Cyberseminar Transcript

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Session: An Introduction to VA Pharmacy Data: Sources and Uses for Medication Information

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Hira: All right. Hi everyone, and welcome to Database and Methods, a Cyberseminar series hosted by VIReC, the VA Information Resource Center. Thank you to CIDER for providing technical and promotion support. So Database and Methods is one of VIReC's core Cyberseminar series, and it really focused on helping VA researchers access and use VA databases.

This slide shows the series schedule for the year. Sessions are held on the first Monday of every month at 1 PM Eastern. More information about this series and other VIReC Cyberseminars is available on VIReC's website, and you can view past sessions on HSR&D's VIReC Cyberseminar archives.

Quick reminder once again to those of you just signing on, slides are available do download. This is a screenshot of a sample email you should have received today before the session. In it, you will find the link to download the slides. Today's presentation is titled "Introduction to VA Pharmacy Data: Sources and Uses for Medication Information." It will be presented by Dr. Bonnie Paris and Dr. Walid Gellad.

Dr. Paris is a data knowledge analyst at VIReC, where she manages VA REDCap and develops data knowledge products. Prior to joining VIReC, she worked as a deputy associate director for the Clinical Partnerships for Healthcare Transformation Group within the VA Center for Applied Systems Engineering. Dr. Gellad is a core investigator at the VA Center for Health Equity Research and Promotion, staff physician at VA Pittsburgh, and associate professor at the University of Pittsburgh School of Medicine and School of Public Health. He is also co-director for the Center for Pharmaceutical Policy and Prescribing. His research focuses on physician prescribing practices and on policy affecting patient access to medications. He was the recipient of a VA HSR&D Career Development Award for addressing regional variation in drug prescribing and spending among patients with diabetes in the VA system. Thank you both for joining us today.

Dr. Bonnie Paris: Thank you so much, Hira. Are you able to see my screen?

Hira: Yes, looks good.

Dr. Bonnie Paris: Okay, great. Thank you. Welcome, everybody, and thank you for joining us today. After a brief introduction, we will talk about five commonly used Pharmacy Data sources and then Dr. Walid Gellad will talk about an example of research that he did that's focused on pharmacy care at the VA. Then we'll come back to me, and I'll talk more about the resources that we have available to you on VA Pharmacy Data. Then we'll open it up to questions and answers. Typically we receive a lot of questions, so we're allowing a bit of time for that. But first, we want to know a little bit more about you. We have a role about you as your use of data at the VA. What is your role in the VA? Are you an investigator, a PI, or a co-investigator; a data manager, analyst, or programmer; a project coordinator; or other? And if you pick other, please use the Q&A function in the chat window to let us know a little bit more about that. Some people wear a lot of different hats. Just try to choose the role that's most representative of what you do.

Heidi: Responses are coming in. We'll give everyone a few more moments to respond before we close the poll out and go through the results.

Dr. Bonnie Paris: Great. Thank you, Heidi.

Heidi: Okay, it looks like we're slowing down, so I'm going to close this out. What we're seeing is 22% of the audience saying investigator, PI, or co-I; 50% data manager, analyst, or programmer; 12% project coordinator; and 16% other. In that other category, we have pharmacoeconomics, clinical informatics and neurology, clinical program manager, and VOD collaborator. Thank you, everyone.

Dr. Bonnie Paris: Thank you so much for telling us a little bit about yourself and Heidi for walking us through the results. By the end of the Cyberseminar, you'll understand the VA Pharmacy Data that we have available for research and also appreciate the value of using non‑VA data sources in concert to measure pharmacy use. You'll also know where to find more information and resources about VA Pharmacy Data and what you need to do to request the data.

But first, I'll talk about some of the commonly used pharmacy data sources, so the first four are national data sources for data on medications that are provided by, or paid for by the VHA. They contain information from the Veterans Health Information System and Technology Architecture, also known as VistA. So if you take that acronym and pronounce it, we generally call it VistA. It's also sometimes called the Computerized Patient Record System, or CPRS. So if you hear VistA or CPRS, that's our electronic medical record. And data from VistA feeds into these four different sources. The best sources depend on your focus. We'll go through each one and talk about similarities and differences between them. It includes the Corporate Data Warehouse, or CDW; Observational Medical Outcomes Partnership, or OMOP; the MCA, Managerial Cost Account National Data Extracts, or MCA NDE; and Pharmacy Benefits Management, or PBM.

The fifth data source is from the Centers for Medicare and Medicaid Services, or CMS. The data steward for that is the VA Information Resource Center, or VIReC, which is where I work. That dataset contains information on services that were received outside of the VA and paid for by Medicare or Medicaid.

Now we have another quick poll on your use of VA pharmacy datasets. Which sources of pharmacy data have you used in the past or plan to use in the future? Please select all that apply. CDW pharmacy data, OMOP pharmacy data, MCA NDE pharmacy data, PBM pharmacy data, the Medicare Part D Slim file, or none.

Heidi: Unfortunately, because of limits in GoToWebinar, I'm only able to have five options. We do not have the none option, which I'm sure a lot of people want to use. I apologize. To get all of the files out here I had to cut something, and that was...

Dr. Bonnie Paris: That's okay.

Heidi: Because that's a lot of them.

Dr. Bonnie Paris: Yeah, for those of you who have not worked with VA pharmacy datasets before, when you're going through and looking at the Pharmacy Data, it's important to look at what is considered a VA pharmacy item. The VA formulary includes prescription medications and over-the-counter medications as you might expect. But it also includes a variety of supplies and equipment such as sanitary napkins and medical bracelets, toothbrushes, things like that. So just a note for those of you who would be picking none.

Heidi: And it looks like we've actually slowed down here, so I'm going to close this out. And what we're seeing is 90% of the audience saying the CDW Pharmacy Data.

Dr. Bonnie Paris: Okay.

Heidi: Twenty percent OMOP Pharmacy Data, 17% MCA NDE Pharmacy Data, 39% PBM Pharmacy Data, and 17% Medicare Part D Slim File. Thank you, everyone.

Dr. Bonnie Paris: Okay, great. Well, so at least 90% of our attendees have some experience using Pharmacy Data then, which is great. First, thank you for sharing that about yourselves.

First I'll talk about the Corporate Data Warehouse, or CDW. The data steward is National Data Systems. And the CDW is the largest data source that we have. It's central to VHA's strategic goal of increasing VA's capacity to use data and analytics for evidence-based decision making and research. And over time, they're transitioning more and more data into the CDW. We have more than 130 local VistA systems that cover 150 VA medical centers, and there are data feeds for each transaction. So for example, if medication is ordered, that data is fed into a regional data warehouse, and then the CDW pulls data at night, according to the current architecture, into the CDW.

The data in the CDW goes back to 1999. We have over 15 years of data. There's just a massive amount of data that's in the CDW. It's in a Microsoft SQL server that can be queried using SQL. It's organized by different domains.

For Pharmacy Data, the two main domains are Bar Code Medication Administration, or BCMA, and that contains data on medications administered to a patient within the VA system, whether it's in an inpatient setting or sometimes in an outpatient clinic. And the other primary domain is outpatient pharmacy, which is data about medications that are dispensed by VA pharmacy. So the care delivered at all VA facilities regarding the prescription medications gets recorded in the CDW. There's some information about prescriptions that were filled at non-VA facilities but paid for by the VA. There's also a really small percent of non-Veterans who receive care in a VA facility. For example, humanitarian care to somebody who is on a VA facility may be treated by the emergency department at the VA, but it's the Veteran; just something to keep in mind when you're using the CDW data for research. Although a small number are not Veterans, you might want to make sure that that gets cleaned out.

On this slide, and I know there's a lot of data on this slide to absorb, it's just to give you an example of some of the variables that you're going to find in the CDW. It's not an exhaustive list, but I'm going to use the same example of a hydrochlorothiazide tablet and the different data sources, just so that you can get a sense of some of the data that is available in the different systems. Hydrochlorothiazide, or HTZ, is taken for hypertension or high blood pressure. And this [unintelligible 12:12] patient instructions are to take one tablet by mouth every day for blood pressure. Then you can see that there are also variables with the dispensing units, which is the amount to take each time, which is one tablet, and so on. So this is just to give an example of some of that pharmacy data that you can see in the CDW.

The VIReC website has some information about pharmacy data and CDW data, in particular on CDW's structure and content and record counts, null counts, and so on. We produce a number of researcher's notebooks that give a more detailed look at different aspects of working with the data that are generally by and with members of the VA research community to help share vetted methodologies for using the data. I'll talk more about other resources, including how to request access to data, at the end of the presentation.

The next dataset is produced by the VA Informatics and Computing Infrastructure department, or VINCI, which transforms some data from the CDW into the Observational Medical Outcomes Partnership, or OMOP, common data model. The OMOP dataset is not a replacement for the CDW as OMOP does not have all of the variables that CDW has. But an advantage is that the OMOP data goes through a cleaning process. VINCI has informatics research nurses, and they collaborate with other groups, including VA Pharmacy Benefits Management, to map the drug data. They also work closely with the MBP program. Currently, data is available from October 1999 through October 2017, and the data will be refreshed through June 2018 later this month. VINCI is working to reduce the turnaround time with which the OMOP data is refreshed. You can join or follow the VINCI OMOP user's group on VA Pulse to learn more and receive information about when the refreshes are done. And I would like to thank Liz Henchpro [phonetic 14:43], an informatics research nurse specialist at VINCI, for her help on understanding this new resource.

Here are some example values that you may see in the OMOP dataset. Although the OMOP dataset does not include the full fig [phonetic 15:00], or patient instructions, the data can be linked to the CDW to bring all of that in if needed. OMOP is really meant as a supplement to the data in the CDW, and they make it very easy to link back to the CDW. Classes of drugs and ingredients of drugs are easier to identify in OMOP because it uses RXNorm \*15:22, which is a normalized naming system for generic and branded drugs that the National Library of Medicine produces.

This slide has a link to the VINCI team's OMOP data page on VA Pulse. The VINCI team posts a variety of resources for OMOP data on their VA Pulse page. For anyone who is not familiar with VA Pulse, it's an online social networking site at the VA, and any current VA staff member with a valid VA.gov email address can register. So you need to log in to get to see those, but the accounts are free and pretty easy to get.

The MCA National Data Extracts, or MCA NDE, are another important resource for pharmacy research data. The Managerial Cost Accounting National Data Extracts, which we produce the acronym MCA NDE, the data steward is the VHA's Managerial Cost Accounting Office. Sometimes people refer to it as the DSS dataset because it comes from the Decision Support System and the need to get acronym DSS. The files themselves, when you work with them, are still labeled DSS, even though we now call it the MCA NDE, so apologies for confusion for everyone. So even though the name has changed and the data systems have changed over the years, the data extraction process has been updated to maintain the same representation of what the data means.

This data source was created for operational look, to look at different aspects of clinical care in conjunction with the cost to provide that care. So as the name may imply, the Managerial Cost Accounting Office, they are looking at what do things cost. They use activity-based costing to get an idea of not just what supplies cost, but the labor costs and overhead associated with producing and providing a service. So the data in the MCA NDE is available from fiscal year 2005 and includes records for inpatient and outpatient prescriptions from VA pharmacies and Consolidated Mail-Out Pharmacy, or CMOP. The VistA systems are the data source, and this data is housed within the CDW on a CDW Raw server. And although the data lives on a CDW server, the data steward that manages the creation of the data and the curation of the data is the Managerial Cost Accounting Office.

This slide shows some example variables from the MCA NDE. And this example in inpatient fill of 30 days hydrochlorothiazide 25 mg has a dispensing cost of approximate $24.16. Although the price for the drug product itself was about 52 cents, it costs a total of about $24.68 to provide the medication to the patient. So in this example, it's an inpatient fill, and that's part of why the dispensing cost would be higher. The same medication in a CMOP would be lower. So the other thing that I would like to highlight on this slide is that there is a VA product code and the National Drug Code as well, which you can link back to other data and find additional information on the formulary about the medication itself. But one of the advantages of OPOP, which we discussed previously, is that that kind of information is more readily available and you don't have to develop your own crosswalks.

There are a variety of resources for the MCA NDEs. VIReC has a web page with documentation, including an updated Research Users Guide to the pharmacy MCA NDE. The Managerial Cost Accounting Office also has a web page on National Data Extracts and Reporting Information that contains a lot of detailed information about each time the dataset is produced and the processes they go through to produce it. And the Health Economics Resource Center, or HERC, also maintains a web page, not just about MCA NDEs but pharmacy data in general. And just a note that HERC also has information on their website about non-VA medical care pharmacy files, which we don't cover in this presentation because those files do not contain clinical information such as the drug name, drug class, or the quantity dispensed.

The fourth source that's based off VistA data is Pharmacy Benefits Management, or PBM. The PBM service handles all VHA medication dispensing. They have a national database that contains extensive information about all prescriptions dispensed within the VHA system, starting in 1999. And again, the source of that data is local VA facility VistA systems. And there are three prescription level extracts that can be used by researchers: The prescription extracts, the unit dose extract, and the IV extract. And these three are often referred to collectively as the PBM3 database. The data is available from PBM in a custom extract, and it requires a request directly to them, which is a slightly different process than the other data sources. There is a link to more information about that when we talk about the resources.

This slide gives an example of some of the data that you would see from PBM, including the medication, dispensing, the cost to patient, writer. This data can be linked using a patient identifier back to additional information on the patient or patient stay.

This link is to the PBM formulary page that has information on the VA formulary.

Let's take a moment to think about some uses of pharmacy data in research. One is who prescribed the medication or who was the medication prescribed for? What did it cost? When was it dispensed? Where was it dispensed? And why was the medication prescribed? So there are a lot of different uses of pharmacy data in research. It can be to look at trends in medication use, such as which medications are being used to treat a given condition or how use has changed over time due to policy or new treatment options that are available, cohort identification of which patients are taking the given medication, or looking at utilization and quality and how VA performs on process-based quality measures related to medication management, whether medications are being prescribed appropriately or adherence to therapy for a given medication.

And when looking at the best sources for data information on providers and patients found in each of these data sources, the granularity of data can differ. But in general, clinical information and related visits and stays can be linked to the pharmacy data using a patient identifier, so there end up being a lot of similarities.

But note that when looking at the SIG, it's available both in PBM and CDW. The instructions for use include the schedule, unit dose, and dispensing unit. And although there are elements of the drug cost in the CDW and PBM, the total cost to provide the drug to the patient is found in the MCA NDE only. So that includes the cost of the drug itself, the labor cost to fill the prescription, and other costs associated with filling the prescription such as packaging and postage.

When we start to look at what the medication is, in particular the directions for use, as I said before, also called the SIG, the reason why it's in CDW and the PBM but not the others is that PBM and CDW are more closely related to that clinical data where the care is being provided. And the reason why the total cost to provide the drug to the patient is in the Managerial Cost Accounting system is that the purpose of that system is really focused on cost. So the purpose of the system really shapes the data that is in there.

The data and time that the medication was dispensed or returned is available in CDW, MCA NDE, and PBM. The schedule of when dosage should be taken is both in CDW and PBM. But only the CDW has the medication administration time because the medication administration is done by nursing, and PBM is focused on pharmacy and not nursing activities, whereas CDW includes all of that and more.

There are many, and for the most part, overlapping data elements included in all of the databases, including where the pharmacy activity took place.

But when it comes to why the medication was prescribed, none of these data sources can tell you that directly. So sometimes the reason why the medication was prescribed can be assumed from the indication for the medication. So for example, metformin is prescribed to treat high blood sugar or diabetes. However, you can use the patient identifier to link to additional information to help solve the puzzle of why a particular medication was prescribed for something that it may not be as clear for. So for example, Wellbutrin may be prescribed to treat clinical depression. It could be prescribed for smoking cessation or both.

The last dataset that I'll talk about is the Medicare and Medicaid CMS file. The VHA also provides data from external agencies, including CMS. And we send a list of known Veterans to CMS and then CMS sends back data for VA to use. VIReC serves as the data steward. This contains the data for Veterans that are treated by the VA who are also receiving care through Medicare or Medicaid. In 2013, 44% of VHA patients were also enrolled in Medicare Part D, so it can be a substantial number of people.

The drug files come in what's called the Slim File. It's a select [inaudible 28:19] of 15 variables that are the most useful for understanding drug utilization. There's a service date that we see. Code, quantity dispensed, days supply. There's also a patient payment field and a gross drug cost field, which is calculated by Medicare, and so on.

VIReC also provides education and assistance to VA researchers using the data for research on Veterans' use of Medicare and Medicaid, and this links to additional information about that.

Now it is my pleasure to turn you over to Dr. Walid Gellad, who will talk about an in-depth example of pharmacy research using VA data that he did. Thank you.

Dr. Walid Gellad: All right, give me a minute. Thanks, Bonnie. All right, folks see my slide? All right.

Heidi: We are not seeing it in slideshow mode yet.

Dr. Walid Gellad: Yup.

Heidi: Perfect. Just what we need, right there.

Dr. Walid Gellad: Great. Thank you. All right. Thanks, Bonnie, for the introduction. We're going to do things a little bit different from last year where I had gone through three or four studies, just one or two slides each. Here, we're going to go through one study in particular and focus on the details and really the mechanics and how you do research using VA and CMS Pharmacy Data. And this is in response to some feedback from last year, so we'll see how it goes. Please give us your feedback when we finish for how this went this year.

So this is actually a repeat of a slide that slide that Bonnie already did, so I won't spend a lot of time. But VA Pharmacy Data has been used in a lot of ways. We talked about trends in medication use. You can look at policy, the impact of policy change over time. There's studies around utilization and quality, cohort identification, which Bonnie had mentioned. Also important to talk about, there's a lot of more traditional pharmacoepi that's been done in the VA, drug safety and outcomes research and a lot of different examples of that. So this is not an exhaustive list, but gives you a sense of how VA Pharmacy Data has been used in research.

So we're going to focus, like I said, on one particular study, and I, fortunately, decided to use one of our own studies. This just came out a couple months ago in Annals of Internal Medicine. It's titled Receipt of Overlapping Opioid and Benzodiazepine Prescriptions Among Veterans Dually Enrolled in Medicare Part D and the VA. So the objective of this study was to assess the association between dual use of VA and Medicare drug benefits. That's the main exposure. And then receipt of overlapping opioid and benzodiazepine prescription, which is the outcome. So again, I'll go through some of the mechanics of exactly how we did this research using VA and CMS data.

So how was pharmacy data used? The first step is cohort construction. So the cohort was prescription opioid recipients who were dually enrolled in both VA and Medicare Part D. So I won't go into the part where we talked about dual enrollment, but they were dually enrolled. Then we had to identify if they had received an opioid, so we used, in this case, PBM Pharmacy Data to look at opioids, and we used Part D data to look at opioids. We chose PBM for a number of reasons, which we can get into later during discussion if people want. So that's for cohort construction.

Our outcome had to do with overlapping benzodiazepines, so we had to identify benzodiazepines and when they overlapped with opioids. And again, we used PBM data for VA and we used linked CMS Part D data for CMS, so PBM and Part D benzodiazepine data.

One of the first tasks when you do this kind of work is to identify medications similarly in PBM and Part D. This was a little bit of a headache but is really important for this kind of research. The idea is that when you identify opioids or you identify benzodiazepines or you identify whatever drug it is you're studying that you do it the same in VA and Part D. So I'm going to give you examples of how we did that and why that's important.

So how do you, so the first step, we'll go through a number of steps. The first step was to identify opioid recipients in PBM and Part D, and I talked about this. This is how we developed our cohort. But from PBM, we used VA generic name to identify all opioids. In Part D, we used Part D generic names, and I'll show you examples of this later, and also NDC codes that we obtained from Medispan. Medispan is a proprietary database and it has a list of drugs and drug classes and NDC codes. Now we included NDC codes for two reasons. One is to be sure we were complete in making sure we captured all opioids and all benzodiazepines, so in this case all opioids so we used NDC codes. The other is that this project, not this paper but this project, also examined Medicaid drug files which are linked to VA. But Medicaid does not have a dug name identifier. It only has NDC codes, so if you want to look in Medicaid, you need to use NDC codes. So we had used the VA generic names and in Part D generic names and NDC codes, and I'll show you that in a second.

The next step, what we did is we created a common definition of all drugs in PBM and Part D. Essentially that means we mapped Part D drugs to the VA formulary, VA National Drug File. We wanted all drugs in Part D to have a name that was similar to what was seen in VA so that we could identify all drugs the same whether they're in VA or Part D. So to do this, and I'll show you some of the steps, we matched Part D data to the VA National Drug File, which is publically available, using NDC codes. So every Part D drug that's been dispensed has an NDC code. Then we matched that to the National Drug File, which would give us a VA drug name associated with that NDC. We were able to match Part D drugs, 95% of Part D drugs to VA drugs using this file. Now this is all drugs, not just opioid and benzos. We wanted to do this for all drugs that we were studying.

So here's an example. Here are the contents from National Drug File. So you can see here, here's the NDF NDC. So for every Part D drug there was, we linked this NDC back to this National Drug File, which would then give us the VA product name, VA class, and VA generic name for that product. So this was very useful for merging these two datasets together. So the 5% that we couldn't match using NDC we then matched taking the generic name, dosage form, and strength from Part D and merging it to the National Drug File.

So why did we do this? I think this is not absolutely necessary. We did this for a number of reasons, so here are the reasons. One is that you can use VA drug class, which will then apply to both VA drugs and Part D drugs so you have a uniform definition. The other is we wanted to perform drug-based comorbidity adjustment, so we wanted all drugs categorized so we could look at all antidepressants, all cardiovascular drugs, etc., and we can do it the same in both VA and Part D. This is valuable for when you want to calculate morphine equivalent so you can make sure you're calculating everything the same in VA and Part D. We wanted to do drug count and so if we were counting the number of drugs, the same thing that's a drug in VA will be called a drug in Part D. And we wanted to identify non-drugs. As Bonnie had mentioned, in PBM data, you have supplies, you have syringes, you have pads, you have test strips. And so if you just do a count of the number of drugs, you're not going to be measuring things the same in VA and Part D. So that's one benefit of doing this merger.

So we mapped these Part D drugs to the VA formulary, and then step three is we identified opioids in PBM and Part D. So in this case, now that everything is arranged based on VA product name and VA generic name, we could search the generic field in PBM data for these names essentially is what we did in this step to identify opioids.

What you get is here. So this is an example of, if you search all prescriptions containing oxycodone. Now this is now in PBM data. I'll show you CMS data later. But these are all the oxycodone-containing products. Here's the VA generic name, acetaminophen/oxycodone, and then the VA product name. The VA product name includes also a dose and a dosage form, how it's different from the VA generic name, and you can see all these different products. So if you take an example on the first one, acetaminophen/oxycodone, what's interesting is that for a given VA product, which includes the dose and the dosage form, you'll have a number of different NDCs. But we get around that issue by just having merged all these drugs up front and having a common description and just being able to use the VA product name and the VA generic name, but that step will identify all opioid-containing products from PBM.

Then we do the same in Part D. So this is a column of the drugs identified from Part D that contain oxycodone. So you have a VA product name, you have a VA generic name. You have the generic name from Part D. And then this is just from our data. This is how we matched the VA and Part D data in this case and the number of drugs. So you could probably skip the first line. But if you go to the second line, you can see oxycodone 10 and acetaminophen 325. Here's the generic name. Here's the generic name from Part D, and then we matched these based on NDC codes.

So in this way we identify all the opioids from Part D, and I think this is a good example, actually if you look here, of why this standardization can help. It's simple issues as this. If you look in the VA data, it's acetaminophen/oxycodone. And in the Part D data, it's the reverse. It's oxycodone/acetaminophen and you have the hydrochloride after the oxycodone. So it's fine if you want to do one or two drug classes. You can identify these issues. But if you're trying to look at all drugs dispensed, all thousands of different drugs, it becomes hard to make sure you've captured every scenario where the names might be different in VA and Part D, so that's one reason in addition to merge, to merge using a common drug name as we did.

So we've identified opioids in VA and Part D. That gave us our study cohort. So we had VA and Medicare Part D enrolled individuals who received at least two opioid prescriptions on two different days, with 15 days total days supply in the calendar year. And days supply is easily obtained from the Pharmacy File. And then we categorized this cohort into three groups based on where they received their prescription. This is not just opioid prescriptions or benzos, it's any prescription. So we have a VA only use that receives all their prescriptions from VA. Medicare only use receives all their prescriptions from Medicare. Then there's the cohort of 189,000, about half the cohort that received at least one prescription from each, from both VA and CMS. We called this our dual use group.

So we've identified opioids. We identified a cohort. Then the next step is quite easy. You're just identifying benzodiazepines in PBM and Part D. Again, since the names have been merged, since we can just use VA generic name, we searched both VA and PBM, VA and Part D files for these names, the names of all benzos. Now an obvious question is how do you know you have all the right generic names? That's obviously a key issue and you need to be sure of that. In our case, we used VA class so we could identify all benzodiazepines. We had also looked in Medispan to make sure we capture all possible generic names of benzodiazepines. Then we asked around. That's really the way to make sure you have a full list of all drugs. If you only search within VA data for benzodiazepines, you would miss the drugs that are not on formulary or that are not dispensed at all in VA, and you might miss them then in Part D.

All right, just a couple more minutes and then we'll be done with this section. So then we needed to identify overlap with PBM and Part D data. So we've identified opioids and benzos. How do they overlap? This was another headache. It's actually not that hard, but I wanted to make sure I used this headache thing at least one time so you know it wasn't super easy but it takes a little bit of work. But this is a pictorial of how it's really done.

What you do is for every day of the year, these numbers represent each day of the year. You identify if someone is receiving an opioid or receiving a benzodiazepine. Many on the seminar may already know how to do this. But we identify from VA, PBM, if they're receiving an opioid on those days. We identify if they're receiving benzodiazepines from PBM. And the same with Part D opioids and Part D benzodiazepines. You identify this simply based on the release date for VA and the days supply, and in Part D it'll be the service date plus the days supply. Then you can identify for each day of the year whether there's an active prescription. Then you can count up the number of days, in this case where you have overlapping opioids and benzos, whether they're from VA or Part D.

You can see, in this way you can also add up the morphine equivalents. You can add up the daily dosage of opioids here. You add the dosage from PBM and you add the dosage from Part D and you get the total dosage. That way we can count up the number of morphine equivalents and we can count up the number of days overlap.

Then this is just the one result slide, and then I'll turn it over to Bonnie. Let me run you through this. I think this is really interesting. This is the slide from the paper. On the bottom is the percentage of days supply that you, of all your meds you received from VA. So this 0% means they get none of their meds from VA. So these are the Part D only users. They get all their prescriptions, not just opioid and benzos but all their prescriptions from Part D. On the other side here, you get 100% of your days supply from VA, so these are the VA only users. Then in between are different percentages of your days supply of medications you received from VA. So folks in this group, 60 to 70%, will receive between 60 and 70% of their days supply medications from the VA, the rest from Part D, etc.

Then we're plotting the two outcomes we looked at. This is an opioid/benzo overlap measure. It's from the Pharmacy Quality Alliance, but it's 30 days of overlapping opioid and benzos. Then the orange was our own outcome where we wanted to have 30 days of overlap, but we wanted the overlap to happen while the opioid was at a very high dosage of 120 morphine equivalents, and that's the orange. What you see is really interesting, is that in the VA only and Part D only groups, the rates of these outcomes is the lowest. Then they're highest where the prescriptions are more evenly split between VA and Part D. This was interesting when you think about the hypothesis about whether there's some issues around care fragmentation.

So we'll end it here or I'll end it here. Hopefully through the mechanics has been helpful. If not, definitely tell us in the feedback. But I'll turn it over to Bonnie now.

Dr. Bonnie Paris: Thank you so much, Walid. It was great to hear about your project as well. So hopefully you're able to see my screen again. I'm going to quickly go through some different resources that we have available, and then we'll have some time for questions.

Okay, on the intranet, VIReC has a Pharmacy page that gives an overview of Pharmacy Data sources and links out to additional information about each source.

We also produce a variety of different products. For example, the Research User Guide on prescription data, CDW Factbooks that provide information on each domain or some of the domains on the CDW.

One of the main resources is the VHA Data Portal. If anybody has not visited the VHA Data Portal, I highly recommend visiting the site. It's a one-stop shop to learn about requesting access to VHA data or to learn more about the various VHA data sources and resources available to users.

Just very quickly, to request access to the data, there is a link to the VA Data Portal. There is a page on data access to learn more about the process, whether you're requesting for research or operational use. There is also a really good presentation by Linda Kok on requesting access to VA data. The link is provided there, and she walks through how to find data to answer your question, determine your project's data access category, identify the request process for the data source or sources that you need, and then how the, that you would receive access to the data.

VIReC also offers a variety of options to have any questions that you have answered. We have an HSRData Listserv that Hira talked about earlier. There are a variety of people who participate and it's really, really to sign up. There's a link here on the slide. We also have a help desk. You can either call or email us with any questions.

Dr. Gellad and I are happy to answer any questions that you have now or later. You can contact us. The information is on this slide.

The next session of VIReC's Database and Methods Cyberseminar is Ascertaining Veterans' Vital Status: Data Sources for Mortality Ascertainment and Cause of Death by Dr. Charles Maynard of the Denver-Seattle Center of Innovation. And that will take place on February 4th.

Thank you! What questions do you have?

Hira: Hi Bonnie! I'll be fielding those to you now. We've got a few questions in for both you and Dr. Gellad. Okay, the first one. Where are data on scripts filled in on non-VA facilities but paid for by the VA stored?

Dr. Bonnie Paris: Okay, so that the dataset that I alluded to that HERC has some information on, on their website. So there's basically a dataset on purchased services from the VA. So if you go to the link to the HERC website, you'll find more information about that.

Hira: All right, thank you. I think this next question came in during Dr. Gellad's explanation about his example. Why did you choose PBM to identify opioids?

Dr. Walid Gellad: Yeah, I thought that question might come up. I think part of it depends on what dataset you're familiar with. This was also, we did this, we started this four or five years ago. So I think we had been familiar with PBM data. PBM data come in a standardized format. It's always going to look the same. And so there's some familiarity with it once you use it. CDW is more complicated. I think once you're able to, once you know how to use it, it can be very valuable and you don't have to re-request additional data and all the data are there. But initially, we had been more comfortable with using PBM data at the time we did this study. I think the information is very similar. It's just a matter of what your comfort level is with each of the datasets. But we wanted to be able to access dose and dispensing date and didn't really care too much about cost and so we had focused on that data.

Hira: All right, thank you. The next question: Does MCA NDE also include dispensing cost for drugs dispensed at non-VA facilities but paid for by VA?

Dr. Bonnie Paris: No, it does not. The MCA NDE only has the information on pharmacy care that's provided by the VA. The purpose of the system is to understand the cost of providing care. So although I believe the MCA NDE set may have some information about purchased care services and the work that goes along with providing that, but again, the data on purchased pharmacy care doesn’t have the granularity of the clinical information about the pharmacy care that’s provided. One place that you can find some information about non-VA meds is in the CDW. But that is generally self-reported patient data and dependent on what the care provider records as medications that the patient is taking that were not paid for or prescribed by a VA provider.

Dr. Walid Gallad: And Bonnie, as well, just one thing I might add is that there’s an important nuance with, there’s going to be care purchased outside the VA for which the prescription is still dispensed within the VA. So those data are going to be included, and they’re dispensed by the VA, even though a non-VA prescriber through Choice, through some other, or one of the newer programs may be prescribing it. But right, that’ll be different than prescriptions that are actually dispensed at a non-VA pharmacy, which are much more rare but do happen.

Dr. Bonnie Paris: Great. Thank you.

Hira: All right, the next question: Dr. Gellad, if you had used OMOP and thus had the RXNorm codes, would that have made it easier to match up the drugs between VA and CMS?

Dr. Walid Gellad: So I’ll tell you right now we’re using OMOP and we’re using CDW, and having RXNorm available is a huge, huge advantage, so I think now we would use OMOP and RXNorm. I think it’s still not a perfect match, so I still think we’d probably go through the same process of making sure we have the right VA product names and the right generic names, but I think the NDC code may be easier to use in the OMOP data than what it has been in the past in the PBM data. As folks probably know, the NDC is not really used within VA to identify drugs, so to use NDC, sorry, NDCs are not used that often, so to use NDC alone previously had not been a great way to identify drugs within VA. I think now the matching to RXNorm and OMOP helps on that end.

Hira: All right. Thank you. Okay, next question. If I’m interested in reviewing medical and pharmacy records for a particular drug for Veterans, besides CDW what other database would need to be checked to capture all medication use by the individual patients?

Dr. Walid Gellad: Bonnie, I don't know if, I would say with CDW, the nice thing about CDW is you have access to all the medical data, medical claims or visits, and all the pharmacy visits, so all of that information will be in the CDW. The non-VA meds that are entered by clinicians will be listed. But for an individual who is dually enrolled in Medicaid or Medicare, you would have to then request those data to get a complete list of what drugs a patient is on. And then you still don’t have 100% guarantee that any meds through private insurance, you won't have access to those. I will say I believe now you can get access to DoD data or Tricare data, although that may be something new, you can get a complete picture through CDW for outpatient meds, for non-VA meds if they’re listed. You can link in Medicaid, Medicare data. You can link in DoD data I think. You just still can't get the private insurance data, the cash pay at the pharmacy, and right. That’s, and Bonnie, I don't know if you have anything else to add to that.

Dr. Bonnie Paris: No, you gave a great answer. So when you’re looking for the comprehensive care that’s provided by the VA, CDW is really the largest data source in terms of the different domains that are included, so that would be the first place that I would look. But as Walid said, that you know, if somebody is receiving care outside of the VA, that doesn’t necessarily get captured by us. So there are challenges in finding the right additional data sources and then linking them to the VA data.

Dr. Walid Gellad: And I would just say two more things. One is that the other piece I should add is that you can get some Bar Code Administration data, so if they administered drug on the inpatient side, if they’re in a nursing home and they’re administered drugs in a VA nursing home, if they’re administered Part D institutional drugs, so those are some additional datasets. The other thing I would say is we had a paper recently about opioids and there’s been other papers also that if you only use VA data to study pharmaceuticals, you’re missing a lot actually. And this is a big issue for VA-related research; it’s actually a big issue for all research, but most other places ignore if someone is in the VA. They just have their own private insurance data that they might study. So I think accessing these other data sources are really important for studying pharmaceuticals within VA.

Hira: All right, thank you. We have a couple more questions, so we’ll try to get those. I think you touched on this already, but can you explain in which data are non-VA medications found?

Dr. Bonnie Paris: So non-VA meds is actually its own domain that’s inside the CDW. I believe VIReC has a Factbook about it that describes the contents of that domain. But that’s what the patient reports taking that has not been prescribed by the VA.

Dr. Walid Gellad: Bonnie, I think we’re going to have to add something to our talk next year.

Dr. Bonnie Paris: Yes, well, we’ll bring that in next year because we got a couple questions about that already.

Hira: I’ll send you guys a full list of questions after the presentation.

Dr. Bonnie Paris: Okay.

Hira: All right. The last question I’ve got here for you guys, can you also explain if My Health*e*Vet data is captured in any of the data options?

Dr. Walid Gellad: No.

Dr. Bonnie Paris: No. No, not in any of the options that we discussed, so if somebody is entering data into their My Health*e*Vet personal health record, that does not get captured in the CDW, OMOP, MCA, PBM, or Medicare datasets.

Hira: Okay. Just got one more question in. Do VA researchers have access to data from the State Prescription Drug Monitoring databases for the purposes of tracking opioid or benzo use?

Dr. Walid Gellad: Well, I’ll take that. I think in some individual states and on individual patients you do, but it hasn’t been linked in to the EHR in VA yet. It’s not available nationally. Eventually it will be, but it is not yet.

Hira: All right. Thank you both so much. Those are all the questions we had. I’m glad we were able to get through them all.

Dr. Bonnie Paris: Okay. Thank you.

Hira: Thank you for taking the time to present today. As Bonnie had mentioned, we do have another session scheduled for our Database and Methods Cyberseminar series. That session will be on Monday, February 4th, at 1 PM Eastern. It will be presented by Dr. Chuck Maynard, who will talk about the mortality ascertainment and cause of death. We hope to see you there.

[ END OF AUDIO ]