Important changes in the health care delivery system have underlined major challenges in terms of quality of care and cost containment. To accurately quantify quality of care, healthcare organizations are increasingly developing quality measurement strategies such as measuring physician and healthcare organizations’ performances. Given that the average hospital has approximately 10 independent IT systems, the challenge to accurately measure these performances is all too real. Therefore, leading healthcare organizations are turning to building in-house data products that focus on patterns of care rather than on specific clinical decisions.
Allowing for Physician Profiling in a Value-Based Environment

About Our Customer
Our customer is a major hospital in Western Europe that employs more than 2300 people.

Industry
Healthcare

Market
Europe

Use Case
Physician Profiling

Challenge
Concerns over Cost Containment and Quality of Care
Our customer, a European healthcare provider, wanted to embrace an Accountable Care Organization (ACO) model as they sought to improve clinical outcomes while improving their ability to compete on cost. Some clinical processes, like prescribing expensive or useless drugs to their patients or recommending longer hospital stays than needed, are unnecessarily costly and detrimental to patient care. Our customer estimated that administering the wrong care at the wrong time represented upward of $1,6M loss per year, a problem that they could solve with accurate physician profiling. Our customer aimed to reduce costs without restricting services on the quality of care. The problems they faced:
- uncoordinated heterogeneous data sources;
- reports of physician profiling based on irregular and poor quality data;
- insufficient risk-adjustment of results;
- missing automation of physician profiling processes.

Solution
Behavioral Analysis for Physician and Care Profiling
With DSS, the customer’s quality manager team built a data service that automatically cleans and aggregates various datasets (claims, patient, physician, and Rx data). The aggregated data enables them to identify precisely which patient, treatments, and outcomes are linked to which physician processes. At the center of this DSS-powered data service, the team has integrated a machine learning algorithm that enables them to isolate patterns that reveal specific impacts on patient health outcome. When the model processes new incoming data from the various systems, practices ranging from drug prescriptions to hospitalization time are scored depending on how detrimental or beneficial they are in terms of cost and specific patient health.

Results
Significant Increase of Final Care and Decrease of Costs
Thanks to this productivity analysis, our customer’s quality manager was able to implement best practices amongst the hospital’s physicians, improving patient care while avoiding superfluous costs:
- hospitalization average length is now below national standards;
- unnecessary drug prescriptions have significantly decreased, resulting in savings that amount to an estimated $1.3 million per year;
- once reticent, physicians are now involved and frequently try to modify their personal practice choices based on this data analysis to increase care and cost.

“Like most healthcare providers, making sure we deliver the best treatment to our patients at a minimal cost is a primary concern. With DSS, we’ve finally managed to make sense of dozens of heterogeneous data sources enabling us to deliver a clear vision of what we can easily improve in our daily practices. Now that DSS has shown its impact, we are extending its functionalities to answer the needs of other departments like nurses or emergency physicians.”
Executive Quality Manager

www.dataiku.com
_data science studio_

External Data (claims, patient, physician, prescription)

Automatically clean, gather, & merge data

Uncover physician behavior patterns & results

Prototyping & delivery of an effective physician profiling data product in under 2 months

A powerful ETL for all data sources, no matter source & format

Data-driven approach to measuring physician performance trusted by physicians themselves

Technology Used

- R
- SQL
- Python

Time

In just 2 months

Team

1 data scientist
1 business analyst
1 data engineer

Models

Random Forests
Logistic Regression
Survival Analysis

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