

FINAL

# ALLEGHENY COUNTY PREDICTIVE RISK MODELING TOOL IMPLEMENTATION: PROCESS EVALUATION

**HORNBY ZELLER ASSOCIATES, INC.**

JANUARY 2018



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## EXECUTIVE SUMMARY

### Background

Allegheny County Department of Human Services (DHS) is using predictive risk modeling (PRM) to assist child welfare staff decide which General Protective Services (GPS) referrals to investigate and which to screen out.

A contracted research team developed the Allegheny Family Screening Tool by conducting an extensive series of analyses using data from the DHS data warehouse and the child welfare case management system to identify factors that are predictive of a child’s re-referral to child welfare or placement into foster care. The research team developed an algorithm that applies weights to a series of factors to assist in determining when a GPS referral should be assigned for investigation or screened out.

Hornby Zeller Associates, Inc. conducted a process evaluation involving stakeholder interviews, surveys, and document review to describe Allegheny County’s experience, including perceived barriers and facilitators, with implementing PRM.

### Methodology

The timeline for the process evaluation is summarized in Table E-1, which includes a description of the strategies employed and the sources used to collect data.

Pre-Implementation		Post-Implementation	
Summer 2016	Fall 2016	Winter 2016	Spring 2017
Interviews with DHS call screening and other DHS staff	Surveys of call screeners	Interviews with DHS research and practice staff  Interviews with external stakeholders	Follow-up surveys of call screeners

### Findings

**Community stakeholders had positive feedback about the presentations introducing Predictive Risk Modeling and hope for continued transparency as the County continues to implement the Allegheny Family Screening Tool.**

Considerable effort went into informing internal and external stakeholders through community meetings about the County’s decision to implement PRM. External stakeholders who attended the presentations generally found them to be “encouraging” and “informative.” They noted the

County and its team of experts know what they are doing and inviting stakeholders to the presentation showed DHS intends to be transparent in its implementation of the tool.

Stakeholders noted the need to continue to inform community stakeholders about PRM progress, outcomes and plans for ongoing maintenance and sustainability. For instance, one provider wanted to know what the “disaster plan” is for the tool, as well as what safeguards are in place to ensure that transparency will continue in the future, regardless of who is overseeing the project.

Following implementation, stakeholders continue to have a positive reaction to implementing the Allegheny Family Screening Tool. Their hope is that the tool will result in increased safety of children and enable the County to be more proactive and less reactive in its case practice.

**The Predictive Risk Modeling Tool is facilitating data-driven decision-making with Allegheny County staff, but there is further room for system-level change.**

Administrators agreed that the tool will help staff to make an informed decision. During the planning period, administrators were confident the tool would lead to more accurate decision-making. More than half of the call screeners (61%) said they believe the tool is facilitating a shift in the workplace environment to be more data-driven.

**Call screening staff report having a good understanding of the Allegheny Family Screening Tool, but are mixed on how confident they are in the resulting scores.**

The majority of call screeners voiced some concern about the reliability of the score, with 72% stating they thought a score seemed inaccurate occasionally and an additional 11% noting it was inaccurate a moderate amount of the time. Half (50%) of the call screeners surveyed said they are confident in the tool’s ability to accurately assess risk. Full-time call screeners were slightly less likely to express confidence than part-time call screeners. The lack of confidence stemmed from the concern that the tool is unable to take a family’s individual circumstances into account; for instance, a family may be receiving services that are improving the family’s situation. More than half of the call screeners (61%) said they are confident in the research that went into developing the tool.

**Call screen staff generally find the Allegheny Family Screening Tool easy to use, and offered technical suggestions for improving the Tool’s user experience.**

The majority of call screeners understand how the score works and all surveyed said they are “adequately prepared to use the tool.” Nearly two-thirds of the call screeners (60%) said the tool is “easy” or “very easy” to use. Approximately one-third (38%) had no opinion on the visual display of the score on the thermometer. More than two-thirds of those with an opinion (70%) said the thermometer is helpful to a limited degree or not at all.

Suggestions offered by call screeners to improve the Allegheny Family Screening Tool were primarily related to technical issues. One of the staff suggested the “score needs to be more visible.” Several screeners remarked that the system is slow, noting it takes a long time for the score to generate and the tool sometimes times out.

### *Recommendations*

#### **Maintain transparent communication with internal and external stakeholders.**

Stakeholders overwhelmingly applauded the efforts that DHS has made to be transparent and to keep them informed throughout the implementation process. It will be important that this transparency continue.

#### **Increase user buy-in.**

Less than half of the call screeners currently view predictive modeling as benefiting the screening practice, though more than 60% agreed that the tool is creating a data-driven culture within the workplace. An opportunity exists to increase user buy-in.

#### **Continue to resolve technical issues as they arise, documenting solutions.**

As changes and enhancements are made to the tool, they should be documented to inform further tool development, increasing the return on the technological investment.

#### **Develop benchmarks for implementing predictive risk modeling.**

Benchmarks can be developed to 1) foster buy-in/increase use of the tool for decision-making by call screening staff and 2) promote transparency with stakeholders.





## INTRODUCTION

### *The Predictive Risk Tool: Development and Goals*

#### Development of the Allegheny Family Screening Tool

Allegheny County, Pennsylvania, has a rich source of data to inform its decision making. The Data Warehouse<sup>1</sup> of the Department of Human Services (DHS) stores data from a wide array of sources including, among others, the juvenile and adult correction systems, public welfare and behavioral health agencies and programs. Data from the warehouse are available to aid child welfare caseworkers and their supervisors, including call screeners, in their decision making. Data integration has paved the way for the use of administrative data in predictive risk analytic models to target services to children and families most in need.

Building on a concept first developed in New Zealand<sup>2</sup> to target social services to families at high risk of using multiple service systems for lengthy periods of time, Allegheny County DHS elected to use Predictive Risk Modeling (PRM)<sup>3</sup> to help prioritize cases and target services to children most at risk. Allegheny County chose to implement PRM specifically to assist child welfare call screening staff to decide which General Protective Services (GPS) referrals warrant investigation and which should be screened out.<sup>4</sup>

Through a competitive Request for Proposals<sup>5</sup> DHS contracted with an international team of researchers, led by Rhema Vaithianathan from the Auckland University of Technology in New Zealand and joined by Emily Putnam-Hornstein from the University of Southern California, Irene de Haan from the University of Auckland, Marianne Bitler from the University of California-Irvine, and Tim Maloney and Nan Jiang from the Auckland University of Technology, to develop the Allegheny Family Screening Tool. The research team conducted an extensive series of analyses using data from the DHS data warehouse and from the County's child welfare case management information system, the Key Information and Demographic System (KIDS). The analyses identified factors that are predictive of re-referral to child welfare or placement into foster care, and produced an algorithm that applies weights to those factors to assist in identifying which GPS referrals are more or less at risk of these outcomes.

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<sup>1</sup> Allegheny County Analytics 2017 DHS Warehouse <http://www.alleghenycountyanalytics.us/index.php/dhs-data-warehouse/>, accessed May 19, 2017.

<sup>2</sup> Vaithianathan, Rhema, Tim Maloney, Nan Jiang, Irene De Haan, Claire Dale, Emily Putnam-Hornstein, and Tim Dare 2012 *Vulnerable Children: Can Administrative Data be Used to Identify Children at Risk of Adverse Outcomes?* Centre for Applied Research in Economics, Department of Economics, University of Auckland.

<sup>3</sup> Allegheny County Department of Human Services 2017 Predictive Risk Modeling in Child Welfare in Allegheny County: The Allegheny Family Screening Tool <http://www.alleghenycounty.us/Human-Services/News-Events/Accomplishments/Allegheny-Family-Screening-Tool.aspx>, accessed May 19, 2017.

<sup>4</sup> Vaithianathan, Rhema, Emily Putnam-Hornstein, Nan Jiang, Parma Nand, and Tim Maloney 2017 *Developing Predictive Models to Support Child Maltreatment Hotline Screening Decisions: Allegheny County Methodology and Implementation*. Centre for Social Data Analytics, Auckland University of Technology.

<sup>5</sup> Decision Support Tools and Predictive Analytics in Human Services RFP <http://county.allegheny.pa.us/Human-Services/Resources/Doing-Business/Solicitations/Archive.aspx>

## *Introduction to the Process Evaluation*

As part of Allegheny County's effort to document and evaluate the implementation of predictive risk modeling, Hornby Zeller Associates, Inc. (HZA), a management consulting firm specializing in evaluations of public human service programs, was contracted through a competitive bid process to conduct the process evaluation of Allegheny County's implementation of PRM.<sup>6</sup> Casey Family Programs and the Human Service Integration Fund of The Pittsburgh Foundation provided funding for this evaluation (and a separate impact evaluation conducted by Stanford University). This report provides an overall summation of the process evaluation conducted by HZA between mid-2016 and early 2017. The report considers the steps the County took prior to and during the initial implementation, the reactions of internal and external stakeholders to predictive risk modeling in Allegheny, challenges that arose and were addressed, as well as lessons learned during the implementation process.

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<sup>6</sup> Evaluation of a Predictive Risk Modeling Tool for Improving the Decisions of Child Welfare Workers RFP <http://county.allegheny.pa.us/Human-Services/Resources/Doing-Business/Solicitations/Archive.aspx>

## METHODOLOGY

### *Data Collection*

#### Interviews

Prior to implementation of the Allegheny Family Screening Tool, HZA conducted interviews with DHS administrators and staff from the call screening unit to learn about: a) their involvement in the implementation of the tool, b) steps taken to prepare call screening staff to use predictive risk modeling to inform their decision-making, and c) the call screening process as it existed prior to implementation of the tool. In all, 23 staff were interviewed at baseline, including: 3 administrators, 8 call screen supervisors, and 12 call screeners. Both part- and full-time call screening staff were interviewed, with 55% of the call screening staff providing input. These interviews were conducted in July of 2016, just prior to the tool being implemented on August 1, 2016.

Four months following implementation of the tool, HZA conducted interviews with stakeholders internal and external to DHS. Interviews with community partners focused on their awareness of the Department's efforts to implement PRM, their hopes for what the tool would accomplish and the successes and challenges they expected the County to face. Internal stakeholders were asked about their involvement in implementing the tool, the training they received and how the Allegheny Family Screening Tool informs or impacts their work. In all, a dozen individuals were interviewed post-implementation, half of whom were from the Department's Office of Children, Youth and Families (CYF). Other DHS stakeholders included an administrator and staff from the Office of Data Analysis, Research and Evaluation. Representatives from community service providers, advocacy groups, foundations, and a family court judge made up the group of external stakeholders who were interviewed.

#### Surveys

In September 2016, approximately 2 months post-implementation, HZA administered a web-based survey to call screeners. A total of 16 of 21 call screeners completed the survey for a response rate of 76%. Three-quarters or 12 of the respondents were full-time call screeners. More than half of the survey respondents (56%) had worked as call screeners for at least three years.

Using a series of Yes/No and Likert scale questions, call screeners were asked about the training they received, the functionality of the tool, visualization of the scores, and the impact of the tool on their decision making. Several open-ended questions were also asked to gather input on what could be done to improve the use of the tool and the training provided to prepare staff to use it.

Following a meeting with project staff in early February 2017, which included staff from DHS, representatives from the research team and the process evaluation and outcome evaluation

teams, a decision was made to administer a follow-up survey to call screeners to account for improvements that had been made to the tool.

A total of 18 call screeners responded to the follow-up survey for a response rate of 86%. All full-time screeners responded to the survey while 60% of the part-time screeners participated in the second survey. Just under half (48%) of the second survey respondents reported working as call screeners for at least three years.

## **Data Analysis**

### **Quantitative Analysis**

Quantitative analyses included summary statistics, frequency counts and percentages. Aggregate results of the surveys are provided in the Appendices.

### **Qualitative Analysis**

Data collected during the stakeholder interviews and through open-ended questions on the call screener surveys were carefully reviewed to identify common themes and items of importance. The results of the qualitative analysis describe the implementation process from the perspective of the stakeholders, a grounded theory approach.<sup>7</sup> The qualitative results are also used to support and/or explain the quantitative results, where appropriate.

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<sup>7</sup> Charmaz, Kathy 2000 Grounded Theory: Objectivist and Constructivist Methods. In *The Handbook of Qualitative Research*, edited by N. K. Denzin and Y. Lincoln, pp. 509-535. Sage Publications, Inc., Thousand Oaks, California.

## FINDINGS

### *Pre-Implementation: Preparing for Change*

#### Call Screening Practice

The primary role of call screeners prior to implementation of the Allegheny Family Screening Tool was to gather the information to inform supervisor decision making. Specifically, call screeners collected data about the alleged victim(s), perpetrator(s) and the allegations of suspected maltreatment. Information was collected from four primary sources: 1) the caller, 2) KIDS, 3) the data warehouse and 4) public databases that contain court and jail information. This information was provided to supervisors, who made the decision to screen the call in or out. The information gathered by call screeners was also provided to caseworkers to aid the assessment process after a call was screened in.

Call screeners reported that it is much easier to collect information from a mandatory reporter than from other callers because mandatory reporters are aware of the information they need to supply. Regardless, screeners said they collect as much information about the alleged victim(s), the child(ren)'s family and the alleged perpetrator (e.g., names, addresses, ages, relationships) from the caller as possible, as well as descriptions of the alleged maltreatment. Screeners reported that they check KIDS for every referral to determine if there is already a case open on the child or family, in which case they provide the information to the responsible caseworker, or if the family had past involvement with the Department.

Beyond the information collected from the reporter and KIDS, cross-sector administrative data are available from other County agencies and community providers through a tool commonly known as ClientView.<sup>8</sup> External databases, such as Prothonotary (the Allegheny County Court screen) and PAC file (the Juvenile Court data system), among others, are also searched. When the call screeners were asked during the pre-implementation interviews how frequently they search the data warehouse for data about the family, some stated they check it for nearly every report, while others report that they use it less than half of the time. Staff did report consistent use of the court information.

While a number of call screeners reported that the data they obtain through ClientView contain information that is not accurate or up-to-date, such as a previous address for a family that has moved, call screeners also reported using ClientView to “fill in gaps” in client information and to gain a better picture of a child or family's situation. Call screeners reported taking 10 to 15 minutes to complete a search in ClientView. Several call screeners, however, reported taking as much as an hour, or even several hours for cases with prior history with the Department. When asked how long it typically takes to collect information on a referral, including gathering the information and completing the call report for the supervisor, staff noted it took between 25

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<sup>8</sup> Vaithianathan, Putnam-Hornstein, Jiang, Nand and Maloney, 2017, *Developing Predictive Risk Models to Support Child Maltreatment Hotline Screening Decisions*, Auckland University of Technology in New Zealand

and 35 minutes on average. A major factor in the time it takes to complete the intake process, as described by the call screeners, involves gathering information from the caller; the more information the caller has and is able to provide, the longer it takes to complete the screening.

### Sharing Information with Supervisors and Caseworkers

In addition to describing their data collection processes prior to implementation, call screeners were asked how they document and share the information they collect from the various data sources with their supervisors. All screening staff noted that they discussed the reports with their supervisor and often gave their input, but the ultimate decision to refer the report for investigation was made by the supervisor. Thus, call screeners were primarily tasked with gathering the information that supervisors used to determine whether to screen calls in for an investigation or to screen calls out without further child welfare involvement (referrals may be made to appropriate resources). All staff stated that there are sections within the call report template that facilitate how the information was documented. For example, there was a section labeled “Legal” where information regarding a family’s court involvement, if applicable, was recorded. According to the call screeners, much of the information collected in the screening process went in the “Additional Information” section. The information collected from KIDS and through ClientView during the call screening process was also available to investigation caseworkers for planning and conducting investigations.

### Activities and Responses to Preparing for Change

#### Policy and Practice Changes

A shift in policy was made to guide several changes Allegheny County introduced to the call screening practice in conjunction with PRM. These changes are illustrated in Table 1. Call screeners, rather than just collecting information, were now being asked to complete a risk and safety rating and to generate a family screening score using the Allegheny Family Screening Tool for each child associated with an allegation of maltreatment. Additionally, call screeners now make the recommendation to screen non-mandatory GPS reports in or out while supervisors became responsible for reviewing and approving the call screeners’ recommendations.

Table 1. Changes in Call Screening Policy and Practice	
Before Implementing PRM	After Implementing PRM
Screening decisions made based on clinical judgment.	Screening decisions made based on systematic analysis of data <i>and</i> clinical judgment.
Call screeners collect information.	Call screeners collect information, complete a risk and safety rating and initiate generation of a family screening score.
Supervisors make decision to screen calls in or out.	Call screeners make recommendations to screen calls in or out and supervisor approves or changes.

## Informing External Stakeholders

Considerable effort went into informing external stakeholders about the County's decision to implement predictive risk modeling into its call screening process. Community meetings were held to introduce the project to external stakeholders, including advocacy groups, service providers, court staff and consumer groups. These presentations highlighted the tool's design and underlying research, as well as how it would be integrated into call screening decisions. The external stakeholders who attended generally found the presentations to be "encouraging" and "informative." The degree to which the presentations enhanced their understanding of Allegheny's application of predictive risk modeling, however, varied. For instance, one community provider found the information to be very helpful and condensed into pieces that were easy to comprehend. Another noted she had to attend a few of the presentations to understand predictive analytics, because the topic is "very complex."

The community meetings DHS held for community stakeholders discussed ethical issues the County was facing related to implementation of the screening tool. One topic of interest was security and privacy, and whether or not the tool would collect or share any new data regarding families. Presenters explained that the tool only leverages data that are already collected and owned by the County. Other than to use the data in a more structured and consistent manner in making a decision to screen in or out a GPS referral, the data are not intended to be used other than they have in the past.

Discussions with stakeholders also invoked the possibility of the screening tool maintaining or exacerbating racial or socioeconomic disparities. Allegheny County's historic data suggest that racial disparities already exist at many outcome and decision points throughout the child welfare system.<sup>9</sup> Presenters suggested that ideally, the tool increases transparency and consistency in decision-making, as well as reduces the possibility of call screeners needing to draw from their own implicit biases. In the spring of 2016, an analysis of the ethical questions surrounding the tool was conducted to explore race's possible role in the tool. Ultimately, in conjunction with the researchers' finding that including race in the model did not significantly improve its accuracy, administrators, in conjunction with ethics and legal staff, determined that race would be omitted as a factor for determining the risk score.<sup>10</sup>

## Anticipated Benefits and Challenges

The goal of implementing predictive risk modeling in Allegheny County, according to DHS administrators, was broadly to improve decision making. Collectively, administrators listed six

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<sup>9</sup> Rauktis, Mary E. and Julie McCrae 2010 *The Role of Race in Child Welfare System Involvement in Allegheny County*. Allegheny County Department of Human Services, Pittsburgh, Pennsylvania.

<sup>10</sup> Dare, Tim, and Eileen Gambrill 2017 Ethical Analysis: Predictive Risk Models at Call Screening for Allegheny County. In Vaithianathan, Rhema, Emily Putnam-Hornstein, Nan Jiang, Parma Nand, and Tim Maloney 2017 *Developing Predictive Models to Support Child Maltreatment Hotline Screening Decisions: Allegheny County Methodology and Implementation*. Centre for Social Data Analytics, Auckland University of Technology.

goals related to determinations made at intake, a “key decision point,” as one administrator expressed it (See Table 2).

<b>Table 2. Goals of Implementing Predictive Risk Modeling in Allegheny County</b>	
1.	Change the agency culture to data and research based decision making.
2.	Make better and more efficient use of resources, specifically data resources.
3.	Make decisions based on as much information as possible.
4.	Increase the number of people making call-screening decisions
5.	Create a more uniform screening practice.
6.	Increase the accuracy of screening decisions.

Along with the specific goals, administrators expressed several benefits they hoped would result from using predictive risk modeling. The most frequent response regarding the intended benefits centered on the accuracy of decision making.

Concerns were also expressed by DHS staff prior to implementation that the volume of investigations might increase and that implementation was being done at a time when there had been many recent legislative changes, which might complicate the implementation. One of the DHS administrators interviewed prior to implementation voiced a concern that some calls would be mandatorily screened in based on the resulting risk score, even though the information collected from the caller was not suggestive that the report be assessed. DHS elected to designate referrals with a score of 18 or higher on the placement risk model as mandatory to be screened in for an investigation, although supervisors are able to override the mandate if other factors warrant that decision.

### ***Preparing Call Screeners and Supervisors***

#### ***Staff Training***

Call screening staff received training in how to use the tool in their decision making. This comprehensive training taught call screeners how to use the tool to generate and then interpret the Family Screening Score. It also provided them with an understanding of how predictive risk modeling works and what the Allegheny Family Screening Tool intends to accomplish. The process which call screeners were to follow upon implementation of PRM was described step-by-step with a workflow presented to illustrate the process. A number of case scenarios were also used to demonstrate use of the tool in knowing when to mine for additional data and apply the results in decision making.

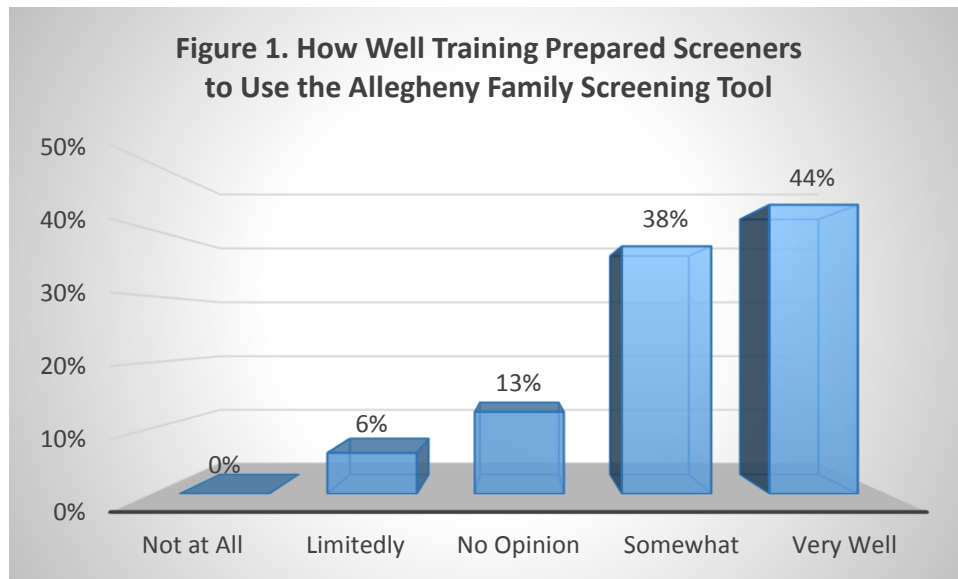
The training also reviewed changes made to the KIDS interface in response to PRM and the added responsibility for call screeners to complete a risk and safety assessment. For instance, the training covered where screeners would record the initial risk and safety decision in the case management system, along with the factors considered in determining the appropriate level of risk and safety. It also included a demonstration of how client service data would be



automatically imported into KIDS from the data warehouse, to help the screener document and justify the recommendation to screen in or out the GPS report.

### Staff Perspectives on Training

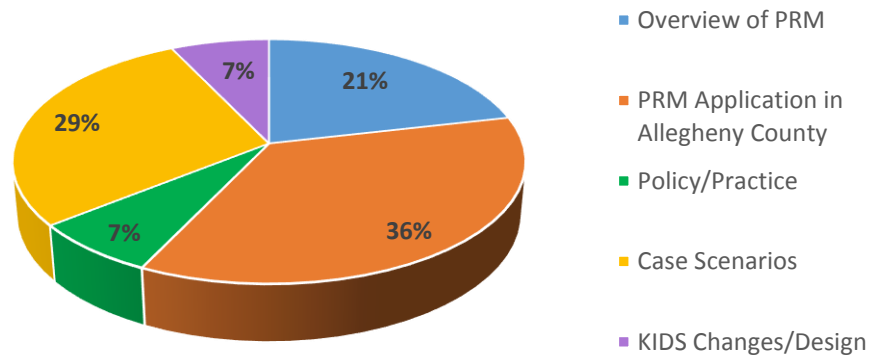
The survey administered to call screeners two months following the implementation of PRM asked if they had received training prior to using the Allegheny Family Screening Tool. All 16 respondents stated that they had completed the training, with the majority of them stating that the training prepared them to use the tool either “somewhat” or “very well,” as shown in Figure 1.



When asked what aspect of the training was most helpful, as shown in Figure 2, over a third of the call screeners (36%) said that information about how predictive analytics was to be applied in Allegheny County was most helpful.

Figure 2. Training Components Found to be Most Helpful

Use of case scenarios to review decision-making were rated as the second most helpful part of the training with just under a third (29%) of the call screeners reporting that training activity to be helpful. The overview of



predictive risk modeling was rated the third most helpful with 21% of the survey participants indicating that it was helpful. Although the sections on changes to KIDS and those made to policy/practice were rated as helpful by fewer call screeners, they were still thought to be important components of the training.

Call screeners were asked what could have been done differently to better prepare them to use the Allegheny Family Screening Tool. Over 40% of the screeners offered no comment or said that nothing additional was needed. The remaining respondents gave a wide range of open-ended responses, including that the tool should have been tested by Intake prior to roll-out, or at least call screeners should have been able to provide input into its design. One staff member indicated additional training would be beneficial, while another noted a handout explaining the information would have been sufficient.

Other internal stakeholders were also asked what could have been done differently to better prepare staff to use the Allegheny Family Screening Tool. One staff member from the Quality Assurance, Best Practices and CYF Analytic teams suggested that the concept of the score not being about the current allegations “needs to be said often because people forget.” The score takes into account the history of household members, along with the current allegation. Another team member suggested clarification was needed about the differences in the definition of “risk.” This stakeholder pointed out that the definition of “risk” according to the tool (future risk of subsequent allegations of maltreatment or placement into foster care) is different from the definition of “risk” of which staff are most familiar (imminent risk of serious harm).

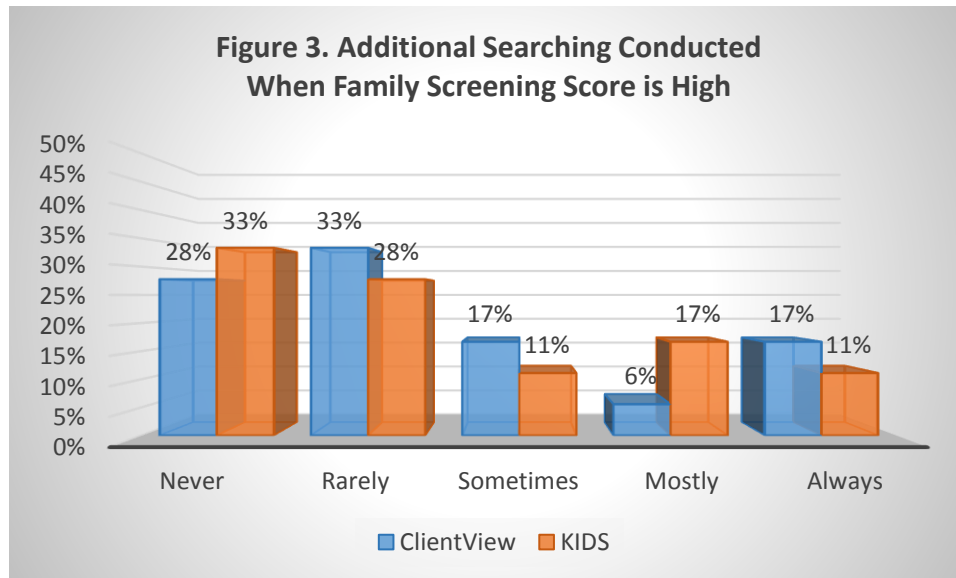
### ***Post-Implementation: Reactions and Process Improvements***

The overall goal of implementing predictive risk modeling in Allegheny County was to improve decision-making by making it more data driven and creating a uniform approach to making decisions, while increasing the number of those responsible to carry out that activity. Prior to implementing PRM, supervisors were responsible for making final call screening decisions. Since implementation, all of the call screeners as well as the supervisors are involved in making call screening decisions.

### ***Use of Data***

The follow-up survey conducted of call screeners also asked about the extent to which they conduct a more thorough search in the data warehouse, as well as KIDS, this time with a focus on reports in which the Family Screening Score was high. A little more than 60% of the call screeners who responded to the survey noted they “rarely” or “never” conduct an additional search in ClientView or KIDS. Figure 3 illustrates the extent to which call screeners report conducting subsequent searches in ClientView when the resulting score is high. Overall, full-time screeners were more likely to conduct additional searches in ClientView than part-time call staff. When asked to explain why additional searches are not done, most call screeners said

that they had done the searches in the data warehouse earlier in the process and one call screener noted that “the score stands for what is pulled” by the PRM tool.



### Call Screener Attitudes and Beliefs

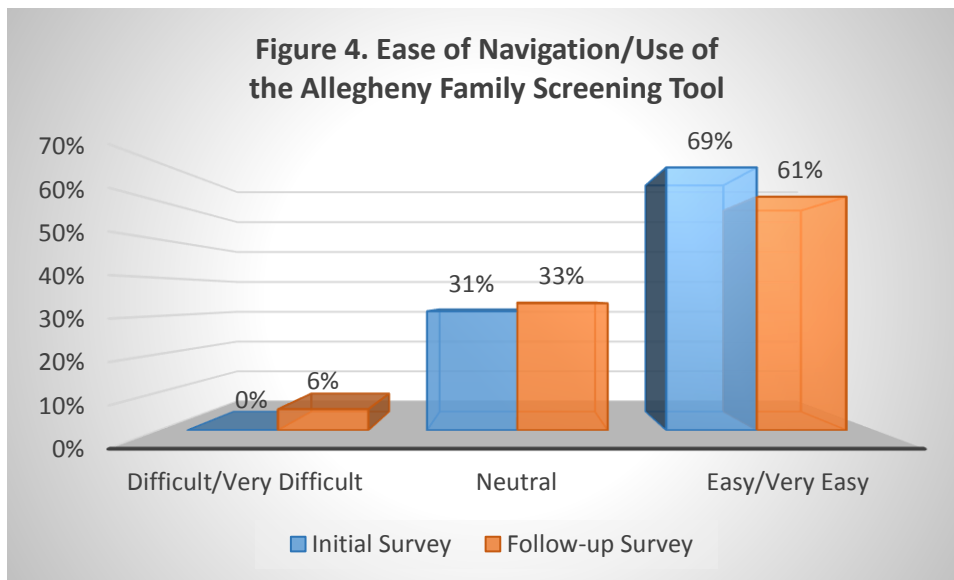
When asked how confident call screeners are in the tool’s ability to accurately assess the risk of placing a child into out-of-home care or incurring a repeat re-referral of maltreatment, half of the call screeners said they were confident. Full-time call screeners were slightly less likely to agree than the part-time call screeners. One screener explained that lack of confidence in the PRM tool stems from its inability to take families’ expected improvement or individual circumstances into account, for instance, when families are receiving services that are improving their situation. When asked how confident they were in the research that went into developing the tool, 11 of the 18 call screeners (61%) reported they were confident in the research that went into developing the tool.

A series of statements were included in the follow up survey which were used to gauge the call screeners’ understanding of the Family Screening Tool. As shown in Table 3, call screeners understand the intention of using the tool in making screening decisions.

<b>Table 3. Attitude of Call Screeners Toward the Allegheny Family Screening Tool</b>	
<b>Percentage of Call Screeners “Agreeing” or “Strongly Agreeing” with Statement</b>	
I understand what the score is predicting.	94%
I understand how the score should relate to or inform screening decisions.	94%
I understand the content of the data sources helping to produce the score.	89%
I am adequately prepared to use the tool.	100%

Call screeners were also asked how easy or difficult it is to use the Family Screening Tool. Over 60% of the call screeners who responded to the surveys, regardless of when administered, find the Family Screening Tool “easy” or “very easy” to use, as displayed in Figure 4. Many of the

respondents appreciate that the resulting score generated by the tool helps to validate their decision to screen in or out the General Protective Services referral for investigation.



A graphical display, using a thermometer, is used to highlight the value of the score. Call screeners were asked in the first survey to indicate how useful the thermometer was to them. While many of the call screeners (38%) said they had “no opinion” about the graphic display, nearly half (44%) found the thermometer to be “somewhat helpful” or “helpful,” explaining that it is straightforward and easy to read. An additional 19% said the graphic was “not helpful at all” or was only “limitedly helpful,” noting the number could be larger and the color scheme could be improved. One call screener said that an actual number would suffice while another, who self-identified as a visual learner, liked everything about the graphic display.

Call screeners were also asked to express concerns they had about the screening tool. One of the call screeners, as noted earlier, stated that “the tool does not take the human element of judgment into account,” while another stated that “the score frequently has nothing to do with what is actually going on with the situation at hand.” Another said that call screeners are able to recognize information that needs to be updated, which the tool is unable to do and thus will generate a score that inaccurately portrays a family’s circumstances.

### ***Stakeholder Input***

Following implementation of PRM in Allegheny County, stakeholders internal and external to DHS continue to have a positive reaction to Allegheny County’s implementation of the Family Screening Tool. Their hope is that the tool will result in the increased safety of children and enable the County to be more proactive and less reactive in its case practice. An internal stakeholder noted that the tool should help with decision making, especially for borderline cases, such as when it is difficult to determine whether the case should be screened in for an investigation or screened out and possibly referred to community services. It should be noted

that the goal of the PRM implementation is to use the tool to make decisions regarding every GPS referral.

The family court judge who participated in the post-implementation interviews stated that she supports use of the tool. While admittedly she does not have the knowledge needed to examine the algorithm used to generate the score, she has confidence in the people who presented the material at the community presentation she attended and in what the algorithm is meant to achieve. She stated it was clear that the County and its team of experts know what they are doing and that inviting stakeholders to the presentation demonstrates that DHS intends to be transparent in its implementation of the tool.

Another external stakeholder explained how her foundation was approached to fund the initiative, in part, based on a longstanding relationship with DHS. This stakeholder went on to say that DHS is going beyond what is required in terms of keeping the foundation informed and those at the foundation welcome the additional information and the County's transparency.

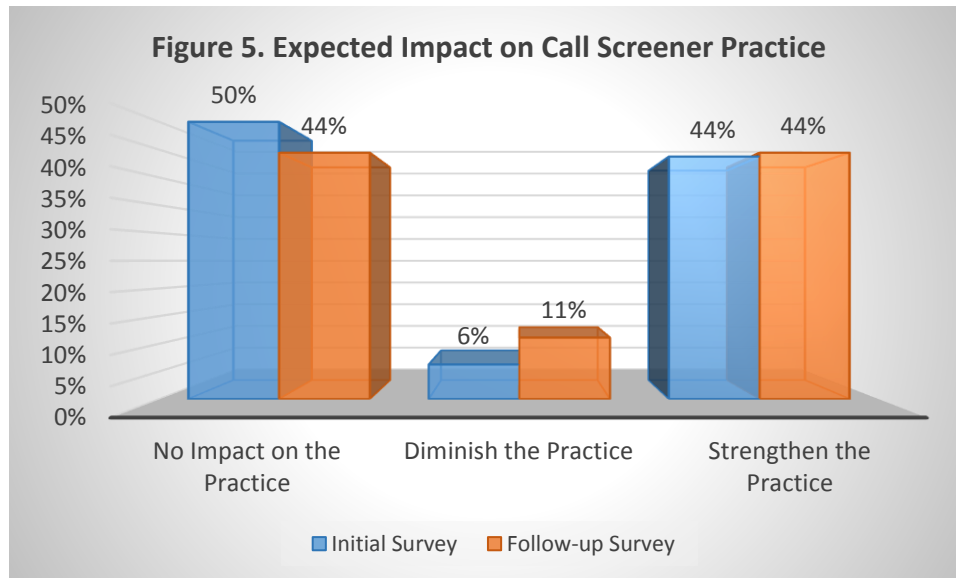
Both internal and external stakeholders noted during the interviews that there is a need to continue to keep community stakeholders informed. For example, one analyst internal to DHS thought that the community needs to remain involved and informed as the County moves forward with predictive analytics. An external stakeholder noted that the PRM community presentation has not evolved in the last two years; the same information is presented in the same manner at each meeting. One provider said it should be stressed that the score is just an additional piece of information to further assist with decision making—it is not the only factor considered. Another provider wanted to know what the “disaster plan” is for the Family Screening Tool, e.g., what safeguards are in place to ensure that transparency will continue in the future, regardless of who is overseeing the project.

## *Process Improvements*

### *Impact on Practice*

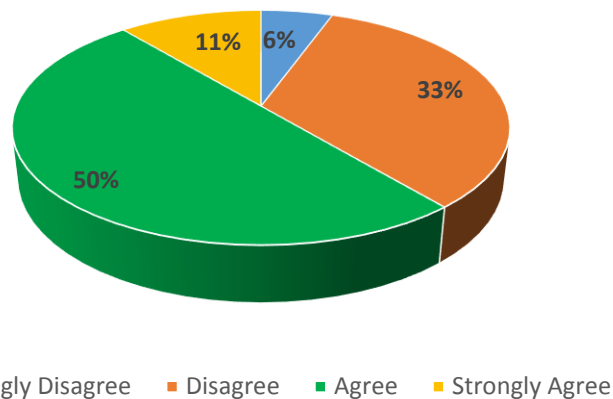
The surveys administered to call screeners two months following implementation and then four to five months later gave them the opportunity to comment on whether they thought the tool would have an impact on the call screening practice. The follow-up survey also asked screeners to explain why or why not it has had an impact, with half (n=9) offering an explanation. While the initial survey found half (50%) of the call screeners did not anticipate PRM to have any impact, this changed slightly (44%) in the later survey. Some call screeners explained that mandatory screen-ins based on a high score would impact practice. Others commented that scores should not be mandatory on active cases and decisions to assess a referral are still based on the allegations presented by the caller. As displayed in Figure 5, 44% of the call screeners overall, when results from both surveys are considered, thought using the tool would strengthen the call screen practice. Call screeners stated “consistent decision making will be increased.” One call screener from the initial survey responded PRM would diminish practice,

while two responded as such to the follow-up survey. This may be due to the reported slowness of the system which may have become more of an irritant over time.



One of the stated goals of implementing PRM was to create a workplace culture that is more data-driven. Call screeners were asked their perspective on whether the use of the predictive risk modeling tool was shifting the workplace culture towards that goal. The follow-up survey administered to call screeners found that 61% of the screeners, as shown in Figure 6, either

**Figure 6. Use of the PRM Tool is Changing the Culture of Our Workplace to Be More Data-Driven**



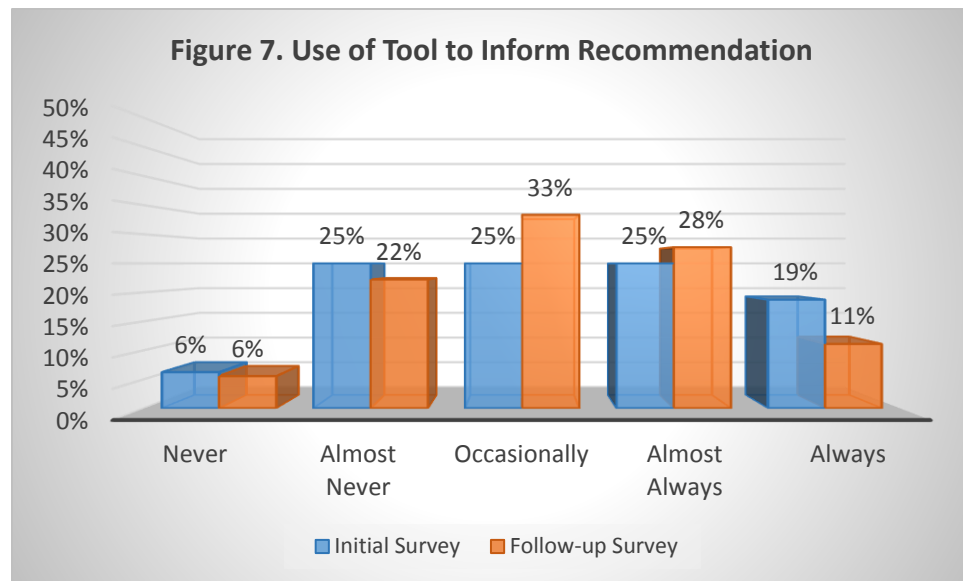
agreed or strongly agreed that the tool is creating a data-driven culture within the workplace. When this finding is considered along with the percentage of call screeners who said the tool would not impact call screener practice (44%), it is possible that call screeners already thought of the culture at Allegheny DHS as being data-driven. It appears the decisions being made by the screening unit prior to PRM implementation were based on good screening practices, with the tool now reinforcing those decisions through a systemized use of data.

## Improved Screening Process

The survey administered to call screeners two months following implementation of the tool found that over 40% of the call screeners use the tool to inform their recommendation on a consistent basis, although a little less than a third (31%) reported they rarely use it, if at all. On the survey administered after enhancements were made to the tool, a smaller percentage of staff said they “always” used it, although a larger percentage “almost always” or “occasionally” use the tool to inform their recommendation. When asked, in the follow-up survey, to explain, three of the call screeners who did not use the tool to inform their recommendation said their recommendation was already formed prior to running the score. One call screener reported

that he or she would discuss the score or concerns about the score with the supervisor while another said that he or she would provide the information to the supervisor to make the decision. One of the call screeners stated that “the score has nothing

to do with assignment; active cases are always high or mandatory.” Figure 7 illustrates the shift in call screeners use of the tool to inform their recommendation.



## Technical Improvements

Call screeners were also asked in the survey administered after the tool was enhanced how often a score was generated that seemed inaccurate given the information they had gathered about the family based on the data which are available and/or from what they had collected from the reporter. Nearly three-quarters (72%) of the call screeners noted they “occasionally” have encountered a score that seems to be inaccurate, while an additional 11% have frequently encountered an inaccurate score.

When asked to explain what they do when the score appears to be inaccurate, nearly half (n = 9) said they notify a supervisor. Three staff, two full-time and one part-time call screener, reported they review KIDS and/or ClientView to inform their decision when they believe the score is not right. Another screener relied on the research he or she already completed, instead

of relying on the tool to assist with that process. Yet another staff member reported contacting the technology staff regarding the inaccurate score.

Suggestions offered by call screeners during both surveys to improve the Allegheny Family Screening Tool were primarily related to technical issues. Several call screeners from the follow-up survey remarked the system is slow; staff noted it takes a long time for the score to generate, with the system sometimes “timing out.” One staff member suggested the risk and safety boxes should not be locked after the score is viewed so that recommendations could be adjusted later in the process. Another screener suggested that the tool should also pull the family history with CYF into the narrative field which lists the factors used to produce the score, not just the program areas identified using ClientView.

While these suggestions may improve the functionality of the tool at some time in the future, there have been two technical issues reported that specifically affected the performance of the tool. A few call screeners noted concerns about the accuracy of the score when clients and Master Client Index (MCI) numbers<sup>11</sup> are duplicated within a referral. A similar issue was identified with the tool not being able to generate the score when MCI numbers were missing. These issues were corrected in November 2016; the follow-up survey identified that most screeners (83%) find the score is "mostly" or "always" clearly displayed.

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<sup>11</sup> Master Client Index or MCI numbers are used by DHS staff to identify individuals known to other agencies and providers across Allegheny County.



## RECOMMENDATIONS

Major changes in policy and practice can be difficult to implement, particularly when the agency making the change is pioneering a new technological solution, such as predictive risk modeling. Allegheny County has chosen to implement a PRM tool to increase appropriate and consistent use of data to drive its decision-making. While the results of this process evaluation are encouraging, some recommendations are offered toward informing the implementation process moving forward.

- 1. Maintain transparent communication with internal and external stakeholders.*  
Stakeholders overwhelmingly applauded the efforts that DHS has made to be transparent and to keep them informed throughout the implementation process. It will be important that this transparency continue.
- 2. Increase user buy-in.*  
Less than half of the call screeners currently view predictive modeling as benefiting screening practice, though more than 60% agreed that the tool is creating a data-driven culture within the workplace. An opportunity exists to increase user buy-in.
- 3. Continue to resolve technical issues as they arise, documenting solutions.*  
As changes and enhancements are made to the tool, they should be documented to inform further tool development, increasing the return on the technological investment.
- 4. Develop benchmarks for implementing predictive risk modeling.*  
Benchmarks can be developed to foster buy-in and promote use of the tool for decision-making. Using the results of the process evaluation, Allegheny might consider developing benchmarks which would target an increase in the percentage of staff who use the tool on an ongoing basis. For example, one measure might challenge call screeners to consistently use the tool in their decision-making, e.g., by March 31, 2018 85% of all call screeners report using the tool always or almost always to inform their recommendation to screen in or out a GPS referral for assessment. Benchmarks to keep stakeholders informed might also be considered to ensure transparency does in fact occur, e.g., issue quarterly newsletters to external stakeholders to keep them informed on progress.



## APPENDIX A: INITIAL SURVEY RESULTS

### Demographics

Characteristics of Call Screeners Participating in Survey	Work Status		
	Full time	Part time	Unknown
Number of Call Screeners Surveyed by Work Status	12	4	0
Average Years Worked as a Call Screener by Work Status	8	5	0
Average Years Worked for Allegheny County by Work Status	14	7	0

### Training

Did you receive training prior to using the Allegheny Family Screening Tool?	#
Yes	14
No	0
No Answer	2
Total	16

How well did the training prepare you to use the Tool?	#
Not at all	1
Limitedly	1
No opinion	3
Somewhat	5
Very well	6
Total	16

How well did the training increase your understanding about how the Tool works?	#
Not at all	1
Limitedly	1
No opinion	3
Somewhat	5
Very well	6
Total	16

Which part of the training did you find to be most helpful?	#
No answer	2
Overview of Predictive Analytics/Predictive Risk Modelling	3
Application of Predictive Analytics in Allegheny County	5
Policy/Practice	1
Case scenarios	4
Process changes	0
KIDS Changes/Design	1
Total	16

## Screening Tool Function and Visualization

How easy/difficult is it for you to navigate or use the PRM tool?	#
Very difficult	0
Difficult	0
Neutral	5
Easy	4
Very easy	7
Total	16

How helpful is the “thermometer” visualization?	#
Not helpful at all	2
Limitedly helpful	1
No opinion	6
Somewhat helpful	4
Very helpful	3
Total	16

## Decision Making

How frequently do you use the PRM tool to inform your recommendation (excluding mandatory referrals)?	#
Never	1
Almost never	4
Occasionally/sometimes	4
Almost every time	4
Every time	3
Total	16

How helpful is the PRM tool to inform your recommendation?	#
Not at all helpful	1
Limitedly helpful	2
Neutral/No opinion	6
Somewhat helpful	7
Very helpful	0
Total	16

How often do you conduct a search in ClientView after viewing the dynamic text (“mad libs”)?	#
Never	1
Almost never	3
Occasionally/sometimes	4
Almost every time	4
Every time	4
Total	16

What impact do you think the Allegheny Family Screening Tool will have on the call screen practice?	#
Strengthen the practice	7
Diminish the practice	1
No impact on the practice	8
Total	16



## APPENDIX B: FOLLOW-UP SURVEY RESULTS

### Demographics

Characteristics of Call Screeners Participating in Survey	Work Status		
	Full time	Part time	Unknown
Number of Call Screeners Surveyed by Work Status	11	6	1
Average Years Worked as a Call Screener by Work Status	9	6	1
Average Years Worked for Allegheny County by Work Status	15	9	3

### Experience and Attitudes with Using the Allegheny Family Screening Tool

How easy/difficult is it for you to navigate or use the Allegheny Family Screening Tool?	#
Very Difficult	0
Difficult	1
Neutral	6
Easy	4
Very Easy	7
Total	18

How often have you had a score that seems inaccurate given the family history you have available or collected during your review of the call?	#
A great deal	0
A moderate amount	2
Occasionally	13
Rarely	3
Never	0
Total	18

Agreement with Statements	Always	Mostly	Sometimes	Rarely	Never	Total
The score is clearly displayed.	7	8	3	0	0	18
I go back and conduct a more thorough search in KIDS when the score is high.	2	3	2	5	6	18
I go back and conduct a more thorough search in ClientView when the score is high.	3	1	3	6	5	18
How frequently do you use the Tool to inform your recommendation (excluding mandatory referrals)?	2	5	6	4	1	18

Agreement with Statements	No Answer	Strongly Disagree	Disagree	Agree	Strongly Agree	Total
I am confident of the Tool's ability to accurately assess risk of future placement or re-referral.	0	1	8	7	2	18
I understand what the score is predicting.	0	0	1	9	8	18
The use of this tool is changing the culture of our workplace to be more data-driven.	0	1	6	9	2	18
I understand how the score should relate to or inform screening decisions.	0	0	1	13	4	18
I understand the content of the data sources helping to produce the score.	0	0	2	10	6	18
I am adequately prepared to use the Tool.	1	0	0	11	6	18
I am confident in the research that went into the development of this tool.	0	1	6	9	2	18

What impact do you think the Allegheny Family Screening Tool will have on the call screen practice?	#
Strengthen the practice	8
Diminish the practice	2
No impact on the practice	8
Total	18