

# Constructing a Sample

## Participant training objectives:

- To understand the purpose of sampling during data collection
- To be able to draw a random sample for a quality improvement project
- To consider how to better define the facility's sampling methodology

## Target audience:

Quality committee members, QI project team members, and other staff involved in the data collection phase of quality improvement projects

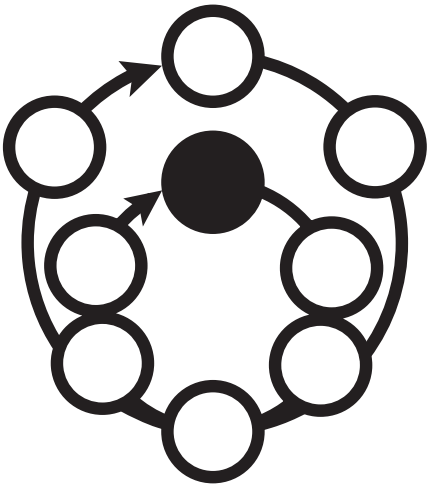
## Type of exercise:

Scenario; group exercise, 60 minutes

## Key concepts:

By sampling data, teams make inferences about a large group based on observations of a smaller subset of that group. A basic methodology for constructing a sample is to:

- Define selection criteria
- Identify eligible cases
- Randomly select cases



## The Big Picture:

Baseline data helps to define the current state, thereby providing the information needed to make informed improvement decisions. In case an HIV program cannot easily and accurately access data electronically from their entire caseload, e.g. through electronic medical record systems, sampling data is a logical alternative. By sampling data, teams can make inferences about a large group (total population) based on observations of a smaller subset of that group (sample).

SESSION AT-A-GLANCE	WHO	HOW LONG
1. Welcome, Learning Objectives, Agenda	Facilitator	5 minutes
2. QI Background: Methodology for Sample Construction	Facilitator	10 minutes
3. Group Exercise: Scenario	Participants	30 minutes
4. Learning Transfer: Worksheet	Participants	10 minutes
5. Wrap-up	All	5 minutes
		60 minutes

## Materials

For this group learning session, you will need the following materials:

- Participant handouts:
  - Scenari
  - Learning Transfer Worksheet
  - Copy of slide presentation
- Flipchart paper and markers
- Overhead projector/LCD panel (optional)
- Wipeboard/chalkboard (optional)

## Preparation

To prepare for the group learning session, complete the following tasks:

Familiarize yourself with the session's structure and content:

- Read through the Group Exercise notes in their entirety, including the exercise answer key, presentation slides, and participant handouts.
- Practice the presentation outlined in the Group Exercise notes.

Photocopy the Scenario, Learning Transfer Worksheet, and slide presentation for each participant.

Prepare your presentation slides for display:

- Photocopy the slides, or write the slide content on transparencies or on flipchart paper.
- For display using an LCD panel, enter the content into a computer file.

Prepare the training room:

- Arrange the tables and chairs in a circle or square shape, if possible.
- Make sure you have flipchart paper and a marker.
- Set up and test equipment (e.g. overhead projector), if applicable.
- Make sure you have enough chalk or wipeboard markers, if applicable.

## Notes

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# Constructing a Sample: Group Exercise

## Welcome and Introductions

To begin the group learning session, welcome participants and thank them for their participation. If necessary, ask individuals to introduce themselves to the group.

### Learning Objectives

Tell participants that by the end of the session they will:

- Understand the purpose of sampling during data collection
- Be able to draw a random sample for a quality improvement project
- Have at least one idea for how to better define the facility's sampling methodology


## Agenda


Provide a brief description of the session's primary components:

- Presentation of a methodology for constructing a sample
- Group exercise on how to construct a sample
- Learning Transfer Worksheet to help generate ideas for defining the facility's sampling methodology on-the-job

## Quality Improvement Background

Distribute a copy of the slides to each participant for note taking and/or future reference.

-  Begin by explaining that sampling allows teams to make inferences about a total patient population based on observations of a smaller subset of that group (i.e. the sample), saving both time and resources during data collection.

-  Introduce and explain the methodology for defining a sample population and constructing a sample:

### Define selection criteria.

Explain that during this step, project teams create selection criteria. For example, the criteria could specify:

- Gender: Does the study apply exclusively to men, women, or both?
- Age: Are there particular age limits?
- Patient condition: Is a confirmed diagnosis required, or simply symptoms or signs? Do certain conditions make the patient ineligible?
- Treatment status: How many visits are required for eligibility? Must the patient currently be in treatment? Must the treatment have occurred within a certain time frame?

### Identify eligible cases.

Explain that during this step, project teams separate out the medical records that are eligible for measurement based on the selection criteria, as described earlier.

### Randomly select cases.

Explain that the minimum sample size for an accurate measurement is based on the number of eligible cases. Some facilities use pre-existing sample tables to determine a project's minimum sample size while others calculate the minimum size based on their own requirements.

### Getting Started

Divide the participants into teams of roughly equal size, 4-6 people per group. You can assign participants to teams yourself or ask them to count off by a given number and form teams with other participants who have the same number.



### Scenario Group Exercise

Distribute the scenario to each participant and provide directions for completing the exercise:

- Read the scenario individually and skim the handouts which accompany the exercise. (10 minutes)
- As a group, answer the questions using the handouts and the information provided in the scenario. (20 minutes)

Assist teams who have problems getting started or become stuck on a particular point. Alert participants when 5 minutes remain so that they are adequately prepared to report back.

### Reporting Back

Call time and read each question out loud, alternating between teams for a response. Write the answers on the flipchart so that everyone can see them.



### Learning Transfer Getting Started

Distribute the worksheet and give participants 5 minutes to complete it.

### Debrief

If time permits, ask participants to individually share one area in which they are doing well and one area in which they could improve.

Finally, ask participants to select one area that requires improvement and to write down one or more things they could do in the next month to better define the facility's sampling methodology.



### Wrap-up

Ask participants to provide feedback on whether or not they have achieved the objectives introduced at the beginning of the group learning session:

- Understand the purpose of sampling during data collection
- Be able to draw a random sample for a quality improvement project
- Have at least one idea for how to better define the facility's sampling methodology

Schedule an informal follow-up session with any participant(s) who has not reached the objectives.

# Constructing a Sample: Scenario

## Instructions:

Read the scenario and answer the questions that follow based on the information provided.

## Background

An HIV drug treatment clinic measures 4 different indicators of care annually: HIV staging, PCP prophylaxis, antiretroviral therapy, and GYN exams.

A project team is assembled to make the clinic's annual quality of care measurements for January 1, 2005 to December 31, 2005. During an initial meeting, the team defines their selection criteria as all HIV+ patients who have had at least 1 visit within the last 6 months of the study period and who have had more than 1 visit during entire the study period.

To begin the sampling process, the team prints out a list of 82 HIV+ patients and identifies eligible cases. Next, team members use HIVQUAL's standard sampling chart to determine the sample size and select specific cases based on a random number calculation worksheet.

## Define selection criteria

1. Who is the population under study?

\_\_\_\_\_

2. What are the selection criteria?

\_\_\_\_\_

## Identify eligible cases

3. What is the total population of eligible cases?

\_\_\_\_\_

4. Which cases are ineligible? (list medical record numbers)

Male Cases \_\_\_\_\_

Female Cases \_\_\_\_\_

5. What is the minimum number of male/female cases based on the eligible population?

Male Cases \_\_\_\_\_

Female Cases \_\_\_\_\_

## HIV+ Patient List

MR #	AGE	GENDER	FIRST VISIT	MOST RECENT VISIT	MR #	AGE	GENDER	FIRST VISIT	MOST RECENT VISIT
1	23	M	1/21/2005	10/12/2005	42	19	M	1/3/2005	8/24/2005
2	45	M	2/26/2005	9/14/2005	43	21	M	5/6/2005	9/2/2005
3	65	F	1/24/2005	7/16/2005	44	22	F	3/7/2005	7/2/2005
4	34	F	9/17/2005	10/1/2005	45	27	F	5/23/2005	9/25/2005
5	19	M	1/26/2005	9/2/2004	46	26	M	4/24/2005	10/12/2005
6	18	F	6/19/2005	7/14/2005	47	50	F	3/5/2005	10/29/2005
7	45	M	2/13/2005	10/28/2005	48	51	F	6/19/2005	7/1/2005
8	43	F	1/23/2005	10/10/2005	49	46	M	6/1/2005	10/8/2005
9	37	F	8/10/2005	9/20/2005	50	23	F	5/12/2005	9/10/2005
10	26	M	2/2/2005	7/21/2005	51	31	F	6/3/2005	8/3/2005
11	29	F	5/26/2005	7/23/2005	52	27	F	5/6/2005	10/13/2005
12	32	M	1/25/2005	4/22/2005	53	23	F	3/7/2005	9/15/2005
13	31	F	7/14/2005	10/14/2005	54	18	F	5/23/2005	6/21/2005
14	34	F	4/24/2005	7/26/2005	55	22	F	7/24/2005	7/30/2005
15	43	F	2/21/2005	7/7/2005	56	24	F	8/5/2005	10/14/2005
16	32	M	5/17/2005	7/4/2005	57	29	M	6/19/2005	11/8/2005
17	58	F	1/3/2005	3/28/2005	58	32	F	6/1/2005	9/4/2005
18	56	F	8/20/2005	12/6/2005	59	37	M	5/12/2005	9/30/2005
19	55	M	2/20/2005	10/28/2005	60	36	F	3/12/2005	10/4/2005
20	54	F	5/30/2005	10/13/2005	61	33	M	2/12/2005	10/5/2005
21	47	M	5/26/2005	11/23/2005	62	19	F	1/3/2005	9/25/2005
22	32	F	1/25/2005	9/18/2005	63	21	M	5/6/2005	9/2/2005
23	29	F	2/14/2005	7/24/2005	64	22	M	3/7/2005	7/2/2005
24	21	F	4/23/2005	9/1/2005	65	25	M	1/26/2004	9/2/2004
25	22	M	2/21/2004	12/7/2004	66	28	F	7/1/2005	7/14/2005
26	20	F	5/17/2005	11/6/2005	67	35	M	2/13/2005	10/28/2005
27	19	F	8/3/2005	10/2/2005	68	23	F	1/23/2005	10/10/2005
28	51	F	6/20/2005	8/9/2005	69	27	F	8/10/2005	9/20/2005
29	29	M	2/20/2005	7/21/2005	70	36	M	2/2/2005	7/21/2005
30	30	M	5/30/2005	10/28/2005	71	19	F	1/5/2005	8/23/2005
31	31	M	7/3/2005	8/3/2005	72	42	M	1/25/2005	4/22/2005
32	27	M	5/6/2005	10/13/2005	73	41	M	2/14/2005	8/14/2005
33	23	F	3/7/2005	9/15/2005	74	24	M	4/24/2005	7/26/2005
34	18	F	5/23/2005	6/30/2005	75	33	M	2/21/2005	7/7/2005
35	22	F	4/24/2005	12/10/2005	76	22	M	5/17/2005	11/4/2005
36	24	M	3/5/2005	10/14/2005	77	48	F	6/3/2005	7/26/2005
37	29	F	8/19/2005	11/8/2005	78	26	F	6/20/2005	10/6/2005
38	32	F	6/1/2005	9/4/2005	79	25	M	2/20/2005	5/30/2005
39	37	M	5/12/2005	9/30/2005	80	37	M	1/9/2005	4/30/2005
40	36	M	3/12/2005	10/4/2005	81	39	M	2/22/2005	8/14/2005
41	33	M	2/12/2005	11/5/2005	82	27	M	7/5/2005	7/16/2005

## Standard Sampling Table

The following table indicates the minimum number of records to be pulled for chart review based on eligible cases. Using the number of eligible female patients, determine the minimum number of female records needed from the Sampling Table. To determine the number of male records subtract the minimum female records from the total minimum records.

STANDARD SAMPLING TABLE		
TOTAL ELIGIBLE POPULATION	MINIMUM TOTAL RECORDS	CHARTS TO PULL
Up to 20	All	All
21 - 30	24	31
31 - 40	30	39
41 - 50	35	46
51 - 60	39	51
61 - 70	43	56
71 - 80	46	60
81 - 90	49	64
91 - 100	52	68
101 - 119	57	74
120 - 139	61	79
140 - 159	64	83
160 - 179	67	87
180 - 199	70	91
200 - 249	75	98
250 - 299	79	103
300 - 349	82	107
350 - 399	85	111
400 - 449	87	113
450 - 499	88	114
500 - 749	94	122
750 - 999	97	126
1000 - 4999	105	137
5000 or more	107	139

STANDARD SAMPLING TABLE		
TOTAL ELIGIBLE FEMALES	MINIMUM FEMALE RECORDS	CHARTS TO PULL
Up to 20	All	All
21 - 30	24	31
31 - 40	30	39
41 - 50	35	46
51 - 60	39	51
61 - 70	43	56
71 - 80	46	60
81 - 90	49	64
91 - 100	52	68
101 - 119	57	74
120 - 139	61	79
140 - 159	64	83
160 - 179	67	87
180 - 199	70	91
200 - 249	75	98
250 - 299	79	103
300 - 349	82	107
350 - 399	85	111
400 - 449	87	113
450 - 499	88	114
500 - 749	94	122
750 - 999	97	126
1000 - 4999	105	137
5000 or more	107	139

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# Constructing a Sample: Learning Transfer Worksheet

## Instructions:

How does your facility complete each step in the sampling methodology? Using the information from today's session, complete the grid below and briefly describe your strengths and weaknesses.

	DOING WELL	NEED TO DO BETTER
DEFINING SELECTION CRITERIA		
IDENTIFYING ELIGIBLE CASES		
RANDOMLY SELECTING CASES		

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# Constructing a Sample: Answer Key

## Define selection criteria

1. Who is the population under study?
  - HIV+ patients of this drug treatment clinic
2. What are the selection criteria?
  - A patient with at least one visit within the last 6 months of the study period, and more than 1 visit during the study period

## Identify eligible cases

3. What is the total population of eligible cases?
  - 72 cases
4. Which cases are ineligible? (list medical record numbers)
  - Male cases: 5, 12, 25, 65, 70, 72, 80
  - Female cases: 17, 34, 54
5. What is the minimum number of male/female cases based on the eligible population?
  - Male cases: 16 records
  - Female cases: 30 records