Global Health & Disasters Course
Denver, Colorado

Elizabeth Shick, DDS, MPH
Assistant Professor in Pediatric Dentistry
Director of Global Health and Director of Admissions
CU School of Dental Medicine
GOALS AND OBJECTIVES:

- Gain an understanding of the field of global oral health.
- Understand the role of the World Health Organization.
- Review region specific oral health problems.
DENTAL CARIES

- Most common chronic childhood illness worldwide, surpassing asthma and allergies
- Globally affects 60-90% of children
- 4th most expensive disease to treat

GLOBAL ORAL HEALTH

- Periodontal disease is a major cause of tooth loss in adults worldwide.

- Oral cancer is the 15th most common cancer worldwide.

- Inequalities of access to oral health care exist:
  - Poor dentist: population ratios
80% of all dental disease in US children occurs in low-income Medicaid eligible children.

Worldwide, dentists migrate and practice in wealthy, urban areas.

More than one billion people live on $1 per day or less, making dental care unaffordable.

In populations of poverty, dental IQ and oral health prevention is extremely low and needs to be improved.
ORAL HEALTH

- Impacts quality of life
- Pain, infection and cellulitis
- High morbidity, low mortality
- Trauma leading to tooth loss
- Poor school performance
QUALITY OF LIFE OUTCOMES

Gherunpong S, Tsakos G, Sheiham A. The prevalence and severity of oral impacts on daily performances in Thai primary school children. Health and Quality of Life Outcomes 2004:2; 57-64.

- Cross-sectional study of 1126 children 11-12 years old

- Instrument: Child-Oral Impacts on Daily Performances (Child-OIDP) with 8 impacts: Eating, Speaking, Cleaning teeth, Relaxing/Sleeping, Smiling/Laughing, Emotional wellbeing, Contact with others.

- Clinical dental exam
QUALITY OF LIFE OUTCOMES


- 85% children had 1-4 impacts out of 8
- 73% had eating as impact
- Eating and Smiling impact was high severity
- Most common cause of impact was 53% dental pain/sensitivity
ORAL HEALTH

- Global health workers will see extensive dental problems in the populations they serve

- Investigate what local dental care options are available

- Consider including a dentist on your trip

- Implementing prevention programs
Leading global organization with oral health program.
Collaborates with academia, researchers and other organizations such as FDI World Dental Federation.
WHO FOCUS AREAS

- Clean drinking water
- Fluoridation
- Tobacco and alcohol use
- Poor dietary habits and sugar consumption
- HIV/AIDS
- Oral health in pediatric and geriatric populations
**FLUORIDE**

- Remineralizing effect on enamel to prevent cavities
- Both topical and systemic effects
- Recommend to drink fluoridated water and use fluoridated toothpaste
- Topical high strength fluoride application 2-4 times/year shown to reduce caries rates
FLUORIDE

- Toothbrushes, toothpaste and floss not readily available in underdeveloped regions or too expensive, low priority
- Contaminated water supplies do not allow for water fluoridation, bottled/bagged water not fluoridated
- Patients not seeing dentist for twice a year preventive maintenance
FLUORIDE VARNISH

- Apply a thin film to teeth, fluoride delivery for up to 24 hours for several hours
- Must be in conjunction with preventive program and regular application
- Costly to supply to a community
FLUORIDE

Salt Fluoridation

- Viable alternative to water fluoridation
- Modeled after iodized salt
- Most studies come out of Switzerland and Colombia where this is documented
- Using salt supplemented with 250ppm Fluoride

Sources:
- Domestic salt for use in homes for table, kitchen, baking
- Table salt
- Baker’s salt
- Salt distributed in the food industry

Marthaler, TM. Salt Fluoridation – an alternative in automatic prevention of dental caries. FDI Publication
<table>
<thead>
<tr>
<th>Country</th>
<th>% Reduction in caries rates in 12 year olds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jamaica</td>
<td>84%</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>72%</td>
</tr>
<tr>
<td>Mexico</td>
<td>44%</td>
</tr>
<tr>
<td>Uruguay</td>
<td>42%</td>
</tr>
<tr>
<td>Colombia</td>
<td>48%</td>
</tr>
</tbody>
</table>

Marthaler, TM. Salt Fluoridation – an alternative in automatic prevention of dental caries. FDI Publication
SILVER DIAMINE NITRATE

- New research showing promise in low resource settings

- Apply to teeth 2-4 times/year to arrest caries process
SILVER DIAMINE NITRATE


- Prospective controlled clinical trial
- Applied to anterior teeth twice/year
- Statistically significant caries arrest
- Black stain on teeth
WHO PARTNERS

- UN Agencies:
  - UNICEF
  - UNAIDS
  - UNESCO
- FDI (Federation Dentaire Internacional)
- IADR (International Association for Dental Research)
REGION SPECIFIC ORAL HEALTH ISSUES

- Africa (AFRO)
- Americas (AMRO/PAHO)
- Eastern Mediterranean (EMRO)
- Europe (EURO)
- South East Asia (SEARO)
- Western Pacific (WPRO)
AFRO

- NOMA
  - From the Greek word Nome, to spread (sores)
  - Occurs in 39 out of 46 countries.
  - Incidence 20:100,000
  - Affects children 2-6 years old
  - 70-90% mortality rate
AFRO

- NOMA
  - Polymicrobial gangrenous infection of the oral cavity
  - *Fusobacterium necrophorum* and *Prevotella intermedia* are thought to be key players in the process and interact with one or more other bacterial organisms
AFRO

- NOMA associated with:
  - Malnutrition or dehydration
  - Poor oral hygiene
  - Poor sanitation
  - Unsafe drinking water
  - Proximity to unkempt livestock
  - Recent illness
  - Malignancy
  - An immunodeficiency disorder, including AIDS
HIV/AIDS

More than 20 million cases in Africa.
50-60% of HIV+ patients will have:
- Oral fungal, bacterial and viral infection
- Oral Hairy Leukoplakia
- HIV gingivitis and periodontitis
- Kaposi Sarcoma
- Non-Hodgkin Lymphoma
- Xerostomia
AFRO

- Insufficient number of dental schools and graduating dentists

- Ratio of Dentist:Population in Ethiopia: 1:1,268,000

- Majority of dentists graduating in African country will emigrate to new continent
War ravaged countries
Oral health is low priority
Malaria, Polio, HIV, Leprosy, TB, take precedence
Some leaders will not allow vaccines and other needed medications into country
### Countries in SEARO

- Bangladesh
- Bhutan
- Democratic People’s Republic of Korea
- India
- Indonesia
- Maldives
- Myanmar
- Nepal
- Sri Lanka
- Thailand
- Timor-Leste

### SEARO

- High rates of dental caries and periodontal disease
- Betel nut consumption leading to high rates of oral cancer
- 40% of worldwide burden of TB exists in SEARO region
WRPO

- Dental caries and periodontal disease common
- 60-90% of children and nearly 100% of adults experience dental caries
- Tooth loss
- Oral cancer
- NOMA
- Fungal infection with HIV/AIDS
- Oro-dental trauma common
- Cleft Lip/Palate: 1:500 births
Main components:
1) Screenings
2) Education
3) School brushing program
4) Fluoride varnish application
5) Referral for dental care
SCHOOL BRUSHING PROGRAM
SCHOOL BASED ORAL HEALTH
SCHOOL BASED ORAL HEALTH
SUMMARY

- Oral disease is epidemic around the world.
- Resources needed to improve oral health but often shifted to other pressing medical problems with higher mortality rates.
- Improvements in oral health systems, access to care and dental education are crucial.