A Study on the Sample Representativeness of the Wisconsin ADRC Clinical Core Participants versus the Wisconsin State Population

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Comparison of Center Participants with State Population

- Demographics
- Vascular risk factors
Wisconsin ADRC Clinical Core Participants

ALZHEIMER’S DISEASE RESEARCH CENTER

- Active participants as of November 30, 2021
- Total: $n = 678$
  - (Younger) 45-64 years: $n = 296$
  - (Older) 65 years & older: $n = 382$
- Age and vascular risk factors: most recent visit data
Wisconsin State Population - Age, Sex, Race, Ethnicity

Wisconsin Interactive Statistics on Health (WISH) Query
Population Module
https://www.dhs.wisconsin.gov/wish/population/form.htm

- Presents population counts and estimates for Wisconsin
- Data are statewide, by region, and by county
Wisconsin State Population - Education

Behavioral Risk Factor Surveillance System

https://www.cdc.gov/brfss/data_tools.htm

- Telephone surveys about US residents on health-related risk behaviors, chronic health conditions, and use of preventive services
- Collect data in all 50 states, District of Columbia, and three U.S. territories
Wisconsin State Population – Rural / Urban

https://www.ruralhealthinfo.org/visualizations

- Provides many data visualization tools including interactive charts, graphs, and maps on a variety of topics related to rural health status, health care, and disparities.
Wisconsin State Population – Vascular Risk Factors

Survey of the Health of Wisconsin (SHOW)
Improving Health in Wisconsin through Research, Community Engagement, and Education

https://show.wisc.edu/

- Household-based examination health surveys on representative samples of Wisconsin residents
- Topics include health conditions, health-related behaviors, health care, social and socioeconomic determinants
- Four waves since 2008 with 6,000+ participants
- Self-reported data, objective measures, biological samples
Statistical Testing Methods

Continuous variables
- One-sample z-test (the population variance is known)

Binary variables
- Exact binomial test

Categorical variables with >2 categories
- Exact multinomial test with the Monte Carlo approach

Correction for multiple testing
- Benjamini-Hochberg false discovery rate (FDR) correction method
Center participants:

Range 45-99 years

Mean (SD) = 67.3 (9.6)
## Results – Demographics

<table>
<thead>
<tr>
<th>Metrics</th>
<th>Younger Age Group (45 - 64 Years)</th>
<th>Older Age Group (65 Years and Older)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>State Population</td>
<td>Center Participants</td>
</tr>
<tr>
<td>Women, % *</td>
<td>50.3%</td>
<td>66.6%</td>
</tr>
<tr>
<td>Underrepresented groups (URG), % *</td>
<td>10.7%</td>
<td>25.3%</td>
</tr>
<tr>
<td>Race, % *</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>91.4%</td>
<td>77.7%</td>
</tr>
<tr>
<td>Black</td>
<td>5.3%</td>
<td>17.6%</td>
</tr>
<tr>
<td>American Indian</td>
<td>1.1%</td>
<td>4.1%</td>
</tr>
<tr>
<td>Asian</td>
<td>2.1%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Hispanic, %</td>
<td>4.7%</td>
<td>3.0%</td>
</tr>
</tbody>
</table>

* Significant for both age groups
## Results – Demographics

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<tbody>
<tr>
<td></td>
<td>State Population</td>
<td>Center Participants</td>
</tr>
<tr>
<td>Education, %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did not graduate high school</td>
<td>7.5%</td>
<td>0.7%</td>
</tr>
<tr>
<td>High school graduate</td>
<td>30.0%</td>
<td>7.4%</td>
</tr>
<tr>
<td>Attended college</td>
<td>33.2%</td>
<td>22.0%</td>
</tr>
<tr>
<td>College graduate</td>
<td>29.3%</td>
<td>69.9%</td>
</tr>
<tr>
<td>Rural, %</td>
<td>27.6%</td>
<td>18.9%</td>
</tr>
</tbody>
</table>

* Significant for both age groups
## Results – Vascular Risk Factors

<table>
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<tr>
<td></td>
<td>State Population</td>
<td>Center Participants</td>
</tr>
<tr>
<td>Hypertension, % *</td>
<td>41.1%</td>
<td>32.4%</td>
</tr>
<tr>
<td>Diabetes, % +</td>
<td>13.7%</td>
<td>13.2%</td>
</tr>
<tr>
<td>Systolic blood pressure (mm Hg), Mean(SD) *</td>
<td>127.3 (16.6)</td>
<td>122.1 (16.3)</td>
</tr>
<tr>
<td>BMI (kg/m²), Mean(SD) *</td>
<td>30.6 (7.3)</td>
<td>29.2 (7.0)</td>
</tr>
<tr>
<td>Total Cholesterol (mg/dL), Mean(SD) +</td>
<td>200.2 (40.5)</td>
<td>202.3 (41.4)</td>
</tr>
</tbody>
</table>

* Significant for both age groups, + significant for older age group only
Conclusions

Compared to the Wisconsin state population 45 years and older, our center participants

- Older
- More women
- Greater percentages of Black and American Indians
- Better educated
- Less living in rural areas
- Better vascular risk profiles
Conclusions

Not designed to be representative of state population
- Not suitable for epidemiology studies

Oversampling underrepresented minorities
- Statistical power
- Precision in effect size estimates

Target recruiting more people who are less educated or live in rural areas
- Allow research findings to be generalizable to these subpopulations
- Support better policy making to meet their needs
Acknowledgement

Collaborators (in alphabetical order of last name)

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ADRC investigators and staff

Thank you!

ADRC research participants