

SLS-19 - Nutrition and Global Health
Monday 3:00-5:00, Science Center Hall B, Spring 2017

Instructors

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Chair, Department of Global Health and Population
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**Since the course professors are primarily based at the Longwood Medical Center, we have set aside the above office hours times to be available at the Cambridge campus for SLS19 students. Email us to set-up a time to discuss the course or your personal interests in Nutrition and Global Health!*

**Please use the email addresses listed on the syllabus, NOT the canvas messaging service. The course professors and the teaching fellows will be FAR more likely to respond in a reasonable time period to an email sent directly to our email inboxes.*

Teaching Fellows

Joshua Petimar (Head TF)
Alen Agaronov
Tayla Ash
Becky Franckle
Nana Keum
Andres Korat
Isabel Madzorera
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Texts

1. **Skolnik, R. *Global Health 101; Third Edition. Jones & Bartlett Publishers Inc., 2015.*** Because global health is a rapidly changing field, we encourage students to purchase the most recent edition of the Skolnik text (available at the Coop). We understand that some students may opt to use an older version of the textbook. If students choose this option, they are responsible for identifying the correct pages & chapters assigned based on the syllabus. Students should also be aware that many of the statistics and figures throughout the textbook may be somewhat out of date. **Please note that chapter 8 on Nutrition & Global Health has been significantly updated. Students will be responsible for the material of chapter 8 in the 3rd edition.*
2. **University Readers Coursepack** - (readings for nutritional assessment lectures) see directions below.

Course Objectives

This course introduces students to nutrition and global health problems through exploration of demographic, epidemiological, biological, and socioeconomic determinants of nutritional status. Emphasis will be placed on the role of nutritional status and dietary intake, as a determinant and consequence, of these health problems. Students will be encouraged to think critically about major challenges to improve nutrition and health at a global level.

Aligned with the pedagogical goals of the Program in General Education, this course seeks to inspire and teach the following principles:

1. **Global awareness:** To increase awareness of the current issues in nutrition and global health - with a focus on the role of nutrition in infectious diseases, maternal and child health, and chronic diseases - through critical evaluation of the scientific literature and exploration of demographic, epidemiological, biological, social, political, and economic determinants.
2. **Grounding in nutrition and research methods:** To understand the basic principles of nutrition and role of nutrients in health in resource-poor and developed settings. To assess nutritional status of specific populations based on

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anthropometric, biochemical, and clinical measurements; to analyze the complex factors that affect the nutritional status of individuals and populations.

3. **Critical thinking:** To critically review scientific literature on nutrition and global health topics, examine the role of nutritional factors and health outcomes, and identify strengths and weaknesses of studies. To discuss the latest findings from epidemiologic studies on the role of nutrition in the prevention and treatment of key infectious, perinatal, and chronic disease outcomes.
4. **Translation of research findings to improve nutrition and public health:** To integrate nutritional research findings and consider practical issues in program design and implementation.

Outcome Measures and Grading Criteria

Nutrient Quiz	10%
Nutritional Assessment Assignment	10%
Study Design Assignment	10%
Lecture Attendance and Participation	5%
Section Preparation & Participation	10%
Mid-term Exam	25%
Final Project and Presentation	30%

Section Attendance and Participation

Section attendance and participation is required. Section participation evaluation will take into account attendance, participation and quality of section preparation. You will be graded on a scale from 0 to 10, with a 10 corresponding to a student with consistent attendance and evidence of strong preparation for section and active participation. If you must miss section please email your TF prior to the beginning of your section and arrange to attend another section that week. Three or more unexcused absences will result in a 0 for section participation. Final section participation grades will also include performance on the case study activity completed during section.

Lecture Attendance

Lecture attendance is required. For this course, we will be using Learning Catalytics – an interactive software that allows lecturers to poll students on various topics and prompt class discussions. Learning Catalytics will be used in many, but not all lectures. When we use Learning Catalytics, the software also keeps track of participation, and we will use these lists to track attendance. We will not deduct lecture participation points for incorrect responses. A student's final lecture participation score will be determined by a sum of the number of lectures he/she attended and submitted learning catalytics answers. The first lecture that students do not complete Learning Catalytics will be considered a "free pass". After one missed lecture, participation points will be deducted. If you must miss lecture for a valid reason, please email your TF prior to 3pm on Monday explaining the reason for your absence. He/she will discuss each absence with the teaching staff on a case-by-case basis.

Electronic Device Policy

Use of electronics (i.e. laptops, tablets, etc.) in lecture is left to the discretion of the lecturer for that day. Use of electronics in sections is left to the discretion of the Teaching Fellow for that section.

Creating a Learning Catalytics Account

All students will be responsible for obtaining a Learning Catalytics account. We will use this tool during lectures both to prompt class discussion and assess attendance. We will be using Learning Catalytics beginning in Lecture 2. **Please create your account prior to lecture on Monday January 30th**, when we will begin using Learning Catalytics for grading purposes

The website can be accessed from laptops, tablets, smart phones, etc. during class. To sign up go to <https://learningcatalytics.com>. In the top right corner click on "Register." When prompted, say "No, I'm not using Learning Catalytics with a MyLab or Mastering product." Choose "I have an access code" and enter the following when prompted: HSSLCS-NOMAD-DECYR-DIVVY-SHAWM-VIRES. This access code is specific to our class so please do not share this account with other classes. If you already have a Learning Catalytics account from a different class, you do not need to create a new account. All users – whether or not they are new to Learning Catalytics – must complete the Welcome Module. Once you have signed in, please enter 74731480 into the session ID and complete the Welcome module. This will help us confirm that each student has successfully created an account. During each class period that we use Learning Catalytics, we will provide you with a new session ID that you will use to access the questions for the lecture. **Any questions about Learning Catalytics should be directed to Isabel Madzorera (ism313@mail.harvard.edu).**

Course Readings

The readings on the syllabus have been broken into required readings and reference readings for your benefit. The teaching

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staff have put in considerable effort into selecting required readings that are manageable each week, and have also created a course pack to minimize the cost of readings for students. All readings should be completed before lecture and section each week, and will be incorporated into exams and other graded assignments.

Purchasing the Course pack

The course pack contains a few required readings that we were unable to provide links to online (due to copyright limitations). We made the course pack so that students do not have to purchase an additional textbook for the class. Please purchase your own copy as soon as possible to stay on top of your assignments. Also, please keep in mind that our institution adheres to copyright law—copyrighted material should not be copied or duplicated in any manner.

Instructions:

Step 1: Log on to <https://students.universityreaders.com/store/>.

Step 2: Choose the correct course pack and proceed with the checkout process.

Step 3: After purchasing, you can access your digital copy* by logging into your account and clicking "My Digital Materials" to get started on your reading right away.

Digital Price: \$12.55

*Digital access: To access digital materials, you will need an Adobe ID and the free Adobe Digital Editions (ADE) software installed on your computer. Visit https://students.universityreaders.com/store/digital_adobe for easy instructions and a video walkthrough of the process. Once you download the digital pack you can access it online or offline at any time on your computer, tablet, or smart phone. You can also annotate, highlight, and search the content. Printing is available from the first device you use to access the content. Please note that the digital rental expires after six months.

If you experience any difficulties, please email orders@universityreaders.com

Academic Integrity and Collaboration Policy Statement

Discussion and the exchange of ideas are essential to doing academic work. For assignments in this course, you are encouraged to consult with your classmates as you work on problem sets. However, after discussions with peers, make sure that you can work through the questions yourself and ensure that any answers you submit for evaluation are the result of your own efforts (articulated in your own words!). Upon submitting your assignments, you must list the names of students with whom you have collaborated on problem sets. For any written work in this course, you must cite any books, articles, websites, lectures, etc. that have helped you with your work for this class. Be sure to use appropriate citation practices.

All students are expected to adhere to the **Harvard College Honor Code**:

Members of the Harvard College community commit themselves to producing academic work of integrity – that is, work that adheres to the scholarly and intellectual standards of accurate attribution of sources, appropriate collection and use of data, and transparent acknowledgement of the contribution of others to their ideas, discoveries, interpretations, and conclusions. Cheating on exams or problem sets, plagiarizing or misrepresenting the ideas or language of someone else as one's own, falsifying data, or any other instance of academic dishonesty violates the standards of our community, as well as the standards of the wider world of learning and affairs.

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Guest Lecturers

Jennifer Coates, PhD

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Frank Hu, MD, MPH, PhD

Chair, Department of Nutrition
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DATE		TOPIC	LECTURER
PART 1: FUNDAMENTALS IN NUTRITION AND GLOBAL HEALTH			
January	23	Introduction to Nutrition and Global Health	Lo
	30	Macronutrients and Micronutrients 1 (vitamins) <i>*Students should fill out the blank micronutrient chart prior to lecture</i>	Lo
February	6	Micronutrients 2 (minerals) Nutritional Assessment Part 1 (Dietary Assessment) <i>*Please complete your FFQ (described in nutritional assessment assignment) prior to lecture</i>	Duggan
	13	Nutritional Assessment Part 2 (Anthropometry, biomedical & clinical assessment) <i>*Nutrient Quiz in lecture</i>	Duggan
	20	President's Day – no lecture but we will hold section this week. <i>*Students should complete at least 1-day of diet record (described in nutritional assessment assignment) before section this week.</i> <i>*Groups and topics for the final project due to canvas on Fri. Feb. 17th by 11:59pm</i>	--
	27	Study Design <i>*Nutritional Assessment Assignment due to canvas by 11:59pm on Tuesday February 28th</i>	Petimar
PART 2: SELECTED TOPICS AND CASE STUDIES IN NUTRITION AND GLOBAL HEALTH			
March	6	Obesity and Chronic Diseases <i>*Study Design Assignment due to canvas by 11:59pm on Friday March 10th</i>	Hu
	13	<i>Spring Recess</i>	--
	20	Nutrition & Maternal & Child Health	Duggan & Shankar
	27	Nutrition & Infection <i>*One-page abstract of final project due by 11:59pm Sunday, March 26th</i>	Fawzi
April	3	<i>*Mid-term Exam during first half of lecture</i> Behavior Change and Nutrition: a Case Study from in Western Nepal	Locks
	10	Nutrition, Food Security & International Development	Coates
	17	UNICEF'S Approach to Scaling Up Nutrition <i>*Presentation materials due 11:59pm Tues 4/18 to canvas. Presentations in section.</i>	Kupka
	24	Selected Student Presentations to Class <i>*Final written proposal due Sunday, April 30th at 11:59pm to canvas.</i>	Fawzi, Duggan & Lo
	30	Grant proposal due	--

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Schedule of Exams and Assignment Due Dates*

1. **Nutrient Quiz:** Monday, February 13th (in lecture)
2. **Dietary Assessment Assignment:** *Due to canvas by 11:59pm on Tuesday February 28th*
3. **Study Design Assignment:** *Due to canvas by 11:59pm on Friday March 10th*
4. **Midterm Exam:** Monday, April 3rd (in lecture)
5. **Final Project:**
 - Groups and topics: due Friday, February 17th by 11:59pm (to canvas).
 - Abstract and preliminary bibliography: due Sunday, March 26th by 11:59pm (to canvas).
 - Abstract and slides/video: due Tuesday 4/18 by 11:59pm (to canvas).
 - Section presentations: April 19th-21st (in section).
 - Selected projects to present in lecture: Monday, April 24th
 - Final written report due Sunday, April 30th at 11:59pm (to canvas).

*Assignments that are turned in late will be deducted 1/3 of a grade for each day of lateness (e.g. from an A to A-, from an A- to B+, etc.).

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Part 1: Principles in Nutrition and Global Health

**Session 1:
Introduction to Nutrition and Global Health – Lo**

January 23

Session Description: This session will introduce students to nutritional and global health problems through exploration of demographic, epidemiological, biological, social, political, and economic determinants. The major causes of the global burden of disease will be explored, with emphasis on nutrition as a cause and consequence of disease and mortality. The central role of nutrition in development and population health will be discussed in detail. The session will also cover macronutrients – the sources of energy in our diets.

Required Readings

- **Skolnik Ch. 1** - The Principles and Goals of Global Health
- **Skolnik Ch 8** - Nutrition and Global Health 193-200 (through the end of Gauging Nutritional Status)
- World Bank. Repositioning Nutrition as Central to Development: A Strategy for Large-Scale Action. Chapters 4 and 5. Washington, D.C. 2006.
- United Nations System Standing Committee on Nutrition. Nutrition and the Post-2015 Sustainable Development Goals.

As Reference:

- Results of the Copenhagen Consensus 2008.
- Kristoff, N. The Hidden Hunger. New York Times. May 23, 2009 (<http://www.nytimes.com/2009/05/24/opinion/24kristof.html>)
- World Health Organization. Preventing Chronic Disease. A vital investment. Part I: Overview. Geneva, 2005.
- Skolnik, Ch. 2 - Health Determinants, Measurements, and Trends

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**Session 2: Macronutrients and Micronutrients 1
(vitamins) – Lo**

January 30

Session Description: This lecture provides an integrated overview of the physiological requirements and functions of vitamins and minerals in the context of human health and disease. The fundamental roles of nutrients in biological systems, function of nutrients as defined by their chemistry, interrelationships between nutrient functions, mechanistic approaches in the analysis of nutrient-disease relationships, signs and symptoms of deficiency, and dietary sources of the nutrient, will be explored in detail. Particular emphasis is given to current knowledge of mechanisms that may explain the role of diet in the causation and/or prevention of infectious and chronic diseases.

Required Readings:

- **Skolnik, Chapter 8** – Nutrition and Global Health, pages 200-205 "Key Nutritional Needs & Nutritional Needs throughout the Life Course"
- **Harrison GG.** Public Health Interventions to Combat Micronutrient Deficiencies. *Public Health Reviews* 2010; 32: 256-266.
- **WHO/FAO Guidelines on Food Fortification with Micronutrients edited by Lindsay Allen et al.** World Health Organisation and Food and Agriculture Organisation, 2006. pp. 41-84 (through the end of the section on Vitamin D)
- Kupka R and Villamor E. "Vitamins" (pages 143-160) in *Nutrition and Pediatrics: Basic Science and Clinical Applications* (5th ed.). Duggan C, Koletzko B, Watkins JB, Walker WA (eds). PMPH, USA. 2016.

**We have posted a blank worksheet on canvas to guide you on what information you need to know for each nutrient. Please fill out this chart as you do the Skolnik and WHO/FAO readings. You should also fill this in during lecture. TFs will expect that students have begun to fill out their nutrient charts BEFORE the first section.*

****Do be sure to also closely read the Harrison article and be prepared to discuss it in section.*

As Reference:

- Shrimpton R, Huffman SL, Zehner ER, Darnton-Hill I, Dalmiya N. Multiple micronutrient supplementation during pregnancy in developing-country settings: policy and program implications of the results of a meta-analysis. *Food Nutr Bull.* 2009; 30(4):S556-73.
- Chung M, Balk EM, Ip S, Lee J, Terasawa T, Raman G, Trikalinos T, Lichtenstein AH, Lau J. Systematic review to support the development of nutrient reference intake values: challenges and solutions. *Am J Clin Nutr.* 2010 Aug; 92(2):273-6. Epub 2010 May 26.
- Conclusions and recommendations of the WHO Consultation on prevention and control of iron deficiency in infants and young children in malaria-endemic areas. *Food Nutr Bull* 2007;28(4 Suppl):S621-7.
- Brown KH, Peerson JM, Baker SK, Hess SY. Preventive zinc supplementation among infants, preschoolers, and older prepubertal children. *Food Nutr Bull* 2009;30(1 Suppl):S12-40.
- Zimmermann MB, Jooste PL, Pandav CS. Iodine-deficiency disorders. *Lancet* 2008; 372:1251-62.
- Gibney Ch. 3 – Energy Metabolism; Ch 4-6: macronutrients

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Session 3:
Macronutrients 2 (minerals)
Nutritional Assessment Part 1 (Dietary Assessment) – Duggan

February 6

Before lecture

- Read the full *Dietary Assessment Assignment* posted on the course canvas page. Although the assignment does not need to be submitted until February 28, several parts of the assignment need to be completed in advance (since you will need to conduct several dietary assessment methods on yourself).
- By Monday February 6, you should **complete part 1: The Food Frequency Questionnaire**. Please note that your individual log-in information for the block FFQ is available on Canvas → Assignments → Nutritional Assessment Assignment → FFQ Log-in Information.

Session Description: The first part of this session will be spent on macronutrients – our dietary source of energy. The second part of this session addresses methodological aspects of assessing food and nutrient intake in the context of researching health and disease. Over the course of the nutritional assessment module, we will discuss methods for measuring dietary intake as well as measuring anthropometric, clinical, and biochemical indicators in order to evaluate nutritional status of individuals and populations.

Required Reading

- **Course Pack: Gibney, Introduction to Human Nutrition (Ch10: Measuring Food Intake)**
 - p. 238-239: Introduction and definition of indirect measurement of food intake.
 - p 244-258: section 10.3 on direct measures of food intake
- **Nutrition and Pediatrics: Basic Science and Clinical Applications (5th ed.). Duggan C, Koletzko B, Watkins JB, Walker WA (eds). PMPH, USA. 2016.**
 - Chapter 8 (Trace elements): pp.95-102 (Zinc); pp.112-116 (Iodine)
 - Chapter 9 (Iron): pp.117-121, 125-131
 - Chapter 10 (Vitamins)
- **Food and Nutrition Board (2000). DRI: Dietary Reference Intakes. Washington, D.C., Institute of Medicine.**
 - pp. 21-27 (Introduction and Background)

As Reference:

1. Willett W. Nutritional Epidemiology. Hunter, D. Chapter 9. Biochemical indicators of dietary intake. Oxford University Press, USA; 2 edition, 198: 174-243. [On reserve at Lamont Library]
2. Sazawal S, Black RE, Ramsan M *et al*. Effects of routine prophylactic supplementation with iron and folic acid on admission to hospital and mortality in preschool children in a high malaria transmission setting: community-based, randomised, placebo-controlled trial. *Lancet*. 2006; 367(9505): 133-143.

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**Session 4:
Nutritional Assessment (Part 2): Anthropometric, Biochemical and
Clinical Assessment of Nutritional Status – Duggan**

February 13

*****Nutrient quiz in lecture*****

Session Description: This session will expand on methods for assessing the nutritional status of individuals and populations. In particular, we will focus on anthropometric, clinical, and biochemical indicators, their use in nutrition research and program implementation, and also some of the limitations of each of these methods.

Required Reading

- **Course Pack: Gibney, Introduction to Human Nutrition (Ch. 2: Body Composition)**
 - pp. 16-25 (until the end of the section on “other anthropometric variables”)
- **Skolnik, Ch 8 – Nutrition and Global Health (p. 205-224, by now you should have read the whole chapter)**
- **Victoria C, de Onis M, Hallal PC, Blossner M, Shrimpton R.** Worldwide timing of growth faltering: revisiting implications for interventions. *Pediatrics.* 2012;125(3):e473-480.
- **Zemel BS, Maqbool A, and Olsen IE.** “Clinical Assessment of Nutritional Status” in *Nutrition and Pediatrics: Basic Science and Clinical Applications* (5th ed.). Duggan C, Koletzko B, Watkins JB, Walker WA (eds). PMPH, USA. 2016.

*****Please closely read the Victoria article and be prepared to discuss it in detail in section.**

As Reference:

1. Grummer-Strawn LM, Reinold C, Krebs NF; Centers for Disease Control and Prevention (CDC). Use of World Health Organization and CDC growth charts for children aged 0-59 months in the United States. *MMWR Recomm Rep.* 2010 Sep 10;59(RR-9):1-15.

Presidents' Day – No Lecture, but sections will meet.

TFs expect students to have completed 1 day of their diet record (and their FFQ as described in the Nutritional Assessment Assignment) BEFORE section the week of February 20th.

February 20

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**Session 5:
Epidemiology and Study Design – Petimar**

February 27

Session Description: How do we know what kinds of policies and programs are most likely to result in improved nutritional status? Rigorous epidemiologic studies are essential to build the evidence base for nutrition interventions. This session will review key concepts in Epidemiology and Study Design as they relate to Global Nutrition.

Required Readings:

- R. Bonita, R. Beaglehole, T. Kjellström. Basic Epidemiology, 2nd edition. World Health Organization
 - Ch 3 (full chapter p. 39-60).
 - Ch2 (p15-21 and 34-35)
 - Ch 11 (p178-181 – the section entitled “Critical reading”)

** We have posted a blank worksheet on the course website to guide you on specific information you should know for study design. Please fill out this chart as you do the Bonita reading, and supplement this with the material covered in lecture. Section leaders will expect students to have filled in much of these charts BEFORE section.*

As Reference for Study Design:

1. Willett W. Nutritional Epidemiology. In Rothman, KH. Modern epidemiology 3rd. Philadelphia, PA: Lippincott Williams & Wilkins, 2008: 580-597.
2. For additional information, see Rothman, Greenland and Lash “Modern Epidemiology” – available as an ebook from the library:
 - Chapter 4: Measures of Effect
 - Chapter 6: Types of Epidemiologic Studies

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Part 2: Selected Topics and Case Studies in Nutrition and Global Health

Session 6: Obesity, Nutrition Transition, and Non-communicable Diseases – Hu

March 6

Session Description: This lecture will explore the role of demographic, epidemiological, biological, social, political, and economic factors in the obesity pandemic and emergence of non-communicable diseases. Epidemiological concepts in the context of the study of chronic diseases and associated risk factors will be examined, in view of disease prevention and control. Examples of epidemiological studies from areas such as obesity, diabetes and cardiovascular disease will be used to illustrate methodological concepts, and explore main issues in study design and interpretation of epidemiological study results. This session will also examine the demographic, epidemiological, and nutrition transitions – and how they relate to trends in chronic disease burden globally, using China as an example

Required Readings:

1. Skolnik Ch. 12 Non-Communicable Diseases (pp. 365-376,380-387)
2. Popkin BM. What can public health nutritionists do to curb the epidemic of nutrition-related non-communicable disease? *Nutr Rev.* 2009 May;67 Suppl 1:S79-82.
3. Malik VS, Willett WC, Hu FB. Global obesity: trends, risk factors and policy implications. *Nat Rev Endocrinol.* 2013 Jan;9(1):13-27. doi: 10.1038/nrendo.2012.199. Epub 2012 Nov 20.

As Reference:

- Chan JC, Malik V, Jia W, Kadowaki T, Yajnik CS, Yoon KH, Hu FB. Diabetes in Asia: epidemiology, risk factors, and pathophysiology. *JAMA.* 2009 May 27;301(20):2129-40.
- Hu FB, Liu Y, Willett WC. Preventing chronic diseases by promoting healthy diet and lifestyle: public policy implications for China. *Obes Rev.* 2011 Mar 2, p552-559.

SPRING BREAK!

March 13

Session 7:
Nutrition and Maternal and Child Health – Shankar and Duggan

March 20

Session Description: Nutrition plays a central role in infection: malnutrition increases susceptibility to infection, and infection causes a deterioration of nutritional status, in a vicious cycle of malnutrition and infectious disease. In this session, we briefly review the relationships of nutritional status, immune function, and infectious diseases – with a focus on the role of nutrition as both a cause and a consequence of disease. Appropriate nutrition is also essential for proper child growth and development. Requirements for nutrition, growth, and development during infancy and early childhood will be explored with emphasis on the role of nutrition in pediatric morbidity and mortality. Presentations will be used to explore the broad range of nutrition interventions utilized in international programs, including: growth monitoring and promotion, nutrition counseling, supplementary and therapeutic feedings, micronutrient interventions, and infant feeding options. This two lecture series will profile the importance of nutrition for acute respiratory infections and diarrhea disease (two major childhood killers) as well as for HIV/AIDS.

Required Readings:

- **Skolnik Ch. 10 – The Health of Young Children**
 - pp. 255-267: until the end of the section on costs and consequences of child morbidity and mortality.
 - pp. 278-286: From the section on “Addressing Key Challenges in Child Health” until the end of the chapter.
- **Black, Robert E, Cesar G Victora, Susan P Walker, Zulfiqar A Bhutta, Parul Christian, Mercedes de Onis, Majid Ezzati, Sally Grantham-McGregor, Joanne Katz, Reynaldo Martorell, Ricardo Uauy, and the Maternal and Child Nutrition Study Group: *Maternal and child undernutrition and overweight in low-income and middle-income countries*. Lancet, 2013.**

As Reference for Maternal & Child Health:

1. Olofin, I et al. “Associations of Suboptimal Growth with All-Cause and Cause-Specific Mortality in Children under Five Years: A Pooled Analysis of Ten Prospective Studies” PLOS one 2013.
2. UNICEF. Tracking progress on child and maternal nutrition. New York, NY, 2009.
3. Million Death Study Collaborators, Bassani DG, Kumar R, Awasthi S, Morris SK, Paul VK, Shet A, Ram U, Gaffey MF, Black RE, Jha P. Causes of neonatal and child mortality in India: a nationally representative mortality survey. Lancet. 2010 Nov 27;376(9755):1853-60. Epub 2010 Nov 12.
4. “Closing the gap in maternal and neonatal health”. UNICEF, 2009.
5. Bahl R, Frost C, Kirkwood BR, Edmond K, Martines J, Bhandari N, Arthur P. Infant feeding patterns and risks of death and hospitalization in the first half of infancy: multicentre cohort study. Bull World Health Organ. 2005 Jun;83(6):418-26.
6. Bhandari N, Kabir AK, Salam MA. Mainstreaming nutrition into maternal and child health programmes: scaling up of exclusive breastfeeding. Matern Child Nutr 2008;4 Suppl 1:5-23.
7. Collins S, Dent N, Binns P, Bahwere P, Sadler K, Hallam A. Management of severe acute malnutrition in children. Lancet 2006;368(9551):1992-2000.
8. World Bank Institute. Business Innovation to Combat Malnutrition Case Study Series. Faire Tache d’Huile: Cooking Oil Fortification in West Africa, 2009.
9. Dewey KG, Adu-Afarwuah S. Systematic review of the efficacy and effectiveness of complementary feeding interventions in developing countries. Matern Child Nutr 2008; 4 Suppl 1:24-85.

Session 8:
Nutrition and Infection – Fawzi

March 27

Session Description: Nutrition plays a central role in infection: malnutrition increases susceptibility to infection, and infection causes a deterioration of nutritional status, in a vicious cycle of malnutrition and infectious disease. In this session, we briefly review the relationships of nutritional status, immune function, and infectious diseases – with a focus on the role of nutrition as both a cause and a consequence of disease. Appropriate nutrition is also essential for proper child growth and development. Requirements for nutrition, growth, and development during infancy and early childhood will be explored with emphasis on the role of nutrition in pediatric morbidity and mortality. Presentations will be used to explore the broad range of nutrition interventions utilized in international programs, including: growth monitoring and promotion, nutrition counseling, supplementary and therapeutic feedings, micronutrient interventions, and infant feeding options. This two lecture series will profile the importance of nutrition for acute respiratory infections and diarrhea disease (two major childhood killers) as well as for HIV/AIDS.

Required Readings:

1. Skolnik Ch. 12 Communicable Diseases

- 311-316 (until the end of the section on the costs and consequences of communicable diseases)
- 325-330 HIV/AIDS
- 336-337 Diarrheal Disease
- From Chapter 5: 134-135 – Case Study on Combatting Diarrheal Disease in Bangladesh

2. World Health Organization. Guidelines on HIV and infant feeding, 2010. Principles and recommendations for infant feeding in the context of HIV and a summary of evidence. Geneva, Switzerland. 2010. (Please read p1-29: from the Executive Summary until the end of the Key Principles section)

3. Katona, Peter, and Judit Katona-Apte. "The interaction between nutrition and infection." *Clinical Infectious Diseases* 46.10 (2008): 1582-1588.

**Be prepared to discuss the WHO Guidelines on Infant Feeding in section*

As Reference:

1. Schaible, Ulrich E. and Stefan H.E. Kaufmann. "Malnutrition and Infection: Complex Mechanisms and Global Impacts." *PLoS Medicine*.
2. Fawzi W, Msamanga G, Spiegelman D, Hunter DJ. Studies of vitamins and minerals and HIV transmission and disease progression. *J Nutr.* 2005 Apr;135(4):938-44.
3. Solomons NW. Malnutrition and infection: an update. *Br J Nutr.* 2007 Oct;98 Suppl 1:S5-10.
4. Moran M, Guzman J, Ropars AL, McDonald A, Jameson N, Omune B, Ryan S, Wu L. Neglected disease research and development: how much are we really spending? *PLoS Med.* 2009 Feb 3;6(2):e30.
5. Munos MK, Walker CL, Black RE. The effect of oral rehydration solution and recommended home fluids on diarrhoea mortality. *Int J Epidemiol.* 2010 Apr;39 Suppl 1:i75-87.
6. Enserink M. Global health. Some neglected diseases are more neglected than others. *Science.* 2009 Feb 6;323(5915):700.
7. John TJ, Dandona L, Sharma VP, Kakkar M. Continuing challenge of infectious diseases in India. *Lancet.* 2011 Jan 15;377(9761):252-69. Epub 2011 Jan 10.

SLS-19 - Nutrition and Global Health
Monday 3:00-5:00, Science Center Hall B, Spring 2017

Session 9:

***Midterm Exam during first half of lecture**

Behavior Change and Nutrition: a Case Study from in Western Nepal – Locks

April 3

Session Description: After the completion of the mid-term on core-competencies in Nutrition and Global Health, this lecture is designed to emphasize key concepts on what makes an effective nutrition intervention. This case study on a multi-stakeholder intervention in Western Nepal will be used to highlight themes that students should keep in mind for their final projects, with a particular focus on behavior-change theory, and why “education” is often only part of successful interventions aimed to improve nutrition.

Required Reading:

- **Locks, LM, PR.** Pandey, AK. Osei, DS. Spiro, DP. Adhikari, NJ. Haselow, VJ. Quinn and JN Nielsen. B Using formative research to design a context-specific behaviour change strategy to improve infant and young child feeding practices and nutrition in Nepal. *Maternal and Child Nutrition*, 2013.

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Session 10:
Nutrition, Food Security & International Development – Coates

April 10

Session Description: In recent years, nutrition experts and policy-makers have increasingly been emphasizing that nutrition is a multi-sectoral problem with complex structural causes underlying an individual's risk of malnutrition. This pair of lectures will tie together key concepts linking Nutrition, Food Security and International Development. It will also explore often overlooked intervention components such as quality of human resources for nutrition interventions.

Required Readings:

- Coates, Jennifer. "Build it back better: Deconstructing food security for improved measurement and action" *Global Food Security*, Volume 2, Issue 3, September 2013, Pages 188–194
- Rogers, Beatrice Lorge and Coates, Jennifer. 2016. *Sustaining Development: A Synthesis of Results from a Four-Country Study of Sustainability and Exit Strategies among Development Food Assistance Projects—Executive Summary*. Washington, DC: FHI 360/Food and Nutrition Technical Assistance III Project (FANTA).
- Lentz Erin, Barrett Christopher, Maxwell Daniel. *On The Choice and Impacts of Innovative International Food Assistance Instruments*. *World Development* Vol. 49, pp. 1–8, 2013
- Menon, P., Covic, N. M., Harrigan, P. B., Horton, S. E., Kazi, N. M., Lamstein, S., Neufeld, L., Oakley, E. and Pelletier, D. (2014), *Strengthening implementation and utilization of nutrition interventions through research: a framework and research agenda*. *Ann. N.Y. Acad. Sci.*, 1332: 39–59. doi:10.1111/nyas.12447

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Session 11:
Programmatic Aspects in Resource-Limited Settings – Kupka

April 17

Session Description: Students will learn about the global nutrition context and the solutions applied by UNICEF, the biggest global agency working to improve the nutritional status of women and children living in low- and middle-resource settings.

Required Readings:

- United Nations Children's Fund (2013). *Improving Child Nutrition: the achievable imperative for global progress*. New York, NY, Pages iv – 27

As Reference:

1. International Food Policy Research Institute (2016). *Nourishing Millions: stories of change in nutrition*. S. Gillespie, J. Hodge, S. Yosef and R. Pandya-Lorch. Washington, D.C.

Session 12: Final Presentations - *Selected presentations in class*

April 24