

# Elizabeth DeYoung Brouwer

1959 NE Pacific St, H364 Box 357660 • Seattle, WA 98105  
ebrouwer@uw.edu

## EDUCATION

---

### University of Washington, The CHOICE Institute, Seattle, WA

PhD Candidate – Health Economics and Outcomes Research 09/2015 – 06/2020  
Graduation June 2020

Dissertation Topic: Using real-world evidence to investigate the association between drug value, patient assistance programs, and cost-sharing levels in managed care settings.

### University of Michigan, Ann Arbor, MI

Master of Public Health, Health Management and Policy 09/2011 – 04/2013  
Bachelor of Arts, Public Policy, French and Francophone Studies 09/2005 – 04/2009

## EMPLOYMENT

---

### University of Washington, Seattle, WA

Research Scientist 06/2016 – 06/2020

- **ENGAGE CVD** (with Dr. Anirban Basu and Dr. Douglas Barthold) Conducted Cox Proportional Hazard analysis to understand the impact of weight change on time to diabetes relapse and remission after gastric bypass surgery. Funded by Kaiser Permanente Southern California.
- **PhRMA Foundation** funded project (with Dr. Josh Carlson of University of Washington, Seattle, and Dr. Robert Brett McQueen of University of Colorado, Denver) to identify alternative methodologies of calculating the quality-adjusted life-year, testing the effects those alternatives on outcomes in 9 existing cost-effectiveness models, and developing a generic simulation tool to explore extreme scenarios.
- **Institute for Clinical and Economic Review (ICER)** consultant; co-authored two ICER drug reports (Multiple Sclerosis, Multiple Myeloma) and supported model building on a third (Atopic Dermatitis).

Teaching Assistant 01/2018 – 08/2019

- PHARM 541, “Pharmacy, Health Care and Society” with Drs Joshua Carlson and Ryan Hansen
- HECON 500, “Principles of Health Economics” with Drs Louis Garrison and Anirban Basu
- HECON 520, “Economic Evaluation in Healthcare” with Drs Joshua Carlson and David Veenstra
- HECON 540, “HTA in a Global Environment” with Drs Sean Sullivan and Beth Devine

**PATH, Seattle, WA**

Economic Evaluation Internship

01/2017 – 08/2017

- Developed a cost study with Dr. Laura DiGiorgio as part of the economic evaluation of delivering Sayana Press contraceptive technology in Burkina Faso, Uganda, and Senegal, resulting in a publication in *Contraception* journal.

**RTI International, Seattle, WA**

Health Economics Scientist

01/2016 – 01/2017

- Created investment cases for non-communicable disease (NCD) policies in low- and middle-income countries with Dr. Rachel Nugent, Vice President of Global Non-Communicable Diseases for RTI International.
- Wrote white papers on NCD policy for the US Centers for Disease Control and Prevention (CDC), the United Nations Development Project (UNDP), and the Copenhagen Consensus.
- Created cost-benefit analysis model for NCD policy measures in Mongolia in partnership with UNDP and the WHO.

**Disease Control Priorities, Seattle, WA**

Health Economics Analyst

05/2013 – 01/2016

- Created a unit cost database of global health intervention and treatment costs through 8 distinct literature reviews and expert consultation, resulting in 3 published papers and 8 chapters of *Disease Control Priorities*, 3<sup>rd</sup> Edition (Published by the World Bank).
- Organized and lead capacity-building economic evaluation workshops, promoting economic evaluation as a tool for priority setting in the health sector in Nairobi, Kenya and Cairo, Egypt.

**William Davidson Institute, Ann Arbor, MI**

Health Care Systems Research Intern

06/2012 – 09/2012

- Analyzed allocative and technical efficiency of real expenditures collected from 25 rural health clinics under India's flexible financing program in National Rural Health Mission.

**University of Michigan, Ann Arbor, MI**

Research Assistant to Dr. Zoë McLaren

09/2011 – 04/2013

- Conducted literature reviews, created data visualizations, cleaned and analyzed data regarding tuberculosis and HIV policy in South Africa, resulting in 2 publications.

**Mary Stopes International (MSI), Accra, Ghana**

Data Collection and Field Aide

01/2011 – 06/2011

- Set up primary health systems data collection at five MSI clinics in Accra, Kumasi, and Tema.
- Developed research protocol to collect information on patient experience, service quality and local demand for reproductive health services, resulting in expanding scope of clinical service.

**Michigan House of Representatives, Lansing, MI**

Legislative Assistant

04/2009 – 01/2011

## PEER REVIEWED PUBLICATIONS

---

1. **Brouwer E**, Basu A, Yeung K. Adoption of Cost Effectiveness-Driven Value-Based Formularies in Private Health Insurance from 2010 to 2013. *PharmacoEconomics*. 2019;1-4. <https://link.springer.com/article/10.1007/s40273-019-00821-5>
2. Di Giorgio L, Mvundura M, Tumusiime J, Namagembe A, Ba A, Belemsaga-Yugbare D, Morozoff C, **Brouwer E**, Ndour M, Drake JK. Costs of administering injectable contraceptives through health workers and self-injection: evidence from Burkina Faso, Uganda, and Senegal. *Contraception*. 2018 Nov 1;98(5):389-95. <https://www.sciencedirect.com/science/article/pii/S001078241830194X>
3. Zimmermann M, **Brouwer E**, Tice JA, Seidner M, Loos AM, Liu S, Chapman RH, Kumar V, Carlson JJ. Disease-Modifying Therapies for Relapsing–Remitting and Primary Progressive Multiple Sclerosis: A Cost-Utility Analysis. *CNS drugs*. 2018 Dec 1;32(12):1145-57. <https://link.springer.com/article/10.1007/s40263-018-0566-9>
4. McLaren ZM, Sharp A, **Brouwer E**, Nanoo A. The Impact of Anti-Retroviral Therapy on Tuberculosis Detection at the National Level in South Africa. *The American journal of tropical medicine and hygiene*. 2018 Dec 5;99(6):1407-14. <https://www.ajtmh.org/content/journals/10.4269/ajtmh.17-0530>
5. Prabhakaran D, Anand S, Watkins D, Gaziano T, Wu Y, Mbanya JC, Nugent R, Ajay VS, Afshin A, Adler A, Ali MK, **Brouwer E**. et al. Cardiovascular, respiratory, and related disorders: key messages from Disease Control Priorities. *The Lancet*. 2018 Mar 24;391(10126):1224-36. <https://www.sciencedirect.com/science/article/pii/S0140673617324716>
6. Jamison DT, Alwan A, Mock CN, Nugent R, Watkins D, Adeyi O, Anand S, Atun R, Bertozzi S, Bhutta Z, Binagwaho A, **Brouwer E**, et al. Universal health coverage and intersectoral action for health: key messages from Disease Control Priorities. *The Lancet*. 2018 Mar 17;391(10125):1108-20. <https://www.sciencedirect.com/science/article/pii/S0140673617329069>
7. Nugent R, **Brouwer E**, Cravioto A, Koehlmoos T. A cost-benefit analysis of a National Hypertension Treatment Program in Bangladesh. *Preventive medicine*. 2017 Dec 1;105:S56-61. <https://www.sciencedirect.com/science/article/pii/S0091743517302992>
8. Carlson JJ, Guzauskas GF, Chapman RH, Synnot PG, Liu S, Russo ET, Pearson SD, **Brouwer ED**, Ollendorf DA. "Cost-effectiveness of drugs to treat relapsed/refractory Multiple Myeloma in the U.S." *Journal of Managed Care & Specialty Pharmacy*. 2017. <https://www.jmcp.org/doi/abs/10.18553/jmcp.2018.24.1.29>
9. Jamison DT, Alwan A, Mock CN, Nugent R, Watkins D, Adeyi O, Anand S, Atun R, Bertozzi S, Bhutta Z, Binagwaho A, **Brouwer E**, et al. Universal health coverage and intersectoral action for health: key messages from Disease Control Priorities. *The Lancet*. 2017 Nov 25. <https://www.sciencedirect.com/science/article/pii/S0140673617329069>
10. Salti N, **Brouwer E**, Verguet S. The health, financial and distributional consequences of increases in the tobacco excise tax among smokers in Lebanon. *Social Science & Medicine*.

2016 Dec 31;170:161-9.

<http://www.sciencedirect.com/science/article/pii/S0277953616305883>

11. Nugent R, **Brouwer E**. Economic benefit-cost analysis of select secondary prevention interventions in LMIC. *Global heart*. 2015 Dec 1;10(4):319-21. [http://www.globalheart-journal.com/article/S2211-8160\(15\)00254-9/abstract](http://www.globalheart-journal.com/article/S2211-8160(15)00254-9/abstract)
12. **Brouwer ED**, Watkins D, Olson Z, Goett J, Nugent R, Levin C. "Provider costs for prevention and treatment of cardiovascular and related conditions in low-and middle-income countries: a systematic review." *BMC Public Health*. 2015 Nov 26;15(1):1. <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-015-2538-z>
13. Verguet S, Gauvreau CL, Mishra S, MacLennan M, Murphy SM, **Brouwer ED**, Nugent RA, Zhao K, Jha P, Jamison DT. The consequences of tobacco tax on household health and finances in rich and poor smokers in China: an extended cost-effectiveness analysis. *The Lancet Global Health*. 2015 Apr 1;3(4):e206-16. [http://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(15\)70095-1/abstract](http://www.thelancet.com/journals/langlo/article/PIIS2214-109X(15)70095-1/abstract)
14. McLaren ZM, **Brouwer E**, Ederer D, Fischer K, Branson N. "Gender patterns of tuberculosis testing and disease in South Africa." *International Journal of Tuberculosis and Lung Disease*. 2015 Jan 1;19(1):104-10. <http://www.ncbi.nlm.nih.gov/pubmed/25519799>

## WHITE PAPERS

---

1. Watkins D, Poggio R, Augustovski F, **Brouwer E**, Pichon-Riviere A, Rubinstein A, Nugent R. "The Cost-Effectiveness of NCDs and Their Risk Factors in the PAHO Region: A Systematic Review of Literature." *Disease control priorities in developing countries*. 2015 Aug 19; [http://dcp-3.org/sites/default/files/resources/PAHO%20NCD%20CEAs\\_Working%20Paper13.pdf](http://dcp-3.org/sites/default/files/resources/PAHO%20NCD%20CEAs_Working%20Paper13.pdf)
2. Nugent R, **Brouwer E**. "Post-2015 Development Agenda Kenya Perspectives: Non-Communicable Diseases." *Copenhagen Consensus, Country Specific Seminars*. 2015. [http://www.copenhagenconsensus.com/sites/default/files/kenya\\_ncd\\_resource\\_packet.pdf](http://www.copenhagenconsensus.com/sites/default/files/kenya_ncd_resource_packet.pdf)
3. Nugent R, **Brouwer E**. "Post-2015 Development Agenda India Perspectives: Non-Communicable Diseases." *Copenhagen Consensus, Country Specific Seminars*. 2015. [http://www.copenhagenconsensus.com/sites/default/files/ndc\\_india\\_compiled\\_for\\_pdf.pdf](http://www.copenhagenconsensus.com/sites/default/files/ndc_india_compiled_for_pdf.pdf)
4. Nugent R, **Brouwer E**. "Post-2015 Development Agenda Indonesia Perspectives: Non-Communicable Diseases." *Copenhagen Consensus, Country Specific Seminars*. 2015. [http://www.copenhagenconsensus.com/sites/default/files/ncd\\_packet\\_indonesia.pdf](http://www.copenhagenconsensus.com/sites/default/files/ncd_packet_indonesia.pdf)
5. Levin C, **Brouwer E**. "Saving brains: Literature review of reproductive, neonatal, child and maternal health and nutrition interventions to mitigate basic risk factors to promote child development." *Grand Challenges Canada: Economic Returns to Mitigating Early Life Risks Project*. 2014 Nov 21. [http://repository.upenn.edu/cgi/viewcontent.cgi?article=1016&context=gcc\\_economic\\_returns](http://repository.upenn.edu/cgi/viewcontent.cgi?article=1016&context=gcc_economic_returns)

## GRANTS, AWARDS, & HONORS

---

- Society for Medical Decision-Making- Social media reporting team October 2019  
*Part of a three-person team reporting via Twitter on the topics discussed during the Fall 2019 SMDM Conference in Portland Oregon.*
- PhRMA Foundation Predoctoral Health Outcomes Award April 2019  
*Predoctoral grant of \$25,000/year to provide stipend support to promising students during advanced stages of training and thesis research and to support the career development of scientists prepared to engage in health outcomes research.*
- Louis Sr. and Marilyn Garrison Endowed Prize in Health Policy and Economics April 2019  
*Annual \$1,000 prize awarded to a paper written on a topic in health policy and economics at the University of Washington; awarded for the submission of my dissertation's first aim.*
- Rubinstein Endowment Awardee May 2016, May 2018  
*An endowed award of up to \$5,000 from the School of Pharmacy's Office of the Dean to support graduate students and their training.*
- University of Washington Top Scholar Award September 2015  
*Merit-based scholarship to support my first year of doctoral studies provided by the University of Washington Graduate School.*

## POSTERS, PRESENTATIONS, AND PODIUMS

---

1. Carlson J, **Brouwer E**. "Alternative Approaches to QALY Estimation within Standard Cost-Effectiveness Models: Literature Review, Feasibility Assessment, and Impact Evaluation." *Society for Medical Decision Making*. Portland, OR. 2019.
2. **Brouwer E**, Basu A, Yeung K. "Have Value-Based Trends Moved the Private Prescription Insurance Market Towards Greater Value as Measured by Cost-Effectiveness?" Podium Presentation. *American Society of Health Economics*. Washington, DC, 2019.
3. **Brouwer E**, Kim E, Carlson J. "Identifying and assessing the feasibility of proposed alternative approaches to QALY estimation within cost-effectiveness models using a systematic literature review: an updated analysis." Poster Presentation. *International Society for Pharmaceutical Outcomes Research*. New Orleans, LA, 2019.
4. **Brouwer E**, Kim E. "A systematic review and content analysis of rhetoric about the Institute for Clinical and Economic Review (ICER) in the written media, 2015-2017." Poster Presentation. *International Society for Pharmaceutical Outcomes Research*. New Orleans, LA, 2019.
5. **Brouwer E**. "Implicit adoption of cost-effectiveness driven value-based formularies in private health insurance 2010-2013." Podium Presentation. *Program in Health Economics and Outcomes Research Methodologies*. Seattle, WA, 2018.

6. **Brouwer E**, Zimmermann M, Carlson J. “Drug-specific discontinuation rates for available multiple sclerosis treatments.” Poster Presentation *International Society for Pharmaceutical Outcomes Research*. Boston, MA, 2017.
7. Watkins D, **Brouwer E**, and Nugent RA. “Economic consequences of cardiovascular disease in South African households: an analysis of WHO Study on Global Aging (SAGE).” Poster Presentation. *World Congress of Cardiology*. Cape Town, South Africa, 2014.
8. **Brouwer E**, Smith M, Yadav P, et al. “Decentralized financing of health facilities: Policy lessons from flexible financing under India’s National Rural Health Mission.” Poster Presentation. *American Society of Tropical Medicine and Hygiene*. Atlanta, GA, 2012

## **PROFESSIONAL SERVICES, SKILLS & MEMBERSHIPS**

---

### Skills

- Work in Stata, SAS, and R coding languages
- Model building in Excel and R
  - Attended three-day workshop “Cost-Effectiveness Analysis and Decision Modeling Using R” presented by the DARTH work group in the Fall of 2019.

### Academic Service

- Creator, editor, and contributor to the CHOICE Student Blog “Incremental Thoughts,” [www.choiceblog.org](http://www.choiceblog.org) (2018-2020)
- Creator and administrator of the CHOICE Marketscan/SAS summer bootcamp program, Summer 2019
- Planned CHOICE Institute Retreat, April 2019
- ISPOR Student Chapter Leadership Board (2017-2019). Planned and lead events to engage students and the broader academic community in pharmacy economics related activities.
- Peer-reviewed manuscripts for the following journals:
  - “Measuring the value healthy individuals place on generous insurance coverage of severe diseases: A stated preference survey of adults with and at-risk of lung cancer” for *Value in Health*, February 2020.
  - “What will it cost to prevent violence against women and girls in low- and middle-income countries? Evidence from Ghana, Kenya, Pakistan, Rwanda, South Africa and Zambia” for *Health Policy and Planning*, February 2020.
  - “Factors Affecting Usage Levels and Trends of Innovative Oncology Drugs Upon and After Reimbursement under Taiwan National Health Insurance: Interrupted Time Series Analysis” for *Value in Health* journal, October 2019.
  - “Think Tank Capacity Building on Tobacco Economics—Experiences & Lessons Learned” for *Tobacco Control* journal, September 2019.
  - “Methods and Rationale of a Multi-Centre Cross Sectional Costing Study of Elective Percutaneous Coronary Intervention: A Study Design based on Malaysia, a Middle-income Country” for *BMJ Open* journal in September 2016.
  - “Financial Burden and Impoverishment due to Cardiovascular Medications in Low and Middle Income Countries: an Illustration from India” for *PLOS One* journal, April 2016
  - “A One Health Framework for the Evaluation of Rabies Control Programmes: A Case Study from Colombo City, Sri Lanka” for *PLOS Neglected Tropical Disease*, July 2014

#### Professional Societies

- Member of the International Society of Pharmaceutical Outcomes Research (2017-2020)
- Member of the American Society of Health Economics (2019-2020)