

Massachusetts Division of Health Care Finance and Policy Application for All-Payer Claims Database (APCD) Data

Applications for APCD data must meet the requirements set forth in regulation **114.5 CMR 22.00: Health Care Claims Data Release** and any Administrative Bulletins promulgated under this regulation. The regulation and bulletins are available online at <http://www.mass.gov/eohhs/gov/departments/hcf/regulations.html>. Information provided on pages 1-4 of this application will be posted on the internet for public comment.

A. APPLICANT INFORMATION	
Applicant Name:	Puneet Batra
Title:	Chief Data Scientist
Organization:	Kyruus, Inc.
Project Title:	Understanding Provider Expertise and Behavior
Date of Application:	January 2013
Project Objectives (240 character limit)	Through the union of clinical procedure data and the Kyruus master physician database, we aim to provide insight into the ongoing challenges of optimal identification of physician expertise to better match physicians to the needs of patients and to provide clearer understanding of the effects that industry interactions may have on care delivery, quality, and efficiency.
Project Research Questions	<ol style="list-style-type: none"> 1. <i>Identify clinical expertise by looking at procedure-level data to improve the quality of patient-physician matches.</i> By creating a more accurate profile of procedural experience of individual providers, we aim to empower care providers with the aggregated information necessary to optimize physician referrals and improve care quality and outcomes. 2. <i>Understand the effects of professional activity, such as interactions with industry, or physical attributes, such as age, on clinical outcomes and cost.</i> We plan to look at the effects of factors that may impact the quality of care received by patients and to identify what factors correlate with quality and value of care.

B. DATA REQUESTED

1. PUBLIC USE									
File	SINGLE USE*			REPEATED USE*			MULTIPLE USE*		
	'08	'09	'10	'08	'09	'10	'08	'09	'10
Medical Claims	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	X	X
Pharmacy Claims	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dental Claims	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Membership Eligibility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Provider	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Product	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. RESTRICTED USE									
File	SINGLE USE*			REPEATED USE*			MULTIPLE USE*		
	'08	'09	'10	'08	'09	'10	'08	'09	'10
Medical Claims	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pharmacy Claims	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dental Claims	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Membership Eligibility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Provider	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Product	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

* The Division reserves the right to change proposed “use level” after review of this application.

Definitions:

- **Single Use:** Use of the data for a project or study.
- **Repeated Use:** Use of the data as an input to develop a report or product for sale to multiple clients or customers provided that it will NOT disclose APCD data. Examples include: development of a severity index tool, development of a reference tool used to inform multiple consulting engagements where no APCD data is disclosed.
- **Multiple Use:** Use of the data to develop a product or service that will be sold in the marketplace and will disclose APCD data. Examples include: a benchmark report produced by analyzing APCD data, a query tool to ease access to APDC data.

3. **Filters:** If you are requesting data elements from the Restricted Use dataset, describe any filters you are requesting to use in order to limit your request to the minimum set of records necessary to complete your project. (For example, you may only need individuals whose age is less than 21, claims for hospital services only, or only claims from small group products.)

File	Data Element(s)	Range of Values Requested
Medical Claims		
Pharmacy Claims		
Dental Claims		
Membership Eligibility		

Provider		
Product		

4. **Restricted data elements:** If you are requesting Data Elements from the Restricted Use dataset, list each restricted data element you are requesting on the attached Data Element List and explain why you need access to EACH Restricted Use data element for your project. Limit your request to the minimum data elements necessary to complete the project and be specific as to how each element relates to your proposed model/analytic plan. Add rows to this table as needed.

Restricted Data Element Name	Restricted Data Element Description	Data File (Medical, Pharmacy, Dental, Eligibility, Provider, Product)	Justification (reason this data element is necessary for your project)

C. PURPOSE AND INTENDED USE

1. Please describe the purpose of your project and how you will use the APCD.

Kyruus is a Boston-based big data start-up company that focuses on helping hospitals and health systems engage, manage, and optimize their physician networks.

Identifying Clinical Expertise

Kyruus plans to pioneer a bottom-up approach to establishing the clinical expertise of physicians based on actual practice patterns with the goal of improving the matching of physician skills/expertise to the needs of the patient. The APCD will be instrumental in this analysis as the database provides a robust aggregation of procedure level data for doctors in Massachusetts. By applying our big data technologies to the APCD, Kyruus will create clinical profiles of doctors that clearly exhibit the proportions of their caseloads allocated to specific procedures. In this way, Kyruus hopes to more accurately portray a physician's true clinical experience as a measure of their expertise.

We believe that quality of care will be improved if a patient who needs hand surgery gets referred to an orthopedic surgeon who spends 90% of her time on hands, rather than an orthopedic surgeon who spends 90% of her time on knees and 10% of her time on hands. Quality and efficiency will be improved by empowering physicians with the information they need to route referrals to the optimal doctor, both from primary care physicians to specialists and from specialists to other specialists.

Understanding the Effects of Non-Clinical Activities and Attributes on Care

We plan to look at the effects of factors that may impact care received by patients and to identify what factors correlate with quality and value of care. We are particularly interested in professional activities, such as industry interactions, and physician attributes, such as age.

By "industry interaction," we mean the financial interactions between physicians and life science companies, such as pharmaceutical companies or medical device manufacturers. While many relationships between physicians and "industry" provide important feedback and fuel innovation in the space of medical research and development, there are worries that financial relationship may cause skews in physicians' judgment and "threaten the integrity of scientific investigations, the objectivity of medical education, the quality of patient care, and the public's trust in medicine" (The Institute of Medicine, "[Conflict of Interest in Medical Research, Education, and Practice](#)").

Worries about the influence of industry money on physician judgment have lead to calls for increased transparency. Many companies in the life science industry, in accordance with their [Corporate Integrity Agreements](#) administered by the OIG, must publicly report payments to physicians. States, like [Massachusetts](#), [Vermont](#), and [Minnesota](#), have "sunshine laws" that require the public disclosure of payments from manufactures to physicians. Soon, all

manufacturers and GPOs in the life science industry will be required to make these public disclosures, in accordance with the [Physician Payment Sunshine Act](#), which has a national scope.

Kyruus maintains an industry-leading database of physicians' interactions with the life science industry by scraping and cataloguing publicly available disclosures of these payments. By combining the APCD with Kyruus's database, Kyruus can answer questions about the practical effects of these interactions. For example, do physicians with industry interactions have higher costs than physicians without industry interactions?

Kyruus has demonstrated through a pilot with a local for-profit health system that physicians' industry interaction activity correlates significantly with high costs in the surgical setting of several high-cost service lines. The APCD will be critical to scaling this conflict-of-interest analysis to a broader swath of healthcare providers throughout Massachusetts. By merging the APCD with Kyruus's master physician database, which contains industry-leading coverage of physician-industry interactions, Kyruus hopes to understand the influence of a physician's non-clinical interactions, specifically industry relationships.

Although the APCD does not provide explicit quality metrics, there are many data elements and combinations that can be used as proxies, such as cost per procedure, volume per physician per ICD-9, and length of stay. Do physicians that interact with industry have higher costs? Do the patients of younger doctors tend to have more inpatient days? While these measures do not provide a comprehensive picture of quality, they do speak to certain quality metrics. Answering these preliminary questions may also open up further avenues for research and increased understanding of the dynamic healthcare ecosystem.

2. Please explain why completing your project is in the public interest.

The team at Kyruus is dedicated to improving healthcare outcomes through targeted data aggregation and analysis. At present, we are already working with hospitals and health systems in Massachusetts and nationally in the areas of conflict of interest management and Stark and anti-kickback compliance. By using the APCD we can expand the understanding of the drivers of provider performance and behavior and aid policy makers and healthcare organizations in their quest to stimulate the delivery of high quality, effective, and efficient care.

Match Optimization: Physician Expertise to Patient Need

Kyruus believes that healthcare outcomes will improve if patients are able to see the doctor that is best suited to the patients' specific needs. Kyruus's unique approach to specialty identification will shine light on critical aspects of a physician's profile and optimize patient choices of an appropriate physician for their needs. At the physician-level, Kyruus hopes to empower physicians with the information needed so that referrals are most appropriate and useful to the patients' needs. At a hospital-level, Kyruus aims to help hospitals focus their recruiting efforts on clinicians with the skills and expertise that fit the precise needs of the

communities that they serve.

Cost Analysis

Kyruus understands the importance of making healthcare affordable and is dedicated to cutting waste from the healthcare system. For this reason, Kyruus sees the importance in identifying non-clinical influences, such as physician relationships with life science manufacturers, that may raise costs or jeopardize quality of care. Kyruus will also study the effects of physician attributes, like age, on cost and outcomes.

3. **Attach** a brief (1-2 pages) description of your research methodology. (This description will not be posted on the internet.)
4. Has your project received approval from your organization’s Institutional Review Board (IRB)?
 - Yes, and a copy of the approval letter is attached to this application
 - No, the IRB will review the project on _____
 - No, this project is not subject to IRB review
 - X No, my organization does not have an IRB and is not subject to IRB review

D. APPLICANT QUALIFICATIONS

1. Describe your qualifications to perform the research described or accomplish the intended use.

Kyruus is a big data start-up with the mission of improving healthcare outcomes and efficiency. We have a blend of technical sophistication and healthcare-specific analytic experience that allow for skillful navigation of massive influxes of data in healthcare.

Kyruus has demonstrated an ability to handle massive amounts of data in an organized and efficient way. Presently, its master physician data base houses over 2 billion data points on 2.2 million healthcare providers.

Kyruus has additionally shown its ability to conduct analysis on this data to solve important healthcare problems. In the compliance space, Kyruus has worked with more than 7 hospitals or health systems in Massachusetts alone. Analysis has ranged from Stark and anti-kickback compliance to cost and device utilization analysis.

In its two-year history, Kyruus has skillfully handled a variety sensitive data for clients. Much of the data Kyruus receives from its customers and partner organizations is confidential and must remain siloed from other customer’s data. Kyruus’s data infrastructure is equipped with the ability to easily and securely branch off and protect data that requires a high level of privacy.

2. Describe the software you plan to use to analyze the data and the experience that the applicant’s team members have in using that software.

Kyruus will house the data in Hadoop and a Postgres SQL database. Analytics will be run locally in

Excel and in R.

3. Attach résumés or curriculum vitae of the applicant/principal investigator, key contributors, and of all individuals who will have access to the data. (These attachments will not be posted on the internet.)

Please see attached folder for resumes of key contributors.

E. DATA LINKAGE AND FURTHER DATA ABSTRACTION

1. Does your project require linking the APCD to another dataset?
YES NO
2. If yes, will the APCD be linked to other patient level data or with aggregate data (e.g. Census data)?
Patient Level Data Aggregate Data

Kyruus will link the APCD to physician-level data.

3. If yes, please identify all linkages proposed and explain the reasons(s) that the linkage is necessary to accomplish the purpose of the project.

Kyruus will link the APCD to a local copy of its master physician database, which gives a comprehensive overview of physicians. Information contained in the Kyruus master physician database includes industry interactions, publications, grants, clinical trials, patents, federal and state disciplinary actions, criminal records, addresses, affiliations, specialties, clinical interests, board certifications, birth year, and a host of other data. Through the union of the APCD and Kyruus datasets, we can achieve a unified view of both a doctor's clinical and professional activities.

This unified view will be important in both Kyruus's pioneering approach to specialty identification and Kyruus's analysis of industry interactions and procedure cost. For example, in the physician-facing application that focuses on finding the right doctor for your patient, the physician may be interested to know the research that the physician has conducted or where the physician practices. Additionally, for the conflict of interest analysis, Kyruus's data will provide critical information about a physician's non-clinical activity, such as industry interactions, and attributes, such as age.

4. If yes, specify the specific steps you will take to prevent the identification of individual patients in the linked dataset.

Kyruus has no patient-identifiable data, only physician-identifiable data.

F. RE-RELEASE OF DATA

Applicants must obtain prior approval from the Division to publish reports that use APCD files. Applicants must provide the Division with a copy of any report at least 30 days prior to release to outside parties, including peer review and prepublication analysis by anyone other than the individuals named in this Application. The Division will review the report to ensure that the publication will not permit identification of an individual patient or permit identification of a specific payment by individual payer. The Division may prohibit release of reports that may permit identification of individual patients or specific payment by individual payer.

1. Describe your plans to publish or otherwise disclose any APCD data elements, or any data derived or extracted from such data, in any paper, report, website, statistical tabulation, or similar document.

APCD data elements will not be disclosed in their raw forms in any public forum on the internet or in print. Kyruus is willing to work with the state government to establish guidelines for the disclosure of APCD data derivatives but requests permission to disclose the following type of information derived from the APCD:

- **Show aggregates at the physician-level to clients.** For example, in the referral application, Kyruus would like to show the proportion of a physician's caseload consists of a particular type of procedure. Physicians and hospital admins at client organizations will have access to this data. The application will be password protected. Additionally, procedural data will be redacted to ensure patient privacy. If a physician has performed fewer than 11 of a given procedure in one year, Kyruus will not include this procedure in the physician's profile.
- **Send electronic reports to clients detailing trends at their organization.** For example, Kyruus would like to look at procedure costs and whether or not cost correlates with doctors with significant levels of non-clinical professional activity. This analysis will not disclose raw APCD data.
- **Publish analytic results on our website.** For example, if Kyruus scales its conflict of interest analysis across hospitals in MA and finds important trends, Kyruus would like to publish the results of this analysis on its website. This analysis will not disclose raw APCD data.

2. Will the results of your analysis be publicly available to any interested party? Will you charge a fee for the reports or analysis? Please describe how an interested party will obtain your analysis and, if applicable, the amount of the fee.

Kyruus does not plan to make the results of its aggregation and analysis public and will instead work with clients to develop optimal solutions. We will charge a fair market fee for the reports, for consultation, and for any application. Interested parties may contact us to receive Kyruus services.

3. Will you use the data for consulting purposes?

YES NO

4. Will you be selling standard report products using the data?

YES NO

5. Will you be selling a software product using the data?

YES NO

6. If you have answered "yes" to questions 3, 4 or 5, please (i) describe the types of products, services or studies; (ii) estimate the number and types of clients for which the data will be used and (iii) describe any rerelease of data by your clients.

Consulting

Kyruus plans to use the results of its analysis of APCD data to help hospitals and health systems make decisions that improve care. The analysis will be used to guide decision-making and should not result in the re-release of Kyruus or APCD data. For example, Kyruus may consult hospital recruiters in the matter of data-driven recruiting efforts.

For conflict of interest management, Kyruus may use the results of its study of industry relationships and device utilizations to help hospitals improve their conflict of interest policies. We estimate interest in this type of consulting to come from our existing clients as well as other academic medical centers in Massachusetts.

Reports

Reports built off of Kyruus and APCD data may be useful to customers by providing insights that will allow them to improve care. For example, a hospital that is looking to revamp its conflict of interest policy may like to receive a report about correlations between cost per procedure and industry activity.

Software

Kyruus envisions using physician-level aggregates of the APCD data to feed applications. For example, Kyruus would like to create a referral management tool that allows doctors to identify other doctors with a specific caseload.

G. USE OF AGENTS OR CONTRACTORS

Third-Party Vendors. Provide the following information for all agents and contractors who will work with the APCD data.

Company Name:	NONE
Contact Person:	
Title:	
Address:	
Telephone Number:	
Fax Number:	
E-mail Address:	
Organization Website:	

1. Will the agent/contractor have access to the data at a location other than your location or in an off-site server and/or database?
 YES NO

2. Describe the tasks and products assigned to this agent or contractor for this project.

3. Describe the qualifications of this agent or contractor to perform such tasks or deliver such products.

4. Describe your oversight and monitoring of the activity and actions of this agent or subcontractor.