

Angela Y. Chang, ScD

Research area Health metrics, health economics, health systems
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EDUCATION

- 2017 **Harvard T.H. Chan School of Public Health**
Doctor of Science (ScD), Global Health and Population
Affiliate, Institute for Quantitative Social Sciences (IQSS), Harvard University
- 2011 **Johns Hopkins Bloomberg School of Public Health**
Master of Health Administration
- 2009 **National Taiwan University**
Bachelor of Science, Pharmaceutical Sciences
- 2008 **Kyoto University**
Certificate, Pharmaceutical Sciences

PROFESSIONAL EXPERIENCE

- 2020- **Assistant Professor**, Danish Institute for Advanced Study, University of Southern Denmark
Marie Skłodowska-Curie Fellow, The Interdisciplinary Centre on Population Dynamics
- 2017-19 **Postdoctoral Fellow**, Institute for Health Metrics and Evaluation (IHME), University of Washington, USA
- 2012-17 **Research Fellow and Doctoral Candidate**, Harvard School of Public Health, USA
- 2013-14 **Research Intern**, Bill and Melinda Gates Foundation, USA
Integrated Delivery – Economic Evaluation, with Damian Walker
Office of the President for Global Health, with Trevor Mundel and Niranjana Bose
- 2010-12 **Senior Consultant**, Healthcare Life Sciences, Deloitte Consulting LLC, USA

SELECTED GRANTS, FELLOWSHIPS, AND AWARDS

- 2022 Bill & Melinda Gates Foundation, Gendered Health Pathway (PI: Sarah Hawkes), USD \$30,000.
Role: Lead on quantitative research
- 2022 The World Bank, Healthy Longevity Initiative (PI: Prabhat Jha), USD \$50,000. Role: Lead on economic burden of disease project
- 2021 Marie Skłodowska-Curie Individual Fellowship, European Union, EUR €219,312
- 2021 Independent Research Fund Denmark (DFR), DKK 2.88 million (EUR €390,000)
- 2021 Helsefonden (Health Foundation), Denmark, DKK 400,000 (EUR €54,000)
- 2020 Danish Institute for Advanced Study, seeding grant, DKK 1.5 million (EUR €202,000)
- 2016 Clarence James & Sarah Bradley Gamble Scholarship, Harvard School of Public Health
- 2014 Barry R. and Irene Tilenius Bloom Fellowship, Harvard School of Public Health
- 2011 Delta Omega, Johns Hopkins School of Public Health. Awarded top 10% graduating class

ACADEMIC TRACK RECORD OVERVIEW [Updated March 2023]

Peer-reviewed papers (first/senior author papers)	Citations without self-citations	H-index (Google)	Book chapters	Invited oral / poster presentations
30 (14/3)	1925	17	2	22 / 7

SELECTED INTERNATIONAL COLLABORATIONS

- With co-chairs Dean Jamison and Lawrence Summers on the Lancet Commission on Investing in Health
3
With Sarah Hawkes (UCL, UK), Kent Buse (The George Institute, AU), and Virginia Zarulli (SDU, DK)
on the gender equality and health
With the World Bank Commission on Healthy Longevity (PI: Prabhat Jha, U of Toronto, CA) on the
value of statistical life-based approaches to quantify economic burdens of disease
With Joseph Dieleman, Stein Emil Vollset (IHME, USA), and Vegard Skirbekk (Norwegian Institute for
Public Health) on measuring age-related burden
With Donald Bundy (LSHTM, UK), Stephane Verguet (Harvard, USA), and Edward Lloyd Evans
(World Food Programme) on impact evaluation of school feeding programs

PEER-REVIEWED PUBLICATIONS

- 1 **Chang AY**, Bryazka D, Dieleman JL. Estimating health spending associated with chronic multimorbidity in 2018: an observational study among adults in the United States. *PLOS Medicine*. 2023 Accepted.
- 2 Mayntz SK, Peronard C, Sogaard J, **Chang AY** (senior author). The economic impact of disease in the Nordic countries: a systematic review. *Scandinavian Journal of Public Health*. Accepted. 2023
- 3 Bolongaita S, Villano D, Tessema Memirie S, Kiros Mirutse M, Mirkuzie AH, Comas S, Rumpler E, Wu SM, Sato R, **Chang AY**, Verguet S. Modeling the relative risk of incidence and mortality of select vaccine-preventable diseases by wealth group and geographic region in Ethiopia. *PLOS Global Public Health*. 2022 Aug 31;2(8):e0000819.
- 4 **Chang AY**, Aaby P, Avidan MS, Benn CS, Bertozzi SM, Blatt L, Chumakov K, Khader SA, Kottiril S, Nekkar M, Netea MG. One vaccine to counter many diseases? Modelling the economics of oral polio vaccine against child mortality and COVID-19. *Frontiers in Public Health*. 2022.
- 5 Skirbekk V, Dieleman JL, Stonawski M, Fejkiel K, Tyrovolas S, **Chang AY** (senior author). The health-adjusted dependency ratio as a new global measure of the burden of ageing: a population-based study. *The Lancet Healthy Longevity*. 2022 May 1;3(5):e332-8.
- 6 Tyrovolas S, Stergachis A, Krish VS, **Chang AY**, et al.. Global, regional, and national burden of diseases and injuries for adults 70 years and older: systematic analysis for the Global Burden of Disease 2019 Study. *BMJ*. 2022 Mar 10;376.
- 7 **Chang AY**, Maswera R, Moorhouse LR, Skovdal M, Nyamukapa C, Gregson S. The determinants and impacts of age-disparate relationships on women in Zimbabwe: A life course perspective. *SSM Population Health*. 2021 Dec 1;16:100947.
- 8 Wade AN, Payne CF, Berkman L, **Chang AY**, Gómez-Olivé FX, Kabudula C, Kahn K, Salomon JA, Tollman S, Witham M, Davies J. Multimorbidity and mortality in an older, rural black South African population cohort with high prevalence of HIV findings from the HAALSI Study. *BMJ Open*. 2021 Sep 1;11(9):e047777.
- 9 Schneider MT, **Chang AY**, Crosby SW, Gloyd S, Harle AC, Lim S, Lozano R, Micah AE, Tsakalos G, Su Y, Murray CJ. Trends and outcomes in primary health care expenditures in low-income and middle-income countries, 2000–2017. *BMJ Global Health*. 2021 Aug 1;6(8):e005798.
- 10 Schneider MT, **Chang AY**, Chapin A, Chen CS, Crosby SW, Harle AC, Tsakalos G, Zlavog BS, Dieleman JL. Health expenditures by services and providers for 195 countries, 2000–2017. *BMJ Global Health*. 2021 Jul 1;6(7):e005799.
- 11 Chumakov K, Avidan MS, Benn CS, Bertozzi SM, Blatt L, **Chang AY**, Jamison DT, Khader SA, Kottiril S, Netea MG, Sparrow A, Gallo RC. Old vaccines for new infections: exploiting innate immunity to control COVID-19 and prevent future pandemics. *Proceedings of the National Academy of Sciences*. 2021 May 18;118(21).
- 12 Haber NA, Lesko CR, Fox MP, **Chang AY**, et al. Limitations of the UNAIDS 90-90-90 metrics: a simulation-based comparison of cross-sectional and longitudinal metrics for the HIV care continuum. *AIDS*. 2020 Jun 1;34(7):1047.

- 13 **Chang AY**, Cesare N. Handing the microphone to women: changes in gender representation in editorial contributions across medical and health journals 2008-2018. *International Journal of Health Policy and Management*. 2020.
- 14 **Chang AY**, Skirbekk S, Tyrovoras S, Kassebaum N, Dieleman JL. Measuring Population Aging Using the Global Burden of Disease Study 2017. *The Lancet Public Health*. 2019; 3: e159–67.
- 15 **Chang AY**, Cowling K, Dieleman JL, et al. Past, present, and future of global health financing: a review of development assistance, government, out-of-pocket, and other private spending on health for 195 countries, 1995–2050. *The Lancet*, 2019.
- 16 **Chang AY**, Gomez-Olive FX, Wagner R, Kahn K, Tollman S, Kabudula CW, Berkman LF, Montana L, Payne L, Rohr J, Salomon JA. 2016. Chronic multimorbidity among older adults in rural South Africa. *BMJ Global Health*. 2019 Jun 1. 4:e001386.
- 17 **Chang AY**, Gómez-Olivé FX, Manne-Goehler J, Wade AN, Tollman S, Gaziano TA, Salomon JA. Multimorbidity and care for hypertension, diabetes and HIV among older adults in rural South Africa. *Bulletin of the World Health Organization*. 2019 Jan 1;97(1):10.
- 18 **Chang AY**, Riumallo-Herl C, Salomon JA, Resch SC, Brenzel L, Verguet S. Estimating the distribution of morbidity and mortality of childhood diarrhea, measles, and pneumonia by wealth group in low-and middle-income countries. *BMC Medicine*. 2018 Dec;16(1):102.
- 19 **Chang AY**, Haber N, Bärnighausen T, Herbst K, Gareta D, Pillay D, Salomon JA. Improving the validity of mathematical models for HIV elimination by incorporating empirical estimates of progression through the HIV treatment cascade. *JAIDS Journal of Acquired Immune Deficiency Syndromes*. 2018 Sep 24.
- 20 **Chang AY**, Riumallo-Herl C, Perales NA, Clark S, Clark A, Constenla D, Garske T, Jackson ML, Jean K, Jit M, Jones EO. The equity impact vaccines may have on averting deaths and medical impoverishment in developing countries. *Health Affairs*. 2018 Feb 1;37(2):316-24.
- 21 Dieleman JL, Sadat N, **Chang AY**, Fullman N, et al. Trends in future health financing and coverage: future health spending and universal health coverage in 188 countries, 2016–40. *The Lancet*. 2018 May 5;391(10132):1783-98.
- 22 Riumallo-Herl C, **Chang AY**, Clark S, Constenla D, Clark A, Brenzel L, Verguet S. Poverty reduction and equity benefits from measles, rotavirus and pneumococcal vaccines in low-and middle-income countries. *BMJ Global Health*. 2018 Apr 1;3(2):e000613.
- 23 **Chang AY**, Li Y, Ogbuoji O. Modest improvements in skilled birth attendants at delivery with increased Mutuelles coverage in Rwanda. *Journal of Public Health*. 2017 Sep 11:1-7.
- 24 Bowser D, Krech L, Mbirizi D, **Chang AY**, Kapaon D, Bossert T. Associations Between Practices and Behaviors at the Health Facility Level and Supply Chain Management for Antiretrovirals: Evidence from Cameroon, Namibia, and Swaziland. *Global Health: Science and Practice*. 2019 Jun 24;7(2):300-16.
- 25 **Chang AY**, Ogbuoji O, Atun R, Verguet S. Dynamic modeling approaches to characterize the functioning of health systems: A systematic review of the literature. *Social Science & Medicine*. 2017 Dec;194:160-7.
- 26 Payne CF, Wade A, Kabudula CW, Davis JI, **Chang AY**, Gomez-Olive FX, Kahn K, Berkman LF, Tollman SM, Salomon JA, Witham MD. Prevalence of frailty in an older rural African population: findings from the HAALSI cohort study. *BMC Geriatrics*. 2017 Dec;17(1):293.
- 27 **Chang AY**, Robinson LA, Hammitt JK, Resch SC. Economics in “Global Health 2035”: a sensitivity analysis of the value of a life year estimates. *Journal of Global Health*. 2017 Jun;7(1).
- 28 Robinson LA, Hammitt JK, **Chang AY**, Resch S. Understanding and improving the one and three times GDP per capita cost-effectiveness thresholds. *Health Policy and Planning*. 2017 Feb;32(1):141–5.
- 29 Hontelez JA, **Chang AY**, Ogbuoji O, de Vlas SJ, Bärnighausen T, Atun R. Changing HIV treatment eligibility under health system constraints in sub-Saharan Africa: investment needs, population health gains, and cost-effectiveness. *AIDS*. 2016 Sep 24;30(15):2341-50.
- 30 Atun R, **Chang AY**, Ogbuoji O, Silva S, Resch S, Hontelez J, Bärnighausen T. Long-term financing needs for HIV control in sub-Saharan Africa in 2015–2050. *BMJ Open*. 2016 Mar 1;6(3):e009656.

WORKING PAPERS AND ONGOING RESEARCH

Chang AY, Stevens G, Cardoso D, Cao B, Jamison DT. Economic burden of avoidable mortality.

Chang AY, Zarulli V, Hawkes S. What we talk about when we talk about “gender equality in health”?
 Rijal S, **Chang AY**. Comparison of self-reported health-related quality of life across diseases in Nordic countries: A systematic review.
 Wartenberg PJ, **Chang AY**. The welfare impact of disease in the Nordic countries: a systematic review.
 Seo A, **Chang AY**. A systematic review of social impact of diseases in Nordic countries.

BOOK CHAPTERS AND REPORTS

Chang AY, Horton S, Jamison DT. 2017. Benefit Cost Analysis in the Disease Control Priorities (DCP3). Disease Control Priorities in Developing Countries, 3rd Edition. Vol 9 Chapter 15.
 Bump JB, **Chang AY**. 2017. Chapter 12: Priority-setting as politics: a political economy framework for analyzing health benefits package decisions. “What’s In What’s Out. Designing benefits for universal health coverage”. Center for Global Development, Washington D.C.
 Bowser D, **Chang AY**, Bossert T, Mbirizi D. 2015. Assessing Facility-Level Practices and Behaviors That Affect Antiretroviral Medicines Supply Chain. Washington, DC MSH-SIAPS/USAID.
Chang AY, Røttingen JA, Hoffman SJ, Moon S. 2014. Governance Arrangements for Health R&D. Geneva, Switzerland: Graduate Institute of International & Development Studies and Cambridge, MA: Harvard Global Health Institute.

RECENT TEACHING AND MENTORING

2022- Supervisor of 1 PhD student and 1 Postdoctoral fellow at University of Southern Denmark
 2021-22 Co-supervisor of 1 Master’s student at Imperial College London
 2020-22 7 Master’s students at University of Southern Denmark
 2017-18 Mentoring 2 students at the Institute for Health Metrics and Evaluation
 2014-15 Teaching Fellow, Applied Political Analysis in Global Health, Harvard. Instructor: Michael Reich
 2014 Teaching Fellow, Supply Chain Management in Global Health, Harvard. Instructors: Reich
 2013-14 Teaching Fellow, Introduction to Decision Science, Harvard. Instructor: Joe Pliskin

SELECTED INVITED ORAL PRESENTATIONS

2021 Society for Benefit Cost Analysis annual conference, oral presentation
 2020 Consortium of Universities for Global Health (CUGH) annual conference, oral presentation
 European Health Economics Association (EuHEA) Conference, oral presentation
 2019 International Health Economics Association (iHEA) congress, oral presentation
 2018 Conference of the American Society of Health Economists, oral presentation
 Immunization Economics Workshop, the Bill and Melinda Gates Foundation, oral presentation
 2017 International Health Economics Association (iHEA) congress, oral presentation
 Population Association America, oral presentation
 Health Technology Assessment international (HTAi) annual meeting, oral presentation
 Consortium of Universities for Global Health (CUGH) annual conference, oral presentation
 2016 Prince Mahidol Award Conference, oral presentation
 Gavi The Vaccine Alliance, panelist
 2015 Harvard University, Economic Evaluation in Health Workshop, panelist
 2014 National Health Insurance Authority, the Republic of Ghana, Stakeholder Dialogue on the National Health Insurance Scheme Benefits Package, panelist and discussant on plenary sessions
 2014 USAID, workshop speaker
 2013 The Graduate Institute Geneva, workshop speaker

OTHERS

Professional affiliations	Population Association of America, International Health Economics Association, Health Systems Global, Society for Benefit-Cost Analysis
Languages	English, Mandarin Chinese, Japanese, Taiwanese (native in speaking, reading, writing), Italian (beginner in speaking, reading)
Programming	R, Python, Stata, SQL

PERIODS OF LEAVE

01/17-08/17, 02/19-03/20, 08/21-02/22 Maternity leave