Colorado All Payer Claims Database
Data Release Application
Part I

CENTER FOR IMPROVING VALUE IN HEALTH CARE

Part I of the Data Release Application should be used to submit background information related to your organization's request for data from the Colorado All Payer Claims Database (CO APCD). This information will help the Center for Improving Value in Health Care (CIVHC), the Administrator of the CO APCD, understand the questions you are trying to answer with your data request and assist us in helping you through the data request process. All CO APCD data requests go through a careful review and approval process and involve a licensing fee. CIVHC has a team of Health Data Solutions Consultant who will work closely with you throughout the data request process.

Prior to completing the questions below, please review the information on requesting data and reports located at https://www.civhc.org/get-data/non-public-data/.

Project Information	
Project Title:	**23.25 Provider networks, hospital systems, and changes in practice in response to regulations**
Date:	5-26-23
Organization Requesting Data:	University of Wisconsin-Madison
Contact Person:	Victoria Zhang
Title:	Assistant Professor of Management and Human Resources
E-mail:	Victoria.zhang@wisc.edu
Phone Number:	607-280-4666
Address:	975 University Ave, Madison, WI
CIVHC Contact:	Eddy Costa

Project Purpose

1. **Describe your project and project goals/objectives in detail.**

   This project will study how provider social networks and social influence shape professional practices and affect the care that patients receive in Colorado. It has the following objectives: (1) Examine how provider characteristics and provider patient-sharing networks are associated with high-risk professional practices; (2) Examine how patient-sharing networks are associated with changes in high-risk practices before and after new policies and regulations are introduced; (3) As an example examine, how provider networks shape the prescribing of buprenorphine's for treating opioid-use disorders (3) Examine how formal forms of organizations – the type of hospital systems and insurance networks – shape provider networks; (4) Examine how providers change their practices in response to new regulations; (5) Examine how adverse events change collaboration patterns between providers; (6) Identify the social network structures and processes that amplify learning at the physician-community-level.

   Identifying the network structures, community characteristics, and social influence processes between physicians is expected to produce new insights into the mechanisms underlying the variability in professional practices. It will inform strategies and interventions that help effectively structure provider networks to optimize efficacious practices. The results of this analysis will provide researchers, regulators, and pharmacy benefit managers with improved understanding

of the type of social network structures and processes that maximize learning and peer influence in social networks that lead to the adoption of efficacious practices.

Methodology: To model how provider network structures and communities are associated with changes in prescribing, I will construct longitudinal provider social networks using patient-sharing records. This method of social network construction has been widely applied in prior health care services research, which has shown that provider networks transmit information and advice between physicians (Barnett et al. 2011), predict the diffusion of expertise and medical innovations (Pollack et al. 2015) as well as collaboration, teamwork, information sharing, health care integration, learning, and teamwork (Everson et al. 2018, Funk et al. 2018, Ghomrawi et al. 2018, Hollingsworth et al. 2016, Zhang and King 2021). I will subsequently construct physician communities using community detection algorithms.

To understand the extent to which network position or prescriber characteristics are associated with changes in prescribing, a difference-in-difference approach will be used to assess changes in prescribing for the physicians who are in states with regulations ("treated") and observationally similar physicians who were not subject to regulations ("control"). I will also use network analytical tools to model the social influence practice across physician community and organizational environments.

2. What specific research question(s) are you trying to answer or problem(s) are you trying to solve with this data request? (Please list and number the individual questions.)

This project will answer these specific research questions:

I. How do provider networks shape response to new policies and regulations (such as opioid prescribing guidelines)?
II. How do changes in the institutional and regulatory environment shape provider networks?
III. How do provider networks shape patients' disparities in care, such as the receipt of a buprenorphine prescription for opioid-use disorder?

3. How will this project benefit Colorado or Colorado residents? (This is a statutory requirement for all non-public releases of CO APCD data. Contributions to the generalizable knowledge is not sufficient.)

This project will produce new insight into the mechanisms underlying the variability in professional practices at the physician network level. It will inform strategies and interventions that help effectively structure provider networks to optimize efficacious practices. The results of this analysis will provide researchers, regulators, and pharmacy benefit managers with improved understanding of the type of social network structures and processes that maximize learning and peer influence. The interventions can inform policy makers of how to optimize provider networks in Colorado to increase the adoption of efficacious practices.

4. Describe how the project will meet one or more of the Triple Aim criteria below.

a. Improve the patient experience of care (including quality and satisfaction)
b. Improve the health of populations
c. Reduce the per capita cost of health care

The findings of the project will provide insights into improving the quality of care and the health of patients by identifying the provider network characteristics that increase efficacious prescribing practices and curb potentially inappropriate prescribing to patients. Our analysis

hopes to answer how formal forms of organizations (hospital systems, insurance networks) affect social influence and collaboration patterns between providers and gain a better understanding of how provider networks shape learning from adverse events. Our research hopes to improve the health of populations by understanding how provider network community characteristics associated with variability in professional practices impact patients and healthcare consumers.

5. **The State of Colorado and CIVHC are committed to ensuring everyone, regardless of demographics, has access to the care they need when they need it. How might your project contribute to that?**

   By investigating how provider networks shape disparities in care, this project will produce insights that help inform policies to improve access to care and overall patient health. Changing health needs, growing public expectations, and ambitious new health goals are raising the bar for health systems to produce better health outcomes and greater social value. Our research and analysis will highlight how high-quality health systems may optimize health care in each given context by consistently delivering care that improves or maintains health, by responding to changing population needs.

6. **Can CIVHC publicly share your organization's' name in the work we do to promote our Change Agent clients in our Change Agent Index?** ☒ Yes ☐ No

Type of Output Requested: *Select the level of detail that you are requesting. If you are unsure, please contact us at ColoradoAPCD@civhc.org.*

☐ De-identified Data Set
☐ Limited Data Set
☒ Identified Data Set
☐ Standard Report
☐ Custom Report

Lines of Business: *Which payers do you need for your project purpose?*

☒ **Commercial Payers (Includes Medicare Advantage)**
☒ **Health First Colorado (Colorado's Medicaid Program)** – *Note: Medicaid only data requests must be reviewed by the Colorado Department of Health Care Policy and Financing (HCPF) to ensure alignment with administration of the Medicaid program as required by federal law.*
☒ **Medicare Fee For Service (FFS) – *Note:*** *Data requests for Medicare FFS are only available for authorized users for research purposes and must be approved by HCPF.*

Years Requested: *What years of claims do you need to meet your project purpose?*

☒ 2012
☒ 2013
☒ 2014
☒ 2015
☒ 2016
☒ 2017
☒ 2018
☒ 2019
☒ 2020
☒ 2021
☒ 2022

Data Needs

The following questions are related to Protected Health Information (PHI) to determine if you need a Limited Data Set or an Identifiable Data Set. The Data Elements Dictionary detailing the fields available for both types of data can be found at https://www.civhc.org/get-data/non-public-data/. **Note that any data request including PHI will need Part 2 of the Application and approval by the Data Release Review Committee.**

1. Do you need patient-specific dates (e.g., dates of service or DOB) or 5-digit zip code? If so, this is a request for a **Limited Data Set**.

   ☒ Yes ☐ No (Dates of Service and Date of Birth are needed for this analysis)

2. Do you need direct patient identifiers such as name, address, or city? If so, this is a request for an **Identifiable Data Set** (requires IRB approval).

   ☒ Yes ☐ No

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Colorado All Payer Claims Database
Data Release Application
Part 2
(Limited Data Sets and Fully Identifiable Data Sets ONLY)

Project Information from Part 1 of Application	
Project Title:	**23.25 Provider networks, hospital systems, and changes in practice in response to regulations**
Date:	6-28-23
Organization Requesting Data:	University of Wisconsin-Madison

The CO APCD is committed to protecting the privacy and security of Colorado's claims data. The CO APCD will limit the use of the data to purposes permitted under applicable laws, including APCD Statute/Rule, HIPAA/HITECH, and Antitrust laws, to information reasonably necessary to accomplish the project purpose as described in this Application. Under HIPAA, PHI may only be released in limited circumstances for public health (public health agency), health care operations, and research purposes under the terms of a HIPAA compliant data use agreement (DUA).

Any requestor receiving a CO APCD data set, must submit to APCD Administrator a Data Management Plan that outlines data security and data management policies and procedures to safeguard the data. This Data Management Plan must be approved by APCD Administrator prior to any data release.

1. **<u>Data Element Selection Member-level Detail</u>** – *Do you need member level PHI data for your project purpose? In keeping with the minimum necessary standard established under HIPAA, CO APCD policy is to release only those data elements that are required to complete your project.*

    ☐ No
    ☒ Yes (*Justification must be provided for each)*
        ☐ 3-digit zip
        ☐ Name (first, last, middle)
        ☐ Street Address
        ☐ City
        ☒ Member 5-digit Zip
        ☒ DOB **(limiting to 18 years of age and older)**
        ☒ Gender

- Patient DOB:
    - Patient ages 18 and above are needed to capture a more comprehensive scope of physicians' high-risk prescribing. Based on prior literature, much of the high-risk

prescribing practices occur among the elderly population, so it is important to have data on older patients to accurately model physician practices.

2. **Claim-Level Detail** – *Include specific diagnosis codes, CPT4, CDT, ICD9 or 10, APR-DRG, or revenue codes in an attachment.*

   ☐ No
   ☒ Yes (*Justification must be provided for each)*
      ☒ Age at time of service
      ☒ Age at year end
      ☒ Diagnosis
      ☒ Procedure/Revenue Code

- Patient age at year end and gender.
    - The study will investigate provider networks shape disparities in care. The analyses will assess prescribing and treatment outcomes for patients split by age, gender.
    - This requires variables of patient age and gender.
    - The study will examine how provider networks contribute to geographical variability in prescribing practices. This will require zip codes to model clustering of treatment at the zip code level. Zip codes will also be used to as a control for co-morbidity and general prevalence of misuse and abuse.
- Diagnosis and procedure code.
    - To investigate how policies shape prescribing practices for physicians who have similar patient pools, it is important to control for measures of co-morbidity using diagnoses information.
    - Both diagnoses and procedure codes are important for analyzing how provider networks influence learning from adverse events of patient overdoses and ER visits, which will be identified from diagnosis and procedure codes.

3. **Claim Type** – *What types of claims do you need for your project purpose?*

   ☒ Inpatient **(IP)** – Related to individuals who receive care in hospital settings
   ☒ Outpatient **(OP)** – Related to an individual receiving medical treatment in any setting other than a hospital admission (i.e. ambulatory surgery center; doctor's office, imaging center, emergency room, home health, etc.)
   ☒ Professional **(PROF)** – Related to medical procedures within professional settings (e.g. physician office, imaging center, etc.) and clinics
   ☒ Pharmacy **(PC)** – Related to prescriptions with an 11-digit National Drug Code
   ☐ Dental **(D)** – Related to individuals receiving dental care in any dental setting

- Inpatient, outpatient, professional, pharmacy data.
  The project will examine provider networks and prescribing patterns, so it will require inpatient, outpatient data to construct provider networks and pharmacy data and professional data to identify prescribing practices by health care setting.

4. **Provider-Level Detail** – *Do you need claims limited to specific providers or provider type(s) for your project purpose? (Provider IDs, locations, hospitals, medical groups, etc.)* ***PLEASE DO NOT LIMIT PROVIDER CLAIMS***

   ☒ No
   ☐ Yes (check all that apply)
      ☐ Facilities (please specify) Click or tap here to enter text.
      ☐ Professionals
      ☐ Provider Taxonomy - Specialty Designations
      ☐ National Provider Identifier
      ☐ Other (please specify) Click or tap here to enter text.

- I will need Provider Taxonomy and NPI to identify characteristics of physicians, including specialty, gender, age to be used as controls for models analyzing the unique effects of social networks.
- To investigate my research question of how formal organizations shape provider networks, I will need Facilities and Professionals data to identify characteristics at the hospital and medical groups level.

5. **Provider Geography** – *Do you need provider geography or location data?*

   ☐ No
   ☒ Yes (check all that apply)
      ☐ Provider location address
      ☐ Provider Zip 3
      ☒ Provider Health Statistic Region http://www.cohid.dphe.state.co.us/brfssdata.html
      ☐ Provider County
      ☒ Provider Zip 5
      ☐ Other (please specify) Click or tap here to enter text.

- This project will investigate how provider networks shape practices. Provider location at the zip5 level and HSR level is crucial to measure the geographic proximity of providers to one another in order to account for peer effects. It is also crucial to the modeling of geographic clustering of prescribing practices.

6. **Payer-Specific Details** – *Do you need specific named payer details? (only available for authorized requestors)*

   ☐ No
   ☒ Yes

- This study will investigate how formal organizations including insurance networks affect informal provider networks. Thus, payer-specific details are needed.

7. **Payment Type** – *Which elements of cost data do you need to support your project purpose?*

   ☒ Charged Amount
   ☒ Plan Paid Amount
   ☒ Member Liability, i.e., amount the member is responsible for
      ☒ Coinsurance
      ☒ Deductible
      ☒ Copay
   ☒ Total Allowed Amount – (summation of plan paid and member liability)
   ☐ Prepaid Amount – (to be considered for capitated payment plans only)

- This study will investigate how changes in formal policies affect provider practices and patient outcomes; thus knowing the payment details for the service patients received may shape this process and thus needed for the study.

8. **Data Element Selection**

If you have not already done so, complete the Data Element Dictionary (DED) to identify the specific data elements that are required for this project.

9. **Data Source Linkage** – *Will you link the CO APCD data to another data source?*

   ☐ No
   ☒ Yes. If yes, please answer the following questions.
      a. What is the other data source or sources you plan to link CO APCD data with?
      b. Which CO APCD identifying data elements will be used to perform the linkage?
      c. Once the linkage is made, what non-CO APCD data elements will appear in the new linked file?

The data will be linked to the following sources:

1) Publicly available provider NPI database using ***provider NPIs*** to identify provider characteristics including gender and graduation year.

2) Publicly available database through ***provider NPI codes*** to get variables of past history of sanction.

3) Publicly available datasets for hospital closures, mergers and acquisitions, which will be linked using ***provider zip codes***, to identify which zip codes had experienced an organizational-level change.

10. **Institutional Review Board** – *Have all necessary approvals been obtained (e.g., IRB or Privacy Board approval)?*

   ☐ No or N/A, reason: Click or tap here to enter text.
   ☐ In progress. Anticipated approval date:
   ☒ Yes. If so please provide copy. **APPROVED AND ATTACHED BELOW.**

2022-1012-CP001ApprovedLetter.pdf

11. Distribution of the Report or Product – *Requires review before publication*

If you are producing a report for publication in any medium (print, electronic, lecture, slides, etc.) the CO APCD Administrator must review the report prior to public release. This requirement is further spelled out in the Data Use Agreement. The CO APCD Administrator will review the report for compliance with CMS cell suppression rules, risk of inferential identification, and consistency with the purpose and methodology described in this Application. Do you acknowledge this requirement?

☐ No
☒ Yes

12. Project Schedule:

Proposed Project Start Date:	August 1st, 2023
Project End Date:	December 31, 2033
Proposed Publication or Release Date:	Results will be publicized through working papers, and then published in academic journals as they are completed.
Data Destruction Period:	All data must be destroyed within 30 days of the project end date and data destruction certificate returned to CIVHC at datacompliance@civhc.org. The Data Destruction Certificate form can be found at https://www.civhc.org/get-data/non-public-data/.

Key measures in the analyses and the fields necessary to construct them.

- Patient-comorbidity controls. The analyses will control for the health status of the patients using comorbidity index. To construct this index requires all patient diagnoses information from inpatient/outpatient records.
- Physician social networks – this will be the key variable of interest in the analyses. To construct provider networks and to be consistent with the measures used in the academic literature, all patient-physician encounters (including the encounter type, the physician ID, the patient-ID, the date of the encounter, what prescription was written, etc.) are needed. This requires outpatient and in-patient records over time.
- Control drugs that do not have substance abuse potential. The analysis will compare prescribing of opioids and other drugs that do not have abuse potential. This requires medications other than opioids and benzodiazepines.