The Oral Health of our Aging Population (TOHAP)

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Overview

- Study Methodology
- Results
- Implications
The Oral Health of our Aging Population (TOHAP)

METHODOLOGY

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H Lawrence
TOHAP

• Cross-sectional provincial survey
• Sample:
  – Proportional representation of rural and urban dwelling adults
    • Living in the community
      – Pre-seniors aged 45 - 64
      – Seniors aged 65+
    • Living in Long Term Care
      – Aged 45+
TOHAP

• Survey in French and English
  – Demographics
  – Dental care utilization
  – Access to care
  – General health
  – Subjective measures of oral health

• Clinical examination
  – Mucosal status
  – Jaw function
  – Prostheses quality
  – Periodontal indices
  – DMFT
    • Coronal and root surfaces
  – Amalgam surfaces
  – Urgent treatment needs
Logistics

• Interviews of *independent living* adults through telephone survey
  – Appointments made for clinical exam within 2 weeks

• Face-to-face interviews in LTC
  – Immediately followed by clinical exam

• All received OHI/ hygiene aids
Independent Living Adults

• Telephone Survey
  – Conducted by Ontario company
  – Screen for adults aged 45 + willing to participate in 10 -20 minute survey AND oral examination
LTC Sample

• Random sample of facilities with $\geq 20$ beds
  – Within the rural and urban areas proportionate to size
    • Small (20-34 beds)
    • Medium (35-101 beds)
    • Large ($\geq 102$ beds)

• Convenience sample of residents able to provide informed consent
  • 7-20 from each facility
Independent Living Sites

• Matching LTC sites where possible
  – Use of facilities
  – Efficiency in travel time/costs
  – Comparisons
TOHAP LTC Sites
N = 31
TOHAP Community
Sites
N= 22
Questionnaire/Interview

- Derived from validated surveys
  - OHIP-14
  - CHMS
  - NHANES

- Data entry
  - Community dwelling: Entered directly into database by survey company at time of interview
  - LTC: Paper copy entered into database later
    - Regular quality control
Clinical Examination

• Data directly entered into password protected database
  – Web forms with pull-down menus
  – Linked to questionnaire data
# Tooth Status

**OHE_N41**-Record crown and root status for each tooth.

<table>
<thead>
<tr>
<th>Tooth</th>
<th>Crown</th>
<th>Root</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>Decayed severely</td>
<td>Decayed - smooth surface caries</td>
</tr>
<tr>
<td>16</td>
<td>Missing - due to caries or periodontal disease</td>
<td>Missing - due to caries or periodontal disease</td>
</tr>
<tr>
<td>15</td>
<td>Sound - never decayed or restored</td>
<td>Sound - never decayed or restored</td>
</tr>
<tr>
<td>14</td>
<td>Missing - due to caries or periodontal disease</td>
<td>Missing - due to caries or periodontal disease</td>
</tr>
<tr>
<td>13</td>
<td>Filled with other material, but filling is defective and needs replacement</td>
<td>Sound - never decayed or restored</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Clinical Examinations

• (1 of) 6 dentists
  – Calibrated to W.H.O. standards
    • Inter and Intra examiner reproducibility
      – Kappa = 0.6 - 0.75 (high)

• Dental assistant/recorder

• Trained interviewer used for LTC
Logistics

- Variety of settings
  - Dental offices in communities
  - Local hospitals
  - LTC facilities
    - Mobile equipment
    - (Wheel)chair -side
    - Bed-side
RESULTS
Independent Living

11,603 Telephone Calls

7,058 Contacted

1122 Participants Interviewed

19 volunteer participants

757 Participants Examined

18 Volunteer Participants Interviewed

- 1141 Participants
- 747 Completed Both Interview & Exam
Community: Completion Rates

- Survey response rate (completed cases/estimate of all eligible cases in the sample)
  - 21% phone interview
  - 13.5% clinical exam
- Reasons?
  - 39% calls were ‘no contact’
  - 38% of eligible calls refused
Completers vs. Partial-completers

• Partial completers (n=384) completed telephone survey, but not clinical exam
• Completers (n=747) more likely to be:
  – Married
  – Not working
  – Post-secondary education
  – Visiting dentist 1+ time/yr.
LTC

48 LTC Facilities invited → 18 declined

31 Participating LTC Facilities

399 Participants Recruited

330 Participants Interviewed

5 not interviewed (hearing problems)

335 Participants Examined

- 335 Participants
- 330 Completed Both Interview & Exam

64 cancelled or did not qualify
LTC

• 93% target sample size achieved
• (over-sampled)
  – Margin of error of 5.2% (95% confidence level)
Community Dwelling vs. Long Term Care Residents

A Comparison
LTC: Average age = 80.8 ± 11.6 years (range 45 – 104)
# Dentate Status (%)

<table>
<thead>
<tr>
<th></th>
<th>Community 45-65 yr</th>
<th>65</th>
<th>LTC 45 yr +</th>
<th>CHMS 60-79 yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dentate - both arches</td>
<td>88</td>
<td>72.7</td>
<td>34.9</td>
<td></td>
</tr>
<tr>
<td>Dentate - upper only</td>
<td>0</td>
<td>0.3</td>
<td>1.8</td>
<td></td>
</tr>
<tr>
<td>Dentate - lower only</td>
<td>9.5</td>
<td>15.4</td>
<td>22.4</td>
<td></td>
</tr>
<tr>
<td>Edentulous</td>
<td>2.6</td>
<td>11.6</td>
<td>40.9</td>
<td>21.7</td>
</tr>
</tbody>
</table>
# Prosthetic Status

<table>
<thead>
<tr>
<th></th>
<th>45-65 yr</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maxilla</td>
<td>Mandible</td>
<td>Maxilla</td>
<td>Mandible</td>
<td>Maxilla</td>
<td>Mandible</td>
<td>Maxilla</td>
</tr>
<tr>
<td>Fixed bridge</td>
<td>10.3</td>
<td>4.7</td>
<td>13.3</td>
<td>8.3</td>
<td>2.7</td>
<td>2.4</td>
<td></td>
</tr>
<tr>
<td>Implant</td>
<td>3.1</td>
<td>1.8</td>
<td>0.7</td>
<td>1.8</td>
<td>0.3</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Partial denture</td>
<td>7.7</td>
<td>5</td>
<td>18.1</td>
<td>15</td>
<td>10.8</td>
<td>8.7</td>
<td></td>
</tr>
<tr>
<td>Full denture</td>
<td>10.7(</td>
<td>2.2</td>
<td>26.8</td>
<td>10.7</td>
<td>57.3</td>
<td>26.3</td>
<td></td>
</tr>
<tr>
<td>Subjective Measures</td>
<td>Community 45-65 yr</td>
<td>³ 65 yr</td>
<td>LTC 45 yr +</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------------------</td>
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<td>---------</td>
<td>-------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health: excellent/vgood/good</td>
<td>87.9</td>
<td>87.5</td>
<td>66.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral health: excellent/vgood/good</td>
<td>80.6</td>
<td>86.8</td>
<td>75.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-reported dental/oral problems</td>
<td>49.3</td>
<td>40.6</td>
<td>52.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toothache</td>
<td>6.0</td>
<td>3.1</td>
<td>5.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature sensitivity</td>
<td>29.8</td>
<td>13.4</td>
<td>8.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Xerostomia</td>
<td>11.6</td>
<td>17.4</td>
<td>36.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived need for dental treatment</td>
<td>31.7</td>
<td>30.1</td>
<td>24.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Caries

<table>
<thead>
<tr>
<th></th>
<th>Community 45-65 yr</th>
<th>Community ≥65 yr</th>
<th>LTC 45 yr +</th>
<th>CHMS 20-79 yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decayed crowns (DT)</td>
<td>0.37</td>
<td>0.20</td>
<td>0.81</td>
<td>0.37</td>
</tr>
<tr>
<td>% with 1+ DT</td>
<td>16.20</td>
<td>13.80</td>
<td>51.00</td>
<td>20.00</td>
</tr>
<tr>
<td>Decayed roots (DR)</td>
<td>0.27</td>
<td>0.26</td>
<td>1.44</td>
<td></td>
</tr>
<tr>
<td>% with 1+ DR</td>
<td>10.90</td>
<td>14.90</td>
<td>44.40</td>
<td>7.00</td>
</tr>
</tbody>
</table>
## Impacts by OHIP-14 subscale

<table>
<thead>
<tr>
<th></th>
<th>Community</th>
<th></th>
<th>LTC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>45-64 years</td>
<td>65 years +</td>
<td>65 years +</td>
</tr>
<tr>
<td><strong>Prevalence:</strong> % reporting 1+ impacts fairly/very often</td>
<td>28.8</td>
<td>22.0</td>
<td>25.3</td>
</tr>
<tr>
<td><strong>Extent:</strong> mean no. of items reported fairly/very often (S.D.)</td>
<td>0.73 (1.73)</td>
<td><strong>0.49 (1.40)</strong></td>
<td>0.94 (2.32)</td>
</tr>
<tr>
<td><strong>Severity:</strong> mean OHIP-14 score (S.D.)</td>
<td><strong>6.22 (8.0)</strong></td>
<td>4.75 (6.92)</td>
<td>5.71 (9.80)</td>
</tr>
</tbody>
</table>
Last Dental Visit

- 45-65 (N=411)
  - Within last year: 75.2%
  - 5+ years ago: 71.8%

- 65 (N=336)
  - Within last year: 26.8%
  - 5+ years ago: 8.3%

- LTC (N=335)
  - Within last year: 41.9%
<table>
<thead>
<tr>
<th></th>
<th>Independent Living</th>
<th>LTC Residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-64 years (N=411)</td>
<td>≥65 years (N=336)</td>
<td>45 yrs + (n-335)</td>
</tr>
</tbody>
</table>

**Median Household Income**

<table>
<thead>
<tr>
<th></th>
<th>Sole adult</th>
<th>Couple</th>
<th>Dental Insurance (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$30,000-$40,000</td>
<td>$60,000-$80,000</td>
<td>65.0</td>
</tr>
<tr>
<td></td>
<td>$20,000-$30,00</td>
<td>$40,000-$50,000</td>
<td>38.6</td>
</tr>
<tr>
<td></td>
<td>$10,000- $20,000</td>
<td></td>
<td>17.3</td>
</tr>
</tbody>
</table>
Periodontal Status

<table>
<thead>
<tr>
<th></th>
<th>45-65 (N=397)</th>
<th>≥65 (N=290)</th>
<th>LTC (N=198)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gingival Index mean (0-3)</td>
<td>0.91</td>
<td>1</td>
<td>1.52</td>
</tr>
<tr>
<td>Debris Index mean (0-3)</td>
<td>0.7</td>
<td>0.78</td>
<td>1.4</td>
</tr>
<tr>
<td>Calculus Index mean (0-3)</td>
<td>0.64</td>
<td>0.73</td>
<td>1.12</td>
</tr>
<tr>
<td>Attachment loss mean (mm)</td>
<td>2.58</td>
<td>3.2</td>
<td>3.92</td>
</tr>
<tr>
<td>% with AL ≥4mm at 1+ sites</td>
<td>44.2</td>
<td>68.5</td>
<td>66.7</td>
</tr>
</tbody>
</table>
Predictors of Disease

• LTC
  – Those who thought they needed dental treatment were 2.6 times more likely to have fillings or decay on root surfaces.
  – Those with a debris score of 2 or 3 were twice as likely to have 1+ teeth with coronal decay.
  – The risk of periodontal disease increased with age, with those age 85+, being nearly 5 times more likely to have attachment loss.
• People living in community aged 65 and older were:
  • 4.5 times more likely to be *edentulous* than those under age 65
  • 2 times more likely to have a restoration or decay on one or more of their tooth roots
  • 3 times more likely to have untreated periodontal disease
Implications

• Those who completed phone interview but not clinical exam are different than those who completed both
  – Underestimation of prevalence of oral disease
• Those in LTC have poorer oral health and least access to care
Implications

• Midlife Nova Scotians are more likely to be dentate as they age, and may require more dental services than the current senior cohort
Relevance of our Research

• In order to implement sustainable changes in services and/or policy related to oral health of aging population we need to understand:
  – Current status of oral health
    • Rural/urban locations
    • Dependant/independent living
    • Generational
  – Human and institutional factors that place oral health care on the “back-burner” in terms of health care
  – Best-practices
    • Policy development
    • Alternative service models
    • Education of care-givers
Acknowledgments

• Funding:
  – Canadian Institutes of Health Research
  – Health Canada (Office of the Chief Dental Officer)
  – Nova Scotia Health Research Foundation
  – Faculty of Dentistry, Dalhousie University
Acknowledgments

• Volunteers for the survey
• Administrators and staff of the participating long-term care facilities
• Staff of the Dalhousie Dental Clinic
• Dentists and staff of the many dental clinics who donated their space for our research