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and analysis

Application for Massachusetts All-Payer Claims Data (Non-Government) [Exhibit A – Data Application]

I. INSTRUCTIONS

This form is required for all Applicants, Agencies, or Organizations, hereinafter referred to as "Organization", except Government Agencies as defined in [957 CMR 5.02](), requesting protected health information. All Organizations must also complete the [Data Management Plan](), and attach it to this Application. The Application and the Data Management Plan must be signed by an authorized signatory. This Application and the Data Management Plan will be used by CHIA to determine whether the request meets the criteria for data release, pursuant to 957 CMR 5.00. Please complete the Application documents fully and accurately. Prior to receiving CHIA Data, the Organization must execute CHIA's [Data Use Agreement](). Organiations may wish to review that document prior to submitting this Application.

Before completing this Application, please review the data request information on CHIA's website:

- Data Availability
- Fee Schedule
- Data Request Process

After reviewing the information on the website and this Application, please contact CHIA at apcd.data@state.ma.us if you have additional questions about how to complete this form.

The Appliciaton and all attachments must be uploaded to IRBNet. All Application documents can be found on the CHIA website.

Information submitted as part of the Application may be subject to verification during the review process or during any audit review conducted at CHIA's discretion.

Applications will not be reviewed until the Application and all supporting documents are complete and the required application fee is received.

A Fee Remittance Form with instructions for submitting the application fee is available on the CHIA website. If you are requesting a fee waiver, a copy of the Fee Remittance Form and any supporting documentation must be uploaded to IRBNet. Please be aware that if your research is funded and under that funding you are required to release raw data to the funding source, you may not receive CHIA Data.

II. FEE INFORMATION

1. Consult the most current Fee Schedule for All-Payer Claims Database data.

2. After reviewing the Fee Schedule, if you have any questions about the application or data fees, contact apcd.data@state.ma.us.

3. If you believe that you qualify for a fee waiver, complete and submit the Fee Remittance Form and attach it and all required supporting documentation with your application. Refer to the Fee Schedule (effective Feb 1, 2017) for fee waiver criteria.

4. Applications will not be reviewed until the application fee is received.

5. Data for approved Applications will not be released until the payment for the Data is received.

III. ORGANIZATION & INVESTIGATOR INFORMATION

Project Title:	**Access to mental health care in Massachusetts, compared to non-mental health care**
IRBNet Number:	Click here to enter text.
Organization Requesting Data (Recipient):	Massachusetts General Hospital
Organization Website:	http://www.massgeneral.org/monganhealthpolicycenter
Authorized Signatory for Organization:	**Sean Leahy, JD**
Title:	Sr. Agreement Associate
E-Mail Address:	sphleahy@partners.org
Telephone Number:	857-282-1675
Address, City/Town, State, Zip Code:	399 Revolution Dr. Somerville, MA, 02145
Data Custodian: **(individual responsible for organizing, storing, and archiving Data)**	**Zhiyou Yang, PhD**
Title:	Data Analyst II
E-Mail Address:	zyang15@mgh.harvard.edu
Telephone Number:	651-202-1960
Address, City/Town, State, Zip Code:	100 Cambridge St Suite 1600, Boston, MA 02114
Primary Investigator (Applicant): **(individual responsible for the research team using the Data)**	**John Hsu, MD, MBA, MSCE**
Title:	Director, Clinical Economics and Policy Analysis Program
E-Mail Address:	john.hsu@mgh.harvard.edu
Telephone Number:	617-643-7767
Address, City/Town, State, Zip Code:	100 Cambridge St, 15th Floor, Boston, MA 02114
Names of Co-Investigators:	Nicole Benson, MD MBI
E-Mail Addresses of Co-Investigators:	nbenson@mgh.harvard.edu;

IV. PROJECT INFORMATION

IMPORTANT NOTE: Organization represents that the statements made below as well as in any study or research protocol or project plan, or other documents submitted to CHIA in support of the Data Application are complete and accurate and represent the total use of the CHIA Data requested. Any and all CHIA Data released to the Organization under an approved application may ONLY be used for the express purposes identified in this section by the Organization, and for no other purposes. Use of CHIA Data for other purposes requires a separate Data Application to CHIA written request to CHIA, with approval being subject to CHIA's regulatory restrictions and approval process. Unauthorized use is a material violation of your institution's Data Use Agreement with CHIA.

1. What will be the use of the CHIA Data requested? [Check all that apply]

☐ Epidemiological	☐ Health planning/resource allocation	☐ Cost trends
☐ Longitudinal Research	☐ Quality of care assessment	☐ Rate setting
☐ Reference tool	☒ Research studies	☐ Severity index tool (or other derived input)
☐ Surveillance	☐ Student research	☐ Utilization review of resources
☐ Inclusion in a product	☐ Other (describe in box below)	

Click here to enter text.

2. Provide an abstract or brief summary of the specific purpose and objectives of your Project. This description should include the research questions and/or hypotheses the project will attempt to address, or describe the intended product or report that will be derived from the requested data and how this product will be used. Include a brief summary of the pertinent literature with citations, if applicable.

Our health care system in Massachusetts relies on the match between the needs of individuals within the state and services offered, i.e., between demand and supply. Moreover, because many individuals with more severe medical or psychiatric conditions require several types of care (including diagnosis, treatment, and follow-up), any problems could lead to bottlenecks earlier in clinical trajectory as well as exacerbate the degree of mismatch during the earlier stages. In recent years, there have been increasingly frequent manifestations of disconnects between the two and specifically, examples of demand exceeding supply, e.g., crowding in emergency departments (EDs) potentially related to shortages in acute inpatient psychiatric hospital beds or spillover effects of the ED crowding on the ED care for patients with non-psychiatric conditions. Because our health care system is not monolithic, some subgroups could be particularly impacted by such mismatches, e.g., children, Medicaid beneficiaries, or residents in rural or lower-income areas.

The supply changes within mental health specifically represent one area in which there have been some stark manifestiations of the supply/demand mismatch problems.

The numbers and composition of acute inpatient psychiatric hospital beds has changed over the last fifty years, with a general decrease in total number of beds and a shift from primarily state hospital-owned beds in the 1970's towards a mixture of state, private, and general hospital psychiatric beds (1). More recently, there has been a modest relative growth in the number of psychiatric hospital beds within Massachusetts, but considerable variation at the local area as several private hospitals have both opened and closed. Understanding how mental health care has changed in the state during this time period is critical as there are increasingly concerning issues around Emergency Department (ED) crowding and access to hospitals, both psychiatric and acute care, and for both patients with mental health conditions and those without

At the same time, psychiatric care is evolving. For example, in recent years there has been major growth in the evidence base supporting Coordinated Specialty Care (CSC) for first episode psychosis (FEP), and new federal/state policies to support FEP care (2-9). Despite this evolution in policy and delivery, there is limited information on which patients receive care from clinics offering FEP or CSC care, or on the real-world effects of CSC on clinical event rates during the initial years after onset. In theory, CSC starting soon after the onset of psychotic symptoms could help many patients and families adapt to their disease and improve long-term outcomes.

This project will assess changes in the supply of care, the nature of this care including innovations in delivery (e.g., CSC clinics or tele-health care), and evaluate differences between the way mental health and non-mental health services are provided and the differences in care received by patients with and without psychiatric illness. For example, as part of this project, we will examine the impact of the changing supply of psychiatric hospital beds as well as psychiatric providers, focusing initially on the impact of supply constraints on care upstream from the hospital, i.e., in the Emergency Department (ED). We will also assess the impact of changing state capacity for other types of care (e.g., first episode psychosis care, mental health clinicians) including for patients without mental heatlh conditions (i.e., spillover effects) on care patterns and clinical event rates (e.g., Emergency Department [ED] visits or hospitalizations) in Massachusetts.

We will assess the care and services rendered to patients with and without mental health conditions. We are explicitly asking for several linked versions of the APCD (V7-V10) in order to examine longitudinal history and follow-up care trajectories. We will exploit ongoing state-level natural experiments created by the changing supply of free-standing psychiatric hospital beds, with emphasis on supply shocks occurring as the number of beds increase or decrease, as well as state-level programs (e.g., first episode psychosis specialty care clinics). We will examine our outcomes for both children and adolescents (e.g., <18 years or <21 years) versus adults (e.g., 18+ years or 21+ years). We will examine these age cut-offs because coordinated specialty care clinic availability varies by age, inpatient psychiatric bed availability varies with age (e.g., adolescent units are only available for those <18), physician availability varies by age, and insurance reimbursements and eligibility varies by age (e.g., those <21 are eligible for MassHealth Standard). We also will stratify resources by age, e.g., the EDs by relevant charactertistics (size, presence of dedicated psychiatric beds, etc.). This information could help both national and state policy makers, as well as clinicians, patients, and families.

References:

1. Geller JL, Biebel K. The premature demise of public child and adolescent inpatient psychiatric beds : part I: overview and current conditions. Psychiatr Q. 2006;77:251-271.
2. Kane JM, Robinson DG, Schooler NR, et al. Comprehensive versus usual community care for first-episode psychosis: 2-year outcomes from the NIMH RAISE early treatment program. *The American journal of psychiatry.* 2016;173(4):362-372.

3. McGorry PD. Early intervention in psychosis: obvious, effective, overdue. *The Journal of nervous and mental disease.* 2015;203(5):310-318.
4. Nordentoft M, Rasmussen JO, Melau M, Hjorthoj CR, Thorup AA. How successful are first episode programs? A review of the evidence for specialized assertive early intervention. *Current opinion in psychiatry.* 2014;27(3):167-172.
5. National Institute of Mental Health. Recovery After an Initial Schizophrenia Episode (RAISE). http://www.nimh.nih.gov/health/topics/schizophrenia/raise/index.shtml. Accessed Apr 10, 2017.
6. Carey B. New plan to treat schizophrenia is worth added cost, study says. *The New York Times.* Feb 1, 2016.
7. International Early Psychosis Association. IEPA history. http://iepa.org.au/iepa-history/. Accessed Apr 10, 2017.
8. International Early Psychosis Association. Publications. http://iepa.org.au/publications/. Accessed Apr 10, 2017.
9. Heinssen RK, Goldstein AB, Azrin ST. Evidence-based treatments for first episode psychosis: components of coordinated specialty care. *NIMH White Paper* 2014; http://www.nimh.nih.gov/health/topics/schizophrenia/raise/nimh-white-paper-csc-for-fep_147096.pdf. Accessed May 5, 2017.

3. Has an Institutional Review Board (IRB) reviewed your Project?

☒ Yes [*If yes, a copy of the approval letter and protocol* ***must*** *be included with the Application package on IRBNet.*]
☐ No, this Project is not human subject research and does not require IRB review.

4. **Research Methodology**: Applicantions must include either the IRB protocol or a written description of the Project methodology (typically 1-2 pages), which should state the Project objectives and/or identify relevant research questions. This document must be included with the Application package on IRBNet and must provide sufficient detail to allow CHIA to understand how the Data will be used to meet objectives or address research questions.

V. PUBLIC INTEREST

1. Briefly explain why completing this Project is in the public interest. Use quantitative indicators of public health importance where possible, for example, numbers of deaths or incident cases; age-adjusted, age-specific, or crude rates; or years of potential life lost. *Uses that serve the public interest under CHIA regulations include, but are not limited to: health cost and utilization analysis to formulate public policy; studies that promote improvement in population health, health care quality or access; and health planning tied to evaluation or improvement of Massachusetts state government initiatives.*

The Commissioners of Public Health, Mental Health, and Insurance have outlined clear guidelines that, under Mental Health Parity and Addiction Equity Act, insurance carriers offering health plans in Massachusetts are mandated to provide medically necessary behavioral health treatment. Among these guidelines, these governing bodies have specified that covered members requiring hospitalization should not spend prolonged periods of time in the Emergency Department waiting for care (7). To mitigate prolonged ED holding time, the policies call for an escalation of work-flow to assist these patients and providers during periods when patients are experiencing extended ED lengths of stay. The effects of these policies and requirements on all patients have not been assessed; nor has the variability in mental health resources on access to care been studied to determine how this variability affects patient wait time and outcomes and overall spending of healthcare dollars. In addition, the underlying causes of the variability in access to care, including provider capacity and hospital bed supply, are not known. Because little is known about the lasting effects on individual patient care and the overall healthcare system when there are significant delays in care, there is a need to quantify these effects and to look for factors that could help improve care for all patients, those with and without mental illness. Further, despite recent increases in funding to support coordinated specialty care clinics for first episode psychosis, there is limited information on which patients receive care from clinics offering FEP or CSC care, or on the real-world effects of CSC on clinical event rates during the initial years after onset. This project will evaluate the growth of specialized FEP clinics in Massachusetts, supply of clinicians, changes in the composition of patients seen in the clinics or elsewhere, and assess potential differential access to care because of distance, timing, or insurance rules to inform future funding and policy decisions.

References:

7. Commissioner of Insurance, Commissioner of Mental Health, Commissioner of Public Health: Prevention of Emergency Department Boarding of Patients with Acute Behavioral Health and/or Substance Use Disorder Emergencies. https://www.mass.gov/files/documents/2018/01/10/BULLETIN 2018-01 %28E D Boarding%29.pdf2018.

VI. DATASETS REQUESTED

The Massachusetts All-Payer Claims Database is comprised of medical, pharmacy, and dental claims and information from the member eligibility, provider, and product files that are collected from health insurance payers licensed to operate in the Commonwealth of Massachusetts. This information encompasses public and private payers as well as data from insured and self-insured plans. APCD data are refreshed and updated annually and made available to approved data users in Release Versions that contain five calendar years of data and three months of run-out. For more information about APCD Release Versions, including available years of data and a full list of elements in the release please refer to release layouts, data dictionaries and similar documentation included on CHIA's website.

Data requests are typically fulfilled on a one time basis, however; certain Projects may require future years of data that will become available in a subsequent release. Projects that anticipate a need for future years of data may request to be considered for a subscription. Approved subscriptions will receive, upon request, the same data files and data elements included in the initial Release annually or as available. Please note that approved subscription requests are subject to the Data Use Agreement, will require payment of fees for additional Data for Non-Government Entities, and subject to the limitation that the Data can be used only in support of the approved Project.

1. Please indicate below whether this is a one-time request, or if the described Project will require a subscription.

   ☐ One-Time Request **OR** ☒ Subscription

2. Select Release Version and years of data requested (Release Versions and years not listed are not available).

☒ **Release Version 8.0**	☒ **Release Version 10.0**
☐ 2014	☐ 2016
☐ 2015	☐ 2017
☐ 2016	☐ 2018
☐ 2017	☐ 2019
☐ 2018	☐ 2020

   We are requesting all years linked for Version 8.0 through Version 10.0 and an ongoing subscription for future versions.

3. Specify below the data files requested for this Project, and provide your justification for requesting *each* file.

☒ **Medical Claims**
Describe how your research objectives require Medical Claims data: This project will assess the care and services rendered to patients with and without mental health conditions in relation to delivery system variability over time, by examining medical care and supply changes in the system as psychiatric resources fluctuate throughout the system (e.g., hospitals open or close, variable capacity, changes in provider availability). We will use the Medical Claims file to characterize outcomes (medical care and clinical event outcomes). We will use information included in the claim to

identify encounters (by visit type and diagnosis)- e.g., using procedure and diagnosis codes, site of service, bill type. We will also using information on costs to examine changes in medical spending associated with the delivery system or policy changes.

We are requesting data from V8.0 through V10.0 and an ongoing subscription. Based on our conversations with CHIA, we understand that there remains a possibility that V7.0 could be linked with V8.0-V10.0, but there is uncertainty about the feasibility. If the V7.0 linkage is feasible, we would be interested in adding the 2013 calendar year data (which is an important policy year for the state) for all of the datasets requested.

☒ Pharmacy Claims

Describe how your research objectives require Pharmacy Claims data:
We will use the Pharmacy Claims data to examine receipt of prescription drugs and drug spending. We will examine receipt of guideline-consistent medications (e.g., receipt of drugs for chronic conditions such as schizophrenia or bipolar disorder) and adherence to these medications using information on the days of supply and fill patterns to calculate the proportion of days covered in relevant time periods. We also will use the drug information to create predictive risk scores for all individuals.

We are requesting data from V8.0 through V10.0. See earlier comments about medical claims.

☐ Dental Claims

Describe how your research objectives require Dental Claims data:

Click here to enter text.

☒ Member Eligibility

Describe how your research objectives require Member Eligibility data:

We will use the Member Eligibility file to identify populations of interest (e.g., individuals with Medicaid vs commercial insurance) using coverage/enrollment information. We will also use information on individual characteristics -e.g., age, gender – as covariates in our analyses.

We are requesting data from V8.0 through V10.0. See earlier comments about medical claims.

☒ Provider

Describe how your research objectives require Provider data:

We are particularly interested in the change in supply from the provider and delivery system perspective. We will use the provider file to identify clinicians, approximately capacity (i.e., how many patients they are treating), and assess quality (e.g., guideline concordant care) at the clinician level.

We are requesting data from V8.0 through V10.0. See earlier comments about medical claims.

☒ Product

Describe how your research objectives require Product data:

We will use information in the Product file to control for relevant plan characteristics that could influence receipt of medical care, such as benefit design and plan design - e.g., HMO vs. PPO, deductible amounts, etc.

We are requesting data from V8.0 through V10.0. See earlier comments about medical claims.

VII. DATA ENHANCEMENTS REQUESTED

State and federal privacy laws limit the release and use of CHIA Data to the minimum amount of data needed to accomplish a specific Project objective.

All-Payer Claims Database data is released in Limited Data Sets (LDS). All Organizations receive the "Core" LDS, but may also request the data enhancements listed below for inclusion in their analyses. Requests for enhancements will be reviewed by CHIA to determine whether each represents the minimum data necessary to complete the specific Project objective.

For a full list of elements in the release (i.e., the core elements and additional elements), please refer to release layouts, data dictionaries and similar documentation included on CHIA's website.

1. Specify below which enhancements you are requesting in addition to the "Core" LDS, provide your justification for requesting each enhancement.

a. Geographic Subdivisions

The geographic subdivisions listed below are available for Massachusetts residents and providers only. Select *one* of the following options.

☐ 3-Digit Zip Codes (standard)	☒ 5-Digit Zip Codes***
*****If requested, provide justification for requesting 5-Digit Zip Code. Refer to specifics in your methodology:** We use the 5-digit zip code to link the data with area-level datasets to assess local measures of socioeconomic status or other social factors based on Census block group. Measures of interest include poverty, income, and education by area, as obtained from datasets such as the American Community Survey. Because these are area-based measures, the finer the geographic resolution, i.e., the smaller the area, the more precise the potential estimate. We also will use the 5-digit zip code centroid to calculate the mean distance between each subject's address (zip code centroid) and each potential ED and hospital. We will use this differential distance in our analyses.	

b. Date Resolution

Select *one* option from the following options.

☐ Year (YYYY) (Standard)	☐ Month (YYYYMM) ***	☒ Day (YYYYMMDD) *** [for selected data elements only]
***** If requested, provide justification for requesting Month or Day. Refer to specifics in your methodology:** Exact dates are needed for analyses of service use, e.g. to determine visit length of stay, readmission time intervals, and timing and patterns of care of encounters for our sample, particularly as exogenous factors change throughout the system (e.g., overall psychiatric bed supply changes, major incidents occur that may cause increased flow of patients, or high levels of hospital occupancy for non-mental health reasons). Indeed, time is a critical dimension for several study variables.		

c. National Provider Identifier (NPI)

Select *one* of the following options.

☐ Encrypted National Provider Identifiers (standard)	☒ Decrypted National Provider Identifiers***
***** If requested, provide justification for requesting decrypted National Provider Identifier(s). Refer to specifics in your methodology:** We are particularly interested in the change in supply of providers over time. We will link the decrypted NPIs to the CMS and state NPI files to obtain information on providers and to identify provider specialties. We will also classify outpatient visits by provider type, define service areas and associated provider availability using address information available in the NPI file.	

We will also link providers with publicly available on providers from the Commonwealth of Massachusetts Board of Registration in Medicine. This website includes supplemental information on physicians, including their license status, address, affiliations, insurance accepted, Medicaid status, whether they are accepting new patients, and education and training. We will use these data to supplement and compare with the other sources of provider information.

VIII. MEDICAID (MASSHEALTH) DATA

1. Please indicate whether you are seeking Medicaid Data:

☒ Yes
☐ No

2. Federal law (42 USC 1396a(a)7) restricts the use of individually identifiable data of Medicaid recipients to uses that are ***directly connected to the administration of the Medicaid program***. If you are requesting MassHealth Data, please describe, in the space below, why your use of the Data meets this requirement. *Your description should focus on how the results of your project could be used by the Executive Office of Health and Human Services in connection with the administering the MassHealth program*. Requests for MassHealth Data will be forwarded to MassHealth for a determination as to whether the proposed use of the Data is directly connected to the administration of the MassHealth program. CHIA cannot release MassHealth Data without approval from MassHealth. This may introduce significant delays in the receipt of MassHealth Data.

Questions regarding access to providers and the effects of policy approaches to improve access to providers are directly relevant for the administration of the Medicaid program in Massachusetts. We will examine primary and specialty provider participation in MassHealth using empirical claims data and changes in participation over time, and associated changes in receipt of medical care (including high value preventive care) for Medicaid enrollees. In particular, we will look at change in coordinated specialty care use for patients with early psychosis as state funding increased for these clinics (leading to increased numbers). We will also investigate potential downstream effects on clinical event rates (e.g., potentially preventable hospitalizations) and medical spending, which will provide evidence to Executive Office of Health and Human Services on the comprehensive effects of these policy changes on Medicaid enrollees utilization and spending. We also suspect that the ED crowding events result in substantially higher spending patterns for Medicaid beneficiaries who received delayed/prolonged ED care, with the Medicaid program bearing much of the financial cost of the bottleneck, i.e., a potential adverse financial spillover effect of the ED crowding on the state.

3. Organizations approved to receive Medicaid Data will be required to execute a Medicaid Aknowlegment of Conditions MassHealth may impose additional requirements on applicants for Medicaid Data as necessary to ensure compliance with federal laws and regulations regarding Medicaid.

IX. DATA LINKAGE

Data linkage involves combining CHIA Data with other data to create a more extensive database for analysis. Data linkage is typically used to link multiple events or characteristics within one database that refer to a single person within CHIA Data.

1. Do you intend to link or merge CHIA Data to other data?

☒ Yes
☐ No linkage or merger with any other data will occur

2. If yes, please indicate below the types of data to which CHIA Data will be linked. [Check all that apply]

☐ Individual Patient Level Data (e.g. disease registries, death data)

☒ Individual Provider Level Data (e.g., American Medical Association Physician Masterfile)

☒ Individual Facility Level Data (e.g., American Hospital Association data)

☒ Aggregate Data (e.g., Census data)

☐ Other (please describe):

3. If yes, describe the dataset(s) to which the CHIA Data will be linked, indicate which CHIA Data elements will be linked and the purpose for each linkage.

We anticipate three levels of linkage:

1. Provider level (physician) – we have been using detailed information about physician characteristics from Doximity, Massachusetts Board of Registration of Medicine, or from the CMS-NPI file, e.g., specialty. We plan to use the MA BORIM number to link these data to MA licensing data. This linkage will also provide a dataset with a linkage to NPI. We believe that these data are more current than the AMA Masterfile. Provider supply and specialty are essential parts of the project.
2. Provider level (clinic/facility) – we will perform the linkage with the MAPNET dataset at the clinic or facility level. Attached is the data dictionary for the deidentified MAPNET dataset. In the project, we will aggregate the MAPNET data to the clinic/facility level, then link this modified dataset with the APCD. Similarly, we have a concise hospital-level dataset from DMH, which we also will link with the APCD at the hospital level. This dataset contains the date that the free-standing inpatient psychiatric hospital became operational in Massachusetts, and the number of inpatient psychiatric hospital beds available within the hospital, i.e., it provides information on the legal maximum capacity of the hospital assessed annually. Given the limited nature of this dataset, we do not append the data dictionary.
3. Area level – to obtain additional information about the local area and the individual patient (e.g., imputed socio-economic status) we will use a number of data sources linkable using the five-digit zip code. Examples of the datasets include the following: 1) Area Health Resource File, another source of information on the area-level provider supply and facility information, plus details about area provider shortage status; 2) U.S. Census/American Community Survey, for local SES and insurance mix; and 3) Local Area Unemployment Statistics Database, to assess local unemployment levels. These measures represent potential explanatory variables and confounders.

4. If yes, for each proposed linkage above, please describe your method or selected algorithm (e.g., deterministic or probabilistic) for linking each dataset. If you intend to develop a unique algorithm, please describe how it will link each dataset.

We will link our datasets using a deterministic algorithm. For example, we will be matching county in one file to county in another file or zip code in one file to zip code in another file. Providers will be linked using BORIM IDs/NPIs.

5. If yes, attach or provide below a complete listing of the variables from all sources to be included in the final linked analytic file.

Patient level variables

- Demographic information, e.g., age, gender, race/ethnicity
- SES information, e.g., zip code based SES measure

Insurance variables

- Insurance type, e.g., Medicare v. Medicaid v. Group commercial v. Individual commercial v. uninsured
- Managed care plan status, e.g., Medicare Advantage, Medicaid Managed Care plan, HMO status
- Benefit design, e.g., deductible presence, ED visit cost-sharing, hospital cost-sharing

Encounter variables

- Visit date and arrival time / time of day
- Visit discharge time and total length of stay
- Type of visit
- Type of provider
- Diagnoses
- Location
- Facility
- Facility type
- CSC care

Patient-care site distance variables

- Mean distance to each potential care site within 50 miles
- Mean travel time to each potential care site within 50 miles

Patient-care site distance variables

- Mean distance to each potential care site (e.g., hospital) within 50 miles
- Mean distance to each potential freestanding psychiatric hospital within 100 miles
- Mean travel time to each potential care site within 50 miles
- Mean travel time to each potential freestanding psychiatric hospital within 100 miles

Physician supply variables

- HRSA provider shortage status
- Psychiatrist counts per 10,000 population in the county
- Presence of psychiatrists in ED
- Presence of psychiatrists in CSC clinics

Hospital supply variables

- Psychiatric hospital beds

Area variables

- Rural vs urban

6. If yes, please identify the specific steps you will take to prevent the identification of individual patients in the linked dataset.

Linking to these aggregate datasets will not increase the ease or likelihood of identifying individual patients as the information is provided in aggregate form. Moreover, we will take extensive steps to ensure the confidentiality of the data.

We will strip the analytic dataset of individual identifiers, keep all data on Research Computing servers that reside behind MGB's firewalls, and present only aggregated study findings. We also will avoid reporting any potentially small cells, e.g., between 1-10 persons, which in theory could be combined with other data sources and impact confidentiality.

X. PUBLICATION / DISSEMINATION / RE-RELEASE

1. Do you anticipate that the results of your analysis will be published or made publically available? If so, how do you intend to disseminate the results of the study (e.g.; publication in professional journal, poster presentation, newsletter, web page, seminar, conference, statistical tabulation)? Any and all publication of CHIA Data must comply with CHIA's cell size suppression policy, as set forth in the Data Use Agreement. Please explain how you will ensure that any publications ***will not disclose a cell less than 11***, and percentages or other mathematical formulas that result in the display of a cell less than 11.

The results will be submitted for publication in academic, peer-reviewed journals and presented, as appropriate at academic conferences and workshops. All results will be reported as aggregate relationships and summary statistics with no cell sizes between 1-10.

2. Describe your plans to use or otherwise disclose CHIA Data, or any Data derived or extracted from such Data, in any paper, report, website, statistical tabulation, seminar, or other setting that is not disseminated to the public.

We plan to publish our findings in the peer-reviewed literature. These will be available per the journal's usual policies (e.g., through subscriptions). We also anticipate presenting our findings at national research conferences. We will not disclose, share, or distribute CHIA data.

3. What will be the lowest geographical level of analysis of data you expect to present for publication or presentation (e.g., state level, city/town level, zip code level, etc.)? Will maps be presented? If so, what methods will be used to ensure that individuals cannot be identified?

We will present data at the zip code level for patients and will use street address level information regarding facilities/clinics.

4. Will you be using CHIA Data for consulting purposes?

☐ Yes
☒ No

5. Will you be selling standard report products using CHIA Data?

☐ Yes
☒ No

6. Will you be selling a software product using CHIA Data?

☐ Yes
☒ No

7. Will you be using CHIA Data as in input to develop a product (i.e., severity index took, risk adjustment tool, reference tool, etc.)

☐ Yes
☒ No

8. Will you be reselling CHIA Data in any format not noted above?

☐ Yes
☒ No

If yes, in what format will you be reselling CHIA Data?

Click here to enter text.

9. If you have answered "yes" to questions 5, 6, 7 or 8, please provide the name and a description of the products, software, services, or tools.

Click here to enter text.

10. If you have answered "yes" to questions 5, 6, 7 or 8, what is the fee you will charge for such products, software, services or tools?

Click here to enter text.

XI. APPLICANT QUALIFICATIONS

1. Describe your previous experience using claims data. This question should be answered by the primary investigator and any co-investigators who will be using the Data.

John Hsu, MD, MBA, MSCE, is the Director of the Program for Clinical Economics and Policy Analysis within the Mongan Institute for Health Policy at Massachusetts General Hospital, Associate Professor of Medicine, Harvard Medical School, and an Associate Professor of Health Policy, Department of Health Care Policy, Harvard Medical School. He is the principal investigator of a number of federally funded studies examining innovations in health care financing and delivery using large datasets. He also has served on the CHIA APCD Data Release Committee for several years.

Nicole Benson, MD, MBI is a child psychiatrist and clinical informaticist. She is the associate chief medical information officer at McLean Hospital. She has extensive experience using large datasets and provides psychiatric clinical expertise.

Vicki Fung, PhD, is an Assistant Professor of Medicine at Harvard Medical School and a Senior Scientist at the Mongan Institute for Health Policy, Massachusetts General Hospital. She received her doctoral training in Health Services and Policy Analysis at the University of California, Berkeley and post-doctoral training at the Philip R. Lee Institute for Health Policy Studies at the University of California, San Francisco. She has extensive experience conducting health policy research using large claims datasets, including within the Medicare program and the Massachusetts APCD (v3) Data.

2. **Resumes/CVs**: When submitting your Application package on IRBNet, include résumés or curricula vitae of the principal investigator and co-investigators. (These attachments will not be posted on the internet.)

XII. USE OF AGENTS AND/OR CONTRACTORS

By signing this Application, the Organization assumes all responsibility for the use, security and maintenance of the CHIA Data by its agents, including but not limited to contractors. The Organization must have a written agreement with the agent of contractor limiting the use of CHIA Data to the use approved under this Application as well as the privacy and security standards set forth in the Data Use Agreement. CHIA Data may not be shared with any third party without prior written consent from CHIA, or an amendment to this Application. CHIA may audit any entity with access to CHIA Data.

Provide the following information for **all** agents and contractors who will have access to the CHIA Data. [*Add agents or contractors as needed.]*

AGENT/CONTRACTOR #1 INFORMATION	
Company Name:	**Biostat Data Consulting Inc**
Company Website	Click here to enter text.
Contact Person:	**Mary Price, MA**
Title:	Biostatistical consultant
E-mail Address:	Mprice4@mgh.havard.edu
Address, City/Town, State, Zip Code:	1840 Lincoln Ave, Saint Paul, MN 55105
Telephone Number:	651-690-1981
Term of Contract:	Click here to enter text.

1. Describe the tasks and products assigned to the agent or contractor for this Project and their qualifications for completing the tasks.

Mary Price will help conduct the data management and analysis for this project. She is a long standing programmer/analyst with Dr. Hsu (over two decades). She has extensive experience working with and conducting analysis using large claims files, including Medicare claims and large commercial claims databases and the Massachusetts APCD v3 data. She has a masters degree in biostatistics from the University of California, Berkeley. She is classified as a consultant because she resides outside of the local MGB area.

2. Describe the Organization’s oversight and monitoring of the activities and actions of the agent or contractor for this Project, including how the Organization will ensure the security of the CHIA Data to which the agent or contractor has access.

CHIA data files will be stored on secure servers maintained by Mass General Brigham using the security described in the Data Management Plan. No data will leave the site. Data will not be stored on personal computers, removable devices such as laptops, USB drives or external hard drives. Mary Price has executed a Confidentiality Agreement with Mass General Brigham that requires her to comply with these policies. Any violation is grounds for termination of employment and/or suspension and loss of privileges. Ms. Price and all analysts have completed the CITI Collaborative Institutional Training Initiative’s couse in the Protection of Human Research Subjects and are listed on the MGB IRB application.

She and any other analysts will only access the data through secure VPN and behind the Partners Firewall. Access to the data will be controlled through Partners Security and the study investigators who grant access to the secure servers via username and password authentication. As described in the data management plan, all of the research analysis and

sharing is conducted within the servers through VPN. Analysts will use a password protected and encrypted Macbook Pro to access the services through the VPN.

3. Will the agent or contractor have access to and store the CHIA Data at a location other than the Organization's location, off-site server and/or database?

☐ Yes
☒ No

4. If yes, a separate Data Management Plan **must** be completed by the agent or contractor.

AGENT/CONTRACTOR #1 INFORMATION	
Company Name:	Click here to enter text.
Company Website	Click here to enter text.
Contact Person:	Click here to enter text.
Title:	Click here to enter text.
E-mail Address:	Click here to enter text.
Address, City/Town, State, Zip Code:	Click here to enter text.
Telephone Number:	Click here to enter text.
Term of Contract:	Click here to enter text.

1. Describe the tasks and products assigned to the agent or contractor for this Project and their qualifications for completing the tasks.

Click here to enter text.

2. Describe the Organization's oversight and monitoring of the activities and actions of the agent or contractor for this Project, including how the Organization will ensure the security of the CHIA Data to which the agent or contractor has access.

Click here to enter text.

3. Will the agent or contractor have access to or store the CHIA Data at a location other than the Organization's location, off-site server and/or database?

☐ Yes
☐ No

4. If yes, a separate Data Management Plan **must** be completed by the agent or contractor.

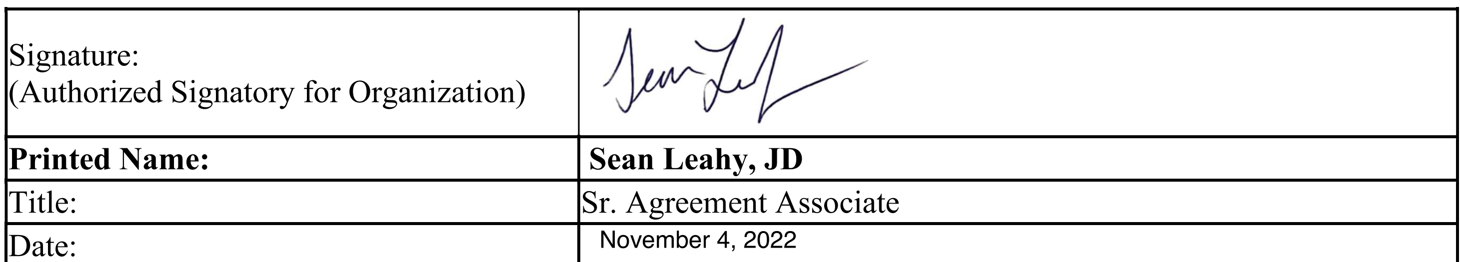
[INSERT A NEW SECTION FOR ADDITIONAL AGENTS/CONTRACTORS AS NEEDED]

XIII. ATTESTATION

By submitting this Application, the Organization attests that it is aware of its data use, privacy and security obligations imposed by state and federal law *and* confirms that it is compliant with such use, privacy and security standards. The Organization further agrees and understands that it is solely responsible for any breaches or unauthorized access, disclosure or use of CHIA Data, including, but not limited to, any breach or unauthorized access, disclosure or use by any third party to which it grants access.

Organizations approved to receive CHIA Data will be provided with Data following the payment of applicable fees and upon the execution of a Data Use Agreement requiring the Organization to adhere to processes and procedures designed to prevent unauthorized access, disclosure or use of data.

By my signature below, I attest: (1) to the accuracy of the information provided herein; (2) this research is not funded by a source requiring the release of raw data to that source; (3) that the requested Data is the minimum necessary to accomplish the purposes described herein; (4) that the Organization will meet the data privacy and security requirements described in this Application and supporting documents, and will ensure that any third party with access to the Data meets the data use, privacy and security requirements; and (5) to my authority to bind the Organization.



Signature: (Authorized Signatory for Organization)	
Printed Name:	**Sean Leahy, JD**
Title:	Sr. Agreement Associate
Date:	November 4, 2022

Attachments:
A completed Application must have the following documents attached to the Application or uploaded separately to IRBNet:

☐ 1. IRB approval letter and protocol (if applicable), or research methodology (if protocol is not attached)

☐ 2. Data Management Plan (including one for each agent or contractor that will have access to or store the CHIA Data at a location other than the Organization's location, off-site server and/or database);

☐ 3. CVs of Investigators (upload to IRBNet)

APPLICATIONS WILL NOT BE REVIEWED UNTIL THEY ARE COMPLETE, INCLUDING ALL ATTACHMENTS.