SECTION 7

Using Data for Quality Improvement

Introduction

Quality improvement relies on information technology to:

1. Define what the practice is trying to accomplish, including defining target populations and setting quality goals.
2. Develop measures so the care team can tell that a change is an improvement by showing that workflow and decision support modifications are having the intended effect.
3. Support workflow changes by organizing information and placing it at the fingertips of the people whose job it is to use the information to make decisions that drive improvement.

In this section, the first two topics are explored, utilizing the Institute for Healthcare Improvement's Model for Improvement**.** The topic of using health information technology (HIT) to support workflow optimization with the goal of improving oral health has been addressed in Section 3: The Oral Health Delivery Framework and Section 5: Staffing Options and Workflow.

"We hold regular staff meetings, and that engages all of the staff throughout the clinic. We focus on a variety of topics, including oral health. We discuss the rates, analyze what happened when rates drop, share how things are going, and celebrate successes. We print the run charts and post them in places the staff will be able to see them."

—Nandini Sengupta, MD, MPH, Dimock Community Health Center

What Is the Oral Health Integration Goal?

For oral health integration, an answer might be "We are trying to ensure that at least 90 percent of the adult patients with diabetes in our panel receive an oral health screening assessment at least once a year." This answer has three parts, each of which requires a data definition if it is to be translatable into a useable reporting framework:

1. **Population:** Population refers to age, gender, and other demographic characteristics of the population to be targeted, in this case, active patients over age 18. The data used for population definition are located in the demographic tables of each patient's electronic health record (EHR).
2. **Clinical condition:** Quality improvement efforts, including oral health integration, frequently focus on a target population defined by a clinical condition, in this case, diabetes. For diabetes, an ICD-10 code on the problem list is the best data definition. For other clinical conditions such as pregnancy, the most recent visit diagnosis or visit type may be more accurate.
3. **Standard of care:** This consists of two components: what has the care team decided to do, and how frequently will those actions happen? Figure 7.1 shows the relationship between the clinical conditions for which the care team is screening and the data definitions for each condition as structured EHR data. Each of these is linked to data definitions for a limited number of actions. Notice that the only difference between this and Figure 3.2 is that medical treatments for oral dryness and acid reflux are omitted, because for these conditions there is no simple data definition for individualized medical therapy to represent all possible correct actions.

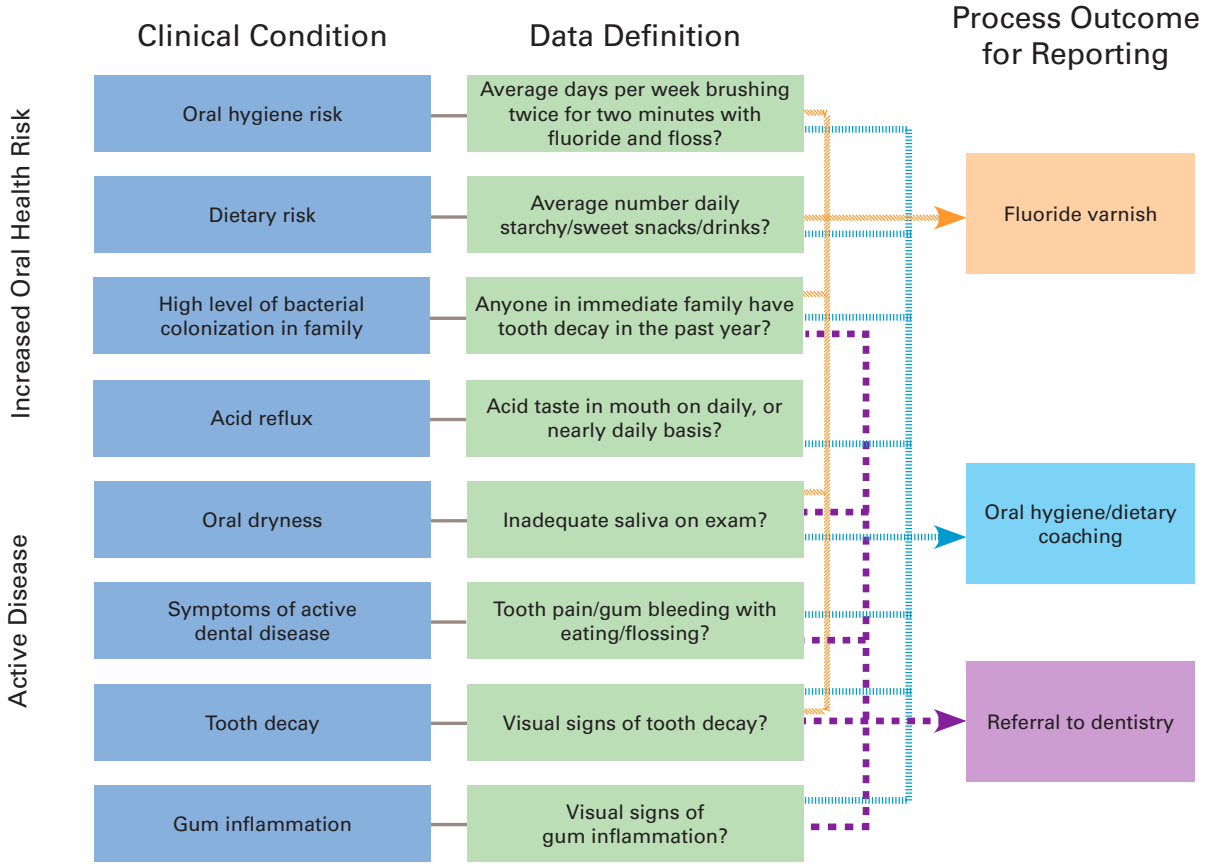
Examples of other stated goals include:

- "We are trying to ensure that all prenatal patients receive oral health education and counseling during the first trimester."
- "We are trying to ensure that all patients under age six receive fluoride varnish at least once a year."

What is population health management?

Population health is a term that connotes accountability for the care of a group of patients attributed to a clinician, a clinic, or a delivery system. Population health represents a paradigm shift away from fee-for-service medicine and away from looking at each individual patient's experience in isolation, to the world of accountable care and value-based reimbursement. The quality measures and total cost on which value is based are measured for the entire population, whether or not they come into the clinic for an office visit. In order to practice population health successfully, clinicians must work in care teams, because the amount of work required to know who is in the population and ensure that all members of that population receive the guideline-based standard of care is more than any single clinician can do alone. It also requires care teams to fully engage patients in self-managing their health, including chronic conditions, because many of the most powerful determinants of health, such as diet, exercise, taking medications correctly, and responding appropriately to important signs and symptoms, are things over which patients, working with their families, have the most control.

Figure 7.1: The oral health screening assessment



How To Determine if a Change is an Improvement

Once the target population and the standard of care are defined as structured data, it is possible to build reports that provide a visual representation of the results of the implemented change over time. A picture of population health consists of the following elements:

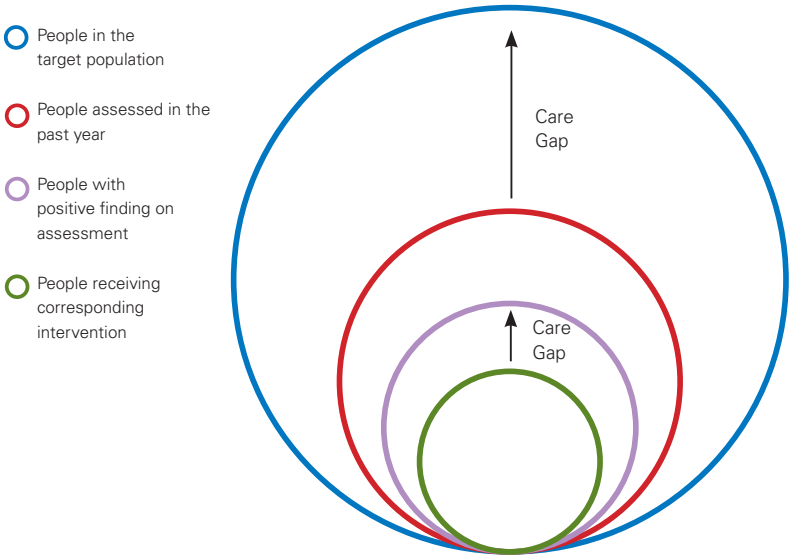
- The target population.
- The patients being assessed within the interval specified in the standard of care.
- What was found in the patients assessed.
- What was done for the patients in whom a problem was found.

An example of this approach would be a practice that has chosen a target population of adults with diabetes. The standard of care the practice selected is for every member of the population to have their oral health assessed at least yearly, with the care team looking for signs of active gum inflammation and tooth decay. Those patients found to have active disease who are not already being treated by a dentist for this condition are to be referred to their own dentist if they have one. Patients with disease who have no dentist are to be referred to a dentist with whom the clinic has a referral agreement.

Point prevalence reporting

For reports to be useful in creating this picture, they need to be designed as "point prevalence" reports. This means that the report identifies a population and the prevalence of some characteristic within that population at a specific point in time. This is appropriate for population reporting because the unit of analysis is the patient, meaning each patient is counted once. For example, the report determines, for each patient in the target population, whether the patient was screened within the prior 12 months or not. A patient screened twice during the past year is counted once as having met the standard of care as of the date the report is run. Figure 7.2 shows a picture of a population taken at a single point in time. Each circle represents a subset (numerator) of the patients in the next-largest circle (denominator).

Figure 7.2: Visual representation of the Oral Health Delivery Framework applied to a target population highlighting care gaps



Source: Hummel J, Evans P. Producing Accurate Clinical Quality Reports for Population Health: A Delivery System-Oriented Approach to Report Validation. Seattle, WA: Qualis Health; March, 2016. Reprinted with permission.

The identified gaps between the colored circles illustrated in Figure 7.2 represent care gaps, while others simply reflect the prevalence of a condition in the target population, such as the percentage of patients in the target population with active caries. The picture created by the reports reveals care gaps, allowing the care team to quickly determine which processes are working well and which ones require attention to close a care gap.
For a more in-depth discussion of population health reporting, refer to Producing Accurate Clinical Quality Reports for Population Health: A Delivery System-Oriented Approach to Report Validation.

"Our biggest challenge has been getting clinicians and clinical assistants to use the oral health template. We're a busy clinic in terms of volume per day, and so the pace is pretty quick here, and it is one more thing to do. Getting clinicians to see the benefit to the patient has been a challenge. Our numbers have picked up over the course of the pilot but not quite to the place that I'd like. I'm seeing that some clinicians and clinical assistants do really well and then some partnerships that don't do as well. This has happened with past improvement efforts, and we have focused on coaching the clinical assistants and clinicians together to help them understand the importance of the work they're doing." **—Benjamin Lightfoot, MD, Brockton Neighborhood Health Center**

Using Run Charts To Tell a Story Over Time

Just as a series of pictures shown in rapid sequence produces a moving picture that tells a story, similarly, a series of reports repeated at regular monthly intervals can be used to tell a clinical quality story that unfolds over time. A simple and effective way to represent this visually is with run charts, an example of which is shown in Figure 7.3. The numerators and denominators are entered into an Oral Health Data Reporting Template and Run Chart tool to create a visual display of the impact of the care team's efforts over time to assess the target population's oral health status and respond appropriately to what they find on assessment. It can be useful to insert a goal line in the run chart once a primary care team has determined what their goal will be.

Figure 7.3: Run chart from Sound Family Medicine showing, for a single clinician, the percentage of patients with diabetes having a yearly oral health screening examination

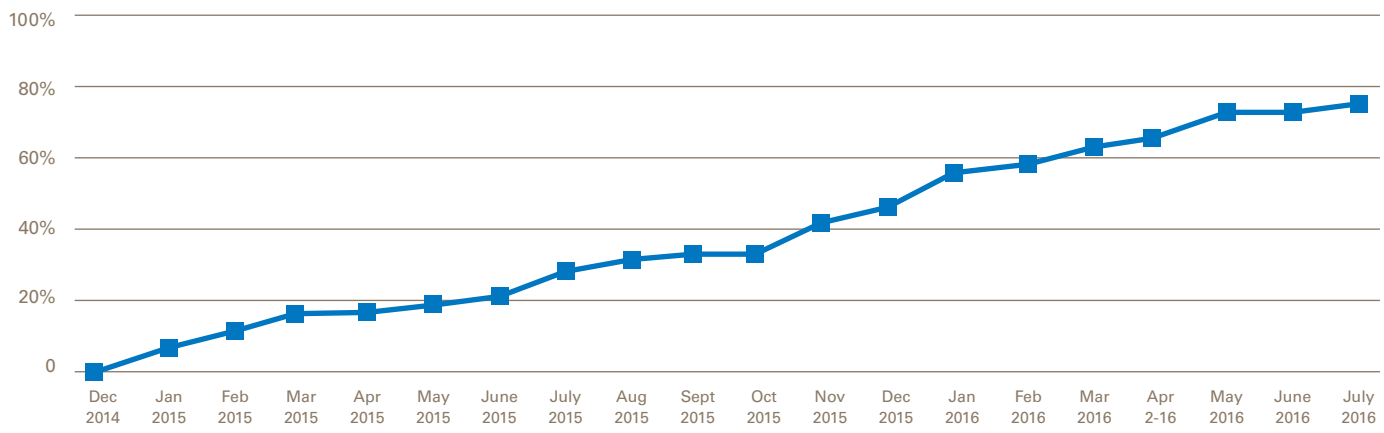
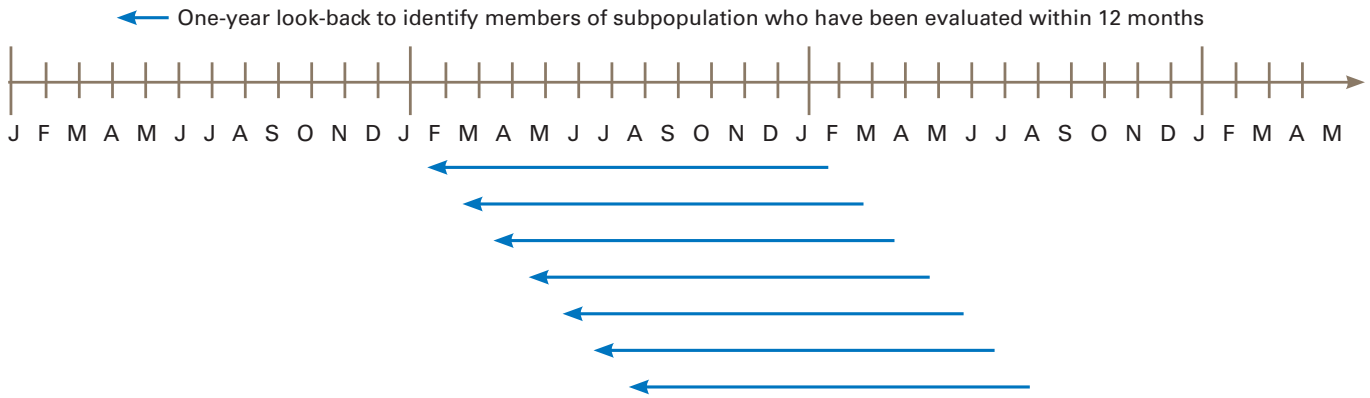


Figure 7.3 shows the findings of a report that was run at the beginning of each month showing the size of the target population and how many members of that population had had an oral health screening assessment within the prior year. These reports have a rolling look-back interval of 12 months, as shown in Figure 7.4.

Figure 7.4: A rolling one-year look-back



Case Vignette: Heart of Kansas Clinic Refines the Data Reporting Process

At Heart of Kansas Clinic, a rural federally qualified health center located in Great Bend, KS (population 16,000), the internal quality improvement staff member was able to make EHR modifications to support documentation and extract that data as regular reports. "We were able to modify our EHR to make a tab in our form for oral health. I created one spot for clinicians to put all of their oral health information, which allows me to get the data out easily in reports. When we first started, I was running data every other week and taking it around to the clinicians' desks. We have a monthly clinician meeting and monthly quality meeting, and they were also being shared there. When we were writing the quality plan for 2016, we included oral health in the quality goals," shares Heather Hicks, RN, quality improvement coordinator at Heart of Kansas Clinic. After several months of implementation, the process has stabilized and the reporting frequency has changed. Hicks explains, "Now I am running the data monthly and just sharing the clinician data at the quality meeting. The clinicians are actively working on their numbers—for example, a clinician asked for a list of the patients that haven't had the assessment done yet, so they could focus on bringing them in for a screening. If someone thinks the data doesn't reflect what they're doing, I can help problem solve—usually it's that the information isn't being put in the right spot." Heart of Kansas had previously maximized the capacity of their EHR system, which set them up for success with this work. "Because we've invested in learning what our EHR system is capable of, we were able to utilize that, and it made the reporting and data part a lot easier than it could have been. If we had to ask the vendor to write a report for us, it would have cost money. But because I could write reports myself, I could write it and revise it as needed. It helped to let the clinicians tell us exactly what they wanted and how they wanted it to look, and then we could write the report around that," shares Hicks.

Putting It Into Practice

One of the most important roles in this process is the individual who will be responsible for producing regular data reports and sharing them with the team. The team can respond by conducting Plan-Do-Study-Act (PDSA) cycles to refine and solidify the workflow. The Plan-Do-Study-Act (PDSA) Worksheet is a helpful tool for teams to use to document a test of change and work through the PDSA cycles. In most cases, monthly reports are sufficient for detecting an effective workflow change if data are viewed on a run chart. As a pilot spreads and the oral health integration program stabilizes, the reporting frequency may change. Ideally, oral health measure reporting will become part of the standard report dashboard that a primary care team reviews regularly. Quality reporting using process measures can be used to bring to life a number of stories about managing oral health in a target population.

For example:

- Patients with signs of gum inflammation who needed a referral to dentistry for diagnosis and treatment and who received it.
- Children at high risk for tooth decay who received fluoride varnish.
- Patients with signs of tooth decay who needed a referral to dentistry for diagnosis and treatment and who received it.
- Patients with signs of tooth decay who received fluoride varnish.
- Parents of young children in families with active tooth decay who received coaching on oral health best practices for the entire family.
- Prenatal patients who were referred to the dentist and received dental care while pregnant.
- Patients at increased risk for tooth decay because of inadequate oral hygiene and/or excessive sugar in the diet, who received coaching for diet/oral hygiene and received fluoride varnish.

The Recommended Oral Health Integration Metrics tool outlines process measures used by field-testing sites to assess their oral health integration experience.

Differences in process measures between clinicians can shed light on where workflows are functioning in an exemplary fashion and where a care team may need additional support.

Each of these scenarios is based on using structured data to track the target population and oral health intervention provided, which allows the care team to tell if they are making progress in closing a care gap.

The care team will develop a number of methods to close care gaps that may include workflow interventions within the clinic, outreach to patients to bring them into the clinic for care, or communication with the referral partners to modify that external workflow.

Using a graphic display of data to share the story with patients and the practice team members creates accountability and motivates teams. Reviewing the visual reports at clinic team meetings offers the opportunity to engage the full team and celebrate successes, as well as problem solve obstacles or impediments to workflow functionality.

"We are running reports monthly to monitor the fluoride varnish rate. We have strategy meetings to see what can be done to improve it. It's about constantly revising the process, assessing what the blockades are that are keeping us from getting to those goals, and trying to find solutions."

—Turner House Children's Clinic

Pitfalls of interval-incidence reporting

Traditionally, practices have used procedures or office visits as the unit of analysis for reporting productivity. These reports ask questions such as "How many office visits were produced during a given time interval?" or "How many visits with a given diagnosis (such as diabetes) met a defined clinical quality standard (such as adequate glycemic control)?" There are two problems with using interval-incidence reports for population health:

1. The unit of analysis is an action or event, not the patient; so if a patient experiences multiple actions in a single reporting period, that patient will be counted multiple times.
2. Patients in the target population who do not have the event or action documented in their chart will not be counted at all.

Interval-incidence quality reports are useful for measuring whether a process that should happen with each visit is working as intended (e.g., whether an after-visit summary is printed at every visit, or blood pressure is taken at every visit). In the context of population health, however, it is very difficult for care teams to look at a report for which the unit of analysis is an event, and be able to tell what it means and what they should do to improve the care of the population.

Other types of measures

As noted above, the measures discussed thus far all represent process measures. These include:

- **Screening process:** Documenting answers to questions and findings on examination.
- **Intervention process:** Ordering interventions for which evidence suggests they may result in improved health.
- **Care coordination process:** Tracking referrals to ensure their completion.

Although the LOOK template elements "signs of tooth decay" and "signs of gum inflammation" describe clinical disease, only dental clinicians have the tools and skill to diagnose caries and periodontal disease, so the validity of a primary care clinical finding as a measure of clinical outcomes is unknown. Measuring clinical outcomes accurately for population oral health will require much closer collaboration between medicine and dentistry. On the other hand, there are a number of other metrics that may be useful in monitoring the impact of oral health integration in primary care:

- **Patient experience measures:** Questions about oral health can be added to general patient satisfaction surveys to assess concepts such as how well the oral integration effort:
  - Helped fill an unmet need.
  - Improved the patient's sense of confidence in his/her ability to protect his/her teeth.
- **Practice/clinician experience measures**: The experience of the care team should also be monitored using questions that address:
  - How the oral health program helped or hindered the ability of the care team to meet patients' overall health needs.
  - The effect it had on job satisfaction.
  - Each care team member's confidence that he/she knew how to protect the oral health of the patients in the panel.

Case Vignette: Harborview Medical Center–Women's Clinic's Chart Audit Work-around

Harborview Medical Center-Women's Clinic is a specialty clinic housed within a large Level 1 adult and pediatric trauma and burn center located in downtown Seattle, serving a diverse urban population. As part of a larger hospital system connected to an academic institution, the practice has been challenged by their inability to modify their EHR and to extract data from the system. Leondra Weiss, RN, nurse manager, explains, "Our ability to make changes to our EHR has been very limited. We were able to get the assessment questions added, with the answers available as a drop-down list, which is very helpful. We built it so we would be able to run reports, but we're not using that function right now." After several months working with the internal HIT department to make the requested modifications, they encountered another roadblock. Weiss explains, "We had to get special approval to run reports on the oral health data, which we did, but when we initially ran the reports, the data didn't match what we were tracking manually. It was a complex process to run the reports and took a lot of time, and since it wasn't accurate we had to go back and double-check all the data." Weiss determined that it wasn't worth doing additional work when they had already established a tracking system they felt was reliable, though they would still like to have concrete data to demonstrate the impact they are making. Weiss shares, "It's easier right now for us to continue doing the manual tracking. We are doing a chart audit right now to look at our data." This chart audit compared a four month period (January–April 2014) before beginning the oral health integration program, to a four month period (January–April 2016) after the oral health integration was established.

Measures	January–April 2014	January–April 2016
Total pregnant patients seen for an initial OB visit	60	98
Number of patients given oral health assessment during initial OB visit	0	61
Number of patients referred to a community dentist	1*	52
Number of patients scheduled for dental appointment	1*	28

*patient went to the emergency department for oral health problem.

Refer to the case examples below to see how some field-testing sites used data to tell their story of oral health integration.

Implementation of the Oral Health Delivery Framework at Dimock Community Health Center

Integrating Oral Health into Primary Care: Lessons Learned from Rodgers Health

Sound Family Medicine Integrates Oral Health into Primary Care for Adults with Diabetes

Supporting Materials, Section 7

Recommended Oral Health Integration Metrics: This PDF tool details the recommended oral health measures used by the oral health integration field-testing sites. The denominators and numerators are defined for each measure. This tool includes the recommended screening questions for adults and pediatrics.

Oral Health Data Reporting Template and Run Chart: This modifiable tool supports oral health integration data reporting. The first tab provides a description of the recommended measures for adults and pediatrics and instructions for using the tool. The second tab is where a practice can enter the numerators and denominators for the oral health data they are reporting. Subsequent tabs automatically generate run charts to show progress over time.