

**Commonwealth of Massachusetts  
Center for Health Information & Analysis (CHIA)  
Non-Governmental Application for Case Mix Data**

*This form is to be used by all applicants, except Government Agencies, as defined in 957 CMR 5.02.*

**NOTE:** *In order for your application to be processed, you must submit the required application fee. Please consult the fee schedule for the appropriate fee amount. A remittance form with instructions for submitting the application fee is available on the CHIA [website](#).*

**I. GENERAL INFORMATION**

APPLICANT INFORMATION	
Applicant Name:	Jon Chilingirian, PhD
Title:	Associate Professor of Human Services Management; Director of the Ph.D. Program in Health Services Research; Director of the Tufts School of Medicine-Brandeis University MD-MBA Program
Organization:	The Heller School for Social Policy and Management, Brandeis University
Project Title:	Being Better Than Average: Benchmarking Efficiency-Quality to Achieve Clinical Excellence in Massachusetts Hospitals
Mailing Address:	415 South St., MS 035, Waltham, MA 02454
Telephone Number:	781-736-3828
Email Address:	chilinge@brandeis.edu
Names of Co-Investigators:	Andrew Wilson, MPH, MA
Email Addresses of Co-Investigators:	<a href="mailto:awwilson@brandeis.edu">awwilson@brandeis.edu</a>
Original Data Request Submission Date:	
Dates Data Request Revised:	
Project Objectives (240 character limit)	The primary objectives of this research project are to benchmark efficiency and performance among Massachusetts hospitals over time and uncover the many sources and factors that contribute to greater efficiencies in patient care and resource use among Massachusetts hospitals
Project Research Questions (if applicable)	<ol style="list-style-type: none"> <li>1. Who are the top performing hospitals in Massachusetts in terms of efficiency and quality for high cost admissions and procedures?</li> <li>2. What factors contribute to more or less variability in hospital performance?</li> <li>3. What was the impact of the 2006 Massachusetts health reform on hospital efficiency?</li> <li>4. What hospital and market level factors impact the efficiency of patient care?</li> </ol>

**II. PROJECT SUMMARY**

Briefly describe the purpose of your project and how you will use the requested CHIA data to accomplish your purpose.

The proposed research project will benchmark the performance of hospitals in Massachusetts along the dimensions of efficiency

and quality for high cost inpatient procedures and admissions, and identify the important environmental and organizational factors that contribute to higher and lower performance. In addition, the study will further measure performance over time, specifically examining the impact the 2006 Massachusetts health reform law on hospital efficiency and quality. The overarching purpose of this research is to enable health care decision-makers to evaluate their performance over a five-year period and uncover practices that yield high levels of efficiency and quality while using the least amount of clinical inputs.

Using the Case-Mix Inpatient data the researchers will: 1) Calculate hospital performance scores and benchmarks using Data Envelopment Analysis (DEA) within each of the top 50 most costly Diagnosis-Related Groups (DRGs) over a five-year period; 2) Examine how hospital efficiency has changed over time in response to the implementation of the 2006 Massachusetts Health Reform; and 3) Use common statistical methods to identify organizational and market-level factors that are associated with high and low performance; 4) Conduct analyses to explore the potential factors that effect efficiency of patient care and resource use within specific hospital service lines (e.g., cardiac surgeries, renal dialysis, behavioral health, etc.).

In addition to these research objectives, in a manner consistent with the data privacy and security requirements set forth in CHIA's data use agreement, the data will be used for educational and instructional purposes pursuant to the mission of the Heller School and Brandeis University. This will include teaching Ph.D. students, MD-MBA students, as well as physician leaders and health executives about the importance of measuring and evaluating performance with frontier methodology. Training Massachusetts Health Leaders and future health services researchers on DEA as a methodology, deepens their knowledge of how to measure and evaluate the important work of health providers. By educating physician and health leaders on how to improve quality and efficiency by applying this methodology not only gives clinical leaders a distinct advantage, it provides them with tools and concepts that can help to serve the public interest. If leaders can improve the performance of their departments and hospitals, the research will help to fulfill the Heller School's mission of "knowledge advancing social justice.

Aggregate data will be used by the researchers in lectures and seminars to demonstrate the existence of variations in the practice of health care, and to generate new knowledge about better ways to estimate the amount and sources of high cost and unsatisfactory quality, by learning from the outliers. No patient-identifiable data will be made available to individuals outside the research team. Any data displayed or otherwise made available during lectures, seminars, or other instructional activities will be de-identified as that term is defined by HIPAA, and no cell with a value of less than eleven (< 11) will be displayed. Most studies of health costs, quality and efficiency are based on State-wide averages, since ratios and statistical models are used. When we want to improve performance, we should focus less on average performance and focus more on who are the high performers, what explains best practices, and can other physicians and hospitals learn from the outliers.

We have already obtained the data for the years 2006-2012. This request is to supplement what we already have with most current data files.

**III. FILES REQUESTED**

Please indicate the databases from which you seek data, and the Level(s) and year(s) of data requested.

CASE MIX	Levels 1 – 6	Fiscal Years Requested
<p><b>Inpatient Discharge</b></p>	<p> <input type="checkbox"/> Level 1 – No Identifiable Data Elements  <input type="checkbox"/> Level 2 – Unique Physician Number (UPN)  <input type="checkbox"/> Level 3 – Unique Health Information Number (UHIN)  <input type="checkbox"/> Level 4 – UHIN and UPN  <input checked="" type="checkbox"/> Level 5 – Date(s) of Admission; Discharge; Significant Procedures  <input type="checkbox"/> Level 6 – Date of Birth; Medical Record Number; Billing Number  <b><u>PLEASE PROVIDE JUSTIFICATION BELOW FOR REQUESTING THE CHOSEN LEVEL:</u></b> </p>	<p> <u>1998 – 2014 Available</u>                      (limited data 1989-1997)                       2013,2014                 </p>

	<p>As part of the project, we want to be able to measure hospital performance over time, as well as measure the performance for specific types of procedures.</p> <p>Moreover, we need specific dates because we want to measure things like 30/60/90-day readmission rates as part of the project. Also, if we wanted to efficiency trends over time intervals of less than a single year, then we will also need this information.</p>	
<p><b>Outpatient Observation</b></p>	<p><input type="checkbox"/> Level 1 – No Identifiable Data Elements  <input type="checkbox"/> Level 2 – Unique Physician Number (UPN)  <input type="checkbox"/> Level 3 – Unique Health Information Number (UHIN)  <input type="checkbox"/> Level 4 – UHIN and UPN  <input type="checkbox"/> Level 5 – Date(s) of Admission; Discharge; Significant Procedures  <input type="checkbox"/> Level 6 – Date of Birth; Medical Record Number; Billing Number</p> <p><b>PLEASE PROVIDE JUSTIFICATION BELOW FOR REQUESTING THE CHOSEN LEVEL:</b></p>	<p><u>2002 – 2014 Available</u></p>
<p><b>Emergency Department</b></p>	<p><input type="checkbox"/> Level 1 – No Identifiable Data Elements  <input type="checkbox"/> Level 2 – Unique Physician Number (UPN)  <input type="checkbox"/> Level 3 – Unique Health Information Number (UHIN)  <input type="checkbox"/> Level 4 – UHIN and UPN  <input type="checkbox"/> Level 5 – Date(s) of Admission; Discharge; Significant Procedures  <input type="checkbox"/> Level 6 – Date of Birth; Medical Record Number; Billing Number</p> <p><b>PLEASE PROVIDE JUSTIFICATION BELOW FOR REQUESTING THE CHOSEN LEVEL:</b></p>	<p><u>2000 – 2014 Available</u></p>

**IV. FEE INFORMATION**

Please consult the fee schedules for Case Mix data, available at [http://chiamass.gov/regulations/#957\\_5](http://chiamass.gov/regulations/#957_5), and select from the following options:

- Single Use
- Limited Multiple Use
- Multiple Use

Are you requesting a fee waiver?

- Yes
- No

If yes, please submit a letter stating the basis for your request. Please refer to the [fee schedule](#) for qualifications for receiving a fee waiver. If you are requesting a waiver based on the financial hardship provision, please provide

documentation of your financial situation. Please note that non-profit status alone isn't sufficient to qualify for a fee waiver.

**V. REQUESTS PURSUANT TO 957 CMR 5.04 (Researchers, Payers, Providers, and Provider Organizations)**

**Please complete only if you are requesting Level 1 (de-identified) Case Mix.**

Please describe how you will use such data for the purposes of lowering total medical expenses, coordinating care, benchmarking, quality analysis or other administrative research purposes.

**VI. ALL OTHER REQUESTS - PURPOSE AND INTENDED USE**

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

Benchmarking hospital performance over time has important implications for the overall health care system. Specifically, such work can shed light on ways in which hospital administrators and providers can reduce costs and waste. This could also free up resources for enhancing or reorganizing current care processes to improve quality, patient experience, and overall satisfaction. That is, this work could help promote a shift toward more care that is more efficient and “patient-centered”.

As discussed above, the educational aspect of the proposed project is also in the public interest because it will empower current and future health care leaders with the skills and knowledge to re-engineer health care delivery processes.

2. **Attach** a brief (1-2 pages) description of your research methodology. (This description will not be posted on the internet.)
3. Has your project received approval from your organization’s Institutional Review Board (IRB)? Please note that CHIA will not review your application until IRB documentation has been received (if applicable).
  - 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.
  - No, my organization does not have an IRB.
- 4.

**VII. APPLICANT QUALIFICATIONS**

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

Jon Chilingirian, PhD  
Dr. Jon A. Chilingirian is a tenured professor at Brandeis University and Adjunct Associate Professor of Public Health and Community Medicine at Tufts School of Medicine. He received his Ph.D. in Management from MIT’s Sloan School of Management. He was recruited to come to Brandeis by Dr. Stuart Altman in 1987.

In 2011-2012, he was a visiting professor of organizational behavior and health care management at INSEAD in Fontainebleau, France. He teaches graduate courses and executive education sessions in Organizational Theory and Behavior, Management of Health Care Organizations, and Health Services Research. He began working with DEA as a Doctoral Student at Massachusetts Institute of Technology (MIT). Today he is an international expert on health applications of DEA.

He is Principle Investigator and Director the AHRQ Doctoral Program in Health Services Research. He is founding director of the MD-MBA Program in Health Management with Tufts Medical School (1995-present), which today is the largest MD-MBA program in the United States with over 200 graduates. Since 1999, the program has graduated an average of 15 MD-MBA students each year.

Professor Chilingirian has lectured across the globe including, Armenia, Belgium, Brazil, China, Denmark, England, Netherlands, Singapore, South Africa, and Spain. He is Program Director of the Brandeis Health Leadership Program, a one-week residential program sponsored by the American College of Surgeons, and the Thoracic Surgery Foundation for Research and Education. Between 1997 and 2011, he directed the European Health Leader's Program, a two-week residential program with nearly 800 alumni. In May 2012, he launched an Advanced Health Policy and Leadership Academy in partnership with the Hanley Center in Maine, which over the next five years will train nearly 10% of all the physicians in the State of Maine.

Dr. Chilingirian is the co-author of *International Health Care Management*, published by Elsevier Press (Summer 2005), and *The Lessons and the Legacy of the Pew Health Policy Program*, with Corinne Kay, published in 1997 by the Institute of Medicine National Academy Press. He has scholarly papers and review essays published in journals such as: *Annals of Operational Research*, *Medical Care*, *European Journal of Operational Research*, *Health Services Research*, *Health Care Management Review*, *Medical Care Research and Review*, *Inquiry*, *Health Services Management Research*, and *The Journal of Health Politics, Policy and Law*. Dr. Chilingirian was former chair of the Health Care Management Division of the Academy of Management. His research focuses on managing health care organizations, ranging from studies of executive leadership and management of professionals to the measurement of performance (i.e., productive efficiency, quality, etc.), identification of physician best practices and the analysis of effective operating strategies. He is currently working on advancing clinical applications of DEA by studying quality, productivity, and technical change in a variety of procedures such as: orthopedic, cardiac and breast cancer surgeries.

Dr. Chilingirian was Assistant Health Commissioner for the City of Boston (1978-1982) past-chair of the Health Care Management Division of the Academy of Management, and 2010 recipient of the Myron Fottler Exceptional Service Award for the Academy of Management. He is the recipient of several academic awards, such as the Academy of Management (Health Care Division's) "Best Paper Award." His research focuses on managing health care organizations, ranging from studies of executive leadership and management of professionals to the measurement of performance (i.e., productive efficiency, quality, etc.), identification of physician best practices and the analysis of effective operating strategies. He is an expert on health care performance studies using mathematical programming and frontier analysis. He recently completed an international study of 444 international health leaders.

#### Andrew Wilson, MPH, MA

Andrew Wilson is a PhD candidate in Health Services Research and an AHRQ Fellow at Brandeis University. As both a researcher and student, he has conducted several research projects using large data sets. This includes statistical analyses of medical and pharmacy claims data for the Medicare, Medicaid, and commercially insured populations, administrative data from primary care practices in the United Kingdom, and data extracted from patient electronic health records. These have led to several peer-reviewed publications, poster and podium presentations, and other reports. In addition, Andrew has extensive training and experience in research design and ethics, statistics, econometrics, and policy analysis. He is proficient with R and SAS.

Andrew received a Master of Public Health with a concentration in health services management and policy from the Tufts University School of Medicine. He also holds a Master of Arts degree in Social Policy with a concentration in

health services research from the Florence Heller School of Social Policy and Management at Brandeis University.

2. Attach résumés or curricula 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.)

**VIII. DATA LINKAGE AND FURTHER DATA ABSTRACTION**

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

1. Do you intend to link or merge CHIA Data to other datasets?
  - Yes
  - No linkage or merger with any other database will occur
  
2. If yes, will the CHIA Data be linked or merged to other individual patient level data (e.g. disease registries, death data), individual provider level data (e.g., American Medical Association Physician Masterfile) , facility level (e.g., American Hospital Association data) or with aggregate data (e.g., Census data)? [check all that apply]

Individual Patient Level Data

What is the purpose of the linkage:

What databases are involved, who owns the data and which specific data elements will be used for linkage:

Individual Provider Level Data

What is the purpose of the linkage:

What databases are involved, who owns the data and which specific data elements will be used for linkage:

Individual Facility Level Data

What is the purpose of the linkage:

To match facilities with their structural characteristics (i.e., teaching status, # of beds, etc.) to examine relationships between hospital characteristics and efficiency.

What databases are involved, who owns the data and which specific data elements will be used for linkage:

The American Hospital Association Annual Hospital Survey

Aggregate Data

What is the purpose of the linkage:

What databases are involved, who owns the data and which specific data elements will be used for linkage:

3. 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 that algorithm will link each dataset.

We will link the data using the name of the facility

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

We will only reported aggregated data at the physician and facility level. No data reported will include patient-level data.

5. If yes, and the data mentioned above is not in the public domain, please attach a letter of agreement or other appropriate documentation on restrictions of use from the data owner corroborating that they agree to have you initiate linkage of their data with CHIA data and include the data owner's website.

**IX. PUBLICATION / DISSEMINATION / RE-RELEASE**

1. Describe your plans to publish or otherwise disclose CHIA Data, or any data derived or extracted from such data, in any paper, report, website, statistical tabulation, seminar, conference, or other setting.

The researchers intend to primarily publish the results of the proposed projects in the peer-reviewed academic literature. The results may also be made available through white papers and other unpublished reports provided to interested individuals or groups. Results will also be included in class handouts and presentation slides.

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

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. Will you be reselling the data?

- Yes  
 No

If yes, in what format will you be reselling the data (e.g., as a standalone product, incorporated with a software product, with a subscription, etc.)?

7. If you have answered “yes” to questions 3, 4 or 5, please describe the types of products, services or studies.

**X. USE OF AGENTS AND/OR CONTRACTORS**

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

Company Name:	
Contact Person:	
Title:	
Address:	
Telephone Number:	
E-mail Address:	
Organization Website:	



8. Will the agent/contractor have access to the data at a location other than your location, your off-site server and/or your database?

- Yes
- No

If yes, please provide information about the agent/contractor's data management practices, policies and procedures in your Data Management Plan.

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

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

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

**XIII. ASSURANCES**

Applicants requesting and receiving data from CHIA pursuant to 957 CMR 5.00 ("Data Recipients") will be provided with data following the execution of a data use agreement that requires the Data Recipient to adhere to processes and procedures aimed at preventing unauthorized access, disclosure or use of data.

Data Recipients are further subject to the requirements and restrictions contained in applicable state and federal laws protecting privacy and data security, and will be required to adopt and implement policies and practices to protect CHIA data in a manner consistent with the requirements of the federal Health Insurance Portability and Accountability Act of 1996 (HIPAA).

Data Recipients must promptly notify CHIA of any unauthorized use or disclosure of CHIA data.

**By my signature below, I attest to: (1) the accuracy of the information provided herein; (2) my organization's ability to meet CHIA's minimum data security requirements; and (3) my authority to bind the organization seeking CHIA data for the purposes described herein.**

Signature:	<i>Ronald Etlinger</i>
Printed Name:	Ronald Etlinger, Chief Administrative Officer, 781 736-3902, etlinger@brandeis.edu
Original Application Submission Date:	November 12, 2015
Dates Application Revised:	February 17, 2016

