

Curriculum Vitae
July, 2007

Personal Information:

Name: Stephen L. Hillis

Address: Center for Research in the Implementation of Innovative Strategies
in Practice (CRIISP)
Department of Veterans Affairs (VA) Iowa City Medical Center
601 Highway 6 West (152)
Iowa City, IA 52246-2208

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Education:

Ph.D. Statistics, 1987
M.S. Statistics, 1982
M.F.A. Music, 1978
B.A. Mathematics and Music, 1972
University of Iowa, Iowa City, IA 52242

Awards and Honors:

2002 American Orthopaedic Foot & Ankle Society Leonard
Goldner Award for outstanding basic research (Tochigi, Y., Amendola, A., Rudert, M.J.,
Baer, T.E., Brown, T.D., Hillis, S.L., Saltzman, C.L., "Direction of subtalar joint laxity
with interosseous, talocalcaneal ligament sectioning")

1997 Orthopaedic Research Society first annual William H. Harris
Award (Pedersen, D. R., Brown, T. D., Hillis, S. L., Callaghan, J. J., "Prediction of
Long-Term Polyethylene Wear in THA, Based on Early Wear Measurements Made
Using Digital Image Analysis")

1992-1994 UI Psychiatric Epidemiology/Biometry Research Fellowship
1991 UI Cardiovascular Center Institutional Research Fellowship
1982 National Endowment for the Arts Jazz Study Fellowship Grant
1971 Phi Beta Kappa, University of Iowa

Employment History:

- 2004-present Senior Biostatistician
Center for Research in the Implementation of Innovative Strategies
in Practice (CRIISP)
VA Medical Center
Iowa City, IA
- 2002-2004 Senior Biostatistician
Program for Interdisciplinary Research in Health Care
Organization
VA Medical Center
Iowa City, IA
- 1994-2002 Director, Statistical Consulting Center
Department of Statistics and Actuarial Science
University of Iowa, Iowa City, IA
- 1992-1994 Psychiatric Epidemiology and Biometry Research Fellow
Division of Biostatistics, Department of Preventive Medicine
University of Iowa, Iowa City, IA
- 1991 Iowa Cardiovascular Center Institutional Research Fellow
Division of Biostatistics, Department of Preventive Medicine
University of Iowa, Iowa City, IA
- 1987-91 Assistant Professor of Statistics
Department of Mathematics and Statistics
The American University, Washington, DC
- 1988 Statistical Consultant
Public Interest Management Group, Inc.
Washington, DC
- 1983-1987 Teaching Assistant
Department of Statistics
University of Iowa, Iowa City, IA
- 1984-1986 Research Assistant
Preventive Medicine Department
University of Iowa, Iowa City, IA
(Primary statistician for a medical study conducted at the
University of Iowa Hospitals)
- 1986 Editorial Consultant for Professor Robert Woolson
Preventive Medicine Department

University of Iowa, Iowa City, IA
(Edited Robert Woolson's book *Statistical Methods for the Analysis of Biomedical Data*, published by Wiley)

- 1981-1982 Teaching Assistant
Business Department
University of Iowa, Iowa City, IA
- 1980-1981 Teaching Assistant
Statistics Department
University of Iowa, Iowa City, IA
- 1979-1980 Visiting Artist
Music Department
Cornell College, Mt. Vernon, IA
- 1979 Teaching Assistant
Music Department
University of Miami, Coral Gables, FL
- 1975-1978 Teaching Assistant
Music Department
University of Iowa, Iowa City, IA
- 1972-1974 Quantico Marine Corps Band
Quantico, VA

Teaching at the University of Iowa:

- 2001-2002 S:161 (Design II), S:173 (Data Analysis)
2000-2001 S:168 (Applied Multivariate Methods), S:173
1999-2000 S:161, S:173
1998-1999 S:161, S:173
1997-1998 S:168, S:173
1996-1997 S:161, S:168, S:173
1995-1996 S:168, S:173, S:172 (Generalized Linear Models)

Professional Memberships:

American Statistical Association
Biometric Society

Publications in Peer-Reviewed Journals:

(Statistical Methodology)

1. **Hillis, S.L.** (2007) A comparison of denominator degrees of freedom methods for multiple observer ROC analysis, *Statistics in Medicine*, 26:596-619 DOI: 10.1002/sim.2532.
2. **Hillis, S.L.**, Berbaum, K.S. (2005) Monte Carlo validation of the Dorfman-Berbaum-Metz method using normalized pseudovalues and less data-based model simplification, *Academic Radiology*, 12:1534-1541 DOI:10.1016/j.acra.2005.07.012.
3. **Hillis, S.L.**, Obuchowski, N.A., Scharz, K.M., Berbaum, K.S. (2005) A comparison of the Dorfman-Berbaum-Metz and Obuchowski-Rockette Methods for receiver operating characteristic (ROC) data, *Statistics in Medicine*, 24:1579-1607 DOI:10.1002/sim.2024.
4. **Hillis, S.L.**, Berbaum, K.S. (2004) Power estimation for the Dorfman-Berbaum-Metz method, *Academic Radiology*, 11, 1260-1273.
5. Obuchowski, N.A., Beiden, S.V., Berbaum, K.S., **Hillis, S.L.**, Ishwaran, H, Song, H.H., Wagner, R.F. (2004) Multi-case ROC analyses: an empirical comparison of five methods. *Academic Radiology*, 11, 980-995 DOI:10.1016/j.acra.2004.04.014.
6. **Hillis, S. L.** & Woolson, R. F. (1996). An iterative weighted least squares algorithm and simulation study for censored data M-estimators, *Communications in Statistics B*, **25**, 247-262.
7. **Hillis, S. L.** (1995). Residual plots for the censored data linear regression model, *Statistics in Medicine*, **14**, 2023-2036.
8. **Hillis, S. L.** & Davis, C. S. (1994). A simple justification of the iterative fitting procedure for generalized linear models, *The American Statistician*, **48**, 288-289.
9. **Hillis, S. L.** (1994). A heuristic generalization of Smith's Buckley-James variance estimator, *Communications in Statistics B*, **23**, 813-832.
10. **Hillis, S. L.** (1993). The equivalence of two Buckley-James variance estimators, *Communications in Statistics A*, **22**, 479-484.
11. **Hillis, S. L.** (1993). A comparison of three Buckley-James variance estimators, *Communications in Statistics B*, **22**, 955-974.

12. Hillis, S. L. (1991). Extending M-Estimation to Include Censored Data via James's Method, *Communications in Statistics B*, **20**, 121-128.

(Applications)

1. Katz, D.A., Aufderheide, T.P., Bogner, M., Rahko, P.S., Hillis, S.L., Selker, H.P. (2007) Do emergency department patients with possible acute coronary syndrome have better outcomes when admitted to cardiology?, *Annals of Emergency Medicine*, in press.
2. Gardner, S.E., Hillis, S.L., Park, H. (2007) Diagnostic validity of semi-quantitative swab cultures, *Wounds*, 19:31-38.
3. Cvengos, J.A., Christensen, A.J., Hillis, S.L., Rosenthal, G.E. (2007) Patient and physician attitudes in the healthcare context: attitudinal symmetry predicts patient satisfaction and adherence, *Annals of Behavioral Medicine*, in press.
4. Katz, D.A., Jarrard, D.F., McHorney, C.A., Hillis, S.L., Wiebe, D.A., Fryback, D.G. (2007) Health Perceptions in Patients Who Undergo Screening and Workup for Prostate Cancer, *Urology*, in press.
5. Foreman-Hoffman, V.L., Yankey, J.W., Hillis, S.L., Wallace, R.B., Wolinsky, F.D. (2006) Weight and depressive symptoms in older adults: direction of influence, *Journal of Gerontology: Social Sciences*, 62B, S43-S51.
6. Gardner, S.E., Frantz, R.A., Saltzman, C.L., Hillis, S.L., Park, H., Scherubel, M. (2006) Diagnostic Validity of Three Quantitative Swab Techniques for Identifying Chronic Wound Infection, *Wound Repair and Regeneration*, 14:548-557 DOI:10.1111/j.1743-6109.2006.00162.x.
7. Kaldjian, L.C., Jones, E.W., Rosenthal, G.E., Tripp-Reimer, T, Hillis, S.L. (2006) An Empirically Derived Taxonomy of Factors Affecting Physicians' Willingness to Disclose Medical Errors, *Journal of General Internal Medicine*, 21:942-948.
8. Noyes, R., Jr., Carney, C.P., Hillis, S.L., Jones, L.E., Langbehn, D.R. (2005). Prevalence and risk factors for illness worry in the general population, *Psychosomatics*, 46:529-539 DOI:10.1176/appi.psy.46.6.529.
9. Saltzman, C., Rashid, R., Hayes, A., Fitzpatrick, D., Klapach, A., Fellner, C., Hillis, S.L. (2004). Gram monofilament sensation beneath the first metatarsal indicates protective foot sensation in diabetic patients, *Journal of Bone and Joint Surgery*, 86, 717-723.
10. Zickmund, S., Hillis, S. L., Barnett, M. J., Ippolito, L, LaBrecque, D. R. (2004). 'He Told me I would Die and I should just Go Away': Hepatitis C Patients Report Communication Problems. *Hepatology*, 39, 999-1007.

11. Cram, P., **Hillis**, S.L., Barnett, M., Rosenthal, G.E. (2004). The impact of weekend admission and hospital teaching status on in-hospital mortality, *The Green Journal*, 117, 151-157.
12. Tochigi, Y., Amendola, A., Rudert, M.J., Baer, T.E., Brown, T.D., **Hillis**, S.L., Saltzman, C.L. (2004). Direction of subtalar joint laxity with interosseous, talocalcaneal ligament sectioning, *Foot and Ankle International*, 25, 588-596.
13. Levy, S. M., Warren, J.J., Broffitt, B., **Hillis**, S.L., Kanellis, M.J. (2003). Fluoride, Beverages, and Dental Caries in the Primary Dentition, *Caries Research*, 37, 157-165.
14. Niehaus, A.C., Heard, S.B., Hendrix, S. D., **Hillis**, S.L. (2003). Measuring edge effects on nest predation in forest fragments: do finch and quail eggs tell different stories? *American Midland Naturalist*, 149, 335-343.
15. Tonioli, M.B, Bouschlicher, and **Hillis**, S.L.(2002). M.R.Laser Fluorescence Detection of Occlusal Caries, *American Journal of Dentistry*, 15(3), 268-273.
16. Levy, S.M., **Hillis**, S.L., Warren J.J., Broffitt, B.A., Islam, A.K.M.M., Wefel, J.S., Kanellis, M.J. (2002). Primary tooth fluorosis and fluoride intake during the first year of life, *Community Dentistry Oral Epidemiology*, 30, 286-95.
17. Thomas, G, Goldberg, J.H., Cannon, D., and **Hillis**, S.L. (2002). Surface Textures Improve the Robustness of Stereoscopic Depth Cues. *Journal of the Human Factors and Ergonomics Society*, 44, 157-170.
18. Catney, M.R., **Hillis**, S.L., Wakefield, B., Simpson, L., Domino, L., Keller, S., Connelly, T., White, M., Price, D., Wagner, K. (2001). Relationship between the incidence of phlebitis/infiltration rates and the frequency of changing peripheral intravenous (IV) catheters. *Journal of Infusion Nursing*, 24, 332-341.
19. Lutgendorf, S.K., Tripp-Reimer, T., Harvey, J., Marks, G., Hong, S-Y., **Hillis**, S.L., & Lubaroff, D. (2001). Effects of Housing Relocation on Immunocompetence and Psychosocial Functioning in Older Adults. *Journals of Gerontology: Medical Sciences*, 56A, M97-M105
20. Davies, K.R., Schneider, G.B., Southard, T.E., **Hillis**, S.L., Wertz, P.W., and Finkelstein, M. (2001). Deciduous canine and permanent lateral incisor differential root resorption. *American Journal of Orthodontics and Dentofacial Orthopedics*, 120:339-347.
21. Southard, T.E., Southard, K.A., Krizan, K.E., **Hillis**, S.L., Haller, J.W., Keller, J., and Vannier, M.W. (2000). Mandibular bone density and fractal dimension in

- rabbits with induced osteoporosis, *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*, 89:244-9.
22. Haselton, D.R., Diaz-Arnold, A.M., and **Hillis**, S.L.(2000). Clinical assessment of high-strength, all-ceramic crowns, *Journal of Prosthetic Dentistry*, 83, 396-401.
 23. Herron, R.E. & **Hillis**, S.L. (2000). The Impact of the Transcendental Meditation Program on Government Payments to Physicians in Quebec: An Update, *Science of Health Promotion*, 14, 284-291.
 24. Pedersen, D.R., Brown, T. D., **Hillis**, S. L., Callaghan, J. J. (1998). Prediction of long-term polyethylene wear in total hip arthroplasty, based on early wear measurements made using digital image analysis, *Journal of Orthopaedic Research*, 16, 557-563.
 25. Leslie, L. R., Southard, T. E., Casco, J. S., Southard, K. A., Jakobsen, J. R., Tolley, E. A., **Hillis**, S. L., Carolan, C., Logue, M. W. (1998). Prediction of mandibular growth rotation: assessment of the Skieller, Bjork, and Linde-Hansen method, *American Journal of Orthodontics and Dentofacial Orthopedics*, 114, 659-67.
 26. Suls, J., Green, P., **Hillis**, S. L. (1998). Emotional reactivity to everyday problems, affective inertia, and neuroticism, *Personality and Social Psychology Bulletin*, **24**, 127-136.
 27. Keenan, G. M., Cooke, R., **Hillis**, S. L. (1998). Norms and nurse management of conflicts: keys to understanding nurse-physician collaboration, *Research in Nursing and in Health*, **21**, 59-72.
 28. Shaver, S. M., Brown, T. D., **Hillis**, S. L., Callaghan, J. J. (1997). Digital edge detection measurement of polyethylene wear in total hip arthroplasty, *The Journal of Bone and Joint Surgery*, **79-A**, 690-700.
 29. MacLean, C. R. K., Walton, K. G., Wenneberg, S. R., Levitsky, D. K., Mandarino, J. V., Waziri, R., **Hillis**, S. L., Schneider, R. H. (1997). Effects of the Transcendental Meditation Program on Adaptive Mechanisms: Changes in Hormone Levels and Responses to Stress after Four Months of Practice, *Psychoneuroendocrinology*, **22**, 277-295.
 30. Southard, T. E., Southard, K. A., Jakobsen, J. R., **Hillis**, S. L., Najim, C. A. (1996). Fractal dimension in radiographic analysis of alveolar process bone, *Oral Surgery, Oral Medicine, Oral Pathology, and Oral Radiology*, **82**, 569-576.
 31. Herron, R. E., **Hillis**, S. L., Mandarino, J. V., Orme-Johnson, D. W., Walton, K. G. (1996). The impact of the Transcendental Meditation Program on government

- payments to physicians in Quebec, *American Journal of Health Promotion*, **10**, 208-216.
32. Haaga, D. A. F., Davison, G.C., McDermut, W., **Hillis**, S. L. Twomey, H. B. (1993). "State of mind" analysis of the articulated thoughts of ex-smokers, *Cognitive Therapy and Research*, **17**, 427-439.
 33. Furst, D. E., Clements, P. J., Lachenbruch, P. A., **Hillis**, S. L., Miller, B. L., Sterz, G., Paulus, H. E. (1989). Immunosuppression with chlorambucil versus placebo for scleroderma, *Arthritis and Rheumatism*, **32**, 584-593.

Book Chapters

1. **Hillis**, S. L. & Woolson, R. F. (2002). An Analysis of Categorized Data: Use of the Odds Ratio as a Measure of Association, chapter in *Textbook of Psychiatric Epidemiology, Second Edition*, ed. by Tsuang, M., and , Tohen, M., 35-64. New York: Wiley-Liss, Inc.
2. **Hillis**, S. L. & Woolson, R. F. (1995). *An Analysis of Categorized Data: Use of the Odds Ratio as a Measure of Association*, in *Textbook of Psychiatric Epidemiology*, ed. by Tsuang, M., Tohen, M., & Zahner, G., 55-80. New York: Wiley.

Recent Presentations:

1. **Hillis** S.L., Berbaum K.S. Recent Developments in the Dorfman-Berbaum-Metz (DBM) Procedure for Multireader ROC study analysis. Montreal, Canada, XXIII International Biometric Conference, July 16-21, 2006
2. **Hillis** S.L, Berbaum K.S. Recent Developments in the Dorfman-Berbaum-Metz (DBM) Procedure for Multireader ROC study analysis. Tampa, FL, TX, International Biometric Society ENAR Spring Meeting, March 26-29, 2006
3. **Hillis** S.L, Berbaum K.S. Recent Developments in the Dorfman-Berbaum-Metz (DBM) Procedure for Multireader ROC study analysis. Windermere, UK, Medical Image Perception Conference XI, September 27-30, 2005.
4. **Hillis** S.L. Resolving the degrees of freedom issue concerning the Dorfman-Berbaum-Metz and Obuchowski-Rockette methods for receiver operating characteristic (ROC) data. Houston, TX, International Biometric Society ENAR Spring Meeting, March 20-23, 2005.

Dissertation Supervision:

Supervised Nihaya Awartani's dissertation, completed in 1991 for the Mathematics and Statistics Department, The American University, Washington, D.C. Dr. Awartani presently is an assistant professor in the Department of Mathematics, An-Najah University, Nablus, West Bank.

Research Support:

Ongoing Research Support

1 R01 NR009448 Gardner (PI) 08/01/2007 – 07/30/2012
NIH/NINR
Bioburden Predictors of Diabetic Ulcer Complications
The major goals of the project are to 1) determine the prognostic efficacy of a) high microbial load, b) microbial diversity, and c) *Staphylococcus aureus* and anaerobes based on swab cultures obtained using Levine's technique in predicting infection-related complications among diabetic foot ulcers without signs of clinical infection; and 2) determine the extent to which combining microbiological dimensions will improve the predictive ability above any single dimension.
Role: Biostatistician (10%)

HPF 04-149 Rosenthal (PI) 07/2004-6/2009
VA HSR&D
Center for Research in the Implementation of Innovative Strategies in Practice (CRIISP)
This award will enhance the infrastructure for health service research at the Iowa City VA Medical Center in the area of implementing evidence into practice.
Role: Biostatistician

1 P50 AR-48939-01 Buckwalter (PI) 09/16/2002 – 08/31/2007
NIH/NIAMS
Pathogenesis – Prevention of Post-Traumatic OA
A multidisciplinary group of experienced investigators in clinical, bioengineering, cell and molecular biology research are working to advance understanding of the pathogenesis of post-traumatic OA and to develop innovative approaches for preventing and treating this disease.
Role: Biostatistician (15%)

R01 EB000863 Berbaum (PI) 04/01/2007-03/31/2011
NIH/NIBIB
Improved DBM ROC Methods for Diagnostic Radiology
The goal is to extend the range of application and improve the effectiveness of the Dorfman-Berbaum-Metz method for analyzing multireader ROC data
Role: Statistician (40%)

IIR 04-201 (Christensen) 04/2007 - 12/2009
VA HSR&D
Patient & Provider Attitudes in the Healthcare Context

The general object is to assess patient and provider attitudes toward care and to examine the degree to which similarity of attitudes held by VA patients being treated for comorbid hypertension and diabetes and by their primary care providers. Is a determinant of patient satisfaction, patient regimen adherence and adequacy of diabetic and blood pressure control.

Role: Biostatistician (10%)

IMV 04-066-1 (Kaboli)

01/2006 - 12/2008

VA HSR&D

Implementing Evidence Based Treatment of Hypertension

This grant is to study the efficacy of a patient-centered intervention to activate patients to engage their providers in a discussion of anti-hypertensive therapy and to improve the use of thiazide diuretics.

Role: Biostatistician (5% years 1-2, 10% year 3)

Katz (PI)

01/01/07-12/31/08)

AHA Heartland Affiliate

Brief Intervention to Promote Cardiovascular Risk Reduction in Patient Admitted to Chest Pain Observation Units.

The primary aims of the study are 1) to determine the effectiveness of a brief counseling intervention in increasing chest pain observation unit patients' readiness to change cardiovascular risk-related behaviors (diet, exercise, and smoking) and 2) to determine whether the study intervention leads to changes in cardiovascular risk behaviors (diet, physical activity, and smoking cessation).

Role: Biostatistician (5% year 2)

R21 (Katz)

12/1/07-11/30/09

NIH/NIDA

The Effectiveness of Smoking Cessation Guidelines in the Emergency Department

The specific aims of this study are 1) to determine the feasibility of implementing a nurse-initiated smoking cessation intervention in the ED and its impact on the delivery of brief cessation counseling, and 2) to determine whether the intervention, which couples brief cessation counseling in the ED with the delivery of proactive telephone counseling and free nicotine replacement therapy by the Iowa Quitline, increases 6-month quit rates.

Role: Biostatistician (5% year 2)

Completed Research

NRI-03-312 Wakefield (PI)

7/04 - 6/07

VA HSR&D

Effectiveness of Care Coordination in Managing Medically Complex Patients

This study seeks to evaluate the efficacy of a home telehealth intervention for veterans enrolled in Primary Care Clinic with co-morbid diabetes and hypertension. Using a randomized controlled design, 330 patients will be enrolled. Intervention patients will use a messaging device to transmit clinical and health status data to a nurse case manager over 6 months. Nurses will monitor patients and, if necessary, implement interventions

according to a standard protocol. Outcomes include HbA1c, blood pressure, quality of life, knowledge, self-efficacy, and adherence to medication.

Role: Biostatistician (10%)

R01 EB000863 Berbaum (PI) 04/01/2003-03/31/2007
NIH/NIBIB

Improved DBM ROC Methods for Diagnostic Radiology

The overall goal of this grant is to improve DBM methodology by developing a modular architecture that makes use of various forms of ROC analysis, including "proper" ROC models, joint detection and localization analysis, and alternative free-response operating characteristic analysis.

Role: Statistician

IIR-03-207-1 Vaughan Sarrazin (PI) 5/1/04 - 4/30/06
VA/HSR&D

Estimating the Magnitude of Unmeasured Risk in VA Patients

This two-year study will identify whether VA utilization is an independent risk factor for poor outcomes. Specifically, the study will: 1) compare outcomes of VA users and other patients who receive care in private sector hospitals for 10 high-volume medical and surgical diagnoses, adjusting for severity of illness; and 2) identify characteristics of VA users that are associated with poor outcomes and estimate the prognostic impact of these characteristics. The study will use Medicare administrative data, VA administrative data, and other existing data.

Role: Biostatistician

1 R03 AG026585-01 Hoffman (PI) 09/01/2005 - 08/31/2006
NIH/NIA

Weight, depression and functional status change pathways

This project examines the relationship between changes in depressive symptoms and weight changes in a cohort of aging adults enrolled in the Health and Retirement Study (HRS). The role of functional status as a mediator or moderator of this relationship also will be assessed.

Role: Biostatistician

R01 CA-62362 Berbaum (PI) 7/1/1997-4/30/2003
NIH/NIBIB

New ROC Methodology for Evaluation of Diagnostic Systems

The broad, long-term objective of this project was to assess, perfect, and extend the useful range of application of the Dorfman/Berbaum/Metz multireader ROC methodology for the evaluation of accuracy of diagnostic imaging systems.

Role: Statistician

R01 DE09551 Levy (PI) 4/01/01 - 3/31/05
NIH

Longitudinal Study of Fluoride Exposures and Dental Fluorosis

The broad long-term objective of this study was to provide the scientific basis necessary to assure that fluorides can be used appropriately for maximum public health caries prevention with minimal dental fluorosis risk.

Role: Statistician