



**Hospital Inpatient Quality Reporting (IQR) Program**  
**Inpatient Value, Incentives, and Quality Reporting (VIQR)**  
**Outreach and Education Support Contractor**

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**Hospital Inpatient Quality Program Measures:  
Understanding Population and Sampling**

**Presentation Transcript**

**Speaker**

**Candace Jackson, ADN**  
Project Lead, Hospital IQR Program  
Inpatient VIQR Outreach and Education Support Contractor (SC)

**March 30, 2022**

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**Candace Jackson:** Hello and thank you for tuning into the *Hospital Inpatient Quality Program Measures: Understanding Population and Sampling On Demand* webinar. My name is Candace Jackson, and I am the Hospital Inpatient Quality Reporting Program Lead for the Inpatient Value, Incentives, and Quality Reporting Outreach and Education Support Contractor. I will be your virtual host and speaker for the webinar.

This presentation will provide an overview of the Initial Patient Population and sampling for the Hospital Inpatient Quality Reporting Program.

At the conclusion of today's event, participants will be able to understand how the Initial Patient Population is determined, the sampling, sample size requirements, sampling approaches, and the required data that is submitted to CMS.

This slide lists the acronyms that will be used throughout the presentation.

As stated in the slide, if you have questions that did not get addressed during this presentation, please submit your question to the [QualityNet Inpatient Question and Answer Tool](#) at the link provided in the slide.

Defining the population is the first step to estimate a hospital's performance. A population is generally defined as a collection of patients sharing a common set of universally measured characteristics, such as an ICD-10 principal diagnosis or procedure code.

An Initial Patient Population refers to all patients, Medicare and non-Medicare, who share a common set of specified, administratively derived data elements, with a length of stay less than or equal to 120 days, which is determined by taking the admission date minus the discharge date. This may include ICD-10 diagnosis codes or other population characteristics such as age. For example, the population for the Sepsis measure set includes all patients with an ICD-10 Principal or Other Diagnosis Code as defined in Appendix A, Table 4.01, an ICD-10 Principal or Other Diagnosis Code not equal to U07.1, which is COVID-19, and a Patient Age, which is the Admission Date minus the Birthdate, greater than or equal to 18 years.

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The Initial Patient Population identification process must be completed prior to the application of data integrity filters, measure exclusions, and the application of sampling methodology.

I would just like to note that cases that are greater than 120 days are excluded from the Initial Patient Population due to the probability of crossing over specifications manuals which inappropriately fail or pass cases due to abstraction and algorithm changes to the measure. The specifications manual does not direct what method or methods a hospital must use to determine the Initial Patient Population; however, hospitals typically use the claims data, or the UB, Uniform Billing 04 form, to identify the appropriate cases. The UB-04, the Uniform Billing form, is the standard claim form that any institutional provider can use for the billing of inpatient or outpatient medical and mental health claims. The UB-04 identifies if the case is an inpatient or outpatient episode of care, which only inpatient episodes of care are included in the Initial Patient Population, the patient's birthdate, the admission and discharge date, the principal and other diagnosis codes, and the principal and other procedure codes. There is one thing to note. The UB also contains the episode of care from and through dates for that episode. The "through" date is typically the discharge date but the "from" date is not necessarily the admission date.

Sampling is a process of selecting a representative part of a population in order to estimate the hospital's performance, without collecting data for its entire population. Using a statistically valid sample, a hospital can measure its performance in an effective and efficient manner. Sampling is a particularly useful technique for performance measures that require primary data collection from a source such as the medical record. Sampling should not be used unless the hospital has a large number of cases in the Initial Patient Population because a fairly large number of sample cases are needed to achieve a representative sample of the population. For the purpose of sampling the CMS inpatient measures, the term "sample" is defined as a fraction of the population that is selected for further study, and the term "case" is defined a single record or episode of care within the population.

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To obtain statistically valid sample data, the sample size should be carefully determined, and the sample cases should be randomly selected in such a way that the individual cases in the population have an equal chance of being selected. Each hospital is ultimately responsible that sampling techniques applied for their hospital adhere to the sampling requirements outlined in the specifications manual. Sampling is done by measure sets. For the Hospital Inpatient Quality Reporting Program, only the Sepsis measure set is required and is allowed to be submitted to the *HQR Secure Portal*. For measures requiring medical record abstraction, sampling must be done using available databases that contain all discharges for the transmission quarter. It is important to note that hospitals are not required to sample their data. If sampling offers minimal benefit—for example, if a hospital has 80 cases for the quarter and must select a sample of 76 cases—the hospital may choose to use all cases. There is a data flow or process that hospitals should use to determine the cases that should be sent to the *HQR Secure Portal*. The first step is to identify the Initial Patient Population for the measure set by using administrative data. Second, if the hospital is sampling, use the identified Initial Patient Population to pull the sample of medical records for the measure set using the Sample Size Requirements defined in the appropriate Measure Information section of the manual. Lastly, collect or abstract from the identified medical records the general- and measure-specific data elements that are needed for the measure set. The count of the number of cases used in this step is collected in the sample size data elements.

Hospitals that choose to sample have the option of sampling monthly or quarterly. The sample sizes are different between monthly and quarterly sampling. So, if you are doing monthly sampling and you add up the sample size for all three months in the quarter, it may not match the quarterly sample size. For example, for the sepsis measure, if your monthly population size was 9 for January, 50 for February, and 41 for March, the total population would be 100. If you are sampling monthly, then your monthly sample sizes would be 9 for January, 10 for February, and 10 for March, which would be a total of 29 cases to sample. If you are doing quarterly sampling then you would be required to sample 30 cases.

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Just as a note, when determining your sample size, depending on your population size, you may be required to sample a certain percentage of your population. For example, for the sepsis measure set, if your population size is between 151 and 300, you are required to submit 20 percent of the population. This may result in a number that includes a decimal point. In this case, you should use the next highest whole number as your sample size. For example, if your sample size comes to 80.2, you would round that up and abstract 81 cases. Regardless of the option used, hospital samples must be monitored to ensure that sampling procedures consistently produce statistically valid and useful data. Due to measure exclusions, hospitals selecting sample cases must submit at least the minimum required sample size. The sample size tables for each option automatically build the number of cases needed to obtain the statistically required sample sizes. I would just like to note here that sampled cases that are excluded from the measure denominator are still considered part of the Initial Patient Population and are still submitted to the *HQR Secure Portal*. For example, if you sampled 10 cases and 9 of those cases were excluded from the measure denominator, you would still submit those 9 cases to the secure portal, and you would not have to abstract any additional cases. Hospitals that sample, must sample by their CMS Certification Number, or CCN. That means if you have more than one campus or hospital that is under one CCN, then they would submit one sample for that CCN. Also, a hospital may choose to use a larger sample size than is required. As such, a hospital can choose to submit a larger number of cases than are required or could submit 100 percent of their cases. Hospitals whose Initial Patient Population size is less than the minimum number of cases per quarter or month for the measure set cannot sample. For example, for sepsis, if your population size is between 6 and 29 for the quarter, you cannot sample and must submit 100 percent of your cases. However, hospitals that have five or fewer Sepsis discharges, both Medicare and non-Medicare combined, are not required to submit patient-level data to the *HQR Secure Portal*. For example, if your population size is 4, you can choose to not submit any cases, you could submit all 4 cases, or you could submit 1, 2, or 3 of the cases.

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To determine the sepsis sample size requirements, you will need to refer to the Sample Size Requirement tables provided in the sepsis Measure Information section.

When determining if the hospital has submitted the minimum number of cases required, CMS will use the greater of the population size and the Medicare Claims Count that displays on the Provider Participation Report. So, like in the example on the slide, if your reported population size is 7 and your Medicare Claims count is 0, CMS would use the population size; if your reported population size is 0 but your Medicare Claims Count is 7, then CMS would use the Medicare Claims Count. The Medicare Claims Count on the Provider Participation Report includes only those claims that are pure Medicare, meaning they are Medicare Part A only and those that are in a final status. This count will most likely be different from Medicare Initial Patient Population size, which we will discuss later in this presentation. You can check what cases are included in the Medicare Claims Count by running the Medicare Claims Feedback report within the *HQR Secure Portal*. You can do this by logging into the *HQR Secure Portal* on the home page, left-hand task bar. Under Data Results, click on Chart-Abstracted. On the Data Results Chart-Abstracted page, select Claims Detail. Under Programs, select IQR and the appropriate quarter. Then, click on Export CSV. The report provides the patient's Medicare Beneficiary Number, the claim's start and end date, the patient's first and last name, the birth date, and gender.

Hospitals that choose to sample must ensure that the sampled data must represent their Initial Patient Population by either using the simple random sampling or the systematic random sampling method and that the sampling technique are applied consistently within a quarter. For example, if you are sampling monthly for January, then you must also do monthly sampling for February and March. This slide outlines the two sampling approaches that must be used when sampling for the IQR measures.

Let's go over an example of each of the sampling approaches. Let's say that you have an Initial Patient Population size of 350 for the quarter and the sample size is 78.

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To select a random sample of 78 patients, if using the simple random approach, you would generate random numbers for individual patient records from a random number function using a statistical software package or computer programming language. Then, you would sort the data by the random numbers either in an increasing or decreasing order. If using the systematic random sampling approach, you would divide the Initial Patient Population size by the sample size and take the quotient as the sampling interval  $k$ . In our example of having a population size of 350 and sample size of 78, the sampling interval  $k$  equals 350 divided by 78 which equals 4.5. Thus, every fourth patient record would be selected from the Initial Patient Population until 78 cases are selected. To ensure that each patient record has an equal chance of being selected, the “starting point” must be randomly determined before selecting every fourth patient record. This can be done using a computer random number generator or a random number table to randomly choose a number between 1 and 4 as the starting point. Each hospital is ultimately responsible that sampling techniques applied for their hospital adhere to the sampling requirements outlined in the specifications manual.

CMS requires the transmission of Initial Patient Population and sample count data for all chart-abstracted measure sets, which currently is just the sepsis measure set. The sampling data can be submitted by either an XML file or directly into the population and sampling data form within the *HQR Secure Portal*. If submitting XML files, each file may contain data for only one provider. When submitting the data, it is required to contain all three months within the quarter. If the aggregate population count is 0, meaning the hospital has no cases for that measure set, the hospital is still required to submit the Hospital Inpatient Population Data file and would submit 0 as the population and sample counts. In addition, the Initial Inpatient Population Data file must be transmitted to CMS even if the hospital has elected to not report the patient data when they have five or fewer cases for a measure set during the quarter. Hospitals are required to submit the Medicare and Non-Medicare Population Size and the Medicare and Non-Medicare Sample Size for each month in the quarter.

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Dates in this field should reflect the discharge time period related to the data being submitted. Time period start and end dates must reflect full month increments and may not be greater than one month. Files submitted to the *HQR Secure Portal* are required to contain three monthly time periods which comprise the calendar quarter for which data is being submitted. Along with the population and sample sizes, you are also required to submit the Sampling Frequency that was applied. Files submitted with time periods that do not meet these requirements will be rejected from the *HQR Secure Portal*. We'll go over each of these briefly.

The Initial Patient Population Size – Medicare includes all patients that are billed under Medicare or Title 18. Medicare can be listed as a primary, secondary, tertiary, or lower on the list of payment sources for the patient. In addition, patients who are participating as a member of a Medicare HMO/Medicare Advantage are included in the Medicare counts—for example, Medicare Blue, Humana Gold, Secure Horizons, AARP, Coventry Advantra, etc. You would also include things like Medicare Fee for Service, Medicare Secondary Payer, Railroad Retirement, Black Lung, and ESRD under the Medicare Initial Patient Population. All other cases would be included in the Initial Patient Population – Non-Medicare counts. The same logic would apply for the Sample Size – Medicare and Sample Size – Non-Medicare counts. So, from this, you can see why the Medicare Claims Count on the Provider Participation Report is not going to match the cases in the Medicare Initial Patient Population. The Sampling Frequency indicates if the data being transmitted for a hospital has been sampled either monthly or quarterly, if the hospital is not sampling and submitting 100 percent of their records or not applicable due to the hospital not being required to submit patient-level data. There are several resources available in the *HQR Secure Portal* to verify you have submitted your population and sampling data. On the HQR home page, on the left-side task bar, select Data Submissions. Select the Population and Sampling tab and Data Form. Under the Data Form, select IQR and Launch Data Form. Select the quarter under the reporting period. This will tell you if you have submitted the data or not. You can click on IQR Sepsis to view the data that were submitted.



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Additionally, you can run the Population and Sampling Report by going to Data Results and Population and Sampling. Select IQR and the quarter, and click on Export CSV. This report will display if you have submitted data or not. Then you can also check your Provider Participation Report.

That concludes our presentation. We hope that you found this information beneficial. If you did find this beneficial, we encourage you to view the other two specifications manual webinars in this series: [\*Hospital Inpatient Quality Program Measures Overview\*](#) and the [\*Sepsis Measure Information Form and Algorithm Overview\*](#). Again, if you have questions that are pertinent to the webinar topic, please submit them to the QualityNet Inpatient Question and Answer Tool. Thank you for watching our On Demand webinar. We hope you have a great day.