

# Design Options for Home Visiting Evaluation

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## DOHVE CQI BRIEF

### Presenting Data for Continuous Quality Improvement Purposes

March 2013

#### Overview

There are many ways to display data in continuous quality improvement (CQI) efforts. However, there are essential elements to data presentation that facilitate improvement work. The purpose of this brief is to present these elements, and to show examples of clear and readily interpretable visual displays of data.

As states, territories, and tribes move forward in expanding their home visiting programs, it is important to regularly and consistently produce graphs and tables that show how the programs are functioning in terms of process and outcome variables. As data are accrued over time, such graphs and tables will identify where improvement work should be focused, and how program changes or external influences affect important program outcomes. In this brief, a single variable is used throughout to demonstrate data presentation elements. However, the principles described in the brief apply to other process and outcome variables. By adopting the elements and features described below, you will be able to create visual data presentations that are easy to understand, can be disseminated widely throughout the program, and provide a foundation from which to conduct and document successful improvement work. The examples presented in this brief are best understood in conjunction with prior CQI briefs that describe the core elements of improvement activities.

#### General Considerations in Presenting Data for CQI Purposes

MIECHV grantees are collecting a large amount of data to meet benchmark and evaluation reporting requirements. Some programs and models have additional data elements over and above what is stipulated in the federal legislation. In addition, many states, territories, and tribes are implementing multiple models. As a result, preparing program level data requires some careful thought. Guided by current CQI practices in healthcare, issues to consider are outlined below.

1. **Identify an individual who will be primarily responsible for CQI efforts.** Designating someone at the state, territory, or tribal level to be the primary contact for CQI efforts ensures that CQI work will not be overlooked, that data summaries are produced and distributed on a regular basis to all parties, and that improvement projects closely aligned with outcomes proceed in a timely manner. [see DOHVE CQI Checklist: Next Steps for Action, October 2011]

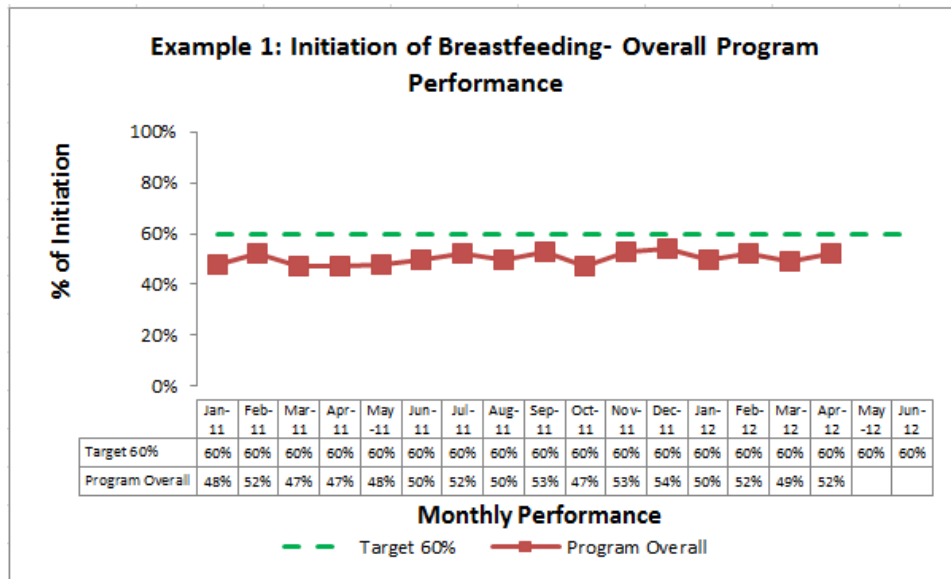
2. **The program-level CQI Team should meet regularly and review graphs and tables.**  
The CQI team (at the state, territory, or tribe level) should be the guiding body for facilitating program-level CQI efforts. They should meet regularly and review the graphs and tables reflecting program performance and oversee improvement work. As a large amount of data are collected, the CQI Team should select some *key variables* to follow closely so as not to be overwhelmed by the quantity of data. This “dashboard” of important elements should include both process and outcome variables, represent system performance at a high level, and be shared transparently throughout the organization. Such sharing helps build the culture of quality that is integral to successful CQI efforts. [see DOHVE CQI Brief: Suggested Guidelines for Continuous Quality Improvement for MIECHV Grantees, June 2011]
  
3. **Data management information systems (MIS) should have the capability to produce clear charts and tables.** A number of management information systems are being deployed by MIECHV grantees, including model specific MIS, those developed by external vendors, and MIS that are constructed by a local site or state. Regardless of the system developer, it is important that it produces graphs and tables with elements similar to those presented in this brief. Simplicity and clarity are essential features of these examples and they will greatly facilitate implementation of CQI initiatives.

### Examples of Data Presentations for CQI Purposes

The remainder of this brief presents examples of graphs that facilitate implementation of CQI. Some examples present data for a single program whereas others present data for multiple program sites. When we refer to “program,” we are referring to a state, territory, or tribe that is responsible for administering the home visiting initiative across several implementing agencies. In contrast, “program sites” are local or regional home visiting implementing agencies. Key elements of data reporting are highlighted and described. As many of these elements are represented in each example, they are only described the first time they are presented. In addition, interpretation of the graph is provided. For ease of presenting and highlighting important elements, *initiation of breastfeeding* is used as the variable of focus in each example.

### Example 1

In this example, a line graph shows initiation of breastfeeding at the program-level over 16 months. Performance has been steady and consistent over this interval.



### Key elements:

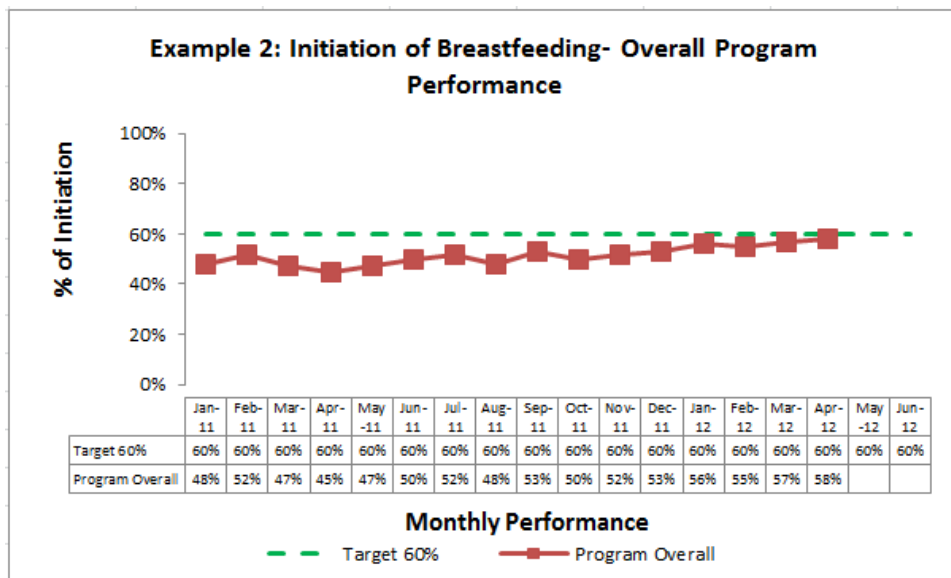
- **Multiple data points reflecting performance over time are presented.** Showing change over time is a powerful tool in CQI. It reveals consistency or inconsistency of performance and allows detection of improvement or deterioration.
- **Short intervals are used.** In this example, data are presented monthly. In CQI, short intervals are desirable because changes can be more readily detected. Longer intervals combining data over periods of time may mask changes that are occurring. Data should be reported as close to the time the event occurred and in the smallest time interval possible so results can be analyzed quickly. In general, intervals of longer than a quarter should be avoided for CQI purposes.
- **A target for performance is clearly indicated.** In the graphs presented in this brief, a dashed line indicates the level of performance that is being sought by the program. It is important to always have a predetermined performance goal to work towards. The level can be generated from a variety of sources, including past program performance, model objectives, state objectives, or a review of the literature. Determination of targets should be made by the CQI Team in consultation with stakeholders and partners. Targets should be set at the beginning, but they may be adjusted over time based on new information of other compelling reasons.

- **Data are presented in graph and table form.** In this and other examples, data are presented both graphically and in a table. Presenting both formats allows readers to focus on the format with which they are most comfortable.

**Interpretation:** In Example 1, the state program has performed below the target over the 16 months. There is a high degree of consistency over this time. Barring any changes in external influences, we can predict future performance will look the same unless a change in the process is introduced. Efforts should look at where the process can be altered to drive an improved outcome. Tracking data at the smallest interval of time will assist in showing if the change appears to be making a positive impact on the results and moving them closer to target.

*Example 2*

This example shows initiation of breastfeeding at the program-level over 16 months. In this graph, there is an improvement in performance starting in November 2011 that leads to the most recent data point which is almost at the predetermined target level of 60%.

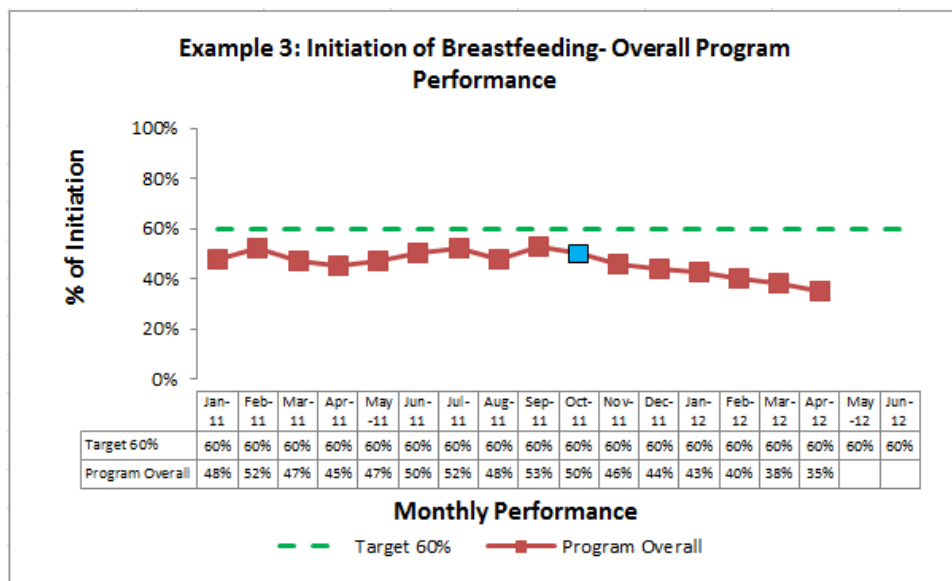


**Interpretation:** In Example 2, the steady improvement in the last half of the time interval suggests that something has happened to facilitate initiation of breastfeeding. It could be as a result of a planned change in the process through an improvement project or something occurring outside of the system (perhaps there has been an increase in the

availability of lactation consultants in the site communities) that warrants follow up and further examination.

*Example 3*

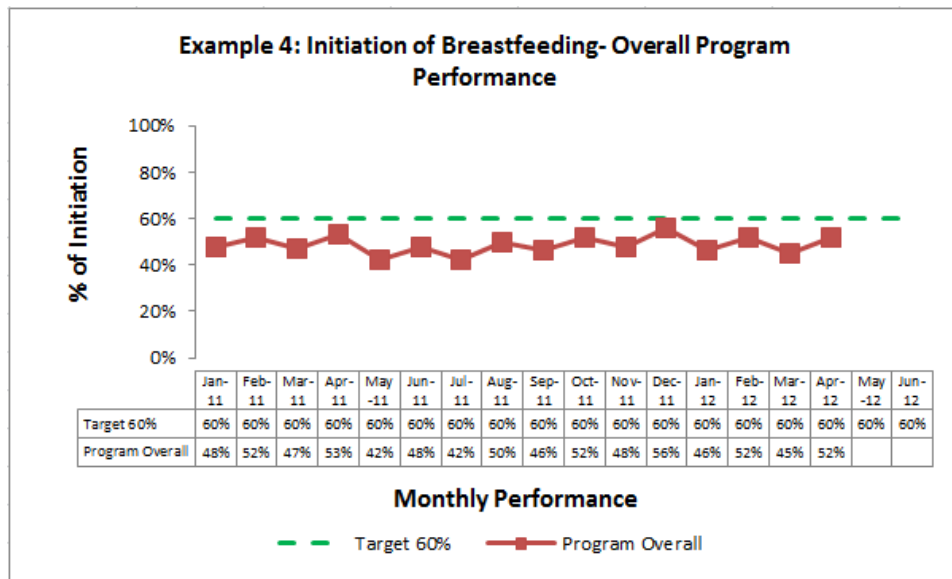
In this example, the program has experienced deterioration in performance starting in October 2011. Because there has been a downward trend away from target for the past 7 straight months, we would expect that the next data point would likely show a further drop in the number of mothers that initiate breastfeeding.



**Interpretation:** The cause of the deterioration in performance is not revealed by the graph in this example, although the multiple and steady drops in performance over 7 months suggest that something important is happening that requires further investigation. Efforts should focus on what internal and external events occurred since October 2011 that could be influenced by implementing a focused improvement project.

**Example 4**

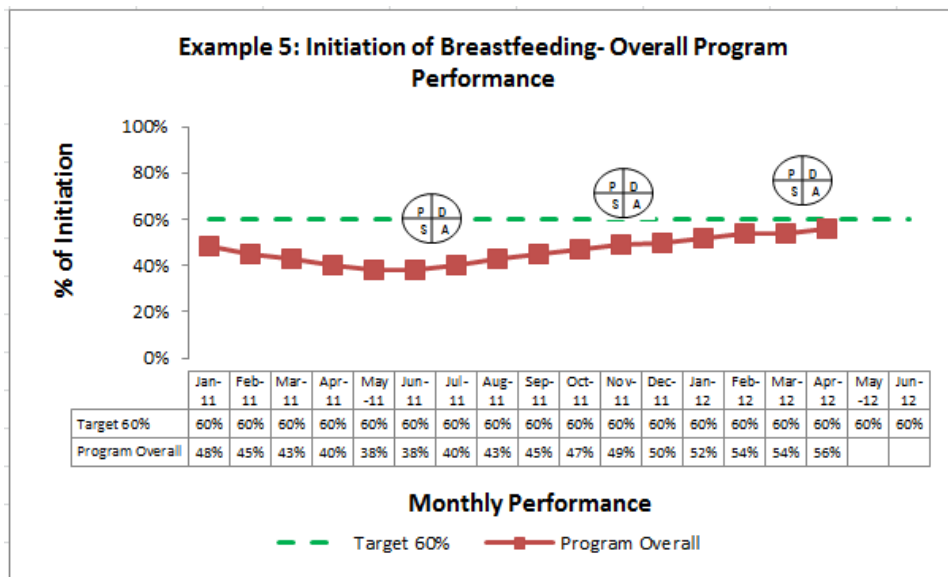
In this example, the program is performing inconsistently over the interval. Each month reflects a sizable increase or decrease in performance. Note that the value of using short time intervals is evident here in that if time points were combined (say every 6 months), the fluctuating pattern would not be revealed.



**Interpretation:** In Example 4, while these are not large swings in performance, something in the process is making it difficult for the program to generate consistent results each month. Efforts should focus on understanding the source of this pattern through the use of process mapping. Small scale improvement initiatives should focus on narrowing the variation in the results through the use of process changes.

### Example 5

In this example, a slipping in performance over the first 5 months is reversed following the introduction of three planned improvement efforts (indicated by the Plan-Do-Study-Act symbols). Each PDSA cycle coincides with incremental improvement and, at the most recent data point, the program has almost reached the target.

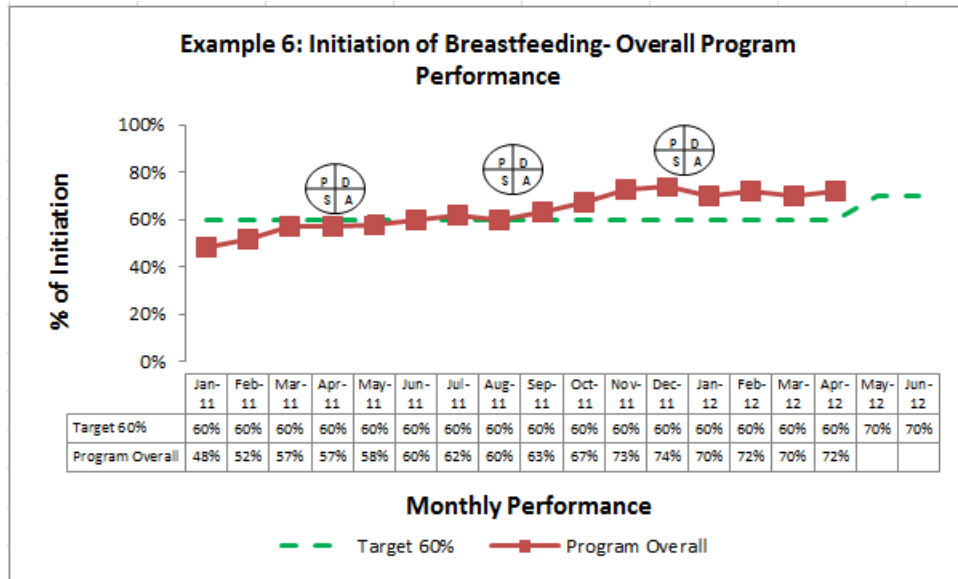


- **Graphs contain annotations when significant events have occurred.** In this example, PDSA symbols (reflecting the Plan-Do-Study-Act cycles that represent small tests of change in specific populations or environments designed to bring about improvement) are used to show when a new intervention has been introduced. Other events could also be documented using data labels on the appropriate data point, such as the opening of a new birth hospital with lactation consultant resources (which might be expected to improve performance) or the loss of experienced home visitors at one or more sites (which might be expected to negatively impact performance).

**Interpretation:** In Example 5, a process is modified through the sequential application of three PDSA cycles. The fact that the system improves following each improvement effort, and gains are maintained over time, suggests that the changes made were successful in improving performance. Consideration should be made in modifying the entire process to consistently incorporate these changes. Ongoing monitoring will illustrate wide spread adoption of the changes through continued performance at this level.

### Example 6

This example also shows changes in performance following the application of three PDSA cycles as part of an improvement effort. Upon reaching and exceeding the target over several measurement periods, a new and more ambitious target is set (from 60% to 75%).



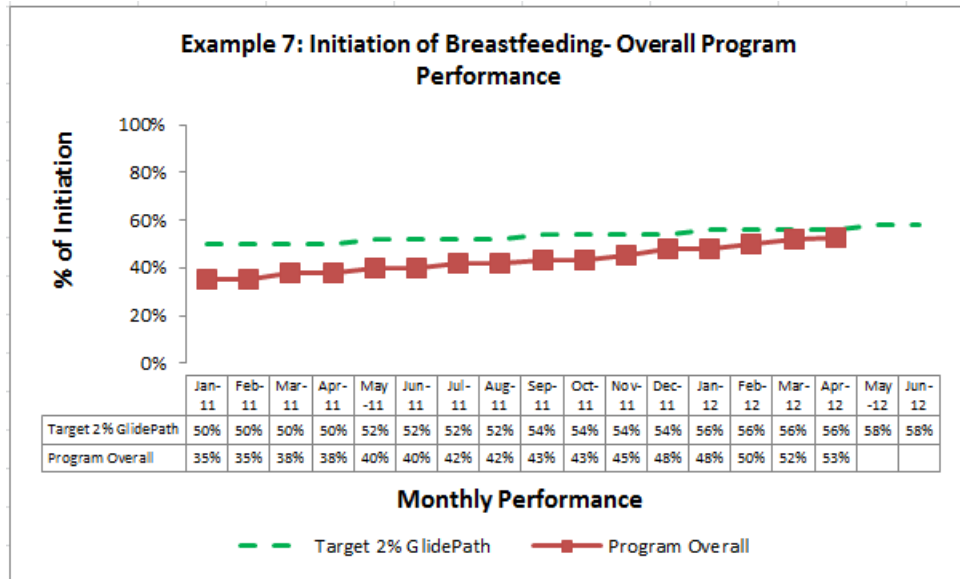
- **The target is increased after it is reached and gains are maintained.** CQI means that programs should always strive for better performance. When a target is reached, and gains are maintained indicating adoption of a revised process, a new and higher target should be considered.

**Interpretation:** Example 6 also reveals the success of three successive PDSA cycles. Incremental improvement and maintenance of gains suggests that changes made to the system have become integral steps of the process and are effective at improving performance at the program level. With a higher target, we can continue to work on improvement and may elect to introduce a fourth PDSA cycle to boost performance further.



*Example 7*

In this example, the program is starting off at a level that is far from the target. Recognizing that this low performing system will have difficulty reaching the target quickly, a steadily increasing target level is established that begins at 50% and ends at 60%.

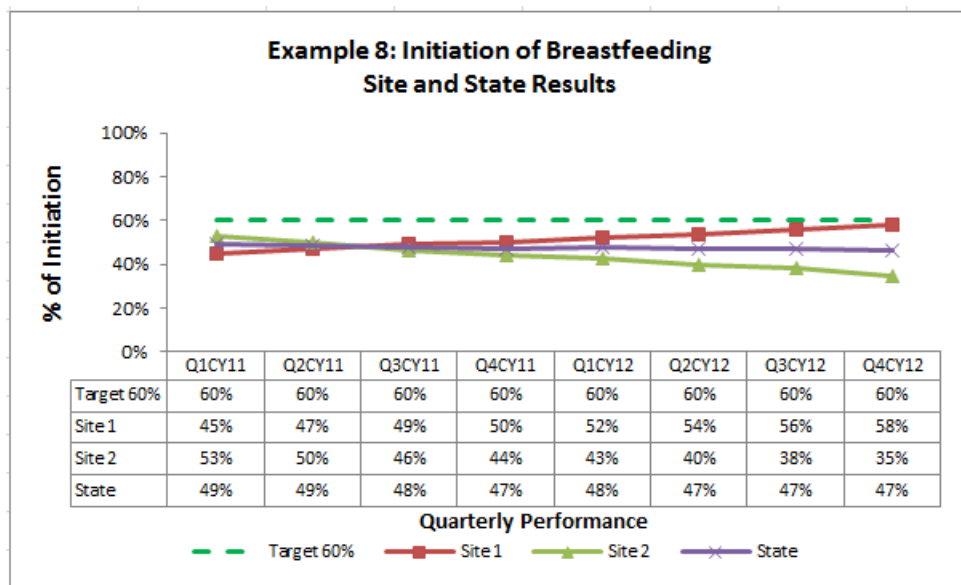


- **A steadily increasing target, called a “glide path,” can be used to reflect short- and long-term performance objectives.** Glide paths allow the program to have more modest and reachable objectives over the short term, while simultaneously keeping an eye on the final target level that was determined by the CQI Team. In this case, we chose a 2% incremental increase that was adjusted every four months.

**Interpretation:** This system, illustrated in Example 7, is incrementally improving over time as the target is increased. At the end, the target is close to being reached, although it continues to increase in subsequent months. The improvement may result from the application of PDSA cycles or some other internal or external source. Consider using annotations to document the apparent reasons for the improvement over time. If performance does not show incremental improvement, consider establishing one specific target as noted in the previous examples.

### Example 8

In this graph, the state results are displayed with two sites in the program represented separately. For clarity of presentation, data are presented for each quarter rather than monthly. The advantage of this type of graph is that individual sites can be represented relative to other sites, the overall program performance, and the target.

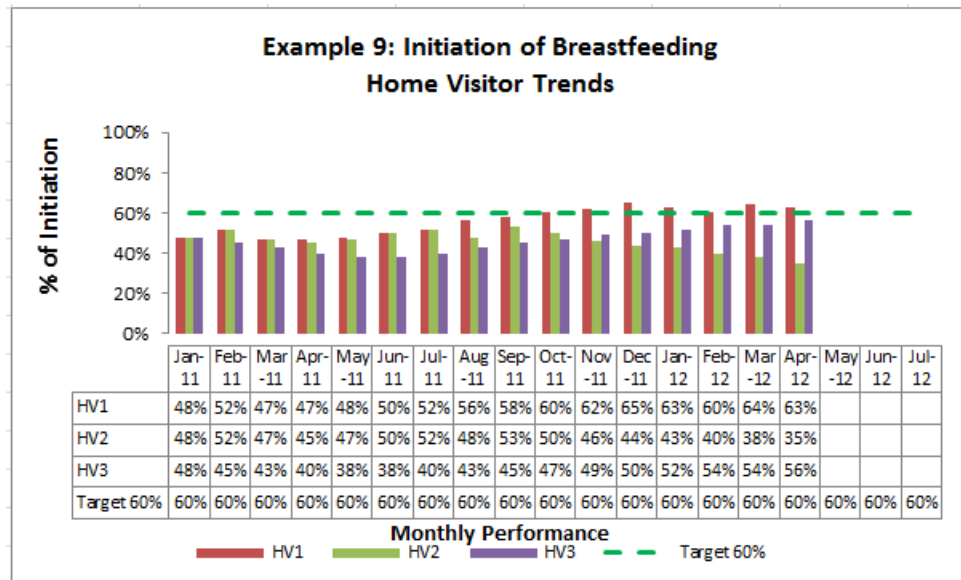


- **Breaking out the performance of sites or some other category provides a more accurate picture of performance.** Although this example divides the program by site, other factors can be used to break out parts of the program, such as model or region. Dividing the program into these parts permits identification of sites (or other category) by their performance and highlights those are performing well and those that are struggling. In this way, improvement work can be targeted more efficiently. In addition, examination of sites that are consistently doing well, as measured by their progress in meeting the established target, may reveal practices that may be more broadly applicable to other sites in the program.

**Interpretation:** The two sites are performing very differently in Example 8. Site 1 is steadily improving over time, while Site 2 is steadily deteriorating. These different patterns are masked if one looks at the overall state level in isolation. Drilling down data to smaller populations encourages the understanding of the system. Site 1 should be further investigated to determine what might be helping its performance, while Site 2 warrants further scrutiny to identify factors that are impeding its performance.

### Example 9

This graph shows the performance of the three home visitors that comprise Site 1. Both line and bar graphs are acceptable for data presentation. While a bar graph is used in this example to clearly illustrate the multiple variables, the key elements for CQI are maintained (change over time, target, etc.). There is considerable variability between the home visitors, which is otherwise masked if their data is combined.



**Interpretation:** In Example 9, although all three home visitors start at the same performance level in January, their performance begins to vary over time. Home Visitor 1 begins to improve after four months, eventually reaching the target and consistently maintaining this performance over time. Home Visitor 2 shows a fluctuating performance, followed by a steady deterioration over the most recent 7 months beginning with September 2011. Home Visitor 3 slips in the first few months, and then steadily improves, approaching, but not reaching, the target by the end of this interval. This graph suggests that there is much to be learned through closer examination of these three home visitors. For example:

- Home Visitor 1 may have identified ways to implement the curriculum in an effective way, and this might be informative for other home visitors.
- Home Visitor 2 is struggling to meet the expectations. Efforts should focus on mapping the process being used to achieve the outcome for all three home visitors. This will identify variation in the process that can be addressed. Perhaps there are elements within the home visitor’s control that could lead to improved performance.

Additionally, external factors specific to the families or community resources should be considered for positive and negative impact. Or, personal factors may be making it difficult for the home visitor to perform effectively.

- A deeper understanding of how each of the home visitors is implementing the model and supporting mothers in initiating breastfeeding may also reveal effective practices that have implications for the program as a whole.

## Conclusion

CQI is guided by data. Data that are reported frequently and close to the time of the event, and are displayed in a graph against a performance target will illustrate how a system is performing. Additionally, examining data for smaller groups, such as from sites within a program or home visitors within a site, will help uncover best practices that can be replicated system-wide. Process maps can be very useful in encouraging the adoption of reliable processes to drive results when implementing improvement projects. When changes are being tested or implemented, data will demonstrate achievement of the predicted results. Annotating data points provides insight into the process changes or other events responsible for the results, whether they are positive or negative in comparison to the performance target. Once the graph shows consistent results trending in the desired direction over time, consider establishing a new performance target.

- Additional DOHVE TA resources are available at:  
<http://www.mdrc.org/dohve-project-resources>
- For more information about presenting and using data for CQI purposes, please contact a DOHVE<sup>1</sup> TA team member at:

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<sup>1</sup> The purpose of the Design Options for Home Visiting Evaluation (DOHVE) is to provide research and evaluation support for the Maternal, Infant and Early Childhood Home Visiting (MIECHV) Program. The project is funded by the Administration for Children and Families in collaboration with the Health Resources and Services Administration.