Real-world application of reach ratios:

A tool to monitor quitline reach among priority populations

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

H. Sharon Campbell PhD¹,², N. Bruce Baskerville PhD²,³, Lynda M. Hayward PhD², K. Stephen Brown PhD²,⁴, Deborah J. Ossip PhD⁵
What is a reach ratio?

A reach ratio 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

% of QL participants that are 18–24 yrs old = 5% = 0.5
ReRa = 1

% of QL participants that reside in a region = 25 % = 1.0
ReRa > 1

% of QL participants that are female = 60 % = 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
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
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

A = 16,290

The number of unique participants who enrolled in QUITPLAN Services from Mar 2014 – Feb 2015. Source: Optum monthly data extracts

B = 7,246

The subset of unique participants from above who are men. Source: Optum monthly data extracts

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

\( (C1 \times C2) \)

- \( C1 \) = 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+
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

C2 = 20.7%

C = 5,420,380 * 0.207 = 1,122,019

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

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

Adult tobacco users in Minnesota in 2013/2014
Denominator = D/C
the % of all tobacco users in [state] that are in your subgroup

\[D \times (D1 \times D2)\]

\[D1 = \text{Number of adults in subgroup in [state] in [FY16]}\]

\[D2 = \text{Tobacco prevalence rate of subgroup}\]
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

\[ D_1 = \frac{2,693,299}{D} \]

\[ D_2 = 27.3\% \]

\[ D = 2,693,299 \times 0.273 = 735,271 \]

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

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

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 = \(\frac{44.5\%}{65.5\%} = 0.679\)
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,¹ Stian Lydersen² and Petter Laake³

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?
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
### Table 2. Detailed reach ratio calculations for American Indians

<table>
<thead>
<tr>
<th></th>
<th>Cigarette use prevalence*</th>
<th>Number of adults: Census Bureau 2013</th>
<th>Number of cigarette users: prevalence x number adults</th>
<th>Average MN tobacco users:</th>
<th>Average QP2 enrollees using cigarettes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall N</td>
<td>14.4%</td>
<td>5,420,380</td>
<td>780,534.72</td>
<td></td>
<td>15,167</td>
</tr>
<tr>
<td><strong>American Indian</strong></td>
<td><strong>59.00%</strong></td>
<td><strong>94,029</strong></td>
<td><strong>55,477.10</strong></td>
<td><strong>7.11%</strong></td>
<td><strong>288</strong></td>
</tr>
</tbody>
</table>

*Overall = MATS 2014, American Indian = TTUP

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

<table>
<thead>
<tr>
<th></th>
<th>Cigarette use prevalence**</th>
<th>Number of adults: Census Bureau 2013</th>
<th>Number of cigarette users: prevalence x number adults</th>
<th>Average MN tobacco users:</th>
<th>Average Helpline enrollees using cigarettes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall N</td>
<td>14.4%</td>
<td>5,420,380</td>
<td>780,534.72</td>
<td></td>
<td>2,102</td>
</tr>
<tr>
<td><strong>GLBT</strong></td>
<td><strong>25.0%</strong></td>
<td><strong>157,191</strong>*</td>
<td><strong>39,297.76</strong></td>
<td><strong>5.03%</strong></td>
<td><strong>106</strong></td>
</tr>
</tbody>
</table>

**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!

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