RFQ Response Form

RFQ for Data Visualization and Information Design Partners

APPLICANT INFORMATION

Applicant Name: Public Consulting Group, Inc. (PCG)

Authorized Representative Name & Title: Lisa Maiuro, MSPH, Ph.D., Director, Performance & Quality, Measurement & Management

Address: 2150 River Plaza Drive, Suite 380, Sacramento CA 95833

Telephone: 916-529-5886

Email: lmaiuro@pcgus.com

Website: www.publicconsultinggroup.com

Legal Status: ☒ For-Profit Corp. ☐ Nonprofit Corp. ☐Sole Proprietor ☐Partnership

Date Incorporated: 1986

Date Submitted 11/14/2017

Check the components for which you are seeking to be qualified:

☒ Simple Design
☒ Complex Development

Rate Requested (provide rate for proposed component(s); include additional information if needed to clarify your response):

PCG Response: For both Simple and Complex Visualization Designs, PCG's costs will be dependent on a resourcing strategy that is specific to the scope of work. Developing meaningful visualizations often depends not simply on Tableau skills but also on understanding the data sources, effective communication with the end users, an understanding of the issues underlying the data, e.g. HEDIS measures or opioid data, and more. Rates for PCG staff are listed below. Total cost of any project will be dependent on the scope of the project and the amount of time required for each specific resource.

For example, a dashboard visualization, simple or complex, is only as good as the accuracy of the underlying data and the relevance of the measures. If the scope of work is based on a data set that has been reviewed for data quality and measures that have been vetted by a stakeholder group as actionable, 80% of the time may be spent on the design of the Tableau dashboard. However, if these two activities, i.e. addressing data quality and vetting the measures is a necessary part of the scope of work, then, conceivably, less than half the time could be spent on the design of the dashboard. In resourcing, it is critical to understand that the design of the dashboard is only as good at quality of the data, the efficiency of the data warehousing, the relevance of the measures, and the extent to which the information being provided is actionable. We will work closely with Allegheny to ensure that

appropriate and adequate mix of resources are assigned to assure that any final visualization will meet the County's objectives and goals.

Various resources may include some combination of the following depending on the scope of work:

Project Manager: This person will manage the project to keep it on time and on track. A larger Tableau deployment may require the skills of a Sr. Project Manager while a simple Tableau dashboard design could be managed by a more junior staff person.

Data Quality and Warehousing Expert: Ensuring data quality and efficient use of back end data sources is critical to the value and efficiency of the dashboards. Depending on the scope of this project, senior staff may be required to ensure that a data cube for live extracts be configured. Alternatively, a small data set in Excel may require more junior staff to simply check to ensure the cells are population with valid values.

Tableau Visualization Expert: Designing dashboards in Tableau is both an art and a science, sometimes depending more heavily on graphic design prowess and other times relying on SQL gymnastics for complex calculated fields. The mix of these skills will be dependent on the scope of work.

Client Communication and Needs Elicitation Expert: A dashboard is only valuable if it meets the client's needs. A visually stunning interface combined with SQL that is genius is useless if it doesn't enable the end user to get at the information they need. Subsequently, it is critical that at the beginning of the project, these needs are clearly identified and understood. The level of expertise required for this is likely to vary depending on the number of people involved and the type of information they require.

Administrator/ Assistant: In both project management and Tableau dashboard development/design there are some tasks that are relatively simple and can be performed by an adminsitr5ative assistant. Tasks may vary from ensuring that colors are used consistently from one dashboard to another to comparing the underlying data with data in the visualization using complex calculations to ensure the accuracy of the visualization.

Subject Matter Expert (SME): The SME may have specific knowledge about the data that is being presented for the visualization. For example, understanding HEDIS measures and how to interpret them may be key to creating a meaningful visualization. We recognize that, depending on the nature of the work, staff with varying levels of skill may be required so we have broken out the roles above into junior and senior staff in the rate chart below. The scope of work will drive our use of the appropriate role and level of resource.

PCG Rates

Project Manager, Senior $165
Project Manager, Junior $135
Data Quality and Warehousing Expert, Senior $165
Data Quality and Warehousing Expert, Junior $150
Tableau Visualization Expert, Senior $180

Tableau Visualization Expert, Junior $150
Client Communication and Needs Elicitation Expert, Senior $165
Client Communication and Needs Elicitation Expert, Junior $150
Administrator/ Assistant, Senior $150
Administrator/ Assistant, Junior $90
Subject Matter Expert, Senior $200
Subject Matter Expert, Junior $165

Note 1: Rates do not include travel which would be priced separately depending on the scope of work. PCG offers the advantage of being able to draw from resources that are local, regional, and national depending on the needs of the project. Our experience indicates that travel requirements are often minimized by employing collaborative tools such as WebEx and Skype. However, we recognize that personal presence is key for some activities and may require additional travel costs.
Note 2: Rates listed here are not-to-exceed rates.
Note 3: The resources listed above are a sample of the types of staff we anticipate for our work with Alleghany, however, depending on the scope, other resources may be required.

REQUIRED CONTACTS

	Name	Phone	Email
Chief Executive Officer	William Mosakowski	617-426-2026	taxadmin@pcgus.com
Contract Processing Contact	Leah Bechtel	916-565-8090	lharper@pcgus.com
Chief Information Officer	Edward Forth	617-426-2026	taxadmin@pcgus.com
Chief Financial Officer	Daniel T. Heaney	617-426-2026	taxadmin@pcgus.com
Administrative Contact	Lisa Maiuro	916-529-5886	lmaiuro@pcgus.com

BOARD INFORMATION

Provide a list of your board members as an attachment or in the space below.

PCG Response:

Directors

William Mosakowski
[redacted]

Stephen Skinner
[redacted]

RFQ Response Form

RFQ for Data Visualization and Information Design Partners

REFERENCES

Provide the name, affiliation and contact information [include email address and telephone number] for three references who are able to address relevant experience with your organization.
Please do not use employees of the Allegheny County Department of Human Services as references.

PCG Response: The references below are people with whom PCG staff have worked on Tableau dashboards and project management.

1. **Jeff Chilton**
   [redacted]
2. **Donna Strugar-Fritsch**
   [redacted]
3. **Marti Kay Sherry**
   [redacted]
4. **Kay Shaffer** (Project Management)
   [redacted]

CERTIFICATION

Please check the following before submitting your Application, as applicable:

☒ I have read the standard County terms and conditions for County contracts and the requirements for DHS Cyber Security, EEOC/Non-Discrimination, and HIPAA.

☒ By submitting this proposal, I certify and represent to the County that all submitted materials are true and accurate, and that I have not offered, conferred or agreed to confer any pecuniary benefit or other thing of value for the receipt of special treatment, advantaged information, recipient's decision, opinion, recommendation, vote or any other exercise of discretion concerning this RFP.

RFQ Response Form

RFQ for Data Visualization and Information Design Partners

ATTACHMENTS

Please submit the following attachments with your Response Form. These can be found at http://www.alleghenycounty.us/dhs/solicitations.

- MWDBE documents
- Allegheny County Vendor Creation Form
- 3 years of audited financial reports
- W-9
- Examples of work

PCG Response: PCG has provided the above-mentioned attachments at the end of this proposal.

RFQ Response Form

RFQ for Data Visualization and Information Design Partners

REQUIREMENTS

Please respond to the following. The maximum score that an Application can receive is 45 points for Simple Design and 55 points for Complex Development. Your response to this section should not exceed the number of pages listed in the section headings. The first six questions must be answered by all Applicants. Applicants for simple design should also complete section B and complex development Applicants should also complete section C. Applicants for both components must answer all 12 questions.

A. All Applicants must respond to the following six questions (30 points possible). Your response to this section should not exceed six pages.

1. Provide evidence that you are fluent with Tableau and/or a free and open source data visualization solution, including advanced calculations and parameters, data manipulation and dashboard actions. You may discuss your experience, examples, training or anything else that demonstrates that you meet these criteria.

   PCG Response: Our experience with Tableau, including advanced calculations and parameters, data manipulation and dashboard actions, is highlighted by several examples described below. However, it is important to note that just as important as technical expertise is our skill in communicating with clients and our commitment to an agreed-upon scope of work within the agreed-upon budget. Our goals are to understand what Allegheny County wants to measure, how that information will be used, and by whom. We will work with Allegheny County staff, listening carefully to their goals and objectives, to create useful and actionable visualizations. As a commitment to Allegheny County and as a measure of our confidence in our ability to deliver, PCG will not charge for any change requests or change orders during the development phase of any project. We stand by the quality and thoroughness of our business requirement and prototyping life cycle methodology that uses collaborative joint application development (JAD) workshops to depict the business viewpoint of end users (or customers) for effective solution development. Any missed requirements found after BR/JAD sessions will be addressed without charge. **Example 1.** Created interactive dashboards and training for one of the largest correctional systems in the country. Used data provided by the Michigan Department of Corrections (MDOC) including off-site claims and electronic health record data (EHR) data to provide information on utilization and costs. Provided information on areas where the Department could target cost savings efforts. Used the data to identify inmates with high cost and highly complex conditions so that they could be targeted for intervention. Also created MDOC dental key performance indicator (KPI) dashboards that removed the necessity to scroll through multiple Excel tabs down to a specific row to determine if a prison site complied. Instead, the Dental Director could simply look at a single visualization to identify sites out of compliance and then coordinate with the dental lead for that site. **Example 2.** Created interactive dashboards for one of the largest Medicaid systems in the country, Medi-Cal. Used data provided by the Medi-Cal Management Information System/Decision Support System (MIS/DSS) to examine dental performance measures. Created dashboards using advanced calculations and applying filters and parameters based on the demographics of providers and patients. **Example 3.** Created interactive dashboards to examine dental utilization and costs for the Washington Dental Foundation to drive policy and strategic planning decisions. Imported a file with patient level WA Medicaid claims data.

Created interactive maps and other visualizations for Foundation's analysis of WA dental care. Used dashboard to create an electronic chartbook summarizing WA dental utilization and costs in the state for public distribution.

2. We seek Applicants who are responsive and able to complete projects in a timely manner. How will you manage your time to ensure responsiveness and timeliness? Provide examples if possible.

   PCG Response: PCG staff have decades of experience managing project schedules and timelines to ensure responsive and timely completion. Effective project management is more than building a schedule, assigning tasks, and monitoring progress. Project management requires looking at a challenge, understanding the goal, assessing the resources available, plotting a course, and keeping things on track until completion. PCG's Project Management Methodology (PMM) draws upon formal processes and standards established by industry leaders such as the Project Management Institute (PMI) and the Institute of Electrical and Electronics Engineers (IEEE); it has been customized based on our hands-on project delivery expertise, and it acknowledges that, as each project is unique, it must have the flexibility to respond to specific needs and challenges. PCG's PMM is built on three tenets that serve as its cornerstone. These are applicable to all projects and reinforce the notion that projects require a commitment that starts on day one.

   Understand the Goal: Success begins with an understanding of the project. Project Managers (PMs) must be active listeners, avid consumers of information, and facilitators of structured discussion that results in a common understanding of the project goals by all parties.

   Be Proactive and Stay on Task: Progress is maintained by thinking ahead, communicating actively, being collaborative, leading decisively, and accepting responsibility for outcomes.

   Deliver Results: Success is realized when a project is delivered on time, in scope, and on budget – and when we have exceeded our clients' expectations. To successfully complete all projects, PCG puts into place essential project management tools that will guide our team's work with Allegheny County to successful, on-time delivery. Effective communication is the cornerstone of PCG's approach. As such, PCG will establish communication channels, discuss project goals, define deliverables, and assist with reaching consensus at each step. PCG has four basic project management objectives that we believe are the foundation of any sound project management methodology: Effective Communication, Proactive Management, High-Quality Work, and On-Time Delivery. Without them, control methods, procedures, and other project management best practices will not be effective. This approach will help guide our project team and deliver the best results. Our project management approach provides structure for planning, organizing, and managing resources to ensure achievement of project goals and objectives. With an expedited timeline, a defined project management methodology becomes a critical factor for project success as it helps to identify priorities and dependencies, track and measure performance, and overcome challenges.

   We will start this engagement with a Project Kick-Off meeting, which is one of the first opportunities to initiate a solid foundation of effective communication in a project. This is an opportunity for project stakeholders to come together and discuss expectations and protocols. It also typically

includes group review of the following: Which stakeholders will be expected to attend status meetings; Roles for each of those stakeholders; The schedule and location for regular status meetings, including conference call information; Format for project status updates; Processes for providing informal status updates outside of formal meetings; and Procedures for initiating changes to the approved evaluation plan.

During the kick-off meeting, the Project Manager will confirm the project's Communication Plan for both informal and formal project status reporting, including frequency and desired content of project status meetings. **Example.** PCG has followed this process through literally hundreds of projects. However, one of these projects focused on the development of a public-facing dashboard to share Early Learning information related to Child Care Works, Certification, Pre-K Counts, Head Start Supplemental Assistance Program, Home Visiting, and Keys to Quality and Early Intervention. The dashboard serves families, community leaders, elected officials at all levels, municipalities of all types, school districts, advocacy groups, child care providers, economic development and community planners researchers, and philanthropists.

3. Describe an example of when you worked across multiple data sources, using data blending or joins to integrate the data.

   PCG Response: An example of working across multiple data sources using both data blending and joins was when we worked with the Michigan Department of Corrections to better understand the types of outpatient services inmates who had chronic conditions, including asthma, and how frequently. We used data from the same data source, an Excel file, with data on prison sites and joined it with another file with patient demographics and then blended it with Electronic Health Record (EHR) data from a different data source using a unique identifier for each inmate. This allowed us to examine an array of questions to determine if standards of care were being met, including ensuring there was infrequent use (< two days a week) of inhaled short acting beta2-agonist (SABA) for quick relief of symptoms (not including prevention of exercise-induced bronchospasm [EIB]). We were then able to identify sites, inmates, and providers who were deviating from standards of care and intervene to modify or enforce clinical practice guidelines.

4. Describe your experience with/ability to create dynamic maps, including maps with custom layers that summarize data at geographic levels not provided by Tableau and/or a free and open source data visualization solution (e.g., Census tract, municipality). You may include an example of a map via link or electronic submission. If you do not share an example, please describe the programs and/or steps necessary to prepare data for display in a data visualization solution.

   PCG Response: PCG staff have experience creating Tableau maps for several projects including monitoring dental performance measures for those eligible for the California Medicaid program and individuals identified as high risk who use the hospital or emergency department for adverse drug events. In the latter example, a file with the coordinates of hospitals was imported and merged with the clinical data. These maps incorporated custom field creation using SQL and various population filters. This allowed us to map the locations of the hospitals and provide information on facility utilization by various subgroups of patients. (Please see *Attachments – Examples of Work Figure 2*.)

5. Discuss your knowledge of basic design principles, including your experience, examples and/or training.

PCG Response: **Training and Experience**. PCG staff has more than seven years of experience developing Tableau dashboards through effective project management and communication. Staff credentials include a certificate of Tableau Advanced Classroom Training, a doctorate in Health Services Research, and a range of advanced degrees and training in research and data analysis.

Knowledge of basic design principles. PCG adopts the 10-point checklist of basic design principles when working with Tableau.

1. Define the purpose. At the very beginning, we work with the client to determine what issue we want to address and why it's important. After we understand the purpose, it's easier to be more strategic in choosing what to include in your visualization, and what to leave out.

2. Determine the metrics. Above all, the metrics we choose must be relevant to the dashboard's purpose. Among other things, we need to consider data availability, data quality and whether the metric is actionable.

3. Choose the right chart type. There is no such thing as a single, correct view for your data. Still, some chart types may be more effective than others. The best way to find the most useful chart type is to consider alternate visualizations and keep the purpose of the visualization and how it will be used in mind before selecting a final chart type.

4. Consider the audience. How will the end users ingest the information — on a desktop with a big screen, or on a mobile device on the go? And how much information will serve them best? The answers to these questions will not only help you determine the size of your dashboard but also the level of detail your visualizations show.

5. Use colors with purpose. It is important to use color purposefully and clearly. Color choices need to highlight the data and be consistent with the client's color scheme insofar as possible. Using too many colors can blur the focus, so it is important to be selective.

6. Lose the clutter. PCG prefers to aim for a crisp and clean dashboard. Things like border choice or additional images shouldn't amount to clutter.

7. Prioritize the most pertinent information. PCG usually places the most important views on top, more specifically in the top-left corner. Any supporting views go on the bottom or to the right. This makes for an intuitive user experience as our eyes naturally start consuming at the upper-left corner of the screen.

8. Make interactivity clear. Interactivity is crucial in empowering the end users to ask and answer their own questions — including those not anticipated. To this end, PCG makes sure the interactivity is intuitive, e.g., legends and filters are user-friendly and labels provide useful information to the end user.

9. Design with performance in mind. The more complex the query necessary to create the view, the greater the impact on performance. PCG is mindful of the number of filters and options added to the dashboard and makes sure each one is necessary. More isn't always better; more might just mean slower.

10. Make sure you've designed a holistic dashboard. Our goal is to make sure all views fit together to tell a single story. Views should flow well from one to the next.

6. How will you provide innovative products while staying within the constraints of DHS's standard color/font scheme?

   PCG Response: By following our 10-point checklist described in #5 above.

B. Simple Design Applicants must respond to the following question (15 points possible). Your response to this section should not exceed three pages. If you are not applying for Simple Design, skip this question and move on to section C.

7. Describe your experience and expertise in integrating graphics with reports (online), retaining interactivity within this context. If you have included an example as an attachment, please refer to this example and describe your process.

   PCG Response: PCG staff have experience integrating graphics with reports on the line while retaining interactivity. These reports have included data tables to support visualizations, storylines to guide readers through the visualization using the Tableau Story feature and links to external online documents that provide context for the visualization. Two of many examples are provided below.
   Example 1. PCG staff created a dashboard to examine dental performance measures for Medicaid enrollees to ensure that plans were meeting benchmarks set for the provision of dental care. This involved creating a dashboard that included mapping of hospitals, supporting data table, and filters to select hospitals and patient populations of interest. (Please see *Attachments – Examples of Work Figure 1.)*
   Example 2. Worked on a team performing a tool selection analysis for a global insurance company. A division of the company was making a decision regarding their go-forward visualization tool of choice. They provided our team with a large extract of their data, along with a high-level set of reporting requirements that were either already required by their business or were desired as future enhancements. Our team developed POC dashboard/reports in Excel (PowerPivot/ PowerView/ Pivot Charts), PowerBI, and Qlik. As a final deliverable, we produced a matrix that explained which tools could meet specific requirements and clearly highlighted gaps. This allowed the client to make an informed decision when making key business intelligence decisions surrounding their strategy for back-end data organization and selecting a data visualization tool.

8. Provide up to two examples of Simple Design data visualization work that you completed independently and completely. You may also provide one additional example of Simple Design work to which you contributed. Your examples must be submitted electronically – links are preferable but other electronic submissions are acceptable. Describe each example, including the topic, purpose, data source, and functionality. If submitting an example to which you contributed, please describe your contribution to the work.

   PCG Response: Two examples of Simple Design data visualization include 1) a project to track hospital quality measures for a CMS-funded project and 2) a medical expense forecasting model. These projects have been proprietary in nature so we cannot provide links but we have provided screenshots. (Please see B8 Example 1 and Example 2. in the attachment with screenshots.)
   Example 1. Using hospital-level data we created a visualization that allows hospitals participating in a CMS project to log in to an off-site Tableau server and view how they are performing on various CMS quality measures relative to a target value and other hospitals over time. Using the Tableau parameter function they can choose which measure they want to view. These data were helpful in assisting hospitals in understanding different areas of hospital quality and identifying areas in most need of quality improvement. (Please see *Attachments – Examples of Work Figure 4*.)

Example 2. PCG staff created a medical forecasting model that was designed to do a sensitivity analysis so end users could pose several "what-if" scenarios and determine how each change might affect expenses. For example, if the numbers of users increased 5 percent and medical inflation increased 3 percent how would that affect expenses compared to drop-in users of 5 percent and a reduction in inflation of 2 percent. Calculations are based on underlying assumptions, but the model allows users to think about how multiple factors may affect expenses. (*Please see Attachments Example of Work – Figure 3.)*

C. Complex Development Applicants must respond to the following three questions (25 points possible). Your response to this section should not exceed five pages. If you are not applying for Complex Development, skip this section.

9. Describe your experience working with a data warehouse.

   PCG Response: PCG staff have worked with data warehouses on several occasions.
   Example 1. Created interactive dashboards for one of the largest correctional systems in the country using their data warehouse. Used data provided by the Michigan Department of Corrections (MDOC) including off-site claims and electronic health record data (EHR) data to provide information on inmate health utilization and costs. Provided information on areas where the Department could target cost savings efforts. Used the data to identify inmates with high cost and highly complex conditions so that they could be targeted for intervention. Also created MDOC dental key performance indicator (KPI) dashboards that removed the necessity to scroll through multiple tabs down to a specific row to determine if a prison site was in compliance. Instead, the Dental Director could simply look at a single visualization to identify sites out of compliance.
   Example 2. Created interactive dashboards for one of the largest Medicaid systems in the country. This deployment was configured with a data warehouse and SQL Server Analysis Services cube. We used a cube with Medicaid Information Support/Decision Support System (MIS/DSS) data to examine dental performance measures created using advanced calculations and applying filters and parameter based on the demographics of providers and patients

10. Explain and give examples of how you are able to create dashboards from live data tables, not just data extracts.

    PCG Response: PCG has several clients with whom they have worked to create dashboards from live data tables, not just data extracts.
    Example 1. Using Medi-Cal cubes we were able to create a dashboard from live data as the cube was updated. PCG staff used a cube with Medicaid Information Support/Decision Support System (MIS/DSS) data to examine dental performance measures created using advanced calculations and applying filters and parameter based on the demographics of providers and patients.
    Example 2. PCG staff developed a suite of sustainability dashboards and reports in Tableau for a leading consumer packaged goods company. The dashboards were connected to a live SQL Server data source. The organization had made a commitment to reducing the environmental impact of their supply chain processes, and the dashboard and report allowed them to track key metrics such as energy consumption, water consumption, and waste output. These metrics were reported along with key performance indicators at supply chain locations, such as production volume and capital expenditure. Dashboards with high-level visualizations were created for executives/managers, and tabular-based reports were available for operational staff.

11. Provide evidence that you are experienced with performance optimization techniques, allowing for efficient data manipulation that does not slow dashboard function for the end user.

    PCG Response: There are a number of steps that PCG may take to ensure performance optimization allowing for efficient data manipulation that does not slow dashboard function for the end user.

Some of these include but are not limited to

1. Identify the problem spots by running and interpreting a performance recording. The performance recorder can pinpoint slow worksheets, slow queries, and long render-times on a dashboard. It even shows the query text, allowing us to work with our database team on optimizing at the database level.

2. Use extracts where possible. Extracts are typically much faster to work with than a live data source and are especially great for prototyping. The key is to use domain-specific cuts of the data. The Data Engine is not intended to be a replacement for a data warehouse. Rather, it's meant to be a supplement for fast prototyping and data discovery.

3. Minimize fields and records. Since an extract is a columnar store, the wider the data set, the slower the query time. We can minimize the number of fields based on the analysis being performed and use the hide all unused fields option to remove unused columns from a data source. We can minimize the number of records by using extract filters to keep only the data we need.

4. Reduce the marks (data points) in the view. When data are highly granular, Tableau must render and precisely place each element. Each mark represents a batch that Tableau must parse. More marks create more batches; drawing 1,000 points on a graph is more difficult than drawing three bars in a chart.

5. Limit filters by number and type. Filtering in Tableau is extremely powerful and expressive. However, inefficient and excessive filters are one of the most common causes of poorly performing workbooks and dashboards. Note: Showing the filter dialog requires Tableau to load its members and may create extra queries.

6. Optimize and materialize calculations. Wherever possible, especially on production views, we will perform calculations in the database to reduce overhead in Tableau. Aggregate calculations are great for calculated fields in Tableau. We will perform row-level calculations in the database when we can.

7. Take advantage of Tableau's query optimization. For example, we will minimize joined tables. Lots of joins take lots of time. and it may be faster to materialize the view in the database.

8. Clean up our workbooks. Excess worksheets on a dashboard can impact performance. PCG routinely deletes or consolidate unused worksheets and data sources.

12. Provide up to two examples of Complex Development data visualization work that you completed independently and completely. You may also provide one additional example of Complex Development work to which you contributed. Your example(s) must be submitted electronically – links are preferable but other electronic submissions are acceptable. Describe each example, including the topic, purpose, data source, and functionality. If submitting an example to which you contributed, please describe your contribution to the work.

PCG Response:

Example 1.

Topic & Purpose PCG is currently leading a two-year Hybrid-Agile development and implementation initiative that creates a comprehensive data visualization platform, Community Dashboards. This project focuses on the development of a public-facing dashboard to share Early Learning information related to Child Care Works, Certification, Pre-K Counts, Head Start Supplemental Assistance Program, Home Visiting, Keys to Quality and Early Intervention. The dashboard serves

families, community leaders, elected officials at all levels, municipalities of all types, school districts, advocacy groups, child care providers, economic development and community planners researchers, and philanthropists.

Data Collection and Functionality In that OCDEL does not have an existing dashboard, PCG started the requirements analysis by conducting a series of nine focus groups with the following stakeholders to identify early learning information that was most helpful to them: Families Providers/Advocates Business Leaders School Districts Higher Education Child Care Information Services (Provider management) Regional Key Representatives (Quality) Grant Writers Infant Toddler and Preschool Early Intervention Upon completion of the conduct of the focus groups, PCG synthetized the input according to data categories (certification, prekindergarten, head start, quality, early intervention), and data format (extract, map format, mobile-friendly, plain language, multi-lingual), along with developing a sense of constraints in dashboard development and dependencies on data feeds. The platform for the dashboard development is Tableau Public, which the Commonwealth was currently using for other data visualization projects, and the look and feel would be consistent with the existing functioning dashboards. PCG facilitated 10 business requirement sessions for the layout and content of the dashboards across all OCDEL sub-program areas. Sessions focused on the development of dashboards for each of the sub-program areas and integration across all areas. Participation included OCDEL executive staff including the Deputy Secretary in the finalization and approval of the business requirements. The dashboards will include the following sections: PreK Counts and Head Start Supplemental Assistance Program Early Intervention Certification and Licensing Child Care Works Integrated Programs Family Engagement Development. The Commonwealth is using its internal development team for the development of the dashboards. PCG is responsible for coordinating and facilitating system testing for each of the sections listed above over an 18-month development timeline. The first of two releases is scheduled for December 2017 with will be for PreK Counts and Head Start, the second release will be in December 2018 for the remaining four sections. (Please see *Attachments Examples of Work - Figure 5.)*

Example 2.

Topic and Purpose The topic and purpose of another complex dashboard were to monitor off-site medical claims for the Michigan Department of Corrections (MDOC). This project's success is demonstrated by the fact that it was maintained, updated and augmented for more than seven years.

Data Sources and Functionality This dashboard was an example of working across multiple data sources using both data blending and joins to better understand the types of off-site services inmates who had chronic conditions, e.g., asthma how frequently. We used data from the same data source, an Excel file, with data on prison sites and joined it with another file with patient demographics and then blended it with Electronic Health Record (EHR) data from a different data source using a unique identifier for each inmate. This allowed us to examine an array of questions to determine if standards of care were being met, e.g., to ensure there was infrequent use (< two days a week) of inhaled short acting beta2-agonist (SABA) for quick relief of symptoms (not including prevention of exercise-induced bronchospasm [EIB]). We were then able to identify sites and inmates and providers who were deviating from standards of care and intervene to either modify or enforce clinical practice guidelines.

Attachments

- MWDBE documents
- Allegheny County Vendor Creation Form
- 3 years of audited financial reports
- W-9
- Examples of work

RFQ Response Form

RFQ for Data Visualization and Information Design Partners

EXAMPLES OF WORK

Inserted on the following pages are screenshots from Tableau dashboards intended to support PCG's narrative describing our experience with data visualizations using Tableau. Unfortunately, our dashboards have been proprietary or confidential for the most part, so we are not able to share links to active dashboards. For each screenshot, we describe the dashboard and how it ties back to the narrative. We recognize that there are many ways to display data, but an important key to developing a useful dashboard is to understand the end users(s) needs and business case and rely on this information to drive development and design.

Please remember that static screenshots are in direct contradiction to the value of Tableau whose strength lies in the dynamic and interactive nature of the visualization. Subsequently, these screenshots cannot fully convey their usefulness but they do provide a glimpse into our extensive experience working with clients on a variety of types of dashboards designed for different purposes.

1. *Figure 1* is a sample of a dashboard which allowed a state Medicaid program to track whether their beneficiaries were getting appropriate dental care. End users could drill down by age group or plan and, by using the Tableau parameter, select which performance measure they want to examine. End users could hover over the question mark to get more information about the data underlying the visualization. (We also provided dashboards with trends and mapping to this client. Not shown).

   The black vertical lines at the end of each bar indicate whether the goal had been met or not. For example, the top blue bar, showing children ages 0-3 in a fee-for-service plan (FFS) indicates that this group of children was getting the targeted number of preventive dental services.

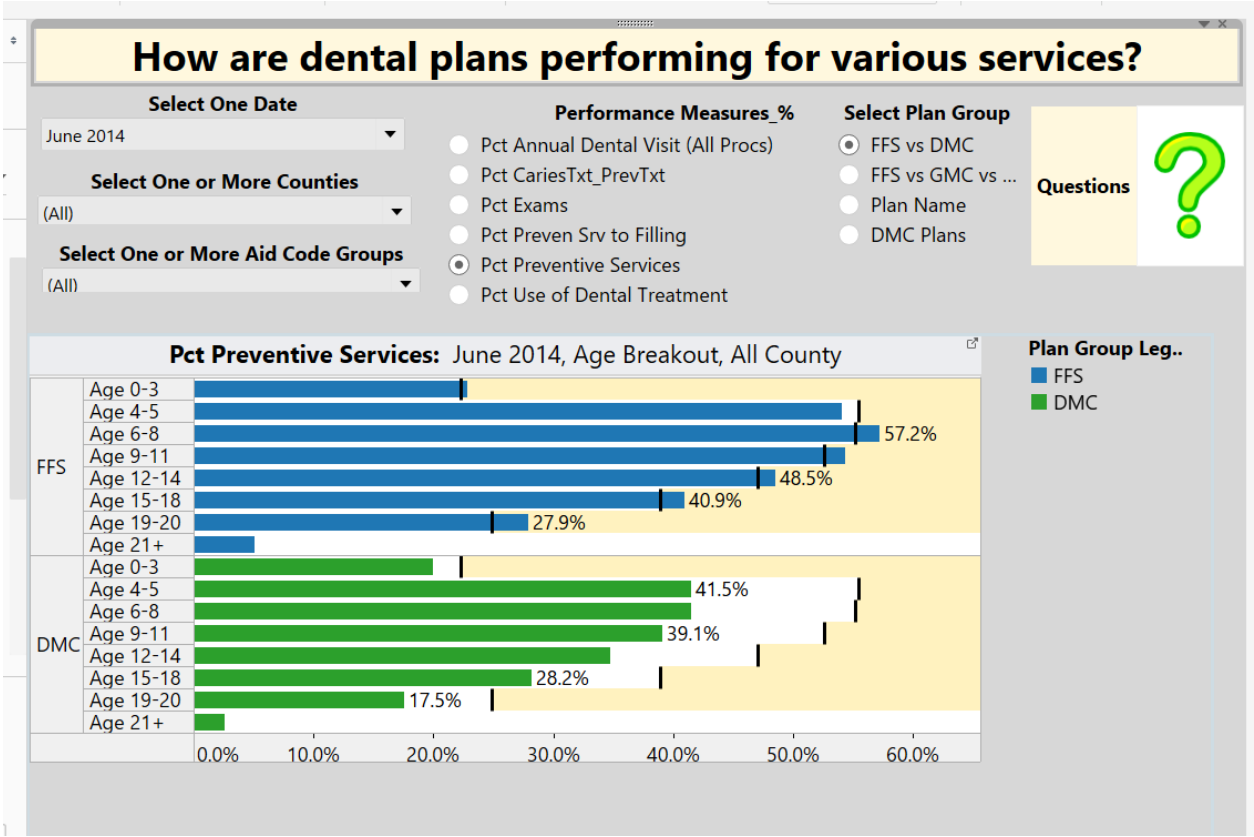

Figure 1: Work Sample - Dental Performance Measures for Medicaid Enrollees

2. *Figure 2* shows a Tableau storyboard created for end users to better understand a subgroup of high-risk Medicaid beneficiaries. The Tableau storyline advances with the slider at the top of the page, rectangle by rectangle, telling the story from beginning to end. The screenshot below is toward the end of the story and shows the emergency department visits for adverse drug events among high-risk beneficiaries.

   End users have the option of choosing a specific hospital, age group, or any number of other filters to examine where to target interventions. Additionally, data in the table next to the map can be sorted in ascending or discerning order to identify hospitals with the lowest or highest rates.

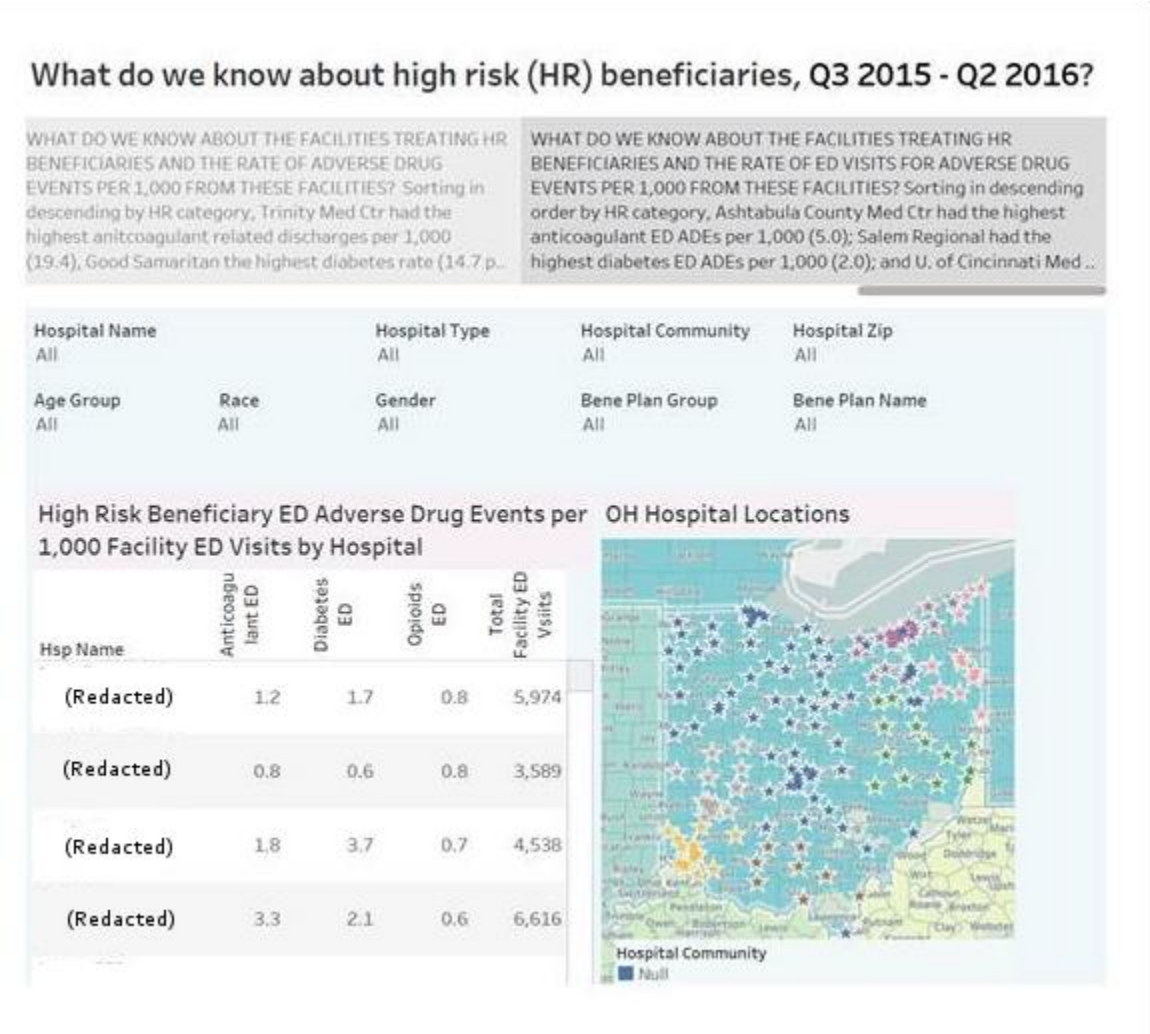

Figure 2: Work Sample Sub-Group of High-Risk Medicaid Beneficiaries

3. *Figure 3* depicts a medical service expenditure forecasting model with a scenario where an end user wants to better understand the impact of multiple factors (indicated by filters on the right) on expenditures. The line at $600K indicates their maximum allowed expenditure level. The shaded red area is above the maximum allowed level. By adjusting the values of the filters on the right, they can assess what actions may keep expenditures below the desired level.

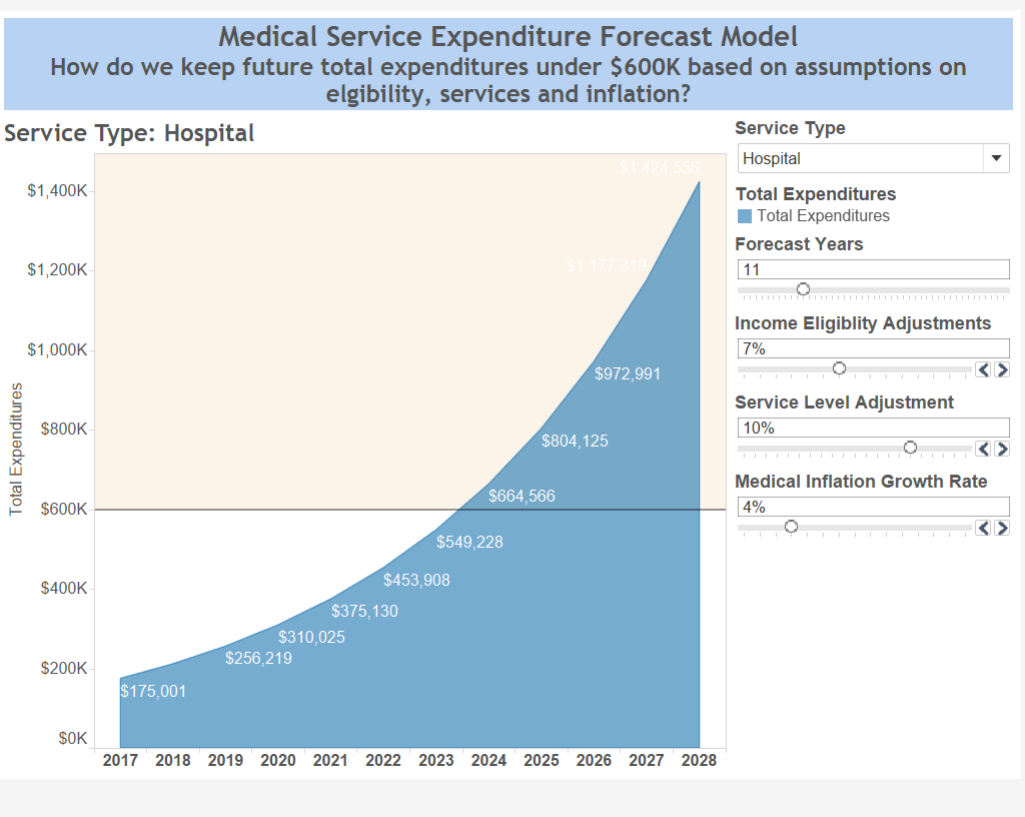

Figure 3: Work Sample - Medical Service Expenditure Forecast Model

4. *Figure 4* created a visualization that allows hospitals participating in a CMS project to log in to an off-site Tableau server and view how they are performing on various CMS quality measures relative to a target value. Using the Tableau parameter function they can choose which measure they want to view. And as shown by the rectangular box with text, users can mouse over points to reveal Tooltips with more information about this specific data point. These data were helpful in assisting hospitals in understanding different areas of hospital quality and identifying areas in most need of quality improvement.

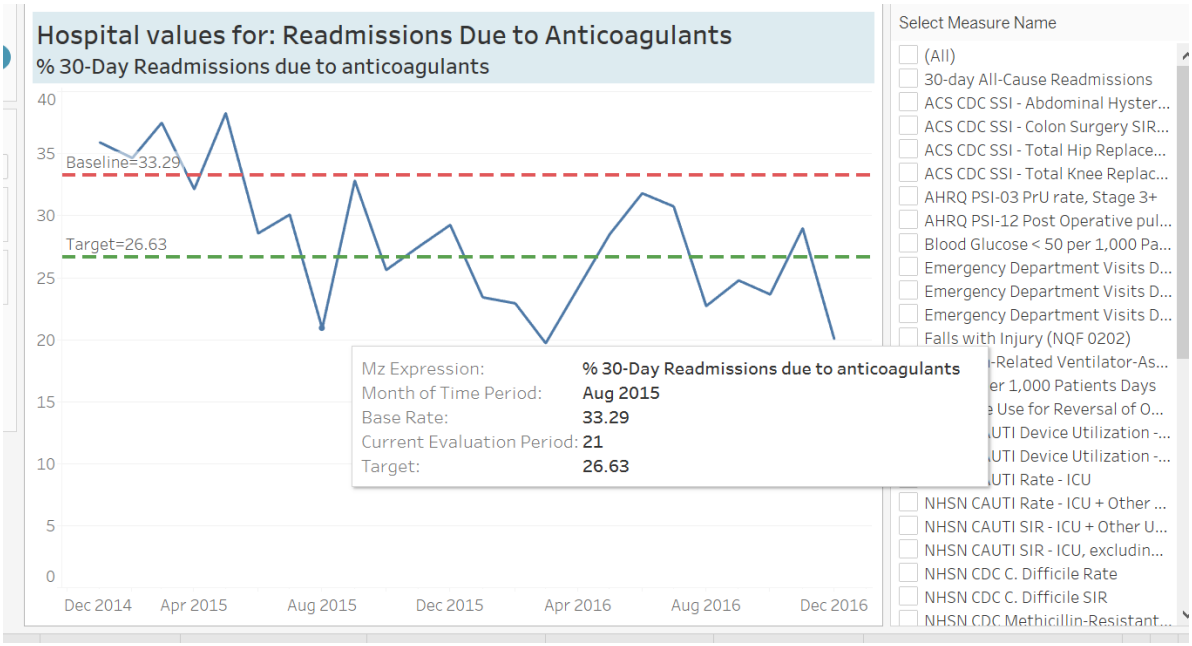

Figure 4: Readmissions Due to Anticoagulants

5. *Figure 5* is one of many from a two-year Hybrid-Agile development and implementation initiative that creates a comprehensive data visualization platform, Community Dashboards. This project focuses on the development of a public-facing dashboard to share Early Learning information related to Child Care Works, Certification, Pre-K Counts, Head Start Supplemental Assistance Program, Home Visiting, Keys to Quality and Early Intervention. The dashboard serves families, community leaders, elected officials at all levels, municipalities of all types, school districts, advocacy groups, child care providers, economic development and community planners researchers, and philanthropists. Data Collection and Functionality

Figure 5: Child Care Certification and Keystone Rating Stars