Master's in Public Health

Course syllabus: Planetary Health

2020/2021

Department of Experimental and Health Sciences
UNIVERSITAT POMPEU FABRA - UNIVERSITAT AUTÒNOMA DE BARCELONA - ISGlobal (Barcelona Institute for Global Health)

Act. 28/12/20

UNIVERSITAT POMPEU FABRA

ISGlobal Barcelona Institute for Global Health

UAB Universitat Autònoma de Barcelona

DESCRIPTION

Academic course: 2020-2021

Subject name: Planetary Health

Kind of subject: Optional

Credits: 3 ECTS (75 hours)

Professors: Cristina O'Callaghan, Josep Maria Antó, Cathryn Tonne, Oriana Ramírez and Marina Bosque

Coordination: Cristina O'Callaghan

Language: English

PROFESSORS

Cristina O'Callaghan Gordo
Associated researcher – Barcelona Institute for Global Health (ISGlobal)
Associate Professor Universitat Oberta de Catalunya (UOC), Faculty of Health Sciences
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Josep M. Antó
Research Professor-Barcelona Institute for Global Health (ISGlobal)
Professor of Medicine – Department of Experimental and Health Sciences-Universitat Pompeu Fabra
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PRESENTATION

Planetary health is the achievement of the highest attainable standard of health, wellbeing, and equity worldwide through judicious attention to the human systems—political, economic, and social— within the limits of Earth's natural systems. The concept of Planetary Health arises in the context of the global environmental and climate crisis that defines the Anthropocene. The general objective of this course is to understand the changes that the Anthropocene entails in natural systems and to analyze the main challenges that these changes pose for health. The main governance strategies for the development and implementation of responses to achieve Planetary Health will also be introduced.

LEARNING OUTCOMES

At the end of this course the students are expected to be able to:

- Describe the main changes in the Earth's natural systems that characterize the Anthropocene, as well as explain the complex dynamics and interactions of these changes.
- Explain health problems in terms of Planetary Health, identifying the impacts of the environment on health and the impacts of human activity, including health, on the planet.
- Identify and explain the main determinants of anthropogenic change in natural systems.
- Identify and categorize the main impacts of global environmental change on human health.
- Recognize, analyze, and argue the main strategies to promote Planetary Health.
- Critically assess the governance strategies necessary to promote a sustainable society, such as the 2030 Agenda.

COMPETENCES TO ACHIEVE

GENERAL SKILLS

- Search for, analyse, assess and use information provided to make decisions in complex situations.
- Work in interdisciplinary teams to attain shared goals in relation to planetary health.
- Write and speak in a correct, clear way that is suitable in academic and/or professional contexts for effective communication of planetary health challenges to the academic sector, civil society, politicians and interested parties.
- Resolve complex situations in a feasible, sustainable way, by analysing their components, finding alternatives, reaching consensus on their application, and assessing the results of their implementation.

SPECIFIC SKILLS

- Analyze health problems from the understanding that these and their social determinants depend on the quality and stability of the Earth's natural systems.
- Analyze, synthesize, and interpret data from global quantitative models from different scientific disciplines related to Planetary Health.
- Determine the complexity of the challenges posed by Planetary Health and evaluate the interactions between natural systems, socioeconomic factors, and the political and cultural context that determine these challenges.
- Apply critical and creative thinking to propose improvements or solutions in areas and situations of diverse complexity in relation to Planetary Health.

METHODOLOGY

3 ECTS credits, 75 hours of dedication distributed in 22 contact hours, distributed in 11 sessions devoted to lectures, case studies and seminars, and 53 hours of personal work:

Activity	Description of the activity	Contact hours
Lectures	Master classes. They may include in-class exercises and classroom discussion.	9 hours 30 minutes
Case studies	Discussion of scientific papers, reports, or real case studies. Students will have to critically read the case study before the session (individual work before the session). During the session, they will analyze and discuss in small groups the case study following a guide provided and present their work to the rest of the students. The session will be complemented by classroom discussion and concluding remarks by the teacher.	9 hours 30 minutes
Seminars, conferences	Visualization of pre-recorded conferences, seminars or talks, followed by a classroom discussion.	3 hours
Personal work (including writing a short essay)	Personal work incudes preparation of cases studies, reading of suggested bibliography, writing a short essay on a relevant topic of Planetary Health and exam preparation.	53 hours: 10 preparation of case studies, 23 writing short essay, 20 exam preparation

EVALUATION

Contribution to the final grade
Exam, short answer questions 40%
Participation in the case studies and classroom discussions 30%
Final essay 30%

CALENDAR

Date	Time	Content of the session	Professor
08/01/2021	15:00-15:15	Presentation of the course	Josep Maria Antó Cristina O'Callaghan
	15:15-16:00	Lecture 1: Introduction to Planetary Health	Josep Maria Antó
	16:00-17:00	Lecture 2: Current changes in the Earth's natural systems	Cristina O'Callaghan
15/01/2021	15:00-17:00	Case study 1: The paradox of improved health and natural systems deterioration.	Cristina O'Callaghan
22/01/2021	15:00-17:00	Lecture 3: Main risks of environmental change for human health	Josep Maria Antó
29/01/2021	15:00-15:30	Introduction to writing an essay on planetary health	Josep Maria Antó Cristina O'Callaghan
	15:30-17:00	Case study 2: Environmental impacts of health systems	Josep Maria Antó
05/02/2021	15:00-17:00	Lecture 4: Challenges for Planetary Health	Cristina O'Callaghan
12/02/2021	15:00-17:00	Case study 3: Food systems: a planetary health approach	Marina Bosque, Cristina O'Callaghan
19/02/2021	15:00-17:00	Lecture 5: Climate change and health	Cathryn Tonne
26/02/2021	15:00-17:00	Case study 4: Climate change and urban environment	Cathryn Tonne
05/03/2021	15:00-17:00	Seminar 1: COVID-19, a disease of the Anthropocene	Josep Maria Antó Cristina O'Callaghan
12/03/2021	15:00-16:00	Lecture 6: Governance for a sustainable society	Josep Maria Antó
	16:00-17:00	Seminar 2: Sustainability	Cristina O'Callaghan
16/03/2021	12:00-13:30	Case study 5: Sustainable development goals	Oriana Ramirez, Cristina O'Callaghan
	13:30-14:30	Co-creation Activity for the Planetary Heath course	Josep Maria Antó Cristina O'Callaghan

OUTLINE SESSIONS AND READINGS

Lecture 1: Introduction to Planetary Health **Josep M. Antó**		**Aula Global**
Outline	• Global health trends and their determinants • The paradox of improving health and deteriorating the environment • Anthropocene and Planetary Health	
Recommended readings	Crutzen PJ. 2002. **Geology of mankind**. Nature 415:23–23; doi:10.1038/415023a. Myers SS. **Planetary health: protecting human health on a rapidly changing planet.** Lancet 2018; 390: 2860-2868 Whitmee S, Haines A, Beyrer C, Boltz F, Capon AG, De Souza Dias BF, et al. 2015. **Safeguarding human health in the Anthropocene epoch: Report of the Rockefeller Foundation-Lancet Commission on planetary health**. Lancet 386:1973–2028; doi:10.1016/S0140-6736(15)60901-1.	Yes Yes Yes

Lecture 2: Current changes in the Earth's natural systems **Cristina O'Callaghan**		**Aula Global**
Outline	• Limits of the Earth for a sustainable society • Changes in major natural systems: climate, oceans, fresh waters, land use and soil erosion, phosphorus and nitrogen cycles, global chemical pollution, loss of biodiversity • Dynamics and complex interactions in natural systems. Tipping points (points of no return)	
Recommended reading	Rockström J, Steffen W, Noone K, Persson Å, Chapin FSI, Lambin E, et al. 2009. **Planetary Boundaries: Exploring the Safe Operating Space for Humanity**. Ecol Soc 14: art32; doi:10.5751/ES-03180-140232. Steffen W, Richardson K, Rockström J, Cornell SE, Fetzer I, Bennett EM, et al. 2015. **Planetary boundaries: Guiding human development on a changing planet.** Science 2015; 347 (a summary) and Science 2015; 347: 1259855; doi:10.1126/science.1259855 (main research article) UN Environement, ed. 2019. **Global Environment Outlook – GEO-6: Summary for Policymake**rs. Cambridge University Press.	Yes Yes Yes

Case study 1: Social, economic and political determinants of anthropogenic change in natural systems **Cristina O'Callaghan**		**Aula Global**
Outline	• Before the session: Reading the following article: "**Safeguarding human health in the Anthropocene epoch: Report of the Rockefeller Foundation-Lancet Commission on planetary health.** Pages **1983-1986**" • During session: o Exercise in small groups and presentation of results o Classroom discussion o Summary provided by professor, covering the following topics: ▪ Population growth ▪ Consumption and production ▪ Technological development ▪ Urban growth ▪ Economic growth	
Mandatory reading (case study)	Whitmee S, Haines A, Beyrer C, Boltz F, Capon AG, De Souza Dias BF, et al. 2015. **Safeguarding human health in the Anthropocene epoch: Report of the Rockefeller Foundation-Lancet Commission on planetary health.** Lancet 386:1973–2028; doi:10.1016/S0140-6736(15)60901-1. Pages **1983-1986**	Yes
Recommended reading	Nelson, G. C., E. Bennett, A. A. Berhe, K. Cassman, R. DeFries, T. Dietz, A. Dobermann, A. Dobson, A.Janetos, M. Levy, D. Marco, N. Nakicenovic, B. O'Neill, R. Norgaard, G. Petschel-Held, D. Ojima, P.Pingali, R. Watson, and M. Zurek. 2006. **Anthropogenic drivers of ecosystem change: an overview. Ecology and Society** 11(2): 29. [online] URL: http://www.ecologyandsociety.org/vol11/iss2/art29/ Steffen W, Persson Å, Deutsch L, Zalasiewicz J, Williams M, Richardson K, et al. 2011. **The Anthropocene: From Global Change to Planetary Stewardship.** Ambio 40:739–761; doi:10.1007/s13280-011-0185-x. Zipperer WC, Northrop R, Andreu M. 2020. **Urban Development and Environmental Degradation.** In: Oxford Research Encyclopedia of Environmental Science. Oxford University Press.	Yes Yes Yes

Lecture 3: Main risks of environmental change for human health **Josep M. Antó**		**Aula Global**
Outline	• Mapping the environmental determinants of human health • A planetary health approach to environmental health risks • Food security and nutrition • Influence of global change in infectious diseases transmitted by water, zoonosis, and vectors • Atmospheric and chemical pollution • Extreme weather events	
Recommended reading	Eisenberg JNS, Desai M A, Levy K, Bates SJ, Liang S, Naumoff K, et al. 2007. **Environmental determinants of infectious disease: a framework for tracking causal links and guiding public health research**. Environ Heal Perpsectives 115: 1216–23 Landrigan PJ, Fuller R, Acosta NJR, Adeyi O, Arnold R, Basu N (Nil), et al. 2018. **The Lancet Commission on pollution and health**. Lancet 391:462–512; doi:10.1016/S0140-6736(17)32345-0. Whitmee S, Haines A, Beyrer C, Boltz F, Capon AG, De Souza Dias BF, et al. 2015. **Safeguarding human health in the Anthropocene epoch: Report of the Rockefeller Foundation-Lancet Commission on planetary health**. Lancet 386:1973–2028; doi:10.1016/S0140-6736(15)60901-1. Willett W, Rockström J, Loken B, Springmann M, Lang T, Vermeulen S, et al. 2019. **Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems**. Lancet 393:447–492; doi:10.1016/S0140-6736(18)31788-4.	Yes Yes Yes Yes

Introduction to final essay preparation **Josep M. Antó and Cristina O'Callaghan**		**Aula Global**
Outline	Students are expected to write a short essay (2000 words, references not included) on a topic relevant to Planetary Health. Essays should include an analysis of a Planetary Health challenge including potential sustainable solutions to it. A list of suggested topics will be provided.	

Case study 2: Environmental impacts of health systems **Josep M. Antó**		**Aula Global**
Outline	• Before the session: Reading the following article: **"Environmental Impacts of the U.S. Health Care System and Effects on Public Health"** • During session: o Exercise in small groups and presentation of results o Classroom discussion o Summary provided by professor	
Mandatory reading (case study)	Eckelman MJ, Sherman J. 2016. **Environmental Impacts of the U.S. Health Care System and Effects on Public Health**. PLoS One 11:e0157014; doi:10.1371/journal.pone.0157014. Malik A, Lenzen M, McAlister S, McGain F. 2018. **The carbon footprint of Australian health care.** Lancet Planet Heal 2:e2–e3; doi:10.1016/S2542-5196(17)30180-8.	Yes Yes

Lecture 4: Challenges for Planetary Health **Cristina O'Callaghan**		**Aula Global**
Outline	• Sustainable food systems • Land use • Preservation of biodiversity • Fresh water resources • Reduction and remediation of global pollution (atmospheric, chemical, etc.) • Urbanization and sustainable cities • Health systems for the Anthropocene	
Recommended reading	Willett W, Rockström J, Loken B, Springmann M, Lang T, Vermeulen S, et al. 2019. **Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems**. Lancet 393:447–492; doi:10.1016/S0140-6736(18)31788-4. **IPBES (2019): Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services**. S. Díaz, J. Settele, E. S. Brondízio E.S., H. T. Ngo, M. Guèze, J. Agard, A. Arneth, P. Balvanera, K. A. Brauman, S. H. M. Butchart, K. M. A. Chan, L. A. Garibaldi, K. Ichii, J. Liu, S. M. Subramanian, G. F. Midgley, P. Miloslavich, Z. Molnár, D. Obura, A. Pfaff, S. Polasky, A. Purvis, J. Razzaque, B. Reyers, R. Roy Chowdhury, Y. J. Shin, I. J. Visseren-Hamakers, K. J. Willis, and C. N. Zayas (eds.). IPBES secretariat, Bonn, Germany. 56 pages.	Yes Yes

Case study 3: Food systems **Marina Bosque and Cristina O'Callaghan**		**Aula Global**
Outline	• Before the session: Reading the following case: **"Today's Solutions for the Future of Food"** • During session: o Exercise in small groups and presentation of results o Classroom discussion o Summary provided by professor	
Mandatory reading (case study)	"**Today's Solutions for the Future of Food**" (Duff H., Faerron Guzmán, C., Almada, A., Golden, C., and Myers, S. "**Planetary Health Case Studies: An Anthology of Solutions**" 2020, **pages 314-359**; https://doi.org/10.5822/phanth9678)"	Yes Yes
Recommended reading	Willett W, Rockström J, Loken B, Springmann M, Lang T, Vermeulen S, et al. 2019. **Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems**. Lancet 393:447–492; doi:10.1016/S0140-6736(18)31788-4.	Yes

Lecture 5: Climate change **Cathryn Tonne**		**Aula Global**
Outline	• Identification and characterization of climate change • Health effects of climate change: direct and indirect effects • Solutions for mitigation and adaptation to climate change from Planetary Health and challenges for their implementation	
Recommended reading	**IPCC, 2018: Summary for Policymakers. In: Global Warming of 1.5°C.** An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. World Meteorological Organization, Geneva, Switzerland, 32 pp.	Yes
	Watts N, Amann M, Arnell N, Ayeb-Karlsson S, Belesova K, Boykoff M, et al. 2019. **The 2019 report of The Lancet Countdown on health and climate change: ensuring that the health of a child born today is not defined by a changing climate**. Lancet 394:1836–1878; doi:10.1016/S0140-6736(19)32596-6.	Yes
	Watts N, Amann M, Ayeb-Karlsson S, Belesova K, Bouley T, Boykoff M, et al. 2018. **The Lancet Countdown on health and climate change: from 25 years of inaction to a global transformation for public health.** Lancet 391:581–630; doi:10.1016/S0140-6736(17)32464-9.	Yes

Case study 4: Climate change and urban environment **Cathryn Tonne**		**Aula Global**
Outline	• Before the session: Reading the following article: **"How urban characteristics affect vulnerability to heat and cold: a multi-country analysis"** • During session: o Exercise in small groups and presentation of results o Classroom discussion o Summary provided by professor	
Mandatory reading (case study)	Sera F, Armstrong B, Tobias A, Vicedo-Cabrera AM, Åström C, Bell ML, et al. 2019. **How urban characteristics affect vulnerability to heat and cold: a multi-country analysis.** Int J Epidemiol 48:1101–1112; doi:10.1093/ije/dyz008.	Yes

Seminar 1: COVID-19, a disease of the Anthropocene **Josep M. Antó and Cristina O'Callaghan**		**Aula Global**
Outline	• Visualization of the seminar organized by **"El Día Después"** to explore the linkages between global environmental change, COVID-19 and the progress towards the Sustainable Development Goals, followed by a classroom discussion. Find seminar here. • Classroom discussion	Yes
Recommended reading	O'Callaghan-Gordo C, Antó JM. 2020. **COVID-19: The Disease of the Anthropocene.** Environ Res 109683; doi:10.1016/j.envres.2020.109683	Yes

Lecture 6: Governance for a sustainable society **Josep M. Antó**		**Aula Global**
Outline	• Transformative principles for a sustainable society • Agenda 2030: Sustainable Development Goals	
Recommended reading	Independent Group of Scientists appointed by the Secretary-General, **Global Sustainable Development Report 2019: The Future is Now – Science for Achieving Sustainable Development,** (United Nations, New York, 2019). **UN, Transforming our world: The 2030 agenda for sustainable development,** United Nations 2015	Yes Yes

Seminar 2: Sustainability **Cristina O'Callaghan**		**Aula Global**
Outline	• Visualization of the following videos: ○ *Beyond the Anthropocene*, by Johan Rockström. See video here. ○ *Doughnut Economics*, by Kate Raworth. See video here. • Classroom discussion	Yes

Case study 5. Sustainable development goals: case study on the Epidemic of Chronic Kidney Disease of unknown causes in Central America **Oriana Ramírez and Cristina O'Callaghan**		**Aula Global**
Outline	• Before the session: Reading the following articles: **"Mapping interactions between the sustainable development goals: lessons learned and ways forward."** (introduction to the methodology used in the session) and **"Chronic Kidney Disease of Unknown Cause in Agricultural Communities"** (introduction to CKDu, real, wicked and complex health problem"). • During session: o Visualization of a video presenting the complex problem of CKDu o Exercise in small groups using the "SDGs interlinkages mapping" and presentation of results o Classroom discussion o Summary provided by professor	
Mandatory reading (case study)	Johnson, R.J., C. Wesseling, and L.S. Newman, **Chronic Kidney Disease of Unknown Cause in Agricultural Communities**. N Engl J Med, 2019. **380**(19): p. 1843-1852. https://pubmed.ncbi.nlm.nih.gov/31067373/ Måns Nilsson , Elinor Chisholm , David Griggs , Philippa Howden-Chapman, David McCollum, Peter Messerli, Barbara Neumann, Anne-Sophie Stevance, Martin Visbeck, Mark Stafford-Smith. **Mapping interactions between the sustainable development goals: lessons learned and ways forward**. Sustain Sci. 2018;13(6):1489-1503. doi: 10.1007/s11625-018-0604-z. Epub 2018 Jul 13. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6267157/	Yes Yes
Recommended readings	UN, Department of Economic and Social Affairs. **Sustainable Development Goals**: https://sdgs.un.org/goals Gómez Martín E, Giordano R, Pagano A, van der Keur P, Máñez Costa M. 2020. **Using a system thinking approach to assess the contribution of nature based solutions to sustainable development goals**. Sci Total Environ 738:139693; doi:10.1016/j.scitotenv.2020.139693. Bennich T, Weitz N, Carlsen H. **Deciphering the scientific literature on SDG interactions: A review and reading guide**. Sci Total Environ. 2020 Aug 1;728:138405. doi: 10.1016/j.scitotenv.2020.138405. Epub 2020 Apr 8. PMID: 32388023. Saroj Jayasinghe, Yong-Guan Zhu. Chronic kidney disease of unknown etiology (CKDu): **Using a system dynamics model to conceptualize the multiple environmental causative pathways of the epidemic.** Science of The Total Environment, Volume 705,2020. https://doi.org/10.1016/j.scitotenv.2019.135766	Yes Yes Yes Yes

Co-creation activity for the Planetary Health course **Josep Maria Antó and Cristina O'Callaghan**		**Aula Global**
Outline	• Before the session: Think about your experience with the Planetary Health course, what did you like and what would you have liked to see. • During session: o Exercise in small groups o Brainstorming activity o Classroom discussion	

BIBLIOGRAPHY AND INFORMATION RESOURCES

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IPCC, 2018: **Summary for Policymakers. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty** [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. World Meteorological Organization, Geneva, Switzerland, 32 pp.

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Landrigan PJ, Fuller R, Acosta NJR, Adeyi O, Arnold R, Basu N (Nil), et al. 2018. **The Lancet Commission on pollution and health.** Lancet 391:462–512; doi:10.1016/S0140-6736(17)32345-0.

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Nelson, G. C., E. Bennett, A. A. Berhe, K. Cassman, R. DeFries, T. Dietz, A. Dobermann, A. Dobson, A.Janetos, M. Levy, D. Marco, N. Nakicenovic, B. O'Neill, R. Norgaard, G. Petschel-Held, D. Ojima, P.Pingali, R. Watson, and M. Zurek. 2006. **Anthropogenic drivers of ecosystem change: an overview.Ecology and Society** 11(2): 29. [online] URL: http://www.ecologyandsociety.org/vol11/iss2/art29/

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