Anthropology 455

Human Biology of the Pacific
Lecture 20: Health & Disease in the Pacific

Philip Houghton 1996

Cambridge: Cambridge University Press

Skeletons

...provide insight into health and well-being, dietary history, lifestyle (activity), violence and trauma, ancestry, and demography…
Health and Disease in the Pacific

- Paleopathology
- Paleodemography
- Growth & development of the skeleton and dentition
- Skeletal & dental paleopathological markers (e.g., iron deficiency anemia, Harris lines, enamel defects)

Indicators of Stress

- “…physiological disruption resulting from impoverished environmental circumstances.”
- environmental constraints
- cultural systems
- host resistance
- biology and culture

Systematic Stress Model

Figure 2: Stress model adapted for use in skeletal science. Although stress, as a physiological disruption, cannot be directly measured, a variety of skeletal changes may be used to infer stress and its impact on individual and population adaptation (from Goodman and Armelagos, 1989: 226).

New Techniques

- Advances in paleopathology
- Trace element analysis
- Stable carbon isotopic analysis

Indicators of Stress (health, diet, lifestyle)

- General
  - Fertility/mortality measures
  - Limb bone lengths
  - Growth arrest lines
  - Dental enamel hypoplasia
- Specific
  - Dental pathology
  - Trauma
  - DJD, infectious diseases

Dental Enamel Hypoplasia

- Childhood stress marker
- Linear enamel hypoplasia (LEH)
Cribra Orbitalia & Porotic Hyperostosis

Porotic hyperostosis

Cribra orbitalia

Infectious Disease

- Non-specific
  - e.g., periostitis, osteomyelitis, etc.
- Specific
  - e.g., syphilis, yaws, leprosy, etc.

Trauma

- Healed fractures
- Dislocation
- Deformity
- Bone modification
**Osteoarthritis & Degenerative Joint Disease (DJD)**
- Osteoarthritis
- Vertebral osteophytosis

**Dental Pathology**
*Antemortem Tooth Loss (AMTL)*

**Dental Caries**
Dental Abscess

Periodontal Disease

Alveolar recession
Dental calculus

Dental Attrition
Chamorro

Pre-Latte (1500 BC - A.D. 400)
Transitional Pre-Latte (A.D. 400-1000)
Latte (A.D. 1000-1521)

Skeletal Series

Pre-Latte: AD1 AD 1000
Latte AD 1000-AD1521
Age/Sex Distributions

<table>
<thead>
<tr>
<th>Material Group</th>
<th>Males (%)</th>
<th>Females (%)</th>
<th>Av. Age at death</th>
<th>Total No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apotoguan</td>
<td>43.5</td>
<td>41.3</td>
<td>39.4</td>
<td>147</td>
</tr>
<tr>
<td>Leo Palace</td>
<td>41.3</td>
<td>39.4</td>
<td>35</td>
<td>26</td>
</tr>
<tr>
<td>Oleai</td>
<td>39.4</td>
<td>35</td>
<td>33.7</td>
<td>35</td>
</tr>
</tbody>
</table>

Paleodemography: Apotoguan

Mortality

<table>
<thead>
<tr>
<th>Material Group</th>
<th>Av. Age at death</th>
<th>Total No.</th>
<th>Life Expectancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apotoguan</td>
<td>43.5</td>
<td>147</td>
<td>28.6</td>
</tr>
<tr>
<td>Leo Palace</td>
<td>41.3</td>
<td>26</td>
<td>26.4</td>
</tr>
<tr>
<td>Oleai</td>
<td>39.4</td>
<td>35</td>
<td>33.7</td>
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</tbody>
</table>
Mean Childhood Mortality (MCM)

<table>
<thead>
<tr>
<th></th>
<th>Apotoguan</th>
<th>Leo Palace</th>
<th>Oleai</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCM</td>
<td>0.071</td>
<td>0.085</td>
<td>0.042</td>
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</tbody>
</table>

Females who survived to 15-45 years

Apotoguan: 5 children
Leo Palace: 6 children
Oleai: 4 children

Adult Stature

Males: 5' 8”  Females: 5' 4”
Chamorro from Saipan
[K. Hasebe: circa 1920]
4 inches shorter
LEH

<table>
<thead>
<tr>
<th>Population</th>
<th>LEH %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mariana Islands</td>
<td>32.5</td>
</tr>
<tr>
<td>Hawaii</td>
<td>7.7</td>
</tr>
<tr>
<td>Okrai, Saipan</td>
<td>68.8</td>
</tr>
</tbody>
</table>

Cribræ Orbitalia

Males: 20.3%
Females: 0.0%
Saipan: 16%
Mariana Is.: 11% vs Hawaiian Is.: 16%

Limb Bone Fractures

Marianas: 0.6%
Hawaii: 1.6%
Total Frequency: 4.3%
All cases from Guam

Degenerative Joint Disease (DJD)
Advanced Appendicular Osteoarthritis 9.1%
Oleai: 21.4%
Knee, ankle & shoulder
Vertebral Osteo: 6.6%
Hawaiian: 3.9%

Relatively little: 7.6%
Oleai: 24.6%
Hawaiians: 9.6%
Dental Caries
Marianas: 10%
Saipan: 12%
Hawaiians: 14%

Betel-stained Teeth

Alveolar Defects
Dental Abscess: 5.1%
Saipan: 7.2%
Hawaiians: 5.2%
**Periodontal Disease**

- Calculus: 15%
- Rota: 30%
- Saipan: 9%
- Alveolar Resorption: 38%
- Rota: 55%
- Saipan: 60%

**Dental Attrition**

- Marianas: 30.3%
- Saipan: 52%
- Hawaiians: 44%

**Treponemal Disease (Yaws)**
Summary

- Life expectancy and fertility
- Relatively tall stature
- Early life stressful (LEH)
- Iron deficiency anemia not marked (cribrum)
- Evidence of treponemal (yaws) disease
- Low rates of dental caries, abscessing, attrition
- Moderate levels of periodontal disease
- Low frequency of trauma