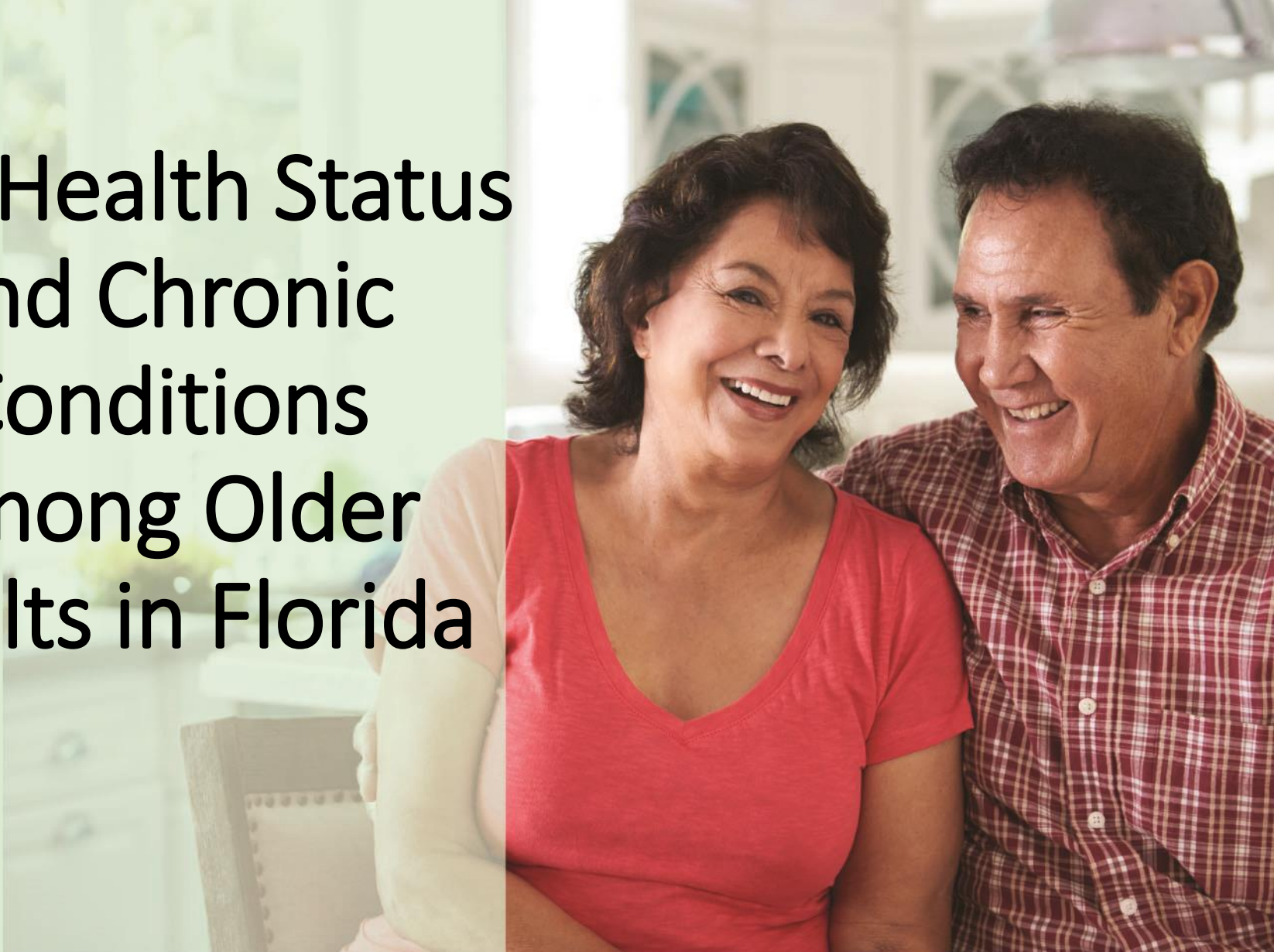


Oral Health Status and Chronic Conditions Among Older Adults in Florida



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Overview of Presentation

- Importance of Oral Health Across the Lifespan
- Data Source-Basic Screening Survey
- Methodology and Analysis
- Results
- Strengths and Limitations
- Conclusions and Implications



Oral Health in Older Adults

- Oral health is vitally important for overall health and should be maintained across the life course
- Oral diseases and conditions are common among older Americans who may not have had access to community water fluoridation and routine preventive dental care as children
- Dental decay and infection can cause significant health problems, amplify existing chronic diseases, and cause nutritional deficiencies among this population

Oral Health in Older Adults-Florida

- During 2014, among Florida adults age 65 and older*:
 - Two in three (66%) had visited the dentist in the past year
 - Highest among non-Hispanic White adults
 - Three in four had at least one permanent tooth removed because of tooth decay or gum disease
 - Highest among non-Hispanic Black adults

Oral Health and Chronic Disease

- There is a growing body of evidence that shows treating oral health conditions can improve overall health status among those with various chronic conditions including diabetes, heart disease, and stroke*
 - Cost savings component of preventing and treating oral disease
- There may be a pathological link between oral disease (particularly periodontal disease) and poor health outcomes such as preterm birth and stroke

*Jeffcoat, M. K., Jeffcoat, R. L., Gladowski, P. A., Bramson, J. B., & Blum, J. J. (2014). Impact of periodontal therapy on general health: Evidence from insurance data for five systemic conditions. *American journal of preventive medicine*, 47(2), 166-174.

Data Source: Basic Screening Survey (BSS)

- Established, standardized screening protocol published by the Association of State and Territorial Dental Directors (ASTDD)
- Allows for comparability across states
- Collects demographic information via participant questionnaire and oral health indicators via open mouth screening
- Several different populations of interest in Florida:
 - Third Grade Children: 2013-2014
 - Head Start Children: 2014-2015
 - Older Adults: 2015-2016 (*Used for this analysis*)

Target Population of BSS

- Older adults (age 60 years and older) attending congregate meal sites statewide
- What is a congregate meal site?
 - Location providing nutritionally balanced meals, nutrition education, and nutrition risk screening to adults age 60 and older and their spouses
 - Organized by the Area Agencies on Aging
 - Can be in various types of facilities including seniors centers and churches
- N=425 congregate meal sites in Florida that serve thousands of meals daily

Methodology of BSS

- Average daily meal enrollment data from congregate meal sites statewide was used to determine sample size
- A Stratified Probability Proportional to Size sample (PPS) design was used to select the representative statewide sample of sites and the meal enrollment data were used to construct the population sample frame
- The list of sites was sorted by region and then by average meal enrollment within each region to achieve geographic stratification

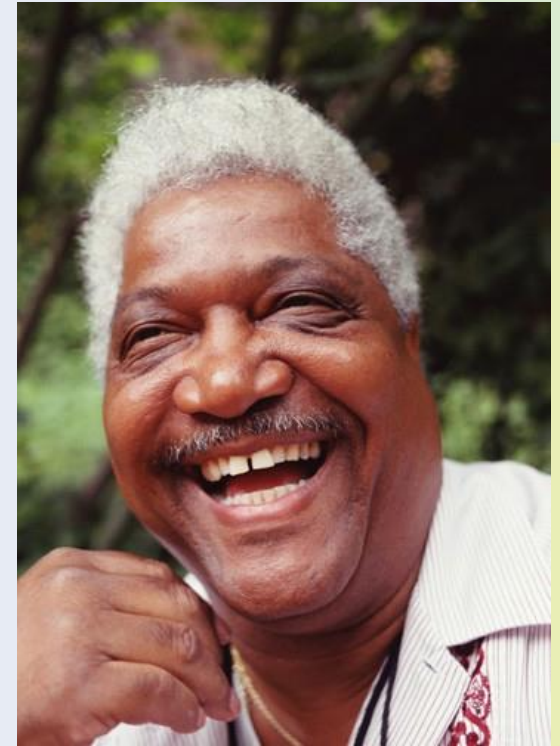
Methodology of BSS

- 3,288 adults were enrolled in all the congregate meal sites in the participating 35 centers from 2015-2016
 - 21.6% of consent forms returned (709/3,288)
 - 95.6% of consent forms returned with positive consent (678/709)
 - 20.5% of sampled adults screened (674/3,288)
- The subsequent analysis was limited to participants aged 60 years and older who were not missing data on key health indicators for a total N=668

Oral Health Indicators

Collected from open mouth screening

1. Dentures and denture use
2. Number of natural teeth
3. Untreated decay
4. Root fragments
5. Need for periodontal care*
6. Suspicious soft tissue lesions
7. Urgency of need for dental care



**This analysis focused on the need for periodontal care given its established relationship to chronic diseases and other adverse health conditions in the literature.*



Chronic Disease Indicators

Collected from participant questionnaire

1. Arthritis
2. Asthma
3. Cancer
4. Diabetes*
5. Heart Disease*
6. Hypertension*
7. Obesity
8. Osteoporosis

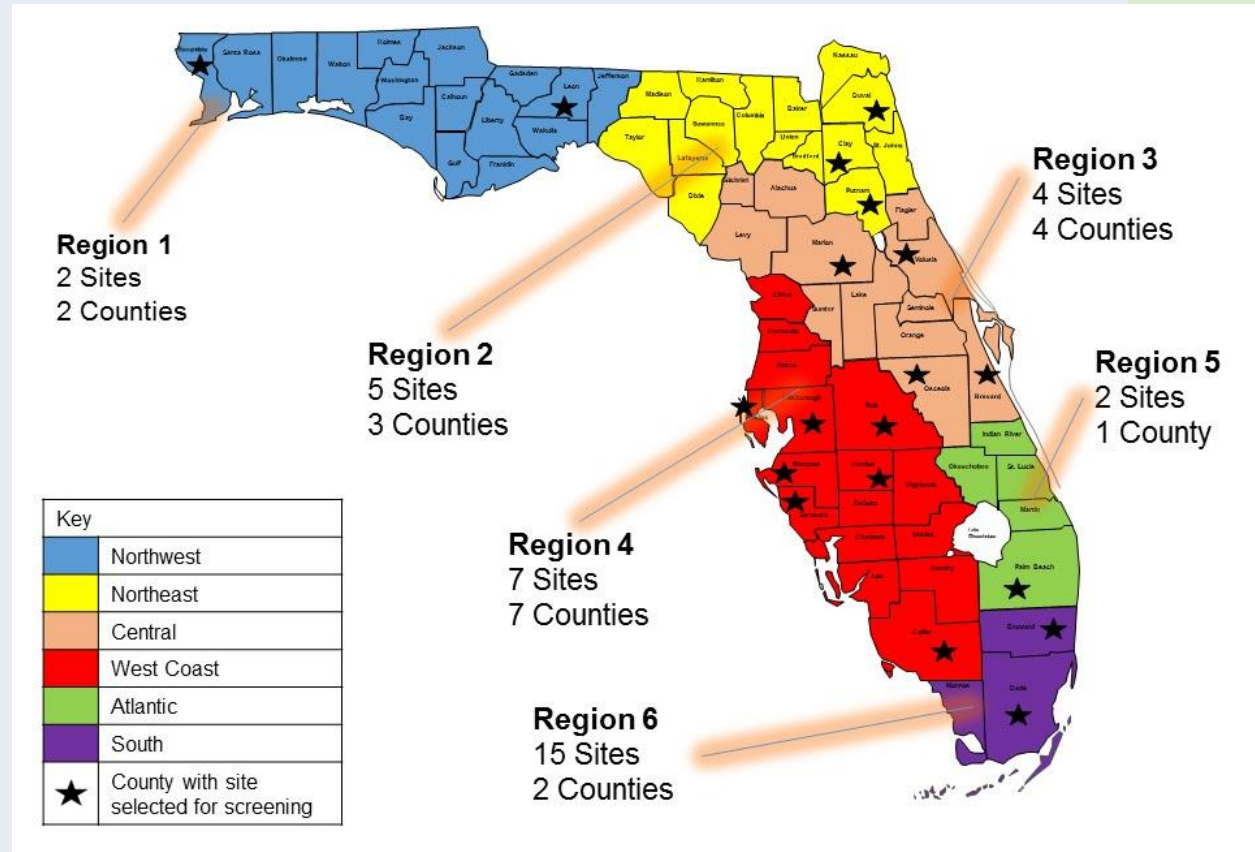
**Diabetes and cardiovascular conditions were selected as the outcomes of interest based their association with periodontal disease in the literature and the potential for improved health outcomes for patients and increase cost-savings for health care systems.*

> Cardiovascular Conditions



Demographic/Socio-Economic Indicators *Collected from participant questionnaire*

- Education Level*
- Age*
- Gender*
- Race/Ethnicity*
- Florida Region
- Dental Insurance Status



**Included in analyses*

Analysis-Variables

- Oral Health Condition of Interest (Risk Factor):
 - Need for Periodontal Care: need to have teeth cleaned before the next regularly scheduled dental appointment or more advanced periodontal treatment is needed
- Chronic Disease Indicators of Interest (Outcomes):
 - Diabetes
 - Cardiovascular Conditions (Heart Disease or Hypertension)
- Demographic Characteristics (Possible confounders):
 - Age: 60-69 years, 70-79 years*, 80 years and older
 - Race/Ethnicity: Non-Hispanic White*, Non-Hispanic Black, Hispanic, Other (includes multi-racial)
 - Education Level: Less than High School Degree, High School Degree*, Some College, Advanced Degree (Masters', Professional, and Doctoral)
 - Gender: Male*, Female

**Reference categories for logistic regression*



Analysis-Methods

- Data analysis was completed utilizing Statistical Analysis Software (SAS) version 9.4
- Outcome data were weighted and adjusted for non-response based upon the Stratified Probability Proportional to Size sample design with a 95% Confidence Interval (CI)
- Chi-square statistics were conducted to compare for differences in demographic characteristics by outcomes of interest
- Weighted Logistic Regression models



Analysis

- Example code:

```
proc surveyfreq data=older.analytic;  
strata str;  
tables agecat*perio/chisq row cl;  
weight wts60;  
run;
```



Results-Sample Characteristics

| Characteristics | Total Population N=668 | |
|---|------------------------|-------------|
| | | N (Percent) |
| Need for Periodontal Care | | 98 (14.7%) |
| Among those with teeth* | | 98 (17.1%) |
| Diabetes | | 187 (28.7%) |
| Cardiovascular Conditions: Heart Disease and/or Hypertension | | 316 (49.7%) |
| Race/Ethnicity | | |
| Non-Hispanic White | | 237 (39.4) |
| Non-Hispanic Black | | 60 (11.2%) |
| Non-Hispanic Other | | 20 (3.0%) |
| Hispanic | | 278 (36.5%) |
| Multi-Racial | | 66 (9.9%) |
| Age (Years) | | |
| 60-69 Years | | 176 (26.3%) |
| 70-79 Years | | 269 (40.3%) |
| 80 Year and Older | | 223 (33.4%) |
| Gender | | |
| Male | | 224 (31.7%) |
| Female | | 442 (67.9%) |
| Missing | | 2 (0.3%) |
| Education Level | | |
| Less than High School | | 166 (24.3%) |
| High School | | 181 (30.0%) |
| Some College | | 212 (32.4%) |
| Advanced Degree | | 89 (13.3%) |

**It is more clinically appropriate to report need for periodontal care among those participants who had teeth (N=543)*



Results

Estimates of Need for Periodontal Care by Demographic Characteristics

| Characteristics | Need for Periodontal Care Weighted Percent (95% Confidence Interval) | P-Value |
|------------------------|--|---------|
| Overall | 17.1% (13.9, 20.4) | -- |
| Race/Ethnicity | | |
| Non-Hispanic White | 18.1% (12.6, 23.5) | 0.8044 |
| Non-Hispanic Black | 12.8% (4.2, 21.5) | |
| Hispanic | 16.8% (11.5, 22.0) | |
| Other | 19.5% (7.8, 31.3) | |
| Age (Years) | | |
| 60-69 Years | 18.8% (12.6, 25.0) | 0.7089 |
| 70-79 Years | 15.5% (10.1, 20.8) | |
| 80 Years and Older | 17.8% (11.6, 24.0) | |
| Gender | | |
| Male | 21.0% (14.6, 27.5) | 0.1339 |
| Female | 15.4% (11.6, 19.3) | |
| Education Level | | |
| Less than High School | 14.7% (8.1, 21.3) | 0.0765 |
| High School | 18.4% (11.6, 25.1) | |
| Some College | 13.1% (8.1, 18.0) | |
| Advanced Degree | 26.3% (15.8, 36.9) | |



Results

Estimates of Diabetes and Cardiovascular Conditions by Demographic Characteristics

| Characteristics | Diabetes Weighted Percent (95% Confidence Interval) | P-Value | Cardiovascular Conditions Weighted Percent (95% Confidence Interval) | P-Value |
|------------------------|---|---------|--|---------|
| Overall | 28.8% (24.8, 32.8) | -- | 49.9% (45.6, 54.3) | -- |
| Race/Ethnicity | | | | |
| Non-Hispanic White | 27.1% (20.5, 33.7) | 0.1146 | 46.2% (38.9, 53.5) | 0.2780 |
| Non-Hispanic Black | 39.0% (24.2, 53.8) | | 54.1% (39.5, 68.8) | |
| Hispanic | 25.4% (19.8, 31.0) | | 49.8% (43.1, 56.4) | |
| Other | 37.5% (25.5, 49.6) | | 60.1% (48.0, 72.2) | |
| Age (Years) | | | | |
| 60-69 Years | 32.6% (24.9, 40.5) | 0.0901 | 49.5% (40.8, 58.2) | 0.3350 |
| 70-79 Years | 31.7% (25.1, 38.3) | | 53.8% (46.9, 60.7) | |
| 80 Years and Older | 22.6% (15.9, 29.2) | | 45.9% (38.3, 53.5) | |
| Gender | | | | |
| Male | 28.8% (22.6, 35.1) | 0.9925 | 42.4% (35.1, 49.6) | 0.0169 |
| Female | 28.9% (23.8, 33.9) | | 53.5% (48.1, 58.9) | |
| Education Level | | | | |
| Less than High School | 38.1% (29.4, 46.9) | 0.0182 | 47.9% (39.0, 56.7) | 0.7670 |
| High School | 30.0% (22.5, 37.5) | | 49.8% (41.5, 58.1) | |
| Some College | 22.9% (16.6, 29.3) | | 53.9% (46.1, 61.8) | |
| Advanced Degree | 21.6% (12.3, 31.0) | | 52.0% (40.2, 63.66) | |

Cardiovascular conditions= Heart disease or hypertension

Results

Association between Need for Periodontal Care and Selected Chronic Conditions

| | Odds Ratio (95% C.I.) Unadjusted | Risk Ratios (95% C.I.) Adjusted* |
|---------------------------|-------------------------------------|-------------------------------------|
| Diabetes | 0.94 (0.55, 1.63) | 0.90 (0.52, 1.55) |
| Cardiovascular Conditions | 1.00 (0.62, 1.63) | 0.94 (0.51, 1.75) |

**Adjusted for race/ethnicity, gender, age, and education level*

Discussion

The analysis revealed no association between:

- Need for Periodontal Care and Diabetes
- Need for Periodontal Care and Cardiovascular Conditions

There are many possible reasons for this:

- The indicator need for periodontal care does not necessarily mean the participant had periodontal disease *i.e. this indicator is not sensitive enough to capture true disease*
- Chronic conditions are self-reported and may not be accurate to the health of the individual
- Small sample size (N=574) limits stratification and power of analysis
- Established literature shows that untreated dental problems can exacerbate current chronic disease and this analysis only looked at existence of chronic disease (not severity)
- Cross-sectional (i.e. moment in time) data collection



Strengths

Strengths

- Utilization of the BSS methodology makes Florida's data comparable to other states
- Rich demographic information collected on the screening form
- The novel addition of a chronic disease question to Florida's screening project allowed for the assessment of oral health and chronic conditions in tandem



Limitations

Limitations

- BSS screeners are trained to be conservative, thus estimates presented here may be a underrepresentation of the true oral health status
- Screening were conducted without radiographs and are not considered a comprehensive oral exam
- Limited assessment of confounding and effect modification due to time
- Small numbers lead to less stable estimates and wide confidence intervals (high standard error)



Conclusions

- Analysis revealed poor oral health status among older adults in Florida
 - Almost one in five (17.1%) had need for periodontal care; the prevalence of other oral health indicators not discussed here were even higher e.g. untreated decay at 23.0%
- The analysis revealed **no** association between:
 - Need for Periodontal Care and Diabetes
 - Need for Periodontal Care and Cardiovascular Conditions



Implications

- Florida is one of only nine states that have used the BSS methodology to assess the oral health status of the older adult population and it revealed a strong oral health need
- The BSS may not be the best data source to explore the relationship between oral health and chronic disease
 - This research is outside of the scope and resources of the Florida DOH
- As public health entities move towards promoting comprehensive care for older adults, it is important that oral health prevention and treatment be integrated, especially as it relates to chronic disease



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Thank you!

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