GUIDANCE FOR MEASURING COLORECTAL CANCER (CRC) SCREENING RATES IN HEALTH SYSTEM CLINICS

DP15-1502 Colorectal Cancer Control Program

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Purpose

The purpose of this document is to provide the Centers for Disease Control and Prevention's (CDC) DP15-1502 grantees with Colorectal Cancer Control Program (CRCCP) guidance for measuring baseline and, thereafter, annual colorectal cancer (CRC) screening rates within participating health system clinics.

Reporting Requirements

CDC has awarded DP15-1502 grants to increase CRC screening rates (priority outcome) among a defined target population within a partner health system, defined geographical area, or disparate population. Grantees implement evidence-based interventions (EBIs) and other (optional) supportive strategies in partnership with health systems to put into place organized screening programs (see Figure). In addition, CRCCP grantees measure and report a baseline screening rate for health systems where implementation is planned, followed by an annual screening rate report.

A health system partner may include federally qualified health centers (FQHCs), community health centers (CHCs), health care or hospital networks, Indian Health Service (IHS) and local health department clinics, among others. Health systems often have multiple clinics (FQHCs refer to them as sites). Because grantees may intervene with only a subset of these clinics and may have different activities in different clinics, it is important to measure and report a baseline CRC screening rate for **every clinic** within a health system, rather than for the overall health system, where CRCCP activities are implemented (see Figure). The clinic-level CRC screening rate is updated annually thereafter. These data will allow grantees and CDC to monitor trends in CRC screening rates in all clinics where program activities are implemented and allow better evidence of the impact of the CRCCP.

Figure. CRCCP Grantee, Health System, Clinic Sites
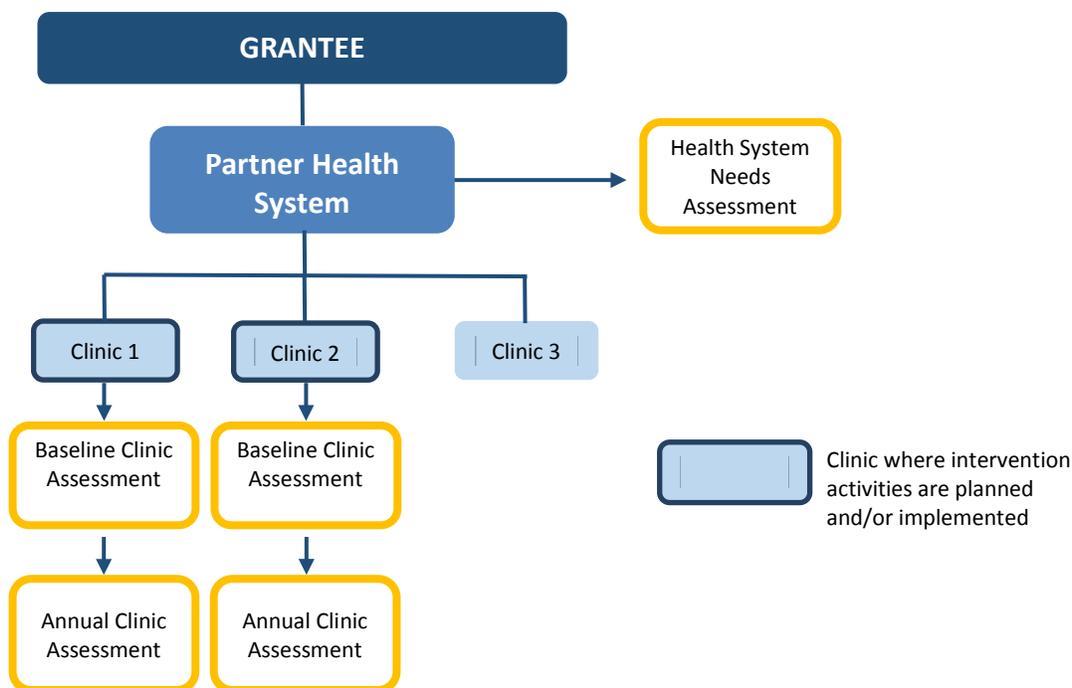
Selecting a CRC Screening Rate Measure and Using It Consistently

This section describes the importance of selecting a specific measure or method to calculate the screening rate at baseline and then using that **same measure** or method consistently throughout the DP15-1502 reporting period. The two options for reporting CRC screening rates are (1) using an existing measure (e.g., Uniform Data System [UDS]) or (2) calculating a new rate based on the National Quality Forum (NQF)-endorsed measure. As part of initial assessment efforts conducted with a partner health system, identify the option most appropriate for each clinic where CRCCP program activities are planned.

Selecting a CRC Screening Rate Measure

Several performance measures exist to monitor CRC screening rates within a health system or clinic. The table at the end of this document provides a comprehensive overview of these measures. If a health system clinic already reports one of these measures (e.g., UDS), then that measure may be reported to CDC. This is intended to facilitate partnership development and build on the existing health system or clinic structure. However, CDC encourages grantees to work closely with partners to improve reporting quality, particularly if there is evidence of imprecision or inconsistency in CRC screening rate reporting (see EHR validation on page 5).

When using an existing CRC screening rate measure such as UDS for a given clinic, report the measure for the same 12-month time period as was reported to the external system. Follow the same guidelines recommended for calculating that measure (see Table on page 9). For example, if a grantee is partnering with a FQHC that has six individual clinic sites and is implementing program activities in four of them, report the UDS screening rates to CDC for the time period January—December for each of the four clinics. If a single, aggregate screening rate for the entire health system (representing all six clinics) was reported by the FQHC to HRSA, **the clinic-level rate for each of the four clinics must be provided to CDC**. Again, report the values representing the same 12-month measurement year that was used to report to HRSA. **Do not** report a number that has been updated to represent a different or longer measurement year. **Important Note***:* In CDC's data collection, grantees will report both the numerator and denominator population sizes (raw data) at baseline and annually.

Baseline Time Period

Grantees need to determine a baseline CRC screening rate for each participating clinic **before** implementing CRCCP program activities. Specifically, the baseline measurement year needs to represent the most recent 12-month measurement year that precedes intervention activities. For example, if a grantee begins implementing program activities in a given FQHC clinic in November 2015, a baseline screening rate (e.g., UDS) for the time period January 2014—December 2014 is reported. **Once baseline clinic data are collected and reported, track the month that CRCCP activities are implemented in each clinic**. This information is provided to CDC as part of your annual clinic data reporting and will aid future analysis to assess the effects of the CRCCP.

Reporting an Annual Screening Rate

Once a baseline screening rate is reported for a given clinic, provide CDC an annual screening rate for that clinic through the end of the 5-year program period, regardless of whether the program remains actively engaged in implementing program activities for that entire period. For instance, a clinic in program year 1 may be identified, and, based on assessment activities, may put into place patient and provider reminder systems along with using small media over a 3-year period to improve screening rates. In this scenario, a baseline screening rate for the clinic before implementing activities would be reported followed by an annual screening rate for all 5 years. This will allow grantees and CDC to assess the full effect of the EBIs that were implemented over the program period.

Note: CDC is requiring that grantees report screening rates annually. However, grantees may choose to monitor these rates more frequently.

Measuring Consistently

Grantees may use different CRC screening measures for different clinics (e.g., UDS for Clinic 1, government performance and results act [GPRA] for Clinic 2). However, after selecting the most appropriate measure for a given clinic, **use that same measure (and calculation) and the same 12-month measurement year for reporting in all subsequent years.** For example, if the UDS CRC screening measure is used as the baseline screening rate for Clinic 1 for the 2015 calendar year (January 1, 2015–December 31, 2015), the UDS CRC screening measure needs to be reported for that clinic for all subsequent years (calendar years 2016, 2017, 2018, etc.). The 12-month measurement year for the screening measure does **not** need to match the CRCCP program year.

Calculating NQF-Endorsed CRC Screening Rate Measure

As of December 2014, the NQF-endorsed measure is the National Committee for Quality Assurance (NCQA) measure for CRC screening (i.e., HEDIS measure).[1] If a grantee's partner health system or clinic does not currently report an existing CRC screening measure, or prefers to use a measure different from what is normally reported, CDC recommends that grantees follow the NQF's endorsed measure definition. Please follow the guidance below to calculate this measure.

Step 1. Determining the Measurement Year

The NQF-endorsed measure uses the calendar year as the measurement year (January 1—December 31).

Step 2. The NQF-Endorsed CRC Screening Rate Measure Definition

The NQF describes the CRC screening rate measure as the percentage of patients 50–75 years of age who are up-to-date with appropriate screening for colorectal cancer. The screening rate needs to be calculated using the numerator and denominator definitions described below. As a reminder, both the numerator and denominator population sizes, not just the screening rate, need to be reported to CDC at baseline and annually.

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[1] For more information regarding NQF (including background information, measure definitions, and relevant CPT codes) visit www.qualityforum.org/Measures_Reports_Tools.aspx.

Step 3. Defining the Denominator

The denominator is the number of patients aged 51–75[2] years with a medical visit during the measurement year.

> #### NOTE: Exclusionary criteria
> Exclude patients with a diagnosis of colorectal cancer or total colectomy from the calculation.

Step 4. Defining the Numerator

The numerator is the number of patients aged 51–75 years with 1 or more appropriate screenings for colorectal cancer, who had at least 1 medical visit during the measurement year.

> #### What Is Appropriate CRC Screening?
> Appropriate screening is defined as having any of the following CRC screening tests:
>
> - **Fecal occult blood test** (**FOBT)**, including fecal immunochemical test (FIT), during the measurement year.
> - **Flexible sigmoidoscopy** during the measurement year or the 4 years before the measurement year.
> - **Colonoscopy** during the measurement year or the 9 years before the measurement year.

Measurement Considerations for FOBT/FIT

To qualify as receiving appropriate screening, sufficient evidence of a test kit receipt and lab processing is needed. Evidence solely of mailing a FOBT/FIT kit to a patient or use of in-office obtained stool specimens (i.e., digital rectal exam) are **insufficient**. As an additional quality consideration, adhere to the quality criteria for a given kit type regarding the number of fecal samples required. Information available in the patient medical chart, including patient-reported screening history, represents adequate evidence of appropriate screening as long as a test date is recorded in the medical record or chart.

Measurement Considerations When Using Electronic Health Records (EHRs)

Health system use of EHRs is increasing. A functional EHR system, especially in clinics with large patient populations, is integral to building an organized screening system. EHRs may represent a potential source of data for calculating CRC screening rates. The accuracy of data extracted from EHRs can vary for many reasons, including how data are documented and entered into the EHR. Grantees are encouraged to work with partner health systems to improve the accuracy of EHR-generated CRC screening rates and improve its functional use.

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[2]Although the measure definition encompasses ages 50–75, the actual calculation covers patients ages 51–75 to allow people to be screened within a year of turning 50 and before reaching the age of 75. For example, if a grantee's 12-month measurement year runs from January 1, 2015—December 31, 2015, only patients with a date of birth between January 1, 1941, and December 31, 1964, are included in the calculation.

The National Colorectal Cancer Roundtable's (NCCRT) summary report, *Use of Electronic Medical Records to Facilitate Colorectal Cancer Screening in Community Health Centers*[3] documents several other potential problems that could lead to calculating an inaccurate CRC screening rate using EHRs. Potential problems may include a system not optimized for easy CRC screening tracking, poor documentation of previous screening received outside of the health system, lack of ongoing training for staff, and family history data not easily accessible. Refer to this guide for additional information that may help to diminish the effect of these problems on extracting data from EHRs.

Assess the quality of the EHR system to determine whether it can be used to calculate a CRC screening rate for reporting to CDC. CDC suggests that the EHR system adhere to the following criteria:

- **Length of time the EHR has been operational.** Preferably, an EHR system needs to be fully operational for at least 2 calendar years (or data for this time period must be imported into the system). If this criterion is not met, conducting a medical chart review is recommended as an alternative to calculate a CRC screening rate.
- **Format of data.** The EHR system needs to have the functionality to identify all CRC screening tests performed in the clinic or by other providers within a specified timeframe. For instance, assess whether data are input into a specific data field or fields or if CRC screening test results have been scanned into the EHR. Also, determine whether the data fields being used are used consistently across providers. The EHR must be able to be effectively queried and accurate data extracted from these fields.
- **Identify exclusions.** The EHR system needs to allow for exclusions as part of a query (e.g., patients who have had colorectal cancer or a colectomy).
- **Comprehensive collection.** The EHR system needs to be able to identify CRC screening data from prior years in order to determine if patients meet standards of being up-to-date with appropriate screening.

Validating the EHR Rate

Validation is an important step in determining the accuracy of the EHR-generated screening rate. Given the EHR issues described above, EHR-generated screening rates may be underreporting the actual screening rate. To validate the accuracy of an EHR-generated CRC screening rate, we recommend comparisons with a screening rate calculated via medical chart review. This type of validation is especially beneficial for EHR systems that have been in place for a short amount of time (less than 2 years) or have not been able to meet the criteria previously detailed. EHR validation is an ongoing process, not a one-time event. Validation may require multiple iterations to achieve accuracy in the EHR-generated CRC screening rate. Thus, the process of validating a clinic's EHR system may overlap with the implementation of EBIs and supportive activities. If discrepancies between the EHR rate and the chart review rate exist, grantees may choose to report medical chart review results to CDC. Validation results can subsequently be used to make improvements or enhancements to the EHR system. Once the

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[3] National Colorectal Cancer Roundtable, American Cancer Society, and National Association of Community Health Centers. *Use of Electronic Medical Records to Facilitate Colorectal Cancer Screening in Community Health Centers*. Access report at http://nccrt.org/about/disparities/report-on-use-of-electronic-medical-records-to-facilitate-colorectal-cancer-screening-in-community-health-centers/.

EHR has been improved or enhanced and the system is able to produce an accurate CRC screening rate, it can be used for reporting to CDC.

Using Medical Chart Review to Estimate a CRC Screening Rate

Guidance for conducting a medical chart review or abstraction is detailed below. This process can also be followed when conducting medical chart reviews to validate an EHR. For more specific information and tools (including Chart Audit Sample Templates), refer to the NCCRT's manual *Steps for Increasing Colorectal Cancer Screening Rates: A Manual for Community Health Centers.* While this manual is set in the context of community health centers, information related to sampling methods and tracking chart audits can be applied to other types of health systems.

Proportion of Medical Charts to Review

To ensure an accurate CRC screening rate, determine the appropriate number of charts to review before initiating the medical chart review process. Many statistically rigorous approaches can be used, such as specifying the confidence level and measurement of error based on the clinic population size. Apply these approaches if the necessary capacity exists or there is access to staff with statistical expertise. If those resources are unavailable, then, at a minimum, conduct a review of 10% of the medical charts for adults meeting the denominator definition for the measure used (e.g., for UDS, 10% of charts for adults aged 51–74, who had at least 1 medical visit during the measurement year). If the clinic population for that group (e.g., adults aged 51–74) exceeds 1,000 patients, then the sample can be limited to 100 patients. Because CDC requires reporting of clinic-level screening rates, draw a sample from *each clinic* where CRCCP intervention activities are planned or implemented. The number of charts reviewed will be used as the denominator for screening rate calculations. **Note:** Remember to oversample (i.e., pull more medical charts than the number initially identified) in order to account for patients who need to be excluded from the denominator (i.e., those patients with a previous diagnosis of CRC or total colectomy).

Selecting Appropriate Charts

This section describes the process for selecting medical charts that will be used to draw a sample. The selection process includes determining the appropriate population, identifying the number to sample, conducting a random or systematic sample, identifying available data sources, or replacing excluded patients.

Determine the Sampling Frame

The sampling frame includes all patients in the clinic population for which it is appropriate to sample. The sampling frame provides the larger patient population list from which samples will be pulled. Inclusion criteria must be identified before generating the list of patients. One important criterion is that the sampling frame must include all patients who had at least 1 medical visit during the 12-month measurement year. Additional criteria can be added as appropriate (e.g., the sampling frame must include patients who received contracted medical services during the 12-month measurement year). A

patient initially listed in the sampling frame may need to be removed if, upon further inspection, he or she was included by mistake or does not meet the predetermined inclusion criteria.

Sampling Method

After determining the appropriate population to sample (sampling frame), select a sampling method that will generate a representative sample of the entire population of patients who meet the selection criteria. Random sampling or systematic sampling are two recommended options. A random sample takes a randomly assigned subset of the population identified in the sampling frame. This is typically accomplished through generating a random number that will be assigned to each patient in the sampling frame. This can be accomplished in many ways (e.g., random number table, Web application, or computer software such as Microsoft Excel).

A systematic sample orders every patient (i.e., alphabetically, by ID) in the sampling frame and then selects every n^{th} patient. A general rule is to take the number of patients in the sampling frame and divide by the number of patients needed in the sample to determine the best interval. For example, if a clinic contains 800 patients in the sampling frame and needs to include 10% (or 80 patients) in the sample, divide 800 by 80 and select every 10th patient. A small percentage (1%–5%) of patients may need to be selected to use as a replacement; for example, if those patients initially selected do not meet criteria or they meet some exclusion criteria.

Measurement Year

The defined 12-month measurement year is used as the basis for the medical chart abstraction. Do not extract data prior to the end of the measurement year because this could exclude patients who are screened toward the end of the measurement year. We recommend conducting the abstraction within 2 months after the end of the measurement year. For example, if the measurement year runs from January 1, 2015 to December 31, 2015, complete chart reviews between January 1, 2016, and March 1, 2016.

Additional Considerations

Assessing Data Reliability

No one method for abstracting data is perfect. CDC anticipates limitations and challenges in calculating a screening rate regardless of the method used (medical chart abstraction, EHR-generated rate). We also anticipate that CRC screening rate estimates may improve over time as a health system's EHR improves or chart abstraction methods are strengthened. Consequently, when calculating a CRC screening rate, it will be beneficial to assess the perceived reliability of the data reported. Identifying and documenting potential issues with the collection or extraction of CRC screening rate data will provide important context to changes in these rates over time. Additionally, CDC will ask grantees to report on the reliability of the screening rate data reported.

Tools and Resources

The following list of resources (many of which are referenced in this document) may be helpful when collaborating with health system partners and clinics:

- National Colorectal Cancer Roundtable and American Cancer Society. *Steps for Increasing Colorectal Cancer Screening Rates: A Manual for Community Health Centers.* http://nccrt.org/about/provider-education/manual-for-community-health-centers-2/.
- National Colorectal Cancer Roundtable, American Cancer Society, and National Association of Community Health Centers. *Use of Electronic Medical Records to Facilitate Colorectal Cancer Screening in Community Health Centers*. http://nccrt.org/about/disparities/report-on-use-of-electronic-medical-records-to-facilitate-colorectal-cancer-screening-in-community-health-centers/.
- Centers for Disease Control and Prevention. *Increasing Colorectal Cancer Screening: An Action Guide for Working with Health Systems. https://www.cdc.gov/cancer/crccp/action-guides.htm.*

Sources

Information in this document was informed by the following sources:

- DP15-1502 FOA: Organized Approaches to Increasing Cancer Screening.
- National Colorectal Cancer Roundtable, American Cancer Society, and National Association of Community Health Centers report: *Use of Electronic Medical Records to Facilitate Colorectal Cancer Screening in Community Health Centers.*
- American Cancer Society and National Colorectal Cancer Roundtable's manual: *Steps for Increasing Colorectal Cancer Rates: A Manual for Community Health Centers.*
- National Quality Forum's (NQF) Quality Positioning System.
- NCQA's Healthcare Effectiveness Data and Information Set (HEDIS) 2015 Performance Measurement Specifications.
- HRSA's Uniform Data System (UDS) 2014 manual: *Reporting Instructions for Health Centers.*
- IHS' Clinical Reporting System's 2013 National GPRA Developmental Report.

Table. Colorectal Cancer Screening Rate Measures

Measure	Reporting Period	Performance Measure	Numerator	Denominator	Appropriate Screening Definition
Government Performance and Results Act (GPRA).	July 1–June 30.	Proportion of clinically appropriate patients 50 through 75 years of age who have received colorectal screening.	Patients who have had ANY CRC screening.	Active clinical patients 50–75 years of age without a documented history of colorectal cancer or total colectomy.	Fecal occult blood test (FOBT) or fecal immunochemical test (FIT) during report period, flexible sigmoidoscopy in past 5 years, or colonoscopy in past 10 years.
Health Care Effectiveness Data and Information Set (HEDIS).	January 1–December 31. Measures reported to NCQA[a] annually in June.	Percentage of adults 50–75 years of age who had appropriate screening for colorectal cancer.	Patients in the denominator who received one or more screenings for colorectal cancer.	All patients 51–75 years of age during the measurement year. Exclusions: Colorectal cancer, total colectomy.	Guaiac or immunochemical (FIT) FOBT during the measurement year, flexible sigmoidoscopy during the measurement year or the 4 years before the measurement year, FIT-DNA test during the measurement year or the 2 years before the measurement year, CT colonography during the measurement year or the 4 years before the measurement year or colonoscopy during the measurement year or the 9 years before the measurement year.
Uniform Data System (UDS).	January 1–December 31. Measures reported to HRSA[b] annually in February.	Percentage of patients 50–75 years of age who had appropriate screening for colorectal cancer.	Number of active patients 51–74 years of age who have received appropriate colorectal cancer screening.	Number of patients who were 51–74 years of age at some point during the measurement year, who had at least 1 medical visit during the reporting year. Exclusions: Have or have had colorectal cancer.	Guaiac-based FOBT, or FIT, during the measurement year, flexible sigmoidoscopy during measurement year or previous 4 years, or colonoscopy during measurement year or previous 9 years.
National Quality Forum (NQF)-Endorsed Measure.	January 1–December 31.	Percentage of adults 50–75 years of age who had appropriate screening for colorectal cancer.	Number of patients 51–75 years of age with 1 or more screenings for colorectal cancer.	Number of patients 51–75 years of age with a visit during the measurement year. Exclusions: Colorectal cancer, total colectomy	FOBT—including FIT—during the measurement year, flexible sigmoidoscopy during the measurement year or the 4 years prior to the measurement year, or colonoscopy during the measurement year or the nine years before the measurement year.

[a] National Committee for Quality Assurance (NCQA)   [b] Health Resources and Services Administration (HRSA)