Study of Adult Emergency Room Visits with a Dental-Related Diagnosis in Hawai‘i: 2016-2020

Completed October, 2021

HAWAI‘I ORAL HEALTH COALITION

Study Biostatisticians:
Masako Matsunaga, PhD. & John Chen, PhD.
UH JABSOM Biostatistics Core Facility
Organizational Acknowledgements

• The Family Health Services Division-Hawai‘i State Department of Health
• The Association of State and Territorial Dental Directors (ASTDD)
• The Laulima Data Alliance
• The Biostatistics Core Facility Team - University of Hawai‘i John A. Burns School of Medicine
• The Hawai‘i Public Health Institute
• The Hawai‘i Children’s Action Network
• The Oral Health Progress and Equity Network (OPEN)
Study Limitations

• Data represents only information gathered from Laulima, which is the repository for health care institutional data statewide.

• No data was collected or analyzed on oral health acute care-related visits to acute care centers, FQHCs, or other dental services sites.
Emergency Rooms (ERs) in Hawai‘i

- Samuel Mahelona Memorial Hospital
- Wilcox Memorial Hospital
- Kauai Veterans Memorial Hospital
- Kahuku Medical Center
- Wahiawa General Hospital
- The Queen’s Medical Center – West Oahu
- Pali Momi Medical Center
- Kaiser Foundation Hospital
- The Queen’s Medical Center
- Straub Clinic and Hospital
- Kapiolani Center for Women & Children
- Adventist Health Castle
- Molokai General Hospital
- Maui Memorial Medical Center
- Lanai Community Hospital
- Kohala Hospital
- North Hawai‘i Community Hospital
- Hilo Medical Center
- Ka‘u Hospital
- Kona Community Hospital
Summary of Findings for ER Visits with a Dental-Related Diagnosis: Hawai‘i 2016-2020

1. There was a total of 29,536 ER visits with a dental related diagnosis by adults aged 21 years and older.

2. 67% (19,691) of the adult visits had a principal dental diagnosis that they visited the ER.

3. A significant proportion of the ER visits with a principal dental-related diagnosis were treated:
   - in Honolulu County (56%, 11,118)
   - for those aged 21-44 years old (62%, 12,138)
   - for Medicaid recipients (49%, 9,680)
     - Native Hawaiian/Part Native Hawaiian (24%, 5,018) patients

4. A large portion of Medicaid claims for ER visits with a principal diagnosis were submitted for Native Hawaiians/Part Native Hawaiian (31%, 2,991) patients.

5. Medicaid claims constituted 45% of the cumulative total charges for the ER visits with a principal dental-related diagnosis (12.3M/27.5M).

6. An average of 10% of patients who visited ER for dental-related conditions revisited the ER at least twice in the same year.

7. Higher rates of ER visits with a dental-related diagnosis were found for Hawai‘i County, Kaua‘i County, and in 21-44 year old patients.
Study Methods
Study Design and Data

• This was a descriptive cross-sectional study looking at trend analysis over 5 years (2016-2020)

• Study Purpose: To examine the frequency and rate of ER visits with a dental-related diagnosis among adults (≥21 years old) in Hawai‘i over 5 years

• Data source: The Laulima Data Alliance

• Data: Outpatient/Inpatient primary diagnosis and secondary diagnosis data from 2016-2020

• Study Exclusions:
  o Patients ages 20 years and younger
  o Patients residing outside Hawai‘i
  o Patients who did not use ER services
Demographics of Study Population

- Sex (male, female)
- Age group (21-44y, 45-64y, 65-84y, +85y)
- County (Honolulu, Hawaii, Maui, Kauai)
  - Community Areas (Central Honolulu, East Honolulu, West Honolulu, Ewa, Kaneohe/Kailua, North Shore, Pearl City/Aiea, Waianae; Hilo/North Hawaii, Kona, South Hawaii; West & Central Maui, Molokai/Lanai/East Maui; East Kauai, North & West Kauai)
- Primary Source of Payment (private, Medicare, Medicaid, other, self-pay)
  - Categorized based on the SEDD/HCUP coding guide
- Race/Ethnicity (White, NH/Part NH, Pacific Islander, Filipino, Japanese, Other Asian, Other)
  - Categorized based on the SEDD/HCUP coding guide
  - “White” includes White/Caucasian and Arab/Arabian
  - “Other” includes Black, Native American (Alaska Native, American Indian), Hispanic (Mexican, Hispanic, Portuguese, Other Hispanic or Latino, Puerto Rican), and other races
Study Variables

• Frequency (%) of ER visits with a principal dental-related diagnosis and with any listed dental-related diagnosis
  o Identified by the ICD-10 codes for non-traumatic dental conditions (ASTDD)
  o Principal diagnosis: a first-listed diagnosis
  o Any listed diagnosis: a first-listed and/or a secondary diagnosis
  o Frequency by demographic characteristics

• Cumulative total charges for the ER visits

• Number of the ER visits per patient

• Rate of ER visits with dental-related diagnosis
  o Rate by county and age group
# Top 10 Principal Dental-Related ICD-10 Diagnoses of ER Visits: Hawaii 2016-2020

<table>
<thead>
<tr>
<th>ICD10</th>
<th>Count (%)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>K0889</td>
<td>4991 (20.8) Other specified disorders of teeth and supporting structures</td>
</tr>
<tr>
<td>2</td>
<td>K047</td>
<td>4333 (18.1) Periapical abscess without sinus</td>
</tr>
<tr>
<td>3</td>
<td>K029</td>
<td>2799 (11.7) Dental caries, unspecified</td>
</tr>
<tr>
<td>4</td>
<td>R6884</td>
<td>1322 (5.5) Jaw pain</td>
</tr>
<tr>
<td>6</td>
<td>K088</td>
<td>743 (3.1) Other specified disorders of teeth and supporting structures</td>
</tr>
<tr>
<td>5</td>
<td>K1120</td>
<td>667 (2.8) Sialadenitis, unspecified</td>
</tr>
<tr>
<td>8</td>
<td>K122</td>
<td>495 (2.1) Cellulitis and abscess of mouth</td>
</tr>
<tr>
<td>7</td>
<td>K1379</td>
<td>491 (2.0) Other lesions of oral mucosa</td>
</tr>
<tr>
<td>9</td>
<td>K130</td>
<td>306 (1.3) Disease of lips</td>
</tr>
<tr>
<td>10</td>
<td>K068</td>
<td>304 (1.3) Other specified disorders of gingiva and edentulous alveolar ridge</td>
</tr>
</tbody>
</table>
Study Results
ER Visits with Any Listed (Principal/Secondary) Diagnosis: Hawaii 2016-2020

- Principal Dx: 19691, 67%
- Secondary Dx Only: 9845, 33%
ER Visits with a Dental-Related Diagnosis: Hawaii 2016 - 2020

Any Listed Diagnosis (n=29,536)  Principal Diagnosis (n=19,691)
Rates of ER Visits with a Dental-Related Diagnosis: Hawaii 2016-2019

<table>
<thead>
<tr>
<th>Year</th>
<th>Any Listed Diagnosis</th>
<th>Principal Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>565.4</td>
<td>374.6</td>
</tr>
<tr>
<td>2017</td>
<td>601.7</td>
<td>403.8</td>
</tr>
<tr>
<td>2018</td>
<td>571.7</td>
<td>383.7</td>
</tr>
<tr>
<td>2019</td>
<td>560.1</td>
<td>379.8</td>
</tr>
</tbody>
</table>
ER Visits with a Dental-Related Diagnosis by County of Residence: Hawaii 2016-2020

Principal Diagnosis (n=19,691)

- Hawaii: 11118 (57%)
- Honolulu: 4515 (23%)
- Kauai: 2248 (11%)
- Maui: 1810 (9%)

Any Listed Diagnosis (n=29,536)

- Hawaii: 18126 (62%)
- Honolulu: 6015 (20%)
- Kauai: 2961 (10%)
- Maui: 2434 (8%)
ER Visits with a Dental-Related Diagnosis by County of Residence: Hawaii 2016-2020

Principal Diagnosis (n=19,691)  Any Listed Diagnosis (n=29,536)
ER Visits with a Dental-Related Diagnosis by County of Residence: Hawaii 2016-2020

Principal Diagnosis (n=19,691)  Any Listed Diagnosis (n=29,536)
Rates of ER Visits with a Dental-Related Diagnosis by County of Residence: Hawaii 2016-2019

Principal Diagnosis

Any Listed Diagnosis

<table>
<thead>
<tr>
<th>Year</th>
<th>Honolulu</th>
<th>Hawaii</th>
<th>Maui</th>
<th>Kauai</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>501.3</td>
<td>785.8</td>
<td>510.4</td>
<td>964.8</td>
</tr>
<tr>
<td>2017</td>
<td>526.9</td>
<td>879.9</td>
<td>516.1</td>
<td>1056.5</td>
</tr>
<tr>
<td>2018</td>
<td>502.7</td>
<td>826.0</td>
<td>486.2</td>
<td>1003.5</td>
</tr>
<tr>
<td>2019</td>
<td>499.7</td>
<td>843.4</td>
<td>461.3</td>
<td>818.3</td>
</tr>
</tbody>
</table>
ER Visits with a Principal Dental-Related Diagnosis by Zip Code (map) and Community Area (table): Hawaii 2016-2020

**Kauai**
- East Kauai: 1125
- North/West Kauai: 685

**Honolulu**
- Ewa: 2272
- West Honolulu: 1816
- Central Honolulu: 1763
- North Shore: 1417
- Pearl City/Aiea: 1351
- Kaneohe/Kailua: 1264
- Waianae: 704
- East Honolulu: 531

**Maui**
- West/Central Maui: 1477
- Molokai/Lanai/East Maui: 771

**Hawaii**
- Hilo/North Hawaii: 2009
- Kona: 1360
- South Hawaii: 1146
ER Visits with a Dental-Related Diagnosis by Sex: Hawaii 2016-2020

**Principal Diagnosis (n=19,691)**
- Male: 10129, 51%
- Female: 9562, 49%

**Any Listed Diagnosis (n=29,536)**
- Male: 14447, 49%
- Female: 15089, 51%
ER Visits with a Dental-Related Diagnosis by Sex: Hawaii 2016-2020

Principal Diagnosis (n=19,691) Any Listed Diagnosis (n=29,536)
ER Visits with a Dental-Related Diagnosis by Sex: Hawaii 2016-2020

<table>
<thead>
<tr>
<th>Year</th>
<th>Male Principal Diagnosis</th>
<th>Female Principal Diagnosis</th>
<th>Male Any Listed Diagnosis</th>
<th>Female Any Listed Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>50%</td>
<td>50%</td>
<td>51%</td>
<td>49%</td>
</tr>
<tr>
<td>2017</td>
<td>51%</td>
<td>49%</td>
<td>51%</td>
<td>49%</td>
</tr>
<tr>
<td>2018</td>
<td>51%</td>
<td>49%</td>
<td>51%</td>
<td>49%</td>
</tr>
<tr>
<td>2019</td>
<td>51%</td>
<td>49%</td>
<td>52%</td>
<td>48%</td>
</tr>
<tr>
<td>2020</td>
<td>54%</td>
<td>46%</td>
<td>54%</td>
<td>46%</td>
</tr>
</tbody>
</table>
ER Visits with a Dental-Related Diagnosis by Age Group: Hawaii 2016-2020

**Principal Diagnosis (n=19,691)**
- 5514, 28%
- 12138, 62%
- 1782, 9%
- 257, 1%

**Any Listed Diagnosis (n=29,536)**
- 16497, 56%
- 8599, 29%
- 3704, 13%
- 736, 2%

21-44y  45-64y  65-84y  +85y
ER Visits with a Dental-Related Diagnosis by Age Group: Hawaii 2016-2020

Principal Diagnosis (n=19,691)  Any Listed Diagnosis (n=29,536)
ER Visits with a Dental-Related Diagnosis by Age Group: Hawaii 2016-2020

Principal Diagnosis (n=19,691)  Any Listed Diagnosis (n=29,536)
Rates of ER Visits with a Dental-Related Diagnosis by Age Group: Hawaii 2016-2019

Rate (per 100,000 persons)

- Principal Diagnosis
- Any Listed Diagnosis

- 21-44y
  - 2016: 549.8
  - 2017: 594.1
  - 2018: 558.9
  - 2019: 531.9

- 45-64y
  - 2016: 311.7
  - 2017: 329.1
  - 2018: 324.0
  - 2019: 334.4

- 65-84y
  - 2016: 135.0
  - 2017: 158.4
  - 2018: 167.1
  - 2019: 186.4

- +85y
  - 2016: 127.5
  - 2017: 161.5
  - 2018: 107.3
  - 2019: 154.0

2016-2019
ER Visits with a Dental-Related Diagnosis by Race/Ethnicity: Hawaii 2016-2020

Principal Diagnosis (n=19,691)    Any Listed Diagnosis (n=29,536)
Medicaid Recipients’ ER Visits with a Dental-Related Diagnosis by Race/Ethnicity: Hawaii 2016-2020

- White: 2991, 31%
- NH/Part NH: 2956, 31%
- Filipino: 1310, 13%
- Other: 856, 9%
- Pacific Islander: 845, 9%
- Japanese: 357, 4%
- Other Asian: 283, 3%
ER Visits with a Dental-Related Diagnosis by Primary Source of Payment: Hawaii 2016-2020

**Principal Diagnosis (n=19,682)**
- Medicare: 5481, 28%
- Medicaid: 9680, 49%
- Private: 2587, 13%
- Self-Pay: 1406, 7%
- Other: 528, 3%

**Any Listed Diagnosis (n=29,522)**
- Medicare: 8065, 27%
- Medicaid: 13473, 46%
- Private: 5200, 18%
- Self-Pay: 861, 3%
- Other: 1923, 6%
NOTE: “Self-Pay” for Principal Diagnosis is greater than Any Listed Diagnosis in all years shown.
ER Visits with a Dental-Related Diagnosis by Primary Source of Payment: Hawaii 2016-2020

- Principal Diagnosis (n=19,691)
- Any Listed Diagnosis (n=29,536)
Cumulative Total Charges for ER Visits with a Dental-Related Diagnosis: Hawaii 2016-2020

*Total charges include outpatient and inpatient

<table>
<thead>
<tr>
<th>Year</th>
<th>Principal Diagnosis ($38.7M)</th>
<th>Any Listed Diagnosis ($276.4M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>6.6</td>
<td>51.4</td>
</tr>
<tr>
<td>2017</td>
<td>7.3</td>
<td>50.5</td>
</tr>
<tr>
<td>2018</td>
<td>8.1</td>
<td>51.0</td>
</tr>
<tr>
<td>2019</td>
<td>9.9</td>
<td>57.6</td>
</tr>
<tr>
<td>2020</td>
<td>6.7</td>
<td>65.8</td>
</tr>
</tbody>
</table>
Cumulative Total Charges for Outpatient ER Visits with a Dental-Related Diagnosis: Hawaii 2016-2020

- **Principal Diagnosis ($27.5M)**
- **Any Listed Diagnosis ($54.7M)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Principal Diagnosis</th>
<th>Any Listed Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>4.9</td>
<td>9.7</td>
</tr>
<tr>
<td>2017</td>
<td>5.7</td>
<td>11.2</td>
</tr>
<tr>
<td>2018</td>
<td>5.7</td>
<td>11.2</td>
</tr>
<tr>
<td>2019</td>
<td>6.2</td>
<td>12.1</td>
</tr>
<tr>
<td>2020</td>
<td>5.1</td>
<td>10.6</td>
</tr>
</tbody>
</table>
Cumulative Total Charges for Outpatient ER Visits with a Dental-Related Diagnosis by Primary Source of Payment: Hawaii 2016-2020

- Medicaid: $21.7M
- Private: $16.1M
- Medicare: $11.5M
- Self-Pay: $2.0M
- Other: $3.3M

Principal Diagnosis ($27.5M) vs. Any Listed Diagnosis ($54.7M)
## Cumulative Total Charges for Outpatient ER Visits with a Dental-Related Diagnosis by Primary Source of Payment: Hawaii 2016-2020

<table>
<thead>
<tr>
<th>Year</th>
<th>Medicaid</th>
<th>Private</th>
<th>Medicare</th>
<th>Self-Pay</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>2.4</td>
<td>1.4</td>
<td>0.8</td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>2017</td>
<td>2.6</td>
<td>1.6</td>
<td>0.9</td>
<td>0.4</td>
<td>0.2</td>
</tr>
<tr>
<td>2018</td>
<td>2.6</td>
<td>1.7</td>
<td>0.9</td>
<td>0.4</td>
<td>0.1</td>
</tr>
<tr>
<td>2019</td>
<td>2.5</td>
<td>1.8</td>
<td>1.1</td>
<td>0.5</td>
<td>0.2</td>
</tr>
<tr>
<td>2020</td>
<td>2.3</td>
<td>1.6</td>
<td>0.8</td>
<td>0.3</td>
<td>0.1</td>
</tr>
</tbody>
</table>

- Principal Diagnosis ($27.5M)
- Any Listed Diagnosis ($54.7M)
Cumulative Total Charges for Outpatient ER Visits with a Dental-Related Diagnosis by Primary Source of Payment: Hawaii 2016-2020


- Principal Diagnosis ($27.5M)
- Any Listed Diagnosis ($54.7M)
Number of Patients with a Dental-Related Diagnosis by Frequency: Hawaii 2016-2020

Principal Diagnosis (n=19,691)  Any Listed Diagnosis (n=29,536)
Summary of Findings for Adult ER visits with a dental-related diagnosis: Hawaii 2016-2020

1. There was a total of 29,536 ER visits with a dental related diagnosis by adults aged 21 years and older
2. 67% (19,691) of the adult visits had a principal dental diagnosis that they visited the ER for treatment
3. A significant proportion of the ER visits with a principal dental-related diagnosis were treated:
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4. Medicaid claims constituted 45% of the cumulative total charges for the ER visits with a principal dental-related diagnosis (12.3M/27.5M)
5. An average of 11% of patients who visited ER for dental-related conditions revisited the ER at least once in the same year
6. Higher rates of ER visits with a dental-related diagnosis were found for Hawaii County, Kauai County, and in 21-44 year old patients.
Study References


Questions or Comments?

For further information on this study, please contact: patrick@hiphi.org or nantika@hawaii.edu