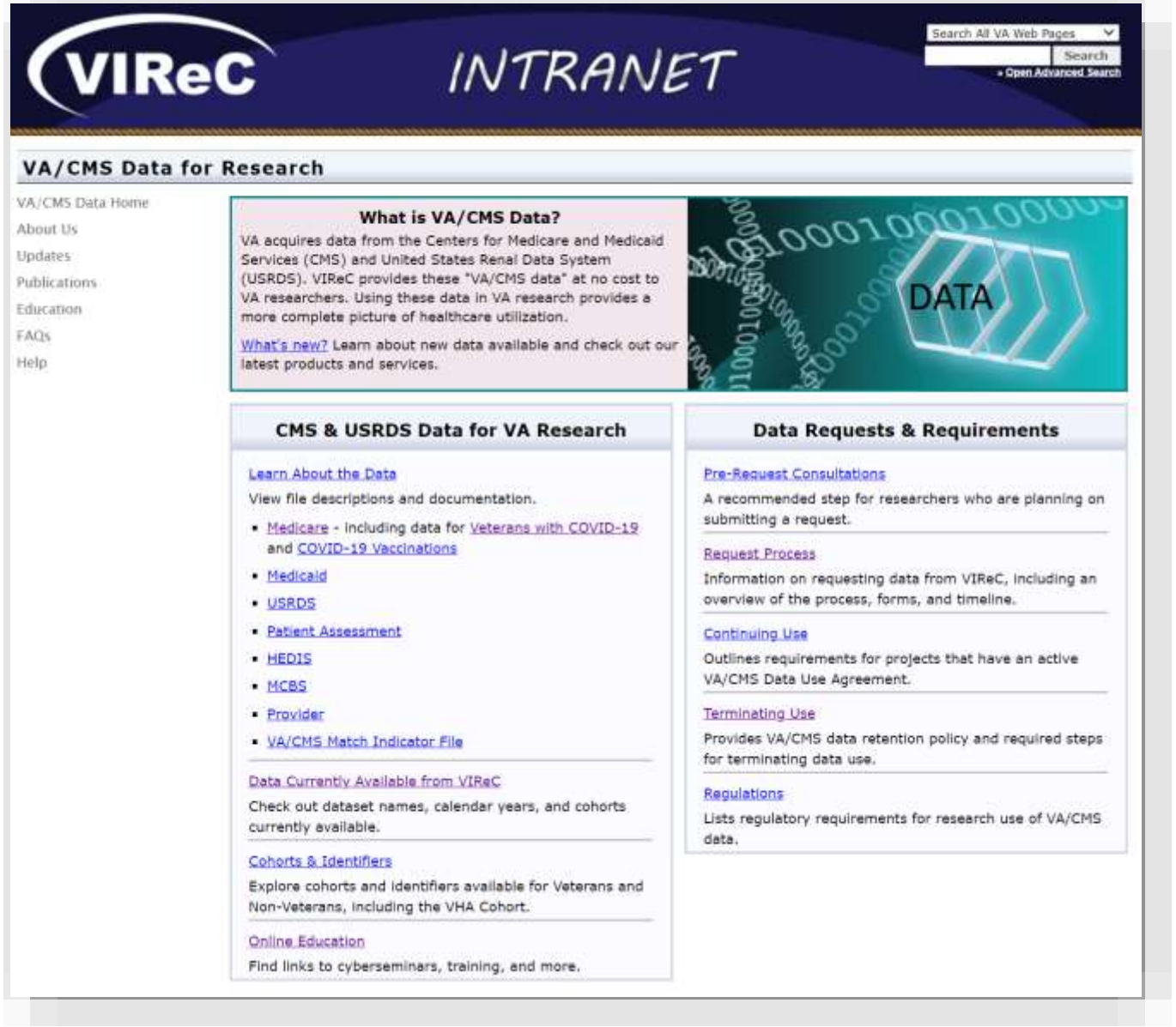




http://vaww.vhadataportal.med.va.gov/DataAccess/DataAccessOverview.aspx

(VA Intranet)

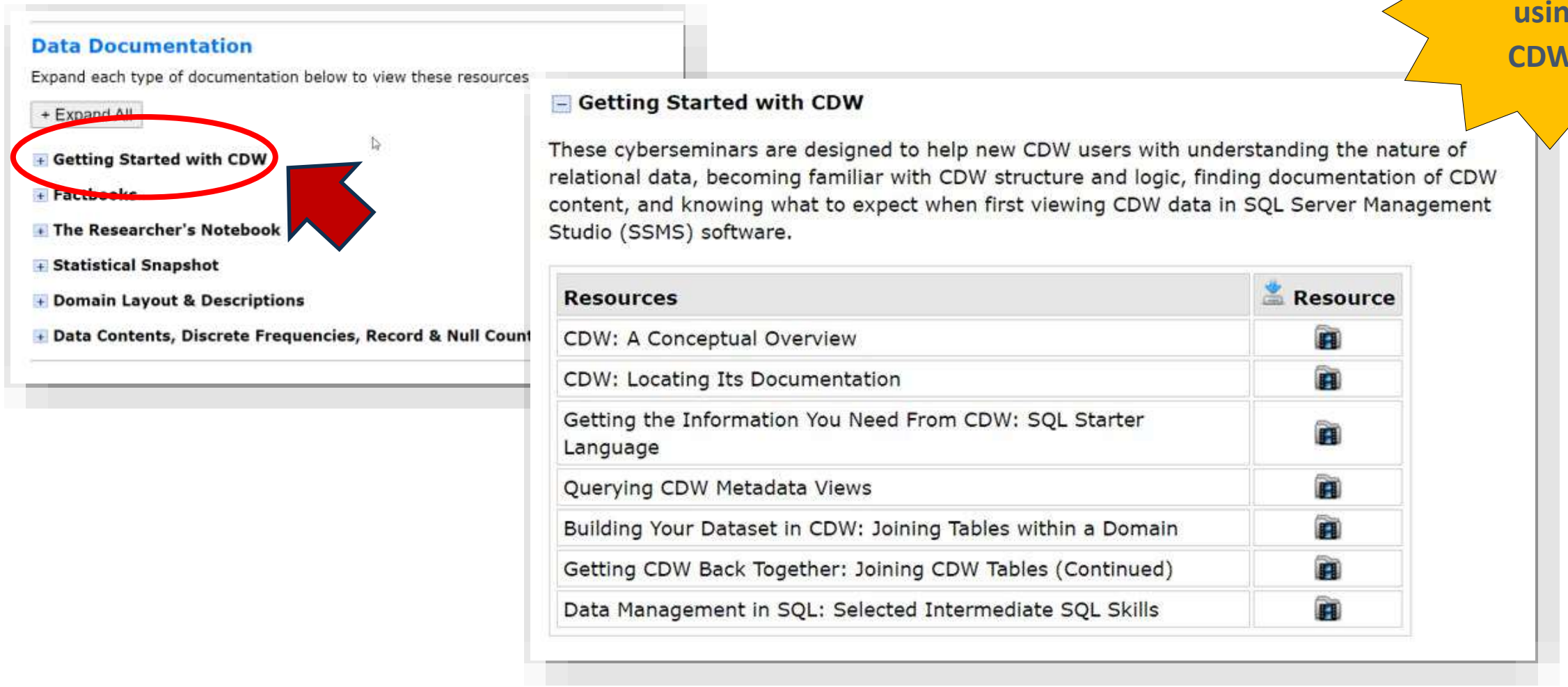
Request Medicare & Medicaid Data for Veterans



https://vaww.virec.research.va.gov/VACMS/Requests/Overview.htm

Learn How to Work with the Corporate Data Warehouse

New to using CDW?

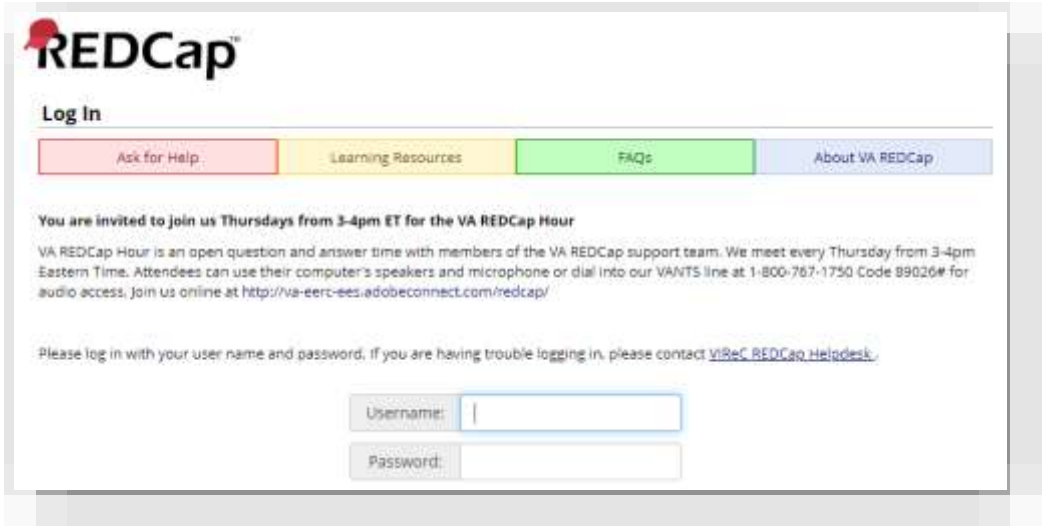


https://vaww.virec.research.va.gov/CDW/Documentation.htm (VA Intranet)

Email virec@va.gov to be notified of new CDW products and seminars.

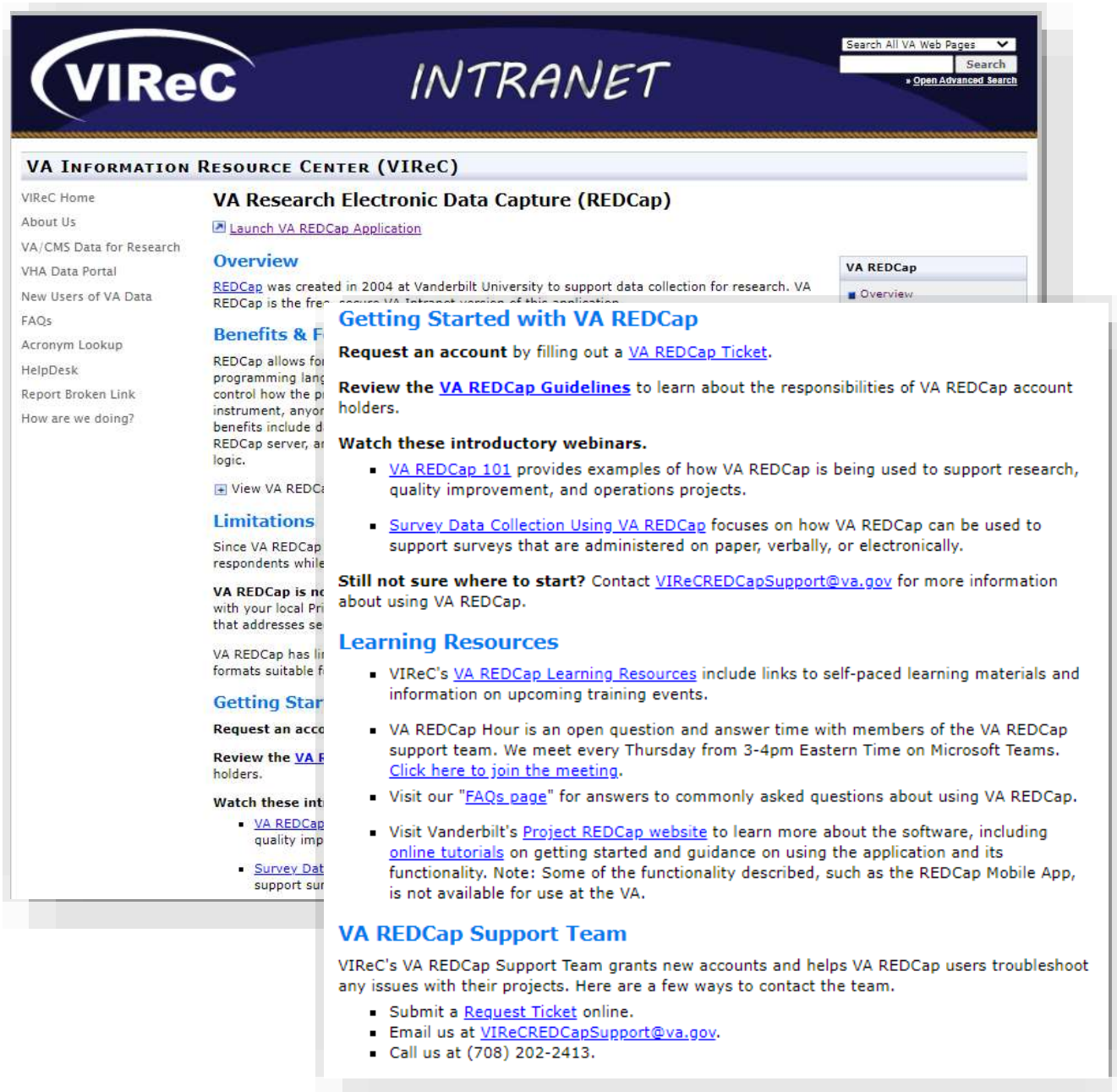
Primary Data Collection & Management

VA REDCap
Research Electronic Data Capture



Learn More:
http://vaww.virec.research.va.gov/REDCap/Overview.htm

(VA Intranet)



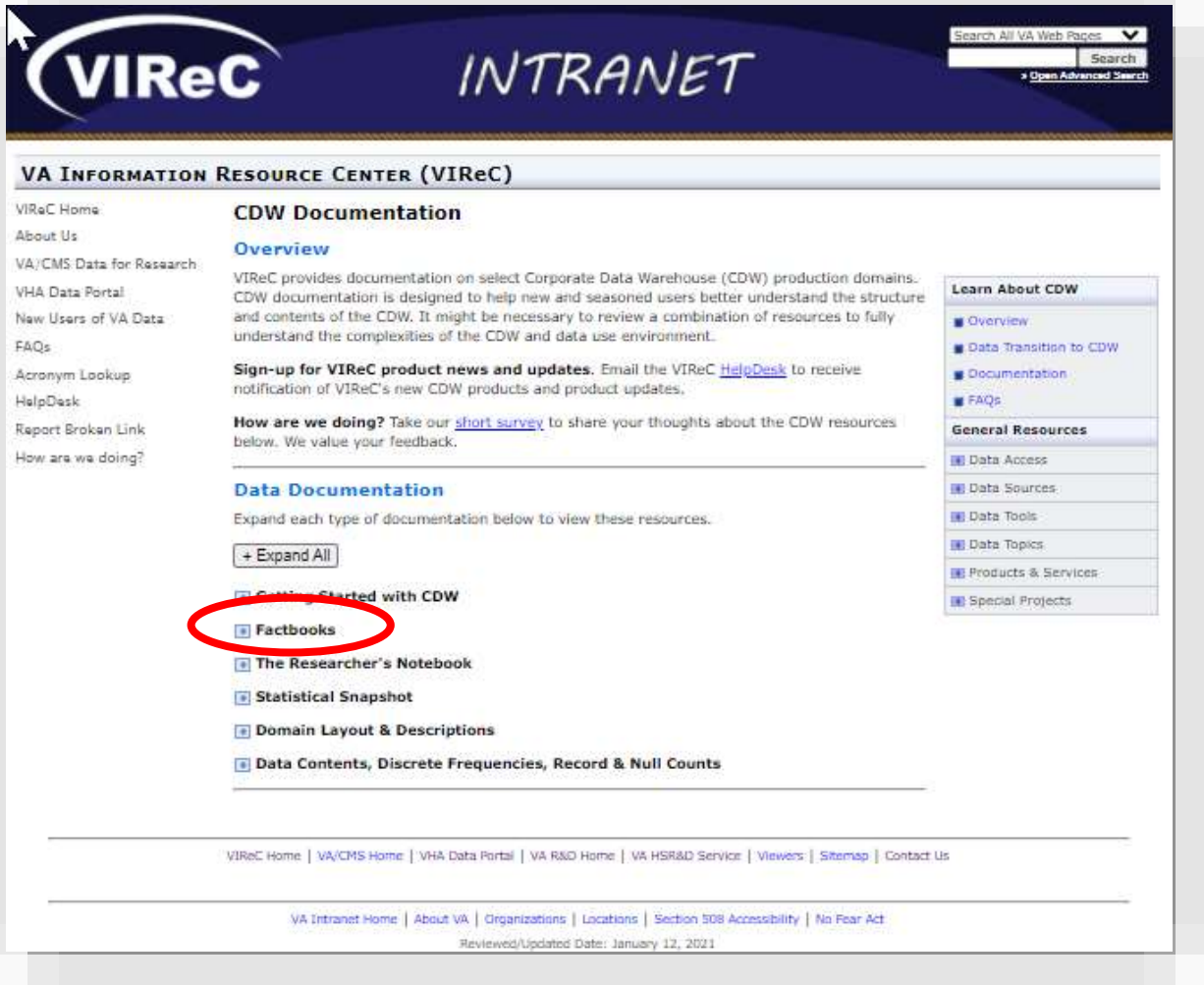
Understand Data Contents and Nuances with the Data

UNDERSTAND DATA ELEMENTS AND FORMAT

METHODS AND TECHNICAL DOCUMENTATION

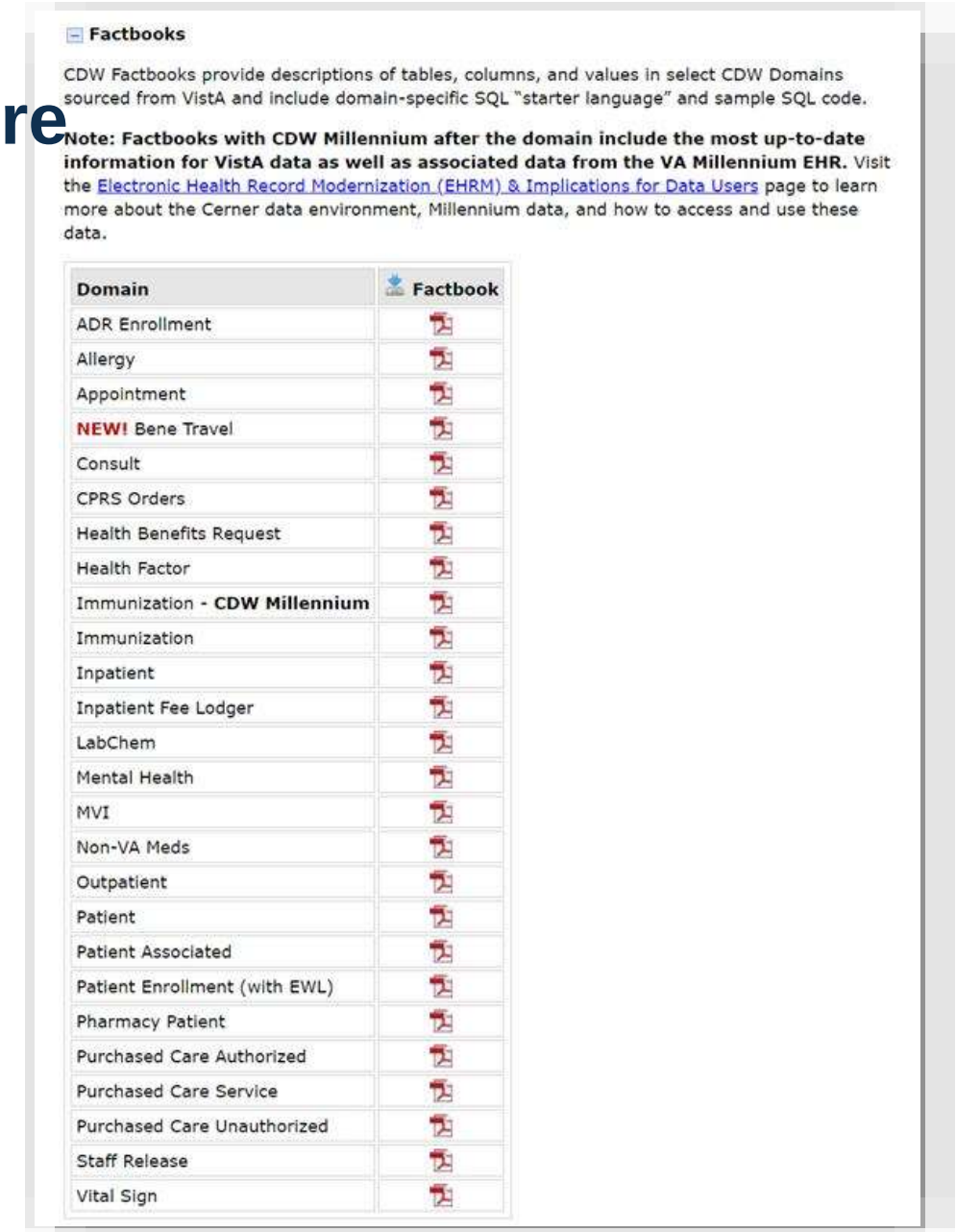
INDIVIDUALIZED SUPPORT (HELPDESK)

Understand Data Contents and Structure



https://vaww.virec.research.va.gov/CDW/Documentation.htm

(VA Intranet)



Factbooks

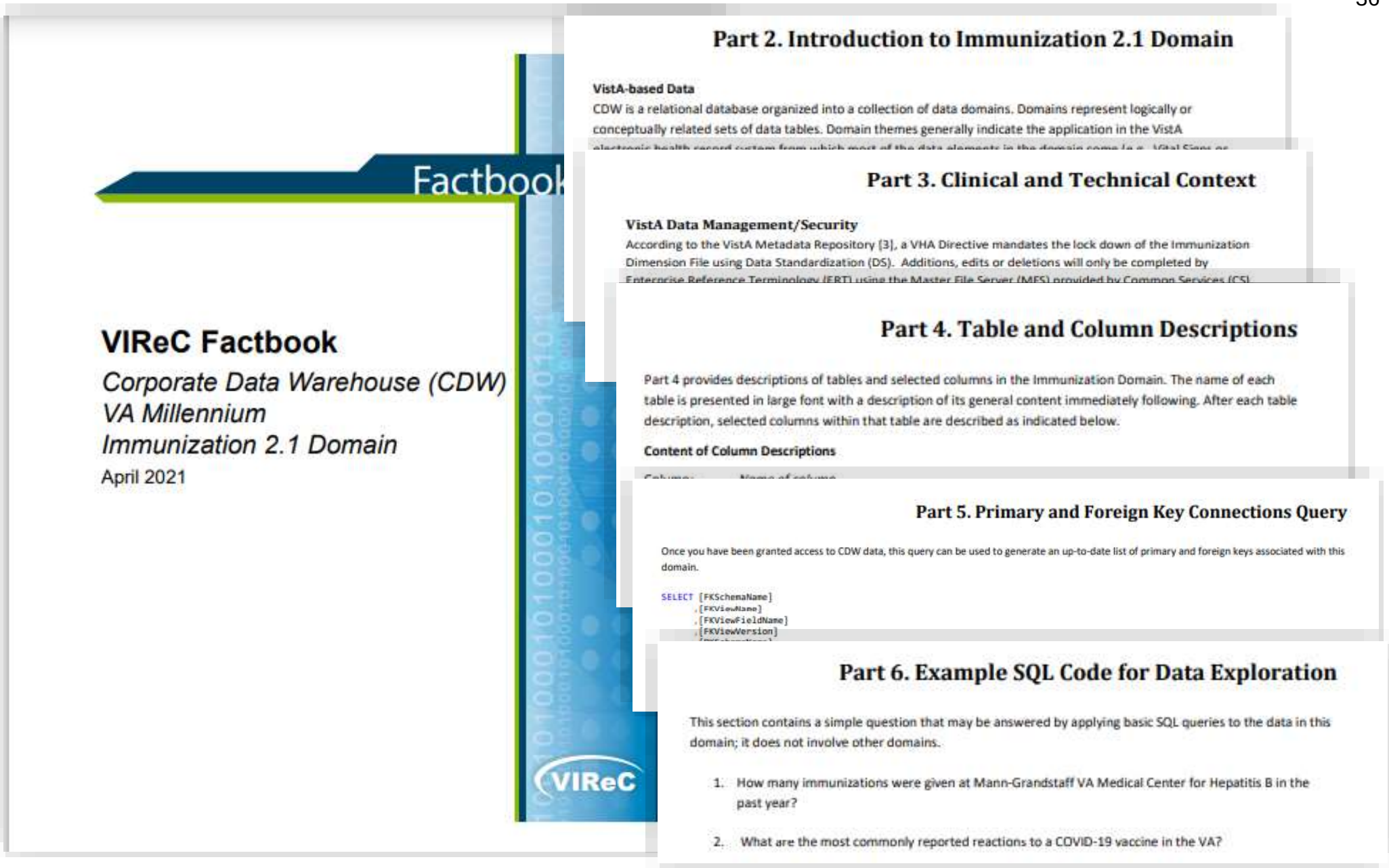
CDW Factbooks provide descriptions of tables, columns, and values in select CDW Domains sourced from VistA and include domain-specific SQL "starter language" and sample SQL code.

Note: Factbooks with CDW Millennium after the domain include the most up-to-date information for VistA data as well as associated data from the VA Millennium EHR. Visit the Electronic Health Record Modernization (EHRM) & Implications for Data Users page to learn more about the Cerner data environment, Millennium data, and how to access and use these data.

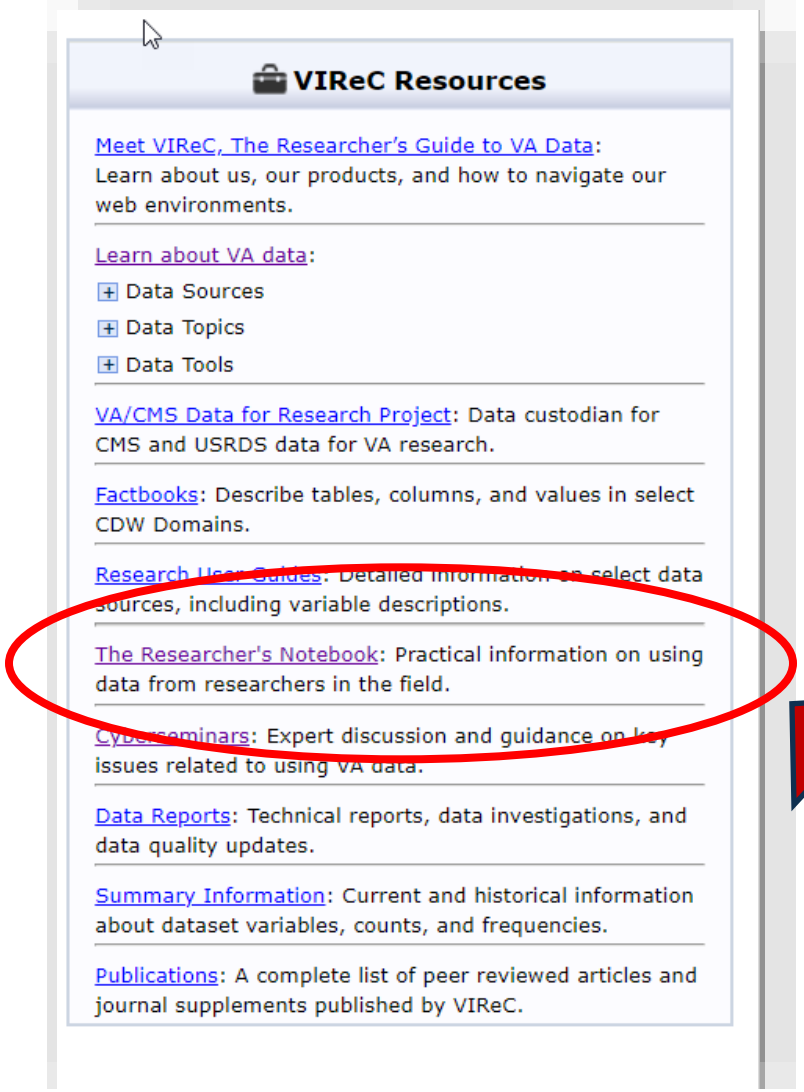
Domain	Factbook
ADR Enrollment	
Allergy	
Appointment	
NEW! Bene Travel	
Consult	
CPRS Orders	
Health Benefits Request	
Health Factor	
Immunization - **CDW Millennium**	
Immunization	
Inpatient	
Inpatient Fee Lodger	
LabChem	
Mental Health	
MVI	
Non-VA Meds	
Outpatient	
Patient	
Patient Associated	
Patient Enrollment (with EWL)	
Pharmacy Patient	
Purchased Care Authorized	
Purchased Care Service	
Purchased Care Unauthorized	
Staff Release	
Vital Sign	

VIReC Product Spotlight

[CDW Factbooks](#) provide detailed descriptions of tables, columns, and values in select CDW domains



Methods & Technical Documentation



Current Issues

How are we doing? Take our short survey to share your thoughts about *The Researcher's Notebooks* below. We value your feedback.

Note: *Notebooks* that utilize Millennium data include an "M" in the issue number.

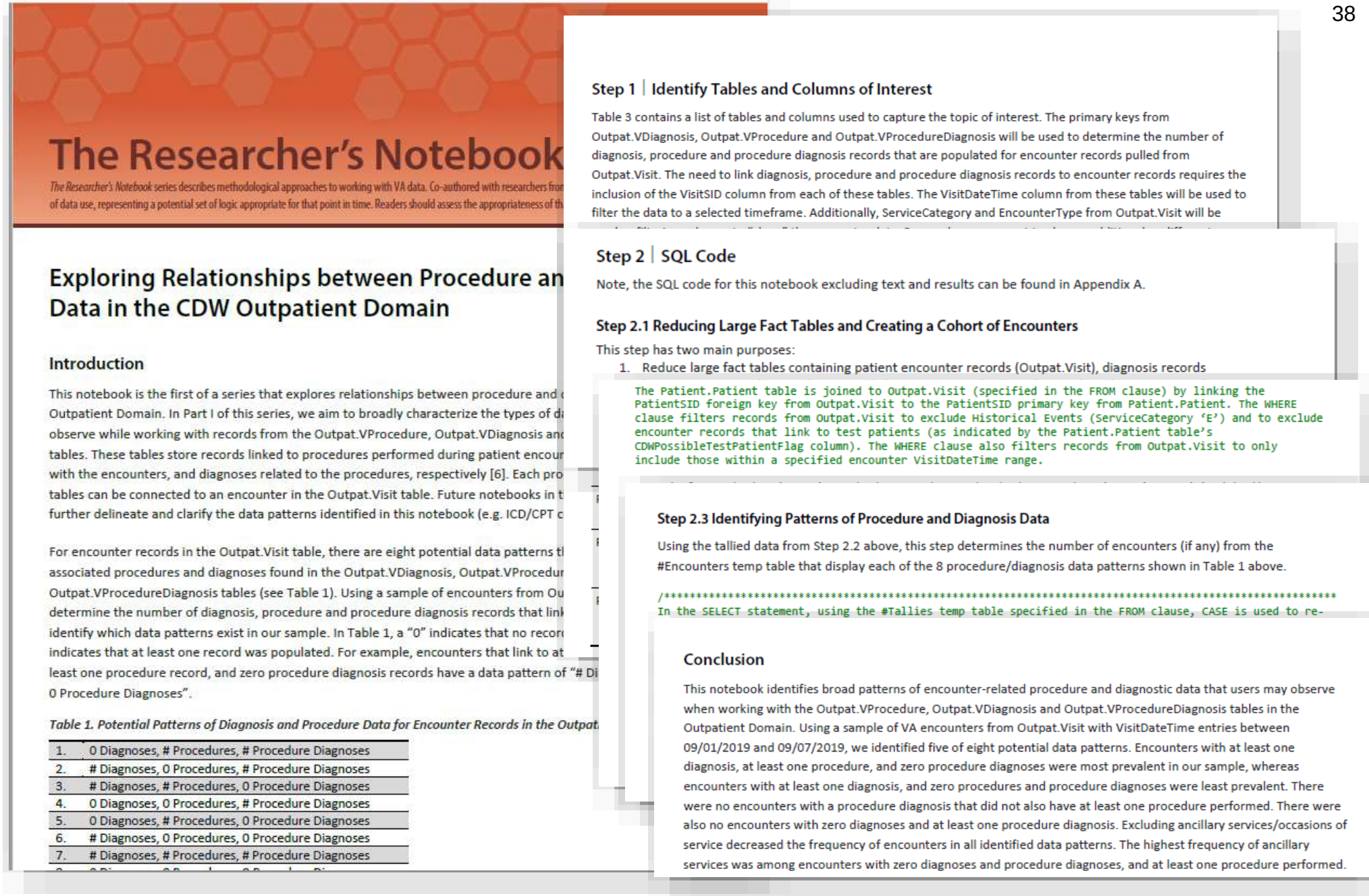
#	Notebook	Author	View PDF
23M	**NEW!** Identifying Immunizations Administered Pre-and Post-Cerner EHR Transition	Jones, L Culbreath, C Gonsoulin, M	
22M	Using PowerForms to Explore Cerner Millennium Data (Part II)	Jones, L Culbreath, C Arnold, N	
21M	Using PowerForms to Explore Cerner Millennium Data (Part I)	Culbreath, C Jones, L	
20	Community Care Data: Comparison of Claims in the CDW FBCS Domain and PIT Domain	Arnold, N	
19	Community Care Data: Comparison of FBCS Domain and Purchased Care Domain Data	Arnold, N	
18	Exploring Relationships between Procedure and Diagnosis Data in the CDW Outpatient Domain	Jones, L Culbreath, C	
17	Overview of Three Community Care Data Sources	Arnold, N	
16	Matching VA Identifier to DoD Identifier: PatientICN to EDIPI Using CDW's MVI Domain	Gonsoulin, M Jones, L	
15	Exploring the Three Procedure Tables in the CDW Inpatient Domain	Gonsoulin, M Culbreath, C	
14	Identifying Encounters in CDW by Clinic Location versus Provider Type	Gonsoulin, M Jones, L	
13	Defining a Cohort with a Diagnosis & Medication: Using CDW to identify VA outpatients with a diagnosis of Rheumatoid Arthritis who are taking Etanercept	Gonsoulin, M Joseph, AM Culbreath, C	
12	**UPDATED!** Identifying CLC Stays in CDW	Scott, WJ Gonsoulin, M Ramanathan D Intrator, O	
11	Procedure Codes in VHA: Use of Inpatient ICD Procedure vs Outpatient CPT Codes	Wagner, T Lachance, M	

https://vaww.virec.research.va.gov/Notebook/Overview.htm

(VA Intranet)

VIReC Product Spotlight

[The Researcher's Notebook](#) lays out **methodological approaches** to working with CDW data



The Researcher's Notebook

The Researcher's Notebook series describes methodological approaches to working with VA data. Co-authored with researchers fro
of data use, representing a potential set of logic appropriate for that point in time. Readers should assess the appropriateness of th

Exploring Relationships between Procedure an Data in the CDW Outpatient Domain

Introduction

This notebook is the first of a series that explores relationships between procedure and
Outpatient Domain. In Part I of this series, we aim to broadly characterize the types of d
observe while working with records from the Outpat.VProcedure, Outpat.VDiagnosis an
tables. These tables store records linked to procedures performed during patient encou
with the encounters, and diagnoses related to the procedures, respectively [6]. Each pro
tables can be connected to an encounter in the Outpat.Visit table. Future notebooks in t
further delineate and clarify the data patterns identified in this notebook (e.g. ICD/CPT c

For encounter records in the Outpat.Visit table, there are eight potential data patterns t
associated procedures and diagnoses found in the Outpat.VDiagnosis, Outpat.VProcedur
Outpat.VProcedureDiagnosis tables (see Table 1). Using a sample of encounters from Ou
determine the number of diagnosis, procedure and procedure diagnosis records that link
identify which data patterns exist in our sample. In Table 1, a "0" indicates that no recor
indicates that at least one record was populated. For example, encounters that link to at
least one procedure record, and zero procedure diagnosis records have a data pattern of "# Di
0 Procedure Diagnoses".

Table 1. Potential Patterns of Diagnosis and Procedure Data for Encounter Records in the Outpat

1.	0 Diagnoses, # Procedures, # Procedure Diagnoses
2.	# Diagnoses, 0 Procedures, # Procedure Diagnoses
3.	# Diagnoses, # Procedures, 0 Procedure Diagnoses
4.	0 Diagnoses, 0 Procedures, # Procedure Diagnoses
5.	0 Diagnoses, # Procedures, 0 Procedure Diagnoses
6.	# Diagnoses, 0 Procedures, 0 Procedure Diagnoses
7.	# Diagnoses, # Procedures, # Procedure Diagnoses

Step 1 | Identify Tables and Columns of Interest

Table 3 contains a list of tables and columns used to capture the topic of interest. The primary keys from Outpat.VDiagnosis, Outpat.VProcedure and Outpat.VProcedureDiagnosis will be used to determine the number of diagnosis, procedure and procedure diagnosis records that are populated for encounter records pulled from Outpat.Visit. The need to link diagnosis, procedure and procedure diagnosis records to encounter records requires the inclusion of the VisitSID column from each of these tables. The VisitDateTime column from these tables will be used to filter the data to a selected timeframe. Additionally, ServiceCategory and EncounterType from Outpat.Visit will be

Step 2 | SQL Code

Note, the SQL code for this notebook excluding text and results can be found in Appendix A.

Step 2.1 Reducing Large Fact Tables and Creating a Cohort of Encounters

This step has two main purposes:

1. Reduce large fact tables containing patient encounter records (Outpat.Visit), diagnosis records

```
The Patient.Patient table is joined to Outpat.Visit (specified in the FROM clause) by linking the
PatientSID foreign key from Outpat.Visit to the PatientSID primary key from Patient.Patient. The WHERE
clause filters records from Outpat.Visit to exclude Historical Events (ServiceCategory 'E') and to exclude
encounter records that link to test patients (as indicated by the Patient.Patient table's
CDWPossibleTestPatientFlag column). The WHERE clause also filters records from Outpat.Visit to only
include those within a specified encounter VisitDateTime range.
```

Step 2.3 Identifying Patterns of Procedure and Diagnosis Data

Using the tallied data from Step 2.2 above, this step determines the number of encounters (if any) from the #Encounters temp table that display each of the 8 procedure/diagnosis data patterns shown in Table 1 above.

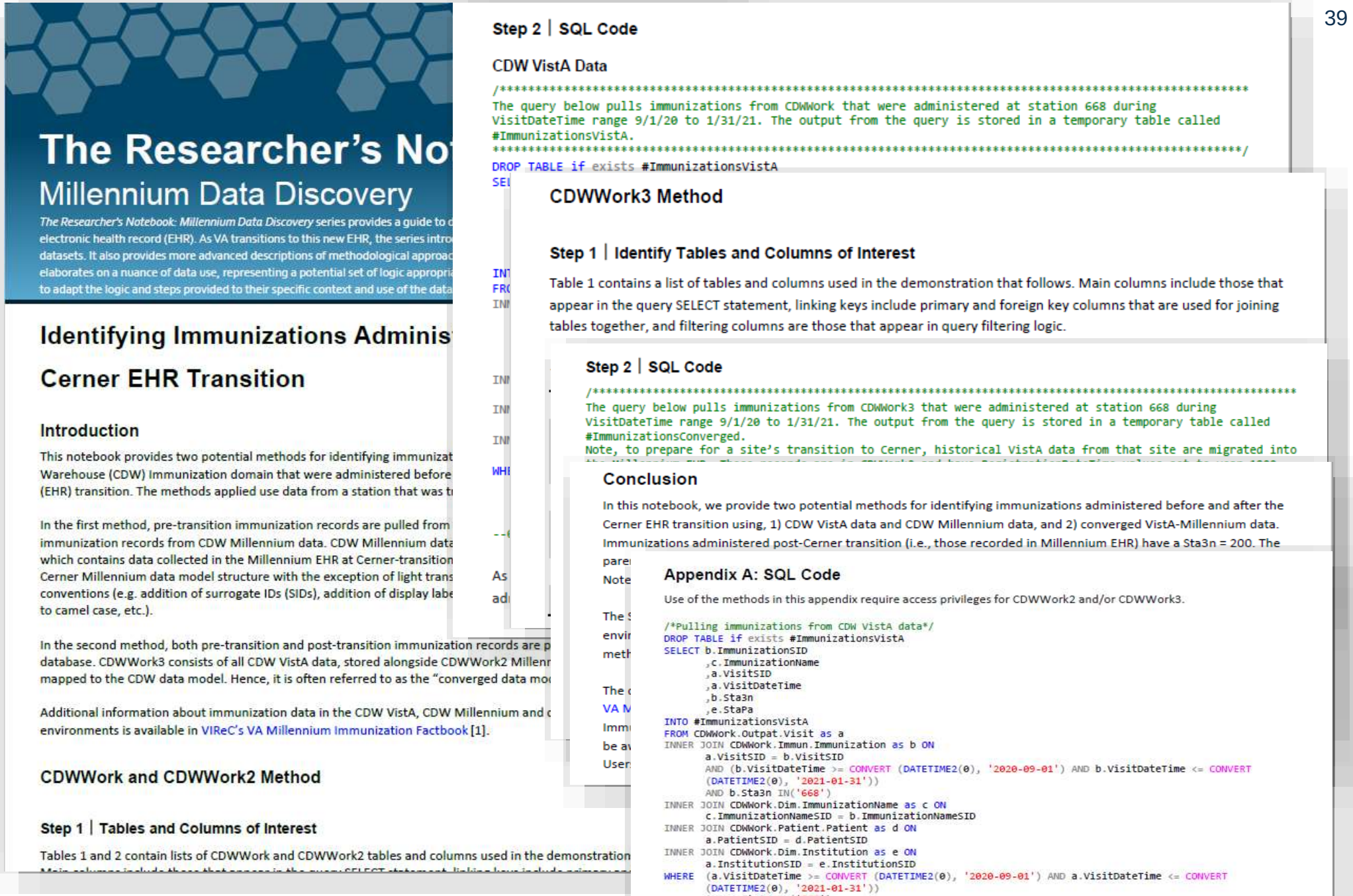
```
/*************************************************************************************************
In the SELECT statement, using the #Tallies temp table specified in the FROM clause, CASE is used to re-
```

Conclusion

This notebook identifies broad patterns of encounter-related procedure and diagnostic data that users may observe when working with the Outpat.VProcedure, Outpat.VDiagnosis and Outpat.VProcedureDiagnosis tables in the Outpatient Domain. Using a sample of VA encounters from Outpat.Visit with VisitDateTime entries between 09/01/2019 and 09/07/2019, we identified five of eight potential data patterns. Encounters with at least one diagnosis, at least one procedure, and zero procedure diagnoses were most prevalent in our sample, whereas encounters with at least one diagnosis, and zero procedures and procedure diagnoses were least prevalent. There were no encounters with a procedure diagnosis that did not also have at least one procedure performed. There were also no encounters with zero diagnoses and at least one procedure diagnosis. Excluding ancillary services/occasions of service decreased the frequency of encounters in all identified data patterns. The highest frequency of ancillary services was among encounters with zero diagnoses and procedure diagnoses, and at least one procedure performed.

VIReC Product Spotlight

Researcher's Notebook: Millennium Data Discovery series provides guides to data collected in the **Cerner EHR**



The Researcher's No

Millennium Data Discovery

The Researcher's Notebook: Millennium Data Discovery series provides a guide to
electronic health record (EHR). As VA transitions to this new EHR, the series intro
datasets. It also provides more advanced descriptions of methodological approac
elaborates on a nuance of data use, representing a potential set of logic appropri
to adapt the logic and steps provided to their specific context and use of the data

Identifying Immunizations Adminis

Cerner EHR Transition

Introduction

This notebook provides two potential methods for identifying immunizat
Warehouse (CDW) Immunization domain that were administered before
(EHR) transition. The methods applied use data from a station that was t

In the first method, pre-transition immunization records are pulled from
immunization records from CDW Millennium data. CDW Millennium data
which contains data collected in the Millennium EHR at Cerner-transition
Cerner Millennium data model structure with the exception of light trans
conventions (e.g. addition of surrogate IDs (SIDs), addition of display labe
to camel case, etc.).

In the second method, both pre-transition and post-transition immunization records are p
database. CDWWork3 consists of all CDW VistA data, stored alongside CDWWork2 Millenn
mapped to the CDW data model. Hence, it is often referred to as the "converged data mo

Additional information about immunization data in the CDW VistA, CDW Millennium and
environments is available in VIReC's VA Millennium Immunization Factbook [1].

CDWWork and CDWWork2 Method

Step 1 | Tables and Columns of Interest

Tables 1 and 2 contain lists of CDWWork and CDWWork2 tables and columns used in the demonstration

Step 2 | SQL Code

CDW VistA Data

```
/*****************************************************************************************************************
The query below pulls immunizations from CDWWork that were administered at station 668 during
VisitDateTime range 9/1/20 to 1/31/21. The output from the query is stored in a temporary table called
#ImmunizationsVistA.
*****************************************************************************************************************/
DROP TABLE if exists #ImmunizationsVistA
```

CDWWork3 Method

Step 1 | Identify Tables and Columns of Interest

Table 1 contains a list of tables and columns used in the demonstration that follows. Main columns include those that appear in the query SELECT statement, linking keys include primary and foreign key columns that are used for joining tables together, and filtering columns are those that appear in query filtering logic.

Step 2 | SQL Code

```
/*****************************************************************************************************************
The query below pulls immunizations from CDWWork3 that were administered at station 668 during
VisitDateTime range 9/1/20 to 1/31/21. The output from the query is stored in a temporary table called
#ImmunizationsConverged.
Note, to prepare for a site's transition to Cerner, historical VistA data from that site are migrated into
```

Conclusion

In this notebook, we provide two potential methods for identifying immunizations administered before and after the Cerner EHR transition using, 1) CDW VistA data and CDW Millennium data, and 2) converged VistA-Millennium data. Immunizations administered post-Cerner transition (i.e., those recorded in Millennium EHR) have a Sta3n = 200. The

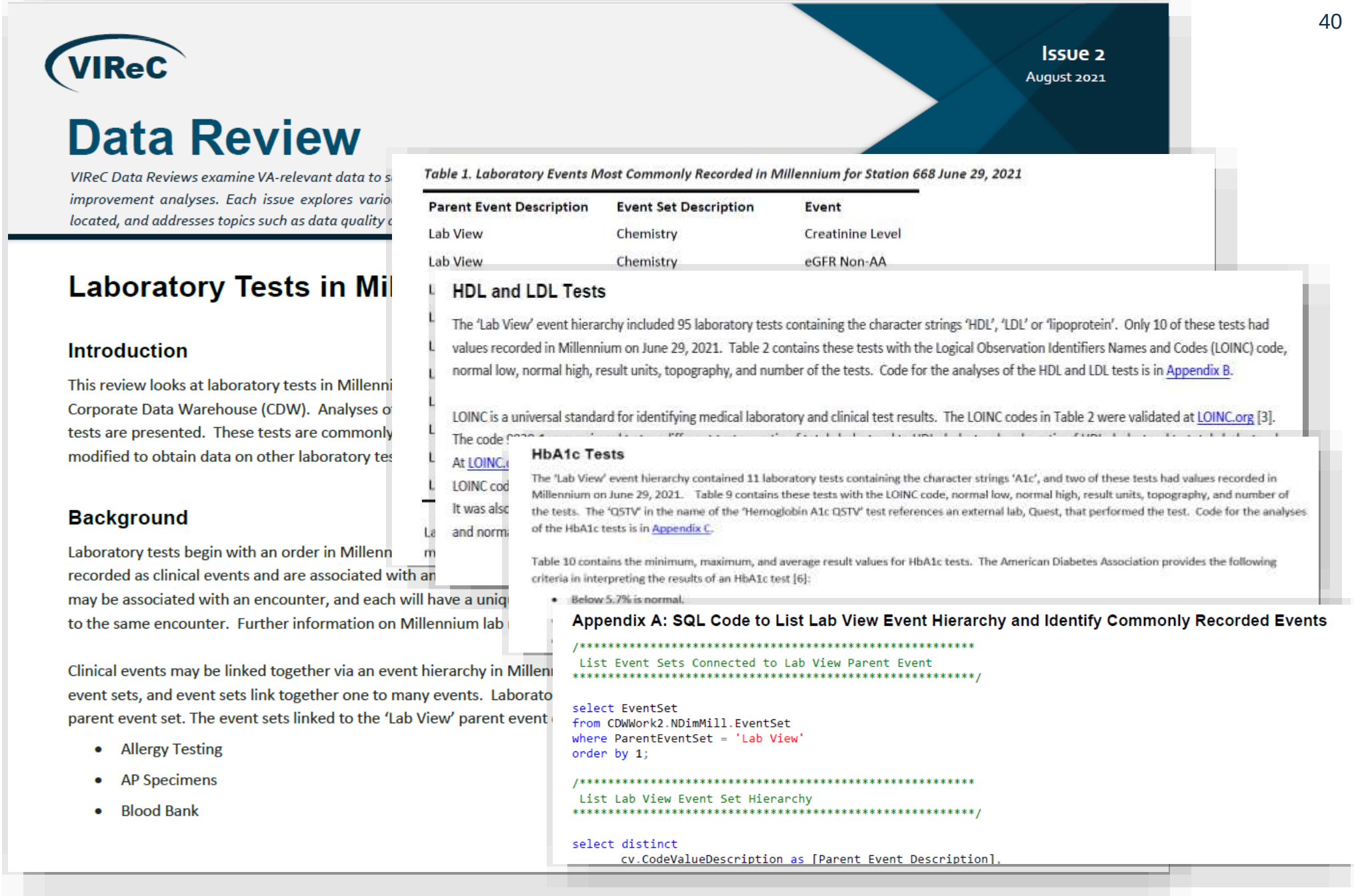
Appendix A: SQL Code

Use of the methods in this appendix require access privileges for CDWWork2 and/or CDWWork3.

```
/*Pulling immunizations from CDW VistA data*/
DROP TABLE if exists #ImmunizationsVistA
SELECT b.ImmunizationSID
      ,c.ImmunizationName
      ,a.VisitSID
      ,a.VisitDateTime
      ,b.Sta3n
      ,e.StaPa
INTO #ImmunizationsVistA
FROM CDWWork.Outpat.Visit as a
INNER JOIN CDWWork.Immun.Immunization as b ON
      a.VisitSID = b.VisitSID
      AND (b.VisitDateTime >= CONVERT (DATETIME2(0), '2020-09-01') AND b.VisitDateTime <= CONVERT
      (DATETIME2(0), '2021-01-31'))
      AND b.Sta3n IN('668')
INNER JOIN CDWWork.Dim.ImmunizationName as c ON
      c.ImmunizationNameSID = b.ImmunizationNameSID
INNER JOIN CDWWork.Patient.Patient as d ON
      a.PatientSID = d.PatientSID
INNER JOIN CDWWork.Dim.Institution as e ON
      a.InstitutionSID = e.InstitutionSID
WHERE (a.VisitDateTime >= CONVERT (DATETIME2(0), '2020-09-01') AND a.VisitDateTime <= CONVERT
      (DATETIME2(0), '2021-01-31'))
      AND a.Sta3n IN('668')
      AND d.CDWPossibleTestPatientFlag <> 'Y';
```

VIReC Product Spotlight

VIReC Data Reviews examine VA-relevant data to support their use in VA research, evaluation, and quality improvement analyses.



VIReC

Issue 2
August 2021

Data Review

VIReC Data Reviews examine VA-relevant data to s
improvement analyses. Each issue explores vario
located, and addresses topics such as data quality

Laboratory Tests in Mi

Introduction

This review looks at laboratory tests in Millenni
Corporate Data Warehouse (CDW). Analyses o
tests are presented. These tests are commonly
modified to obtain data on other laboratory tes

Background

Laboratory tests begin with an order in Millenn
recorded as clinical events and are associated with an
may be associated with an encounter, and each will have a uniq
to the same encounter. Further information on Millennium lab

Clinical events may be linked together via an event hierarchy in Millen
event sets, and event sets link together one to many events. Laborato
parent event set. The event sets linked to the 'Lab View' parent event

- Allergy Testing
- AP Specimens
- Blood Bank

Table 1. Laboratory Events Most Commonly Recorded in Millennium for Station 668 June 29, 2021

Parent Event Description	Event Set Description	Event
Lab View	Chemistry	Creatinine Level
Lab View	Chemistry	eGFR Non-AA

HDL and LDL Tests

The 'Lab View' event hierarchy included 95 laboratory tests containing the character strings 'HDL', 'LDL' or 'lipoprotein'. Only 10 of these tests had values recorded in Millennium on June 29, 2021. Table 2 contains these tests with the Logical Observation Identifiers Names and Codes (LOINC) code, normal low, normal high, result units, topography, and number of the tests. Code for the analyses of the HDL and LDL tests is in Appendix B.

LOINC is a universal standard for identifying medical laboratory and clinical test results. The LOINC codes in Table 2 were validated at LOINC.org [3].

HbA1c Tests

The 'Lab View' event hierarchy contained 11 laboratory tests containing the character strings 'A1c', and two of these tests had values recorded in Millennium on June 29, 2021. Table 9 contains these tests with the LOINC code, normal low, normal high, result units, topography, and number of the tests. The 'QSTV' in the name of the 'Hemoglobin A1c QSTV' test references an external lab, Quest, that performed the test. Code for the analyses of the HbA1c tests is in Appendix C.

Table 10 contains the minimum, maximum, and average result values for HbA1c tests. The American Diabetes Association provides the following criteria in interpreting the results of an HbA1c test [6]:

- Below 5.7% is normal.

Appendix A: SQL Code to List Lab View Event Hierarchy and Identify Commonly Recorded Events

```
/************************************************************
 List Event Sets Connected to Lab View Parent Event
************************************************************/

select EventSet
from CDWWork2.NDimMill.EventSet
where ParentEventSet = 'Lab View'
order by 1;

/************************************************************
 List Lab View Event Set Hierarchy
************************************************************/

select distinct
       cv.CodeValueDescription as [Parent Event Description],
```

VIReC HelpDesk for Individualized Support

Assists researchers with understanding VA data and information systems within the context of their specific projects.

- VIReC subject matter experts respond directly to HD questions
- Use organizational knowledge and liaison relationships to connect requestors with the expertise they need

virec@va.gov

Stay Abreast of New Data or Updates

NEWS FOR USERS OF VA DATA AND INFORMATION SYSTEMS

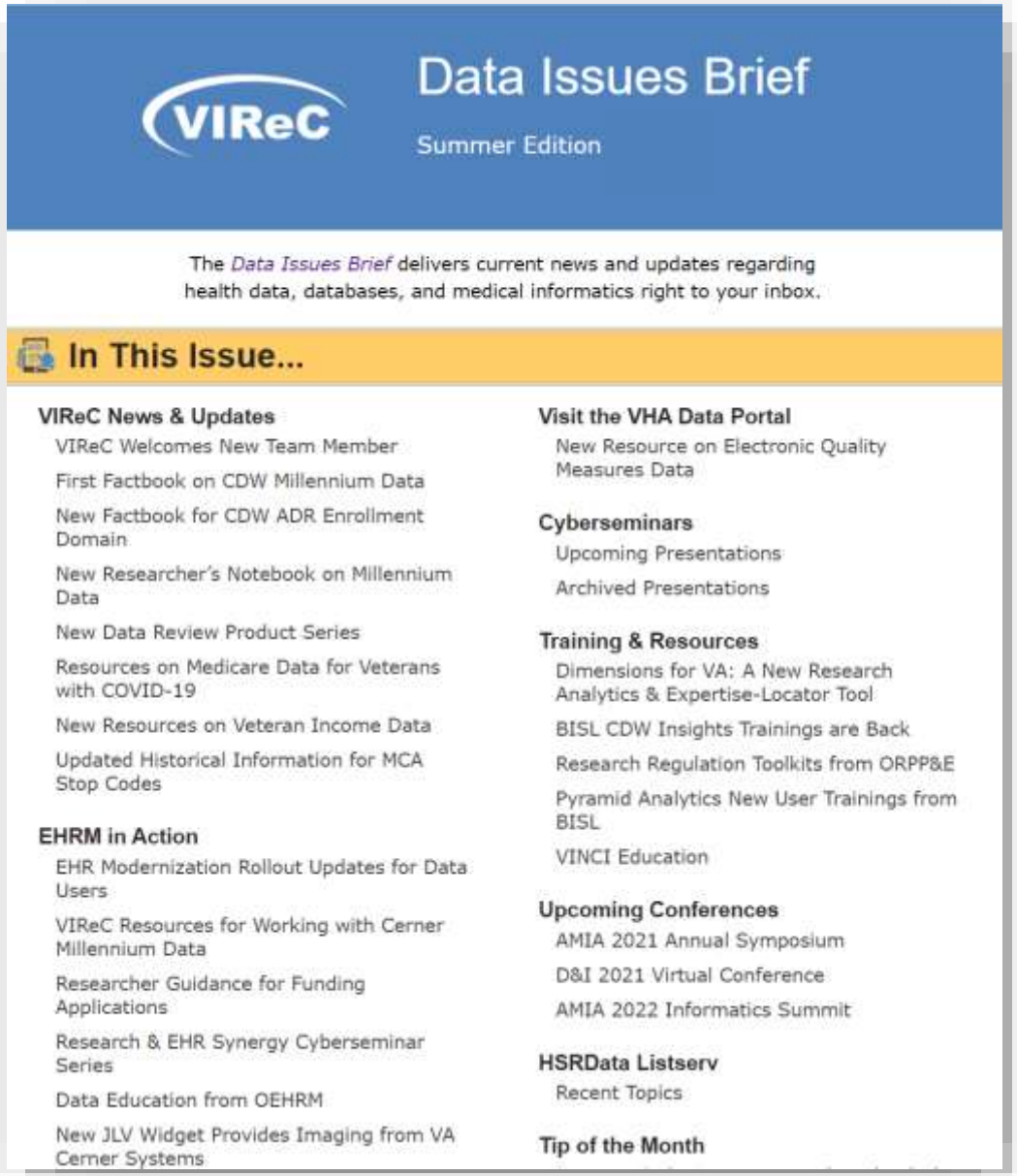
PEER LEARNING & COMMUNITY KNOWLEDGE-SHARING

TRANSITION TO NEW ELECTRONIC HEALTH RECORD

News for Users of VA Data and Information Systems

- Quarterly updates on clinical and administrative data resources, VA databases, clinical informatics, electronic health record modernization
- Timely topics, spotlight tips, and training opportunities

Current and archived issues:
https://vaww.virec.research.va.gov/DIB/Overview.htm (VA Intranet)
E-mail virec@va.gov to subscribe


VIReC

Data Issues Brief

Summer Edition

The *Data Issues Brief* delivers current news and updates regarding health data, databases, and medical informatics right to your inbox.

In This Issue...

VIReC News & Updates
- VIReC Welcomes New Team Member
- First Factbook on CDW Millennium Data
- New Factbook for CDW ADR Enrollment Domain
- New Researcher's Notebook on Millennium Data
- New Data Review Product Series
- Resources on Medicare Data for Veterans with COVID-19
- New Resources on Veteran Income Data
- Updated Historical Information for MCA Stop Codes

EHRM in Action
- EHR Modernization Rollout Updates for Data Users
- VIReC Resources for Working with Cerner Millennium Data
- Researcher Guidance for Funding Applications
- Research & EHR Synergy Cyberseminar Series
- Data Education from OEHRM
- New JLV Widget Provides Imaging from VA Cerner Systems

Visit the VHA Data Portal
- New Resource on Electronic Quality Measures Data

Cyberseminars
- Upcoming Presentations
- Archived Presentations

Training & Resources
- Dimensions for VA: A New Research Analytics & Expertise-Locator Tool
- BISL CDW Insights Trainings are Back
- Research Regulation Toolkits from ORPP&E
- Pyramid Analytics New User Trainings from BISL
- VINCI Education

Upcoming Conferences
- AMIA 2021 Annual Symposium
- D&I 2021 Virtual Conference
- AMIA 2022 Informatics Summit

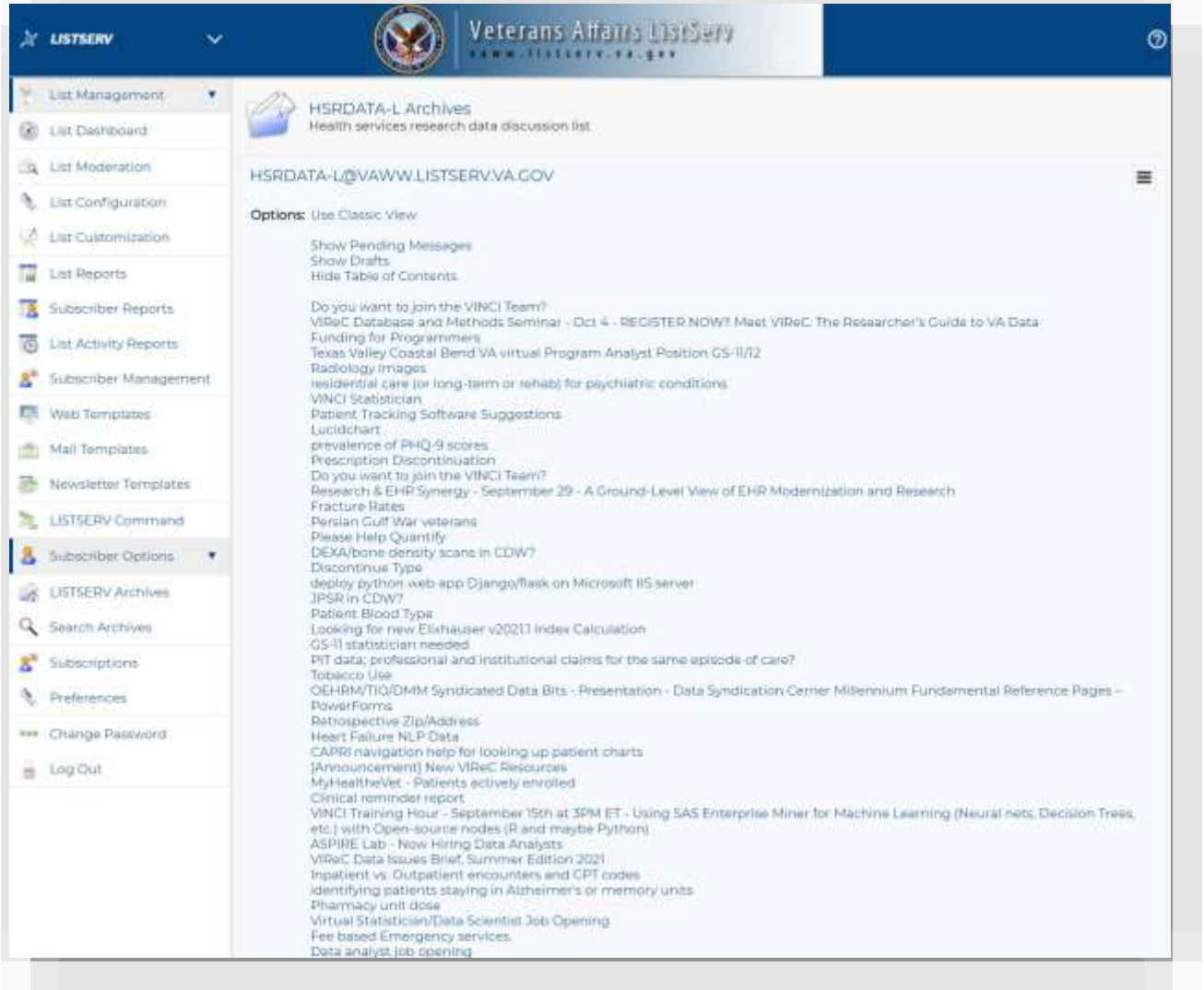
HSRData Listserv
- Recent Topics

Tip of the Month

HSRData Listserv for Community Knowledge-Sharing

- Members **ask and answer** specific questions about using VA data
- **1,600+ participants**
- Multiple perspectives from across the **VA data ecosystem**: PIs, fellows, analysts, data managers, statisticians, operations and program staff, data stewards, resource center experts, data architects
- Shared experience and tacit knowledge about **historical and nuanced aspects of VA data** and their application to research questions

CONVERSATIONS ABOUT VA DATA
HSRData Listserv



More information about HSRData
http://vaww.virec.research.va.gov/Support/HSRData-L.htm
(VA Intranet)

PARTNERING WITH THE VA

VA | U.S. Department of Veterans Affairs

OPPORTUNITIES FOR USING AND WORKING WITH VA DATA

VA Partnerships, Collaborations, Affiliations

All VA research is intramural, meaning only VA employees can conduct research under VA's sponsorship. Non-VA researchers can access VA data through collaborative research studies or by becoming a VA employee.

Get Involved in VA Research

- Collaborate with a VA researcher
  - Search the VA Health Services Research & Development (HSR&D) Directory to find VA researchers who share your research interests. www.hsrd.research.va.gov
  - Reach out to the Associate Chief of Staff (ACOS-R) for Research at your local VA Medical Center (VAMC) to ask about collaboration opportunities. www.research.va.gov/about/national_directory.cfm
  - Unpaid, without compensation (WOC) research positions will allow you to work with a VA investigator.

Become a VA employee

- Visit the VA Office of Research and Development website for a list of open Research positions and fellowship opportunities. www.research.va.gov
- Visit USAJobs.gov

VIReC has positions available!

Visit our website to learn more about open positions!

THANK YOU!

Visit our website at:
www.virec.research.va.gov

Contact our HelpDesk for questions on VA data at:
virec@va.gov

Additional questions may be sent to:

Maria Souden, MSI, PhD
National Chair, EHR Modernization Research Sub-Council
PI, ORD Strategic Initiative for Research & EHR Synergy (OSIRES)
Director, VA Information Resource Center
maria.souden@va.gov

Chandrea Culbreath, MPH, BSN, CHTS-TR
Customer Engagement, Assessment and Portfolio Management Lead, VA Information Resource Center
chandrea.culbreath@va.gov