Estimating the Costs of Primary Care Transformation: A Practical Guide and Synthesis Report

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Background

The Nation's health care system is currently undergoing a vast transformation with the goals of achieving higher quality, more accessible, and more efficient health care for all Americans. As part of the transformation, the Patient Protection and Affordable Care Act of 2010 described and incentivized several models of patient-centered, highly-coordinated care. The models include the patient-centered medical home (PCMH), a model of care that aims to transform the delivery of comprehensive primary care to children, adolescents, and adults.[1-3] The focus of the PCMH is to improve population health through high-quality, accessible patient-centered care with an emphasis on care coordination and communication. Adoption of PCMH-type models by primary care practices is incentivized through Federal, State, and insurance company incentive payments. A number of local, State, and national PCMH recognition and accreditation programs are available.

An emerging body of scientific evidence suggests that PCMHs and similar models are saving money by reducing hospital and emergency department visits, reducing health disparities, and improving patient outcomes.[4] A small number of studies have found that the economic costs of transforming primary care practices to such models can be significant. However, it is believed that over time the adoption of a PCMH-type delivery system can help sustain lower costs of delivering care.[5-7] To expand the body of evidence, the Agency for Healthcare Research and Quality (AHRQ) funded 15 Estimating the Costs of Supporting Primary Care Practice Transformation (Estimating Costs) grants to estimate the costs of supporting primary care transformation.[8] These grants examined the costs of primary care transformation for a wide range of primary care settings and included a range of practice changes and stages of primary care transformation.

A Practical Guide for Estimating the Costs of Primary Care Transformation

Introduction and Purpose

This Practical Guide was developed based on the experiences and lessons learned from the 15 AHRQ Estimating Costs grants. Final reports for these grants were reviewed when available. In addition, telephone interviews were conducted with each principal investigator in February and March 2015. Interviews focused on clarifying what costs of primary care transformation were estimated; what methods were used to estimate costs; what, if any, tools were developed based on the study; and key lessons learned. Interviews were recorded and transcribed. The information collected from these sources was used to identify successful approaches for measuring the costs of a primary care transformation effort and key lessons learned for the field.

In addition, AHRQ hosted a conference call in July 2015 with the grantees to discuss their advice for other researchers, based on their experiences, to be included in a Practical Guide that would be useful for 1) researchers examining the costs of primary care transformation, and 2) administrators in health care organizations who want to predict or report the costs of primary care transformation efforts.

The intention of this guide is not to provide detailed methodological instructions, but rather to list the key steps in an analysis of the costs of a primary care transformation effort, review the range of methodological options, and describe key considerations for each method. References and appendixes provide additional detail for readers who wish to learn more about each method.

Step 1. Develop a Detailed Description of Study Setting and Transformation Efforts

An important first step in estimating the costs of a primary care transformation effort is to describe the transformation effort and the setting in which it is taking place. The costs of implementing primary care transformation can vary widely by organization type and clinic characteristics. Contextual information about the setting of interest, including provider and other staff mix, patient demographics and health status, number of providers, number of administrative staff, number of patient visits per year, payer mix, indicators of health care quality, and PCMH recognition or certification status, are important to consider when making cost calculations.

Primary care transformation can take many forms; therefore, it is important to describe the nature of the transformation whose cost is being estimated. Research questions at this stage may include: What standards or aspects of care were addressed by the transformation effort? What specific changes were implemented to address each standard or aspect of care? How did quality of care improve after practice changes were made (e.g., as measured by patient satisfaction ratings or the proportion of hypertension patients with blood pressure of ≤140/70 mm Hg)? It is also important to consider, and report, whether PCMH certification was sought and what level

and stages of transformation are included in the study, including planning, model development, and training; implementation of PCMH-related practice changes; and maintenance. Primary care transformation efforts can take a number of years to implement and are an ongoing process. Therefore, determining what stages to include and the timeframe for these should be done at the outset of the study.

In addition, detailed descriptions of study settings, practice change efforts, and what is included in the cost estimations can help others infer the applicability of estimated costs to other settings.

Step 2. Select and Apply a Cost Estimation Method

Cost estimation methods can be divided into two main categories: **micro-costing** methods, also known as activity-based costing (ABC), which are based on a detailed analysis of resource use and unit costs of each resource; and **gross-costing** methods, which are based on aggregate data.[9] Most AHRQ Estimating Costs grantees used an ABC method. **Exhibit 1** summarizes for each method the purposes it serves, data required, possible analysis methods, and key considerations. Additional details about each method are provided below.

Gross-Costing Methods

Gross-costing methods can be used to conduct retrospective cost analyses of a primary care transformation effort when a good source of aggregate data is available. Data sources can include insurance claims data, general ledger data (e.g., from a staff model health maintenance organization [HMO] with many primary care clinics), or general ledger data from a grant program funding a primary care transformation effort.

It is important to note that claims data reflect the costs and savings experienced by insurers. This information may not reflect the full costs of the primary care transformation effort incurred by clinics, because many of the costs related to practice redesign are not fully covered.

Aggregate sources of data can be used to produce a **descriptive analysis** of clinic cost evolution before, during, and after the transformation effort took place. **Exhibit 2** provides an example of cost trend analyses completed using general ledger data from a grant program that funded the primary care transformation effort. The graphs compare grant expenditures by clinics that ultimately succeeded in transforming into PCMHs with those of clinics that did not. The graphs' middle line shows the difference in the costs incurred by clinics that completed transformation to a PCMH with clinics that did not.[10]

Descriptive analyses alone cannot establish the cost of a PCMH transformation effort; factors not related to the PCMH transformation effort, such as changes in patient mix and co-occurring quality improvement or other initiatives, can differentially affect costs across clinics over time.

Linear regression models can be used to compare costs before and after a transformation effort, or the costs of clinics that transformed versus those that did not, controlling for other possible causes of trends examined. Control variables can include patient case-mix, demographics, clinic

characteristics, and other factors. When patients are the unit of analysis, fixed effects and random effects models can be used to account for unobserved clinic characteristics that may affect results.

A strong study design uses a **difference-in-difference method**, which compares differences in costs between transformed and untransformed clinics before and after transformation. This design requires data not only about clinics that completed PCMH transformation, but also data about a comparable control group of clinics that did not undergo or complete transformation. Propensity score matching techniques can be used to identify a comparable sample. Control groups are also helpful in descriptive analyses.

Key considerations for gross-costing methods include:

- These methods require access to general ledger or claims data spanning periods before, during, and after the transformation effort took place.
- Analysis of claims data may not fully reflect the costs of PCMH transformation efforts incurred by clinics.
- Attribution of costs to PCMH transformation can be challenging. While trend analysis is informative, it does not differentiate between the cost of PCMH transformation and other unrelated initiatives and trends that can differentially affect costs across clinics over time. To address this challenge, note the following:
  o Regression analyses can be used to adjust cost estimates for risk (patient case-mix), patient demographics, clinic characteristics, and other variables.
  o Use of a comparable control group that did not undergo transformation can help to distinguish changes caused by transformation efforts versus other trends or co-occurring initiatives.
  o The difference-in-difference method requires a comparable control group that did not undergo transformation.
  o Propensity score matching can be used to identify intervention and control clinics that are comparable on multiple covariates.

ABC Method

The ABC method can be used to either prospectively or retrospectively assess the clinic-level costs of primary care transformation efforts. ABC estimates are based on a detailed analysis of resources used and the unit costs of each resource.

The ABC method is the most common approach to assess the clinic-level costs of PCMH transformation efforts. It is most appropriate for estimating the costs of a single practice or small group of practices. While it is theoretically possible for the ABC method to be used over a large number of practices or an entire health system, this method is very labor intensive, and therefore is generally not practical for this purpose.

The basic ABC method follows these four steps:

- **Step 1:** Identify key cost elements and the degree to which they were or will be utilized. This can be achieved by interviewing a wide variety of key informants (i.e., practice leaders, clinicians, information technology staff, transformation leaders, and administrative staff) to collect information about the activities, staff, investments, and purchases associated with the transformation or by asking practice leaders to complete questionnaires. Questionnaires can be structured according to predefined categories of transformation expenses drawn from the published literature,[11-14] or based on investigators' prior experience with primary care transformation.
- **Step 2:** Assess unit costs for each cost element. In most cases, clinic leaders can provide this information by completing a spreadsheet or questionnaire and reporting on actual costs, such as staff salaries and benefits, equipment and space purchases, or leases. This can also be determined by using external data sources (e.g., national or local labor rates from the U.S. Bureau of Labor Statistics) to calculate standardized staff costs based on labor categories.
- **Step 3:** Multiply unit costs by the quantities of each resource utilized (e.g., number of full-time equivalent (FTE) staff per job category) to produce total costs for each item.
- **Step 4:** Add total costs for each item to produce a total cost.

To make cost estimates derived through the ABC method more relevant to other settings and increase external validity, sensitivity analyses can be used to estimate the range of costs given a variety of circumstances. For example, cost estimates can be stratified by clinic size, rural/urban location, geographic location, organizational attributes (e.g., group vs. independent practice), transformation activity or component implemented, and level of PCMH recognition achieved.

Data Collection

For researchers using a micro-costing or ABC method, data collection may present the greatest challenge for generating accurate cost estimates of transforming care. Barriers to data collection using the ABC method include the following:

- Data collection can often be time consuming and burdensome for both researchers and respondents.
- Respondents may have limited expertise in cost data collection and a lack of familiarity with practice costs.
- Retrospective data collection is subject to recall and nonresponse biases due to staff turnover. Staff may not recollect all activities implemented as part of the transformation effort, and staff who have left the practice cannot report on the time they spent on transformation-related activities.
- Estimating the costs of maintaining practice changes may be difficult because of challenges of attribution. Once the transformation has been implemented and the changes have become part of the regular workflow, clinicians and staff may not be able to easily distinguish how much time is being spent on general practice activities versus transformation-related activities.
- These challenges can be mitigated by offering flexible options for data collection, developing easy-to-use data collection instruments designed to facilitate recall, providing technical assistance to participants, and allowing for ample time to estimate costs.

Selection of Cost Elements

An additional challenge of data collection is identifying cost elements to be collected. The costs of a transformation effort can be classified into direct and indirect costs. While what is considered a direct and indirect cost can vary by site, direct costs of primary care redesign efforts are those that are clearly attributable to these efforts, such as staff training on the PCMH or new staff hired to implement PCMH-specific aspects of care (e.g., care coordinators). Indirect costs are those that can be attributed to PCMH-related practice changes but can also be incurred as a result of other activities. This includes costs such as overhead expenses and expenses associated with staff turnover. Total costs can also be classified into fixed and variable costs. Fixed costs remain the same regardless of the level or intensity of redesign, such as the cost of a facility upgrade, while variable costs can change (e.g., staff time).

Transitions to electronic health records (EHRs) may or may not be relevant for inclusion when estimating the costs of primary care redesign, depending on whether efforts to implement or adapt EHRs occur as part of the primary care transformation initiative or are considered a parallel effort, with separate costs and funding. Researchers should consider whether the costs of implementing an EHR system are relevant for inclusion, and may want to keep these costs separate from other costs.

Similarly, some organizations may not include the costs of the technical assistance, such as practice facilitation, that they receive to implement or maintain a PCMH. Often, this is because the assistance came through participation in a demonstration program or training collaborative. When possible, it is helpful to include the costs of technical assistance in cost estimations. Otherwise, researchers should explain when it is not possible to identify and report these costs; in these cases, researchers should fully describe the types and level of technical assistance received. It is important for groups that are contemplating transformation, but are not participating in such a program, to plan for the costs of technical assistance that may be needed to assist with the implementation of PCMH-related practice changes.

AHRQ Estimating Costs grantees have identified key cost elements, based on the literature and interviews with primary care clinic leaders, that may be useful for other investigators. These cost elements have been integrated into a variety of tools, including user-friendly spreadsheets, questionnaires, and online forms, with detailed instructions on how to collect cost data. Some of these tools are quite detailed, while others focus only on key cost drivers (e.g., staff time for various activities). Examples of these tools are provided in **Appendix B**.

Key considerations for the ABC method include:

- This method can be used to fairly precisely estimate the costs of practice changes at the clinic level.
- This method is computationally simple.
- Data collection using this method can be very time consuming.
- AHRQ Estimating Costs grantees found that it was most effective to include on the research team one or more junior staff members who focused on data collection; a clinician who practices in the clinics studied and has a good rapport with the staff who

will be interviewed; and a multidisciplinary research team, including finance and systems operations specialists, to facilitate cost attribution and analysis.

- This method can be used to estimate costs either prospectively or retrospectively.
- In retrospective analyses, recall bias and staff turnover are barriers to data collection.
- Researchers must find or develop a tool for accurately collecting cost data. Examples of cost data collection tools developed by AHRQ Estimating Costs grantees are included in **Appendix B**. These tools provide a detailed breakdown of cost elements and may be helpful to estimate the costs of primary care transformation in other settings.

Step 3. Report Results

While readers may be very interested to see a "price tag" for a clinic or health system transformation effort, total cost estimates presented in isolation may be misleading. To help readers interpret study results, important contextual information should be presented along with results, such as:

- Whose costs were estimated (i.e., costs to a clinic, grant program, or payer)?
- What practice change activities were implemented?
- Are technical assistance and EHR implementation costs included?
- What stage of transformation was the focus of the cost study (i.e., model development, implementation, certification, and/or maintenance)?
- Was PCMH certification sought, and at what level?

Further, to help readers apply the findings, results should be presented in a standardized way. A variety of metrics can be used to adjust estimates for clinic size, staff mix, and PCMH-related practice changes implemented. These include:

- Cost per member or per patient, per month
- Cost per clinician FTE
- Cost per administrative staff person
- Cost per patient per encounter/visit
- Cost per accreditation standard or element

Another way to standardize results is to report them in standardized dollars (e.g., 2012 dollars).

Other Key Considerations for Estimating Costs of Primary Care Transformation

Some additional insights produced by the AHRQ Estimating Costs studies may be useful for future researchers, regardless of the cost estimation method employed:

- On average, AHRQ Estimating Costs grantees found that the transformation efforts they studied occurred over a 2- to 4-year period. Thus, future researchers planning to study the

costs related to primary care transformation efforts should plan to examine data spanning a 2- to 4-year period.

- Several limitations of cost estimation studies suggest that the full costs of implementing or maintaining a PCMH-type initiative may be underestimated or overestimated. Recall and nonresponse biases are a particular concern in micro-costing studies, and challenges of attribution are a concern in all study types.
- Costs may be affected by co-occurring quality improvement or other initiatives whose activities overlap with transformation efforts.
- The definition of a PCMH has evolved and will likely continue to do so. As recognition standards evolve along with the definition, so will the costs of obtaining and retaining PCMH certification.

Synthesis Report: Methods and Results From the AHRQ Estimating Costs Research Grants

To facilitate future cost estimation efforts, in this section we summarize the studies conducted by AHRQ Estimating Costs grantees. Short summaries of each team's projects are available on the AHRQ Web site at www.ahrq.gov/professionals/systems/primary-care/pcp-costs/pcptransform-costs.html. **Appendix A** summarizes key features of each study.

Settings and Practice Change Elements Studied

The 15 studies conducted by AHRQ Estimating Costs grantees included varying numbers of primary care practices, ranging from two to more than 500. Collectively, the studies obtained cost information from more than 700 primary care practices, including family medicine and safety net clinics located in rural, urban, and suburban areas. The organizational structures of the practices varied and included independent practices, for-profit and nonprofit health care organizations, Federally Qualified Health Centers, integrated medical groups, and staff model HMOs.

Most PCMH transformation efforts studied by AHRQ Estimating Costs grantees took between 2 and 4 years to implement and occurred between 2005 and 2015. Practice change efforts included redesigning senior care; implementing cardiovascular and diabetes care processes; integration of behavioral health services into primary care; expanded roles for physician assistants, medical assistants, and nurses; integration of virtual medicine; chronic disease management; and smoking cessation and depression screening initiatives.

Some practices developed and implemented their own PCMH-type transformation model to meet internal goals and standards (e.g., the Care by Design™ model developed and implemented by the University of Utah). Others followed a pre-existing model, such as the Lean methodology (also called the Toyota Production System), which was implemented at Group Health.

The majority of practice initiatives took place as part of an effort to achieve National Committee for Quality Assurance (NCQA) PCMH certification. Formal NCQA recognition is based on six standards, comprised of 27 separate elements (six of which must be passed), and is scored on a scale of 0 to 100. Depending on the total score, NCQA recognizes PCMHs as Level 1, 2, or 3, with Level 1 being the lowest level of recognition and Level 3 the highest. NCQA standards for achieving PCMH recognition have evolved since they were first developed in 2008, with updates issued in 2008, 2011, and 2014.[3] Practices that sought NCQA recognition had to meet the standards of care necessary to obtain certification; however, other practices implemented just one or two standards or elements.

Cost Elements Estimated

AHRQ Estimating Costs grantees estimated a wide range of cost elements. In addition to estimating cost outlays, some grantees also factored the following into their cost estimates:

- Any savings achieved (e.g., from efficiencies achieved through adopting PCMH-type delivery models)
- Added revenue through PCMH incentive payments
- Forgone revenue from reducing the number and insurance value of billable services

Most grantees classified costs as direct or indirect costs, but definitions of direct and indirect costs varied across studies. For example, indirect costs variously included overhead expenses, forgone revenue, and unanticipated expenses resulting indirectly from care transformation (such as expenses associated with staff turnover). Some grantees did not distinguish between direct and indirect costs, choosing instead to report total costs, while others divided total costs into fixed and variable costs. **Exhibit 3** shows items commonly reported by grantees as direct or indirect cost elements.

Some costs were typically not factored in by grantees. Transitions to EHRs were often excluded from cost estimates, either because the movement to implement EHRs predated many of the primary care transformation initiatives or because EHRs were viewed as a parallel effort, with separate costs and funding options. Some organizations received technical assistance through their participation in a PCMH demonstration program or training collaborative. However, most studies did not include the potentially significant expenses of technical assistance or other resources received through similar programs in their cost estimations.

Data Sources and Data Collection Methods

Most AHRQ Estimating Cost grantees collected information on transformation processes retrospectively to cover a past period of transformation activities; in one case, however, the information was collected both prospectively and retrospectively.

Data on the setting, PCMH-related practice changes, and cost elements were obtained from a variety of sources, including:

- **Qualitative and mixed data collected from clinic representatives (e.g., clinic leaders, clinical and administrative staff):** Structured and semistructured interviews with clinic leaders and staff, reviews of documents provided by clinic leaders and staff, and reviews of calendar entries and other documentation of transformation activities
- **Quantitative data provided by clinics and insurers:** Quality indicators; claims/billing data; organizational accounting/general ledger data, including overall financial records, payroll, billing, and expenditures; and data entered into study spreadsheets and questionnaires (online or not) by clinic leaders and staff

- **External data**: National and local labor rates provided by the U.S. Bureau of Labor Statistics

AHRQ Estimating Costs grantees identified key cost elements based on the literature and interviews with primary care clinic leaders to develop a variety of tools, including user-friendly spreadsheets, questionnaires, and online forms, with detailed instructions on how to collect cost data. Some of these tools are quite detailed, while others focus only on key cost drivers (e.g., staff time for various activities). Examples of these tools are provided in **Appendix B**.

In one example, Miller and colleagues integrated sensitivity analyses into their Web-based tool, allowing clinic leaders to estimate their costs under different scenarios, such as changing staff mix and adding or removing transformation activities. This tool can be used to estimate costs of transformation efforts either prospectively or retrospectively. Additional information about this tool is provided in **Appendix B**.

Data Analysis Methods

Grantees used qualitative and mixed methods to describe study settings and methods to estimate costs. The ABC method was used to calculate costs from the clinic's perspective, while gross-costing methods were used to estimate costs from the perspectives of the insurer, staff model HMO, and grant program that funded primary care transformation efforts.

Analysis Methods to Describe Study Settings and Transformations Implemented

Most AHRQ Estimating Costs grantees used a case study method to describe key setting characteristics and practice changes. To develop narratives describing the transformation efforts, grantees used rich qualitative data collected through interviews and observations, as well as quantitative data about clinic size, populations served, and other practice characteristics.

Some grantees used quantitative data to compare measures of care quality and utilization before and after the transformation effort took place. For example, Kralewski and colleagues examined health care quality and access metrics such as ambulatory care sensitive hospitalization rates, blood A1c levels for diabetes patients, and patient satisfaction surveys.[15]Martsolf and colleagues used claims data to construct an index composed of several quality indicators for diabetes, asthma, and cardiovascular disease care (G Martsolf, oral interview, March 2015).The index was then used to select primary care practices that achieved high levels of quality improvement associated with the transformation effort.

Cost Analysis Methods

Exhibit 1 provides a summary of the methods used to estimate the costs of primary care transformation efforts, including the purposes each method serves, the data required to use that

method, possible analysis methods, and key considerations. How AHRQ Estimating Costs grantees used these methods specifically is described below.

ABC Methods

Most AHRQ Estimating Costs grantees used an ABC approach to retrospectively estimate the specific costs of primary care transformation efforts for their clinic or group of clinics. Grantees drew on several sources to develop ABC methods for their studies,[12-14, 16-21] and then developed specific tools for data collection, several of which are included in **Appendix B**. A full description of how the ABC method can be used to estimate the costs of primary care practice transformation is provided in the Practical Guide section of this report.

Global Costing Methods: Trend Analysis and Econometric Modeling

Shi and colleagues[10] used a global costing method including both trend analysis and regression modeling to estimate the costs incurred by a grant program to fund primary care transformation efforts across 110 clinics within 24 health care organizations in a large metropolitan area. Grant program expenditure data were used to estimate costs for each participating health care organization and clinic, including personnel, fringe benefits, travel, equipment, supplies, and alterations and renovations. Grant expenditure data were collected at 6-month intervals over a 3-year period. The trend analysis tracked total cost, cost per FTE physician, and cost per visit over the study period. The findings showed the incremental cost for clinics that achieved NCQA PCMH recognition versus clinics that did not. The incremental cost methodology is also discussed in Zuckerman et al.[23]

Shi and colleagues then used a Mann-Whitney test to determine if clinics that achieved PCMH recognition were significantly different from clinics that did not. Propensity score matching was used to identify and retain for linear regression analysis pairs of clinics that were comparable at baseline and differed primarily in whether they attained PCMH recognition during the study period. Linear regression models were used to control for factors other than PCMH transformation that may have affected cost, such as total number of visits, number of FTE physicians, patient demographics (e.g., sex, race, and age), and percentage of uninsured patients. Based on the results of a Hausman test, a fixed effects model was selected to control for unobserved clinic characteristics not varying over time that may have biased results. A difference-in-difference method was used to estimate the difference in cost changes before and after PCMH transformation, comparing clinics that did and did not ultimately achieve PCMH recognition.

Two studies used global costing methods to examine the costs of primary care transformation from a payer's perspective. In one study, Kralewski and colleagues used claims data from a major health insurance plan to track patient-level costs of care. Allowed amounts paid were risk-adjusted (i.e., adjusted for patient case-mix) using the Johns Hopkins Adjusted Clinical Groups® algorithm plus patient age and sex. Patient-level, per member, per month costs for two clinics that underwent a major transformation were compared with those of 28 primary care clinics that did not transition to new models. Risk-adjusted costs were compared before, during, and after the transformation effort.[14]

In another example, Fishman and colleagues used general ledger data from a staff model HMO, which integrates coverage and care systems. Two methods were used to calculate the production costs of health care provided to members. Actual costs were measured using an internal cost model to allocate utilization and cost data, including overhead expenses. Standardized costs were also measured using the Resource Based Relative Value Scale, which is used by the Centers for Medicare & Medicaid Services to reimburse providers for services covered by Medicare part B, as described in O'Keeffe-Rosetti et al.[24] To estimate the change in costs attributable to PCMH transformation, two regression models were used: 1) a linear regression model to estimate the change in health care costs before and after transformation in the HMO clinics that underwent PCMH transformation, and 2) a difference-in-difference method to compare cost changes for patients in those clinics compared with patients receiving care in the HMO's statewide contracting network. Subgroup analyses were performed for patient subsets, including all adults, older adults, children, and persons with chronic conditions.

Results

Six of the 15 AHRQ Estimating Costs grantees were still in the process of analyzing data as of this writing; therefore, not all results were available.

The practices studied incurred a range of direct and indirect costs related to primary care transformation efforts, some of which were partially offset by PCMH incentives received. Across studies, staff time and benefits for existing staff and new hires, as well as lost revenue, were the main drivers of the cost of primary care redesign efforts. Similarly, reporting requirements (including staff time spent meeting them) were an important cost driver as well. One grantee reported that adapting an EHR to support transformation was a moderate cost driver. Some preliminary, illustrative findings from the AHRQ Estimating Costs grants are provided below.

- Halladay and colleagues found that the cost of initial transformation and attaining PCMH recognition was approximately $11,000 per clinician FTE in four small to medium practices (≤10 clinicians) in North Carolina (J Halladay, oral interview, February 2015).
- Magill and colleagues found that the average cost of sustaining transformation over time entailed significant monthly costs per FTE clinician (including physicians, nurse practitioners, physician assistants, and residents). Costs were also estimated per encounter and per member per month.[25]
- Kralewski and colleagues found that the cost of developing and implementing an advanced PCMH-type model (beyond PCMH certification standards) was greater than $1 million per clinic in two midsized high-performing clinics (5–9 clinicians) in Minnesota, but insurance companies saved more than $4 million in one year (about $31 per member per month). These gains were not sustainable, however, because the clinics were unable to bill for services provided by nurses and for telephone visits. After 2 years, patient costs for transformed clinics were higher than those of control clinics.[15]
- Miller and colleagues found that because of variation in personnel and integration activities, the total cost of mental and behavioral health integration ranged greatly (from <$30,000 to >$500,000) across six Colorado practices ranging from solo rural practices to large urban multispecialty primary care practices. Costs were lowest in practices that

did not have behavioral health providers and utilized primary care providers and other staff to implement behavioral health screenings. Costs were highest in a large practice with multiple embedded behavioral health providers.[26]

- Shi and colleagues found that a large grant-funded PCMH transformation in 110 clinics in Louisiana had significantly higher overall and per patient per month costs during the transformation period in practices that achieved PCMH recognition compared with those that did not. Estimates of total incremental costs were sensitive to model specifications and sample size, and costs per FTE physician were deemed unreliable owing to the difficulty of quantifying FTE physicians due to staff turnover.[10]

Conclusions

The conclusions drawn from synthesizing the approaches, methods, and lessons learned from the 15 AHRQ Estimating Costs grantees were used to develop the Practical Guide at the beginning of this report. A summary of those findings is provided here.

Detailed descriptions of study settings and transformation efforts are important. Study settings and transformation efforts can vary widely. Robust descriptions of exactly what is being studied can help contextualize study results and clarify which audiences may find them helpful.

Consider the benefits and drawbacks of each cost estimation approach. A gross-costing method uses aggregated data, such as general ledger or claims data, to retrospectively analyze the costs of practice changes implemented. The benefits of this approach are that it does not require burdensome data collection and analyses can be adjusted for patient case-mix, demographics, and other variables such that the results are more generalizable to other settings. When trend analyses are conducted, problems with attribution can occur. Changes in cost trends can be caused by factors other than primary care transformation efforts. When claims data are used, they may not reflect all of the costs related to transformation efforts incurred by clinics (which are often not reimbursable).

A micro-costing (or ABC) approach creates a cost estimate based on a detailed analysis of resources used and the unit costs of each resource. This approach is appropriate to assess the costs of PCMH transformation efforts for most clinics. The benefits of the ABC approach are that it can be used either prospectively or retrospectively, does not require access to aggregate data, can account for all clinic-level resources spent as well as opportunity costs, and is computationally simple (i.e., it does not require statistical analysis software or skills). However, this method is time consuming for both investigators and clinic staff. This method is also susceptible to recall bias (for retrospective studies).

Report standardized results when possible. To help readers interpret and use the results from cost estimate studies, it is helpful to report results in standardized dollars (e.g., 2012 dollars) and provide metrics that adjust for clinic size (e.g., cost per member or per patient per month, per clinician FTE, or per visit).

Research Gaps and Future Directions

The Estimating Costs research team's experiences highlight some research gaps and suggest promising directions for future research. The suggestions below build on input provided by AHRQ Estimating Costs grantees.

Standardizing measurements. The use of a variety of methods and metrics to report the costs of primary care transformation efforts makes meta-analysis difficult. It may therefore be important for the field to develop a consensus on standardized measurement strategies to measure costs on a larger scale. A useful industry model is the Medical Group Management Association's use of annual cost benchmarking surveys of primary care practices.[27]

Examining understudied costs. Few grantees examined the cost of maintaining PCMH-related practice changes, and those who did encountered great difficulty disentangling the cost of maintaining practice change from other costs of providing health services. In addition, none of the grantees examined the costs or savings experienced by patients as a result of primary care transformation efforts. Studying these costs could be a useful contribution to the field.

Further research on the nature of primary care transformation. The definition of the PCMH has evolved and will likely continue to do so. In addition, the ways in which clinics implement PCMH standards vary greatly and will also continue to evolve. Understanding the PCMH practice changes implemented is an essential task to interpreting cost estimates; therefore, ongoing research on the nature of transformation efforts is needed. A useful industry model may be the Advisory Board Company's ongoing Primary Care/Medical Home Benchmarking Survey.[28]

Measuring the value of primary care transformation. Beyond estimating the costs of primary care transformation efforts, several AHRQ Estimating Costs grantees commented on the importance of conducting research on the value of primary care transformation efforts, both to identify worthwhile practice changes that translate into measurable quality improvements and to identify other practice changes whose expense may not be justified by their contribution to PCMH goals. The use of large-scale benchmarking studies on the costs and components of primary care transformation, such as those mentioned previously, may be particularly helpful in this regard.

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Exhibit 1. Methodological Options for Estimating the Costs of Transforming Primary Care

Method Name and Definition	Study Purpose	Data Sources and Analysis Methods	Key Considerations
Gross-Costing Cost estimate based on aggregated data	Retrospective analysis of the costs of transformation to health care facilities or insurers	**Data Sources:** - Claims data or - General ledger data spanning periods before, during, and after transformation **Analysis Methods:** - Descriptive analysis (trend analysis) - Econometric modeling (linear regression, difference-in-difference method)	**Benefits:** - Does not require burdensome data collection - Analyses can be adjusted for patient case-mix, demographics, and other variables, enhancing the applicability of results beyond study settings **Drawbacks/Challenges:** - Claims data do not necessarily reflect costs of primary care transformation efforts incurred by clinics - Changes in cost trends can be caused by factors other than PCMH transformation efforts **Keys to Success:** - Use linear regression to control for patient case-mix, demographics, and other variables - Consider fixed or random effects models to address unobserved variation - Consider a difference-in-difference method to compare differences in costs in transformed vs. untransformed clinics before and after the transformation effort - Use a comparable control group to address attribution challenges; consider using propensity score matching to identify a comparable control group
Micro-Costing (also known as **Activity-Based Costing**) Cost estimate based on a detailed analysis of resource use and unit costs of each resource	Prospective or retrospective study of the costs of transformation to health care facilities	**Data Sources:** Primary data collection using interviews and questionnaires **Analysis Methods:** Basic accounting methods (multiply number of units by unit costs and add together). If cost estimates are produced for multiple clinics, results can be stratified to show how costs vary by geography, clinic type, transformation components implemented, and other characteristics.	**Benefits:** - Can be used to account for uncompensated time spent and opportunity costs in addition to outlays - Does not require statistical analysis software or skills **Drawbacks/Challenges:** - Burdensome data collection - During the maintenance period, staff cannot distinguish between time spent on PCMH activities and their regular jobs - Potential for recall bias in retrospective studies **Keys to Success:** - Ample time and adequate staff for data collection - Pre-established rapport with clinics providing data - Web-based data collection tools for data collection efforts across large numbers of clinics

Abbreviation: PCMH = patient-centered medical home.

Exhibit 2. Example of a Trend Analysis Graph
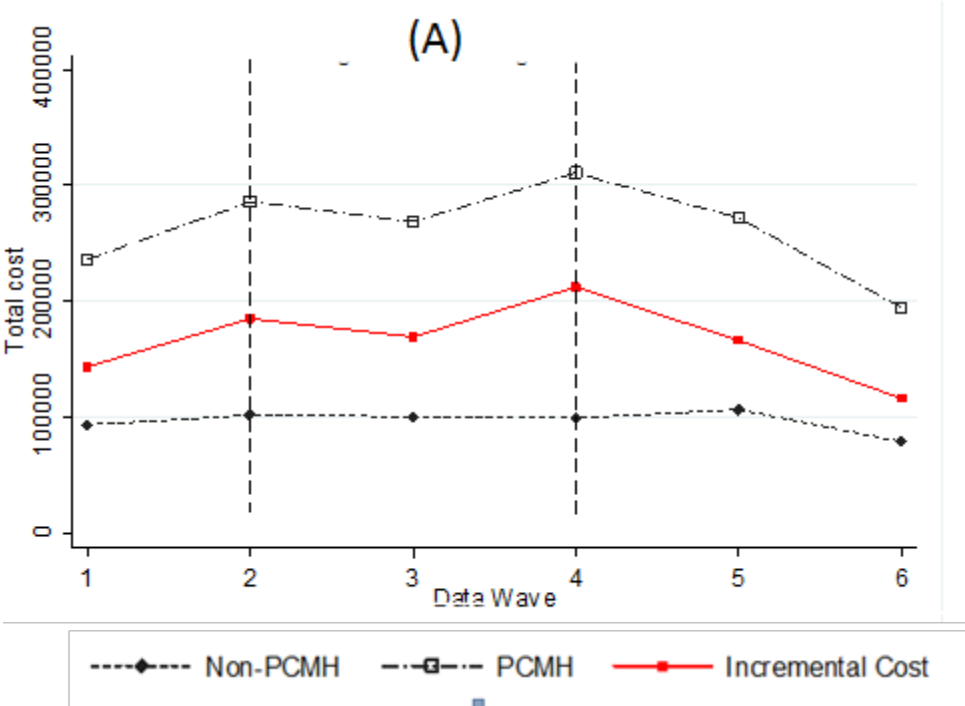
Source: From Shi L et al.[10]

Exhibit 3. Items Classified by Estimating Costs Grantees as Direct and Indirect Cost Elements

Direct Cost Elements	Direct or Indirect Cost Elements	Indirect Cost Elements

• Staff time/salaries and benefits:
  o New FTEs
  o Staff time spent on various activities, such as training, patient recruitment, patient visit time, integration activities, generating monthly quality data reports, documenting processes, survey development, and applying for recognition
  o Training
• Consultants/contracted services
• Project supplies and materials
• Capital expenditures:
  o Space
  o Equipment
• Program costs:
  o Development
  o Implementation
  o Incentive payments
  o New revenue
• Travel/transportation
• Patient visit times
• Patient care costs
	• Information technology support
	• Administrative resources
	• Postage and printing
	  o Duplication (e.g., training materials)
		• Resources involved in project planning
		• Shared management of resources
		• Forgone revenue (e.g., lost revenue from fewer visits or a decline in billable services)
		• Organizational dislocation
		• Staff turnover
		• Costs and benefits related to transformation that may not be present in financial ledgers
		• Utilities/rent

Abbreviation: FTE = full-time equivalent.

Appendix A. Key Characteristics of Estimating Costs Grants

PI Name, Project Title, Grant Number, Institution	Practice Description	PCMH Transformation Effort Studied	Study Description	Costs Estimated	Study Methods
Paul Fishman, PhD; Estimating the Cost of a Medical Home Transformation R03 HS022618 Group Health Cooperative	26 primary care clinics belonging to an integrated health system located in Washington State	A systemwide initiative to transform Group Health's primary care clinics into PCMHs. The Group Health PCMH model included four practice change modules: virtual medicine (including after-hours nurse consultations and increased virtual visits via secure messaging), chronic disease management, previsit preparation, and outreach. These were accompanied by additional systems changes. All 26 clinics achieved Level 3 NCQA PCMH recognition.	Document the costs of conducting a systemwide PCMH transformation of an integrated health care system and to estimate the change in direct health care costs attributable to the transformation. The study examined direct and indirect costs of designing, developing, implementing, and refining a transformation model.	Total health care costs, costs associated with primary and other types of care, and costs for all patients with chronic conditions	A gross-costing method was used. Cost data were obtained from general ledger data and assigned to health care production costs based on two methods, an internal cost model and the Resource Based Relative Value Scale. The change in total direct health care costs and in categories of use attributable to transformation were determined using regression analyses. Two different empirical models, both using interrupted time series regression, were used to estimate the change in cost over time.
Neil Fleming, PhD; Costs of Transforming Established Primary Care Practices to Patient-Centered Medical Homes R03 HS022621 Baylor Research Institute	60 primary care practices within a large ambulatory care medical group practice in the greater Dallas/Fort Worth area	All primary care practices within the HealthTexas Provider Network were required to meet NCQA criteria for PCMH recognition. Practice changes included improved processes to assign a primary care physician to each patient; improved care coordination, scheduling, and team-based care; using health information technology to identify patients who are overdue for services; and others. 57 practices were recognized as NCQA Level 3 PCMHs and three practices as Level 2 PCMHs.	Estimate the costs of a primary care practice's initial PCMH transformation and application for formal recognition under 2008 NCQA criteria and to estimate the additional costs of renewing PCMH recognition and opportunity costs (forgone revenue)	Corporate and practice-level infrastructure or capital expenditures, costs of applying for PCMH certification, and recertification	An activity-based costing method was used. Data were collected from various sources, including payroll data, expenditure data, and qualitative data from interviews. Direct costs were calculated based on observed expenditures and staff wages multiplied by the estimated number of hours spent on transformation activities. Costs were estimated separately for transformation and for applying for NCQA recognition.

Appendix A. Key Characteristics of Estimating Costs Grants

PI Name, Project Title, Grant Number, Institution	Practice Description	PCMH Transformation Effort Studied	Study Description	Costs Estimated	Study Methods
Jacqueline Halladay, MD, MPH; Understanding the Direct and Indirect Costs of Transformation to Medical Homes R03 HS022629 University of North Carolina at Chapel Hill	Four small- to medium-sized primary care practices (three pediatric and one family practice) that participated in the North Carolina Practice Support Program	Practices participated in the North Carolina Practice Support Program, a statewide initiative to help primary care practices transform into PCMHs. Practices focused on improving the care of patients with asthma or diabetes, including use of patient registries, planned care templates, disease-specific care protocols, patient self-management tools, and regular care team meetings. Out of 76 practices participating in the program, 25 (33%) achieved 2008 NCQA PCMH recognition; 22 practices were recognized at Level 3, and three at Level 1. Practices with PCMH recognition benefited from provider incentives in the form of enhanced payments from some regional payers.	Estimate the incremental costs of PCMH transformation; specifically, costs that are attributed to new activities required for NCQA PCMH recognition and that are above and beyond previous or baseline costs	Costs by phase of PCMH transformation (development, implementation, and maintenance), costs per FTE clinician, cost per element specified in the NCQA application, costs of applying for PCMH recognition, and total costs	An activity-based costing method was used. Data were obtained primarily through qualitative, semistructured interviews and practice documents and then categorized and analyzed. Costs of staff time were computed using mean hourly salaries for 2012 obtained from the U.S. Bureau of Labor Statistics.
Elbert Huang, MD, MPH; Case Studies on the Cost of Medical Home Transformation and Maintenance in the Safety Net R03 HS022628 University of Chicago	Nine safety net practices in five States (Colorado, Idaho, Massachusetts, Oregon, and Pennsylvania)	Practices participated in a demonstration project to transform safety net practices into PCMHs. The practice transformation effort was structured along eight "change concepts": 1) engaged leadership, 2) quality improvement strategy, 3) empanelment, 4) continuous and team-based healing relationships, 5) patient-centered interactions, 6) organized evidence-based care, 7) enhanced access, and 8) care coordination. Diabetes care was a common focus for practice transformation efforts.	Evaluate the long-term sustainability and maintenance costs of PCMH transformation and to compare the costs of PCMH transformation and maintenance by type of practice	Direct clinical and administrative costs and indirect costs related to PCMH transformation and maintenance	An activity-based costing method was used. Data was collected from a self-administered survey, clinic-level billing data, and qualitative interviews. In-depth case studies were conducted. The study reported descriptive statistics on differences in costs and revenue.

Appendix A. Key Characteristics of Estimating Costs Grants

PI Name, Project Title, Grant Number, Institution	Practice Description	PCMH Transformation Effort Studied	Study Description	Costs Estimated	Study Methods
John Kralewski, PhD; Transition of Primary Care Medical Group Practices to Next Generation Models R03 HS022617 Medica Research Institute	Two high-performing, midsized family medicine clinics owned by a large, hospital-based, integrated health care system in the Minneapolis-St. Paul metropolitan area, Minnesota	Clinics transitioned from traditional fee-for-service, illness-oriented, physician-centric health care to a patient-centered population health model. A health insurance plan provided compensation for 2 years while the clinics developed, implemented, and tested the model. The goal of the transformation was to position the clinics to participate in Total Cost of Care contracts being developed by insurance companies. Both clinics received a State medical home certification based on the NCQA model.	Document practice changes to patient care processes and programs and experiences implementing the transformations; document initial implementation costs and costs to maintain transformation; and document patient-level savings to insurance plans (per member/per year costs from the insurance company's perspective)	Direct and indirect and initial and ongoing costs related to primary care transformation efforts, including staff time, consultant fees, administrative expenses, capital outlays, training costs, lost revenue from fewer clinic visits and provision of unbillable services, and patient-level costs	Both activity-based costing and gross-costing methods were used. The study used an in-depth, mixed methods, case study approach. Data were collected through interviews, surveys, and document reviews and comparison ratios and tables were used to estimate costs for each transformation component. Multivariate regressions were used to analyze patient-level costs and compared with a control group of 28 clinics.

Appendix A. Key Characteristics of Estimating Costs Grants

PI Name, Project Title, Grant Number, Institution	Practice Description	PCMH Transformation Effort Studied	Study Description	Costs Estimated	Study Methods
Michael K. Magill, MD; Tool to Assess Ongoing Costs of Patient-Centered Medical Homes R03 HS022620 University of Utah, School of Medicine, Department of Family and Preventive Medicine	20 primary care practices, including independent practices, FQHCs, and clinics belonging to a university-owned network in Utah and Colorado	Participating practices redesigned systems and implemented changes consistent with mature PCMH practices. Eight clinics belonging to a university-owned network implemented Care by Design™, a model that emphasizes timely access, team-based care, and care planning and yielded improvements in clinical quality as well as patient and provider satisfaction. Five FQHCs implemented changes to enhance access, continuity of care, and teamwork. Seven independent practices participated in a PCMH pilot and achieved significant improvements in cardiovascular and diabetes care, smoking cessation, depression screening, and preventive care. Of the 20 clinics, 12 obtained Level 3 NCQA recognition and eight opted not to pursue NCQA recognition.	Understand the cost structure associated with ongoing maintenance of PCMH services and to correlate practice characteristics with the cost of ongoing maintenance of PCMH services, as well as estimate per patient per month costs for practices while accounting for the variation in practice-level characteristics	Direct costs of maintaining PCMH services were estimated, including: cost per FTE clinician, costs per patient per month, and costs per element of NCQA PCMH recognition	An activity-based costing method was used. A cost analysis was conducted in primary care practices that varied in terms of NCQA recognition. The analysis focused on estimating the direct costs (primarily salaries and benefits) of maintaining PCMH services. The PCMH Cost Dimensions Tool was used to estimate costs. Data were collected through structured interviews and financial and administrative data sources. The study team also collected data on practice characteristics to be used in aggregate cost analyses.

Appendix A. Key Characteristics of Estimating Costs Grants

PI Name, Project Title, Grant Number, Institution	Practice Description	PCMH Transformation Effort Studied	Study Description	Costs Estimated	Study Methods
Grant R. Martsolf, PhD, MPH, RN; Estimating Costs Associated With Patient-Centered Medical Home Transformation R03 HS022616

RAND Corporation | 81 primary care practices in Pennsylvania, including general internal medicine and pediatric practices and nurse-managed health centers | Practices participated in a 3-year demonstration project, which engaged primary care practices in improving the care of patients with chronic diseases through implementation of the PCMH model. Practices that achieved NCQA PCMH recognition also received enhanced payments from a coalition of regional payers. The extent of PCMH transformation varied across practices. | Describe the costs associated with PCMH transformation across practices with varying levels of transformation | One-time costs, ongoing costs, total costs, costs per clinician, costs per provider FTE, category-specific costs, and costs per patient | An activity-based costing method was used. Survey and claims data were used to identify a sample of 81 practices and used to compute quality index scores for each practice. Practices were then ranked and three from each region (12 in total) were selected for case studies, which included semistructured interviews. Interviews were used to obtain estimates of initial and ongoing costs of transformation. |
| Richard T. Meenan, PhD, MPH, MBA; Estimating the Costs of Primary Care Renewal R03 HS022627

Center for Health Research–Kaiser Permanente Northwest | Eight clinic systems with more than 40 primary care practices, including neighborhood health centers, school-based clinics, and primary care practices serving primarily low-income patients in western Oregon | Practices implemented a PCMH through a training collaborative based on the Primary Care Renewal (PCR) experience. PCR encourages practices to provide multidisciplinary, coordinated, and comprehensive care. Practices implementing PCR agree to establish team-based and customer-driven care, barrier-free access, proactive health improvement for patient panels, and onsite or otherwise integrated behavioral health services. The participating organizations have adopted formal improvement methods, redesigned practices to increase patient empanelment, and introduced care teams. | Quantify the true resource and cost burden that similar clinics are likely to bear in successful PCMH transformation by using process improvement theory as a framework, and to apply costing methodology and qualitative research methods to the identification, categorization, and quantification of the direct and indirect costs of successful PCMH practice transformation within a safety net–based medical care system | Direct and indirect costs of PCMH implementation, including costs of specific implementation activities, total costs, costs per service, and costs per member | An activity-based costing method was used. Data were collected from project reports and semistructured interviews, including financial information. Information was then used to develop a model of the implementation process. Activity-based costing methods were used to identify costs associated with each activity. |

Appendix A. Key Characteristics of Estimating Costs Grants

PI Name, Project Title, Grant Number, Institution	Practice Description	PCMH Transformation Effort Studied	Study Description	Costs Estimated	Study Methods
Benjamin Miller, PsyD; Cost Assessment of Collaborative Healthcare (CoACH) R03 HS022619 University of Colorado Denver, Department of Family Medicine	Six primary care practices in Grand Junction, Colorado, ranging from solo rural practices to large, urban, multispecialty primary care practices	The six participating practices were already providing or considering whether to offer onsite integrated behavioral health care. The practices were part of the Sustaining Healthcare Across Integrated Primary-Care Efforts project, which studied whether a global budget for primary care, including mental health, is sustainable.	Develop and test a Web-based tool to both prospectively and retrospectively estimate the annual incremental expenditure of integrating mental and behavioral health services into primary care practices through the PCMH	Both initial and ongoing costs were estimated, including staff salaries and benefits, training costs, and operational costs such as space, equipment, and software	An activity-based costing method was used. The Web-based data collection tool developed includes a practice intake questionnaire and an integration activities graphic workflow. Respondents can then edit workflow assumptions to model the total cost of different scenarios. The six participating practices piloted the tool to assess and improve its usability and accuracy.
Linzheng Shi, PhD; Estimating Costs of Supporting Safety Net Patient-Centered Medical Home Transformation in New Orleans R03 HS022624 Tulane University	110 safety net clinics (75 primary care clinics and 35 behavioral health clinics) from 24 health care organizations in New Orleans	A systemwide effort to rebuild and transform primary care using the PCMH model and supported by a Primary Care Access and Stabilization Grant (PCASG). Participating clinics were required to implement PCMH quality standards and many clinics also improved care management for patients with diabetes and depression, in some cases by integrating primary care and behavioral health care services. PCASG offered incentives for PCMH transformation through bonus payments to clinics with NCQA recognition. Of the 110 clinics, 39 primary care and two behavioral health clinics attained NCQA PCMH recognition.	Understand the differences between PCASG clinics that attained NCQA PCMH recognition and those that did not	Baseline and incremental costs of the PCMH transformation process, including total costs, costs per visit, and costs per FTE physician	A gross-costing approach was used. The study team used program data to estimate costs by tracking actual program expenditures in various categories. Trend analyses were conducted to understand cost trends for clinics that attained recognition and those that did not. Econometric modeling was used to estimate incremental costs of transformation.

Appendix A. Key Characteristics of Estimating Costs Grants

PI Name, Project Title, Grant Number, Institution	Practice Description	PCMH Transformation Effort Studied	Study Description	Costs Estimated	Study Methods
Sarah Shih, MPH; What Are the Costs to Small Practices and Community Health Centers to Maintain Comprehensive Primary Care in New York City? R03 HS022626 New York City Department of Health and Mental Hygiene	45 small, office-based practices and CHCs serving lower income neighborhoods in New York City	Practices participated in the Primary Care Information Project to help primary care practices and CHCs implement electronic health record systems; the project also helped practices and CHCs optimize their workflows and adopt changes reflecting NCQA PCMH standards. The practices generally used a combination of informal and structured techniques to achieve PCMH goals related to improving access, coordinating care, improving the care of patients with chronic conditions, and assessing improvement efforts.	Quantify the time and resources utilized by practices for new activities or revised workflows as part of maintaining primary care medical home services relating to patient engagement and care coordination, to translate the time and resources spent into costs, and to examine the range of costs by organizational attributes	Costs of time and resources to maintain PCMH activities related to patient engagement and care coordination, including total costs per practice, average costs per provider and administrative staff, and costs per patient per encounter	An activity-based costing approach was used. The study team used a multistep data collection process that included a survey and structured interviews. Data obtained from interviews were translated into costs using salary data from the practices. Program data about practice characteristics were used to examine the relationship between costs and organizational attributes.
Ming Tai-Seale, PhD, MPH; Estimating the Costs of Supporting Primary Care Practice Transformation R03 HS022631 Palo Alto Medical Foundation Research Institute	17 primary care practices affiliated with a community-based, multispecialty group practice in northern California	Redesign efforts were guided by the core principles of team-based care, whole person orientation, integrated care, enhanced access, quality and safety, and appropriate reimbursement for services. Between 2007 and 2010, 10 of the 17 primary care practices affiliated with the Palo Alto Medical Foundation applied for and received NCQA PCMH recognition; five practices were recognized at Level 2 and five at Level 3.	Identify the key components of the transformation process and sources of indirect costs and determine the costs of the identified key components. The study focused on costs associated with several specific interventions and examined the activities and costs associated with the early planning stage of each intervention and the initial rollout of the interventions in the clinics.	Indirect costs (estimated at the physician, practice, division, and organization level) of planning and introducing PCMH interventions, including shared medical appointments, team-based care, and automatic laboratory test ordering	An activity-based costing approach was used to calculate indirect costs associated with each intervention as determined through a multistep process. Data were primarily collected through interviews, with additional data obtained from electronic calendars used by staff members, meeting minutes, and project tracking and payroll data. Costs were examined at the physician, practice, division, and organizational levels.

Appendix A. Key Characteristics of Estimating Costs Grants

PI Name, Project Title, Grant Number, Institution	Practice Description	PCMH Transformation Effort Studied	Study Description	Costs Estimated	Study Methods
George Valko, MD; Patient-Centered Medical Home Cost of Sustaining and Transforming R03 HS022630 Thomas Jefferson University	11 rural, urban, and suburban primary care practices located in southeastern Pennsylvania	Participating practices achieved NCQA PCMH recognition as the result of a statewide demonstration program, which brought together family medicine, general internal medicine, and pediatric practices to implement the chronic care model. Major insurers in the State offered ongoing payment incentives to practices with NCQA recognition. The 11 practices participating in this study implemented a variety of transformation activities, including expanding patient access and continuity, improving care coordination and care transitions, and increased shared decisionmaking.	Estimate the cost of transforming a small primary care practice into a PCMH and to create a structured tool to provide practices with a way to estimate the costs of transforming into a PCMH	Direct and indirect costs of achieving NCQA recognition and costs of maintaining recognition, including staff salaries, training costs, costs associated with patient care, and space and equipment costs	An activity-based costing approach was used. Data were collected from each practice and costs were classified according to whether or not they were one-time or ongoing. The net cost of achieving recognition was computed for each practice. A structured cost tool was developed to estimate and report the cost of practice transformation.
Arturo Vargas-Bustamante, PhD, MPP, MA; Examining the Costs of a Medical Home Transformation for Seniors R03 HS022634 University of California, Los Angeles	A large integrated medical group with 31 practice sites and 213 IPAs in three geographic regions in the greater Los Angeles area	Practices participated in a wellness care redesign for older adult patients in an ACO. The primary goals of the redesign were to improve the quality of patient-primary care team interactions, support shared decisionmaking, and help coordinate preventive and chronic patient care needs.	Develop a cost capture template to retrospectively quantify startup and incremental expenses for senior care redesign in the integrated medical group and IPA primary care practice sites and compare startup and incremental practice expenses for site-level implementation of the PCMH redesign between integrated group primary care and IPA practice sites	Startup (initial) and incremental practice expenses for PCMH transformation, including training material development, staff costs, equipment costs, and incidental costs (transportation and incentives)	An activity-based costing approach was used. Data were collected using a customized cost-capture template completed by program administrators and was then coded and aggregated to enable cost comparisons across time, presented in 2012 dollars.

Appendix A. Key Characteristics of Estimating Costs Grants

PI Name, Project Title, Grant Number, Institution	Practice Description	PCMH Transformation Effort Studied	Study Description	Costs Estimated	Study Methods
Benjamin Yarnoff, PhD; Estimating the Costs of Supporting Primary Care Practice Transformation R03 HS022615 Research Triangle Institute	Study includes all primary care practices in the United States that attained PCMH recognition between December 2014 and February 2015, a total of 467 practices	All participating practices received recognition from NCQA as a PCMH	Estimate the cost of primary care transformation through a survey of primary care practices	Direct costs of attaining PCMH certification, including labor, equipment, materials, travel, and contracted services	An activity-based costing approach was used. The study examined the direct costs of NCQA recognition and used an activity-based costing approach to collect costs data. Respondents were asked to retrospectively report only on the costs of the transformation effort itself, not the ongoing costs. Practice managers were surveyed to examine the average cost of transformation for each practice transformation element, the distribution of costs across resource components for each element, and how costs vary by practice characteristics. Costs were captured by resource component and activity using a Web-based survey/cost data collection tool.

Abbreviations: ACO = Accountable Care Organization; CHCs = Community Health Centers; FQHCs = Federally Qualified Health Centers; FTE = full-time equivalent; IPA = Independent Practice Association; NCQA = National Committee for Quality Assurance; PCMH = patient-centered medical home.

Appendix B. Example Data Collection Tools

Sections from the data collection instruments developed and used by AHRQ Estimating Costs grantees are included here as examples for researchers who are considering how to best collect information to measure the costs of primary care transformation efforts. Please contact the appropriate principal investigators for permission to use these instruments and for full versions of the tools. Contact information is provided with each tool.

Example 1. Pre-Interview Questionnaire
Principal Investigator: Sarah Shih
Institution: New York City Department of Health
Contact Information: sshih@health.nyc.gov
The following questionnaire was used as a pre-interview preliminary assessment. The first page (describing the purpose of the questionnaire) and a sample page of the questionnaire are presented below. The full questionnaire contains 38 questions assessing the practice site, quality improvement activities, participation in incentive programs, patient information systems, care coordination, language services, self-care support and community resources, patient population and volume, finances, and respondent information.

Patient Centered Medical Home Pre-Interview Questionnaire

Purpose: The goal of this pre-interview questionnaire and interview is to understand the resources used and activities conducted by primary care practices in order to meet Patient Centered Medical Home (PCMH) standards. PCMH, also referred to as advanced primary care or comprehensive primary care, is an increasingly popular model of care delivery.

Why you were asked: You are invited because your practice has obtained PCMH recognition in the past. The pre-interview questionnaire is administered by PCIP.

Benefits of participating: There are no direct benefits to participating in this pre-interview questionnaire. If you choose to participate, you will receive $100 as a thank you.

Risks or discomforts: No risks or discomforts are anticipated. You may skip any questions that you do not want to answer, or mark not applicable ("NA").

Confidentiality/How the findings will be used: Participation is completely voluntary and will not affect the services you receive from PCIP, nor your relationship with NCQA. Your answers will only be shared internally amongst PCIP members. The findings will potentially influence future incentive or reimbursement policies. Summary results may be presented at conferences and in publications. We may use individual quotations, such as "a small practice provider reported…", but no names and/or identifying information will be shared.

How long will it take: The pre-interview questionnaire should take about 25–30 minutes. If you have

Appendix B. Example Data Collection Tools

concerns, please contact the Principle Investigator, Sarah Shih.

By clicking "Next" at the bottom of the page, you acknowledge that you have read this information and agree to participate.

14. About how often do you think your patients experience the following at this practice/clinic site?

	Usually (75%–100% of the time)	Often (50%–74% of the time)	Sometimes (25%–49% of the time)	Rarely (1%–24% of the time)	Never
a. Patients' appointments are scheduled with their personal clinician versus another clinician					
b. Patients are able to receive a same- or next-day appointment when they request one					
c. Patients can get telephone advice on clinical issues during office hours					
d. Patients can get telephone advice on clinical issues on weekends or after regular office hours					
e. Patients can email clinicians about clinical issues					

Appendix B. Example Data Collection Tools

Example 2. Interview Guide
Principal Investigator: Ming Tai-Seale
Institution: Palo Alto Medical Foundation Research Institute
Contact Information: Tai-sealeM@pamfri.org
The interview guide presented below was used to conduct interviews with key informants/individuals who were involved in the target interventions. Through the interviews, the study team obtained details about practice personnel and resources used in the intervention, changes to workflow, and financial information.

<u>**Primary Care Transformation Costs Interview Guide**</u>

Project Beginnings

- How did the project start?
  - o Any additional time spent on the project outside of work hours (e.g., thinking/brainstorming)?
    - How much time did these beginning activities take?
      - Could we perform an Outlook calendar/email search to give a more accurate representation?
- When did the project start (year/month)?
  - o Could we perform an Outlook calendar/email search to give a more accurate representation?
- When did the intervention roll out for clinical practice?
  - o Did the intervention expand to other sites/departments, and if so, when?

Individual Contribution

- When did you start working on the project?
- Tell me about your role in the intervention.
  - o What were your responsibilities?
    - Describe in detail a typical day of doing tasks specific to the implementation.
    - How much time did it take to complete each responsibility?
      - Could we perform an Outlook calendar/email search to give a more accurate representation?
- How long were you a part of the initiative?

Key Personnel

- Who were the key personnel involved in the project?
  - o Is there a personnel list?
- Did the key personnel change over time?
- Who else was involved in the intervention?
- Who would you recommend we talk to in order to learn more about how this project was developed and implemented, specifically regarding costs (leadership and clinical level)?

Budget

- Outline what has happened with the budget over time—from early development to clinic implementation:

Appendix B. Example Data Collection Tools

- o When did the budget begin?
- o What was your involvement in the creation of the budget?
- o What was the decision process for deciding how much money would be allocated to the project?
  - Was there a budget proposal?
  - Were other data/ documents used?
- o What kind of budgeting practice is used (e.g., bottom line)?
- o How accurately did it reflect what actually occurred with the project?
- If budget modifications occurred when project was implemented:
- o Who determines modifications to the budget?
- o What is the decision process for making a change?
  - Were data/documents needed?
- If NO budget, how did you cover the costs?
- What are the overall fiscal implications of the implementation?

Resources/Organizational Expenses

- What were some of the resources/organizational expenses associated with the project?
- o Purchasing equipment/hardware/software?
- o Hiring personnel/reallocating job responsibilities?
- o Information technology work?
- o Building/reallocating facility space?
- o Staff trainings (days and hours)?
- o Anything else?
  - Please specify specific costs of each.
  - If you do not know, who has the knowledge and/or documentation of each?

What else should we know? What did we not ask that we should have? What more do you have to add?

Appendix B. Example Data Collection Tools

Example 3. Organizational Survey
Principal Investigator: John Kralewski
Institution: University of Minnesota
Contact Information: krale001@umn.edu

The screenshots below are excerpts of the practice organizational survey developed by Kralewski et al. This survey was distributed at the time of the interviews and was used to collect data on clinic structure and organization as well as cost data. Data elements collected through this survey included clinical and support staffing levels (by type, job category, and specialty); patient workload (patient visits per provider per year, adjusted for illness level); unique patients, patient encounters, and procedures per FTE physician by specialty; medical revenue; cost data pertaining to transformation components described during interviews, such as new equipment, additional staff, and training costs, and changes in patient level costs. In addition to the practice organizational survey, the research team also used an organizational culture assessment. This survey is not featured in the Practice Guide but is available upon request.

Medical Group Practice Organizational Survey

Clinic Identification Code: _____

Please provide the following information about your group practice.

1. Number of physicians   Number of FTEs
   a) Primary care: _____   _____
   b) Surgery specialty: _____   _____
   c) Medical specialty:_____   _____
   d) Pediatrics:_____   _____
   e) OB/GYN_____   _____

2. Indicate how many primary care physicians in the following categories work at your clinic.
   a) Less than 10 hours a week ____
   b) 10 to 24 hours a week ____
   c) 25 to 35 hours a week ____
   d) More than 35 hours a week ____

3. Please complete the following regarding the number of health professional staff in your clinic and their FTEs:

Staff Title	# Staff	FTEs	Staff Title	# Staff	FTEs
Nurse practitioner			Psychologist		
Registered nurse			Optometrist		
Medical assistant/LPN			Social worker		
Audiologist			Speech-language pathologist		
Chiropractor			Respiratory therapist		
Dietician			Other (please specify)		
Occupational therapist					
Physician assistant					
Psycho-geriatric					
Pharmacist					
Physiotherapist					

Appendix B. Example Data Collection Tools

6. Average number of patients scheduled per primary care physician and NP/PA during a normal day:
    Physician _____   NP/PA _____

7. Average number of patients scheduled per primary care physician and NP/PA per clinic hour:
    Physician _____   NP/PA _____

8. Is someone in your practice designated to monitor patients with chronic illnesses?
    Yes _____   No _____

9. Total support staff FTE per FTE physician

	Number
Total business operations support staff FTE per FTE physician	
Total front office support staff FTE per FTE physician	
Total clinical support staff FTE per FTE physician	
Total ancillary support staff FTE per FTE physician	
Primary care physicians per FTE physician	
Nonsurgical physicians per FTE physician	
Surgical specialty physicians per FTE physician	
Total NPPs per FTE physician	

10. Cost

	Cost
Total operating cost per FTE physician	
Total operating and NPP cost per FTE physician	
Total operating cost as a percent of total medical revenue	
Total operating and NPP cost as a percent of total medical revenue	

11. Revenue

	Revenue
Total medical revenue per FTE physician	
Total medical revenue after operating cost per FTE physician	
Total medical revenue after operating and NPP cost per FTE physician	

12. At your clinic, for follow up of people with chronic illnesses (e.g., COPD, diabetes, heart failure), do you (doctors or clinic staff):

	Always	Often	Sometimes	Rarely	Never
Use a tracking system to remind patients about needed visits or services?					
Offer to follow up with patients between visits by telephone?					
Use recognized practice guidelines as the basis for their treatment plans?					
Assist patients in setting and attaining self-management goals (e.g., participation of patient in management of their care)?					
Refer patients to someone within your clinic for education about their chronic illness?					
Refer patients to someone outside your					

	Always	Often	Sometimes	Rarely	Never
clinic for education about their chronic illness?					
Have flow sheets (checklists) in medical records to track critical elements of care?					

13. What are the roles and functions of the nurse practitioners on your medical team? (Check all that apply)

	There are no nurse practitioners in our clinic
	Triage of walk-in patients
	Counseling on tobacco use, diet, and physical activity
	Patient education (e.g., blood glucose testing, blood pressure measurement)
	Follow up of specific patient groups (e.g., chronic diseases, age group)
	Sexually transmitted and blood borne infections (STBI) counseling
	Prescribe diagnostic examinations (e.g., radiography, blood tests)
	Liaison and coordination with LTCF, hospitals, and other clinics
	Support for medical activities (blood pressure, weight, injections and vaccinations)
	Participation in clinical decisions
	Conducting clinical activities as part of a delegated medical act
	Prescribe medications and other substances

14. During the last year, approximately how many patients received primary care from your clinic? Please count each patient only once, no matter how much care he or she received (your best estimate will do). Number of patients _____

15. Is your clinic currently accepting new patients for management and followup? Check a single answer only.

	Our clinic accepts all new patients who ask
	Our clinic selectively accepts a limited number of new patients
	Our clinic is not accepting new patients

16. Is your clinic currently accepting new patients with the following health insurance?

Yes	No	Health insurance
		Medicare
		Medicaid
		Uninsured
		Patients with high deductible commercial insurance
		Minnesota Care

17. At your clinic, how much time is scheduled for the following patients?
    a) A routine visit for a new patient? _____ minutes
    b) A routine visit for an established patient? _____ minutes

18. If a patient requests an appointment for a non-urgent condition, how long will the patient need to wait before being seen? _____days

19. Do you offer open-access scheduling? _____ yes _____no

Appendix B. Example Data Collection Tools

20. Please indicate whether your clinic offers patient the option to:

	Yes	No	Don't Know
Request appointments or referrals online			
Email a medical question or concern			
Request refills for prescriptions online			
View test results on a secure Web site			

Example 4. Web-Based Data Collection Tool: Cost Assessment of Collaborative Healthcare (CoACH)
Web Site: http://emrpl.us/CoachCostTool/
Principal Investigator: Benjamin Miller
Institution: University of Colorado Denver
Contact Information: Benjamin.Miller@ucdenver.edu
The screenshots below show the CoACH tool developed and used by Miller et al. This tool consists of an online questionnaire and integration activities graphic workflow. The intake questionnaire asks about practice demographic information; number, FTEs, salary, and benefit information for all providers and staff involved in integrated care delivery; time spent on integration activities by each provider and staff type; and operational costs directly related to integration, including new space, computers, software, and other materials. Based on information provided in the intake questionnaire, the tool estimates the total cost of integration activities and displays a graphic workflow and a table summarizing minutes per activity per personnel. Respondents can then edit workflow assumptions to model the total cost of different scenarios; for example, adjusting the number of minutes per activity or adding new activities.

CoACH-Cost Assessment of Collaborative Healthcare

The following questionnaire will assess cost for integrating behavioral health in your primary care practice (either current efforts around integration or plans for future integration).

3%

PROFILE *

Name of Practice *

Sample Practice

Contact Name *

John   Doe

First   Last

Practice Email Address *

john.doe@samplepractice

Please describe your type of practice *

Community Health Center ▼

Who is the majority owner of your primary practices? *

Hospital or health system ▼

Population size of the community in which your primary practice is located *

Less than 2500 people ▼

Zip code of primary practice location *

02138

Number of patients in your practice *

350

PAYOR MIX %

What is the percentage of each payer mix. The total of all payers should add to 100%.

Commercial %

Medicare Advantage- Disabled/Dual %

Medicare Advantage- Aged %

Medicare FFS- Disabled/Dual %

Medicaid %

Other government assistance %

Uninsured %

TOTAL

0%

☐ Save my progress and resume later

CONTINUE

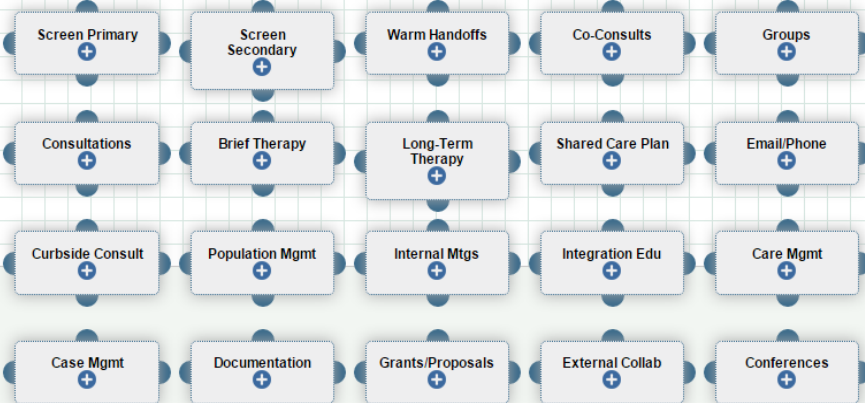**Appendix B. Example Data Collection Tools**

Interactive workflow:

Appendix B. Example Data Collection Tools

Example 5. Cost Dimensions Tool
Principal Investigator: Michael Magill
Institution: University of Utah, School of Medicine
Contact Information: michael.magill@hsc.utah.edu

The screenshots below are extracts of the cost dimensions tool developed by Magill et al. This tool was based on NCQA 2011 PCMH recognition criteria to assess the line item costs to practices associated with activities to sustain PCMH services. The tool includes three worksheets: Costs, Personnel, and PCMH Functions. Staff used to support each NCQA Standard, Element, and Factor were identified, including the number of FTEs in various staff positions (e.g., nurse, clinical care manager) and hours worked per month to deliver PCMH services (cost worksheet). An hourly rate was calculated for every staff position (salary or hourly rate adjusted for the cost of benefits) and referenced to produce the line item cost attributed to each PCMH service.

2011 NCQA PCMH

Resources and Systems unique to mature PCMH 2011 Level III practices (i.e., not found in traditional, high performing, primary care practices) (Development and implementation NOT bolded.)

	Resources and Systems (LOE)		New FTE	New Job Descriptions	External Resources	Physician + APP	External activities	Org TW systems	HIT/IS	Data Mgmt	TOTAL Cost/Mo
	(Examples)		Added work, expertise	Training, new duties, opp cost	Practice coaching, behav health, care coor	Training, opp cost, new roles	CE/CME, learning collab	PIT, group visits, compacts	Analytics, warehouse, pt portal, HIE	PI reporting, data validation	
	Units (examples)		S/hr/role	S/hr/role	S/hr/role	S/hr/role	S/hr/role; enrollment	S/hr/role	S Contract S/hr/role	S/hr/role	
	Time/interval (examples)		FTE hrs	hrs per impl; FTE hrs	FTE hrs	FTE hrs	FTE hrs; freq of conferences	Mtg freq, duration	hrs/month per role		
	1. Enhance Access and Continuity										
1A	*Access During Office Hours***										
	Cost (roll-up, per mo)										
1	Providing same day appointments CRITICAL FACTOR	X									
2	Provide timely advice by phone	X									
3	Timely advice by electronic	X									
4	Document clinical advice	X									
1B	*After Hours Access*										
	Cost (roll-up, per mo)		$800			$2,500					$3,300
1	Provide access to routine and urgent-care outside business hours	X	**Staffing for 5 hr on Sat am (2 support staff)**			**Added provider = 5 hrs**					

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Appendix B. Example Data Collection Tools

Medical Home Cost Dimensions Tool

Part II: Practice Staff Survey

Practice: |
Interviewees: |
Surveyor Name: |

Survey Date:

#	Position Title	Hourly Rate/ Salary	Exempt (Y/N)	Full Time (Y/N)	Avg. Hrs. Per Wk.	Has a Written Job Description (Y/N)	Receives Ongoing Training (Y/N)	Cost of Training Per Position/per Year	Annual Benefit Costs: Additional costs to practice, beyond salary or wage, for health, dental, vision, disability and/or life insurance, 401k/PSP contributions, mileage or other reimbursements, continuing education, membership fees, license fees, and/or other benefits.	Yearly Roll-up Costs per FTE Staff Position (Practice average per unique job description)	Hourly Roll-up Costs per FTE Staff Position (Practice average per unique job description)
1											
2											
3											
4											
5											

Appendix B. Example Data Collection Tools

Medical Home Cost Dimensions Tool					
Part III: Practice Functional Assessment (PCMH Certified Content Expert Survey)					

Practice:		NCQA PCMH Recognition (Y/N)?		
Interviewees:		Standard and Guidelines Tool? (2008, 2011, 2014)		
CCE Name:		Recognition Yr/Mo:		
Survey Date:		Total Points:		
			Level:	

Elements/Factors requiring additional costs to practice (23):   PCMH CCE Assessment   PCMH Recognition

Element/ Factor	Description	Factor P/F	Functional %	Possible Points	Recognition Points
1A	**Access During Office Hours****			4	
1	Providing same day appointments CRITICAL FACTOR				
2	Provide timely advice by telephone				
3	Timely advice by electronic				
4	Document clinical advice				
1B	**Access After Office Hours****			4	
1	Provide access to routine and urgent-care outside business hrs.				
2	Provide continuity of medical record information for care and advice when office is closed.				
3	Provide timely advice by phone when closed CRITICAL FACTOR				
4	Provide timely advice using interactive electronic system when office is closed				
5	Document after hours advice				
1C	**Electronic Access**			2	
1	Electronic copy of health information within 3 days to more than 50% of patients who request it +				
2	Electronic access to current health information within 4 days to at least 10% of patients ++				
3	Clinical summaries provided for more than 50% of office visits within 3 days +				
4	Two-way communication				
5	Request for appointments or prescription refills				
6	Request for referrals or test results				
1D	**Continuity**			2	
1	Expecting patients to select a personal clinician				
2	Documenting the choice of clinician				
3	Monitoring percent of patient visits with clinician				
1E	**Medical Home Responsibilities**			2	
1	Practice responsible for coordinating patient care				
2	How to obtain care/ advice during / after office hours				
3	Patients provide complete medical history and information on care obtained outside practice				
4	Care team gives patient access to evidence-based care and self-management support.				
1G	**Practice Team**			4	
1	Defining roles for clinical/non clinical team members				
2	Holding regular team meetings CRITICAL FACTOR				
3	Using standing orders				
4	Training and assigning care team to coordinate care				
5	Training on self-management, self-efficacy & behavior change				
6	Training on patient population management				
7	Training on communication skills				
8	Care team involvement in performance evaluation and QI				

Example 6. Cost Capture Template
Principal Investigator: Arturo Vargas-Bustamante
Institution: University of California, Los Angeles
Contact Information: avb@ucla.edu
The screenshots below are of the structured cost tool developed by Vargas-Bustamante et al. This tool is a short, easy-to-understand cost capture template (CCT) that was completed by key program administrators to report on the costs of senior wellness care redesign. The CCT structure was based on the Prescription for Health (P4H) framework (developed in collaboration between the Robert Wood Johnson Foundation and AHRQ), which outlines various categories of startup and incremental expenses. To customize the CCT, appropriate job descriptions were added to the template based on labor resources used for the transformation. Screen shots of the original P4H tool have also been included in this Practice Guide.

Overview: The cost capture template is designed to collect costs for the Comprehensive Wellness Visit (CWV).

Regions: The upper section includes costs for all regions together. Below that, the regions are listed separately. While the regions are now broken into North and South; however, the former region names are used to indicate the historical regions.
- Region 1 is _____
- Region 2 presents _____
- Region 3/4 are _____

Time periods: The template includes columns for each year from 2008–2012.
- Please include both startup and incremental costs. If the program was not implemented in a year, please indicate this in the comments. For example, if there were no costs in 2008 ($0 in 2009), startup costs in 2009 ($X in 2009), and early pilot testing in 2010 ($Y in 2010), please indicate each costs in the appropriate year with the comments indicating which costs are entered in each year.
- Please also indicate the number of clinics operating the program in each year (in the green section, to the right of the blue costs section). For example, there could be 0 clinics in 2008, 0 clinics in 2009, and X clinics in 2010.

I. Methods to calculate costs:
Since there may be multiple methods used to estimate the costs for each category, please provide:
- Comments or supporting documentation to facilitate review and support of the cost identified.
- A detailed description of the allocation method used to distribute total provider costs.

Appendix B. Example Data Collection Tools

I. Cost line items:

	Category	Data Source
Training Costs		
1	Creating training	Refer to Staffing Costs definitions below for defining staff costs
2	Updating training	Refer to Staffing Costs definitions below for defining staff costs
Staff costs **Additional clinician and Medical Assistant (CTM2) time**		
5	Attending trainings	Refer to Staffing Costs definitions below for defining staff costs
6	Contacting patients (recruitment, scheduling, and follow-up)	Refer to Staffing Costs definitions below for defining staff costs

			Total for All Regions				
Item		Data source/Notes	2008	2009	2010	2011	2012
	Training costs						
1	Creating training						
2	Updating training						
	Staff costs **Additional Clinician and Medical Assistant (CTM2) time**						
3	Attending trainings						
4	Contacting patients (recruitment, scheduling, & followup)						
5	Incidental (stipends, mileage)						
6	Patient visit time						
	Equipment						
7	Medical equipment						
8	Office equipment						

			Region 1_____				
Item		Data source/Notes	2008	2009	2010	2011	2012
	Training costs						
1	Creating training						
2	Updating training						
	Staff costs **Additional Clinician and Medical Assistant (CTM2) time**						
3	Attending trainings						
4	Contacting patients (recruitment, scheduling, & followup)						
5	Incidental (stipends, mileage)						
6	Patient visit time						
	Equipment						
7	Medical equipment						
8	Office equipment						

			Region 2_____				
Item		Data source/Notes	2008	2009	2010	2011	2012
	Training costs						
1	Creating training						
2	Updating training						
	Staff costs **Additional Clinician and Medical Assistant (CTM2) time**						
3	Attending trainings						
4	Contacting patients (recruitment, scheduling, & followup)						
5	Incidental (stipends, mileage)						
6	Patient visit time						
	Equipment						

Appendix B. Example Data Collection Tools

Overview: The cost capture template is designed to collect costs for the Senior Wellness Visit (SWV).

Regions: The upper section includes costs for all regions together. Below that, the regions are listed separately. While the regions are now broken into North and South; however, the former region names are used to indicate the historical regions.

- Region 1 is _____
- Region 2 presents _____
- Region 3 / 4 are _____

Time periods: The template includes columns for each year from 2008–2012.

- Please include both startup and incremental costs. If the program was not implemented in a year, please indicate this in the comments. For example, if there were no costs in 2008 ($0 in 2009), startup costs in 2009 ($X in 2009), and early pilot testing in 2010 ($Y in 2010), please indicate each costs in the appropriate year with the comments indicating which costs are entered in each year.
- Please also indicate the number of clinics operating the program in each year (in the green section, to the right of the blue costs section). For example, there could be 0 clinics in 2008, 0 clinics in 2009, and X clinics in 2010.

I. Methods to calculate costs:

Since there may be multiple methods used to estimate the costs for each category, please provide:

- Comments or supporting documentation to facilitate review and support of the cost identified.
- A detailed description of the allocation method used to distribute total provider costs.

Appendix B. Example Data Collection Tools

I. Cost line items:

	Category	Data Source				
Training Costs						
1	Creating training					

			Total Cost for All Regions				
Item		**Data source**	**2008**	**2009**	**2010**	**2011**	**2012**
	Training costs						
1	Creating training						
2	Updating training						
	Staff costs						
3	Attending trainings						
4	Contacting patients (recruitment, scheduling, and follow-up) and providers						
5	Incidental (stipends, mileage)						
6	Patient visit time						
	Equipment						
7	Medical equipment						
8	Office equipment						
	Patient costs						
9	Transportation						
10	Incentives						

		Region 1_____ Cost for the Region by Year					
Item		**Data source**	**2008**	**2009**	**2010**	**2011**	**2012**
	Training costs						
1	Creating training						
2	Updating training						
	Staff costs						
3	Attending trainings						
4	Contacting patients (recruitment, scheduling, and follow-up) and providers						
5	Incidental (stipends, mileage)						
6	Patient visit time						
	Equipment						
7	Medical equipment						
8	Office equipment						
	Patient costs						
9	Transportation						
10	Incentives						

		Region 2_____Cost for the Region by Year					
Item		**Data source**	**2008**	**2009**	**2010**	**2011**	**2012**
	Training costs						
1	Creating training						
2	Updating training						
	Staff costs						
3	Attending trainings						
4	Contacting patients (recruitment, scheduling, and follow-up) and providers						
5	Incidental (stipends, mileage)						
6	Patient visit time						
	Equipment						
7	Medical equipment						

Example 7. Prescription for Health (P4H) Toolkit: Templates for Collecting and Calculating Expenditure Data in Primary Care Interventions
Web Site: http://www.prescriptionforhealth.org/results/toolkit.html
Contact Person: Maribel Cifuentes
Institution: University of Colorado Health Sciences Center
Contact Information: Maribel.cifuentes@uchsc.edu
The screenshots below contain images taken from the original P4H templates for collecting and calculating expenditure data in primary care interventions, developed in collaboration between the Robert Wood Johnson Foundation and AHRQ. This set of standardized tools was created for the collection of expenditure data in primary care practices during three phases of a behavioral change intervention (baseline, steady state midpoint, and steady state endpoint). The user's guide provides step-by-step instructions on the use of these tools. The tools were developed to arrive at credible estimates of startup and incremental expenses incurred by practices to implement their Prescription for Health interventions. The tools were not developed to be used as data collection/calculation instruments to undertake a full-fledged cost-benefit or cost-effectiveness study. The screenshots included in this Practice Guide are for the baseline intervention only; the steady state midpoint and steady state endpoint tools were similar.

Collecting intervention expenses data
Figure 1 - Participant Flow Diagram

Practice ID: 205

Reporting Month and Year (MM/YYYY): Mar 2006

```
                    ┌─────────────────────┐
                    │      Patients       │
                    ├─────────────────────┤
                    │                     │
                    └─────────────────────┘
                              │
                              ▼
                    ┌─────────────────────┐
                    │ Patient Recruitment │
                    ├─────────────────────┤
                    │                     │
                    └─────────────────────┘
                              │
                              ▼
                    ┌─────────────────────┐
                    │ Screening, Assessment,│
                    │    and/or Testing   │
                    ├─────────────────────┤
                    │          0          │
                    └─────────────────────┘
           ┌──────────────────┼──────────────────┐
           ▼                  ▼                  ▼
 ┌──────────────────┐ ┌──────────────────┐ ┌──────────────────┐
 │Clinician Counseling│ │Clinician Referral to│ │Clinician Treatment│
 │                  │ │    Specialist    │ │                  │
 ├──────────────────┤ ├──────────────────┤ ├──────────────────┤
 │        0         │ │        0         │ │        0         │
 └──────────────────┘ └──────────────────┘ └──────────────────┘
           └──────────────────┼──────────────────┘
                              ▼
                    ┌─────────────────────┐
                    │ Case Management and │
                    │      Follow-up      │
                    ├─────────────────────┤
                    │          0          │
                    └─────────────────────┘
```
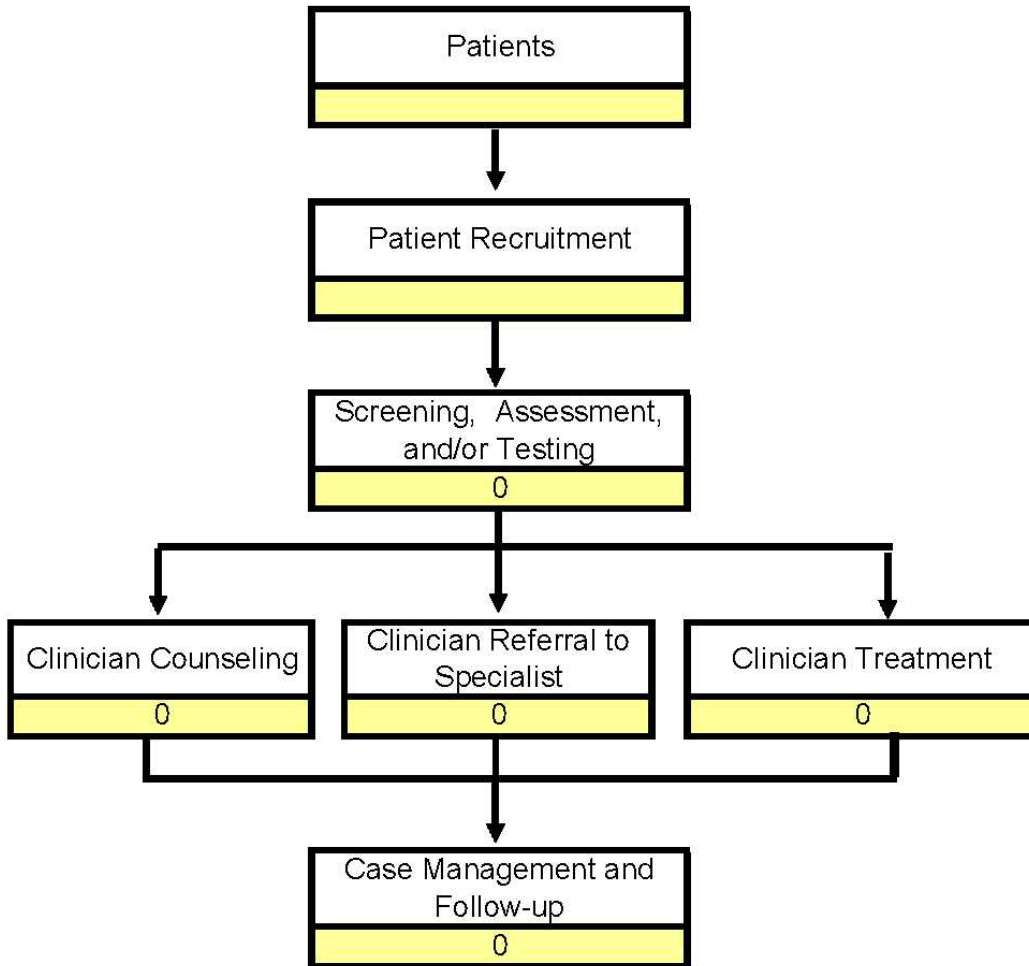
Collecting intervention expenses data
Table 3 - Basic Operating Expenditures

Practice ID:

Indicate the reporting month:

Calendar Month and Year (MM/YYYY):
1. Baseline month 2. Midpoint Month 3. Month before end of steady state

Number of hours facility open in reporting month:

				Physicians		
# of patients available for the activity in the month	# of patients completed participation in month	Avg LOP (sessions or days) that ended in month		# of participants seen by physicians in month	Total # of physician FTEs in month	Average physician minutes per session per patient in month

Section A. Recurrent expenditures

Patient Recruitment						
Health Risk Assessment/Testing						
Clinician Counseling						
Clinician Referral to Community Resource						
Educational Material Distributed						
Case Management/Follow-up						

Estimated total replacement cost ($)	Average # of months since possession

Section B. Non-recurrent expenditures on capital assets

Building and space occupancy purchases in the month	
Furniture, computer hardware & equipment	
Computer software and template purchases in month	
Technical books and materials purchases in month	
Other asset purchases:	

Sum of all FTE staff for month	Sum of all expenditure for month ($)	Average % devoted to intervention

Section C. Overhead (NOT direct) expenditures

Administrative and clerical support staff		
Supervision/Management staff used in month		
Other overhead staff expenses		

Building and occupancy lease/rental in month	
Equipment lease/rental in month	
Phone and utilities in reporting month	
Insurance(NOT malpractice) & finance fees	
Travel and transportation in month	
Administrative supplies and services in month	
Other expenses:	

Section D. Additional expenditure items

Were there additional practice expenditure items that even though not directly related to your P4H intervention, were triggered by the intervention?

List the items and indicate the expenditure

Expend. Amount

1 | | |

Calculating intervention expenses
Table for Calculating - Gross Direct Patient Expenses

Practice Number:

Indicate the reporting month: 1. Baseline month 2. Midpoint Month 3. Month before end of steady state

Calculation of participation rates for recurrent expenditure activities

	# of patients available for the activity in the month	# of patients completed participation in month	Participation Rates
Section A. Recurrent expenditures			
Patient Recruitment			
Health Risk Assessment/Testing			
Clinician Counseling			
Clinician Referral to Community Resource			
Educational Material Distributed			
Case Management/Follow-up			

Direct Activity gross expenditures for each Direct Staff Category:

	# of participants seen by this staff type in month	Average LOP (sessions or days) that ended in month	Average staff type minutes per session per patient in month (Divided by LOP)	Gross Patient-Hours	Hourly average salary per FTE ($) (Table 2)	Gross Direct Expenses
Physicians						
Patient Recruitment						
Health Risk Assessment/Testing						
Clinician Counseling						
Clinician Referral to Community Resource						
Educational Material Distributed						
Case Management/Follow-up						
Nurses						
Patient Recruitment						
Health Risk Assessment/Testing						
Clinician Counseling						
Clinician Referral to Community Resource						
Educational Material Distributed						
Case Management/Follow-up						

Total Direct Activity expenditures	**Total Gross Direct Expenses per patient**
Patient Recruitment	
Health Risk Assessment/Testing	
Clinician Counseling	
Clinician Referral to Community Resource	
Educational Material Distributed	
Case Management/Follow-up	

Calculating intervention expenses
Table for Calculating - Overhead Gross Expenses

Practice Number:

Indicate the reporting month:

1. Baseline month
2. Midpoint Month
3. Month before end of steady state

Calculation of staff overhead expenses

    Administrative and clerical support staff
    Supervision/Management staff used in month
    Other overhead staff expenses

                Total

Calculation of non-staff overhead expenses

    Building and occupancy lease/rental in month
    Equipment lease/rental in month
    Phone and utilities in reporting month
    Insurance(NOT malpractice) & finance fees
    Travel and transportation in month
    Administrative supplies and services in month
    Other expenses:

                Total

Depreciation and calculation of non-recurrent expenses

    Building and space occupancy purchases in the month
    Furniture, computer hardware & equipment
    Computer software and template purchases in month
    Technical books and materials purchases in month
    Other asset purchases:

                Total

Allocating overhead expenses to intervention activities per patient

	From Direct Patient calculations	% of Total	Staff Overhead expenses	Non-staff overhead expenses	Non-recurrent expenses	**Total overhead expenses per patient**
Patient Recruitment						
Health Risk Assessment/Testing						
Clinician Counseling						
Clinician Referral to Community Resource						
Educational Material Distributed						
Case Management/Follow-up						
Total						

Appendix C. Methodological References Cited by Grantees

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