

Global Health Starter Kit for Pre-Doctoral Dental Education

Module 1: Global Trends

The process of creating and designing this module took place in the following order:
Competencies → Learning Objectives → Evaluation Metric → Content → Pedagogy → Evaluation Measure

Module	Themes	Related Competencies	Collaborating Author (with Brittany Seymour- project PI)
1	Global burden of disease; demographic and epidemiologic trends	1.1.1, 1.1.2, 1.1.3, 1.1.4, 2.2.1, 2.3.2	<u>Christy Colburn, MA</u> Associate Director Global Health and Health Policy Undergraduate Program Harvard University

Related competencies:

- 1.1.1. Explain the global burden of oral diseases with regard to prevalence, distribution, and the relationship among oral disease, population trends, and global disease patterns.
- 1.1.2. Understand the essential facts about the etiology of main oral conditions and their symptoms and signs.
- 1.1.3. Describe the impact of oral diseases on well-being and quality of life, as well as its social and economic impact.
- 1.1.4. Identify and assess relevant oral health information and make sound decisions (oral health literacy).
- 2.2.1. Understand the burden and distribution of oral and associated diseases in specific community and country.
- 2.3.2. Identify and advocate to address specific oral health needs and reduce inequities and health care system deficits.

Learning objectives:

- Describe major population trends at the global level
- Discuss the relationship between the global burden of infectious/communicable, non-communicable/chronic, and oral diseases
- Predict how current global trends could be affecting oral health across the world
- Explain how the epidemiologic and demographic transition theories assist in understanding the disease patterns (including oral conditions) of and their impact on a community, country, or region

Evaluation metric:

Pass:

- Student is able to state that the world population is aging and growing on average
- Student is able to describe the basic characteristics of the stages of the epidemiologic and demographic transitions (e.g. shift from communicable to non-communicable disease; as death rates drop and birth rates remain the same, the population grows)
- Student is able to express that the world has changed from more rural to more urban, on average
- Student is able to describe the oral disease burden is increasing on average
- Student is able to make the connection between changing risk factors and differing disease outcomes, should be able to describe at least 2-3 specific examples (e.g. lack of sanitation and higher rates of infectious disease, increasing access to sugar and higher rates of NCDs, etc.)
- Student is able to link evolving risk factors with oral disease patterns, should be able to describe at least 2-3 specific examples (e.g. more urbanization and access to processed

foods/refined sugars leads to higher caries rates; sedentary lifestyle increases risk for NCDs such as diabetes and periodontal disease)

- Student is able to describe the impact of a growing burden of oral disease on society, should be able to name at least 3 outcomes (missed school days, missed work days, negative impact on other systemic diseases, pain, decline in self-confidence, lower quality of life, etc.)

Critical error:

- Student is not able to state that the world population, on average, is aging, growing, and urbanizing
- Student cannot describe at least three basic characteristics of the demographic transition stages and at least two of the epidemiologic transition
- Student is not able to state that the global burden of oral disease, on average, is increasing
- Student is not able to make the connection between risk factors and resulting disease/demographic trends, cannot name at least two examples (e.g. urbanization leads to greater access to processed/sugary foods and beverages, which is a risk factor for non-communicable disease)
- Student is not able to list at least two examples of global trends and related oral disease outcomes
- Student is not able to list at least three ways oral disease impacts their respective communities (e.g. missed school days)

Content: Population trends and risk factors for disease trends, demographic and epidemiologic transitions, global burden of disease, and oral disease

Pedagogy:

Lecture: Interactive Presentation

In-class activity: GapMinder, GBD/IHME interactive data, mapping oral health to the transitions

Pre-readings:

- Chapter 2, Chapter 3, and Chapter 7 pgs. 79-83 in: The Challenge of Oral Disease- A call for global action. The Oral Health Atlas. 2nd ed. Geneva: FDI World Dental Federation; 2015. http://www.fdiworldental.org/media/77552/complete_oh_atlas.pdf
- Sheiham A, Williams DM, Weyant RJ, Glick M, Naidoo S, Eiselé JL, Selikowitz HS. Billions with oral disease: A global health crisis- a call to action. J Am Dent Assoc. 2015 Dec;146(12):861-4. [https://jada.ada.org/article/S0002-8177\(15\)01036-3/fulltext](https://jada.ada.org/article/S0002-8177(15)01036-3/fulltext)
- Kassebaum NJ, Smith AGC, Bernabe E, Fleming TD, Reynolds AE, Vos T, Abyu GY, Alsharif U, Asayesh H, Benzian H, Dandona L, Dandona R, Kasaeian A, Khader YS, Khang YH, Kokubo Y, Kotsakis GA, Lalloo R, Misganaw A, Montero P, Nourzadeh M, Pinho C, Qorbani M, Rios Blancas MJ, Sawhney M, Steiner C, Traebert J, Tyrovolas S, Ukwaja KN, Vollset SE, Yonemoto N, Murray CJL, Marcenes W. Global, regional, and national prevalence, incidence, and disability-adjusted life years for oral conditions for 195 countries, 1990–2015: a systematic analysis for the Global Burden of Diseases, Injuries, and Risk Factors. *Journal of Dental Research*. 2017 Apr;96(4):380–387. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5912207/>

Evaluation method: This module can be effectively evaluated using short answer, essay, or multiple-choice questions. The evaluation metric may be used to inform short answer questions, the following questions may be used, or the instructor may wish to write the evaluation based on how the module was taught and what was covered.

1. Which of the following statements is true?

- A. The global population is growing, on average
- B. The global population is aging, on average
- C. The global population is more urban, on average
- D. The global population is experiencing more dental disease, on average
- E. All of the above, except D
- F. All of the above, except C

G. All of the above

2. Which answer correctly describes the stages of the Demographic Transition?

A.

Stage 1: High birth rates, high death rates

Stage 2: Decreasing birth rates, high death rates

Stage 3: Decreasing death rates, decreasing birth rates

Stage 4: Low birth rates, low death rates

B.

Stage 1: High rates of famine, malnutrition, and infectious disease

Stage 2: Decreasing rates of infectious disease, increasing rates of non-communicable disease

Stage 3: Moderate rates of both infectious and non-communicable disease

Stage 4: Low rates of infectious disease, high rates of non-communicable disease

C.

Stage 1: High birth rates, high death rates

Stage 2: High birth rates, decreasing death rates

Stage 3: Decreasing death rates, decreasing birth rates

Stage 4: Low birth rates, low death rates

3. Which statement best describes the related oral health implications for a country that is progressing through Stages 2 and 3 of the Demographic Transition?

A. Increase in periodontal disease due to a rise in non-communicable disease rates

B. Decrease in edentulism due to a decrease in infectious disease rates

C. Increase in dental caries rates due to a changing diet

D. A growing, aging population requiring more oral health care

E. Both A and C

4. Which statement best describes the related oral health implications for a country that is progressing through Stages 2 of the Epidemiologic Transition?

A. Increase in periodontal disease due to a rise in non-communicable disease rates

B. Decrease in edentulism due to a decrease in infectious disease rates

C. Increase in dental caries rates due to a changing diet and longer lifespan

D. A growing, aging population requiring more oral health care

E. Both A and C

5. Which if the following are implications for the global burden of oral diseases?

a. As the population ages, the oral disease burden is expected to rise

b. As the burden of non-communicable diseases increases, the burden of oral disease is expected to rise

c. As the global population grows, the burden of oral disease is expected to rise

d. The rise in global disease burden will negatively impact quality of life and overall well-being of communities

e. All of the above