



CENTER FOR IMPROVING
VALUE IN HEALTH CARE



Data Release Application

Limited and Identifiable Extracts

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Client Application Revision History

The following reflects the history of changes made to this document during the application process prior to project production. Once in production, any further changes to the application may result in additional cost and production delays.

To be completed by CIVHC staff			
Date	New Version Number	Description of Change(s)	CIVHC Change Author (full name, complete title)
5/31/2024	V.01	Initial version drafted with client.	Lucía Sanders, Key Account Manager
6/14/2024	V.02	Updated project delivery date, added justification for each PHI element, elaborated on need for all patients aged 18-65.	Lucía Sanders, Key Account Manager
6/20/2024	V.03	Removed references to “symptoms” from methodology. Corrected age ranges to 18-65 years.	Lucía Sanders, Key Account Manager
	V.04		
	V.05		
	V.06		
	V.07		
	V.08		
	V.09		
	V.10		

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Data Requestor Details

General Project Details

Project Title:	AHRQ - Quality Indicator Analysis
Application Start Date:	5/31/2024
Requested Project Delivery Date:	10/1/2024
Client Organization (legal name):	Mathematica Inc
Client Organization Address:	955 Massachusetts Avenue, Cambridge, MA 02139
To be completed by CIVHC staff	
CIVHC Contact (full name, complete title):	Lucía Sanders, Key Account Manager
Project Number:	24.57
Condensed Project Title:	Quality Indicator Analysis

Project Contacts

Project Contact Name:	Alex Bohl
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Invoice Contact Name:	(working to identify)
Title:	
Email:	
Phone Number:	
Data Release Fee Signatory:	(working to identify)
Title:	
Email:	
Phone Number:	
Data Use Agreement Signatory:	(working to identify)
Title:	
Email:	
Phone Number:	

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Project Schedule and Purpose

Proposed Project Start Date ¹ :	10/1/2024
Anticipated Project End Date:	9/25/2026
Proposed Publication or Release Date:	9/25/2026

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

Individual research questions:

- i. Can quality measures for maternal health and diagnostic safety be developed from APCD data? AHRQ aims to assess the potential for APCD data to be used to develop patient safety measures that can contribute to national and state level healthcare quality improvement efforts. In particular, AHRQ is exploring the development of quality indicators in the area of diagnostic safety and maternal health. We will assess whether meaningful quality indicators in these areas can be constructed from APCDs. Such measures may improve transparency, allow for cross-state comparisons, and provide an opportunity to benchmark with other health insurance claims data sources.
- ii. What are methods to develop reliable and valid maternal health and diagnostic safety measures from APCD data? AHRQ will develop the technical specifications for diagnostic safety and maternal health measures with the CO APCD data, which will allow AHRQ to develop new measures across new care settings. AHRQ will test the validity and reliability of the measures to assess whether reliable and valid measures for maternal health and diagnostic safety can be developed from APCD data.
- iii.
- iv.
- v.

¹ After all required documents have been signed, typical production time is 30-60 days for a Limited or Identifiable Extract. Anticipate a longer production period for projects including a Finder File or creation of a Member Match File.

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2. Describe your methodology or how you will be using data from the Colorado All Payer Claims Database (CO APCD) to answer your research questions.

The AHRQ team would use the APCD to construct and test hospital- and area-level diagnostic safety and maternal health quality indicators.

The first step is to construct measure specifications, which will predominantly use groupings of ICD-10-CM/PCS diagnosis and procedure codes to identify potential patient safety events. We would obtain the patients' full experiences by linking ED visits, inpatient admissions, ambulatory encounters, and pharmacy data. It is essential to include all Commercial claims with services provided by related hospitals and facilities in the analysis to capture the most complete patient healthcare pathways possible with the data. We will limit the age range to 18-65 years. Based on sets of ICD-10-CM/PCS, we will study maternal health cohorts by identifying pregnant persons ages 18-65 and those with a recent delivery. For diagnostic safety measures, we will use the CO APCD data to identify and refine the list of diagnosis associated with each condition of interest. We will then examine individuals ages 18-65 who present to the ED or primary care setting who are subsequently admitted for conditions such as acute myocardial infarction, stroke and other cardiovascular conditions, cancer, appendicitis, and other infections. Our team includes clinical and coding experts who can leverage existing groupers (e.g., the Healthcare Cost and Utilization Project Clinical Classification Software Refined(CCSR)) and develop customized code sets (referred to as Setnames by the Quality Indicators program).

In addition to ICD-10-CM/PCS, we will use other aspects of the CO APCD data to develop measures, including service dates and enrollment periods. Service dates are important for measuring patient safety events that present in the healthcare setting after an initial encounter. For example, we may construct a measure that identifies how often a treat-and-release ED visit leads to a related inpatient admission within 90 days, or that identifies a severe maternal morbidity diagnosis at any healthcare setting within 90 days of a delivery. To ensure we are observing all outcomes, we propose to restrict the analysis to those enrolled in their health plan during the follow-up period.

After developing the potential diagnostic safety and severe maternal morbidity measures, we propose to conduct validity and reliability testing at the hospital- and area-level. This information will be used to assess scientific acceptability and develop potential refinements. Following industry standards to test validity and reliability, we will study the variation in event rates across areas, hospitals, and groups of patients or providers. The lowest level of geography we will consider is the county. We will stratify results by patient demographics or service provider peer groups (e.g., teaching hospitals).

ARHQ would not be able to develop these new measures across multiple care settings without access to the Colorado APCD. The AHRQ Quality Indicator program currently relies on HCUP data, which is limited to only inpatient and emergency department data and therefore lack information on outpatient visits, pharmacy orders, and enrollment. For example, without ambulatory care data, we cannot construct measures of diagnostic safety linking initial outpatient visits to subsequent ED visits or hospital admissions. Pharmacy data helps us to understand the conditions

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and comorbidities that should be considered as exclusions or risk adjusters for new measures. Enrollment data is critical to identify whether we can observe all events during the follow-up observation period. All of these concepts are crucial for determining the validity and reliability of potential maternal health and diagnostic safety measures.

3. Explain how this project will benefit Colorado and its residents.²

The measures we will develop have the potential to provide important information about patient safety in care settings in Colorado that could eventually be leveraged by hospitals, health systems, public health officials, and policymakers to implement healthcare quality improvement efforts, inform policy reforms, and improve healthcare outcomes for Colorado residents. Specifically, our efforts are focused on diagnostic safety and maternal health—two patient-centered topics that impact the residents of Colorado.

Diagnostic safety is a significant public health issue as roughly [12 million diagnostic errors occur annually in the US](#), with one in two such errors leading to serious harm. One barrier to improving diagnostic safety is the lack of standardized measures to support quality improvement efforts. While no benchmark national- or state-level statistics are available on diagnostic safety, these potentially preventable safety events impact the residents of Colorado. The results of the proposed work from the Quality Indicator program will be publicly-available specifications that public health agencies, payers, and health systems can use with their own data to calculate these new measures and target quality improvement efforts. The development and testing of these measures using the Colorado APCD will potentially lead to improvements in the quality of care received by Colorado residents.

Maternal health and improvements to address disparities in health outcomes are of national importance, and multiple institutions in Colorado are organizing to improve maternal health outcomes. Recent reports focused on maternal health in Colorado estimated an [increasing maternal mortality rate](#), and the Severe Maternal Morbidity rate in Colorado was at 102.5 per 10,000 deliveries, [which is above the 2020 national average](#). Thus, patient safety for maternal health is of concern for Colorado residents. The development of maternal health measures that examine conditions important to Colorado residents, such as post-discharge outcomes and mental health in pregnancy and following birth, and the ability to develop refinements to such measures will contribute to maternal care improvement efforts. Thus, the development of new maternal measures through the AHRQ Quality Indicators program using the CO APCDs will potentially lead to improved maternal health outcomes for Colorado residents.

² It is a statutory requirement for all non-public releases of CO APCD data to benefit Colorado or its residents. Contributions to generalizable knowledge alone are not sufficient to satisfy this requirement.

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4. Describe how your project will improve health care quality, increase health care value, or improve health outcomes for Colorado residents.²

Colorado hospitals, health systems, public health officials, and policymakers can eventually use the measures developed through this work to develop quality improvement initiatives, inform policy reforms, and ultimately improve health care quality and health outcomes for Colorado residents. For example, Colorado Department of Public Health and Environment (CDPHE) officials have expressed interest in developing quality measures related to severe maternal morbidity (SMM) via a request for information put forth by AHRQ. Access to APCD data would enable AHRQ to develop measures of healthcare services that occur in various care settings and contribute to SMM events. In addition, with Colorado APCD data, AHRQ will develop and test diagnostic safety measures of different conditions to help identify potential diagnostic safety issues and quality improvement opportunities. Once measures are developed, AHRQ can share measure specifications and risk adjustment parameters with others, who could then calculate these measures using their own data. AHRQ would not share CO APCD data with users. However, the provision of measure specifications to AHRQ QI users will allow hospitals, hospital associations, states, and others to calculate these potential quality measures for themselves, thereby contributing to transparency in health care quality.

5. Health equity is defined as the state in which everyone has a fair and just opportunity to attain their highest level of health. Explain how your project addresses health equity.

AHRQ is committed to ensuring equity in healthcare, as it is crucial to our mission: “The Agency for Healthcare Research and Quality’s (AHRQ) mission is to produce evidence to make healthcare safer, higher quality, more accessible, equitable, and affordable, and to work within the U.S. Department of Health and Human Services (HHS) and with other partners to make sure that the evidence is understood and used.” HHS is committed to addressing inequities and advancing equity through assessing and changing policies, programs, and processes across the Department and sustain a focus on equity over time. The AHRQ Quality Indicators program is also committed to equity, having developed many of the key indicators that go into the National Healthcare Quality and Disparities Report, which highlights healthcare differences by race, ethnicity, region, and other demographic factors. Providing the evidence base with which to measure and log progress in equitable access to healthcare quality is an important part of the Quality Indicators program mission. In addition, the AHRQ Quality Indicators program currently produces and shares software that allows users to calculate a number of quality indicators with an option to stratify by race/ethnicity, sex, age, payer, as well as user-specified variables. Using the CO APCD to contribute to new measure development will allow us to identify additional areas of care that can eventually be targeted for improvements in equitable access to quality healthcare services.

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6. Describe any publication you plan to develop based on your use of CO APCD data, its intended audience, and whether it will be made publicly available.

Work from this analysis could contribute to the development of new measures in diagnostic safety and or severe maternal morbidity, including technical specifications and risk adjustment. Should new measures be developed using the CO APCD data, prior to public release, AHRQ would offer a courtesy copy of the technical specifications and risk adjustment information and extend a custom invitation to beta test the measures. The AHRQ Quality Indicators program will not publish any CO APCD data. However, if desired by the CO Center for Improving Value in Health Care (CIVHC), AHRQ may share with the CIVHC state-level benchmark data on any quality measures developed, including a breakdown by demographic characteristics such as age, sex, race, ethnicity, to the extent the data permit.

Data Matching and Linkage

Finder File

A Finder File is a file you submit to CIVHC with information about a pre-selected cohort for matching to CO APCD data. Ask your CIVHC Contact for more information about this process and requirements for Finder File submission.

Will you provide CIVHC with a Finder File as part of this project?

- No
- Yes

Member Match File

A Member Match File is a file that CIVHC creates on your behalf to send to a registry or other outside entity to create a crosswalk connecting data from the CO APCD to the other entity's data.

Does this project require the creation of a Member Match File?

- No
- Yes. Consult with your CIVHC Contact about completing a separate Data Element Selection Form specifying the data elements that should be used to create the Member Match File.

Answer the following:

Who will receive the Member Match File?

Control Group

A Control Group is a group of individuals who can be used to compare against the cohort identified in the Finder File.

Will you need to create a Control Group as part of this project?

- No
- Yes. Consult with your CIVHC Contact about completing a separate Control Group Data Element Selection Form specifying the data elements that should be used to define the Control Group.

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Linkage

Data Linkage is a method of joining data from different sources together to create a new data set.

Will the CO APCD data be linked to another data source?

- No
- Yes. Answer the following:

What is/are the other data source/s?
American Community Survey, AHRQ SDOH database
Who will perform the data linkage?
Mathematica Staff
What identifying data elements will be used to perform the data linkage?
5-digit ZIP Code, County, Census Tract
What non-CO APCD data elements will appear in the new linked file?
Social Determinants of Health

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Data Inclusion Criteria

Make selections in the following sections based on what data you want to have included in this extract. If you will be creating a Control Group, complete this section for your study population and not the Control Group.

Protected Health Information (PHI)

Indicate which [Protected Health Information](#) data elements you require for your project purpose:

Available for Limited and Identifiable extracts:		
<input checked="" type="checkbox"/> Member 5-Digit Zip Code	<input checked="" type="checkbox"/> Member County	<input type="checkbox"/> Member City
<input checked="" type="checkbox"/> Member Dates of Service	<input checked="" type="checkbox"/> Member Eligibility Dates	<input type="checkbox"/> Employer Name
<input checked="" type="checkbox"/> Member Census Tract	<input type="checkbox"/> Member Census Block	<input type="checkbox"/> Member Census Block Group
Available for Identifiable extracts only (see also Identifiable Data Use Approval):		
<input type="checkbox"/> Member Name	<input type="checkbox"/> Member Date of Birth (if requesting more than year only)	
<input type="checkbox"/> Member Street Address	<input type="checkbox"/> Member Latitude and Longitude	
<input type="checkbox"/> Employer Tax ID		
Provide detailed justification for the inclusion of all PHI data selected above, and explain how its inclusion meets the Minimum Necessary Requirement . ³		
<ul style="list-style-type: none"> Member 5-Digit Zip Code Will be used to link to ACS and AHRQ SDOH database for risk adjustment and stratification. Member County For diagnostic safety, it will be used to link numerator events (as flagged in CO APCD claims) to area-level denominator (i.e., the population at risk). Will be used to link to ACS and AHRQ SDOH database for risk adjustment and stratification. Member Dates of Service 		

³ Limited and Identifiable extracts must adhere to the [Minimum Necessary Requirement](#) under the [HIPAA Privacy Rule](#); only that data required to answer the project purpose can be included in the request.

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Will be used in identifying measure numerator and denominator criteria for maternal health and diagnostic safety measures.

- Member Eligibility Dates

Will be used in identifying measure denominator population for maternal health and diagnostic safety measures.

- Member Census Tract

Will be used to link to ACS and AHRQ SDOH database for risk adjustment and stratification.

Line(s) of Business

- Commercial Payers
- Health First Colorado (Colorado’s Medicaid and CHP+ programs)⁴
- Medicare Advantage
- Medicare Fee for Service (FFS)⁵

Year(s) of Data

- | | | | | | |
|-------------------------------|-------------------------------|-------------------------------|--|--|---|
| <input type="checkbox"/> 2012 | <input type="checkbox"/> 2013 | <input type="checkbox"/> 2014 | <input type="checkbox"/> 2015 | <input type="checkbox"/> 2016 | <input type="checkbox"/> 2017 |
| <input type="checkbox"/> 2018 | <input type="checkbox"/> 2019 | <input type="checkbox"/> 2020 | <input checked="" type="checkbox"/> 2021 | <input checked="" type="checkbox"/> 2022 | <input checked="" type="checkbox"/> 2023 ⁶ |

Claim Type(s)

- | | | |
|--|---|--|
| <input checked="" type="checkbox"/> Inpatient Facility | <input checked="" type="checkbox"/> Outpatient Facility | <input checked="" type="checkbox"/> Professional |
| <input checked="" type="checkbox"/> Pharmacy | <input type="checkbox"/> Dental | |

Financial Detail by Line Item

- | | | |
|---|---|--|
| <input type="checkbox"/> Charged Amount | <input type="checkbox"/> Allowed Amount | <input type="checkbox"/> Plan Paid Amount |
| <input type="checkbox"/> Plan Pre-Paid Amount | <input type="checkbox"/> Member Copay | <input type="checkbox"/> Member Deductible |
| <input type="checkbox"/> Member Coinsurance | <input type="checkbox"/> Total Member Liability | |

⁴ Medicaid-only data requests must be approved by the Colorado Department of Health Care Policy and Financing.

⁵ Medicare FFS data are not available for all requests and must go through a separate approval process.

⁶ This year’s data is not fully adjudicated.

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Filter Criteria – Services, Providers, Facilities

If you need data for specific services, providers and/or facilities, specify that filter criteria below (ask your CIVHC Contact about including an additional file with this application for large code lists):

ICD Diagnosis Code(s):
Procedure(s) (list CPT, HCPCS, DRG, ICD, and/or CDT codes):
Drug(s) (list pharmacy NDC and/or HCPCS codes):
Facility Type(s):
Facilities (list NPIs and/or Pharmacy IDs):
Facilities within these geographical areas (list county, zip code, Census Tract , etc.):
Provider Type(s):
Provider(s) (list NPIs):
Providers within these geographical areas (list county, zip code, Census Tract , etc.):
Specific payers (minimum of five):

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Other claim specification:

Filter Criteria – Members/Patients

If you need data for specific member/patient groups, specify that filter criteria below (ask your CIVHC Contact about including an additional file with this application for large code lists):

Ages:		
18 – 65 years		
<input checked="" type="checkbox"/> At the time of service	<input type="checkbox"/> At year end	<input type="checkbox"/> By another anchor date: <i>Specify here</i>
With these ICD Diagnosis Code(s):		
Who have had the following procedure(s) (list CPT, HCPCS, DRG, ICD, and/or CDT codes):		
Within these geographical areas (list county, zip code, Census Tract , etc.):		

Value-Add Data Elements

- [Medicare Severity Diagnosis Related Group](#) Codes (MS-DRGs)
- [3M All Patient Refined Diagnosis Related Group](#) Codes (3M APR DRGs)
- [Medicare Repricer](#) (available at the claim line level)
- Fields from the [American Community Survey](#) (available at the Census Tract level):

<i>Specify here</i>

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Additional Documentation

Data Element Selection Form (DESF)

The Data Release Application must be accompanied by a completed Data Element Selection Form. Ask your CIVHC Contact for more information about completing this form.

- By checking this box, the Client Organization confirms that the Data Element Selection Form has been completed.
- If applicable, by checking this box the Client Organization confirms that a separate Member Match File Data Element Selection Form has been completed.
- If applicable, by checking this box the Client Organization confirms that a separate Control Group Data Element Selection Form has been completed.

Identifiable Data Use Approval

If you are requesting [Identifiable](#) information, approval from an [Institutional Review Board \(IRB\)](#) or a [Privacy Board](#) is required before such data can be released.

- Not applicable; the Client Organization is requesting a Limited Extract.

Approval Type

- IRB Approval
- Privacy Board Approval

Approval Type

- Approval request not yet submitted.
Anticipated submission date:
- Approval request submitted and under review.
Anticipated project approval date:
- Approval already received.

Approval Documentation

- By checking this box, the Client Organization confirms that the IRB or Privacy Board **application and approval documents** have been provided to CIVHC.

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Data Management Plan

An organization requesting CO APCD data must submit an organizational Data Management Plan to CIVHC outlining the organization’s data security and data management policies and procedures to safeguard the data. This Data Management Plan must be approved by CIVHC prior to any data release.

Date Submitted to CIVHC:	5/31/2024
Date Approved by CIVHC:	

Client Acknowledgements and Signatures

Change Agent Index

CIVHC can publicly share the Client Organization’s name in its [Change Agent Index](#)?

- Yes
- No

Report or Product Distribution

If your project results in the production of a report for public distribution in any format (print, electronic, lecture, slides, etc.), including peer-reviewed publication, it must be submitted to CIVHC for review prior to public release. CIVHC will assess compliance with [CMS Cell Size Suppression Policy](#), risk of inferential identification, CIVHC and CO APCD citations, and consistency with the purpose and methodology described in this Data Release Application. CIVHC will not assess the accuracy of the study results or attempt to recreate results.

This requirement is further defined in the Data Use Agreement. Failure to pursue and obtain CIVHC approval prior to publication will be a violation of the Data Use Agreement and may put the organization’s future access to data from the CO APCD at risk.

- By checking this box, the Client Organization acknowledges this requirement.

Data Destruction Period

All data must be destroyed within 30 days of the project end date. If your project end date changes from this application, please reach out to your CIVHC Contact for a project extension request form.

- By checking this box, the Client Organization acknowledges that CIVHC’s [Data Destruction Certificate](#)⁷ must be completed and returned to DataCompliance@CIVHC.org by 10/25/2026 based on the [Anticipated Project End Date](#).

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Data Users

List any individuals that will be working with the data. The Data Use Agreement must be updated through your CIVHC Contact every time individuals are granted access to the data during the course of the project.

Full Name	Title/Role	Organization
Sharon Zhao	Data Scientist	Mathematica
Lalitha Sundaresan	Programmer	Mathematica
Xiaojing Lin	Programmer	Mathematica
Haixia Xu	Programmer	Mathematica
Huihua Lu	Data Scientist	Mathematica
Andrew Pfeiffer	Programmer	Mathematica
Emily Hernandez	Programmer	Mathematica
Ian Huff	Data Scientist	Mathematica

⁷ Available on the [Data Release Application and Documents](#) page of CIVHC’s website under *Privacy, Security, and Regulatory Information*.

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Data Release Application Version Approvals

The Client Organization has reviewed and confirms that the final version number of the Data Release Application reflected below correctly represents the project objectives.

Version	Checkpoint
V.02	Presented at CIVHC Application Review
V.03	Presented to the Data Release Review Committee (DRRC)
V.00	Final version approved for production

CIVHC Sign-Off		Receiving Organization Sign-Off	
Signature:		Signature:	
Name:		Name:	
Title:		Title:	
Date:		Date:	

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Data Element Selection Form Version Approvals

The Client Organization has reviewed and confirms that the final version number of the Data Element Selection Form reflected below correctly represents the data specifications needed to meet the project objectives.

Version	Checkpoint
V.03	Presented at CIVHC Application Review
V.05	Presented to the Data Release Review Committee (DRRC)
V.00	Final version approved for production

CIVHC Sign-Off		Receiving Organization Sign-Off	
Signature:		Signature:	
Name:		Name:	
Title:		Title:	
Date:		Date:	