

# UNIFORM DATA SYSTEM

Calendar Year 2014



## **UDS SAMPLING METHODS, INCLUDING RANDOMIZER.ORG**

**Bureau of Primary Health Care**

**November 6, 1:30 – 3:00 PM (EST)**

# Agenda



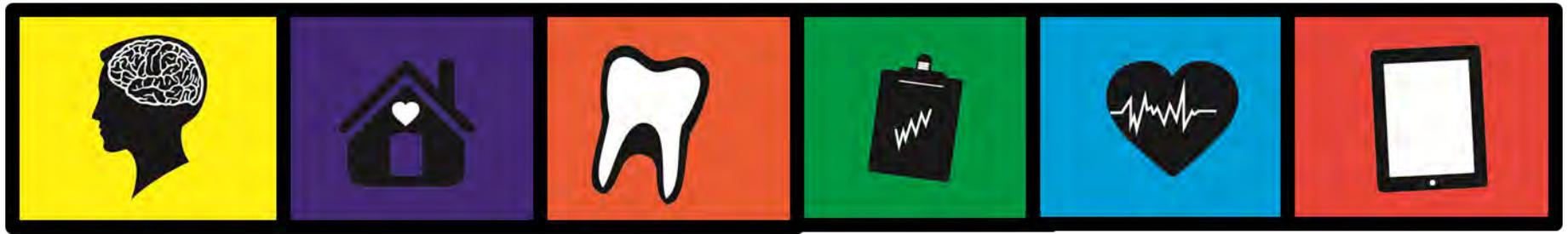
- Why discuss sampling
- Where sampling may be used in the Uniform Data System (UDS)
- Reporting methods
  - Choosing between a sample and the universe of patients for reporting
- For each measure – when to sample
- Identifying a random sample
- Extracting data from clinical records
- Reminders and strategies for successful reporting
- References and available assistance

# Purpose of this Webinar

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- Define the universe and a sample for each of the clinical measures
- Identify when sampling is necessary
- Describe methods for creating a random sample of clinical records
- Discuss some issues to take into consideration when performing a chart review using a sample



# WHY DISCUSS SAMPLING

# Why Discuss Sampling?



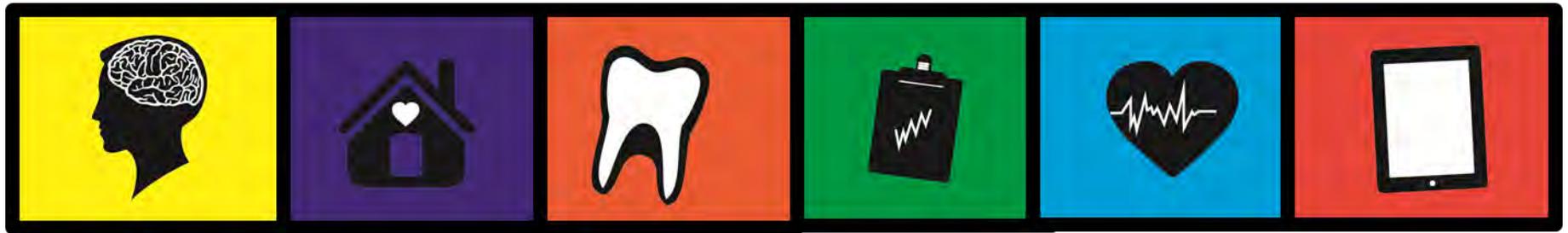
- For 2014, over 1,300 health centers will be reporting on 15 clinical measures
  - the UDS clinical measures represent the full spectrum of comprehensive primary care that health centers are delivering including pediatric, adult, prevention, chronic disease management, behavioral health, and HIV.
- Health centers have different abilities to capture and report on these data

# Why Discuss Sampling? (Continued)

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- Measure alignment is a priority for the BPHC
- Changes/additions to UDS clinical measures may not be fully implemented in existing system
- Reporting on the universe is preferred



# CLINICAL MEASURE TABLES

# Clinical Quality Tables



- Two tables report on the combined 15 clinical measures discussed here:
  - Table 6B: 12 Quality of Care Measures
  - Table 7: 3 Health Outcomes and Disparities Measures
- Note: Sampling is not permitted on Table 6A.
- Other UDS tables similarly do not permit sampling

# Table 6B: Quality of Care Process Measures

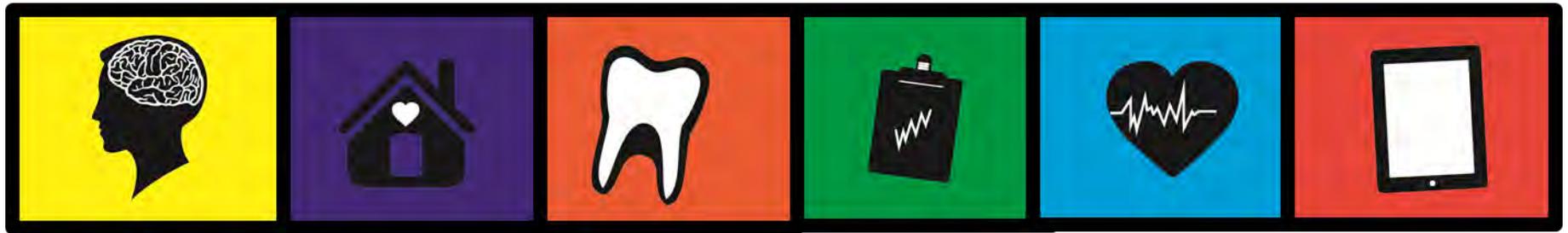


- Purpose of Table
  - Evaluate the extent to which medical patients are receiving appropriate preventive and chronic care.
    - *If* patients receive timely preventive care, *then* we can expect improved health status
- Access to prenatal care (Trimester of entry into prenatal care)
- Childhood immunizations
- Cervical cancer screening
- Child and adolescent weight screening and counseling
- Adult weight screening and follow-up
- Tobacco use screening and cessation intervention
- Asthma pharmacologic therapy
- Coronary artery disease and lipid-lowering therapy
- Ischemic vascular disease and aspirin
- Colorectal cancer screening
- New HIV cases with timely follow-up
- Patients screened for depression and follow-up

# Table 7: Health Outcomes and Disparities



- Purpose of Table
  - Evaluate the extent to which medical patients are receiving clinical intervention using proxy “intermediate outcome” quality of care measures
    - *If* this measurable intermediate outcome is met, *then* later negative health outcomes will be less likely.
  - Intermediate Outcome Measures Evaluated:
    - Birth outcomes (normal birth weight)
    - Blood pressure control (hypertensive patients with blood pressure < 140/90)
    - Diabetes control (diabetic patients with HbA1c  $\leq$  9%)



# WHO, WHAT, AND HOW TO REPORT CLINICAL MEASURES

# Who is Being Evaluated – Reporting the Universe



- The Universe is defined as 100% of the patients who meet the reporting criteria.
  - Must be determined from EHR or other automated system, regardless of the method chosen for reporting the number of patients who meet the measurement standard
- Universe must include all patients across all sites:
  - of specified age(s)
  - with medical visit(s)
  - with specific conditions and exclusions (for specified measures)
  - by race and ethnicity for Table 7

# Measurement Reporting



- Once the universe is defined, it is evaluated to determine the number of patient clinical records that meet the measurement criteria.
- For 13\* of the 15 measures, health centers will report the number of records that met the measurement standards based on *either* the universe of patients *or* a sample.

\* Prenatal care and birth weight outcomes must report on the universe – no sample option.

# Measurement Reporting (Continued)



- Universe is preferred, but not always possible.
- Samples are used if all of the patient records do not show all of the pertinent or historical information needed.
- A sample may include results pulled from automated systems and/or chart reviews.
- The choice is made independently for each of the measures.



# Format Used for Table 6B

- **Column A:** Universe – All patients who meet the reporting criteria.
- **Column B:** Number of charts reviewed
  - The universe – all patients who meet criteria **OR**
  - A sample – 70 randomly selected patients
  - Except for prenatal care where Universe must be reported
  - May select method for each measure independently
- **Column C:** Measurement Standard – Number of records in column B which meet the measurement rules.

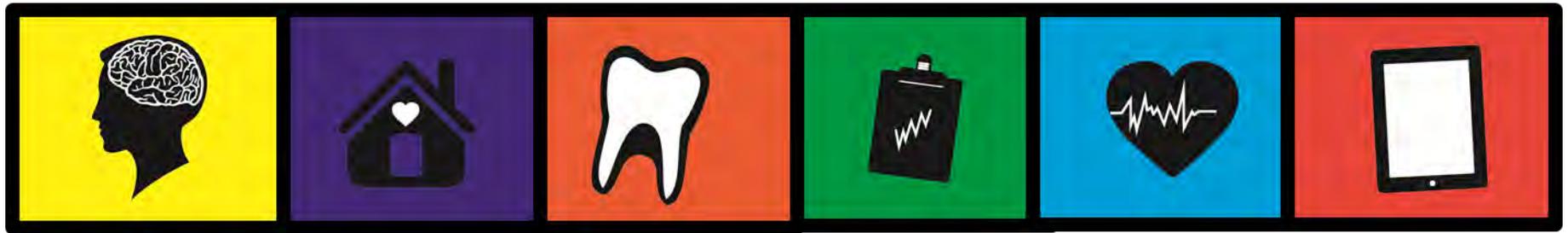
CHILDHOOD IMMUNIZATION		TOTAL NUMBER OF PATIENTS WITH 3 <sup>RD</sup> BIRTHDAY DURING MEASUREMENT YEAR (a)	NUMBER CHARTS SAMPLED OR EHR TOTAL (b)	NUMBER OF PATIENTS IMMUNIZED (c)
10	MEASURE: Children who have received age appropriate vaccines who had their 3 <sup>rd</sup> birthday during measurement year (on or prior to 31 December)	Universe	Sample or Universe	Records meeting the measurement standard



# Format Used for Table 7

Line #	Race and Ethnicity
<b>Hispanic/Latino</b>	
1a	Asian
1b1	Native Hawaiian
1b2	Other Pacific Islander
1c	Black/African American
1d	American Indian/Alaska Native
1e	White
1f	More than One Race
1g	Unreported/Refused to Report Race
	<i>Subtotal Hispanic/Latino</i>
<b>Non-Hispanic/Latino</b>	
2a	Asian
2b1	Native Hawaiian
2b2	Other Pacific Islander
2c	Black/African American
2d	American Indian/Alaska Native
2e	White
2f	More than One Race
2g	Unreported/Refused to Report Race
	<i>Subtotal Non-Hispanic/Latino</i>
<b>Unreported/Refused to Report Ethnicity</b>	
h	Unreported/Refused to Report Race and Ethnicity
i	<b>Total</b>

- **Columns 1a, 2a, and 3a:** Universe requires total number of:
  - 1a: women who delivered
  - 2a: patients with hypertension
  - 3a: patients with diabetes
- Universe must be used for reporting on delivery and birth data (columns 1a-1d).
- **Columns 2b and 3b:** For diabetes and hypertension, report on:
  - The universe of patients meeting criteria (number in columns 2a and 3a) **OR**
  - 70 randomly selected patients
  - The method is selected independently for each measure
  - Random sample is across total, not 70 for each race or ethnicity
- Data must be reported by race and ethnicity for all table sections: birth, hypertension, diabetes



# OPTIONS FOR REPORTING THE NUMBER OF RECORDS MEETING MEASUREMENT STANDARDS

# When to Report on the Universe for the Measurement Standard

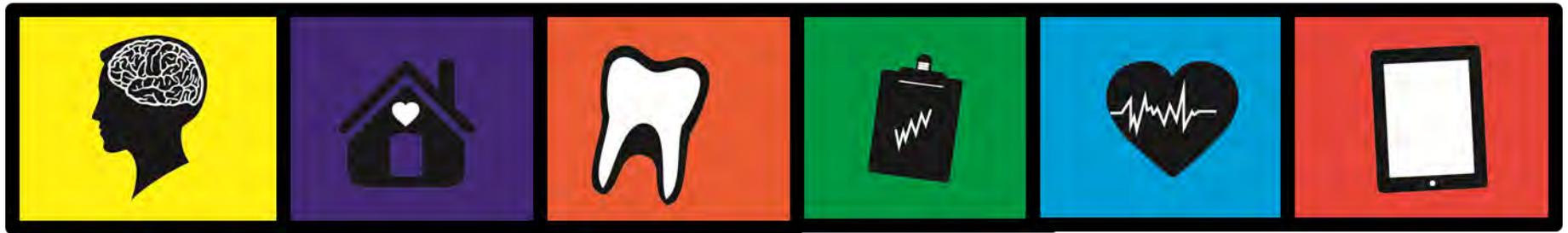


- To report the number of records in the universe which meet the measurement standard, your data source must:
  - Include all sites within the scope of your BPHC supported program
    - Including sub-recipient / sub-grantee sites, if any
  - Cover the time period to be reviewed (often multiple years)
  - Be able to exclude records that do not meet criteria (e.g., women who have had a hysterectomy in the pap test measure)
  - Be able to extract clinical data as required (e.g., HbA1c result or receiving a DTP shot)

# When to Use a Sample to Report the Measurement Standard (Continued)



- Reasons for sampling patient charts:
  - Automated systems cannot generate the number meeting measurement standard (e.g., exclusions cannot be removed)
  - Not all sites have been on the system for the entire measurement period
  - Sub-recipient / sub-grantee's data are not included in your system
  - The BPHC is considering a specific threshold
- A probabilistic sample can:
  - produce accurate estimates of the patient universe within a reasonable confidence limit
  - Work where automated systems do not contain required data
  - Comply with OMB mandate of 70 for sample size
- *A sample will not help* when you have problems in finding the universe of patients who meet the reporting criteria. You need to find the universe of patients to be measured no matter which method of reporting is used.



# **WHEN TO SAMPLE**

## ***TABLE SPECIFICS***

# Childhood Immunizations and Cervical Cancer Screening



- Use a sample when your automated systems do not:
  - For **Childhood Immunizations:**
    - Include data on all required vaccinations (or evidence of disease or contraindication) received regardless of who provided it (must indicate vaccine name, name of provider, and date of vaccine)
      - Implies total interoperability with registry as a minimum
    - Include vaccination data for all of 2012, 2013, and 2014
  - For **Cervical Cancer Screening:**
    - Include data on all Pap tests and HPV tests regardless of who did the test (including test date and result)
    - Include Pap and HPV data for prior years
    - Remove women who had a hysterectomy



# Weight Screening

- Use a sample when your automated systems do not:
  - For **Child and Adolescent** Weight Assessment and Counseling:
    - Show if BMI percentile was recorded or visible (not just BMI or weight and height)
    - Specifically identify both nutrition (not just diet) and activity (not just exercise) counseling
    - Include information for all of 2014
    - Exclude pregnant adolescents
  - For **Adult** Weight Screening and Follow-up:
    - Show if BMI (not just weight and height) is recorded or visible
    - Include a code for follow-up plan
    - Include information for July 1, 2013 through December 31, 2014 (date within 6 months of last visit)
    - Exclude pregnant women and terminally ill patients

# Tobacco Use Screening and Cessation Intervention



- Use a sample when your automated systems do not:
  - Show tobacco use (not just smoking) assessment
    - *May* be recorded by any staff.
    - *May not* rely on code for “tobacco dependence”
  - Include tobacco use assessments for 2012, 2013, and 2014
    - to query within 24 months of last visit
  - Identify all tobacco users with at least two medical visits ever with at least one visit in 2014
  - Show cessation counseling and/or medications prescribed or taken

# Asthma Treatment



- Use a sample when your automated systems do not:
  - For Persistent Asthma Treatment:
    - Include a mechanism for identifying *persistent* asthmatics (exclude intermittent asthma)
    - Identify all current patients with at least two visits in 2013 and/or 2014 including at least one medical visit in 2014
    - Include drug prescribed / dispensed data
    - Exclude patients with allergic reaction to asthma medications

# Lipid Therapy



- Use a sample when your automated systems do not:
  - For Lipid Therapy for Patients with Coronary Artery Disease (CAD):
    - Identify all current CAD patients and those who have had an MI or cardiac surgery
    - Show medications prescribed or taken
    - Identify CAD patients with at least two medical visits ever with at least one visit in 2014
    - Exclude patients with last LDL lab test  $<130$  mg/dL or an allergy to, adverse outcomes from, or intolerance to LDL lowering medications

# Aspirin Therapy and Colorectal Cancer Screening



- Use a sample when your automated systems do not:
  - For Aspirin Therapy for Patients with Ischemic Vascular Disease (IVD):
    - Identify all current IVD patients (and patients who had been discharged after acute myocardial infarction (AMI) or coronary artery bypass surgery (CABG) or percutaneous transluminal coronary angioplasty (PTCA) in 2013)
    - Include 2013 and 2014 data on aspirin or other anti-thrombotic drugs prescribed, dispensed, or taken
  - For Colorectal Cancer Screening:
    - Identify all tests done in-house or by another provider within specified time frame
    - Exclude patients who had colorectal cancer or a colectomy
    - Include colorectal cancer screening data from prior years

# New HIV Cases with Timely Follow-Up



- Use a sample when your automated systems do not:
  - For New HIV Cases with Timely Follow-Up:
    - Include a mechanism for identifying those newly diagnosed with HIV
    - Track date of HIV diagnosis (for period 10/1/13 – 9/30/14)
    - Show that within 90 days of HIV diagnosis the patient had a medical visit with the health center or referral source for HIV medical care

Note: it is likely that all patients in the universe will be reviewed for this measure

# Patients Screened for Depression and Follow-Up

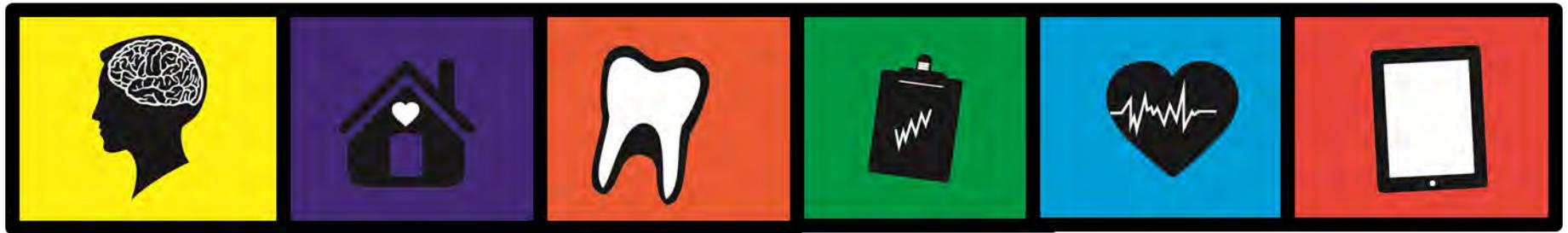


- Use a sample when your automated systems do not:
  - For Depression Screening and Follow-Up:
    - Include a depression screening code used only for a standardized depression screening tool
    - Include results of screening in 2014
    - Identify a code for follow-up plan for those with a positive screening result
    - Exclude patients with an active diagnosis of depression or bipolar disorder
    - Exclude patients participating in on-going treatment for depression

# Hypertension Control and Diabetes Control



- Use a sample when your automated systems do not:
  - For Hypertension Control:
    - Identify the most recent blood pressure recorded in 2014
    - Identify patients with hypertension (diagnosed prior to June 30 ) with at least two medical visits during the year
    - Include prior year diagnosis data (up to three years)
    - Exclude pregnant women and patients with End Stage Renal Disease
  - For Diabetes Control:
    - Identify the results of the most recent HbA1c test done either in-house or by another provider in 2014
    - Exclude those with only a diagnosis of gestational diabetes or steroid-induced diabetes



# STEPS TO REPORT USING A RANDOM SAMPLE

# Random Sample Defined



- Random Sample: A part of the universe where each member of the universe has the exact same chance of being selected as every other member of the universe.
- A random sample must:
  - Be generated from the entire **universe** of medical patients who meet the selection criteria
  - Include all sites, contract medical services, all grant-funded programs, and activities of all medical providers

# Process for Reporting Using a Random Sample

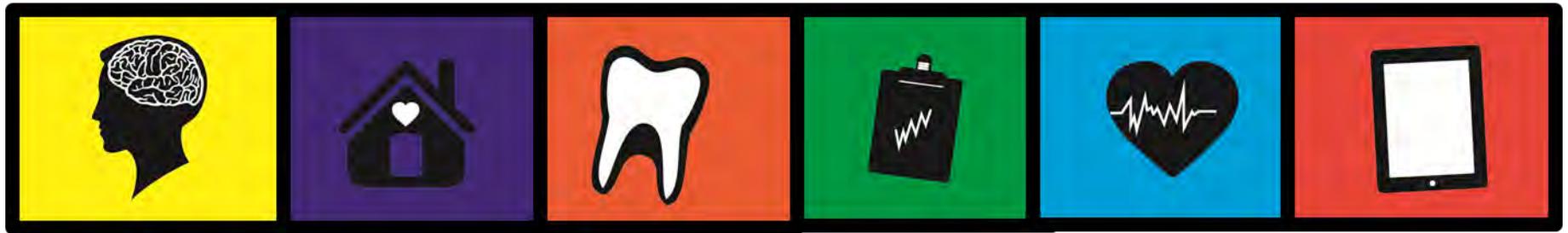


- **Step 1:** Identify the patient population to be sampled (the universe)
  - Create a list and number each person in the universe
  - (This will almost always involve the EHR)
- **Step 2:** Randomly select 70 patients to be included in the sample
  - May use EHR to identify the sample if it can be programmed to do so
  - Two other methods to randomize data are discussed
  - Strategy: Select 5-10 more to use as replacements (e.g., to replace records that do not meet the criteria for the universe or who meet the exclusion criteria)

# Process for Reporting Using a Random Sample (Continued)



- **Step 3:** Review the records sampled to determine if measurement standard has been met
  - If possible, use available automated data sources (e.g., electronic health records, disease registries, state immunization registries, logs, practice management systems)
  - Review charts for some or all of patients
- **Step 4:** Replace records for patients that do not meet the requirements and/or should be excluded (e.g., not a medical patient, or exclude pregnant patients from the weight measures)



# OPTIONS TO CREATE A RANDOM SAMPLE

# Option 1: Random Number List

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- Prepare numbered list of all patients in universe
- Generate a list of random numbers - can use web site such as <http://www.randomizer.org/form.htm>
- Random numbers correspond with the records identified in the numbered list of patients
- Identify a replacement set - for exclusions
- Review identified records



# Randomized Sets

- Prepare two randomized sets
  - Initial sample of 70
  - Replacement set of 5 or more (e.g., a sample of 75 – 80)

Input	Initial Sample	Replacements
Set of Numbers	1	1
Number per set	70	At least 5 or as many as needed
Number range = 1-“n”	Last sequence number in list	Last sequence number in list
Unique numbers	Yes	Yes
Sort numbers	Not if including extras (otherwise ‘Yes, least to greatest’)	No

# Randomizer.org Example

(<http://www.randomizer.org>)



To generate random numbers, enter your choices below (using integer values only):

How many sets of numbers do you want to generate?  [Help](#)

How many numbers per set?  [Help](#)

Number range (e.g., 1-50):  
From:   
To:  [Help](#)

Do you wish each number in a set to remain unique?  [Help](#)

Do you wish to sort the numbers that are generated?  [Help](#)

How do you wish to view your random numbers?  [Help](#)

[Randomize Now!](#)

Sets of numbers = 1

Numbers per set = 70

Number range = 1- "n" (enter last sequence number in your numbered list)

Unique numbers – Yes

Sort numbers –  
Yes: Least to Greatest  
unless including replacements

# Option 2: Interval



- Prepare numbered list of all patients in universe
- Randomly select a patient from universe
- Calculate a sampling interval
  - Divide number of patients in universe by 70
- Select a random starting point
- Select every  $n^{\text{th}}$  patient record based on sampling interval until you reach 70 patients
  - May select additional records for replacements
  - Loop around if necessary, *or*
  - Select replacement records (exclusions) with the next patient in list
- Review identified charts



# Interval Method Example

1	951456
2	234951
3	492374
4	157614
5	736812
6	453764
7	416145
8	801784
9	481454
10	487151
11	158124
12	484504
13	789415
14	781763
15	745485

Sample Interval (SI) = 3

First Record = #2

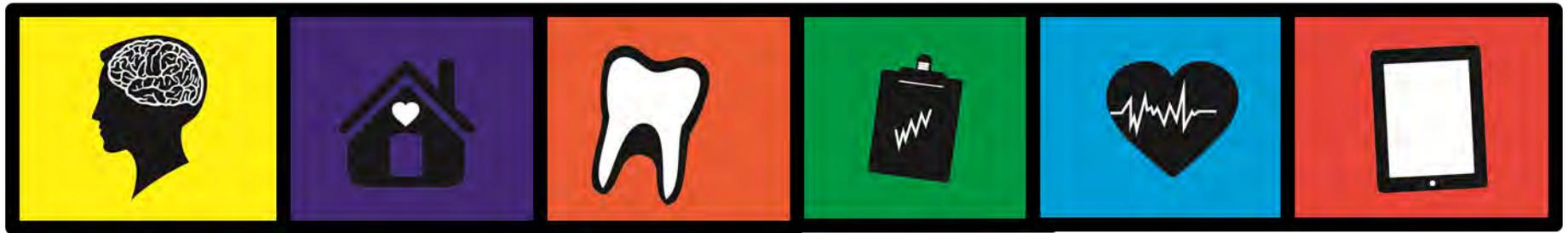
(selected at random from 1 to 3)

Next records = #5 (2+3)

#8 (5+3)

#11 (8+3)

#14 (11+3)



# EXTRACTING DATA FROM RECORDS

# Extracting Patient Data



- Before any charts are actually pulled and reviewed, use other sources to obtain data:
  - Sources which may include some but not all patients who meet the criteria such as EHRs, PMSs, and disease registries
  - Immunization registries maintained by the state
  - Logs or other “off line” lists

# Reviewing the Records



- Eventually, some or all records in the sample for one or more of the measures will need to be reviewed
- Practices may:
  - Use a single reviewer for each measure
  - Use different reviewers to review different measures
- Data Entry Tool available from the Support Center training website <http://www.bphcdata.net> to assist with recording chart details

# Criteria vs. Exclusions



- “Criteria” and “exclusions” are used in the UDS to either constrain the universe or to identify records to be replaced in a record review.
- Conditions may sometimes be listed as criteria and sometimes as an exclusion.
- EHR system reporting must limit the universe to the specified criteria and remove exclusions.
- If unable to remove exclusions, health center must make use of a random sample.

# Criteria vs. Exclusions (Continued)



- Criteria can be made exclusions and vice-versa. For example, for the Child and Adolescent Weight Assessment measure, we may state:
  - Criteria: “All children aged . . . . *who are not pregnant*” OR
  - Exclusion: “All children aged . . . . “ Exclude pregnant adolescents from the universe.
- In general, automated systems will look for constrained criteria, while record reviews will look at exclusions
- *And* exclusions will be used when the variable is not coded – especially if it is an in-patient condition
- Either method is acceptable

# Addressing Exclusions in a Sample



- Example: Cervical Cancer Screening
  - Column A will equal the universe unadjusted for exclusions (including an unknown number of women who have had a hysterectomy)
  - Use a random sample of 70 records from the universe. Enter 70 for Column B.
  - Review the 70 records to determine the number meeting the measurement standard and report in Column C.
  - If a woman with a hysterectomy is included in your initial sample, do not reduce Column A but substitute another randomly selected patient to replace the excluded record (sample remains 70 eligible women)

# Obtaining a Sample – Special Situations



- Under certain situations a larger number of random records may need to be pulled to identify a sample of 70, including:
  - When unable to determine universe from existing system
  - Most likely used with the persistent asthma measure
- Use alternative instructions to determine universe and to meet the measurement standard
- Automated systems should be in place to capture information for future

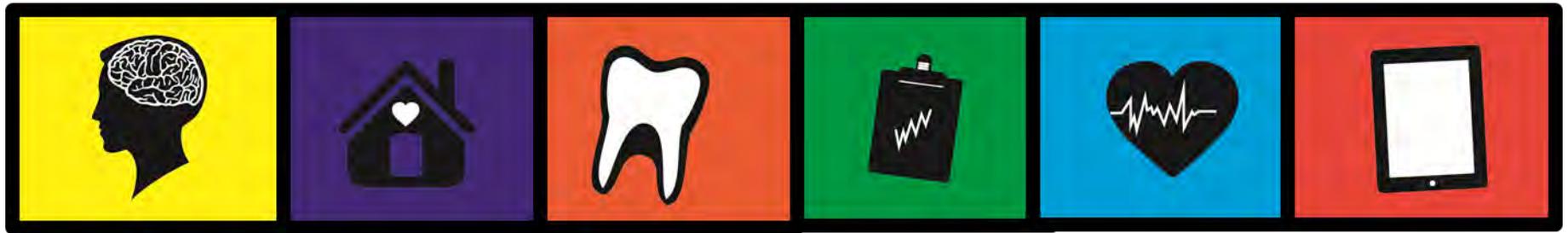
# Universe Generation from a Sample – Special Situations



*Example:* Determine the number of persistent asthmatic patients from a sample of all asthmatic patients

- Identify all patients with any asthma diagnosis. —————→
- Randomly select 300 charts. —————→
- Review charts until you have 70 asthma patients who were first diagnosed with “persistent asthma.” Keep track of how many charts were reviewed to find 70 cases. —————→
- Divide 70 by the total number of charts of asthmatic patients reviewed to find 70 patients with persistent asthma. (This percentage will be used as the percent of all asthmatics who have persistent asthma.) —————→
- Multiply percentage by the total asthmatics found. The calculated result is the estimated universe of patients with persistent asthma (report in Column A). —————→
- Review the 70 charts (report 70 in Column B) to assess number that meet the measurement standard. (The result is reported in Column C).

All asthmatics	1,200
Sample (random)	300
# from Sample to get 70 persistent asthmatics	200
% estimated persistent asthma	$70/200 = 0.35$
# Estimated persistent asthma – Universe	$0.35 \times 1,200 = 420$



# REFERENCES AND REMINDERS

# Critical Dates in the UDS Process



- DATA ENTRY: Report through EHB (“Electronic Handbook”) beginning January 1, 2015  
<https://grants.hrsa.gov/webexternal/login.asp>
  - EHB training available through HELP in application and online training module
  - EHB incorporates hundreds of edits to alert you to possible problems that require follow-up
- REPORT DUE DATE: February 15, 2015
- REPORT FINALIZATION: March 31, 2015
- REPORT FEEDBACK: Trend and comparison reports available during the summer
  - Final data can be used as part of QI initiatives

# Strategies for Successful UDS Reporting



- Work as a team
  - Tables are interrelated.
- Adhere to definitions and instructions
  - Read manual, fact sheets, and other resources and apply definitions.
- Check your data before submitting
- Work with your reviewer
  - Refer to last years reviewer’s letter emailed to UDS Preparer.
  - Check data trends, relationships across tables, and compare benchmarks.
  - Address edits in EHB by correcting identified reporting errors
  - Show your understanding of the basis for data accuracy by providing clear explanations to edits and questions raised in EHB and by your reviewer.
  - Report timely, accurate data.

# UDS Clinical Measures Reporting Resources



- UDS Reporting Manual, PALs, Clinical Measures Data Entry Tool (Excel), clinical measures pre-recorded webinar, modules, fact sheets, and other technical assistance materials
  - <http://www.bphcdata.net>
  - <http://bphc.hrsa.gov/healthcenterdatastatistics/index.html>
- Random sample website: <http://www.randomizer.org>
- In-person Regional trainings and UDS Reviewers  
[http://www.bphcdata.net/docs/training\\_flyer.pdf](http://www.bphcdata.net/docs/training_flyer.pdf)
- Telephone and email support for UDS reporting questions and use of UDS data: 866-UDS-HELP or [udshelp330@bphcdata.net](mailto:udshelp330@bphcdata.net)
- Technical support to review submission
- EHB Support
  - HRSA Call Center for EHB account access and roles: 877-464-4772
  - BPHC Help Desk for EHB system issues: 877-974-2742

# Questions?

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# UNIFORM DATA SYSTEM

Calendar Year 2014



**Thank you for attending this webinar and for all of your hard work to provide comprehensive and accurate data to BPHC!**

Ongoing questions can be addressed to

[UDSHelp330@BPHCDATA.NET](mailto:UDSHelp330@BPHCDATA.NET)

866-UDS-HELP.