

Understanding Patient Populations in New Hampshire using SAS® Visual Analytics

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ABSTRACT

As part of its Accountable Care Project (ACP), the Institute for Health Policy and Practice at the University of New Hampshire has developed a set of analytic reports to provide healthcare systems undergoing transformation a capacity to compare measures of quality, utilization, and cost across systems and regions. The purpose of these reports is to provide data and analysis on which the ACP learning collaborative can share knowledge and develop action plans that can be adopted by healthcare innovators in New Hampshire. This paper showcases the claims-based reports, powered by SAS® Visual Analytics and driven by the New Hampshire Comprehensive Health Care Information System (CHIS), which includes commercial, Medicaid, and Medicare populations. With the power of SAS® Visual Analytics, thousands of pages of PDF files were distilled down to a manageable, dynamic, web-based portal that allows users to target information most appealing to them. This streamlined approach reduces barriers to obtaining information, offers that information in a digestible medium, and creates a better user experience.

INTRODUCTION

The Accountable Care Project (ACP) is a collaboration of advocacy organizations, state agencies, employers, healthcare provider organizations, commercial payers and others working together to promote healthcare system transformation. Among the initial goals of the ACP is the creation of a report suite aimed at enabling the transformation and payment reform efforts of ACP member organizations, to understand the health patterns of the population in New Hampshire, and to share learning and develop action plans to improve healthcare in New Hampshire and beyond. This report suite utilizes a common data source and features consistent measures so that comparisons can easily be made across ACP member organizations and across time. For more information on the goals of the ACP, visit http://www.nhaccountablecare.org/About_Us.html.

The ACP report suite is powered by the New Hampshire Comprehensive Health Care Information System (CHIS), an example of an all-payer claims database (APCD). CHIS contains healthcare claims data from commercial insurers, Medicaid and Medicare. For more information about CHIS, visit <https://nhchis.com/> and for more information about APCDs, visit <http://www.apcdcouncil.org/>.

The Institute for Health Policy and Practice (IHPP) created a report suite, using SAS® to produce PDFs. Preliminary versions of this suite included PDF reports that had to be sliced by many factors (e.g. provider, payer, region). As the interests of ACP members widened, the PDF reports likewise grew to unmanageable sizes (thousands of pages spread across several reports). Comparisons were difficult, requiring organizations to examine multiple reports (e.g. by comparing an organization-level report to the state comparator report). If an organization wished to track changes over time, it would be responsible to archive past reports and compare them side-by-side with current reports. Additionally, report delivery was crude and unsatisfactory. Reports were emailed and represented a static version of the reports. Changes required altering, then rerunning SAS® code, resending the reports via email, and asking recipients to delete prior versions. In order to improve upon these shortcomings (size and delivery), IHPP transitioned to a solution based on SAS® Visual Analytics.

The purpose of this paper is to highlight the improvements to the ACP report suite as a result of the transition from PDF-based reports to SAS® Visual Analytics. This paper is not intended to provide step-by-step instruction from conception to completion for building a report suite in SAS® Visual Analytics.

FROM PDF TO PORTAL

Once it had been determined that a better way to deliver information to ACP users was needed, IHPP began exploring solutions and ultimately landed on SAS® Visual Analytics, providing ACP users with a

dynamic portal into the data. After learning how to build reports in SAS® Visual Analytics, IHPP initially set out to replicate the PDF report suite. It was important to take this small step first, validating that the information contained in both PDF and SAS® Visual Analytics formats were identical. From there, IHPP made improvements to the report suite, adding content and altering formatting. IHPP will continue to add value to the existing report suite going forward.

To get a sense of the starting point, **Error! Reference source not found.** shows an excerpt from the Overview by Month section within the PDF report suite. In this section, representing one of thousands of pages, the user is able to view measures by month for all ACP member organizations within the Greater Manchester Public Health Region (PHR).

Network/Region: ACP/Greater Manchester Attribution Type: PCP

Overview by Month (Medical)

Prepared by UNH Center for Health Analytics for NH CHIS - NH Accountable Care Project Version
Measurement Period: 01/01/2010 - 12/31/2011

	01/01/2010 - 12/31/2010			01/01/2011 - 12/31/2011			
Month	Member Months	Cost	PMPM	Member Months	Cost	PMPM	% Change in PMPM
January	21,584	\$7,351,518	\$341	22,734	\$8,217,712	\$361	5.9%
February	21,844	\$7,250,876	\$332	22,983	\$7,215,484	\$314	-5.4%
March	22,047	\$9,155,195	\$415	23,167	\$9,958,954	\$430	3.6%
April	22,273	\$8,436,002	\$379	23,381	\$8,338,467	\$357	-5.8%
May	22,305	\$7,698,161	\$345	23,391	\$9,193,097	\$393	13.9%
June	22,327	\$8,684,773	\$389	23,399	\$9,239,116	\$395	1.5%
July	22,335	\$7,852,234	\$352	23,425	\$8,007,853	\$342	-2.8%
August	22,335	\$8,309,091	\$372	23,441	\$9,428,120	\$402	8.1%
September	22,350	\$8,114,619	\$363	23,475	\$9,813,926	\$418	15.2%
October	22,133	\$8,472,371	\$383	23,191	\$9,348,751	\$403	5.2%
November	21,916	\$8,754,371	\$399	22,983	\$8,939,962	\$389	-2.5%
December	21,769	\$8,620,091	\$396	22,738	\$8,471,512	\$373	-5.8%
Total	265,218	\$98,699,301	\$372	278,308	\$106,172,955	\$381	2.4%

Error! Reference source not found.1: Excerpt From The Overview By Month Section Within The PDF Report Suite

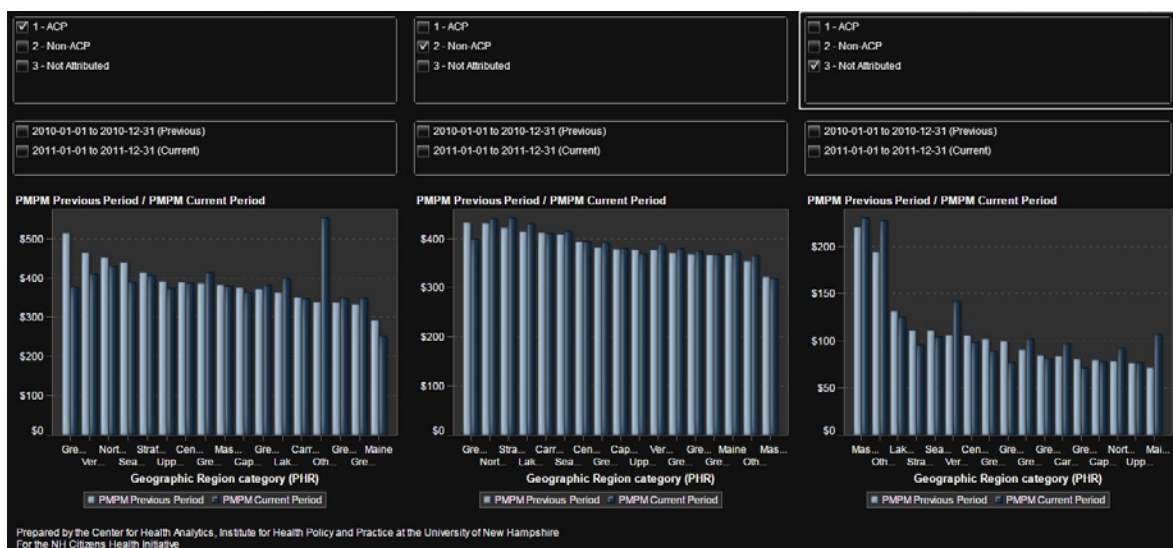
In order to make the reports more readable and digestible, IHPP utilized filtering within SAS® Visual Analytics. While simple, filters are a powerful tool that reduced the “size” of the reports from thousands of pages to roughly 20 “pages” (sections). Filtering allows for more information to be displayed on screen (Display 2). By selecting “1 – ACP” and “Greater Manchester” the user is able to drill down into the data, yielding the same data as found in Display 1. Data from multiple PHRs may be combined using the dynamic filters. In order to replicate this functionality using the PDFs a user would have to manually sum measures from separate pages of the PDF reports. Designing the report suite as shown in Display 2 saves time, reduces errors, and creates an enhanced user experience.



Display 2: Screenshot Of The Overview By Month Section Within The SAS® Visual Analytics Public Report Suite

ADVANTAGES OF TRANSITION

The advantages of this transition are many. First, the delivery of the reports is faster. IHPP simply notifies users that new data has been loaded. That data is then immediately accessible in the report suite. Second, if IHPP decides to make changes to an existing report suite, those changes can be made by either overwriting or adding to an existing report suite. For example, if an error is found in the current data, IHPP is able to fix that error and replace the suite without having to send new, static versions of the reports. This reduces the risk that users will refer to obsolete or inaccurate versions of the report suite. Third, the reports are easier to digest and navigate. By reducing the report suite to 20 sections, users are able to browse to the section of interest and drill down as desired to obtain the information they seek. The comparison sections allow for a side-by-side view that would have been possible only by comparing different PDFs (Display 3). Fourth, the dynamic nature of SAS® Visual Analytics allows us to add sections, measures and other content, to reorder content, to remove content, to change appearance, and to perform other similar alterations not only on the current version of the data, but on historical versions as well. This is powerful in that it allows us to control, to a great extent, the user experience. While it is possible for our users to print or take screenshots of the report suite, it is no longer required to archive static versions of the suite as was the case when using PDFs. Lastly, IHPP is able to track usage of the reports by ACP users (as well as by the public). The old method of report delivery did not allow IHPP to know if or when ACP users were accessing the reports.



Display 3: Screenshot Of The Overview By Month Section Within The SAS® Visual Analytics Public Report Suite

To see the current version of the public level reports, see <http://nhaccountablecare.org/>.

A NOTE ON THE UNDERLYING DATA

ACP clients want to look at the data in a variety of ways (i.e. by region, payer, and service type, to name a few). In order to reduce the size of the data being loaded into the LASR server, summary tables were produced using SAS® that contained just enough detail to allow these levels of analysis. While it would have been possible to load claim line level data into the LASR server, this would have increased the need for memory, thereby increasing hardware costs, and reduced response times. A detailed discussion of data construction and summarization is beyond the scope of this paper, however, the general message is that summarized data requires less memory and increases response time within SAS® Visual Analytics. Therefore the goal should be reducing data set sizes as much as possible while maintaining adequate detail to slice the data as desired.

CONCLUSION

This paper illustrates the transition from a report suite based upon PDFs to one utilizing SAS® Visual Analytics and highlights the advantages of doing so. A similar transition within your organization may speed delivery of information, ease the burden of making changes to reports, enhance the presentation of information, reduce errors, and give users greater access to information. IHPP received positive feedback about the transition and will continue to add content to the report suite going forward.

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RECOMMENDED READING

- *Base SAS® Visual Analytics: Getting Started*
- Accountable Care Project: <http://nhaccountablecare.org/>

- APCD Council: <http://www.apcdcouncil.org/>
- NH CHIS data: <https://nhchis.com/>

CONTACT INFORMATION

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