

**BRADLEY P. CARLIN**

**Contact Information:**

e-mail: [brad@counterpointstat.com](mailto:brad@counterpointstat.com)

web: <http://counterpointstat.com/>

phone: (952) 922-2534

**Education:** Ph.D. (Statistics), University of Connecticut, May 1989  
major areas: Bayes and empirical Bayes methodology and applications  
M.S. (Statistics), University of Connecticut, December 1986

Attained Associateship, Society of Actuaries, May 1985

B.S. (Mathematics and Actuarial Science), magna cum laude, University of Nebraska, May 1984

**Experience:** Counterpoint Statistical Consulting, LLC  
Founder and President, June 2018–

Division of Biostatistics, School of Public Health, University of Minnesota  
Division Head, May 2010–August 2017

Mayo Professor in Public Health, July 2003–June 2018

Professor, July 1999–June 2018

Associate Professor, July 1995–July 1999

Assistant Professor, August 1991–July 1995

Statistical Innovation, Data Sciences and Statistics, AbbVie, North Chicago, IL  
David Jordan Visiting Statistical Scholar, August 2017–December 2017

Department of Quantitative Sciences, M.D. Anderson Cancer Center, Houston, TX  
Visiting Faculty Fellow, September 2008–January 2009

Medtronic Corporation and HealthPartners Research Foundation  
Visiting Senior Statistician, September 2001–December 2001

Medical Research Council Biostatistics Unit, Cambridge University (UK)  
Visiting Research Associate, Summer 1997

Department of Statistics, Carnegie Mellon University  
Visiting Assistant Professor, August 1989–July 1991

Center for Environmental Health, University of Connecticut  
Statistical Research Assistant, August 1988–June 1989

Department of Statistics, University of Connecticut  
Statistics Instructor/Teaching Assistant, September 1985–May 1988

Department of Mathematics and Statistics, University of Nebraska  
Mathematics Instructor/Teaching Assistant, September 1982–July 1985

**Awards  
and Honors:**

Elected to Phi Beta Kappa, University of Nebraska, May 1984.  
H. Fairfield Smith Award in Applied Statistics, University of Connecticut,  
December 1986.  
University of Connecticut Research Fellowship, 1987-89.  
Elected to Sigma Xi, Carnegie Mellon University, April 1990.  
*Journal of the American Statistical Association* 1992 Special Invited Applications  
Paper, "Hierarchical Bayes models for the progression of HIV infection using  
longitudinal CD4 T-cell numbers" (with N. Lange and A.E. Gelfand).  
Accepted invitation to join the editorial board of *Statistics in Medicine*, July 1994.  
Elected Ordinary Member of the International Statistical Institute, January 1995.  
University of Nebraska–Lincoln College of Arts and Sciences Alumni Association  
1995 Young Alumni Achievement Award, May 1995.  
Accepted invitation to join the editorial board of *Journal of the American  
Statistical Association (Theory and Methods)*, May 1996.  
Accepted invitation to join the organizing and editorial board, *Case Studies in  
Bayesian Statistics* biannual conference series, July 1996.  
Elected to Delta Omega (Public Health Honorary Society), University of Minnesota,  
May 1997.  
Accepted invitation to join the editorial board, *Bayesian Statistics 6*  
(Valencia volume) quadrennial conference series, June 1998.  
Elected Fellow of the American Statistical Association, May 1999.  
Accepted invitation to join the NIH Social Sciences, Nursing, Epidemiology and  
Methods biostatistical methods study section (SNEM-5), July 1999  
APHA Mortimer Spiegelman Award (health statistician under age 40),  
June 2000.  
Harvard School of Public Health Department of Biostatistics Myrto Lefkopoulou  
Distinguished Lectureship (biostatistician within 15 years of earned doctorate),  
April 2001.  
14th place worldwide (out of 81,700 researchers), "Most-cited authors in the  
mathematical sciences, 1991-2001," Science Citation Index, October 2001.  
The International Environmetric Society (TIES) Abdel El-Shaarawi Young  
Researcher's Award (environmental statistician under age 40), June 2002.  
Named Mayo Professor in Public Health (three-year rotating endowed chair),  
University of Minnesota School of Public Health, April 2003.  
Accepted invitation to join the editorial board, Texts in Statistical Science series,  
Chapman and Hall publishers, 2004.  
Accepted nomination as Editor-in-Chief, *Bayesian Analysis* (official journal of  
the International Society for Bayesian Analysis), May 2006.  
University of Minnesota School of Public Health Leonard M. Schuman Award  
for Excellence in Teaching, June 2008.  
Joint Statistical Meetings Excellence-in-CE Award, "Bayesian Adaptive Methods  
for Clinical Trials," August 2010 (with D. Berry, J.J. Lee and S. Berry).  
University of Minnesota Council of Graduate Students (COGS) Outstanding Faculty  
Award, April 2011.  
University of Minnesota School of Public Health Award for Excellence in Advising,  
May 2014.  
University of Connecticut Department of Statistics Distinguished Alumnus Award,  
November 2015.  
Named Fellow of ISBA (International Society for Bayesian Analysis), June 2016.

## Personal Statement:

I am a biostatistician interested in methods research, data analysis, programming, and report-writing. My own training and research has focused on hierarchical Bayesian statistical modeling and associated computational methods, including Markov chain Monte Carlo (MCMC) methods. I have a proven track record of publishing and externally funded methodological grant support in Bayesian methods, computing, and applications related to spatial and environmental statistics, clinical trials, and meta-analysis, as well as mentoring the research of others. I have also been involved in the creation and dissemination of user-friendly software for implementing these models in practice; both through my own website and through the CRAN archive (see e.g. my work on the `spBayes` package). I have taught a variety of both traditional academic courses and government, industry, and professional short courses in hierarchical Bayesian modeling and its implementation via the `R` and `BUGS` packages, with special emphasis on Bayesian adaptive clinical trials, including simulation of procedure operating characteristics. I have coauthored three leading textbooks on Bayesian methods, including one on adaptive methods for clinical trials, and serve as president and founder of my own consulting firm that specializes in exactly this sort of work.

## Contributions to Science and Selected Publications (from 175):

Dr. Carlin's research has focused on hierarchical Bayesian methods and associated computational approaches to complex scientific problems in environmental science and clinical research. His most significant research contributions can be grouped into 5 primary areas:

**1. Hierarchical Bayesian biostatistical model development and selection:** Unlike the classical "frequentist" statistical paradigm, which uses p-values and other "design-based justifications for inference, Bayesian approaches are "model-based. This means that all aspects of the chosen model (including any assumed prior distributions) must be correctly specified. Several of my most significant publications have been in this area, many in biostatistical model choice, and often using MCMC methods for their implementation.

1. **Carlin, B.P.** and Chib, S., "Bayesian model choice via Markov chain Monte Carlo methods," *J. Roy. Statist. Soc. Ser. B*, **57**, 473–484, 1995.
2. **Carlin, B.P.** and Hodges, J.S., "Hierarchical proportional hazards regression models for highly stratified data," *Biometrics*, **55**, 1162–1170, 1999.
3. Spiegelhalter, D.J., Best, N., **Carlin, B.P.**, and van der Linde, A., "Bayesian measures of model complexity and fit" (with discussion), *J. Roy. Statist. Soc. Ser. B*, **64**, 583–639, 2002.
4. Murray, T.A., Hobbs, B.P., Sargent, D.J. and **Carlin, B.P.**, "Flexible Bayesian survival modeling with semiparametric time-dependent and shape-restricted covariate effects," *Bayesian Analysis*, **11**, 381–402, 2016.

**2. Bayesian approaches for longitudinal and joint longitudinal-survival modeling:** This work on methods for analyzing complex multi-level datasets began with empirical Bayes approaches, but quickly veered into fully Bayesian methods implemented via MCMC techniques. My particular focus here has been the analysis of longitudinal data (repeated observations on the same subject), often in concert with associated survival information (say, disease-free survival times for those subjects).

1. Lange, N., **Carlin, B.P.** and Gelfand, A.E., "Hierarchical Bayes models for the progression of HIV infection using longitudinal CD4 T-cell numbers," *J. Amer. Statist. Assoc.*, **87**, 615–626, 1992.
2. Cowles, M.K., **Carlin, B.P.** and Connett, J.E., "Bayesian Tobit modeling of longitudinal ordinal clinical trial compliance data with nonignorable missingness," *J. Amer. Statist. Assoc.*, **91**, 86–98, 1996.
3. Hatfield, L.A., Boye, M.E., Hackshaw, M.D., and **Carlin, B.P.**, "Multilevel Bayesian models for survival times and longitudinal patient-reported outcomes with many zeros," *J. Amer. Statist. Assoc.*, **107**, 875–885, 2012.
4. Rizopoulos, D., Hatfield, L.A., **Carlin, B.P.**, and Takkenberg, J.J.M., "Combining dynamic predictions from joint models for longitudinal and time-to-event data using Bayesian model averaging," *J. Amer. Statist. Assoc.*, **109**, 1385–1397, 2014.

### 3. Bayesian spatial and spatiotemporal approaches for geographically referenced health data:

My primary area of emphasis here has been on methods for areal data, where we observe only data summaries over predefined geographic regions (say, counties or zip codes). Two particular areas of interest have been spatial data misalignment (where two variables are defined over different zonations) and gradient analysis and “wombing” (where seek boundaries that separate regions or epochs of high and low response). I’ve also been associated with software development in this area (notably through the `spBayes` package in R). Application areas here include air pollution, environmental justice, cancer control, and alcohol policy research.

1. Waller, L.A., **Carlin, B.P.**, Xia, H., and Gelfand, A.E., “Hierarchical spatio-temporal mapping of disease rates,” *J. Amer. Statist. Assoc.*, **92**, 607–617, 1997.
2. Toomey, T.L., Erickson, D.J., **Carlin, B.P.**, Quick, H.S., Harwood, E.M., Lenk, K.M., and Ecklund, A.M., “Is the density of alcohol establishments related to non-violent crime?” *Journal of Studies on Alcohol and Drugs*, **73**, 21–25, 2012.
3. Erickson, D.J., **Carlin, B.P.**, Lenk, K.M., Quick, H.S., Harwood, E.M., and Toomey, T.L., “Do neighborhood attributes moderate the relationship between alcohol establishment density and crime?” *Prevention Science*, **16**, 254–264, 2015.
4. Quick, H., Banerjee, S., and **Carlin, B.P.**, “Bayesian modeling and analysis for gradients in spatiotemporal processes,” *Biometrics*, **71**, 575–584, 2015.

**4. Bayesian hierarchical approaches for adaptive clinical trials:** A strength of Bayesian methods is that their model-based nature means they can adapt more easily to changes in experimental design, a significant advantage in the design and analysis of early phase clinical trials, especially in cancer. My work here has developed such methods, and more recently has focused on methods that adaptively borrow from historical and other auxiliary data, but in a cautious way that is governed by the “commensurability” (similarity) of the various data sources, automatically discarding less reliable sources when they conflict with more recent or reliable ones. Accurate inference for subgroups has also been a recent research focus. Some of my main papers in this area are as follows, with a supporting website at <http://research.mdacc.tmc.edu/SmeeactWeb/>.

1. Hobbs, B.P., **Carlin, B.P.**, Mandrekar, S., and Sargent, D.J., “Hierarchical commensurate and power prior models for adaptive incorporation of historical information in clinical trials,” *Biometrics*, **67**, 1047–1056, 2011.
2. Renfro, L.A., **Carlin, B.P.**, and Sargent, D.J., “Bayesian adaptive trial design for a newly validated surrogate endpoint,” *Biometrics*, **68**, 258–267, 2012.
3. Schnell, P.M., Tang, Q., Offen, W.W., and **Carlin, B.P.**, “A Bayesian credible subgroups approach to identifying patient subgroups with positive treatment effects,” *Biometrics*, **72**, 1026–1036, 2016.
4. Schnell, P.M., Tang, Q., Müller, P., and **Carlin, B.P.**, “Subgroup inference for multiple treatments and multiple endpoints in an Alzheimer’s disease treatment trial,” *Annals of Applied Statistics*, **11**, 949–966, 2017.

**5. Bayesian hierarchical approaches to network meta-analysis:** This work refers to combination of evidence from a large number of (typically previously published) studies, most of which did not all compare the same treatment interventions. My research here has focused on developing “arm-based” hierarchical modeling methods that are more flexible and permit more interpretable inference than traditional “contrast-based” methods. My recent extensions permit inclusion of both aggregate and individual-level patient data.

1. Zhang, J., Fu, H., and **Carlin, B.P.**, “Detecting outlying trials in network meta-analysis,” *Statistics in Medicine*, **34**, 2695–2707, 2015.
2. Hong, H., Fu, H., Price, K.L., and **Carlin, B.P.**, “Incorporation of individual patient data in network meta-analysis for multiple continuous endpoints, with application to diabetes treatment,” *Statistics in Medicine*, **34**, 2794–2819, 2015.

3. Hong, H., Chu, H., Zhang, J., and **Carlin, B.P.**, “A Bayesian missing data framework for generalized multiple outcome mixed treatment comparisons” (with discussion and rejoinder), *Research Synthesis Methods*, **7**, 6–33, 2016.
4. Hong, H., Fu, H., and **Carlin, B.P.**, “Power and commensurate priors for synthesizing aggregate and individual patient-level data in network meta-analysis,” to appear *J. Roy. Statist. Soc., Ser. C (Applied Statistics)*, 2018.

**For More Information:**

Full academic-style CV, including

- complete bibliography of all books and refereed papers
- past and current grant support
- seminars and conference presentations given
- course instruction
- PhD and MS advising
- service activities
- professional activities
- grant and manuscript refereeing
- selected consulting experience

is available upon request.