

January 11, 2024

CURRICULUM VITAE

BRYAN N. PATENAUDE

EDUCATION AND TRAINING

- 2017 **Sc.D.** Harvard T.H. Chan School of Public Health (*Field: Health Economics*)
2014 **M.A.** Boston University (*Field: Global Development Economic*)
2012 **B.A.** Boston College (*Field: International Studies - Economics*)

PROFESSIONAL EXPERIENCE

- 2023– **Associate Professor**
Johns Hopkins Bloomberg School of Public Health
Department of International Health (Health Systems Program)
- Director of Economics & Finance at the International Vaccine Access Center (IVAC)
 - Member of the Gupta-Klinsky India Institute
 - Member of the University-Wide COVID-19 Policy Modelling Hub
- 2018–2023 **Assistant Professor**
Johns Hopkins Bloomberg School of Public Health
Department of International Health (Health Systems Program)
- Director of Economics & Finance at the International Vaccine Access Center (IVAC)
 - Member of the Gupta-Klinsky India Institute
 - Member of the University-Wide COVID-19 Policy Modelling Hub
- 2017–2018 **Senior Health Economist**
United States Agency for International Development
Bureau for Global Health, Office of HIV/AIDS
- Served in the Global Health Fellowship Program (GHFP-II)
 - Planned and managed the USAID Sustainable Financing Initiative investments in Botswana, Namibia, Rwanda, Uganda, and Ethiopia.
 - Conducted economic evaluation training programs for USAID mission staff in Guyana & South and East Africa Regions.
 - Member of the UNICEF, Global Fund, Bill & Melinda Gates Foundation, USAID, CDC, and UNAIDS joint health financing & economics taskforce.

- 2017 **Postdoctoral Research Associate**
Harvard T.H. Chan School of Public Health

Department of Global Health & Population (Health Systems Program)

- Worked under Dr. Peter Berman leading a body of work on the empirical estimation of health financing inequality in India.

2016–2017 **Economic Consultant**

Tufts University

Friedman School of Nutrition Science & Policy

- Designed & conducted empirical analyses for publications on the economic implications of micronutrient inadequacy in Ethiopia under the USAID funded ENGINE Project..

2014–2017 **Research Assistant**

Harvard T.H. Chan School of Public Health

Department of Global Health & Population

- Worked as an RA with Dr. Till Bärnighausen and Dr. Günther Fink
- Designed & conducted field studies on perceived risk and HIV preventive behavior in Tanzania & South Africa.
- Researched feedback loops between poverty and economics and anti-retroviral therapy adherence in KwaZulu-Natal, South Africa.
- Designed & conducted econometric evaluations of spillovers of a Malaria prevention and information program in Namibia & Angola utilizing a natural experiment study design.

2014–2016 **Statistician & Economic Consultant**

Massachusetts General Hospital

Department of Neurology

- Lead economist and statistician for the Global Neurology Program.
- Designed and conducted economic and statistical evaluations of access, affordability, and economic implications of neuro-diagnostic and treatment services in low- and middle- income countries.
- Contributed to conference presentations and publications.

2013 – 2014 **Research Assistant**

Boston University

Department of International Relations (2013 – 2014)

- Research Assistant to Dr. Cornel Ban
- Designed and conducted econometric and network analyses of the impact of social, employment, and educational networks on the likelihood of promoting fiscal austerity and other specific types of macroeconomic policy among leading decision-makers at international organization.
- Co-Authored a paper on the social economics of fiscal austerity in *Public Affairs*. One of the leading political science journals.

- Led research and policy work on the transfer of European Structural Fund management from the executive branch to development banks in Romania.

2013 – 2014 **Graduate Research Fellow & Research Assistant**

Boston University

Frederick S. Pardee Center for the Study of the Longer-Range Future

- Research Assistant to Dr. Anthony Janetos
- Utilized Global Climate-Change Assessment Models (GCAM) to assess the implications of various climate change scenarios on global agricultural markets and commodity prices over time.
- Led economic evaluation research on the economic impact of the informal economy for electronic waste recycling in China.

2013 – 2014 **Economic Research Consultant**

Médecins Sans Frontières

- Led economic evaluations of the services and policies promoted by the MSF Access campaign surrounding point-of-care CD4 and Viral Load HIV testing in low & middle income countries.
- Contributed financing needs and demand forecasts for HIV testing products in LMICs to conference presentations (ICASA 2013) and the MSF access investment cases

2012-2013 **Research Assistant**

Boston University School of Public Health

Center for Global Health & Development

- Research Assistant to Dr. Bruce Larson
- Led an economic evaluation of the impact of village saving and loan associations on economic, health, and nutritional outcomes in rural Kenya utilizing quasi-experimental difference-in-difference, propensity score matching, and synthetic control techniques.

PROFESSIONAL ACTIVITIES

Participation on Advisory Panels

2021 **World Health Organization**

Immunization & Vaccines Related Implementation Research – Advisory Committee (IVIR-AC)

March 1-5, 2021

- Provided feedback on economic evaluation of vaccines
- Presented on the return-on-investment and financing of Gavi vaccines as well as the costing of the immunization agenda 2030.

2020–2022 **International Federation on Aging**

- Economics of Aging Network member and advisor

- Provide technical assistance to those interested in conducting economic evaluations or economic research on aging.
 - <https://expertfile.com/experts/bryan.patenaude/bryan-patenaude>
- 2020–2022 **Center for Strategic International Studies (CSIS)**
Roundtable On Global Covid-19 Vaccine Procurement Member
- Provide economic policy, financing, and technical expertise to policymakers and stakeholders concerning COVID-19 vaccination financing and global procurement.
- 2019–2022 **United Nations Foundation**
Shot@Life Campaign
- Speak to & educate advocates at advisory meetings on the economic impacts of vaccines.
 - Provide talking points on the economic impact of vaccines when advocates approach members of congress.
- 2019–2022 **Stop TB Partnership**
Sustainable Finance & Economics Advisory Committee Member
- Attend meetings to & provide guidance on sustainable financing and estimation of economic program benefits for advocacy.
- 2014–2016 **The Aspen Institute of Romania**
Economic Advisor to the Romania Gateway Project
- Supervised the transition of European Structural Fund (ESF) project approval and financing allocation decision-making from the Ministry of Public Administration to two local development banks which resulted in a 500% increase in absorption of ESF financing over the 2-year period.
 - Invited to speak before the Parliament of Romania, the Ministry of Finance of Romania, and the Central Bank of Romania on the economics of the transition.

Consultations

- 2021 **Asian Development Bank**
- *Consultation on the Economics of COVID-19 Vaccination*
 - Advise ADB member countries on the optimal procurement and efficient and equitable allocation of COVID-19 Vaccines
- 2020–2022 **World Health Organization**
- Provide technical consultation and technical assistance to conduct analyses to support costing the Immunization Agenda 2030 (IA2030).
- 2020–2021 **Learning Network for Countries in Transition (LNCT)**

- Consultations on conducting economic & equity assessment for Results for Development (R4D)
- Hosted a webinar and engaged in a series of consultations with ministry of health and ministry of finance officials from countries planning to undergo Gavi transition on measuring the economic and equity implications of their vaccination financing and delivery strategies.

2014-2019 **Massachusetts General Hospital, Department of Neurology**
The Global Neurology Research Group

- Advise on economic evaluations and statistical evaluations of access, affordability, and economic implications of neuro-diagnostic and treatment services in low- and middle- income countries.
- <https://www.massgeneral.org/neurology/research/global-neurology-research-group>

EDITORIAL ACTIVITIES

Editorial Activities

2023- Associate Editor, *International Journal for Equity in Health*

Peer Review Activities

BMC Health Services Research
BMC Public Health
BMJ Global Health
Bulletin of the World Health Organization
Clinical Epidemiology and Global Health
Health Affairs
Health Economics
Health Policy & Planning
Health Services Research
Health Systems & Reform
International Journal for Equity in Health
JAMA Network Open
Journal of Benefit-Cost Analysis
Journal of the International AIDS Society
Pharmacoeconomics
PLOS One
PLOS Medicine
Social Science & Medicine
The Lancet Global Health
Vaccine
Vaccine: X
Value in Health

HONORS AND AWARDS

Honors

- 2023 Johns Hopkins Bloomberg School of Public Health – Excellence in Teaching
Course: Advanced Topics in Economic Evaluation & Modelling for Global Health Policy (221.647.01, 4th Term)
- 2021 Johns Hopkins Bloomberg School of Public Health – Excellence in Teaching
Course: Advanced Topics in Economic Evaluation & Modelling for Global Health Policy (221.647.01, 4th Term)
- 2020 Editor’s Pick: Top 10 *Health Affairs* Article In 2020
Article: “Return On Investment From Immunization Against 10 Pathogens In 94 Low- And Middle-Income Countries, 2011–30”
<https://www.healthaffairs.org/doi/10.1377/forefront.20210114.871781>
- 2020 Johns Hopkins Bloomberg School of Public Health – Excellence in Teaching
Course: Advanced Topics in Economic Evaluation & Modelling for Global Health Policy (221.647.01, 4th Term)
- 2019 Forbes 30 Under 30 – Healthcare
- 2017 Harvard University Derek Bok Center for Teaching & Learning - Certificate of Distinction in Teaching. *Course:* Introduction to Economics with Applications to Health & Development (GHP 230)

Awards

- 2015 NIH & Harvard Program on the Global Demography of Aging Research Support (Pilot Grant Award)
- 2014 Boston University Center for Finance, Law & Policy Research Grant
- 2013 Boston University Frederick S. Pardee Center Graduate Research Fellowship
- 2012 Phi Beta Kappa
- 2011 Georgetown University - Egalitcheff Institute of Comparative Political & Economic Systems Summer Scholarship

PUBLICATIONS

Journal Articles (signifies peer review)

1. Ravi SJ*, Vecino-Ortiz AI, Potter CM, Merritt MW, **Patenaude BN**. Group-based trajectory models of integrated vaccine delivery and equity in low- and middle-income countries. *Int J Equity Health*. 2024;23(1):5. Published 2024 Jan 9. doi:10.1186/s12939-023-02088-x
2. Farrenkopf BA*, Zhou X, Shet A, Olayinnka F, Carr K, **Patenaude B**, Chido-Amajuoyi, Wonodi C. Understanding household-level risk factors for zero dose immunization in 82 low- and middle-income countries. *PLoS One*. 2023;18(12):e0287459. Published 2023 Dec 7. doi:10.1371/journal.pone.0287459
3. Zhang H*, Lai X, **Patenaude BN**, Jit M, Fang H. Adding new childhood vaccines to China's National Immunization Program: evidence, benefits, and priorities. *Lancet Public Health*. 2023;8(12):e1016-e1024. doi:10.1016/S2468-2667(23)00248-7
4. **Patenaude B**, Dubosse N, Sriudomporn S*, Mak J*. Sustainable Development Goal Halftime Project: Benefit-Cost Analysis Using Methods from the Decade of Vaccine Economics Model. *Journal of Benefit-Cost Analysis*. 2023:1-45. doi:10.1017/bca.2023.11
5. Mak J*, Sriudomporn S*, Moss WJ, **Patenaude BN**. An Estimate Of The Return On Investment Of A Malaria Vaccine In 20 Sub-Saharan African Countries, 2021-30. *Health Aff (Millwood)*. 2023 Aug;42(8):1091-1099. doi: 10.1377/hlthaff.2022.01328. PMID: 37549331
6. Zhang H*, **Patenaude B**, Ma C, Fang H. Vaccine pricing strategies in China. *BMJ Glob Health*. 2023 Jul;8(7):e011405. doi: 10.1136/bmjgh-2022-011405. PMID: 37402511; PMCID: PMC10335538
7. Lai X, Zhang H*, Pouwels KB, **Patenaude B**, Jit M, Fang H. Estimating global and regional between-country inequality in routine childhood vaccine coverage in 195 countries and territories from 2019 to 2021: a longitudinal study. *EClinicalMedicine*. 2023 Jun;60:102042. doi: 10.1016/j.eclinm.2023.102042. Epub 2023 Jun 8. PMID: 37304497; PMCID: PMC10249397.
8. Zhao Y*, Mak J*, de Broucker G*, **Patenaude B**. Multivariate Assessment of Vaccine Equity in Cambodia: A Longitudinal VERSE Tool Case Study Using Demographic and Health Survey 2004, 2010, and 2014. *Vaccines*. 2023; 11(4):795. <https://doi.org/10.3390/vaccines11040795>
9. Mak J*, Odihi D*, Wonodi C, Ali D, de Broucker G*, Sriudomporn S*, **Patenaude B**. Multivariate Assessment of Vaccine Equity in Nigeria: A VERSE Tool Case Study using Demographic and Health Survey 2018. *Vaccine*. 2023 Mar 16:100281.
10. **Patenaude B**, Sriudomporn S*, Odihi D*, Mak J*, de Broucker G*.

Comparing Multivariate with Wealth-Based Inequity in Vaccination Coverage in 56 Countries: Toward a Better Measure of Equity in Vaccination Coverage. *Vaccines*. 2023; 11(3):536.
<https://doi.org/10.3390/vaccines11030536>

11. Sriudomporn S*, Watts E*, Yoon Sim S*, Hutubessy R, **Patenaude B**. Achieving immunization agenda 2030 coverage targets for 14 pathogens: Projected product and immunization delivery costs for 194 Countries, 2021-2030. *Vaccine X*. 2022;13:100256. Published 2022 Dec 28.
doi:10.1016/j.jvacx.2022.100256
12. Pollard R, Enugu A, Sriudomporn S*, Bell J, Ghosh SC, Arumugam V, Mugundu P, Singh A, McFall AM, Mehta SH, **Patenaude B**, Solomon SS. COVID-19 Impact on Index Testing Services and Programmatic Cost in 5 High HIV Prevalence Indian Districts. *BMC Infect Dis* **22**, 918 (2022).
<https://doi.org/10.1186/s12879-022-07912-3>
13. Aldridge LR*, Garman EC, **Patenaude B**, *et al*. Healthcare use and costs among individuals receiving mental health services for depression within primary care in Nepal. *BMC Health Serv Res* **22**, 1596 (2022).
<https://doi.org/10.1186/s12913-022-08969-1>
14. Budigan H, de Broucker G*, **Patenaude B**, Dudley MZ, Hampton LM, Salmon D. Economic Impact of Vaccine Safety Incident in Ukraine: The Economic Case for Safety System Investment. *Vaccine*. 2023 Jan 4;41(1):219-25.
15. Sriudomporn S*, Sim S*, Mak J*, Brenzel L, **Patenaude B**. Financing And Funding Gap For 16 Vaccines Across 94 Low-And Middle-Income Countries, 2011–30. *Health Affairs*. 2023 Jan 1;42(1):94-104.
16. Zhang H⁺, Lai X⁺, Mak J*, Sriudomporn S*, Zhang H⁺, Fang H⁺, **Patenaude B**. The Coverage and Equity of Childhood Vaccines in China. *JAMA Network Open*. 2022;5(12):e2246005. Published 2022 Dec 1.
doi:10.1001/jamanetworkopen.2022.46005
17. Aldridge LR*, Luitel NP, Jordans MJD, Bass JK, **Patenaude B**. Cost-effectiveness of psychological intervention within services for depression delivered by primary care workers in Nepal: economic evaluation of a randomized control trial. *Global Mental Health*. 2022;9:499-507.
doi:10.1017/gmh.2022.54
18. **Patenaude B**, Ballreich J. Modeling the potential economic benefits of an oral SARS-CoV-2 vaccine during an outbreak of COVID-19. *BMC Public Health*. 2022;22(1):1792. Published 2022 Sep 22. doi:[10.1186/s12889-022-14148-y](https://doi.org/10.1186/s12889-022-14148-y)
19. Jimbo-Sotomayor R⁺, Watts E*, Armijos L, Sriudomporn S, Sánchez X,

- Echeverria A, Whittombury A, **Patenaude B**. Return on Investment of 10-Valent Pneumococcal Conjugate Vaccine in Ecuador From 2010 to 2030. *Value Health Reg Issues*. 2022;31:148-154. doi:[10.1016/j.vhri.2022.05.003](https://doi.org/10.1016/j.vhri.2022.05.003)
20. Yoo KJ*, Mehta A*, Mak J*, Bishai D, Chansa C, **Patenaude B**. COVAX and equitable access to COVID-19 vaccines. *Bull World Health Organ*. 2022;100(5):315-328. doi:[10.2471/blt.21.287516](https://doi.org/10.2471/blt.21.287516)
 21. **Patenaude B**, Odihi D*, Sriudomporn S*, Mak J*, Watts E*, de Broucker G*. A standardized approach for measuring multivariate equity in vaccination coverage, cost-of-illness, and health outcomes: Evidence from the Vaccine Economics Research for Sustainability & Equity (VERSE) project. *Soc Sci Med*. 2022;302:114979. doi:[10.1016/j.socscimed.2022.114979](https://doi.org/10.1016/j.socscimed.2022.114979)
 22. **Patenaude B**, Ballreich J. Estimating & comparing greenhouse gas emissions for existing intramuscular COVID-19 vaccines and a novel thermostable oral vaccine. *J Clim Chang Health*. 2022;6:100127. doi:[10.1016/j.joclim.2022.100127](https://doi.org/10.1016/j.joclim.2022.100127)
 23. Watts E*, Mak J*, **Patenaude B**. Benefit-Cost Ratios of Continuing Routine Immunization During the COVID-19 Pandemic in Africa. *Journal of Benefit-Cost Analysis*. **13(1)**, 91-106. doi:[10.1017/bca.2021.13](https://doi.org/10.1017/bca.2021.13)
 24. Trautmann ST, Xu Y, König-Kersting C, **Patenaude B**, Harling G, Sié A, Bärnighausen T. Value of statistical life year in extreme poverty: a randomized experiment of measurement methods in rural Burkina Faso. *Population Health Metrics*. 2021;19(1):45. doi:[10.1186/s12963-021-00275-y](https://doi.org/10.1186/s12963-021-00275-y)
 25. **Patenaude B**, Rao KD, Peters DH. An Empirical Examination of the Inequality of Forgone Care in India. *Health Syst Reform*. 2021;7(2):e1894761. doi:[10.1080/23288604.2021.1894761](https://doi.org/10.1080/23288604.2021.1894761)
 26. Ekirapa-Kiracho E⁺, De Broucker G*, Ssebagereka A⁺, Mutebi A⁺, Apolot RR⁺, **Patenaude B**, Constenla D. The economic burden of pneumonia in children under five in Uganda. *Vaccine X*. 2021;8:100095. doi:[10.1016/j.jvacx.2021.100095](https://doi.org/10.1016/j.jvacx.2021.100095)
 27. Wahl B, Gupta M, Erchick DJ, **Patenaude B**, Holroyd T, Sauer M, Blunt M, Santosham M, Limaye RJ. Change in full immunization inequalities in Indian children 12-23 months: an analysis of household survey data. *BMC Public Health*. 2021;21(1):841. doi:[10.1186/s12889-021-10849-y](https://doi.org/10.1186/s12889-021-10849-y)
 28. Hasan MZ⁺, Mehdi GG⁺, De Broucker G*, Ahmed S, Martin Del Campo J, Constenla D, **Patenaude B**, Uddin MJ⁺. The economic burden of diarrhea in children under 5 years in Bangladesh. *Int J Infect Dis*. 2021;107:37-46. doi:[10.1016/j.ijid.2021.04.038](https://doi.org/10.1016/j.ijid.2021.04.038)

29. **Patenaude BN**. The relationship between development assistance for health and public health financing in 134 countries between 2000 and 2015. *Health Policy Plan*. 2021;36(4):369-383. doi:[10.1093/heapol/czab004](https://doi.org/10.1093/heapol/czab004)
30. Odihi D*, De Broucker G*, Hasan Z⁺, Ahmed S⁺, Constenla D, Uddin J⁺, **Patenaude B**. Contingent Valuation: A Pilot Study for Eliciting Willingness to Pay for a Reduction in Mortality From Vaccine-Preventable Illnesses for Children and Adults in Bangladesh. *Value Health Reg Issues*. 2021;24:67-76. doi:[10.1016/j.vhri.2020.10.004](https://doi.org/10.1016/j.vhri.2020.10.004)
31. Carcelen AC*, Hayford K, Moss WJ, Book C, Thuma PE, Mwansa FD, **Patenaude B**. How much does it cost to measure immunity? A costing analysis of a measles and rubella serosurvey in southern Zambia. *PLoS One*. 2020;15(10):e0240734. doi:[10.1371/journal.pone.0240734](https://doi.org/10.1371/journal.pone.0240734)
32. de Broucker G*, Ssebagereka A⁺, Apolot RR⁺, Aloysius M⁺, Ekirapa Kiracho E⁺, **Patenaude B**, Constenla D. The economic burden of measles in children under five in Uganda. *Vaccine X*. 2020;6:100077. doi:[10.1016/j.jvacx.2020.100077](https://doi.org/10.1016/j.jvacx.2020.100077)
33. Watts E*, Sim SY*, Constenla D, Sriudomporn S*, Brenzel L, **Patenaude B**. Economic Benefits of Immunization for 10 Pathogens in 94 Low- and Middle-Income Countries From 2011 to 2030 Using Cost-of-Illness and Value-of-Statistical-Life Approaches. *Value Health*. 2021;24(1):78-85. doi:[10.1016/j.jval.2020.07.009](https://doi.org/10.1016/j.jval.2020.07.009)
34. Sim SY*, Watts E*, Constenla D, Huang S, Brenzel L, **Patenaude BN**. Costs of Immunization Programs for 10 Vaccines in 94 Low- and Middle-Income Countries From 2011 to 2030. *Value Health*. 2021;24(1):70-77. doi:[10.1016/j.jval.2020.07.010](https://doi.org/10.1016/j.jval.2020.07.010)
35. de Broucker G*, Ahmed S⁺, Hasan MZ⁺, Mehdi GG⁺, Martin Del Campo J, Ali MW⁺, Uddin MJ⁺, Constenla D, **Patenaude B**. The economic burden of measles in children under five in Bangladesh. *BMC Health Serv Res*. 2020;20(1):1026. doi:[10.1186/s12913-020-05880-5](https://doi.org/10.1186/s12913-020-05880-5)
36. Sim SY*, Watts E*, Constenla D, Brenzel L, **Patenaude BN**. Return On Investment From Immunization Against 10 Pathogens In 94 Low- And Middle-Income Countries, 2011-30. *Health Aff (Millwood)*. 2020;39(8):1343-1353. doi:[10.1377/hlthaff.2020.00103](https://doi.org/10.1377/hlthaff.2020.00103)
37. de Broucker G*, Sim SY*, Brenzel L, Gross M, **Patenaude B**, Constenla DO. Cost of Nine Pediatric Infectious Illnesses in Low- and Middle-Income Countries: A Systematic Review of Cost-of-Illness Studies. *Pharmacoeconomics*. 2020;38(10):1071-1094. doi:[10.1007/s40273-020-00940-4](https://doi.org/10.1007/s40273-020-00940-4)
38. Rice DR, Sakadi F, Tassiou NR, Vogel AC, Djibo Hamani AB, Bah AK,

- Patenaude BN**, Fode Cisse A, Mateen FJ. Socioeconomic associations of poorly controlled epilepsy in the Republic of Guinea: cross-sectional study. *Trop Med Int Health*. 2020;25(7):813-823. doi:[10.1111/tmi.13407](https://doi.org/10.1111/tmi.13407)
39. **Patenaude BN**, Semali I, Killewo J, Bärnighausen T. The Value of a Statistical Life-Year in Sub-Saharan Africa: Evidence From a Large Population-Based Survey in Tanzania. *Value Health Reg Issues*. 2019;19:151-156. doi:[10.1016/j.vhri.2019.07.009](https://doi.org/10.1016/j.vhri.2019.07.009)
 40. Fitts W, Rahamatou NT, Abass CF, Vogel AC, Ghislain AH, Sakadi F, Hongxiang Q, Conde ML, Baldé AT, Hamani ABD, Bah AK, Anand P, **Patenaude B**, Mateen FJ. School status and its associations among children with epilepsy in the Republic of Guinea. *Epilepsy Behav*. 2019;97:275-281. doi:[10.1016/j.yebeh.2019.05.040](https://doi.org/10.1016/j.yebeh.2019.05.040)
 41. **Patenaude BN**, Bärnighausen T. Quality-adjusted life year weights and treatment bias: Theory and evidence from cognitive interviews. *SAGE Open Med*. 2019;7:2050312119856986. doi:[10.1177/2050312119856986](https://doi.org/10.1177/2050312119856986)
 42. Holroyd K, Vogel A, Lynch K, Gazdag B, Voghel M, Alakel N, **Patenaude BN**, Chiong-Rivero H, Mateen FJ. Neuromyelitis optica testing and treatment: Availability and affordability in 60 countries. *Mult Scler Relat Disord*. 2019;33:44-50. doi:[10.1016/j.msard.2019.05.013](https://doi.org/10.1016/j.msard.2019.05.013)
 43. Bowser D, **Patenaude B**, Bhawalkar M, Duran D, Berman P. Benefit incidence analysis in public health facilities in India: utilization and benefits at the national and state levels. *Int J Equity Health*. 2019;18(1):13. doi:[10.1186/s12939-019-0921-6](https://doi.org/10.1186/s12939-019-0921-6)
 44. Coates J, **Patenaude BN**, Rogers BL, Roba AC, Woldetensay YK, Tilahun AF, Spielman KL. Intra-household nutrient inequity in rural Ethiopia. *Food Policy*. Published online October 19, 2018. doi:[10.1016/j.foodpol.2018.10.006](https://doi.org/10.1016/j.foodpol.2018.10.006)
 45. Ban C, **Patenaude B**. The Professional Politics of the Austerity Debate: A Comparative Field Analysis of the European Central Bank and the International Monetary Fund. *Public Administration*. 2018;0(ja). doi:[10.1111/padm.12561](https://doi.org/10.1111/padm.12561)
 46. Khadka A, Perales NA, Wei DJ, Gage AD, Haber N, Verguet S, **Patenaude B**, Fink G. Malaria control across borders: quasi-experimental evidence from the Trans-Kunene malaria initiative (TKMI). *Malar J*. 2018;17(1):224. doi:[10.1186/s12936-018-2368-4](https://doi.org/10.1186/s12936-018-2368-4)
 47. Wibecan L, Fink G, Tshering L, Bruno V, **Patenaude B**, Nirola DK, Dorji C, Dema U, Pokhrel D, Mateen FJ. The economic burden of epilepsy in Bhutan. *Trop Med Int Health*. 2018;23(4):342-358. doi:[10.1111/tmi.13035](https://doi.org/10.1111/tmi.13035)

48. **Patenaude BN**, Chimbindi N, Pillay D, Bärnighausen T. The impact of ART initiation on household food security over time. *Soc Sci Med*. 2018;198:175-184. doi:[10.1016/j.socscimed.2017.11.036](https://doi.org/10.1016/j.socscimed.2017.11.036)
49. Saadi A, **Patenaude B**, Mateen FJ. Quality of life in epilepsy-31 inventory (QOLIE-31) scores: A global comparison. *Epilepsy Behav*. 2016;65:13-17. doi:[10.1016/j.yebeh.2016.09.032](https://doi.org/10.1016/j.yebeh.2016.09.032)
50. Saadi A, **Patenaude B**, Nirola DK, Deki S, Tshering L, Clark S, Shaull L, Sorets T, Fink G, Mateen F. Quality of life in epilepsy in Bhutan. *Seizure*. 2016;39:44-48. doi:[10.1016/j.seizure.2016.05.001](https://doi.org/10.1016/j.seizure.2016.05.001)
51. Brizzi K, Deki S, Tshering L, Clark SJ, Nirola DK, **Patenaude BN**, McKenzie ED, McLane HC, Cash SS, Dorji C, Mateen FJ. Knowledge, attitudes and practices regarding epilepsy in the Kingdom of Bhutan. *Int Health*. 2016;8(4):286-291. doi:[10.1093/inthealth/ihw017](https://doi.org/10.1093/inthealth/ihw017)
52. McKenzie ED, Nirola DK, Deki S, Tshering L, **Patenaude B**, Clark SJ, Cash SS, Thibert R, Zepeda R, Leung EC, Lam AD, Lim AS, Mantia J, Cohen J, Cole AJ, Mateen FJ. Medication prescribing and patient-reported outcome measures in people with epilepsy in Bhutan. *Epilepsy Behav*. 2016;59:122-127. doi:[10.1016/j.yebeh.2016.03.035](https://doi.org/10.1016/j.yebeh.2016.03.035)
53. McLane HC, Berkowitz AL, **Patenaude BN**, McKenzie ED, Wolper E, Wahlster S, Fink G, Mateen FJ. Availability, accessibility, and affordability of neurodiagnostic tests in 37 countries. *Neurology*. 2015;85(18):1614-1622. doi:[10.1212/WNL.0000000000002090](https://doi.org/10.1212/WNL.0000000000002090)

4.

*Signifies a student or Research Associate who worked on this publication under my direct supervision.

⁺Signifies in-country partner first-author who led the article under a primary grant of which I am the PI.

Articles, Editorials and other publications not peer reviewed

1. Odihi D*, Watts E, **Patenaude B**, Sriudomporn S*, Garcia C*, de Broucker G*. Economics of COVID-19 Vaccines. Johns Hopkins University Coronavirus Resource Center. Vaccine Reports. 23 December 2020. <https://coronavirus.jhu.edu/vaccines/report/economics-of-covid-19-vaccines>
2. Mak J*, Mehta A*, Yoo KJ*, **Patenaude B**. “Is the COVAX Facility Ensuring Equitable Vaccine Distribution?”. #VaccinesWork Blog. Gavi. 29 March 2020.

<https://www.gavi.org/vaccineswork/covax-facility-ensuring-equitable-vaccine-distribution>

3. **Patenaude B, Watts E***. “New Evidence Shows Investments in Vaccination Produce Even Greater Returns than Previously Thought”. #VaccinesWork Blog. Gavi. 3 August 2020. <https://www.gavi.org/vaccineswork/new-evidence-shows-investments-vaccination-produce-even-greater-returns-previously>
4. Ban C. “Ruling Ideas: How Global Neoliberalism Goes Local. Oxford University Press. New York. 2016.
https://books.google.com/books?id=VMcwDAAAQBAJ&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false
Acknowledged for research assistance for all statistical work within the book

Practice-Related Reports

1. Patenaude B, Sriudomporn S, Mak J. *Child Immunization SDG Halftime Project: Benefit-Cost Analysis using Methods from the Decade of Vaccine Economics (DOVE) Model* [Internet]. Lowell, Massachusetts: The Copenhagen Consensus Center; 2023 Feb p. 46. (Halftime for the Sustainable Development Goals 2016-2030: Child Immunization). Report No.: Vol. 14, No. S1. Available from:
<https://copenhagenconsensus.com/sites/default/files/2023-03/Child%20Immunization%20Best%20Investment%20Manuscript%20230211.pdf>
 - Commissioned by The Copenhagen Consensus Center, for use in their investment case series SDG halftime assessment. The report was designed to encourage impact investors to better prioritize SDGs for potential impact.
2. *Return on Investment for RTS,S Vaccine in Gavi Countries*. October 2021.
 - Commissioned by Gavi, the Vaccine Alliance for use in their investment case for RTS,S vaccine against malaria, which resulted in its approval for inclusion as a Gavi-funded vaccine.
3. *IA2030 Costing of Vaccines against 15 Antigens in 194 Countries*. 15 April 2021.
 - Used by the World Health Organization as the primary economic and costing values for their Immunization Agenda 2030 (IA2030) investment case.
4. *PrEP Costing Guidelines*. 15 December 2018.
https://www.prepwatch.org/wp-content/uploads/2019/01/OPTIONS_PrEP_Cost_Guidelines_Dec2018.pdf
 - I contributed heavily to the technical direction and development of methods used in the report as well as provided feedback on the

application to practice. *Report Summary:* The PrEP Costing Guidelines provide a framework for estimating the cost of providing pre-exposure prophylaxis (PrEP), which is the use of antiretroviral (ARV) drugs for preventing the acquisition of HIV infection. They are intended to provide a PrEP-specific resource for costing that could be accessible to individuals tasked with collecting, evaluating, and utilizing cost data, and who may have differing levels of familiarity with economics.

5. *Case for Investment in the Health Workforce to Achieve HIV Goals: Lessons Learned from Uganda. Human Resources for Health 2030 (HRH 2030).*
<https://hrh2030program.org/investment-case-for-the-hiv-workforce-in-uganda/>
 - I provided methodological guidance, development, review and feedback for this investment case report which was produced for the United States Agency for International Development. It was prepared by members of the HRH2030 consortium and used to advocate for HRH investment in Uganda and the sub-Saharan African region.
6. Robinson, L.A., J.K. Hammitt, L. O’Keeffe, C. Munk, **B. Patenaude**, and F. Geng. “Benefit-Cost Analysis in Global Health and Development: Current Practices and Opportunities for Improvement (Scoping Report).” May 2017.
<https://cdn2.sph.harvard.edu/wp-content/uploads/sites/94/2017/05/BCA-Guidelines-Scoping-Report-Review-Draft.pdf>.
 - Led to the development of the reference case for Benefit-Cost Analysis and BCA guidelines, which have been adopted by numerous organizations including the Copenhagen Consensus and Bill & Melinda Gates Foundation.
7. Patenaude, Bryan N. “Reinventing Development Banking in Frontier Economies: The Case of Romania.” *Frederick S. Pardee Center: Global Economic Governance Initiative Working Paper Series*. February 2014.
<http://www.bu.edu/pardee/research/global-economic-governance-2/romaniaworkingpaper/>.
 - Led to successful policy reform in Romania.
 - Interview with me about report and reform success:
[\(http://www.intellinews.com/romania-s-new-development-bank-96251/\)](http://www.intellinews.com/romania-s-new-development-bank-96251/)
8. “How Low Can We Go? Pricing for Viral Load Testing in Low- and Middle-Income Countries”. Médecins Sans Frontières Access Campaign. *Issue Brief*.
http://www.msf.org/sites/msf.org/files/how_low_can_we_go_vl_pricing_brief.pdf.
 - I am acknowledged for developing the costing models used and analytics for this work. Results were disseminated in seminars at ICASA 2013 in Cape Town, South Africa. This brief and results

has been widely cited in costing literature around viral load in Sub-Saharan Africa.

9. Teri Roberts & Cara Kosack. “Prices Analysis of Essential HIV CD4 and VL Technologies”. Médecins Sans Frontières Access Campaign. *Presentation to WHO Diagnostics Network*. 30 September 2014.
http://www.who.int/hiv/events/MSF_AMDS.pdf
 - I am acknowledged for developing the costing models used and undertaking all data analysis for this work. Results were disseminated to the WHO via this presentation. This brief and results has been widely cited in costing literature around viral load in Sub-Saharan Africa.

PRACTICE ACTIVITIES

Presentations to policy-makers and other stakeholders

- 2023 **Consultation with Bangladesh Ministry of Health, Health Economics Unit.** *Multivariate approach to measuring equity in healthcare systems*. 19 June 2023.
 - Dissemination seminar presenting the results of the VERSE study showing persistent inequities in immunization status, cost-of-illness, and burden of vaccine-preventable disease between urban slum and non-slum residents in Dhaka and Chattogram, Bangladesh. Results spurred discussion of potential pilot strategies to close the immunization gap. Dhaka, Bangladesh.
- 2022 **Training of Uganda Bureau of Statistics (UBOS) and Uganda National Expanded Program on Immunization (UNEPI).** “*Multivariate approach to measuring equity in healthcare systems*”. 1-10 October 2022.
 - Training on using VERSE Equity toolkit for economic and equity evaluations and adapting statistical toolkit for use at UBOS and UNEPI for the programs to routinely measure and incorporate equity into routine monitoring & evaluation of healthcare programs. Kampala, Uganda.

Webinar: Official Launch of the VERSE Equity Toolkit for Multidimensional Equity Assessments. International Vaccine Access Center (IVAC). 25 May 2022.

<https://www.technet-21.org/en/network/technet-blog/register-for-webinar-launch-of-the-verse-equity-toolkit>

- Presented and demonstrated the VERSE Equity Toolkit, which I created under the VERSE grant of which I am the PI, to policy makers and statisticians from over 20 countries. The tool was subsequently adopted by 6 country statistical evaluation teams (Ethiopia, Bangladesh, The Gambia, China, India, and Uganda)

- 2021 **Presenter at the Immunization & Vaccines Related Implementation Research – Advisory Committee (IVIR-AC).** World Health Organization. 1-5 March 2021.
- Provided feedback on economic evaluation of vaccines. Presented on the return-on-investment and financing of Gavi vaccines as well as the costing of the immunization agenda 2030. Inputs will shape the WHO IA2030 investment case.

- 2020 **Roundtable Discussion. “Immunization Financing in the Era of COVID”.** Center for Strategic International Studies (CSIS). 17 September 2020.
- Presented research on COVID-19 disruptions to immunization financing and delivery and what needs to be done to fill the gap. Audience was policymakers from US government and international organizations. Served on panel with Allison Portnoy, Logan Brenzel, and Laura Boonstoppel.

Stakeholder Meeting: Presented on COVID-19 and Immunization Financing. UN Foundation Stakeholder Communications and Partner Advocacy Meeting. 9 September 2020.

- Sensitized advocates and policymakers to the risks of COVID-19 on immunization financing and achieving IA2030 goals.

Webinar & Stakeholder meeting: “Investments in vaccinations produce even greater returns than previously thought”. USAID - Global Health Bureau. 8 September 2020.

- Discussion of results and methods to inform USAID global health bureau on new methods for using economic evidence for decision-making.

Webinar: “New Tools to Measure & Track Vaccine Equity”. LNCT-VERSE Joint Webinar. Learning Network for Countries in Transition (LNCT). 17 September 2020.

- The VERSE project presents an innovative toolkit that is under development to measure and track vaccine equity. The presentation will showcase the VERSE team’s approach to equity alongside mock-ups of the equity toolkit’s dashboards and output in order to elicit feedback to maximize adoption, usability, and policy-relevance. Participants will have the opportunity to raise questions and provide suggestions to potentially inform toolkit development. 17 September 2020.

Webinar: “Measuring the Impact of Vaccines”. Bryan Patenaude & Libby Watts. 27 April 2020.

- The webinar presents the estimates from the Decade of Vaccine Economics (DoVE) study of the economic benefits and return-on-investment of vaccines against 10 antigens in 73 countries

receiving Gavi Support. The webinar will begin with an overview of the methodology used to compute these estimates and then showcase how we apply these methods to calculate the return-on-investment from 2011-2020 and predict the future return-on-investment from 2021-2030. International Vaccine Access Center. World Immunization Week Webinar.

2018 **Webinar: 5 Points Forward: Best Practices in Cascade Analytics and Costing as Steps to 95-95-95.** Presented by Health Policy Plus (HP+) a project of United States Agency for International Development (USAID). Washington, DC. 1 February 2018.

<http://www.healthpolicyplus.com/pubs.cfm?get=7187-7346>

- I presented in a webinar attended by nearly 200 participants on best practices in cascade analytics and the importance of costing along the HIV treatment and prevention cascades for achieving 95-95-95 goals. The participants were USAID and Palladium headquarters and field staff as well as affiliated development practitioners, and local country ministry of health and ministry of finance participants.

Webinar: Mobilizing Domestic Resources for the HIV Workforce – Estimating Investment Needs. Presented by Human Resources for Health in 2030 (HRH2030) a project of United States Agency for International Development (USAID). Washington, DC. 28 August 2018.

<https://www.hrh2030program.org/hivworkforcwebinar/>

- I presented in a webinar attended by nearly 500 participants on estimating the investment needs for the health workforce and on both the methodological and logistical issues with current practices, as well as potential paths forward. The participants were USAID and HRH 2030 headquarters and field staff as well as affiliated development practitioners.

USAID Washington Health Finance Workshop. USAID Global Health Bureau. Washington, DC. 25-28 June 2018.

- I taught 1 day on innovative approaches for health financing, economic trends in development finance, and sustainable financing considerations. Participants included 30 USAID mission and USAID/Washington staff members.

Sustainable Financing for Expanding Quality Healthcare in Africa Workshop. Presented by Health Finance and Governance (HFG) a project of United States Agency for International Development (USAID). Kampala, Uganda. 13 – 18 May 2018.

- I presented for 2 days on innovative approaches for health financing, economic trends in development finance, and economic analysis of HIV interventions. Participants included ministry of health and finance officials from across Sub-Saharan Africa,

Private sector health representatives, African Development Bank, USAID, Global Fund, and other key policy actors.

- 2014 **Addressing Needs & Leveraging Resources in Financing the Romanian Economy Conference.** “Fiscal Space for Growth - Addressing the Needs of a Growing Economy”. Bucharest, Romania. March 2014.
https://www.aspeninstitute.ro/uploads/files/AIR_Addressing_Needs_conf_March_18_agenda1.pdf
- I presented for 2 days on tactics for improving European Structural Fund absorption rates to members of the Parliament of Romania, Ministry of Finance, Ministry of Public Affairs, Central Bank of Romania, ExIm Bank of Romania, and CEC Bank of Romania. The results of my research were translated into policy action and implemented by the Ministry of Public Affairs resulting in a 5-fold improvement in European Structural Fund absorption.

Consultations with policy-makers and other stakeholders

- 2023 **Consultation with Bangladesh Ministry of Health, Health Economics Unit.** *Multivariate approach to measuring equity in healthcare systems.* 19 June 2023.
- Consultation results of the VERSE study showing persistent inequities in immunization status, cost-of-illness, and burden of vaccine-preventable disease between urban slum and non-slum residents in Dhaka and Chattogram, Bangladesh. Results spurred discussion of potential pilot strategies to close the immunization gap.
- 2022 **Consultation with Uganda Bureau of Statistics (UBOS) and Uganda National Expanded Program on Immunization (UNEPI).** *Multivariate approach to measuring equity in healthcare systems.* 1-10 October 2022.
- Consultation on adapting statistical toolkit for use at UBOS and UNEPI for the programs to routinely measure and incorporate equity into routine monitoring & evaluation of healthcare programs.
- 2020 **Consultation with WHO, Gavi, World Bank, and UNICEF.** *Vaccine Economics Research for Sustainability & Equity Stakeholder Meeting.* 3 August 2020.
- Consultation on use cases, format, and methodology for incorporation of equity into economic evaluation for vaccinations.
- 2019 **Consultation with Stop TB Partnership.** *Costing & Sustainable financing for TB Programming & Global Fund Replenishment.* New York, NY. 24-26 September 2019.
- Consultation on sustainable financing for TB programs held with

members of The Global Fund, United Nations, and World Health Organization.

Consultation with Bill & Melinda Gates Foundation (2019). *Decade of Vaccine Economics Return-on-Investment Results for Gavi countries*. Seattle, WA. 18 June 2019.

- Consultation on strategic communication of return on investment results and incorporation of equity into economic evaluation for vaccinations.

2017 **Consultation with Government of Guyana and Civil Society Organizations.** *Costing & Sustainable financing for HIV/AIDS Programming*. Georgetown, Guyana. November 2017.

<http://www.healthpolicyplus.com/GuyanaSC.cfm>

- Consultation on what skills civil society organizations would need in order to engage in public-private partnerships or contracting out of HIV/AIDS services from the federal government.

Research finding dissemination through media appearances and other communication venues (federal, state, and local)

2022 National Science Foundation – News. “Infusing Human Behavior into Epidemiological Models is Focus of new NSF-Supported Research Projects”. Announcement of Award: RAISE: IHBEM: Modeling Dynamic Disease-Behavior Feedbacks for Improved Epidemic Prediction and Response. 15 August 2022. Bryan Patenaude – Co-PI.

2020 Healthcare Purchasing News. “Immunization programs save hundreds of billions of dollars” 5 August 2020. Bryan Patenaude - Quoted.

WTOP News. “Johns Hopkins Study Finds Immunization Programs Pay Off in Long Run”. 4 August 2020. Bryan Patenaude – Interviewed.

Gavi #VaccinesWork Blog. “New Evidence Shows Investments In Vaccination Produce Even Greater Returns Than Previously Thought. Analysis suggests that investments in vaccination programmes will result in US\$ 0.8 trillion in returns over the next ten years. 3 August 2020”. Bryan Patenaude - Quoted.

SciTech Daily. “Study of 94 Countries Shows Immunization Programs Yield High ROI, Saving Hundreds of Billions of Dollars”. 3 August 2020. Bryan Patenaude – Quoted.

Global Health Now. “Immunization Programs Yield High ‘Return on Investment,’ Saving Hundreds of Billions of Dollars Study of low- and

middle-income country programs highlights the huge costs of preventable diseases compared to the costs of immunizing against them”. 3 August 2020. Bryan Patenaude – Quoted.

NewScientist. “Economic benefits of vaccination programmes vastly outweigh costs”. 3 August 2020. Bryan Patenaude – Interviewed.

Software development

VERSE() R-package. This open-access package allows users to utilize any country’s Demographic & Health Surveys (DHS) data to explore key equity and coverage metrics and sub-national geographic visualizations relating to vaccination coverage, equity, and efficiency. A web-based R-Shiny application is also under development scheduled for rollout in 2023. (Github: <https://github.com/VERSE-Equity/Toolkit-DHS> and <https://github.com/VERSE-models>)

CURRICULUM VITAE

BRYAN N. PATENAUDE

PART II

TEACHING

Advisees

Academic Advisees

MHS Global Health Economics

2023-2024	Noor Alesawy Yifei Zhao
2022-2023	Charlotte Baillie Nara Lee
2021-2022	Theodore Bolas Jing Feng Claudia Fernandez Perez Rayssa Putri
2020-2021	Samantha Sack Pooja Sangha
2019-2020	Iman Nourhussein Adetoun Olateju
2018-2019	Nishtha Ahuja

MSPH Health Systems

2019-2021	Chaoran Dong
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MPH International Health

2020-2021	Emily Stirzaker
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PhD Health Systems

2022-	Gatien de Broucker
2020-	Brooke Farrenkopf
2019-2023	Akriti Mehta

DrPH International Health

2023-	Katelyn Jison Yoo
2022-2023	Vinayak Bhardwaj (co-advisor with Krishna Rao)
2021-	Ruben Conner

Capstone Advisees

2024	Marina Rincon Torroella	MSPH
2020	Chen Liu	MHS GHE
	Zongzong Li	MHS HEOR
	Masatoshi Ishikawa	MPH (co-advisor R. Morgan)
2019	Daniel Arias	MSPH

Departmental Oral Participation

2023	Katelyn Jison Yoo	DrPH
	Brooke Farrenkopf	PhD Health Systems
	Alex Kong	PhD Health Systems
2022	Vinayak Bhardwaj	DrPH
2021	Akriti Mehta	PhD Health Systems
	Adetoun Olateju	PhD GDEC
2020	Luke Aldridge	PhD Global Mental Health

School-Wide Oral Participation

2023	Katelyn Jison Yoo	DrPH
	Brooke Farrenkopf	PhD Health Systems
	Alex Kong	PhD Health Systems
2022	Vinayak Bhardwaj	DrPH
2021	Akriti Mehta	PhD Health Systems
	Adetoun Olateju	PhD GDEC
2020	Luke Aldridge	PhD Global Mental Health

Thesis Advisory Committee

2023-	Gatien de Broucker	PhD Health Systems
2023-	Alex Kong	PhD Health Systems
2023-	Katelyn Jison Yoo	DrPH
2022-	Brooke Farrenkopf	PhD Health Systems
2022-	Vinayak Bhardwaj	DrPH
2021-2023	Akriti Mehta	PhD Health Systems
2021-2022	Adetoun Olateju	PhD GDEC
2021-2022	Sanjana Ravi	PhD Health Systems
2020-2022	Luke Aldridge	PhD Global Mental Health

Classroom Instruction

Course: Advanced Topics in Economic Evaluation & Modeling for Global Health. (221.647.01). Johns Hopkins University Bloomberg School of Public Health. AY 2020-2021 (Enrollment: 23), 2021-2021 (Enrollment: 31). 4th Term | 3 Credits. Role: **Primary Instructor.** I designed this new course from scratch and teach it as the sole instructor in the 4th term since 2020.

Course: Health Systems Program Seminar. (221.801.01 and 221.801.02). Johns Hopkins University Bloomberg School of Public Health. AY 2019-2020 (Enrollment: 25) , 2020-2021 (Enrollment: 28), 2021-2022 (Enrollment: 49), 2022-2023 (Enrollment: 30) . – 1st & 2nd Terms | 3 Credits. Role: **Co-Instructor.** I co-instruct the seminar in 1st and 2nd term with Dr. Yusra Shawar and we have redesigned it completely in 2020 to fulfill new CEPH competencies.

Course: Economic Evaluation IV. (313.604.01). Johns Hopkins University Bloomberg School of Public Health. AY 2018-2019 (Enrollment: 31), 2019-2020 (Enrollment: 28) - 4th Term | 3 Credits. Role: **Primary Instructor.** I designed this new course from scratch and taught it as the sole instructor for the 4th term for 2 years.

Lecture: “Health Economics & Global Health Systems” in (221.801.01) Health Systems Program Seminar I. Johns Hopkins University Bloomberg School of Public Health. Term I, 2018-2019, 2019-2020.

Lecture: “Cost of Injuries” in Abdul Bachani’s (221.612.81) Confronting the Burden of Injuries: a Global Perspective, Session 5. Johns Hopkins University Bloomberg School of Public Health. Term II, 2018-2019, 2019-2020.

Lecture: “Health Financing” in (221.646.81) Health Systems in Low and Middle Income Countries. Johns Hopkins University Bloomberg School of Public Health. Term II, 2018-2019, 2019-2020, 2021-2022, 2022-2023.

Course: HPM 260D: Introduction to Economics for Health Policy Harvard T.H. Chan School of Public Health (Summer 2016 & 2017)

Other Significant Teaching

Instructor – USAID Health Financing Fundamentals course. United States Agency for International Development – Global Health Bureau (25-28 June, 2018). Taught two 2-hour sessions to USAID workers and technical staff on trends in global health finance and tools for sustainable health finance.

Teaching Assistant - PHS 2000: Quantitative Methods - Harvard T.H. Chan School of Public Health (2016-2017). Taught weekly 2-hour lab sessions.

Teaching Assistant - ECON 2395: Health, Inequality & Development - Harvard

University, Department of Economics (2015-2016). Taught weekly 2-hour lab sessions.

Teaching Assistant - GHP 230: Introduction to Economics with Applications to Health & Development - Harvard T.H. Chan School of Public Health (2015-2016). Taught weekly 2-hour lab sessions.

Teaching Assistant - GHP 210: Concepts & Methods in Global Health & Population - Harvard T.H. Chan School of Public Health (2015). Taught weekly 2-hour lab sessions.

RESEARCH GRANT PARTICIPATION

1. Award Number: 2229996
RAISE: IHBEM: Modeling Dynamic Disease-Behavior Feedbacks for Improved Epidemic Prediction and Response (10/1/2022 – 9/30/2025)
National Science Foundation (NSF)
Principal Investigator: Bryan Patenaude (Co-PI with Lauren Gardner, Nicholas Papageorge, Allison Hill, and Shaun Truelove)
Main Grant Objective: The goals of this study are to: 1) More accurately predict disease spread and health outcomes during an outbreak, epidemic, or pandemic; 2) Enable multi-objective policy design by simultaneously quantifying both the disease burden and economic costs of proposed policies, allowing for the evaluation of both economic and health policies; and 3) Evaluate heterogeneity and equity by quantifying the distributional impacts of disease burden and economic cost across socio-demographic and risk groups.
Funding Level: Personal LOE 15% (Overall Funding \$999,908)
2. Award Number: R56AG074839-01A1
PEARL 2.0: The impact of the Ending the HIV Epidemic initiative and risk factor interventions on the projected multimorbidity burden and healthcare costs for people aging with HIV in the United States. (2022 – 2027)
National Institutes of Health (NIH) (National Institute on Aging (NIA))
Principal Investigator: Keri Althoff
Role: Co-Investigator for Health Economics Evaluation & Cost-Effectiveness Analysis
Main Grant Objective: Evaluate the economic impact multi-comorbidity among people living with HIV in the United States and project future economic burden.
Funding Level: Personal LOE 15% (Overall Funding \$3,755,304)
3. Award Number: CP 10195 6 21 A19
Economic Impact Modelling work for Malaria RTS,S Vaccine as Part of Malaria Investment Case (June – October, 2021)
Gavi
Principal Investigator: Bryan Patenaude
Main Grant Objective: Evaluate the economic impact of RTS,S vaccine under routine and seasonal use cases in select LMICs based on clinical and modeled epidemiologic data. (Overall Funding: \$26,000)

4. Award Number: APW 2026743134
Immunization Agenda 2030 Costing (January – June, 2021)
World Health Organization
Principal Investigator: Bryan Patenaude
Role: Health Economics Research & Design for Cost-Benefit Analysis
Main Grant Objective: Estimate the financing needs and ROI for the IA2030 agenda.
Funding Level: Personal LOE 20% (Overall Funding: \$100,000)
5. Award Number: 90080811
Common Elements Treatment Approach (CETA) Evaluation (2022 – 2024)
United States Agency for International Development
Principal Investigator: Dr. Laura Murray
Role: Co-Investigator for Health Economics Research & Design for Cost-Effectiveness Analysis
Main Grant Objective: Evaluate the economic impact of integrated CETA mental health service delivery approach. (Overall Funding: \$1,400,657)
6. Award Number: 90082886
Project ACCELERATE (2020 – 2024)
United States Agency for International Development
Principal Investigator: Dr. Shruti Mehta
Role: Co-Investigator for Health Economics Research & Design for Cost-Effectiveness Analysis
Main Grant Objective: Evaluate the impact of integrated HIV programs in India. (Overall Funding: \$20 million)
7. Award Number: INV-003813
Vaccine Economics Research for Sustainability & Equity (VERSE) 2020 – 2025
Bill & Melinda Gates Foundation
Principal Investigator: Bryan Patenaude
Main Grant Objective: Evaluate cost-of-illness & equity for vaccine programs
Funding Level: Personal LOE 60% (Overall Funding: \$2.9 million)
8. Award Number: 2019/969882
Immunization Financing Data Analysis – 2020-2021
World Health Organization
Principal Investigator: Bryan Patenaude
Main Grant Objective: Evaluate barriers to country transition and sustainable financing of vaccine programs & create a predictive model for WHO use.
Funding Level: Personal LOE 20% (Overall Funding \$198,000).
9. Award Number: 121523
Decade of Vaccine Economics IV (DOVE-IV) 2017 - 2019
Bill & Melinda Gates Foundation
Principal Investigator: Bryan Patenaude

Main Grant Objective: Evaluate return-on-investment & cost-of-illness for vaccination

Link: <http://immunizationeconomics.org/dove-home>

Funding Level: Personal LOE 30% (Overall Funding \$3.4 million).

10. Award Number P30AG024409.

2015-2017 National Institute on Aging

Principal Investigator Till Bärnighausen

Role: Co-Investigator

Main Grant Objective: Evaluate local VSLY in Tanzania

Principal Responsibilities of Individual: Create survey, setup/oversee field data collection, clean and perform analyses data (Overall Funding: \$7.8 million).

ACADEMIC SERVICE

Division and/or Department

- International Vaccine Access Center (IVAC) – Senior Management Team (2021-Present)
- MHS Global Health Economics – Admissions Committee Member (2019-Present)
- Health Systems Seminar – Co-Instructor (Terms I & II – 2019-2022)

School

- Johns Hopkins Gupta-Klinsky India Institute – Member (2020 – Present)

University

- Member - University-Wide COVID-19 Modeling & Policy Taskforce

PRESENTATIONS

Scientific Meetings

2023 Long Oral Presentation: 15th International Health Economics Association World Congress on Health Economics (IHEA 2023). "Comparing Multivariate with Wealth-Based Ranking for Computing Inequity in Access to Healthcare Services, Health Outcomes, and Financial Risk Protection: Toward a Better Measure of Equity in Health Policy". Bryan Patenaude, Deborah Odihi, Salin Sriudomporn, Joshua Mak, Gatien de Broucker. **Cape Town, South Africa.** July 8-12, 2023.

Long Oral Presentation: 15th International Health Economics Association World Congress on Health Economics (IHEA 2023). "Comparing Multivariate with Wealth-Based Ranking for Computing Inequity in Access to Child

Immunization Services in India over Time”. Bryan Patenaude, Deborah Odihi, Salin Sriudomporn, Joshua Mak, Gatien de Broucker. **Cape Town, South Africa**. July 8-12, 2023.

Short Oral Presentation: 15th International Health Economics Association World Congress on Health Economics (IHEA 2023). "Estimation of the Cost and Implementation Requirements of HPV Vaccine Introduction in Pakistan". Salin Sriudomporn, Deborah Odihi, Joshua Mak, Gatien de Broucker, Bryan Patenaude. **Cape Town, South Africa** July 8-12, 2023.

Short Oral Presentation: 15th International Health Economics Association World Congress on Health Economics (IHEA 2023). “Examining Inequities in Child Vaccination Coverage in Urban (Slum and Non-slum) and Rural Areas of Bangladesh”. Deborah Odihi, Salin Sriudomporn, Joshua Mak, Gatien de Broucker, Bryan Patenaude. **Cape Town, South Africa** July 8-12, 2023.

Poster Presentation: 15th International Health Economics Association World Congress on Health Economics (IHEA 2023). "Return-on-Investment for National Immunization Program Vaccines in Ecuador for Children Under One: A Sub-National Extension of the DOVE Model”. Salin Sriudomporn, Deborah Odihi, Joshua Mak, Gatien de Broucker, Bryan Patenaude. **Cape Town, South Africa** July 8-12, 2023.

Poster Presentation: 15th International Health Economics Association World Congress on Health Economics (IHEA 2023). “Maternal Education and Empowerment, and Its Impact on Vaccination Outcomes”. Gatien de Broucker, Deborah Odihi, Salin Sriudomporn, Joshua Mak, Bryan Patenaude. **Cape Town, South Africa** July 8-12, 2023.

Poster Presentation: 15th International Health Economics Association World Congress on Health Economics (IHEA 2023). “Return on Investment for RTS,S Vaccination in sub-Saharan African Gavi Countries”. Joshua Mak, Salin Sriudomporn, Deborah Odihi, Gatien de Broucker, Bryan Patenaude. **Cape Town, South Africa** July 8-12, 2023.

2022 Poster Presentation: The Seventh Global Symposium on Health Systems Research (HSR 2022). “Comparing Multivariate with Wealth-Based Inequity in Vaccination Coverage: Toward a Better Measure of Equity in Health Systems Evaluation”. **Bryan Patenaude**, Deborah Odihi, Salin Sriudomporn, Joshua Mak, Gatien de Broucker. Abstract 813. Bogotá, Colombia. 31 October - 4 November 2022.

Poster Presentation: The Seventh Global Symposium on Health Systems Research (HSR 2022). “Measuring the Influence of Maternal Education on Childhood Immunization”. Gatien de Broucker, Madhu Gupta, Anita Shet, Elizabeth Ekirapa Kiracho, Anthony Ssebagereka, Rornald Muhumuza

Kananura, Joshua Mak, Salin Sriudomporn, Deborah Odihi, **Bryan Patenaude**. Abstract 1421. Bogotá, Colombia. 31 October - 4 November 2022.

Poster Presentation: The Seventh Global Symposium on Health Systems Research (HSR 2022). “Examining cost-of-illness of vaccine preventable diseases in urban (slum and non-slum) and rural areas of Bangladesh”. Md. Zahid Hasan, **Bryan Patenaude**, Deborah Odihi, Gatien de Broucker, Md. Wazed Ali, Zerine Jannat, Hemel Das, Md. Jasim Uddin. Abstract 1657. Bogotá, Colombia. 31 October - 4 November 2022.

Poster Presentation: The Seventh Global Symposium on Health Systems Research (HSR 2022). “Examining inequities in child vaccination coverage in urban (slum and non-slum) and rural areas of Bangladesh”. Deborah Odihi, Gatien de Broucker, Md. Zahid Hasan, Md. Wazed Ali, Zerine Jannat, Hemel Das, Md. Jasim Uddin, **Bryan Patenaude**. Abstract 1657. Bogotá, Colombia. 31 October - 4 November 2022.

Poster Presentation: The Seventh Global Symposium on Health Systems Research (HSR 2022). “Measure of Vaccine Inequity in Pakistan: Assessing the Determinants of Oral Polio Vaccination Inequities”. Salin Sriudomporn, Gatien de Broucker, Joshua Mak, **Bryan Patenaude**. Abstract 1657. Bogotá, Colombia. 31 October - 4 November 2022.

Oral Presentation: The Seventh Global Symposium on Health Systems Research (HSR 2022). “Multivariate Assessment of Vaccine Equity in Nigeria: A VERSE Tool Case Study”. Joshua Mak, Deborah Odihi, Chizoba Wonodi, Daniel Ali, Gatien de Broucker, Salin Sriudomporn, **Bryan Patenaude**. Bogotá, Colombia. 2 November 2022.

2021 Oral Presentation: Conference on Retroviruses and Opportunistic Infection (CROI) – 2021. “Covid-19 Impact On The Cost Of Index Testing Hiv Case Detection In 5 Indian Districts”. Online Conference. 6-10 March 2021.

Panel Moderator: International Health Economics Association (iHEA) – 2021 Congress. “Financing to Achieve UHC”. Invited Session Organizer & Panel Moderator Baltimore, MD. 14 July 2021.

Oral Presentation: International Health Economics Association (iHEA) – 2021 Congress. “The Vaccine Economics Research For Sustainability & Equity (VERSE) Toolkit – A New Approach For Assessing Multidimensional Inequities In Healthcare Access & Outcomes”. Baltimore, MD. 13 July 2021.

Oral Presentation: International Health Economics Association (iHEA) – 2021 Congress. “An Evaluation Of The Drivers Of Inequity In Zero-Dose Vaccination Status In India: Results From A Multidimensional Inequity Analysis”. Baltimore, MD. 13 July 2021.

- 2020 Oral Presentation: Shot@Life Campaign - Champions Summit. “Return on Investment for Immunization”. United Nations Foundation. Washington, DC. 25 February 2020.
- 2019 Oral Presentation: 10th International AIDS Society (IAS) Conference on HIV Science. “Do Changes in Development Assistance for Health Crowd out Domestic Investment and What are the Implications for HIV/AIDS outcomes?”. Mexico City, Mexico. 21-24 July 2019.
- Oral Presentation: International Health Economics Association (iHEA) – Basel 2019 Congress. “Do Changes in Development Assistance for Health Crowd out Domestic Investment and What Are the Implications for Health Outcomes?”. Basel Switzerland. 13-17 July 2019.
- Oral Presentation: International Health Economics Association (iHEA) – Basel 2019 Congress. “The Value of a Statistical Life in Africa: Evidence from a Large Population-Based Survey in Tanzania”. Basel Switzerland. 13-17 July 2019.
- 2016 Poster Presentation: AIDS 2016. “*The causal impact of ART initiation on household food security over time*”. Durban, South Africa. July 2016.
<http://programme.aids2016.org/Abstract/Abstract/8889>
- Oral Presentation: *USAID/ENGINE Research Symposium*. “Predictors of Intra-household food and nutrient allocation inequity in Ethiopia”. Addis Ababa, Ethiopia. 27-28 June 2016.
<http://engine.nutrition.tufts.edu/sites/engine.nutrition.tufts.edu/files/documents/Annex%20-%20Symposium%20Booklet.pdf>
 Abstract presented under the ENGINE program in Ethiopia.
- Poster Presentation: Neurology 2016. “*Medication Versus Management: Beyond Pills-to-Mouths Measures of Epilepsy Care (S6.003)*.”
 Erica McKenzie, Damber Nirola, Lhab Tshering, Sonam Deki, **Bryan Patenaude**, SarahClark, Sydney Cash, Ronald Thibert, Rodrigo Zepeda Garcia, Edward Leung, Alice Lam, Andrew Lim, Jo Mantia, Joseph Cohen, Andrew Cole, Farrah Mateen. April 2016. 86 (16 Supplement) S6.003.
https://n.neurology.org/content/86/16_Supplement/S6.003
- Poster Presentation: Conference on Retroviruses and Opportunistic Infections 2016. “*The Causal Impact of ART Initiation on Household Food Security*”. Boston, Massachusetts February 2016.
<http://www.croiconference.org/sessions/causal-impact-art-initiation-household-food-security>
- 2014 Oral Presentation: International HIV Treatment as Prevention Workshop 2014. Robert T, Bonner K, Chua A, **Patenaude B**, Lynch S, Larson B, Cohn J. “*Viral load testing—are cost and complexity out-dated arguments?*” Presented at the 4th International HIV Treatment as Prevention Workshop. Vancouver,

BC, Canada. April 1–4, 2014. Abstract 5082 (oral).
<http://www.treatmentaspreventionworkshop.org/wp-content/uploads/2014/11/2014-TasP-Workshop-Final-Report-July.pdf>

Invited Seminars

2022 **Seminar: “Tracking Progress in Healthcare Service Coverage & Equity: The VERSE Equity Toolkit”.** Makerere University School of Public Health. Kampala, Uganda. 7 October 2022.

Webinar: Official Launch of the VERSE Equity Toolkit for Multidimensional Equity Assessments. International Vaccine Access Center (IVAC). 25 May 2022.

<https://www.technet-21.org/en/network/technet-blog/register-for-webinar-launch-of-the-verse-equity-toolkit>

- Presented and demonstrated the VERSE Equity Toolkit, which I created under the VERSE grant of which I am the PI, to policy makers and statisticians from over 20 countries. The tool was subsequently adopted by 6 country statistical evaluation teams (Ethiopia, Bangladesh, The Gambia, China, India, and Uganda)

2020 **Webinar & Stakeholder meeting: “Investments in vaccinations produce even greater returns than previously thought”.** USAID - Global Health Bureau. 8 September 2020.

- Discussion of results and methods to inform USAID on new methods for using economic evidence for decision-making.

Webinar & Stakeholder meeting: “Investments in vaccinations produce even greater returns than previously thought”. USAID - Global Health Bureau. 8 September 2020.

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Webinar: “New Tools to Measure & Track Vaccine Equity”. LNCT-VERSE Joint Webinar. Learning Network for Countries in Transition (LNCT). 17 September 2020.

- The VERSE project presents an innovative toolkit that is under development to measure and track vaccine equity. The presentation will showcase the VERSE team’s approach to equity alongside mock-ups of the equity toolkit’s dashboards and output in order to elicit feedback to maximize adoption, usability, and policy-relevance. Participants will have the opportunity to raise questions and provide suggestions to potentially inform toolkit development. 17 September 2020.

Webinar: “Measuring the Impact of Vaccines”. Gavi, the Vaccine Alliance. International Immunization Week Webinar. 27 April 2020.

- The webinar presents the estimates from the Decade of Vaccine Economics (DoVE) study of the economic benefits and return-on-investment of vaccines against 10 antigens in 73 countries receiving Gavi Support. The webinar will begin with an overview of the methodology used to compute these estimates and then showcase how we apply these methods to calculate the return-on-investment from 2011-2020 and predict the future return-on-investment from 2021-2030. International Vaccine Access Center. World Immunization Week Webinar.

2019 **Seminar: “Decade of Vaccine Economics Return-on-Investment Results for Gavi countries”.** Bill & Melinda Gates Foundation. Seattle, WA. 18 June 2019.

- Consultation on strategic communication of return on investment results and incorporation of equity into economic evaluation for vaccinations.

2018 **Webinar: 5 Points Forward: Best Practices in Cascade Analytics and Costing as Steps to 95-95-95.** Presented by Health Policy Plus (HP+) a project of United States Agency for International Development (USAID). Washington, DC. 1 February 2018.

<http://www.healthpolicyplus.com/pubs.cfm?get=7187-7346>

- I presented in a webinar attended by nearly 200 participants on best practices in cascade analytics and the importance of costing along the HIV treatment and prevention cascades for achieving 95-95-95 goals. The participants were USAID and Palladium headquarters and field staff as well as affiliated development practitioners, and local country ministry of health and ministry of finance participants.

Webinar: Mobilizing Domestic Resources for the HIV Workforce – Estimating Investment Needs. Presented by Human Resources for Health in 2030 (HRH2030) a project of United States Agency for International Development (USAID). Washington, DC. 28 August 2018.

<https://www.hrh2030program.org/hivworkforcwebinar/>

- I presented in a webinar attended by nearly 500 participants on estimating the investment needs for the health workforce and on both the methodological and logistical issues with current practices, as well as potential paths forward. The participants were USAID and HRH 2030 headquarters and field staff as well as affiliated development practitioners.

USAID Washington Health Finance Workshop. USAID Global Health Bureau. Washington, DC. 25-28 June 2018.

- I taught 1 day on innovative approaches for health financing, economic trends in development finance, and sustainable financing

considerations. Participants included 30 USAID mission and USAID/Washington staff members.

Sustainable Financing for Expanding Quality Healthcare in Africa Workshop. Presented by Health Finance and Governance (HFG) a project of United States Agency for International Development (USAID). Kampala, Uganda. 13 – 18 May 2018.

- I presented for 2 days on innovative approaches for health financing, economic trends in development finance, and economic analysis of HIV interventions. Participants included ministry of health and finance officials from across Sub-Saharan Africa, Private sector health representatives, African Development Bank, USAID, Global Fund, and other key policy actors.

2017 **Faculty Candidate Seminar. “Assessing Welfare Spillovers: Using Regression Discontinuity to Evaluate the Impact of ART Initiation on Household Food Security in South Africa”.** Johns Hopkins Bloomberg School of Public Health Department of International Health, Health Systems Program. 17 October 2017. <https://www.jhsph.edu/new-calendar/>

2014 **Addressing Needs & Leveraging Resources in Financing the Romanian Economy Conference.** “Fiscal Space for Growth - Addressing the Needs of a Growing Economy”. Bucharest, Romania. March 2014. https://www.aspeninstitute.ro/uploads/files/AIR_Addressing_Needs_conf_March_18_agenda.pdf

- I presented for 2 days on tactics for improving European Structural Fund absorption rates to members of the Parliament of Romania, Ministry of Finance, Ministry of Public Affairs, Central Bank of Romania, ExIm Bank of Romania, and CEC Bank of Romania. The results of my research were translated into policy action and implemented by the Ministry of Public Affairs resulting in a 5-fold improvement in European Structural Fund absorption.

ADDITIONAL INFORMATION

Personal statement of research and practice goals, objectives and impact

My research interests are broadly in the sub-fields of decision sciences, economic evaluation, behavioral economics, development economics (micro), econometrics, and the empirical evaluation of inequity. I am particularly interested in the economic & inequity implications of public health investments, blending economic and epidemiologic models of infectious disease transmission and decision-making around vaccines, sustainable health financing in donor transitioning countries, and the long-term and external impacts of health interventions in developing countries. I work primarily to provide research to support policy decision-making and long-term strategic planning of health investments that provide additional economic returns.

Keywords

Health Economics, Behavioral Economics, Development Economics,
Vaccines, Immunizations, HIV/AIDS, Global Health, Economic Evaluation,
Econometrics, Decisions Sciences, Quantitative Methods, Equity, Inequality