

# Real-world application of reach ratios:

PDA

ClearWay<sup>SM</sup>  
MINNESOTA

## A tool to monitor quitline reach among priority populations

Becky Lien & Emily Subialka Nowariak | Professional Data Analysts, Inc.

Randi Lachter | ClearWay Minnesota

2017 NAQC Conference

# The next 30 minutes of your life...



**What is a reach ratio?**



**How to calculate a reach ratio?**



**Reach ratios in action:  
Minnesota example**



**What is a reach ratio?**

**BRIEF REPORT**

# **The Reach Ratio—A New Indicator for Comparing Quitline Reach Into Smoking Subgroups**

**H. Sharon Campbell PhD<sup>1,2</sup>, N. Bruce Baskerville PhD<sup>2,3</sup>, Lynda M. Hayward PhD<sup>2</sup>, K. Stephen Brown PhD<sup>2,4</sup>,  
Deborah J. Ossip PhD<sup>5</sup>**



# What is a reach ratio?

A ReRa compares the proportion of quitline participants from a subgroup to the proportion of the target population of tobacco users from the same subgroup.

# ReRa < 1

$$\frac{\% \text{ of QL participants that are 18–24 yrs old}}{10\%} = \frac{5\%}{10\%} = 0.5$$

$$\text{ReRa} = 1$$

$$\frac{\% \text{ of QL participants that reside in a region}}{\text{---}} = \frac{25\%}{\text{---}} = 1.0$$

# ReRa > 1

% of QL participants  
that are female

60%

$$\frac{\text{\% of QL participants that are female}}{1} = \frac{60\%}{0.4} = 1.5$$



# ReRa = 1

proportionate representation  
of subgroup in QL population

## ReRa < 1

subgroup is under-represented in QL  
population; opportunities may exist

## ReRa > 1

subgroup is over-represented in QL  
population; don't fret, but look at  
complementary subgroups

0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0



**How to calculate a reach ratio?**

# 3

## Questions before you begin...




Who is your target population?



What is the time period (e.g. 1 year)?



What is the subgroup(s) of interest?



The key to success . . .

DATA SOURCES

# Numerator = B/A

the % of quitline enrollees in your subgroup

- A** How many unique people enrolled in services in [FY16]?
- B** How many of the above are in your subgroup of interest?

# Numerator Data Sources

- Monthly reports
- Monthly registration extracts
- Ask your vendor
- Ask your evaluator

# Numerator = B/A

the % of quitline enrollees in your subgroup

$$\text{A} = 16,290$$

The number of unique participants who enrolled in **QUITPLAN Services** from **Mar 2014 – Feb 2015**.

Source: Optum monthly data extracts

$$\text{B} = 7,246$$

The subset of unique participants from above who are **men**.

Source: Optum monthly data extracts

$$\text{Numerator} = 7,246 / 16,290 = 44.5\%$$

**There is a  
fine line  
between**

**NUMERATOR**

**and**

**DENOMINATOR**



# Denominator = $D/C$

the % of all tobacco users in [state] that are in your subgroup

**C**

How many tobacco users were living in [state] in [FY16]?

**D**

How many tobacco users in your subgroup were living in [state] in [FY16]?

# Denominator = D/C

the % of all tobacco users in [state] that are in your subgroup



How many tobacco users were living in [state] in [FY16]? ( $C1 * C2$ )

- $C1$  = Number of adults in [state] in [FY16]
- $C2$  = Tobacco prevalence rate in [state] in [FY16]

# Data Sources for C1

Number of adults in [state] in [FY16]

- Census Bureaus' Annual Population Estimates [2015 or 2016] for 18+
- <http://www.census.gov/data/datasets/2016/demo/population/nation-detail.html>

# Data Sources for C2

Tobacco prevalence rate in [state] in [FY16]

- [State] Adult Tobacco Survey [2015 or 2016]
- BRFSS [2015 or 2016]

# Denominator = D/C

the % of all tobacco users in [state] that are in your subgroup

$$C1 = 5,420,380$$

The number of adults living in **Minnesota** in **2013**.  
Source: Census Bureau Pop Estimates 2013 for 18+

$$C2 = 20.7\%$$

Tobacco prevalence rate for **adults** in **MN**.  
Source: MATS 2014 (all tobacco types combined)

$$\text{C} = 5,420,380 * 0.207 = 1,122,019$$

Adult tobacco users  
in Minnesota in  
2013/2014

# Denominator = D/C

the % of all tobacco users in [state] that are in your subgroup



How many tobacco users in your subgroup were living in [state] in [FY16]? ( $D1 * D2$ )

$D1$  = Number of adults in subgroup in [state] in [FY16]

$D2$  = Tobacco prevalence rate of subgroup in [state] in [FY16]

# Data Sources for D1

Number of adults in subgroup in [state] in [FY16]

- Census Bureaus' Annual Population Estimates [2015 or 2016]: age, sex, geographic region, some racial/ethnic groups
- Gallop: LGBTQ
- Other state, local, or population-specific sources

# Data Sources for D2

Tobacco prevalence rate of subgroup in [state] in [FY16]

- [State] Adult Tobacco Survey [2015 or 2016]
- BRFSS [2015 or 2016]
- Other state, local, or population-specific sources



# Denominator = D/C

the % of all tobacco users in [state] that are in your subgroup

$$D1 = 2,693,299$$

The number of adult **men** living in **Minnesota** in **2013**.  
Source: Census Bureau Pop Est 2013 for males 18+

$$D2 = 27.3\%$$

Tobacco prevalence rate for **adult men** in **MN**.  
Source: MATS 2014 (men, all tobacco types combined)

$$D = 2,693,299 * 0.273 = 735,271$$

Male adult tobacco users in Minnesota in 2013/2014

# Putting it all together

**A** = 16,290

**B** = 7,246

**C** = 1,122,019

**D** = 735,271

**B/A**

44.5%

**D/C**

65.5%

**ReRa**

$\frac{44.5\%}{65.5\%} = .679$

# Calculate confidence intervals (CIs)

Campbell et al. and  
PDA use **Katz Log**  
method found in the  
following journal article:

**Recommended confidence  
intervals for two independent  
binomial proportions**

**Morten W Fagerland,<sup>1</sup> Stian Lydersen<sup>2</sup> and  
Petter Laake<sup>3</sup>**

Statistical Methods in Medical  
Research. 2015 Vol 24(2) 224-  
254

**ReRa (Men): 0.679**

**CI: 0.668 to 0.691**





# How to calculate a ReRa?



Who is your target population?



What is the one year time period?



What is the subgroup(s) of interest?



**DATA SOURCES and CIs**



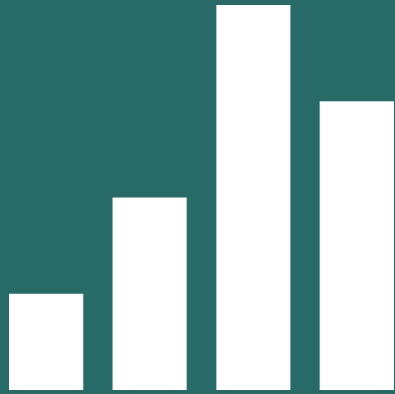
# **Reach ratios in action: Minnesota example**

# Why reach ratios?



# Strategic priorities

# Measurement leads to action

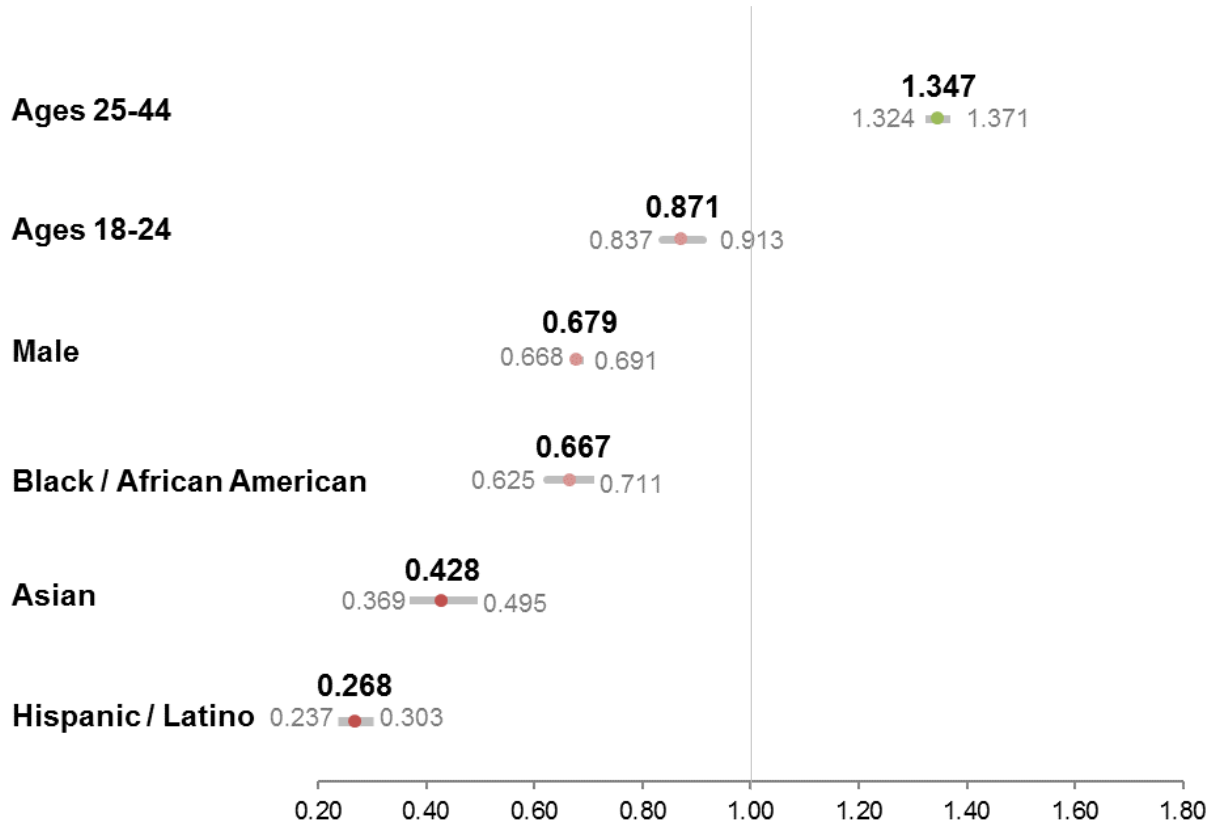




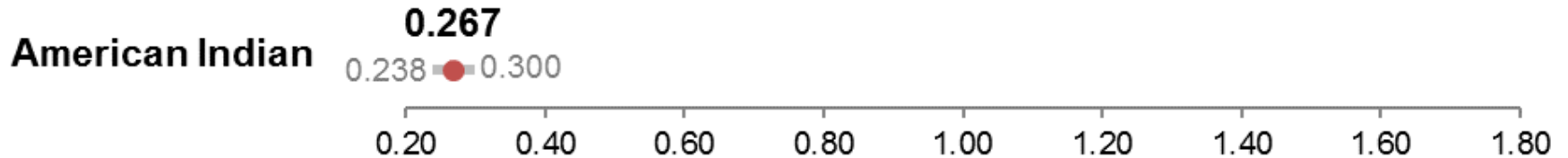


**Team approach**

# QUITPLAN Services ReRas for demographic groups of interest



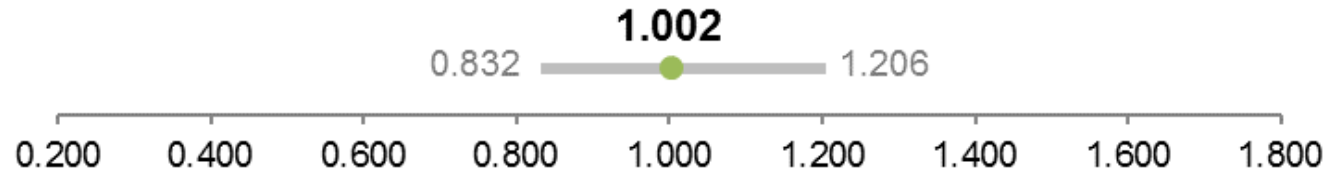
# Reach Ratio for American Indians



Based on a prevalence of cigarette use among American Indians of 59.0% per TTUP 2013. Minnesota Adult Tobacco Survey (MATS) 2014 reported a tobacco use prevalence rate of 36.1%, which results in a higher reach ratio of .6165 (.5505-.6903). Both estimates show that American Indians are underserved.

# Reach Ratio for GLBT

**GLBT**  
(Helpline only)





# Multiple uses for Reach Ratios...



Programmatic



Marketing



Key reference



One-stop data source

# Example

Table 2. Detailed reach ratio calculations for American Indians

	Cigarette use prevalence*:	Number of adults: Census Bureau 2013	Number of cigarette users: prevalence x number adults	Average MN tobacco users:	Average QP2 enrollees using cigarettes
Overall N	14.4%	5,420,380	780,534.72		15,167
American Indian	59.00%	94,029	55,477.10	7.11%	288 1.90%

\*Overall = MATS 2014, American Indian=TTUP

Table 3. Detailed reach ratio calculations for Gay, Lesbian, Bisexual and Transgender

	Cigarette use prevalence**:	Number of adults: Census Bureau 2013	Number of cigarette users: prevalence x number adults	Average MN tobacco users:	Average Helpline enrollees using cigarettes
Overall N	14.4%	5,420,380	780,534.72		2,102
GLBT	25.0%	157,191***	39,297.76	5.03%	106 5.04%

\*\*Overall = MATS 2014, GLBT=Voices of Health Study

\*\*\*Not available via the 2013 Census. A 2012 Gallup poll estimated that 2.9% of adults in MN were GLBT. The number of adults in the state (5,420,380 per the 2013 Census) were multiplied by 2.9% to estimate the proportion of MN adults identifying as GLBT.

# In sum...



A reach ratio measures how well a subgroup is represented in quitline services.



Break the reach ratio into small pieces and use the best data source available for each piece. Calculate CI's.



Use reach ratios to inform program and marketing decisions and as a quick reference.



*Thank you!*

**Becky** [blien@pdastats.com](mailto:blien@pdastats.com)

**Randi** [rlachter@clearwaymn.org](mailto:rlachter@clearwaymn.org)