

The Process of Quality Measure Validation in Relevant

By Ben Fouts, Data Analyst, Redwood Community Health Coalition

Data Workgroup Webinar, August 10, 2021

Agenda

1. Developing a System of Validation
2. Validation at the Summary Level
3. Line Level Validation
4. Other Ideas and Tips

Developing a System of Validation

The Quest for Valid Data

The goal is to produce useful data

Is the data accurate enough that you can:

- Apply it to inform clinical decisions
- Apply it to make organizational decisions
- Report it to outside organizations for funding and potentially have it audited
- Report it to the public

Definition of Validation

The process ensuring that your data is accurate and correct

- In this presentation, we will be talking specifically about data in Relevant
- Compare data in the EHR with data in Relevant: is what you see in the EHR the same as in Relevant on a line-by-line basis?
- Summaries and calculations: would a human making a manual calculation get the same result as a report or Quality Measure? Are groupings and formulas in Relevant commonly understood among users?

The Perception of Valid Data

- For you and all users of Relevant. Everybody should trust the data
- Quality Managers, Analysts and others in the Data Department of your organization are the guardians of data quality and the perception of it among staff

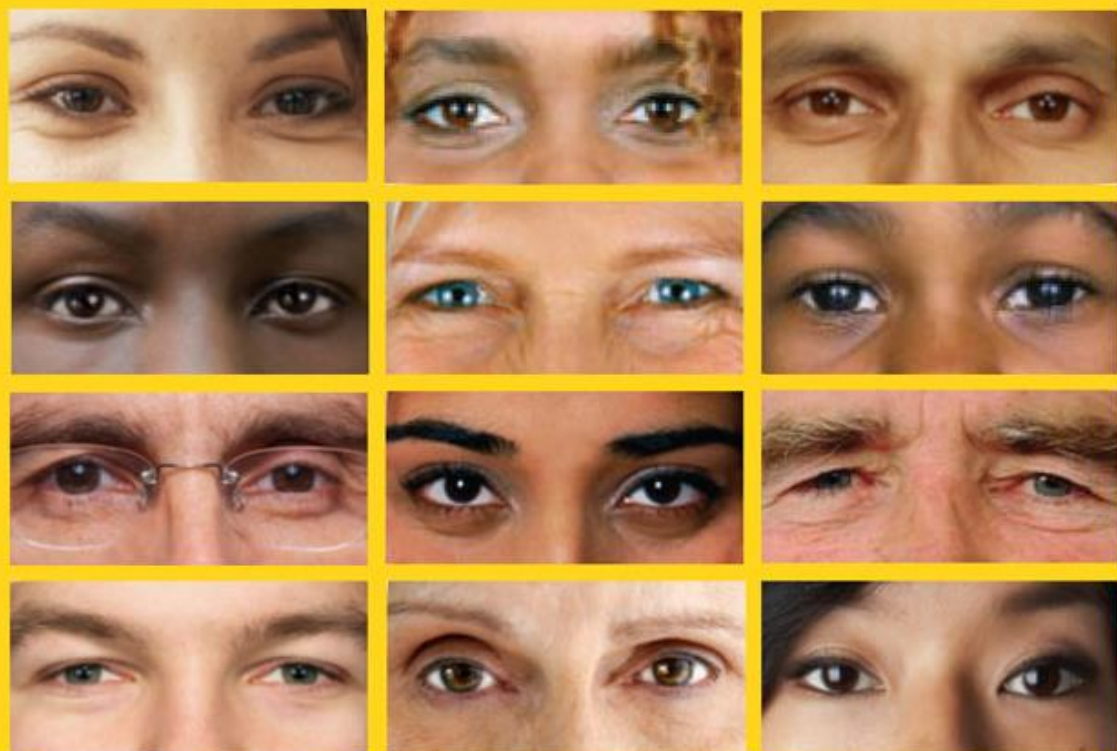
Actively Promote the Perception of Valid Data

- Design a system where users feel motivated to report inaccurate results and have an opportunity to do so in an easy and efficient manner. They must know you take this subject seriously.
- You want as much feedback from Relevant users as possible. Dozens of people looking at the data for weeks and months contribute to widespread validation.
- You (and your department) do not have unlimited time to validate. However, users may find the rare events that you can miss in your own evaluation.

Validation Campaign Examples

- Take a page from a public safety campaign...
- You do not want users to just ignore bad data
- Have them report it!





**THERE ARE 16 MILLION EYES IN THE CITY.
WE'RE COUNTING ON ALL OF THEM.**

IF YOU SEE SOMETHING, SAY SOMETHING.

Tell a cop, an MTA employee or call 1-888-NYC-SAFE.



Validation Campaign Examples

- Crime-stoppers – reward given upon conviction
- Error-stoppers – reward given if their suggestion leads to a change in Relevant (like a change to the SQL in a Transformer or QM)
- A reward could be a special certificate or gift card



Error/Discrepancy Reporting

- Have several ways to report discrepancies in order to maximize response
- There is a discrepancy button in Relevant for some types of users
- An e-mail or electronic form can be used if people want to write out what they see in more detail. This can also be used when the error is not related to line level data (i.e., Quality Measures, Visit Calendar, or other summaries)
- Encourage them to be as specific as possible so you can investigate carefully and efficiently

System of Validation

- Validation is a process, so it relies on a clear, well-designed system
- For example, Relevant suggests using a task list. What is the task, who is responsible for it, when they have to get it done, and how do they communicate the results?
- In other words, use the list to track progress. Know where you are for each Quality Measure or Report. Document the kind of validation, when it was done and by whom
- This can be done on a spreadsheet or in project management software
- If a problem arises (someone reports a discrepancy or you otherwise find a problem), document the findings and also document how it was fixed

System of Validation, continued

- Having this kind of system lets you see problems over time, which might lead to pattern recognition and anticipating other problems
- For example, if you find that somehow a cancelled A1c lab made it onto the numerator results, you should check the A1c lab Transformer, but also check the other lab Transformers for the same problematic SQL code
- Sometimes groups of Transformers or Reports are designed similarly, or SQL code was borrowed from one thing to design another

Policies and Procedures

- Clear policies and procedures should describe how your health center approaches validation.
- This should include the validation work of the Quality Assurance Department, the task list, how staff can report errors, etc.
- Sometimes HRSA or Joint Commission inspectors ask for these kinds of policies

Approaching Validation

- You are an investigator looking for any clues that the data may be wrong. Make it a personal challenge to find something wrong.
- Consider all aspects of the data. Compare what you see on a report or Quality Measure to what you know from experience and what you feel. Listen to your voice that says “that does not seem right” and then investigate it until you isolate an error or have evidence that it is right.
- Those doing validation should have rights to see PHI in Relevant

How to do Validation

- When you find something wrong, stop and investigate
- “Fix” the problem in the SQL, validate that your change worked, and THEN continue validating
- This method is more efficient than first making a list of problems and then fixing them together

When to do Validation

- As soon as a report or Quality Measure is available, perform the initial validation
- Do another validation mid-way through the year and/or in December, right before beginning to look at the UDS and QIP annual data for submission.
- Sometimes there are new labs, medications, etc. entered during the year
- Use the RCHC Validation Report Set (see the instructions section System Set-up and Utilization Reports)

Validation at the Summary Level

Quality Measure Validation

- Does the current value of a measure look reasonable compared to what you know from reported history, from other similar measures, or from other reports/sources of data?
- Is the difference significant? (i.e., larger than natural variation)
- If different, could there be a real-world explanation?
- Can that explanation be tested?

Example: Quality Measure Validation

- You are validating the Controlling High Blood Pressure measure and see that the numerator percentage is currently lower than what was reported in prior years. Why? Is the source of the change the SQL code or the underlying data?

Example: Quality Measure Validation

1. Are there changes to the measure definition or the SQL code that would account for the difference

NO- these are the same

2. Are the denominators approximately the same for two measurement periods of equal time?

YES- the denominators in 2019 and 2020 approximately equal

Example: Quality Measure Validation

3. Are there differences in the blood pressure numerator categories or sub-categories?

YES- A high proportion of recent patients did not have a documented blood pressure due to Covid, and this was categorized as “not controlled” on the report

- 2019 no blood pressure reading: 5% of HTN patients
- 2020 no blood pressure reading: 20% of HTN patients

Compare to Other Data Sources

- Are summary results in the expected range compared to other sources of data?
- Compare the 2020 version to the 2021 version of a report for the same measurement period. Were there changes to the definition? Did Relevant or RCHC change the SQL? Are any new Transformers involved?
- Compare to Population Explorer (Note: this is good for some things because if there is a problem with the Transformer, it will not show)

Check the Quality Measure Graphs

- Look at the history graph. Is it fairly smooth or does it fluctuate a lot? If the denominator is relatively large, there should not be much variability
- If you find variability, research what is making the difference. First step: is the source of the variability in the denominator or the numerator (or both)?

Check the Quality Measure Graphs

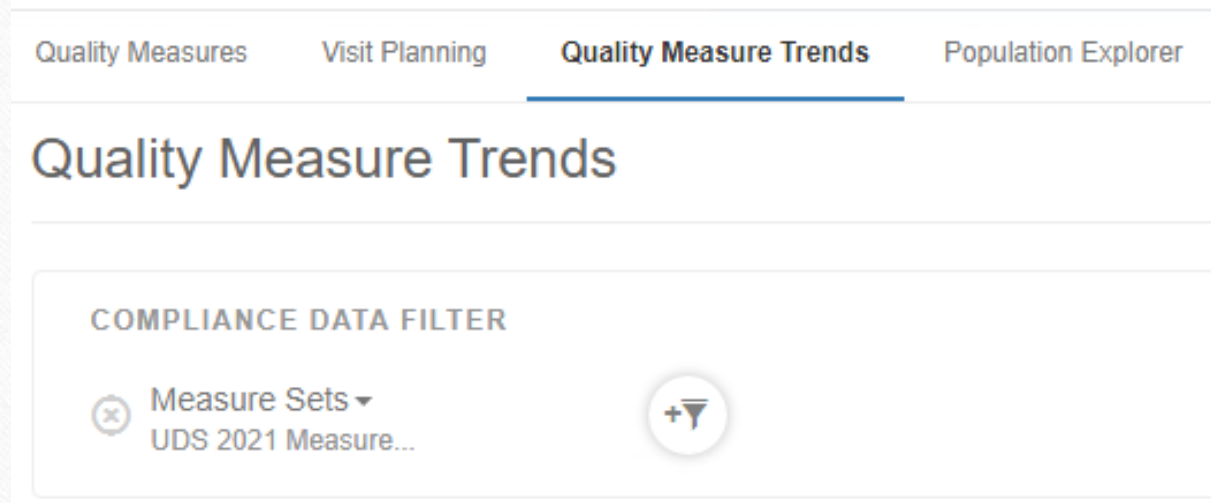
- Remember that the QMs are based rolling measurement periods.
- Therefore, if you are comparing month-to-month data, only one month out of 12 is “different.”
- If you compare year-to-year data (like 2019 vs 2020) then you have 12 months of different data
- Nonetheless, with chronic disease measures, most likely a large portion of patients is the same in both years, so that should add to consistency

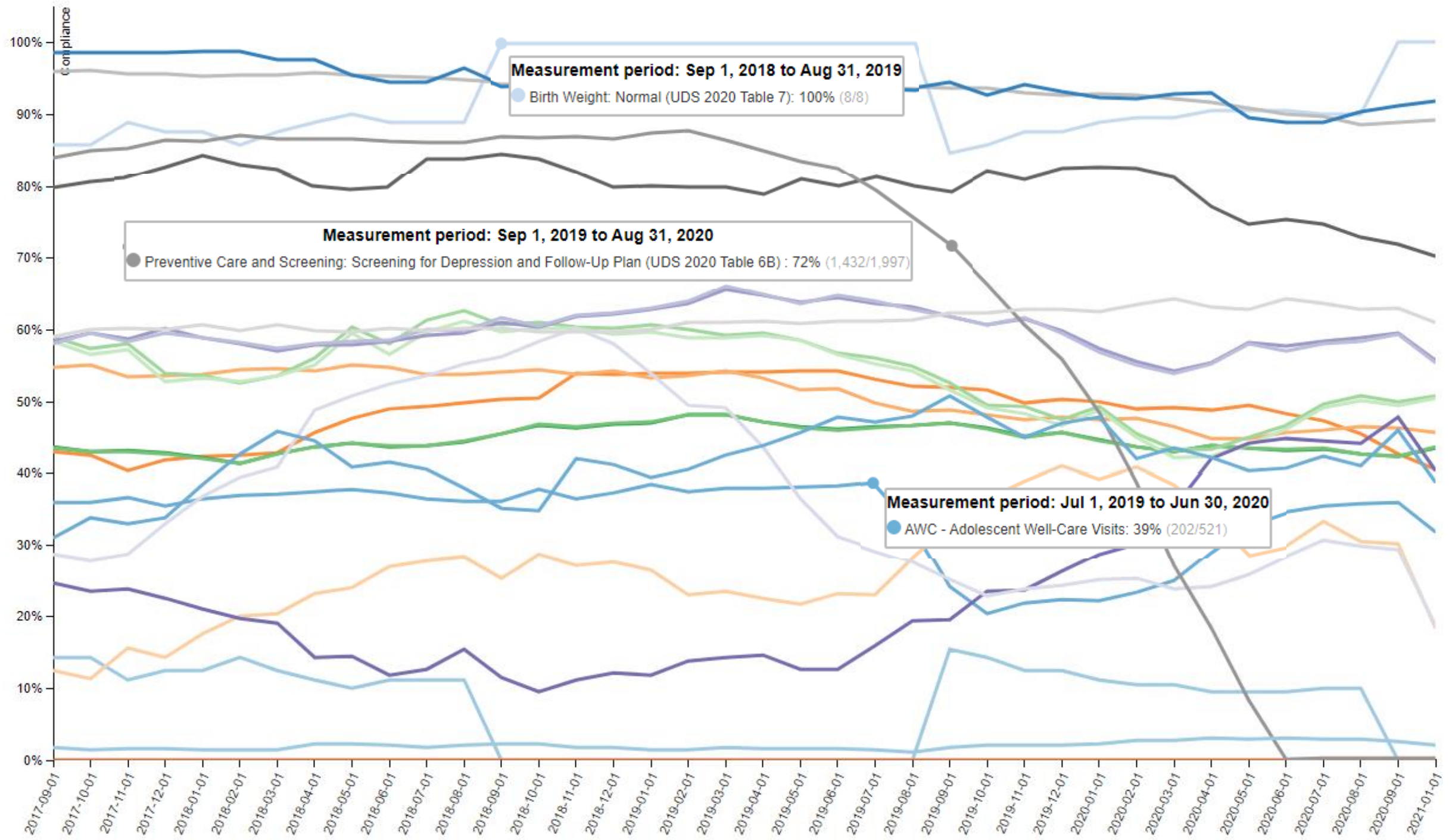
Do Not be Afraid to Use Your Intuition

- Does the denominator make sense?
“Wait, we don’t have 2000 patients with diabetes!”
- Does the numerator percentage make sense?
“How can it be possible that 40% of our patients enter prenatal care in the first trimester when the county average is 80%?”
- Does the number of exclusions make sense?
“Something seems wrong if 100 infants are excluded from the immunization measure due to rare cancers.”

Other Graphs

- Look at the Quality Measure Trends graphs. Does anything pop out?
- Use your measure groups to unclutter the graph





Line Level Validation

Looking at individual records

Line Level Validation

- This involves examining individual records (i.e., rows or lines). The records can be patients, encounters, labs, claims, etc.
- Compare specific data in Relevant to specific data in the EHR
- Can be done on-screen or by comparing a list from Relevant to another list from Relevant, DataGrip, the EHR or another source

Two Common Approaches

1. Targeted: a defined field or piece of information is investigated as a result of a finding from the summary level validation
2. Random: patients (or other denominator rows, like encounters or claims) are selected at random

When You Get a “Finding”

- If you find an error, document it with screenshots or copies of the rows from your lists (depending on the approach you are taking)
- Your department policy/procedure should define what to do next. Some health centers may contact their Relevant point person or their own programmers to look into the SQL code.
- Generally, for the standard UDS Quality Measures, Relevant is the main contact. Keep in-mind that it might not be a problem with the report itself, but with the Transformers or Importers.

Measure Results

All Patients

Compliant Patients

Non-Compliant Patients

Excluded Patients

Displaying 25 of 4,341 results

Export ▾



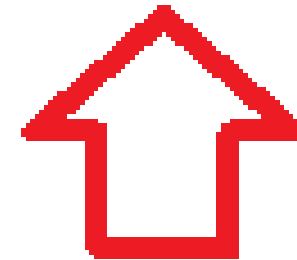
Search

Measure ↓	Start Date	End Date	Patient Name	MRN	Risk Score	DOB	Provider Name	Location	Msrmt Value	Numerator	
Breast Cancer Screening (UDS 2021 Table 6B)	09/01/2020	08/31/2021			COVID 0.0				No recent mammogram	N	Report discrepancy



- The Report Discrepancy button appears in Relevant for patient-level results
- Someone in your organization should get the e-mails (along with your Relevant contact)

[Report discrepancy](#)



Most Common Type of Quality Measure Validation

- Comparing two versions of the same quality measure
- This applies to most of the quality measures because the names do not usually change year to year
- For example, compare the 2020 version of a Quality Measure to the 2021 version

Steps in Quality Measure (QM) Validation: Preparation

- Define a measurement period ending at least a couple of months ago or even last calendar year. That way, if you modify the Transformer or the QM, then you can see how the data changes from the modification and not be influenced by changes to the data itself (like you would if you took the current measurement period ending the current month or last month)
- Use the same measurement period for both versions
- Document the numerator, denominator and number of exclusions for the two years

Steps in Quality Measure Validation: Summary Level Validation

First, the summary level validation work:

- For the same measurement period, are there differences in the measure output?
- If yes, is the change in the numerator, denominator or both?
- If yes, has the measure definition changed? See measure comparison document

New Measure Comparison Document

- Should be ready this week
- Will be on the RCHC website where the data quality documents are posted
- Look for an e-mail from RCHC

Comparison of Measurements Between Different Projects and Funders
Version 1.0

Redwood Community Health Coalition, August 2021

Measure Name	UDS/BPHC (2021)		QIP/Partnership (2021)		PIP (2021)		PHASE/HEDIS (2021)		Hearts of Sonoma County (2021)	
	Denominator	Numerator	Denominator	Numerator	Denominator	Numerator	Denominator	Numerator	Denominator	Numerator
Colorectal Cancer Screening	<ul style="list-style-type: none">• (Reference: CMS130v8)• Between 50 and 74 years at the beginning of the measurement period• Had at least one medical encounter during the measurement period• Exclusions: had colorectal cancer, had a total colectomy or was receiving hospice care during the measurement period; in hospice care during the measurement period; aged 66 or older and living long-term in an institution for more than 90 days during the measurement period; aged 66 and older with advanced illness and frailty	<ul style="list-style-type: none">• Patients with at least one of the following in the time-frame indicated before the end of the measurement period:<ul style="list-style-type: none">• Fecal occult blood test (FOBT) in the past year• FIT-DNA in the past 3 years• Flexible Sigmoidoscopy in the past 5 years• Computed tomographic (CT) colonography in the past 5 years• Colonoscopy in the past 10 years	<ul style="list-style-type: none">• Continuously enrolled PHP members between 51 and 75 years at the end of the measurement period• Exclusions: had colorectal cancer or total colectomy	<ul style="list-style-type: none">• Patients with at least one of the following in the time-frame indicated before the end of the measurement period:<ul style="list-style-type: none">• Fecal occult blood test (FOBT) in the past year• FIT-DNA in the past 3 years• Flexible Sigmoidoscopy in the past 5 years• Computed tomographic (CT) colonography in the past 5 years• Colonoscopy in the past 10 years	<ul style="list-style-type: none">• Between 51 and 75 years at the end of the measurement period• Had at least one encounter during the measurement period• Exclusions: had colorectal cancer, had a total colectomy or was receiving hospice care during the measurement period	<ul style="list-style-type: none">• Had at least one of the following in the time-frame indicated before the end of the measurement period:<ul style="list-style-type: none">• Fecal occult blood test (FOBT) in the past year• FIT-DNA in the past 3 years• Flexible Sigmoidoscopy in the past 5 years• Computed tomographic (CT) colonography in the past 5 years• Colonoscopy in the past 10 years				
Blood Sugar Control Among Patients With Diabetes	<ul style="list-style-type: none">• (Reference: CMS122v8)• Between 18 and 74 years of age at the beginning of the measurement period• Diagnosed with diabetes• Had at least one medical encounter during measurement period• Exclusion: received hospice care during the measurement period; aged 66 or older and living long-term in an institution for more than 90 days during the measurement period; aged 66 and older with advanced illness and frailty	<ul style="list-style-type: none">• Numerator is broken down into HbA1c categories (<8% and >9%) by race and ethnicity• Patients without HbA1c test assumed to be in the >9% category and not removed from denominator	<ul style="list-style-type: none">• Continuously enrolled PHP members between 18 and 75 years of age at the end of the measurement period• Diagnosed with diabetes• Had two face-to-face encounters in an outpatient setting on different dates of service during the past two years• Denominator exclusion if patient has a diagnosis of gestational diabetes or steroid-induced diabetes during the past two years	<ul style="list-style-type: none">• Patients with an HbA1c lab performed within the past year and the latest result had a value equal to or less than 9%.	<ul style="list-style-type: none">• Between 18 and 75 years of age at the end of the measurement period• Diagnosed with diabetes• Had at least one medical visit during measurement period• Exclusions: pregnant during measurement period; in hospice care during the measurement period	<ul style="list-style-type: none">• Patients with an HbA1c lab performed within the past year and the latest result had a value equal to or less than 9%.	<ul style="list-style-type: none">• (Reference: CMS122v8)• Between 18 and 74 years of age at the beginning of the measurement period• Diagnosed with diabetes• Had at least one medical encounter during measurement period• Exclusion: received hospice care during the measurement period; aged 66 or older and living long-term in an institution for more than 90 days during the measurement period; aged 66 and older with advanced illness and frailty	<ul style="list-style-type: none">• Patients with last A1c test over 9% or no A1c test in the measurement period• Measure for all denominator patients and measure for denominator patients who are uninsured	<ul style="list-style-type: none">• (Reference: CMS122v8)• Between 18 and 74 years of age at the beginning of the measurement period• Diagnosed with diabetes• Had at least one medical encounter during measurement period• Exclusion: received hospice care during the measurement period; aged 66 or older and living long-term in an institution for more than 90 days during the measurement period; aged 66 and older with advanced illness and frailty	<ul style="list-style-type: none">• Patients with last A1c test over 9% or no A1c test in the measurement period• Measure for all denominator patients and measure for denominator patients who are uninsured

For Example, Compare 2020 vs 2021

Breast Cancer Screening QM

Breast Cancer Screening (UDS 2020 Table 6B) ✓

Percentage of women 50–74 years of age who had a mammogram to screen for breast cancer in the 27 months prior to the end of the measurement period

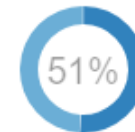


$\frac{2,140}{4,279}$



Breast Cancer Screening (UDS 2021 Table 6B) ✓

Percentage of women 50–74 years of age who had a mammogram to screen for breast cancer in the 27 months prior to the end of the measurement period



$\frac{2,371}{4,649}$

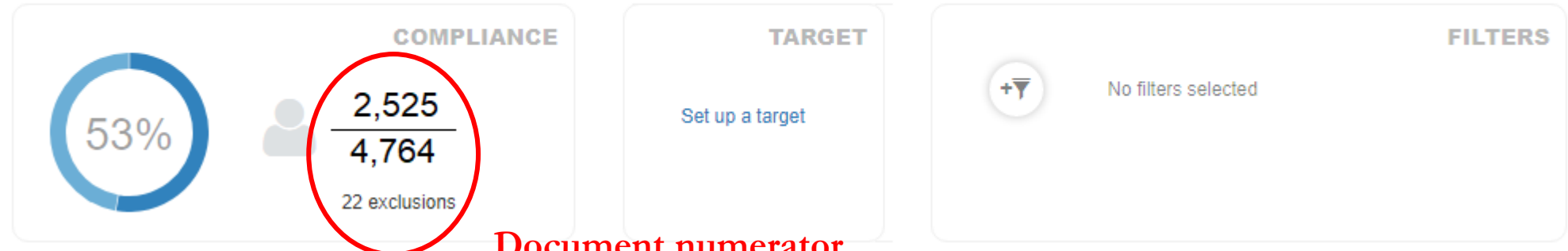


For Each Measure

Set to the same
measurement period
(some time in the past)

Breast Cancer Screening (UDS 2020 Table 6B) ^

Measurement period: January 1, 2020—December 31, 2020
Data last refreshed on 8/10/2021



Document numerator,
denominator and
exclusions. Are there any
differences?

When a Difference is Detected

If a difference is detected,

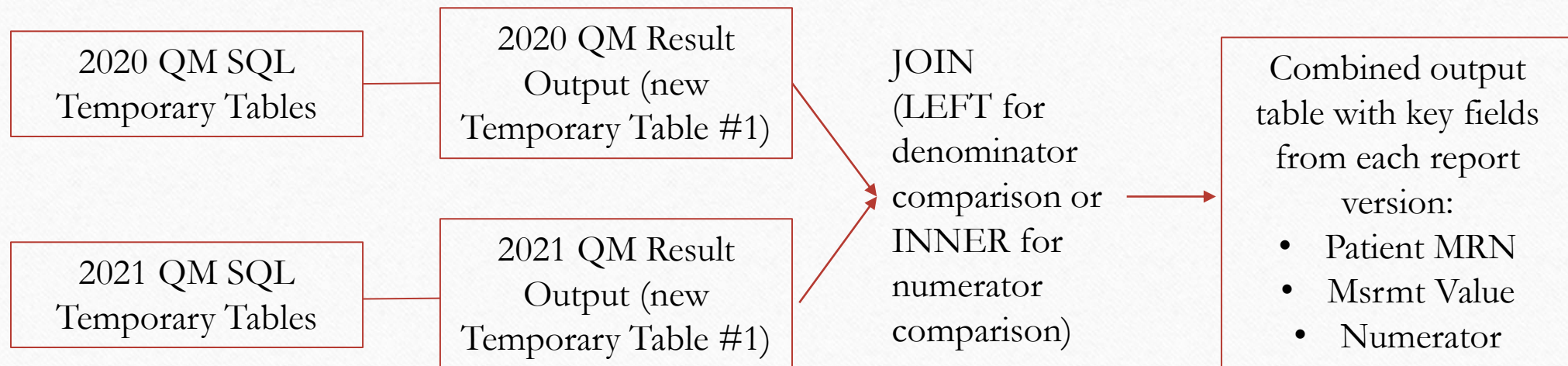
- Look at the comparison document to see if there was a definition change
- Programmers can look for differences in the QM SQL code. Was there a change in logic or a new Transformer developed?

Decide on a comparison method. In this example, you can compare line-level lists from each report in DataGrip or in Excel

Comparison Method #1: Compare in DataGrip

- Copy the SQL of both QMs to DataGrip and add a CREATE TEMPORARY TABLE to the results query of each. Remove measurement period parameters and add the measurement period dates themselves
- Then JOIN the results of the two queries in a final query
- For differences in the denominator, use a LEFT JOIN
- For differences in the numerator differences, use an INNER JOIN
- Display a comparison of the results query for both and identify patients with different values

Visual Data Grip FLOW



Then, copy the combined output table to Excel and look for those patients who do not perfectly match (or, add SQL code for a column that can identify those for you)

Method #2:

Export the Results and Compare in Excel

Breast Cancer Screening (UDS 2020 Table 6B) ^

Measurement period: January 1, 2020—December 31, 2020
Data last refreshed on 8/10/2021



Click to see Measure Results

Measure Results

Export results

Displaying 25 of 4,764 results

Export ▾

Measure ↓	Start Date	End Date	Patient Name
Breast Cancer Screening (UDS 2020 Table 6B)	01/01/2020	12/31/2020	

Method #2:

Export the Results and Compare in Excel

- Copy the comparison columns (Patient MRN, Msrmt Value, Numerator) from each version to a separate Excel Worksheet and compare each set of results line-by-line (i.e., row-by-row)
- Each row has the same patient.
- Sort by medical record number and manually line them up
- Highlight those with differences and investigate further

Excel Example

	A	B	C	D	E	F	G	H	I
1	Msrmt Value	Numeratc	MRN		MRN	Msrmt Value	Numerator		=G1=C1
2	No recent mammogram		47377		47377	No recent mammogram			TRUE
3	Mammogram performed on: 03/05/21	Y	47365		47359	Mammogram performed on: 02/09/20	Y		FALSE
4	Mammogram performed on: 02/09/20	Y	47359						FALSE
5	No recent mammogram		47333		47333	No recent mammogram			TRUE
6	No recent mammogram		47299		47299	No recent mammogram			TRUE
7	No recent mammogram		47283		47283	No recent mammogram			TRUE
8	Mammogram performed on: 12/08/20	Y	47276		47276	Mammogram performed on: 12/08/20	Y		TRUE
9	No recent mammogram		47207						FALSE
10	No recent mammogram		47172		47172	No recent mammogram			TRUE
11	Mammogram performed on: 05/30/20	Y	47137		47137	Mammogram performed on: 05/30/20	Y		TRUE
12	No recent mammogram		47048		47048	No recent mammogram			TRUE
13	No recent mammogram		47016		47016	No recent mammogram			TRUE
14	Mammogram performed on: 11/19/20	Y	46984		46984	Mammogram performed on: 11/19/20	Y		TRUE
15	No recent mammogram		46885		46885	No recent mammogram			TRUE
16	Mammogram performed on: 07/13/20	Y	46855		46855	Mammogram performed on: 07/13/20	Y		TRUE
17	No recent mammogram		46852		46852	No recent mammogram			TRUE
18	No recent mammogram		46849		46849	No recent mammogram			TRUE
19	No recent mammogram		46847		46847	No recent mammogram			TRUE
20	Mammogram performed on: 09/23/19	Y	46834		46834	Mammogram performed on: 09/23/19	Y		TRUE
21	No recent mammogram		46823		46823	No recent mammogram			TRUE
22	Mammogram performed on: 06/06/19	Y	46810		46810	Mammogram performed on: 06/06/19	Y		TRUE
23	No recent mammogram		46751		46751	No recent mammogram			TRUE
24	Mammogram performed on: 06/11/21	Y	46749		46749	Mammogram performed on: 06/11/21	Y		TRUE
25	Mammogram performed on: 01/14/20	Y	46748		46748	Mammogram performed on: 01/14/20	Y		TRUE
26	No recent mammogram		46746		46746	No recent mammogram			TRUE

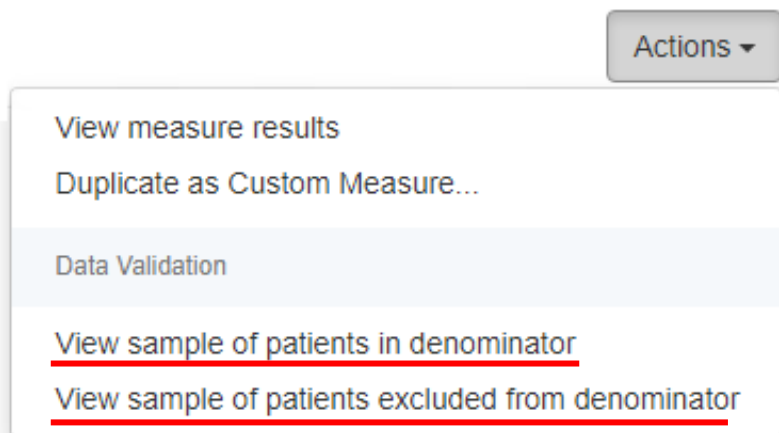
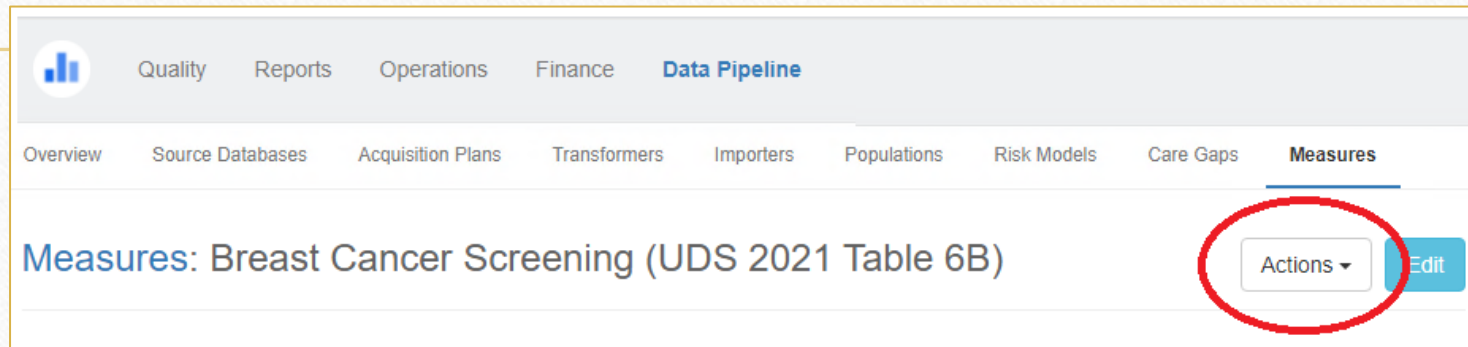
Identify Patients With Different Data

- Once you have identified the patients with different data (using method #1 or #2 or your own method), then investigate.
- Compare data displayed on the list (from Relevant) with data in the EHR. Which one is correct? Is there a pattern?
- Send details to Relevant or, if you know SQL, trace where the difference in the code arises

Another Common Type of Quality Measure Validation

- Generate a random sample and compare the data from the list to data in the EHR
- Does not need a summary validation first
- Should be done on all new measures
- Can identify problems with Transformers that may not appear in a version comparison
- But may not identify rare events

Generate a Random Sample



Other Ideas and Tips

Perfection




- Perfection may be unrealistic and so it should not be the goal
- You never really know if your data is “perfect” anyway. You only know that you have not (yet) found any errors
- How much time do you spend looking for errors? Usually, you cannot look up every single denominator patient
- Accuracy vs Good Use of Time – there is a trade off

Validation Documentation in Relevant



Bottom-right
side of screen



-  Help Center
-  Contact Support
-  Submit Feedback

Help ?

Implementation



[Relevant Healthcare Technologies](#) > Implementation

Implementation

Validation

[Validation Overview](#)

[Validating Patients](#)

[Validating Visits](#)

[Validating Quality Measures](#)

[Validating Care Gaps](#)

Text on the Validation Overview page

Relevant provides tools to validate the following concepts using random samples. Please click the links below for more details:

- [Patients](#)
- [Visits](#)
- [Care Gaps](#)
- [Quality Measures](#)

Relevant recommends validating Patients and Visits before moving on to Care Gaps and Quality Measures, because the latter rely on the former.

Publishing

- Quality Measures can remain unpublished while you validate them

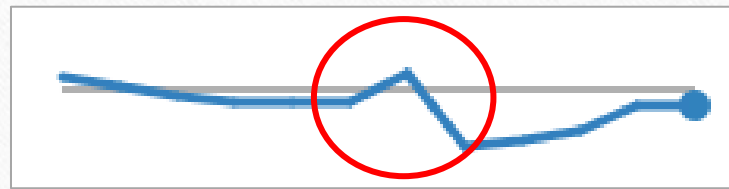
Breast Cancer Screening (UDS 2021 Table 6B) ✓

This measure is published.
Everyone can see it.

Percentage of women 50–74 years of age who had a mammogram to screen for breast cancer in the 27 months prior to the end of the measurement period

Add Goals to the QM

- It is a good idea to have goals for all of your measures in order to give people looking at it a relative sense of where the measure is
- It also prompts you to look at places in the data to focus validation efforts. In the graph below, there was a sudden dip. If this was the cervical cancer measure, it could be because there was a new pap lab was added that was not being picked up by the Transformer



Share Validation Results

- Share the validation results with the report designer... like your Relevant contact or RCHC report developer
- These people are also continuously learning and improving their SQL skills and understanding of the data

Questions?
