Introduction to Research

Rocky Mountain Tribal Leaders Council, Epidemiology Center (RMTEC)

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Agenda

Tribal Epidemiology Centers Background

Overview of RMTLC/RMTEC

Overview of Research Methods

Programmatic Examples

Tribal Epidemiology Centers Background

What is Epidemiology?

▶ Investigate what causes disease or injury

▶ Determine the risks of these causes

▶ Identify who is at risk

▶ Evaluate the effectiveness of health programs and services

Tribal Epidemiology Centers

▶ Established via Indian Health Care Improvement Act (IHCIA)

▶ Four TECs were started in 1996, now 12 TECs

▶ TECs function independently, but also as part of a national group

▶ Core Funding: Cooperative Agreement with Indian Health Service Division of Epidemiology and Disease Prevention
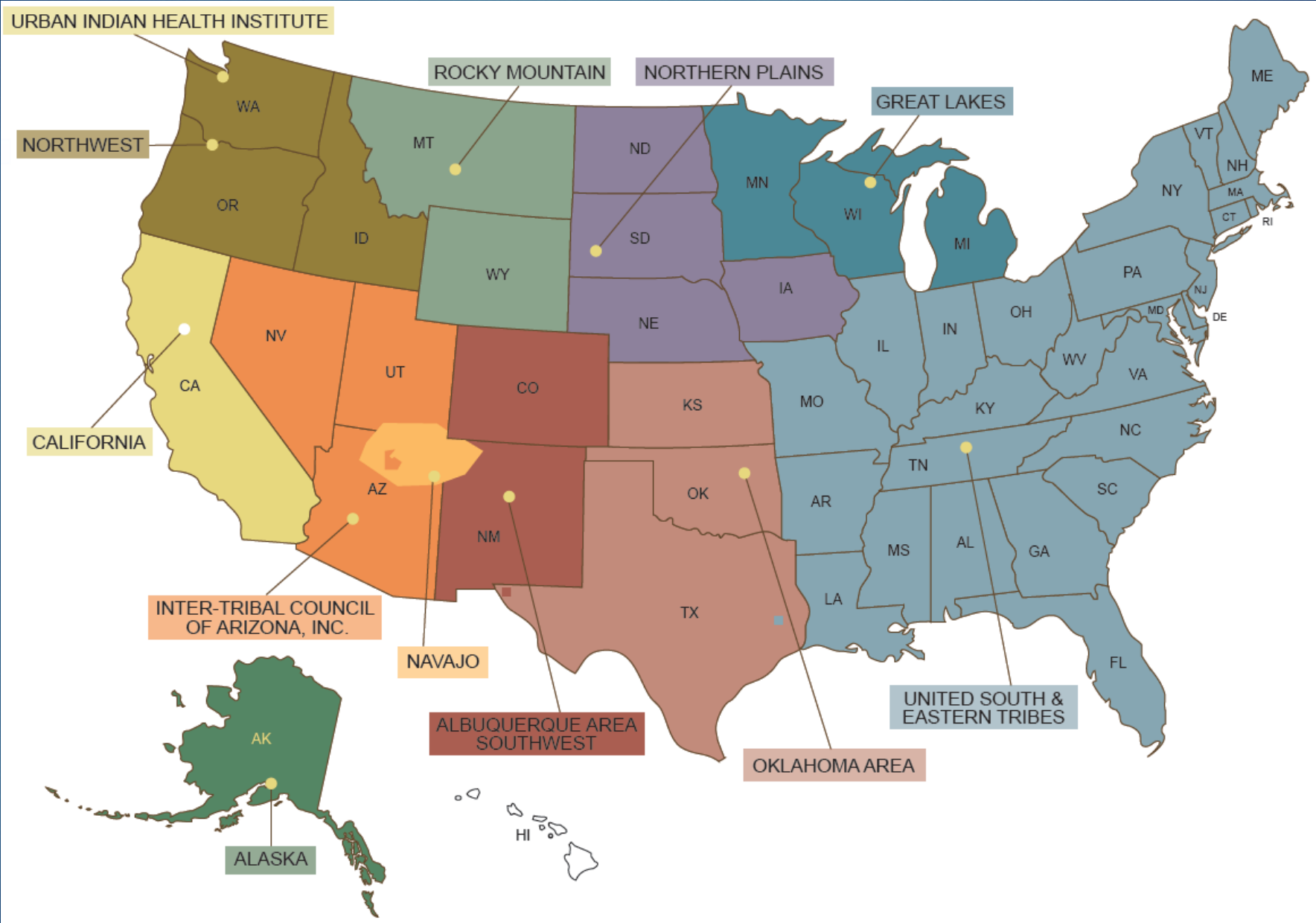
Public Health Authority

- 2010 Affordable Care Act permanently reauthorized the IHCIA

- TECs given "Public Health Authority" status

- Health and Human Services (HHS) directed to give TECs access to HHS data, systems, and protected health information

- Centers for Disease Control and Prevention must provide TECs with technical assistance

- Each IHS Area must have TEC access

Seven Core Functions

1. Collect data

2. Evaluate data and programs

3. Identify health priorities with Tribes

4. Make recommendations for health service needs

5. Make recommendations for improving health care delivery systems

6. Provide epidemiologic technical assistance to Tribes and Tribal organizations
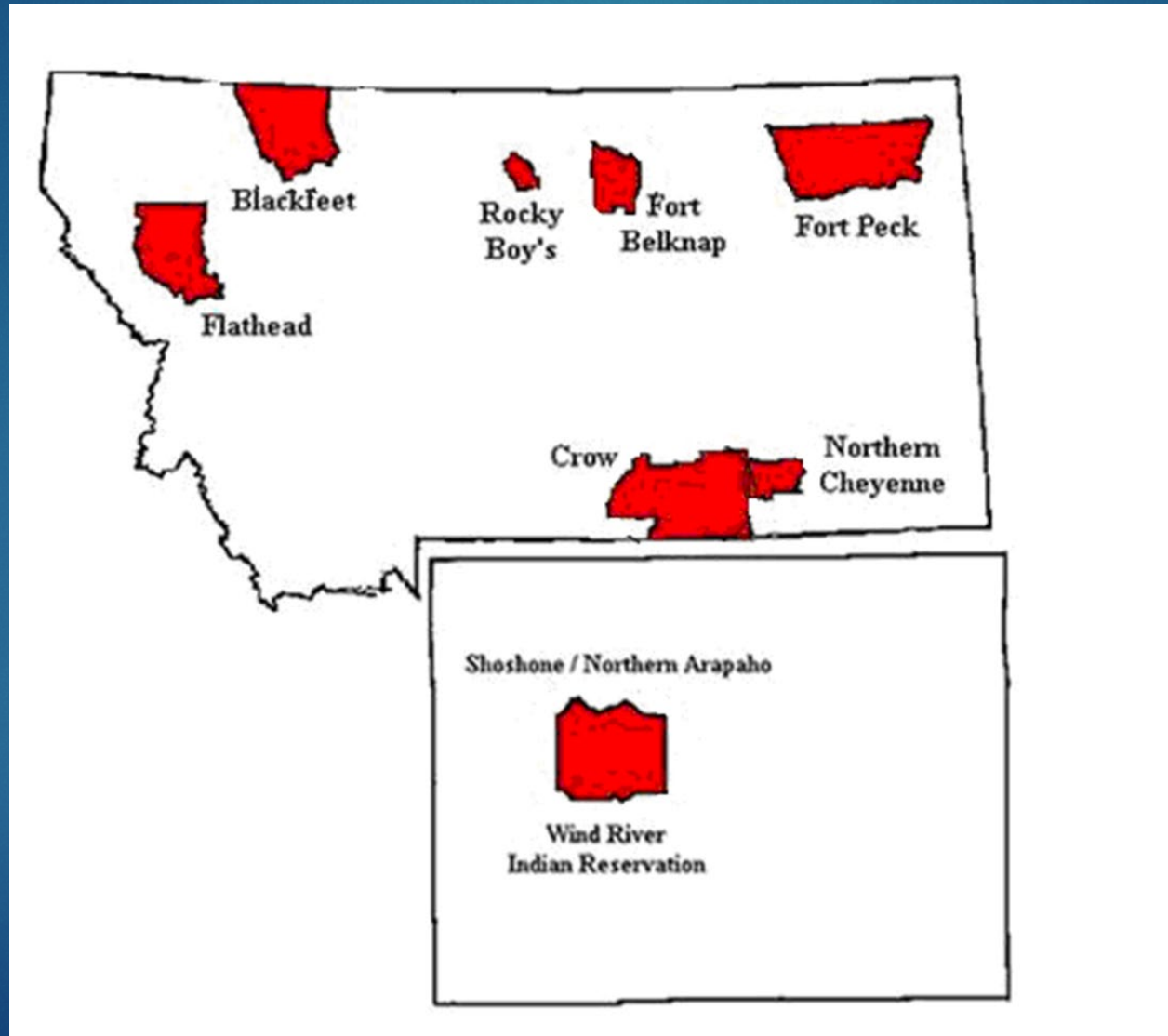
7. Provide disease surveillance to Tribes

Rocky Mountain Tribal Epidemiology Center Overview

RMTEC Overview

- A division of the Rocky Mountain Tribal Leaders Council (RMTLC)
  - https://www.rmtlc.org

- RMTEC serves the Tribes of Montana and Wyoming
  - https://www.rmtec.org/

Who We Serve

Mission Statement

To empower the American Indians of Montana and Wyoming in the development of services, systems, and epidemiologic capacities to address their public health concerns.

Focus Areas

- Capacity Building

  - Tribal Epidemiology Center – Public Health Infrastructure (TEC-PHI)

- Surveillance

  - Chronic disease and infectious disease surveillance

  - Systematic Surveillance of Substance Use and Mental Health (SUMH)

- Health Promotion & Disease Prevention

  - Child Health Measures (CHM)

    - Clinical & Translational Research Program (CTRP)

Focus Areas, cont.

- Environmental Health & Social Determinants of Health

  - Tribal Injury Prevention Cooperative Agreement Program (TIPCAP)

  - RMTEC Explores the Social Determinants of Health (SDOH) and Substance Use and Mental Health (SUMH) in Montana and Wyoming

- Data Improvement & Evaluation

  - Tribal Behavioral Risk Factors Surveillance System (TBRFSS)

  - Chemical Dependency Resource Assessment Project

  - Community Health Profile

Technical Assistance Available

▶ Training

▶ Input from/collaboration with RMTEC staff

▶ Connection to Subject Matter Experts

▶ Access to data

  ▶ Requires a Data Request Form signed by the Tribal Health Director specifying the type of data

▶ Connection to resources/tools/best practices

Additional Assistance Available

▶ Product/protocol/document review

▶ Completion of tasks/projects by RMTEC staff

▶ Program/product development and support

www.rmtec.org

Research Methods Overview

Basic Research Methods

- Qualitative
  - Data is a description of something (words, observations)
  - Data can be analyzed for themes, sub-themes, and even counts/frequencies
- Quantitative
  - Data is numerical and can be measured
  - Can be analyzed using statistical methods
- Mixed Methods
  - Combination of qualitative and quantitative

Why Use Qualitative Research?

▶ Can be used for exploratory research – you don't know what you are looking for

▶ If you want a better understanding of something

▶ If you want to know major themes or issues

▶ If you need narratives or stories (quotes)

▶ If you want in-depth, rich information

Why Use Quantitative Research?

- Can be used to find answers to concrete questions – you know in advance what you are looking for

- If you need to classify, count, or measure something

- If you want to generalize the results to a larger group (statistical requirements must be met)

- You want to show that there is a correlation between variables

What are our Data Sources ?

Epi Data Mart (EDM)	• Morbidity data from Indian Health Services Units
Vital Statistics	• Birth & death records from MT DPHHS
Behavioral Risk Factor Surveillance System (BRFSS)	• Health risk behaviors, chronic health conditions, and use of preventive services data
Child Health Measures (CHM)	• 10-year study that collected health data on school-aged children
Montana Cancer Tumor Registry	• Incidence data for cancer in Montana
National Survey of Drug Use and Health (SAMSHA)	• National, state, and sub-state data for drug use and mental health
Surveillance, Epidemiology, and End Results (SEER)	• Cancer statistics

What are our Data Sources ?

TRAC I Peer Recovery	• Qualitative data for substance abuse recovery
U.S. Census	• Demographic data
Web-Based Injury Statistics Query and Reporting System (WISQARS)	• Injury, violent death, and cost of injury data
Youth Risk Behaviors Surveillance System (YRBSS)	• Health-risk behavior data
American Community Survey	• Detailed population and housing information
National Immunization Survey	• Vaccination coverage data for children and teens

Additional Data Sources

▶ Rural Health Information Hub

▶ https://www.ruralhealthinfo.org/topics/statistics-and-data/data-sources-and-tools

Data Reporting and Presentation

Basic Statistics

- Mean
  - This is the average, and most common way data is reported statistically

- Median
  - The middle value in a list of numbers

- Mode
  - The number (value) that occurs most often (you may not have a mode)

- Range
  - The difference between the highest and lowest number

Basic Statistics, cont.

- Mean
  - To find the mean you add up all the numbers and divide by how many numbers

- Median
  - List your numbers from lowest to highest and the middle value is the median.

- Mode
  - The number (value) that occurs most often (you may not have a mode)

- Range
  - Subtract the lowest number from the highest

Basic Statistics Examples

▶ Mean = 35.71

   ▶ 10+20+30+40+50+50+50 = 250 (N = 7), 250/7= 35.71

▶ Median = 40

   ▶ 10, 20, 30, **40**, 50, 50, 50 (median is 40)

▶ Mode = 50

▶ Range = 40

   ▶ 50 – 10 = 40

Epidemiology Summary Measures

- Incidence
  - Measures NEW cases of disease among a population at risk for the disease over a period of time
  - Often reported as a NUMBER or a RATE
- Prevalence
  - Measures existing cases of a disease at a particular point in time or over a period of time
  - Often reported as a PERCENTAGE
- Mortality & Morbidity
  - Mortality is death whereas morbidity is injury or illness

Epidemiology Data Reporting

- Ratio

  - The ratio of obese AI youth to U.S. youth is approximately **2:1** (32% versus 17%) according to 2011-2014 Child Health Measures

- Proportion

  - 65,110 of the 899,503 persons (7%) in Montana selected 'American Indian Alone' in the 2010 Census

- Crude Rate

  - 279.5 injuries due to falls per 10,000 persons with any injury per year

    - Determined by number of falls (3,139) divided by all injuries (11,229) multiplied by 10,000

    - Rate = 3,139 / 11,229 x 10,000

      .2795 x 10,000 = 279.5

Epidemiology Data Reporting

▶ Age-Adjusted Rate

   ▶ Disease or death is often associated with age

   ▶ Age-adjusted rates are a way to make more fair comparisons between groups with different age groups

All Diagnosed Cancer Incidence among American Indians, 2013-2015, Montana Central Tumor Registry, MT-IBIS		
	Missoula County	Montana
Number of Cases	35	787
Crude Rate, per 100,000 persons	309.9	354.4
Age-adjusted Rate, per 100,000 persons	621.5	521.1

Programmatic Examples

RMTLC/RMTEC Examples

- TEC-PHI Grant

- HIDA Grant

- PHWEIC Grant

- TOR Grant

TEC-PHI Examples

Table 1. <u>Frequency of opioid[a] prescriptions</u> at facilities reporting to the National Data Warehouse among American Indians self-reporting residence in the [reservation] Service Unit, FY 13-17, Epidemiology Data Mart.

	Fiscal Year				
Characteristic	2013 (N =) N (%)	2014 (N =) N (%)	2015 (N =) N (%)	2016 (N =) N (%)	2017 (N =) N (%)
Gender					
Female					
Male					
Age					
0 -17					
18 – 29					
30 – 44					
45 – 59					
65+					

[a] Prescribed opioids include: codeine, fentanyl, hydrocodone or dihydrocodeinone, hydromorphone, meperidine, methadone, morphine, oxycodone, oxymorphone, tramadol, nalbuphine, pentazocine, and buprenorphine.

Table 2. Frequency of persons exposed[a] to any prescription opioids[b] at facilities reporting to the National Data Warehouse among American Indians self-reporting residence in the [reservation] Service Unit, FY 13-17, Epidemiology Data Mart.

	Fiscal Year				
Characteristic	2013 (N =) N (%)	2014 (N =) N (%)	2015 (N =) N (%)	2016 (N =) N (%)	2017 (N =) N (%)
Gender					
Female					
Male					
Age					
0 -17					
18 – 29					
30 – 44					
45 – 59					
65+					

[a] An individual person is counted only once per year for any opioid prescription.
[b] Prescribed opioids include: codeine, fentanyl, hydrocodone or dihydrocodeinone, hydromorphone, meperidine, methadone, morphine, oxycodone, oxymorphone, tramadol, nalbuphine, pentazocine, and buprenorphine.

Table 3. Crude rates of opioid prescriptions and persons exposed[a] to any prescription opioids[b] at facilities reporting to the National Data Warehouse among American Indians self-reporting residence in the [reservation] Service Unit[c], FY 13-17, Epidemiology Data Mart.

Fiscal Year	Crude rate of opioid prescriptions per 1,000 persons	Crude rate of persons exposed[c] per 1,000 persons
2013		
2014		
2015		
2016		
2017		

[a] An individual person is counted only once per year for any opioid prescription.

[b] Prescribed opioids include: codeine, fentanyl, hydrocodone or dihydrocodeinone, hydromorphone, meperidine, methadone, morphine, oxycodone, oxymorphone, tramadol, nalbuphine, pentazocine, and buprenorphine.

[c] [reservation] Service Unit population by year: 2013 – | 2014 – | 2015 – | 2016 - | 2017 – .

Table 4. Frequency of opioid prescriptions and persons exposed[a] to specific opioid[b] prescriptions at [name] Hospital, FY 17, Epidemiology Data Mart.

Prescription Opioid	Frequency of Prescriptions N (%)	Number of Persons Exposed N (%)
Codeine (various brand names)		
Fentanyl (Actiq®, Duragesic®, Sublimaze®)		
Hydrocodone or dihydrocodeinone (Vicodin®, Norco®, Zohydro®, and others)		
Hydromorphone (Dilaudid®)		
Methadone (Dolophine®, Methadose®)		
Morphine (Duramorph®, MS Contin®)		
Oxycodone (OxyContin®, Percodan®, Percocet®, and others)		
Tramadol (ConZip, Ultram, and others)		

[a] An individual person is counted only once per year for each medication. For example, a person prescribed codeine and fentanyl will be counted once in each row; thus, columns for persons exposed should not be totaled because of repeat counts.

[b] Prescribed opioids include: codeine, fentanyl, hydrocodone or dihydrocodeinone, hydromorphone, meperidine, methadone, morphine, oxycodone, oxymorphone, tramadol, nalbuphine, pentazocine, and buprenorphine.

[c] The estimate has been suppressed because 1) the observed number of events is very small and not appropriate for publication, or 2) the estimate is considered unreliable and should not be reported.

HIDA Examples

HIDA Objectives

▶ Strengthen Partnerships – create a consortium focused on improving opioid overdose data

▶ Improve racial misclassification

▶ Improve non-fatal overdose data

▶ Improve fatal overdose data