Existing Data may be in the form of individual records (e.g., academic, medical, financial), data sets, interview notes, biospecimens, online profiles and posts (e.g., social media), and audio- or video-recordings. These data could be available for purposes other than research, and are sometimes, but not always, identifiable.

This form is to be used when:

1. The data are individually identifiable. Data are identifiable if they include direct identifiers, such as names, email addresses or images. They may also be identifiable if a person's identity could be deduced based on the information contained in the data (e.g., a combination of unique demographics characteristics).

   Note: Data are considered identifiable when they contain unique identifiers linked to participants' names, even if the researcher does not have the key.

2. The data provider requires IRB approval even though the data are not identifiable.

3. The data, whether identifiable or not, are not public. Data are not public if researchers need to create an account, register a study, submit an application, or enter into an agreement before accessing the data. Data provided by colleagues by way of a personal arrangement or request are not considered public.

This form is to be used **regardless of the type of review** (exempt, expedited, or full) that will be used for the protocol.

- Fill out this application and email it to campusirb@duke.edu or the IRB staff person you are working with. **Combine this form and any appendices into a single Word file.** Submitting the protocol in multiple files or as a PDF will delay the pre-review of your application. (However, agreements specifically pertaining to the request or access of existing data can be submitted as PDFs.)
- **Please note**: Signatures in Section 2 are required for final approval. Faxed and scanned signatures are acceptable, as are electronic signatures. We cannot accept typed names.

Section 1: General Information

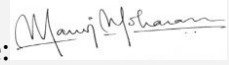
Protocol Title: Effects of Negotiated Price Transparency Regulations: Evidence from Hospital Prices

Section 2: Key Study Personnel

Principal Investigator

Identify one Principal Investigator (PI) on this project and sign below.

- This person is responsible for the overall conduct of the research. For all students, fellows, and post-docs, this is your faculty advisor.
- If you have more than one PI, only choose one.
- By signing, the PI certifies to the following:
  - I have read and approved the protocol.
  - I assume responsibility for ensuring that my advisees are aware of the responsibilities as researchers.
  - I ensure that the IRB will be immediately notified in the event of unanticipated risks to participants, protocol deviations, or findings during the study that would affect the risks of participation.

Name: Manoj Mohanan: dissertation committee member, advisory role on this project	**Department or School**: Public Policy
E-mail Address: manoj.mohanan@duke.edu **NetID**: mm267	**Phone Number**: (919) 613-9263
☒ **Faculty Advisor** ☐ **Faculty Researcher** ☐ **Staff** ☐ **Other**: Click or tap here to enter text.	
Signature: 	**Date**: 4/28/2023

Duke Research Team

Please list the other Duke members of the research team AND indicate their role on the project. Do not list non-Duke researchers. These team members can be added in a later section.

Feel free to copy and paste, or delete the blocks as necessary.

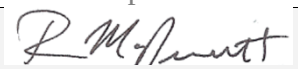
All signatories agree to the following:

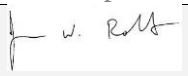
- I will not begin the research until written approval is secured from the IRB. Note: Approval will not be provided unless certification to conduct research with human subjects for each researcher named on the protocol is current.

- I will conduct this study as described in the approved protocol.
- If any changes are anticipated, I will submit a Request to Amend an Approved Protocol, and I will not implement the changes until I receive approval from the IRB.
- I will contact the IRB staff promptly if any of the following events occur: unanticipated risks of harm to participants, protocol deviations, and findings during the study that would affect the risks of participation.

Name: Christopher Behrer: primary researcher, this project is Mr. Behrer's dissertation	**Department or School**: Public Policy, Economics, Medicine
E-mail Address: christopher.behrer@duke.edu **NetID**: cb431	**Phone Number**: 412-551-5464
☐ **Faculty** ☐ **Undergraduate** ☒ **Graduate student** ☐ **Postdoc** ☐ **Research associate** ☐ **Other**: Click or tap here to enter text.	
Signature: 	**Date**: 5/3/2023

Name: M. Kate Bundorf: dissertation committee member, advisory role on this project	**Department or School**: Sanford School of Public Policy
E-mail Address: kate.bundorf@duke.edu **NetID**: mkb87	**Phone Number**: (919) 613-9368
☒ **Faculty** ☐ **Undergraduate** ☐ **Graduate student** ☐ **Postdoc** ☐ **Research associate** ☐ **Other**: Click or tap here to enter text.	
Signature: 	**Date**: 5/3/2023

Name: Ryan McDevitt: dissertation committee member, advisory role on this project	**Department or School**: Fuqua School of Business
E-mail Address: ryan.mcdevitt@duke.edu **NetID**: rcm26	**Phone Number**: 919-660-7740
☒ **Faculty** ☐ **Undergraduate** ☐ **Graduate student** ☐ **Postdoc** ☐ **Research associate** ☐ **Other**: Click or tap here to enter text.	
Signature: 	**Date**: 4/28/2023

Name: James Roberts: dissertation committee member, advisory role on this project	**Department or School**: Department of Economics
E-mail Address: j.roberts@duke.edu **NetID**: jr139	**Phone Number**: 919-660-1800
☒ **Faculty** ☐ **Undergraduate** ☐ **Graduate student** ☐ **Postdoc** ☐ **Research associate** ☐ **Other**: Click or tap here to enter text.	
Signature: 	**Date**: 5/4/2023

If there are more members of the research team, copy and paste the researcher information and signature block as needed.

Other Study Contacts

If there are additional personnel (e.g. a departmental staff member) who assist in protocol preparation and record keeping, and would like to be copied on correspondence from the IRB, please add them here.

Name: Click or tap here to enter text.
E-mail Address: Click or tap here to enter text. **NetID**: Click or tap here to enter text.
Type of Correspondence: ☐ Approval and Reminder Notices ☐ All correspondence related to the submission, including feedback

IRB USE ONLY

This section is to be completed by IRB staff or IRB members only.

APPROVED as ☐ Exempt ☐ Expedited or ☐ Full	
☐ IRB Designee or ☐ IRB Member	**Date**

Section 3: Departmental & Institutional Affiliations

3.1 Identify the department, institute, or center that you consider the home of the study.

Sanford School of Public Policy

3.2 Will you be collaborating with researcher(s) at other institution(s)?

See our **Collaborative Research** policy or contact IRB staff at campusirb@duke.edu to determine whether you are engaged in an inter-institutional collaboration.

☐ Yes ☒ No

If YES, please specify the following for each collaborator:

Collaborator's Name:	Click or tap here to enter text.
Role in Research:	Click or tap here to enter text.
Research Activities/ Responsibilities:	Click or tap here to enter text.
Organization/Institution:	Click or tap here to enter text.
Has your collaborator reached out to their organization/institution about IRB or ethics review?	
☐ Yes* ☐ No ☐ Collaborator's organization/institution does not have an IRB or ethics review board	
*If you indicated that your collaborator has reached out to their organization/institution's IRB or ethics review board, please describe their determination or the status of the request: Click or tap here to enter text.	

Important items to note:

- Review by the Campus IRB extends only to members of the Duke research team unless there is a formal, fully executed inter-institutional agreement among the IRBs engaged in the research.
- If your collaborator is a foreign entity, IRB staff will forward this protocol to the Export Controls and Privacy offices for ancillary reviews.

Section 4: Funding Sources and Conflict of Interest

4.1 Please identify your funding source(s):

Funding is pending from the Agency for Healthcare Research and Quality (AHRQ), which is an agency of the United States Department of Health and Human Services, and from the Washington Center for Equitable Growth (a 501(c)3 organization).

4.2 Are any of the above funding source(s) a U.S. Federal Agency or Department?

☒ Yes ☐ No

If YES, please append the grant application to this protocol request. The budget information can be removed.

4.3 Are any of the above funding source(s) a component of the Department of Defense?

☐ Yes ☒ No

If YES, please complete and append the DOD attachments to this protocol request.

4.4 Do you have an outside interest (financial or otherwise) that is in any way related to this study?

☐ Yes ☒ No

If YES, please explain.

Click or tap here to enter text.

Section 5: Research Question

5.1 What is your research question or the purpose of your research?

The purpose of this research is to assess the effects of the Center for Medicare and Medicaid Services 2021 Hospital Price Transparency rule and the state of Colorado's Shop for Care Tool, both government policies aimed at increasing price transparency for hospital services. Specifically, the research questions are:

1. What are the effects of mandated price transparency on hospital prices?
2. What does variation in effects across markets and prices suggest were the mechanisms of the effects of price transparency?
3. Did price transparency lead to follow-on effects such as changes in employer health care costs, individual marketplace premiums, and healthcare use, thereby affecting consumers?

5.2 Provide background information about the research that will help the reviewer understand your project. Avoid discipline-specific jargon.

This research will examine prices paid by private insurance companies to hospitals for medical services used by individuals insured by those companies. The study will compare these prices before and after CMS's policy requiring public posting of prices for hospital-insurer-service observations differently affected by the policy. These differences in effect exist because the state under study (Colorado) publicly posted price information for some kinds of hospital services before CMS's policy was enacted. Additionally, different hospitals face different penalties for not posting data and there is variation across hospitals in whether and how many prices were posted.

The prices for years prior to CMS's policy (pre-2021) are only available from health insurance claims data. An observation in this data is a medical service for which a hospital or health care provider submits a bill to an insurance company. For each observation, there is information about patient characteristics, service type, provider characteristics, facility characteristics, and prices.

In addition to the prices, I will use patient, provider, and facility data to construct a model to understand how patients choose and value health care providers as a function of their location, demographics, comorbidities, and patient-facility-provider specific matching (e.g. preferences of patients with a specific disease for a provider or facility specializing in treatment of that disease).

In addition to health care claims from the Colorado All Payer Claims Database, the project will use public data from CMS on hospital characteristics, a dataset of publicly posted prices (post 2021) assembled by the information technology firm Turquoise Health, and various other public government data on zip-code or county level population, demographic, and socioeconomic characteristics to conduct the above analysis.

Finally, the project will use publicly available data on insurance plan characteristics and market share and employer expenditures on health care to assess follow-on consequences of CMS's regulation on consumer and employer health insurance costs.

Section 6: Secondary Data

Research involving the study of existing data may include individual records (e.g., academic, medical, financial), data sets, interview notes, biospecimens, online profiles and posts (e.g., social media), and audio- or video-recordings. These data could be available for purposes other than research, and may be provided with or without direct or indirect identifiers, including a key.

6.1 Will any of your data be provided by the North Carolina Educational Research Data Center (NCERDC)?

☐ Yes ☒ No

If YES, append all the completed NCERDC forms to this protocol.

6.2 Do any of the data include (check all that apply):

☐ Medical records provided by Duke Health (clinic, department, or facility)
☒ Medical records provided by a non-Duke entity
☐ Academic records
☐ Data provided by a component of the DOD (Department of Defense)
☐ None of the above

6.3 Identify the dataset(s). Include the estimated number of records you will receive in each set.

Health insurance claims and patient eligibility file from the Colorado All Payer Claims Database, 600 million observations.

6.4 Identify the individuals and/or organizations providing the data.

Center for Improving Value in Health Care (CIVHC).

6.5 Are the data publicly available? Data are considered public if they are readily available for research purposes without making a formal request. That is, anybody can download the data with a simple click from an open, public-facing website.

☐ Yes ☒ No

6.6 Describe the process or mechanism to obtain the data. For example, you may need to create an account, register a study, submit an application, or enter into an agreement (e.g., a data use agreement or DUA). The process or mechanism could also include a personal arrangement with a colleague to provide you with the data.

To access the data I will submit an application and data management plan, and enter into a Data Use Agreement with the Center for Improving Value in Health Care. The application is included in Appendix B, and the data source's standard Data Use Agreement is included in Appendix C.

Include in the Appendices any documentation that explain or describe the mechanism for obtaining the data. Documentation may include an agreement, copies of confirmation emails from the data provider, or screenshots of a completed online data request application.

Important items to note:

- If the mechanism to obtain the data specifies requirements for how Duke must securely store or protect the data, the data meet Duke's "sensitive" data classification standard. The "Sensitive" Data Classification questions (Section 7) must be completed.
- If the mechanism to obtain the data requires an institutional signature, researchers may not sign on behalf of the university.

6.7 Describe the variables. The description should include any direct identifiers (names, email addresses, images, or home addresses) and/or indirect identifiers (data points that, when combined, would allow someone to deduce the identity of the subjects).

A full list of variables and definitions is included in Appendix A. Variables broadly describe medical facilities, providers, patients, services and insurance plans. Specifically, variables include type, name, and location of facilities and type, name, work location, and national (DEA/Medicare) identifiers of providers. Patient variables include a member ID variable (indirect identifier linked to name), age, zip-code, race, ethnicity, gender, and diagnosis codes that describe various health conditions of the patient, and employer identification number. Variables describing services include type of service, date of services, cost, and payment. Insurance plan variables include plan types and insurance company.

6.8 If the data include any identifiable information (direct or indirect), will the identifiers be removed from the data either before or after you receive them?

☐ Yes ☒ No ☐ N/A - data do not include identifiers

If NO, explain why the identifiers will not be removed.

Indirect identifiable information patient information includes the member ID, a de-identified variable constructed by the data source, and patient names are removed from the data before I receive them. The member ID and other indirect identifiers (age, gender, zip-code) are necessary for the analysis.

If YES, describe the process for removing the identifiers, including when they will be removed and by whom. In some cases, a third-party may be required to remove identifiers from the data.

6.9 Would an inadvertent release of identifiable data place individuals at risk of harm?

☒ Yes ☐ No

Please elaborate. For example, explain why you are confident they are no risks, or if risks are possible, describe the risks and how they may be mitigated.

The data are medical claims, so the risk to individuals is a potential breach of confidentiality. I will mitigate these risks by storing the data on Duke's Protected Network (PN).

Note: If an inadvertent release of identifiable data may place individuals at risk of harm your data meet Duke's "sensitive" data classification standard. The "Sensitive" Data Classification questions (Section 7) must be completed.

6.10 Describe how Duke will receive the data. For example, Duke researchers may need to download the data via a secure FTP service. If data will not be transferred to Duke please explain. For example, a data provider may require that Duke researchers remote into their internal servers to access the data.

Data will be downloaded from a secure portal. If necessary based on the specific technical configuration of this secure portal, Duke IT staff will transfer the data from the secure portal to the Protected Network (PN) via a temporary virtual machine that will be destroyed after the transfer.

6.11 Where will data be stored when they are "at rest" (i.e., not in use)?

All identifiable data for this project will be stored on the Duke Sanford School of Public Policy servers (SSPP) contained within the Duke University Protected Data Network (https://oit.duke.edu/about/policies/protected-network-policy) operated by Duke University Office of Information Technology (OIT).

Please review the Developing Data Protection Plans guide for a list of best practices and recommendations from the IT Security Office (ITSO).

Note: Duke University has determined that the use of non-Duke cloud services, like Google Drive, Apple iCloud, and DropBox are not approved for official Duke use.

6.12 Where will the data be analyzed?

All identifiable data for this project will be analyzed on the Duke Sanford School of Public Policy servers (SSPP) contained within the Duke University Protected Data Network (https://oit.duke.edu/about/policies/protected-network-policy) operated by Duke University Office of Information Technology (OIT).

Please review the Developing Data Protection Plans guide for a list of best practices and recommendations from the IT Security Office (ITSO).

Note: Duke University has determined that the use of non-Duke cloud services, like Google Drive, Apple iCloud, and DropBox are not approved for official Duke use.

6.13 Who will have access to the data? If any non-Duke researchers will have access to the data, please identify them.

Christopher Behrer, MD/PhD student at Duke, will have direct access to the data. This project is part of Christopher Behrer's dissertation in fulfilment of the requirements of his PhD in Public Policy & Economics. Manoj Mohanan, Kate Bundorf, Ryan McDevitt, James Roberts are Duke faculty and Christopher Behrer's dissertation committee members. They will not have direct access to the data, but will be shown de-identified, aggregate results.

6.14 Do any of your data providers require that the data be returned or destroyed after you have completed your analysis?

☒ Yes ☐ No

If YES, by what date will your data be returned or destroyed?

06/30/2026

6.15 Please indicate whether your research requires that you re-consent participants for the secondary use of their data. If you must re-consent participants, please explain how participants will be re-consented and include the consent process in the Appendices.

My research does not require that I re-consent participants.

Section 7: "Sensitive" Data Classification

This section should be completed if your study involves the collection or storage of data that meet Duke's "sensitive" data classification standard. Data are considered "sensitive" if an of an inadvertent disclosure of the data would pose risk of harm to participants or Duke is required to protect the data.

- If an accidental release of the data will place participants at risk of harm, the data are classified as **sensitive**.
- If a data mechanism specifies how Duke must be securely store or protect the data, the data are classified as **sensitive**.

Research oversight offices apart from the Campus IRB may need to conduct an ancillary review before the IRB can issue a protocol approval. Campus IRB staff will notify you in the event your research must undergo an ancillary review.

7.1 Do your data meet Duke's "sensitive" data classification? Data are considered "sensitive" if an accidental release of the data will place participants at risk of harm or a data mechanism specifies how Duke must securely store or protect the data.

☒ Yes ☐ No

If YES, the "Sensitive" Data Classification section must be completed. Please answer the remaining questions in this section.

If NO, SKIP to Appendices. Click the arrow to the left of "If NO" to temporarily collapse the ITSO questions.

7.2 Please describe the devices (laptops, tablets, mobile phones, etc.) that will be used to collect, transfer, store, and/or analyze data.

The data will be stored and analyzed on a virtual machine on Duke's Private Network. The virtual machine will be accessed via secure connection from a laptop computer issued to Christopher Behrer by Duke Medical School.

7.3 Please describe how the devices identified in 7.2 (above) will be protected.

Resources in the PN are technically configured and regularly maintained to comply with the University IT Security Office (ITSO) Server security standard and the ITSO Log standard. Network access to the infrastructure is over encrypted channels and all connections are logged. A valid Duke NetID and enrollment in Duke's multifactor authentication are required for access. Users must meet password strength requirements for accounts and personal computers according to Duke security guidelines. Backups of the data are encrypted, the infrastructure is housed in locked data centers, and only authorized staff has physical access to the data centers. The laptop that will be used to access the data was issued to Christopher Behrer by Duke Medical School and meets ITSO minimum security standards.

Note: IT Security (ITSO) has identified minimum security standards that include encryption of the mobile device or laptop, application of security patches, installation and regular updates of antivirus, and a password-protected screensaver.

7.4 Who is your departmental or unit IT contact?

Neil Prentice.

7.5 Who is responsible for data security, including upgrades?

Neil Prentice.

7.6 Sensitive data must be stored securely. Select the ITSO-approved environment where you will store and/or analyze the data.

☐ Duke's Box
☐ Duke's Microsoft OneDrive
☐ Duke's Qualtrics
☐ Duke's Zoom
☒ Duke University Protected Network ("PN")
☐ Other (please specify: Click or tap here to enter text.)

7.7 **If data will not be stored on an ITSO-approved server (see 7.6), where will they be stored?** Be specific.

Data will be stored on an ISTO approved server on the Duke Protected Network.

Note: Duke University has determined that the use of non-Duke cloud services, like Google Drive, Apple iCloud, and DropBox are not approved for official Duke use.

7.8 **Please identify the individuals who will have access to the data and describe their role in the project.** If non-Duke individuals will also have access to the data, please clarify whether data access will be on their local storage or if they will remote in to a Duke server.

Christopher Behrer, MD/PhD student will have access to the data. He will conduct all analyses on virtual machine on the Duke Protected Network. Manoj Mohanan, Kate Bundorf, Ryan McDevitt, James Roberts are Duke faculty and Christopher Behrer's dissertation committee members. They will not have direct access to the data, but will be shown de-identified, aggregate results.

If data include direct and/or indirect identifiers (see question 6.8), question 7.9 must be answered.

7.9 **How will access to the identifiable information be controlled?** For example, identify any individual(s) responsible for authorizing access to identifiable information.

Only Christopher Behrer will have access to identifiable information.

Appendices: Study Documents and Consent Processes

In this section, please include any study documents (e.g. recruitment materials, survey/interview questions, measures, and instruments, DUAs, etc.) and consent processes that you will use in your study.

Appendix A: Data Dictionary

Category	Elements	Security	Description
Key	Billing_Provider_Composite_ID	De-Identified	A unique billing provider identifier.
Key	Claim_ID	De-Identified	A unique medical claim identifier.
Key	Member_Composite_ID	De-Identified	A unique identifier consolidating member_id's from various payers and assigned to all eligibility and claims records associated with a given individual.
Key	Member_ID	De-Identified	A unique identifier associated with a single payer and assigned to all eligibility and claims records associated with a given individual for that payer.
Service	ICD_Primary_Procedure_Cd	De-Identified	Primary procedure code for this line of service.
Service	ICD_Vers_Flag	De-Identified	A flag that indicates if a code is ICD-10 or ICD-9. 0 = claim includes ICD-09 CM codes, 1 = claim included ICD-10-CM codes.
Diagnosis	Admit_Diagnosis_Cd	De-Identified	Required on all inpatient admission claims and encounters. ICD-9-CM or ICD-10-CM.
Diagnosis	Principal_Diagnosis_Cd	De-Identified	ICD-9-CM or ICD-10_CM.
Date	Admit_Dt	Limited	Date of patient admission.
Date	Admit_Dt_Day	Limited	Day of patient admission.
Date	Admit_Dt_Month	Limited	Month of patient admission.
Date	Admit_Dt_Year	De-Identified	Year of patient admission.
Date	Admit_Time	Limited	Time of patient admission.
Date	Discharge_Dt	Limited	Date of patient discharge.
Date	Discharge_Dt_Day	Limited	Day of patient discharge.
Date	Discharge_Dt_Month	Limited	Month of patient discharge.
Date	Discharge_Dt_Year	De-Identified	Year of patient discharge.
Date	Discharge_Time	Limited	Time of patient discharge.
Date	Paid_Dt	Limited	Date claim paid.
Date	Paid_Dt_Day	Limited	Day claim paid.
Date	Paid_Dt_Month	Limited	Month claim paid.
Date	Paid_Dt_Year	De-Identified	Year claim paid.
Date	Service_End_Dt	Limited	Date services for patient ended.
Date	Service_End_Dt_Day	Limited	Day services for patient ended.
Date	Service_End_Dt_Month	Limited	Month services for patient ended.
Date	Service_End_Dt_Year	De-Identified	Year services for patient.
Date	Service_Start_Dt	Limited	Date services to patient rendered.
Date	Service_Start_Dt_Day	Limited	Day services to patient rendered.
Date	Service_Start_Dt_Month	Limited	Month services to patient rendered.
Date	Service_Start_Dt_Year	De-Identified	Year services to patient rendered.
Cost	Allowed_Amt	De-Identified	The sum of the member liability amount and the plan covered amounts.
Cost	Charge_Amt	De-Identified	The dollar amount of charge.
Cost	Coinsurance_Amt	Sensitive	The dollar amount an individual is responsible for.

Cost	Copay_Amt	Sensitive	The preset, fixed dollar amount for which the individual is responsible.
Cost	Deductible_Amt	Sensitive	The amount an individual pays for covered health services before an insurance plan begins to pay.
Cost	Member_Liability_Amt	Sensitive	The percent of the medical allowed amount that the member is responsible for paying.
Cost	Plan_Covered_Amt	Sensitive	The amount the insurance plan pays.
Cost	Plan_Paid_Amt	Sensitive	Includes any withhold amounts.
Cost	Prepaid_Amt	De-Identified	For capitated services, the fee for service equivalent amount.
Cost	COB_TPL_Amount	Sensitive	Amount due from a secondary carrier.
Other	Admit_Source_Cd	De-Identified	A code indicating the point of patient origin for this admission or visit.
Other	Admit_Source_Desc	De-Identified	A description of the point of origin of admission.
Other	Admit_Type_Cd	De-Identified	The priority type of the patient visit.
Other	Admit_Type_Desc	De-Identified	A description of the priority type of the patient visit.
Other	Bill_Type_Cd	De-Identified	Identifies the facility where the claim occurred, the type of claim, and the frequency of the claim.
Other	Bill_Type_Desc	De-Identified	A description of the type of bill.
Other	Capitation_Flag	De-Identified	Indicates if services are paid under a capitated arrangement or not.
Other	Claim_Status_Cd	De-Identified	A code that indicates the status of a claim.
Other	Claim_Type_Cd	De-Identified	A code that identifies the type of a claim.
Other	COB_Flag	De-Identified	Coordination of Benefits flag indicates if the plan is a secondary/tertiary payer or a primary payer for a given member.
Other	Dental_Carrier_Flag	De-Identified	A flag that indicates if a payer is a standalone dental carrier. The standalone dental carriers will be identified by CIVHC.
Other	Dental_Flag	De-Identified	A flag that indicates if a claim has a dental service.
Other	Discharge_Status_Cd	De-Identified	A 2-digit code that indicates the status of the patient upon discharge. Required for all inpatient claims.
Other	E_Cd	De-Identified	Describes an injury, poisoning or adverse effect. ICD-9-CM or ICD-10-CM.
Other	ER_Flag	De-Identified	A flag that indicates an emergency room visit.
Other	Insurance_Product_Type_Cd	De-Identified	A code that indicates an insurance coverage type.
Other	Insurance_Product_Type_Desc	De-Identified	A description of insurance product type.
Other	Length_of_Stay	De-Identified	A duration of a single episode of inpatient admission, measured in days.
Other	Line_Count	De-Identified	A line number for a service in a claim.
Other	Line_of_Business_Cd	De-Identified	A code that classifies insurance product types into broad categories.
Other	Member_Age_Days	Limited	The member's age in days.
Other	Member_Age_Years	De-Identified	The member's age in years.
Other	Member_Age_Years_YE	De-Identified	The member's age in years at years end.
Other	Member_Eligible_Flag	De-Identified	A flag that indicates that a member was active at the time of the date of service of a claim.
Other	Payer_Cd	Sensitive	A unique identifier of a payer who is submitting payments.
Key	Billing_Provider_Composite_ID	De-Identified	A unique billing provider identifier.

Key	Claim_ID	De-Identified	A unique medical claim identifier.
Key	Member_Composite_ID	De-Identified	A unique identifier consolidating member_id's from various payers and assigned to all eligibility and claims records associated with a given individual.
Key	Member_ID	De-Identified	A unique identifier associated with a single payer and assigned to all eligibility and claims records associated with a given individual for that payer.
Key	Service_Provider_Composite_ID	De-Identified	A service provider identifier.
Service	CPT4_Cd	De-Identified	Health Care Common Procedural Coding System (HCPCS) and CPT codes.
Service	CPT4_Mod1_Cd	De-Identified	Procedure modifier.
Service	CPT4_Mod2_Cd	De-Identified	Procedure modifier.
Service	CPT4_Mod3_Cd	De-Identified	Procedure modifier.
Service	CPT4_Mod4_Cd	De-Identified	Procedure modifier.
Service	Revenue_Cd	De-Identified	National Uniform Billing Committee Codes.
Date	Service_End_Dt	Limited	Date services for patient ended.
Date	Service_End_Dt_Day	Limited	Day services for patient ended.
Date	Service_End_Dt_Month	Limited	Month services for patient ended.
Date	Service_End_Dt_Year	De-Identified	Year services for patient.
Date	Service_Start_Dt	Limited	Date services to patient rendered.
Date	Service_Start_Dt_Day	Limited	Day services to patient rendered.
Date	Service_Start_Dt_Month	Limited	Month services to patient rendered.
Date	Service_Start_Dt_Year	De-Identified	Year services to patient rendered.
Cost	Charge_Amt	De-Identified	The dollar amount of charge.
Cost	Allowed_Amt	De-Identified	The sum of the member liability amount and the plan covered amounts.
Cost	Coinsurance_Amt	Sensitive	The dollar amount an individual is responsible for – not the percentage.
Cost	Copay_Amt	Sensitive	The preset, fixed dollar amount for which the individual is responsible.
Cost	Deductible_Amt	Sensitive	The amount an individual pays for covered health services before an insurance plan begins to pay. Do not code decimal point.
Cost	Member_Liability_Amt	Sensitive	The percent of the medical allowed amount that the member is responsible for paying.
Cost	Plan_Covered_Amt	Sensitive	The amount the insurance plan pays.
Cost	Plan_Paid_Amt	Sensitive	Includes any withhold amounts.
Cost	Prepaid_Amt	De-Identified	For capitated services, the fee for service equivalent amount.
Cost	COB_TPL_Amount	Sensitive	Amount due from a secondary carrier. Report the amount that another payer is liable for after submitting payer has processed this claim line. If only collected on the header record report the COB/TPL amount on the first claim line. Report 0 if there is no COB/TPL amount.
Drug	NDC_Cd	De-Identified	An NDC code used only when a medication is paid for as part of a medical claim.
Other	Capitation_Flag	De-Identified	A flag that indicates if services are paid under a capitated arrangement or not.

Other	Dental_Carrier_Flag	De-Identified	A flag that indicates if a payer is a standalone dental carrier. The standalone dental carriers will be identified by CIVHC.
Other	Dental_Flag	De-Identified	A flag that indicates if a claim has a dental service.
Other	ER_Flag	De-Identified	A flag that indicates an emergency room visit.
Other	Line_No	De-Identified	Line number for this service.
Other	Claim_Status_Cd	De-Identified	A code that indicates the status of a claim.
Other	Place_of_Service_Cd	De-Identified	Place of service code.
Other	Service_Qty	De-Identified	Count of services performed.
Other	Unit_Of_Measure	De-Identified	Types of units for quantity reported in MC061.
Other	Provider_Network_Indicator	De-Identified	Servicing provider is a participating provider.
Other	Denied_Claim_Ind	De-Identified	Use this field to indicate whether the payer denied this specific line on this specific claim.
Other	Claim_Line_Type	De-Identified	The code that defines the claim line status in terms of adjudication.
Other	Payment_Arrangement_Type	De-Identified	Indicates the payment methodology.
Key	Claim_ID	De-Identified	A unique medical claim identifier.
Diagnosis	DX_Cd	De-Identified	ICD diagnosis code.
Diagnosis	DX_Description	De-Identified	ICD diagnosis code description.
Diagnosis	DX_Type	De-Identified	ICD diagnosis code type.
Diagnosis	ICD_Seq_Num	De-Identified	ICD diagnosis sequence number.
Diagnosis	ICD_Vers_Flag	De-Identified	A flag that indicates if a code is ICD-10 or ICD-9.
Diagnosis	POA_Cd	De-Identified	Present on admission code.
Diagnosis	POA_Description	De-Identified	Present on admission description.
Diagnosis	POA_Seq_Num	De-Identified	Present on admission sequence number.
Key	Claim_ID	De-Identified	A unique medical claim identifier.
Service	ICD_Vers_Flag	De-Identified	A flag that indicates if a code is ICD-10 or ICD-9.
Service	Procedure_Cd	De-Identified	ICD procedure code.
Service	Seq_Num	De-Identified	ICD procedure sequence number.
Date	Procedure_Dt	Limited	Date of procedure.
Date	Procedure_Dt_Day	Limited	Day of procedure.
Date	Procedure_Dt_Month	Limited	Month of procedure.
Date	Procedure_Dt_Year	De-Identified	Year of procedure.
Key	Provider_Composite_ID	De-Identified	A unique provider identifier
Other	Credential_Text_1	De-Identified	NPI credential.
Other	Gender_Cd	De-Identified	Provider Gender.
Other	License_1	Sensitive	Provider state license code number 1
Other	License_2	Sensitive	Provider state license code number 2
Other	License_3	Sensitive	Provider state license code number 3
Other	License_4	Sensitive	Provider state license code number 4
Other	License_5	Sensitive	Provider state license code number 5
Other	License_State_1	Sensitive	Provider where provider license number 1 was granted.
Other	License_State_2	Sensitive	Provider where provider license number 2 was granted.
Other	License_State_3	Sensitive	Provider where provider license number 3 was granted.

Other	License_State_4	Sensitive	Provider where provider license number 4 was granted.
Other	License_State_5	Sensitive	Provider where provider license number 5 was granted.
Other	Medicaid_Facility_Number	Sensitive	Medicaid facility number.
Other	Medicare_Provider_Id	Sensitive	Medicaid unique medicare provider identifier.
Other	National_Provider_ID	Sensitive	Provider Identifier (NPI).
Other	Organization_Nm	Sensitive	Name of organization.
Other	Organization_Nm_Clean	Sensitive	Name of organization without punctuation or symbols.
Other	Organization_Other_Nm	Sensitive	Other name of organization.
Other	Organization_Other_Nm_Clean	Sensitive	Other name of organization without punctuation or symbols.
Other	Other_First_Initial	Sensitive	Other initial of first name.
Other	Other_First_Nm	Sensitive	Other first name.
Other	Other_Last_Nm	Sensitive	Other last name.
Other	Other_Middle_Initial	Sensitive	Other initial of middle name.
Other	Other_Middle_Nm	Sensitive	Other middle name.
Other	Other_Nm_Prefix	De-Identified	Other prefix of name.
Other	Other_Nm_Suffix	De-Identified	Other suffix of name.
Other	Phone_Number	Limited	Phone number from the billing provider or service provider.
Other	Primary_Address_ID	Sensitive	Primary provider address identifier.
Other	Provider_DEA_No	Sensitive	Provider Drug Enforcement Administration (DEA) number.
Other	Provider_First_Initial	Sensitive	Initial of provider first name.
Other	Provider_First_Nm	Sensitive	Provider first name.
Other	Provider_Last_Nm	Sensitive	Provider last name.
Other	Provider_Middle_Initial	Sensitive	Initial of provider middle name.
Other	Provider_Middle_Nm	Sensitive	Provider middle name.
Other	Provider_Nm	Sensitive	Provider name.
Other	Provider_Nm_Prefix	De-Identified	Prefix of provider name.
Other	Provider_Nm_Suffix	De-Identified	Suffix of provider name.
Other	Provider_Type	De-Identified	Type of provider.
Other	Taxonomy_Cd_1	De-Identified	Code that indicates provider specialty or taxonomy 1
Other	Taxonomy_Cd_2	De-Identified	Code that indicates provider specialty or taxonomy 2
Other	Taxonomy_Cd_3	De-Identified	Code that indicates provider specialty or taxonomy 3
Other	Taxonomy_Cd_4	De-Identified	Code that indicates provider specialty or taxonomy 4
Other	Taxonomy_Cd_5	De-Identified	Code that indicates provider specialty or taxonomy 5
Key	Provider_Composite_Address_ID	Sensitive	A unique provider address identifier.
Location	Address	Sensitive	Address of provider.
Location	Address_Type_Cd	De-Identified	Address type of provider.
Location	City	Sensitive	City location of provider.
Location	Latitude	Sensitive	Latitude location of provider.
Location	Longitude	Sensitive	Longitude location of provider.
Location	State	De-Identified	State of provider.

Location	Zip_Cd	Sensitive	Zip Code of provider.
Location	Zip_Cd_3_Digit	De-Identified	Zip Code of provider 3-digit.
Location	URF_Designation	De-Identified	Rural, or Frontier geography type.
Location	HSR	De-Identified	Statistics Region Code
Key	Provider_Composite_Address_ID	Sensitive	A unique provider address identifier.
Key	Provider_Composite_ID	De-Identified	A unique provider identifier that ties all of the claims records associated with a given provider together.
Key	Member_ID	De-Identified	A unique identifier associated with a single payer.
Date	Eligibility_Dt	Limited	Start date of a member's eligibility.
Date	Eligibility_Day	Limited	Start day of a member's eligibility.
Date	Eligibility_Month	Limited	Start month of a member's eligibility.
Date	Eligibility_Year	De-Identified	Start year of a member's eligibility.
Date	Plan_Effective_Dt	Limited	Insurance plan effective date.
Date	Plan_Effective_Dt_Day	Limited	Insurance plan effective date day.
Date	Plan_Effective_Dt_Month	Limited	Insurance plan effective date month.
Date	Plan_Effective_Dt_Year	De-Identified	Insurance plan effective date year.
Date	Plan_Term_Dt	Limited	Last continuous day of coverage date.
Date	Plan_Term_Dt_Day	Limited	Last continuous day of coverage day.
Date	Plan_Term_Dt_Month	Limited	Last continuous day of coverage month.
Date	Plan_Term_Dt_Year	De-Identified	Last continuous day of coverage year.
Location	Employer_ZIP_Code	De-Identified	5 or 9 digit Zip Code of the employer.
Other	Coverage_Level_Cd	De-Identified	Benefit coverage level.
Other	Coverage_Type_Cd	De-Identified	A code indicating the type of coverage.
Other	Dental_Coverage_Flag	De-Identified	A flag indicating whether member has dental coverage.
Other	Insurance_Product_Type_Cd	De-Identified	A code that indicates an insurance coverage type.
Other	Insurance_Product_Type_Desc	De-Identified	A description of insurance product type.
Other	Line_of_Business_Cd	De-Identified	A code that classifies insurance product types into broad categories.
Other	Market_Category_Cd	De-Identified	A code indicating whether plan is sold to individual or franchise.
Other	Medical_Coverage_Flag	De-Identified	A flag indicating whether member has medical coverage.
Other	Prescription_Drug_Coverage_Flag	De-Identified	A flag indicating whether member has prescription drug coverage.
Other	Primary_Insurance_Ind	De-Identified	Indicator for whether plan is member primary plan.
Other	Employer_Tax_ID	Sensitive	Subscriber’s employer EIN.
Other	ERISA_Ind	De-Identified	A code indicating when the plan is governed by ERISA.
Other	Exchange_Offering	De-Identified	A code indicating whether the plan was purchased through the exchange.
Other	Grandfather_Status	De-Identified	A flag indicating plans grandfather status.
Other	Group_Size	De-Identified	A code indicating the group size of the plan.
Other	High_Deductible_Health_Savings_Account_Plan	De-Identified	A code indicating whether the plan is a high deductible plan.
Other	Metallic_Value	De-Identified	Metallic Value as defined under the Affordable Care Act.
Other	Metallic_Value_Desc	De-Identified	Description of Metallic Value

Other	Risk_Basis	De-Identified	An indicator for whether plan is fully insured or self insured.
Other	Actuarial_Value	De-Identified	Actuarial Value as defined under the Affordable Care Act
Key	Member_ID	De-Identified	A unique member identifier associated with a single payer
Location	Member_City_Nm	Limited	City location of member.
Location	Member_State_Cd	De-Identified	State location of member.
Location	Member_Zip_Cd	Limited	ZIP Code of member.
Location	Member_Zip_Cd_3_Digit	De-Identified	ZIP Code of member 3-digit.
Location	Member_HSR	De-Identified	Statistics Region Code.
Location	Member_URF	De-Identified	Rural, or Frontier geography type.
Other	Ethnicity_1_Cd	De-Identified	Ethnicity of member primary.
Other	Ethnicity_2_Cd	De-Identified	Ethnicity of member secondary.
Other	Hispanic_Ind	De-Identified	Indicator for whether member is Hispanic.
Other	Member_Gender_Cd	De-Identified	A code for member gender.
Other	Member_Subscriber_Rlp_Cd	De-Identified	Member's relationship to insured.
Other	Other_Ethnicity	De-Identified	Other ethnicity.
Other	Other_Race	De-Identified	Other race.
Other	Payer_Cd	Sensitive	A unique identifier of a payer who is submitting payments.
Other	Race_1_Cd	De-Identified	Race of member primary.
Other	Race_2_Cd	De-Identified	Race of member secondary.

Appendix B: Application for Data

Colorado All Payer Claims Database
Data Release Application
Part I

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:	Effects of Negotiated Price Transparency Regulations: Evidence from Hospital Prices
Date:	
Organization Requesting Data:	Duke University
Contact Person:	Christopher Behrer
Title:	MD/PhD candidate
E-mail:	christopher.behrer@duke.edu
Phone Number:	412-551-5464
Address:	Room 147 Rubenstein Hall, Sanford School of Public Policy 201 Science Drive Durham, NC 27708
CIVHC Contact:	Everett E. Costa III

Project Purpose

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

   My project will study the effects of price transparency of hospital prices negotiated between health systems and private insurers. Specifically, I plan to study how hospital prices and consumer behavior changed due to the Centers for Medicare and Medicaid Services (CMS) 2021 Hospital Price Transparency Rule, as well as how Colorado's Shop for Care Tool impacted these market outcomes. I plan to study these effects with difference-in-differences techniques, comparing changes in prices for services included in the Shop for Care Tool versus similar services not included in the tool before versus after prices were posted. I also plan to compare changes in prices before versus after CMS's policy for prices that were included in the Shop for Care Tool to prices for services not included in the tool. Finally, I plan to use a regression kink design to study whether hospitals that faced different fines for non-compliance as a function of their number of beds complied with the policy at different rates, and how prices changed for those likely induced to post prices by the increased fines.

   Next, I plan to study the likely mechanisms of any effect on prices in several ways. First, I will study whether consumers appear to respond to price information by studying consumers' choices of hospitals

before versus after price information becomes available. Further, because the Shop for Care Tool included quality ratings, I will study whether consumers appear to respond to this quality information when choosing hospitals. Second, I will study how the relative market structure and market power of hospitals and insurers is associated with changes in the negotiated prices. Third, I will study variation in effects across different prices and different insurance plans to determine what sources of uncertainty price information resolved. Finally, I plan to study whether any price changes resulted in follow-on effects, for example changes in employer health care costs, individual marketplace premiums, or levels of utilization of care.

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.)

   My specific research questions are:
   1. What are the effects of mandated price transparency on hospital prices?
   2. What does variation in effects across markets and prices suggest were the mechanisms of the effects of price transparency?
   3. Did price transparency lead to follow-on effects such as changes in employer health care costs, individual marketplace premiums, and healthcare use, thereby affecting consumers?

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 benefit Colorado and Colorado residents by generating evidence on policies that were designed to reduce health care prices and health care costs. Rising health care costs are a major policy concern and both the State of Colorado and the federal government have enacted policies to make hospital prices more transparent in an effort to control health care costs. However, the effects of these policies are unknown. This research will provide evidence on the effects of these policies. This evidence will contribute to improvements in future policies and regulations to control health care costs, directly benefiting Colorado and Colorado residents by making health care more affordable and accessible and allowing savings to be reallocated to other beneficial investments.

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

   This project will most directly meet the Triple Aim criteria of reducing the per capita cost of health care. The project will do so by generating evidence on both state and federal policies intended to reduce health care costs. These policies aimed to reduce costs by making prices transparent, facilitating consumer price shopping, and promoting competition. However, the effects of these policies are not known. This research will study the effects of these policies and provide evidence to policymakers to inform future efforts to control the cost of health care. The project will also study how consumers respond to quality information, which has the potential to inform policy on quality information disclosure to improve the patient experience of care. Finally, by contributing to efforts to reduce health care costs, the project will facilitate increased affordability of care, which has the potential to improve the health of Colorado residents.

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?

   This project could contribute to equitable access by contributing to efforts to reduce health care costs, as described above. High health care costs can discourage individuals from seeking care, so reducing these

costs has the potential to increase individuals' ability to receive necessary care. Further, by studying variation in health care prices and effects of both federal and state price transparency policies, this research has the potential to identify unequal cost burdens experienced by different sociodemographic groups. This evidence could contribute to targeted policy to reduce cost and improve access to care for populations most exposed to high health care costs.

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.*

☐ Standard 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
☒ 2023 (when available)

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

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

CIVHC
CENTER FOR IMPROVING VALUE IN HEALTH CARE

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:	Effects of Negotiated Price Transparency Regulations: Evidence from Hospital Prices
Date:	
Organization Requesting Data:	Duke University

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. **Data Element Selection Member-level Detail** – *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
     - ☒ Zip
     - ☐ DOB
     - ☒ Gender

Justification:

Zip-code: One of my proposed analyses is to study whether consumers become more responsive to hospital prices when price information is transparent. To conduct this analysis I will study which hospitals consumers choose from the set of hospitals that they could have chosen. One important factor that prior work has documented influences consumer choice of hospital is distance from their residence to the hospital. I would like to use member zip-code to calculate the distance from the centroid of each member zip-code to each hospital to be able to include this distance in analyses of hospital choice.

Gender: Individuals of different genders have different medical needs. I would like to be able to conduct heterogeneity analyses to test whether prices or price changes due to price transparency are different for health services used by individuals of different genders.

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

   Justification:
   Age: Individuals of different ages have different medical needs. I would like to be able to conduct heterogeneity analyses to test whether prices or price changes due to price transparency are different for health services used by individuals of different ages.

   Diagnosis: My project will study prices for health services and how those prices change due to price transparency regulations. To study changes in prices for the same services over time and variation in prices for the same services across hospitals, my proposed analyses require diagnoses.

   Procedure/Revenue Code: My project will study prices for health services and how those prices change due to price transparency regulations. To study changes in prices for the same services over time and variation in prices for the same services across hospitals, my proposed analyses require procedure/revenue 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

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.)*
   - ☐ No
   - ☒ Yes (check all that apply)
     - ☒ Facilities (please specify) All facility and professional claims for inpatient services
     - ☒ Professionals
     - ☐ Provider Taxonomy - Specialty Designations
     - ☐ National Provider Identifier
     - ☐ Other (please specify) Click or tap here to enter text.

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.

6. **Payer-Specific Details** – *Do you need specific named payer details? (only available for authorized requestors)*
   - ☐ No
   - ☒ Yes

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)

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?

I plan to link the CO APCD data with the following sources:

1) Turquoise Health data on when and for which services hospitals posted prices to comply with CMS's Hospital Price Transparency rule.
2) Publicly available data on hospitals from CMS Health Cost Report Information System (HCRIS), the National Academy for State Health Policy (NASHP), and CMS star ratings.
3) Hospital trauma level from CO Department of Public Health and Environment (CDPHE)
4) Publicly available data from Internal Revenue Service (IRS) Form 5500A on employer health care costs.
5) Data on Hospital Referral Regions (HRR) and Health Services Areas (HSA) from the Dartmouth Atlas
6) Distance to hospitals from zip-code centroid latitude and longitude coordinates from the National Bureau of Economic research.
7) Zip-code level income, population, and race/ethnicity demographic information from the US Census Bureau American Community Survey
8) County-day COVID-19 incidence data from CDPHE

b. Which CO APCD identifying data elements will be used to perform the linkage?

I will use Medicare facility number, name, and/or address to link hospitals to Turquoise Health, HCRIS, trauma level, and CMS data.

I will use employer identification numbers to link CO APCD data to IRS form 5500A data.

I will use zip-code to link CO APCD data to HRR, HSA, distance to hospital, and census data.

I will use county to link CO APCD data to CDPHE COVID-19 incidence data

c. Once the linkage is made, what non-CO APCD data elements will appear in the new linked file?

Non-CO APCD data elements include:

1) Turquoise Health data: publicly posted prices, a compliance score (1-5) created by Turquoise measuring compliance with CMS's Hospital Price Transparency rule

2) HCRIS, NASHP, CMS: hospital number of beds, teaching hospital affiliation, hospital service availability (e.g. cardiac catheterization lab, intensive care unit, nursery) ownership type, independent vs within a health system, payer mix, and hospital-by-year financial information on revenue, costs, profit, and number of discharges, CMS's overall and patient survey star ratings.

3) CO DPHE: hospital trauma level

4) IRS form 5500A: insurance carrier NAIC code, number of covered persons, insurance broker commissions and fees, contract type, and premiums.

5) Dartmouth Atlas: HSA number, HRR number

6) Distances from a zip-code centroid to each hospital in CO.

7) Census: zip-code level population, racial/ethnic demographic estimates, mean, and median household income.

8) CDPHE COVID data: county-day one- and two-week cumulative incidence and one and two week average positive test probability

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: 05/31/2023
☐ Yes. If so please provide copy.

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:	07/01/2023
Project End Date:	06/30/2026
Proposed Publication or Release Date:	02/28/2024 – presentations internal to Duke 11/01/2025 – working paper
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/.

Appendix C: Data use agreement template

APCD DUA
#
NAME

DATA USE AGREEMENT

AGREEMENT FOR USE OF COLORADO ALL PAYER CLAIMS DATA

This Data Use Agreement ("Agreement" or "DUA") is made and entered as of _____ (the "Effective Date") by and between the Center for Improving Value in Health Care ("CIVHC"), in its capacity as the APCD Administrator, and **Company name** (hereinafter, the "Receiving Organization").

This Agreement addresses the conditions under which the APCD Administrator will disclose and the Receiving Organization may obtain, use, reuse, and disclose the APCD data file(s) or reports specified in this Agreement and/or any derivative file(s) (collectively, the "Data" or "APCD Data"). This Agreement supersedes any and all agreements between the parties with respect to the use of APCD Data. The terms of this Agreement can be changed only by a written modification to this Agreement or by the parties adopting a new agreement. The parties agree further that instructions or interpretations issued to the Receiving Organization concerning this Agreement, or the Data specified herein, shall not be valid unless issued in writing by the APCD point-of-contact or the APCD signatory to this Agreement.

1. Project and Data Release Application. This Agreement pertains to the following projects entitled: **Project title** as described in the Data Release Application ("Application") approved by the APCD Administrator and incorporated into this Agreement as Exhibit 1.

2. Requested Data Elements or File. This Agreement pertains to access to the data elements specified in Exhibit 3 through an electronic interface or to the following specialized data file created in accordance with the specifications contained in the Application:
Company name.

3. Permitted Data Uses and Purposes. The Receiving Organization will not use or disclose the Data for any other purpose or in any other way than the purpose and uses described in this Agreement.

4. Safeguards. The Receiving Organization agrees to establish appropriate administrative, technical, and physical safeguards to protect the confidentiality of and prevent unauthorized use of or access to the Data. The Receiving Organization acknowledges that the use of unsecured telecommunications, including the Internet, to transmit individually identifiable, or deducible, information derived from the APCD Data is prohibited. Further, the Receiving Organization agrees that the Data must not be physically moved, transmitted, or disclosed in any way from or by the site

indicated in the Receiving Organization's Data Management Plan without written approval from the APCD Administrator unless such movement, transmission, or disclosure is required by law.

5. Inspections. The Receiving Organization agrees to grant access to its personnel, facilities, and the Data to the authorized representatives of the APCD Administrator at the site indicated in the Receiving Organization's Data Management Plan for the purpose of inspecting to confirm compliance with the terms of this Agreement.

6. Cell Suppression Policy. The Receiving Organization agrees that any use of APCD Data in the creation of any document (manuscript, table, chart, study, report, etc.) concerning the specified purpose must adhere to APCD cell size suppression policy. This policy stipulates that no cell (*e.g.*, admittances, discharges, patients, services, others) with less than eleven observations may be displayed**.** Also, no use of percentages or other mathematical formulas may be used if they result in the display of a cell displaying less than eleven observations. Individual level records may not be published in any form, electronic or printed. Reports and analytics must use complementary cell suppression techniques to ensure that cells with fewer than eleven observations cannot be identified by manipulating Data in adjacent rows, columns or other manipulations of the report. Examples of such data elements include, but are not limited to geographic location, age if > 89, sex, diagnosis and procedure, admission/discharge date(s), or date of death.

7. Identification of Individuals. Except as provided in the protocol described in detail in [Exhibits 1 and 2, referencing Section #10 of this document], which has been reviewed and expressly authorized by the APCD Administrator, the Receiving Organization will not attempt to identify individuals in the APCD data or to link records included in the APCD data to any other individually identifiable source of information.

8. Results and Reports. The Receiving Organization agrees to provide the APCD Administrator with a copy of any results derived from the APCD Data and information regarding the outcome of the project, as it is described in the Application. The Receiving Organization must obtain approval from the APCD Administrator to release any reports or outputs prior to distribution outside the named project team. Distribution includes but is not limited to: peer review, submission to any federal or state agency, presentation of findings, or synopsis of research. The APCD Administrator will review the report within six weeks of receipt to confirm:

a. The Receiving Organization's compliance with minimum cell size and complimentary cell suppression rules;

b. That the report or output has incorporated appropriate protections to prevent inferential identification; and

c. That the report or output is consistent with the project description contained in the Receiving Organization's Application, as approved.

9. Additional Projects. Use of the same Data for a project other than the one described in this Agreement must be approved through a separate application process. The Receiving Organization understands and agrees that original or derivative Data file(s) cannot be reused or further

disclosed without prior written approval from the APCD Administrator.

10. Exhibits. The parties mutually agree that the following are part of this Agreement:

☐ Exhibit 1: Approved Application for to the Release and Use of Colorado APCD Data
☐ Exhibit 2: Receiving Organization's Data Management Plan
☐ Exhibit 3: List of Requested Data Elements
☐ Other_____

11. Reporting and Treatment of Unauthorized Uses or Disclosures of Data. The Receiving Organization will report any unauthorized use or disclosure of the Data to the APCD Administrator within two days. In the event that the APCD Administrator determines or has a reasonable belief that the Receiving Organization has made or may have made a use, reuse, or disclosure of the APCD Data that is not authorized by this Agreement, or another written authorization from the APCD Administrator, the APCD Administrator may, at its sole discretion, require the Receiving Organization to perform one or more of the following, or such other actions as the APCD Administrator, in its sole discretion, deems appropriate:

a. promptly investigate and report to the APCD Administrator the Receiving Organization's determinations regarding any alleged or actual unauthorized use, reuse, or disclosure;
b. promptly resolve any issues or problems identified by the investigation;
c. submit a formal response to an allegation of unauthorized use, reuse, or disclosure;
d. submit a corrective action plan with steps designed to prevent any future unauthorized uses, reuses, or disclosures; and
e. return all Data or destroy the Data it has received under this Agreement.

The Receiving Organization understands that as a result of the APCD Administrator's determination or reasonable belief that unauthorized uses, reuses, or disclosures have taken place, the APCD Administrator may refuse to release further APCD Data to the Receiving Organization for a period of time to be determined by the APCD Administrator.

12. Indemnification. Receiving Organization will indemnify, defend, and hold CIVHC harmless from any and all claims, losses, liabilities, damages, judgments, fees, expenses, awards, penalties (including civil monetary penalties), and costs (including reasonable attorneys' and court fees and expenses) arising out of or related to any breach of this Agreement by Receiving Organization, or any breach or alleged breach of APCD Data arising from Receiving Organization's breach, or failure to perform, pursuant to this Agreement. If the APCD Administrator, in its sole discretion, determines that the risk of harm created by such a breach or alleged breach of APCD Data requires notification of affected individuals and/or other remedies, the Receiving Organization agrees to carry out such remedies under the direction of and without cost to the APCD Administrator.

13. Antitrust Compliance and Indemnification. Receiving Organization agrees to treat APCD Data confidentially, as specified in this Agreement, and not to use, or enable any other parties to use, the APCD Data for anticompetitive or other unlawful purposes, including but not limited to price-fixing,

market or customer allocation, service or output restriction, price stabilization, or any other agreement or coordination among parties that in any way restricts or limits competition. Receiving Organization also agrees to indemnify and hold CIVHC harmless for any antitrust liability, damages, judgments, fees, expenses, awards, penalties (including civil monetary penalties), and costs (including reasonable attorneys' and court fees and expenses) arising from or relating in any way to the APCD Data, or that in any way involve use of the APCD Data. Such indemnification shall include, but not be limited to, payment by Receiving Organization of any fines, penalties, or damages of any sort, including but not limited to compensatory, treble, punitive, or any other damages, fines, or penalties assessed against CIVHC for any antitrust violation arising from or relating in any way or any part to the APCD Data or use of the APCD Data, as well any and all of CIVHC's related legal fees, costs, and/or other expenses incurred in or arising from the matter.

Receiving Organization further agrees that it shall not attempt to identify, "reverse engineer," decompile, or in any other way attempt to discern the identities of specific parties that have been de-identified in the APCD Reports, nor shall Receiving Organization try to translate, convert, adopt, alter, modify, enhance, add to, delete, or tamper with any APCD Data or in any other way attempt to calculate or determine specific parties' prices from the APCD Data.

14. Project Workforce. All of the Receiving Organization's employees, contractors, and clients must adhere to the requirements contained in the Application and this Agreement. Any person or entity that processes or receives the Data and its agents must be obligated, by contract, to adhere to the terms of this DUA and agree to follow the Data privacy, security, and protection requirements, prior to being granted access to APCD Data. The following named individuals, and only these individuals, will have access to the APCD Data. The Receiving Organization will notify the APCD Administrator when an individual leaves the project. The Receiving Organization will obtain written approval from the APCD Administrator for any additions to this list, prior to granting such individuals with access to APCD Data.

Name	Role	Organization

15. Data Retention and Destruction. The Receiving Organization agrees to notify the APCD Administrator within 30 days of the completion of the Project Purpose (as specified in Section I of the Application) if the project is completed before the Last Day of the Data Retention Period (as specified in the Project Schedule). Upon such notice or the Last Day of the Data Retention Period, whichever

occurs sooner, the Receiving Organization agrees to destroy all APCD Data, in accordance with the methods established by the "*Guidance to Render Unsecured Protected Health Information Unusable, Unreadable, or Indecipherable to Unauthorized Individuals,*" as established by the U.S. Department of Health and Human Services (HHS). The Receiving Organization may request an extension of the Data Retention Period by submitting a written request that includes justification to the APCD Administrator.

When retention of the Data is no longer justified and/or required by law, the Receiving Organization agrees to destroy the Data and send a completed "Certification of Project Completion & Destruction or Retention of Data" form (Appendix 1 to this Agreement) to the APCD Administrator within 30 days. The Receiving Organization agrees not to retain any APCD Data, or any parts thereof, or any derivative files that can be used in concert with other information to identify an individual, either directly or indirectly, after the aforementioned file(s) and Data are destroyed unless the APCD Administrator grants written authorization. The Receiving Organization acknowledges that such date for retention of Data is not contingent upon action by the APCD Administrator.

16. <u>Term and Termination.</u> The APCD Administrator or the Receiving Organization may terminate this Agreement at any time for any reason upon 30 days written notice. Upon notice of termination by either party, the APCD Administrator will cease releasing Data to the Receiving Organization under this Agreement and will notify the Receiving Organization to destroy all Data. This Agreement will remain effective in its entirety until the completed "Certification of Project Completion & Destruction or Retention of Data" has been received by the APCD Administrator. Sections 11, 12, 13, and 15 of this Agreement shall survive termination of the other provisions of this Agreement.

By signing this Agreement, the Receiving Organization agrees to abide by all provisions set out in this Agreement.

SIGNATURES:

For the CO APCD:	**For Receiving Organization:**
Signature:	**Signature:**
Name: Pete Sheehan	**Name:**
Title: VP of Client Solutions & State Initiatives	**Title:**
Date:	**Date:**