

Maya Liv Petersen
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EDUCATION:

M.D., University of California, San Francisco	2009
Ph.D. in Biostatistics, University of California, Berkeley <i>Advisor: Mark van der Laan</i> <i>Dissertation: "Application of causal inference methods to improve the treatment of antiretroviral resistant HIV infection" (Published as a monograph by VDM Verlag)</i>	2007
M.S. in Health and Medical Sciences, University of California, Berkeley <i>Advisor: Arthur Reingold</i> <i>Thesis: "Bacterial meningitis surveillance in Salvador, Bahia, Brazil"</i>	2002
B.A. in Human Biology, Stanford University <i>Advisor: William Durham</i> <i>Honors Thesis: "Hol Chan Marine Reserve, Belize: A case study in marine ecotourism"</i>	1998

POSITIONS:

Assistant Professor of Biostatistics, University of California, Berkeley	2008-
Graduate Student Researcher, University of California, Berkeley	2004-2007
Graduate Student Instructor, University of California, Berkeley	2001-2002

AWARDS/FELLOWSHIPS:

Alpha Omega Alpha, Honor Medical Society	2008
Evelyn Fix Prize <i>Awarded to the Ph.D. student showing the greatest promise in statistical research, with preference for applications to biology and problems of health.</i>	2007
Howard Hughes Medical Institute Pre-Doctoral Fellowship in Biological Sciences	2001-06
Graduation with Academic Distinction and Honors from Stanford University	1998
Stanford University Human Biology Invited Commencement Speaker	1998
Phi Beta Kappa	1997

RESEARCH:

- University of California, Berkeley; University of California, San Francisco; University of North Carolina, Chapel Hill; Johns Hopkins University** 2006-
with M. van der Laan, UC Berkeley; S. Deeks, UCSF; J. Eron and S. Napravnik, UNC, Chapel Hill; R. Moore, Johns Hopkins University
Coordination of multi-cohort collaboration to investigate strategies for the management of antiretroviral resistant HIV
- University of California, Berkeley; University of California, San Francisco; Harvard University** 2004-
with M. van der Laan, UC Berkeley; S. Deeks and D. Bangsberg, UCSF
Application of causal inference methodology to the analysis of longitudinal HIV data; Investigation of dynamic treatment strategies for patients infected with resistant strains of HIV; Investigation of the causal effects of non- suppressive antiretroviral treatments; Evaluation of strategies to improve adherence to antiretroviral therapy
- University of California, Berkeley; Kaiser Permanente Medical Center; Stanford University Medical Center** 2004-07
with M. van der Laan, UC Berkeley; R. Shafer, Stanford; J. Fessel, Kaiser Permanente
Application of causal inference and machine-learning methods to the analysis of HIV genotypic resistance data in a large clinical database
- Oswaldo Cruz Foundation, Rio de Janeiro, Brazil** 2003
with F. Bastos, Oswaldo Cruz Foundation
Investigation of trends in the Brazilian HIV epidemic following introduction of universal access to antiretroviral therapy; Research on access to HIV care among vulnerable populations
- Oswaldo Cruz Foundation, Salvador, Brazil** 2001
with L. Riley, UC Berkeley; A. Ko, Oswaldo Cruz Foundation
Analysis of surveillance data for bacterial meningitis in Salvador, Brazil
- Div. Child Psychiatry, Stanford University Medical Center,** 1998-2000
with H. Steiner, Stanford
Collection, management, and analysis of data from several child psychiatry research projects, primarily focused on treatment of conduct disorder in adolescents
- Dept. Anthropology, Stanford University** 1997
with W. Durham, Stanford
Fieldwork in Belize and Costa Rica researching the community impact of ecotourism

TEACHING:

- Graduate Student Instructor, Epidemiologic Methods** 2002
University of California, Berkeley
- Seminar, Medical Students for Choice** 2001-2002
University of California, Berkeley
Planning and coordination of a seminar on issues surrounding reproductive health
- Graduate Student Instructor, Molecular and Cellular Biology** 2001
University of California, Berkeley
- Seminar, Evolution and Medicine** 2001
University of California, Berkeley
Design and coordination of course in Evolution and Medicine

REFEREE SERVICE:

Statistics

- Journal of the Royal Statistical Society, Series B
- Biometrika
- Biometrical Journal
- Biometrics
- Statistics in Medicine

Epidemiology

- Epidemiology
- American Journal of Epidemiology

Medicine

- Lancet
- PLOS Medicine
- Journal of Infectious Disease
- Journal of the Canadian Medical Association

PUBLICATIONS:

1. Bembom O, Petersen ML, Rhee SY, Fessel WJ, Sinisi SE, Shafer R, van der Laan MJ. Biomarker discovery using targeted maximum likelihood estimation: Application to the treatment of antiretroviral resistant HIV infection. *Statistics in Medicine*: 2009 28(1):152-72.
2. Petersen ML, van der Laan MJ. Direct Effect Models. *The International Journal of Biostatistics*: 2008 4(1): Article 23.
3. Petersen ML, van der Laan MJ, Napravnik S, Eron J, Moore R, Deeks S. Long Term Consequences of the Delay between Virologic Failure of Highly Active Antiretroviral

- Therapy and Regimen Modification: a Prospective Cohort Study. *AIDS*: 2008 22(16):2097-106.
4. Petersen ML, Wang Y, van der Laan MJ, Guzman D, Riley E, and Bangsberg DR. Pillbox Organizers are Associated with Improved Adherence to HIV Antiretroviral Therapy and Viral Suppression: A Marginal Structural Model Analysis. *Clinical Infectious Diseases*: 2007 45(7):908-15.
 5. Petersen ML, Deeks SG, van der Laan, MJ. Individualized Treatment Rules: Generating Candidate Clinical Trials. *Statistics in Medicine*: 2007 26(25):4578-601.
 6. Petersen ML, Deeks SG, Martin JN, van der Laan MJ. History-Adjusted Marginal Structural Models to Estimate Time-Varying Effect Modification. *American Journal of Epidemiology*: 2007 166(9):985-93.
 7. Petersen ML, van der Laan MJ, Response to Invited Commentary: Petersen et. al. Respond to “Effect Modification by Time-varying Covariates”. *American Journal of Epidemiology*: 2007 166(9):1003-1004
 8. Cordeiro SM, Neves AB, Ribeiro CT, Petersen ML, Gouveia EL, Ribeiro GS, Lobo TS, Reis JN, Salgado KM, Reis MG, Ko AI. Hospital-based surveillance of meningococcal meningitis in Salvador, Brazil. *Transaction of the Royal Society of Tropical Medicine and Hygiene*. 2007 101(11):1147-53.
 9. Petersen ML, Molinaro A, Sinisi SE, van der Laan MJ. Cross-validated Bagged Learning. *Journal of Multivariate Analysis*: 2007 98 (9): 1693-1704.
 10. Petersen ML, Wang Y, van der Laan MJ, Rhee SY, Shafer RW, WJ Fessel. Virologic Efficacy of Boosted Double vs. Boosted Single Protease Inhibitor Therapy *AIDS*: 2007 21(12): 1547-1554.
 11. van der Laan MJ, Petersen ML. Statistical Learning of Origin-Specific Statically Optimal Individualized Treatment Rules. *The International Journal of Biostatistics*: 2007 3(1): Article 6
 12. van der Laan MJ, Petersen ML. Causal Effect Models for Realistic Individualized Treatment and Intention-to-Treat Rules. *The International Journal of Biostatistics*: 2007 3 (1): Article 3
 13. Sinisi SE, Polley EC, Petersen ML, Rhee SY, van der Laan MJ. Super Learning: an Application to Prediction of HIV-1 Drug Susceptibility. *Statistical Applications in Genetics and Molecular Biology*: 2007; 6(1): Article 7
 14. Bembom O., Petersen ML, van der Laan MJ (2006). Identifying important explanatory variables for time-varying outcomes. In W. Dubitzky, M. Granzow, and D.P. Berrar (eds.), *Fundamentals of Data Mining in Genomics and Proteomics*, Springer, Chapter 11. pp. 227-250.

15. Petersen ML, Wang Y, van der Laan MJ, Bangsberg D. Assessing the Effectiveness of Antiretroviral Adherence Interventions: Using Marginal Structural Models to Replicate the Findings of Randomized Controlled Trials. *JAIDS* 2006; 43 (Suppl 1): S96-S103
16. Petersen ML, Sinisi SE, van der Laan MJ. Estimation of direct causal effects. *Epidemiology*: 2006; 17(3): 276-284
17. Bastos FI, Malta M, Hacker M, Petersen ML, Sudbrack M, Colombo M, Caiaffa WT. (2006) Assessing Needle Exchange Operations in a Poor Brazilian Community. *Substance Use and Misuse*: 2006; 41(6-7): 937-51.
18. Petersen ML, Boily MC, Bastos FI. Assessing HIV resistance in developing countries: Brazil as a case study. *Rev Panam Salud Publica*: 2006; 19(3): 146-56.
19. van der Laan MJ, Petersen ML, Joffe MM. History-Adjusted Marginal Structural Models and Statically-Optimal Dynamic Treatment Regimens. *The International Journal of Biostatistics*: 2005; 1(1): 10-20 (Article 4). <http://www.bepress.com/ijb/vol1/iss1/4>
20. Malta, M, Petersen ML, Clair S, Freita F, Bastos FI. Adherence to antiretroviral therapy: a qualitative study with physicians from Rio de Janeiro, Brazil. *Cadernos de Saúde Pública* 2005; 21(5): 1424-1432.
21. Petersen ML, Travassos C, Bastos FI, Hacker MA, Beck EJ, de Noronha JC. The healthcare system and HIV epidemic in Brazil. In: Beck EJ, Mays N, Whiteside A, Zuniga JM, eds. The HIV Pandemic: local and global implications. 2005. Oxford: Oxford University Press.
22. Hacker MA, Petersen ML, Enriquez M, Bastos FI. Highly active antiretroviral therapy in Brazil: The challenge of universal access in a context of social inequality. *Rev Panam Salud Publica*. 2004; 16(2):78-83.
23. Bastos FI, Petersen ML, Kerrigan D, Boily MC. Management of HIV/AIDS: The Brazilian experience. In: Lévy JJ, Pierret J, Trottier G. Antiretroviral treatment: Experiences and challenges. 2004, Québec, Canada. Presses de l'Université du Québec. [French]
24. Ribeiro GS, Reis JN, Cordeiro SM, Lima JB, Gouveia EL, Petersen M, Slagado K, et al. Prevention of *Haemophilus influenzae* type b (Hib) meningitis and emergence of serotype replacement with type a strains after introduction of Hib immunization in Brazil. *Journal of Infectious Diseases*. 2003;187(1):109-16.
25. Steiner H, Petersen ML, Saxena K, Ford S, Matthews Z. Divalproex sodium for the treatment of conduct disorder: a randomized controlled clinical trial. *Journal of Clinical Psychiatry*. 2003; 64(10):1183-91.

INVITED TALKS:

1. Estimation of dynamic treatment regimes and extrapolation to populations with distinct monitoring structures: The use of laboratory monitoring to detect HIV treatment failure. Joint Statistical Meetings, August 8, 2009. Washington. DC, USA.
2. Inverse probability weighting to improve the treatment of antiretroviral resistant HIV infection; practical aspects of implementation and extension to dynamic treatment regimes. Biostatistics Seminar Series. November 18, 2008. McGill University, Montreal, Canada.
3. Application of inverse probability weighting to improve the treatment of antiretroviral resistant HIV infection. Course on Epidemiologic Research Methods and New Directions. Conference of the International Epidemiologic Association. September 20-21, 2008. Porto Alegre, Brazil.
4. Marginal structural models and inverse probability of treatment weighting for the estimation of causal effects: An introduction based on the antiretroviral treatment of HIV infection. 40th Annual Society for Epidemiological Research (SER) Meeting. June 19 - 22, 2007. Boston, Massachusetts, USA.
5. Estimation of direct effects: Illustration in a study of the treatment of HIV infection. May 19, 2007. School of Public Health, University of California, Los Angeles, USA.
6. Statistical estimation of individualized treatment rules: Deciding when to modify the antiretroviral therapy regimen of individuals infected with resistant HIV. Howard Hughes Medical Institute Meeting of Predoctoral & Physician Postdoctoral Fellows. Sept. 18- 20, 2006. Chevy Chase, Maryland.
7. Individualized Treatment Rules: Generating Candidate Clinical Trials. The Western North American Region of the International Biometric Society (WNAR) Annual Meeting. June 27-30, 2006. Flagstaff, Arizona, USA.
8. Models for direct effects: generalization and estimation illustrated in a study of treatment for HIV. Second American Congress of Epidemiology. June 21-24, 2006 Seattle, Washington, USA.
9. Variable Importance Measures to Rank the Effects of Viral Mutations on Clinical Virologic Response.. Workshop on Quantitative Methods for Antiviral Resistance. Collaborative Forum for HIV Research. May 10-11, 2006. Boston, Massachusetts, USA.
10. History-Adjusted Marginal Structural Models: an application in HIV research. Invited talk. Statistics Section. American Public Health Association (APHA) Annual Meeting. December 10-14, 2005. Philadelphia, Pennsylvania, USA.

11. History-Adjusted Marginal Structural Models and Time-Dependent Causal Effect Modification. Session 214, Joint Statistical Meetings (JSM). August 9, 2005. Minneapolis, Minnesota, USA.

PRESENTATIONS/POSTERS:

1. Petersen ML, van der Laan MJ, Napravnik S, Eron J, Moore R, Deeks S. Incomplete viral suppression on a first line protease inhibitor-based regimen is associated with slower CD4+ T cell declines than that observed on a reverse transcriptase inhibitor regimen: implications for treatment strategies in resource poor regions and the management of drug-resistant HIV. Poster# K-210. 12th International Workshop on HIV Observational Databases. March 27-30, 2008. Malaga, Spain.
2. Petersen ML, van der Laan MJ, Napravnik S, Eron J, Moore R, Deeks S. Long Term Consequences of the Delay between Virologic Failure of Highly Active Antiretroviral Therapy and Regimen Modification: a Prospective Cohort Study. 15th Conference on Retroviruses and Opportunistic Infections (CROI). February 3-6, 2008. Boston, MA, USA.
3. Petersen ML, Wang Y, van der Laan MJ, Guzman D, Riley ED, Bangsberg DR. Pill Box Organizers are Associated with Improved Antiretroviral Adherence, Viral Suppression and are Highly Cost Effective. Poster # K-179. 14th Conference on Retroviruses and Opportunistic Infections (CROI). February 25-28, 2007. Los Angeles, CA, USA.
4. Petersen ML, Wang Y, van der Laan MJ, Guzman D, Riley ED, Bangsberg DR. Pill box organizers are associated with improved HIV antiretroviral adherence and viral suppression: A marginal structural model analysis. Poster #90. 10th International Workshop on HIV Observational Databases. March 23-26, 2006. Madrid, Spain.
5. Petersen ML, Wang Y, van der Laan MJ, Guzman D, Riley ED, Bangsberg DR. No evidence that once daily antiretroviral therapy improves adherence to HIV antiretroviral therapy: a marginal structural analysis. Poster #89. 10th International Workshop on HIV Observational Databases. March 23-26, 2006. Madrid, Spain.
6. Petersen ML, van der Laan MJ, Martin JN, Deeks SG. Defining the Immunologic Consequences of Early vs Delayed Treatment Modifications Using Marginal Structural Models. Session 87, Poster # 524. 13th Conference on Retroviruses and Opportunistic Infections (CROI). February 5-9, 2006. Denver, Colorado, USA.
7. Petersen ML, Sinisi SE, Rhee SY, Shafer RA, Fessel JW, van der Laan MJ. The Use of Machine Learning and Causal Inference Methodology to Interpret the Association between Drug-Resistance Mutations and Treatment Response. Poster Presentation. XIV International HIV Drug Resistance Workshop: Basic Principles and Clinical Implications. July 7-11, 2005. Quebec City, Quebec, Canada.

8. van der Laan MJ, Petersen ML, Sinisi S, Shafer R, Fessel J. Data-adaptive learning of direct effects: Application to HIV research. Presentation to the Biomarkers in HIV and Cancer Research Workshop, Mathematical Biosciences Institute, Ohio State University April 18-22, 2005. Columbus, Ohio.
9. Petersen, ML, Hacker MA, Renton A, Bastos FI. Trends in the distribution of opportunistic diseases among newly notified AIDS cases in Brazil over a period spanning introduction of universal access to antiretroviral therapy. Abstract TuPeC4718. XV International AIDS Conference (IAC): Access for All. July 11-16, 2004. Bangkok, Thailand.
10. Bastos FI, Petersen ML, Renton A, Hacker MA. The impoverishment of the Brazilian AIDS epidemic is partially driven by new cases among gay men from deprived communities. Abstract WePeC6078. XV International AIDS Conference (IAC): Access for All. July 11-16, 2004. Bangkok, Thailand.
11. Bastos FI, Petersen ML, Renton A, Hacker MA. Dramatic declines in AIDS deaths and AIDS-related hospitalizations are made of small steps: Findings from a monthly reconstruction of the introduction of HAART in Brazil. Abstract TuPeC4708. XV International AIDS Conference (IAC): Access for All. July 11-16, 2004. Bangkok, Thailand.
12. Malta M., Petersen ML, Freitas F, Bastos FI. ARV adherence: A qualitative study with physicians from Rio de Janeiro, Brazil. Abstract WePeE6685. XV International AIDS Conference (IAC): Access for All. July 11-16, 2004. Bangkok, Thailand.
13. Enriquez MEM, Petersen ML, Hacker M, Bastos FI. An ecological study of HAART in Brazil: The impact of universal access on AIDS incidence and mortality (1984-2000). Oral Presentation TuOrC1160. XV International AIDS Conference (IAC): Access for All. July 11-16, 2004. Bangkok, Thailand.
14. Petersen ML. The Brazilian response to the HIV epidemic. Presented to the 6th International Conference on Healthcare Resource Allocation for HIV/AIDS (ICHRA): Healthcare Systems in Transition. October 13-15, 2003. Washington, DC, USA.

SELECTED TECHNICAL REPORTS:

1. Wang Y, Petersen ML, Bangsberg DR, van der Laan MJ. (2006) Diagnosing Bias in the Inverse Probability of Treatment Weighted Estimator Resulting from Violation of Experimental Treatment Assignment. U.C. Berkeley Division of Biostatistics Working Paper Series. <http://www.bepress.com/ucbbiostat/paper211>
2. van der Laan MJ, Petersen ML (2004), Estimation of Direct and Indirect Causal Effects in Longitudinal Studies, *U.C. Berkeley Division of Biostatistics Working Paper Series*. Working Paper 155. <http://www.bepress.edu/ucbbiostat/paper155>.