

Kamakshi Lakshminarayan

IDENTIFYING INFORMATION

Academic Rank:

Assistant Professor
Epidemiology & Community Health
School of Public Health
University of Minnesota

Assistant Professor
Neurology
School of Medicine
University of Minnesota

Graduate Faculty member, Clinical Research MS program; faculty member, Epidemiology MPH program; Program Director MS in Clinical Research

Degrees Awarded

Degree	Institution	Date Degree Granted
MS Health Services Research & Policy	University of Minnesota	2011
Postdoctoral Fellow Clinical Research Training	University of Minnesota	2004
Clinical Residency Training	University of Minnesota	2002
PhD Cognitive Science	University of California – Irvine	1995
MBBS	Jawaharlal Institute of Postgrad. Medical Education & Research, India	1989

Licenses

ABPN Board Certification in Neurology and Pediatric Neurology 2004, 2014: 52780.
Vascular Neurology Sub-specialty Certification 2008: 529

Employment

University of Minnesota, Twin Cities
Assistant Professor 2010 – Present (Epidemiology & Comm. Hlth)
Assistant Professor 2004 – Present (Neurology)
Adjunct Assistant Professor 2005 – 2009 (Epidemiology & Community Hlth)
Fellow 2002 – 2004 (Neurology)
Resident Physician 1998 – 2002 (Neurology)
Administrative Chief Resident 2001 – 2003 (Neurology)
Automated Reasoning, Honeywell Technology Center, Minneapolis, MN.
Senior Research Scientist 1996 - 1998
Research Associate 1994 - 1995

VA Medical Center, PET Imaging Center, Minneapolis, MN.
Research Associate 1996 - 1997

University of California, Dept. of Cognitive Sciences, Irvine, CA.
Research Assistant 1991 - 1993
Teaching Assistant 1989 – 1991

Current Membership in Professional Organizations
American Heart Association - Stroke Council
American Academy of Neurology

RESEARCH AND SCHOLARSHIP

Honors and Awards:

2011 – Fellow of the American Heart Association – Stroke Council

Clinical Research Fellowship Award
2002-2004 American Academy of Neurology

Shapiro Memorial G4 Resident Award
2002 University of Minnesota, Minneapolis, MN

Peterson Memorial G3 Resident Award
2001 University of Minnesota, Minneapolis, MN

G2 Resident Award
2000 University of Minnesota, Minneapolis, MN

Regents Tuition Fellowship Award
1989-1990 University of California, Irvine, CA

Editorships/Journal Reviewer Experience

Journal of the American Medical Association (JAMA)
American Journal of Kidney Disease (AJKD)
Biomed Central (BMC) Cardiovascular Disease
American Heart Association – International Stroke Conference: Abstract Reviewer
PLOS: Public Library of Science
Journal of American College of Cardiology (JACC)
American Heart Journal
Physical Medicine & Rehabilitation
Circulation
Circulation: Cardiovascular Quality & Outcomes
Stroke
Hypertension

American Journal of Epidemiology
Journal of Clinical Epidemiology
Applied Health Economics & Policy

Research and Training Grants

Principal Investigator
1R21HS021794-01 Lakshminarayan (PI) 9/30/12-9/29/14
AHRQ
Promoting Self-management in Stroke Survivors Using Health IT
Direct costs: 298,577

Principal Investigator of sub-award to University of Minnesota
1U58DP000857 Tsai (PI) 06/25/12-06/29/15
CDC, Minnesota Department of Health
Minnesota Stroke Registry – Paul Coverdell National Acute Stroke Care Registry
Direct Costs: 49,826

Co-Investigator
Anne Murray
NIH, NIA – R01 AG037551-01A1
Brain in Kidney Disease 8/01/11-cont.
Direct Costs: 450,000

Co-investigator
X1003900/HHSN268201100002C Virnig (PI) 10/01/10-09/30/15
Health Partners Research Foundation
(Prime: Ohio State Univ./NIH/NHLBI)
Health Outcomes Research using Women's Health Initiative (WHI)-Medicare Linked Data

Principal Investigator of Sub-award from City of Hope Beckman Research Center
Kamakshi Lakshminarayan
NIH, NINDS – 1R21NS075608
Modifiable risk factors in stroke incidence and mortality among women 7/01/11-cont.
Direct Costs: 336,001; Sub-award direct costs – 20,121/year for 2 years

Principal Investigator
151816 Lakshminarayan (PI) 8/1/2012-7/31/2013
University of Minnesota CTSI – Community Collaborative Pilot Grant
Medical and Financial Impacts of Cognitive Screening in Elderly Community People
Direct costs: 30,000

Principal Investigator
Kamakshi Lakshminarayan
NIH, NINDS - 1K23NS051377
Improving Evidence-Based Quality of Care in Acute Stroke 4/1/07-10/31/2012
Direct Costs: 757,425

Co-Investigator
Albert Tsai
CDC, Minnesota Department of Health - 1U58DP000857
Minnesota Stroke Registry
Paul Coverdell Nat. Acute Stroke Care Registry 7/1/07-6/30/2012
Direct Costs: 500,000/ year for 5 years

Scholar
Russell V. Luepker
NIH/NCRR 1K12RR023247
Career Advancement Program for Clinical Research Scholars 7/1/06-4/30/07
Improving Evidence-Based Quality of Care in Acute Stroke

Principal Investigator
Kamakshi Lakshminarayan
Academic Health Center - Seed Grant 2005-43
Algorithms for identification of acute stroke cases in Medicare data 7/1/05-6/30/06

Co-Investigator
Russell V. Luepker
NIH/NINDS - R01 NS39028-05
Minnesota Stroke Survey (MSS) 9/30/00-6/30/06

Co-Investigator
Cathy Borbas
AHRQ - U18 HS11073-01
Project for the Improvement in Stroke Care Management in MN
(PrISMM) 10/1/00-5/30/05

Co-Investigator
Marshall McBean
Centers for Medicare & Medicaid Services
Phase I of ResDAC Activities in Support of Section 723 of the Medicare Modernization Act

Publications

Refereed Journal Articles

1. **Lakshminarayan K**, Larson JC, Virnig B, Fuller C, Allen NB, Limacher M, Winkelmayr WC, Safford MM, Burwen DR. Comparison of Medicare Claims Versus Physician Adjudication for Identifying Stroke Outcomes in the Women's Health Initiative. *Stroke* 2014; 45 (3): 815-21. Role: Conceptualization, Creating Analytic Framework, Directing Data Analysis, Writing Manuscript with collaborators
2. Abraham JM, Larson J, Chung MK, Curtis AB, **Lakshminarayan K**, Newman JD, Perez M, Rexrode K, Shara NM, Solomon AJ, Stefanick ML, Torner JC, Wilkoff BL, Wassertheil-Smoller S. Does CHA2DS2-VASc Improve Stroke Risk Stratification in Postmenopausal Women with Atrial Fibrillation? *Am J Med* 2013; Oct 17. Epub ahead of Print. PMID: 24139523 Role: Contributed to manuscript editing, interpretation of data analysis, setting some of the analytic framework.
3. Shufelt CL, Merz CN, Prentice RL, Pettinger MB, Rossouw JE, Aroda VR, Kaunitz AM, **Lakshminarayan K**, Martin LW, Phillips LS, Manson JE. Hormone Therapy dose, formulation, route of delivery and risk of Cardiovascular Events in Women: Findings from the Womens Health Initiative Observational Study. *Menopause* 2013; Sept 16. Epub ahead of Print. PMID 24045672 Role: Contributed to manuscript editing, interpretation of data analysis, setting some of the analytic framework, provided expertise as WHI stroke adjudicator on setting up some of the data analysis and interpretation of results.
4. Jones SB, Sen S, **Lakshminarayan K**, Rosamond WD. Post-stroke Outcomes Vary by Pathogenic Subtype in the Atherosclerosis Risk in the Communities Study. *Stroke* 2013; 44(8): 2307-2010. PMID: 23686979 Role: Contributed to manuscript editing, interpretation of data analysis, setting some of the analytic framework, provided expertise as WHI stroke adjudicator on setting up some of the data analysis and interpretation of results.
5. Murray AM, Seliger S, **Lakshminarayan K**, Herzog CA, Solid CA. Incidence of Stroke Before and After Dialysis Initiation in Older Patients. *J Am Soc Nephrol.* 2013; 24 (7): 1166-73. PMID: 23620399 Role: Contributed to data analysis, interpretation of analysis and manuscript editing.
6. **Lakshminarayan K**, Rostambeigi N, Fuller CC, Peacock JM, Tsai AW. Impact of an Electronic Medical Record-Based Clinical Decision Support Tool for Dysphagia Screening on Care Quality. *Stroke.* 2012; Oct 2: [Epub ahead of print] NIHMSID: NIHMS 414619 (Awaiting PMCID) Role: Designed study, directed data analysis, wrote manuscript

7. Tekle WG, Chaudhry SA, Hassan AE, Peacock JM, **Lakshminarayan K**, Tsai A, Luepker R, Anderson DC, Qureshi AI. Utilization of intravenous thrombolysis in 3-4.5 hours: analysis of the Minnesota Stroke Registry. *Cerebrovascular Disease* 2012; 34: 400-405. Role: Contributed to data interpretation, part of grant that funded Minnesota Stroke Registry, manuscript revision.
8. Rossouw JE, Johnson KC, Pettinger M, Cushman M, Sandset PM, Kuller L, Rosendaal F, Rosing J, Wasserthal-Smoller S, Martin LW, Manson JE, **Lakshminarayan K**, Merino JG, Lynch J. Tissue Factor Pathway Inhibitor, Activated Protein C Resistance and Risk of Ischemic Stroke due to Postmenopausal Hormone Therapy. *Stroke* 2012; 43(4) 952-7. PMID: PMC3314718. Role: Contributed to stroke expertise, data interpretation, manuscript editing
9. Qureshi AI, Chaudhry SA, Rodriguez GJ, Suri MF, **Lakshminarayan K**, Ezzeddine MA. Outcome of a “Drip-and-Ship” paradigm among Patients with Acute Ischemic Stroke: Results of a Statewide Study. *Cerebrovascular Disease Extra* 2012 Winter 2(1): 1-8 Role: Contributed to data analysis and interpretation
10. Georgiadis AL, Cordina SM, Vazquez G, Tariq N, Suri MF, **Lakshminarayan K**, Adams HP, Qureshi AI. Aspirin Treatment Failure and risk of recurrent stroke and death among patients with ischemic stroke. *J Stroke & cerebrovascular Disease* 2011; August 9; Epub ahead of print. Role: Contributed to methods and manuscript review and editing.
11. Qureshi AI, Chaudhry SA, Hassan AE, Zacharatos H, Rodriguez GJ, Suri MF, **Lakshminarayan K**, Ezzeddine MA. Thrombolytic Treatment of Patients with Acute Ischemic Stroke Related to Underlying Arterial Dissection in the United States. *Archives of Neurology* 2011; 68(12) 1536-42. Role: Contributed to methods and manuscript review and editing.
12. **Lakshminarayan K**, Schissel C, Anderson DC, Vazquez G, Jacobs DR Jr, Ezzeddine M, Luepker RV, Virnig BA. Five-Year Rehospitalization Outcomes in a Cohort of Patients with Acute Ischemic Stroke: Medicare Linkage Study. *Stroke* 2011; Jun;42(6):1556-62 Impact factor 7.041 Role: This represents results of K23 grant. Designed study, directed analysis, interpreted results, wrote manuscript.
13. Zacharatos H, Hassan AE, Vazquez G, Hussein HM, Rodriguez GJ, Suri MF, **Lakshminarayan K**, Ezzeddine MA, Qureshi AI. Comparison of Acute Nonthrombolytic and Thrombolytic Treatments in Ischemic Stroke Patients 80 Years or Older. *Am J Emerg Med* 2011; 30 (1) 158-164. Role: Contributed to methods and manuscript review/editing.
14. Maiser SJ, Georgiadis AL, Suri MF, Vazquez G, **Lakshminarayan K**, Qureshi AI. Intravenous Recombinant Tissue Plasminogen Activator Administered After 3 h

Following Onset of Ischaemic Stroke: A Meta-analysis. *Int J Stroke* 2011, 6(1):25-32.
Role: Contributed to methods and manuscript review/editing.

15. **Lakshminarayan K**, Tsai AW, Tong X, Vazquez G, Peacock JM, George MG, Luepker RV, Anderson DC. Utility of Dysphagia Screening Results in Predicting Poststroke Pneumonia. *Stroke* 2010; 41(12): 2849-54. Impact factor 7.041
Role: Designed study, directed analysis, wrote manuscript. This was a collaborative effort with the CDC and MDH and used data from the 6-state Paul Coverdell Acute Stroke Registry.
16. Tonarelli SB, Tibbs M, Vazquez G, **Lakshminarayan K**, Rodriguez GJ, Qureshi AI. Accuracy of the New ICD9-CM Code for “Drip-and-Ship” Thrombolytic Treatment in Patients with Acute Ischemic Stroke. *J Stroke and Cerebrovascular Diseases* 2012; 21(2): 121-3. Role: Contributed to methods and statistical analysis and manuscript review /editing.
17. Qureshi AI, Tariq N, Vazquez G, Novitzke J, Suri MF, **Lakshminarayan K**, Haines SJ. Low Patient Enrollment in Multicenter Randomized Clinical Trials of Cerebrovascular Diseases: Associated Factors and Impact on Trial Outcomes. *J Stroke and Cerebrovascular Diseases* 2012; 21(2): 131-142.
Role: Contributed to methods and statistical analysis and manuscript review/editing.
18. Qureshi AI, Vazquez G, Tariq N, Suri MF, **Lakshminarayan K**, Lanzino G. Impact of International Subarachnoid Aneurysm Trial Results on Treatment of Ruptured Intracranial Aneurysms in the United States. *J of Neurosurgery* 2011; 114(3): 834-841. Impact Factor 3.346
Impact Factor 3.346
Role: Contributed to methods and statistical analysis and manuscript review/editing.
19. Feng W, Vazquez G, Suri MF, **Lakshminarayan K**, Qureshi AI. Repeated-Measures Analysis of the NINDS rt-PA Stroke Trial. *J Stroke and Cerebrovascular Diseases* 2011; 20(3): 241-6. Role: Contributed to methods and statistical analysis and manuscript review/editing.
20. Maud A, Vazquez G, Nyman JA, **Lakshminarayan K**, Anderson DC, Qureshi AI. Cost-effectiveness Analysis of Protected Carotid Artery Stent Placement versus Endarterectomy in High-risk Patients. *J Endovascular Therapy*. 17(2) 224-229.
Role: Contributed to methods and statistical analysis and manuscript review and editing
21. **Lakshminarayan K**, Borbas C, McLaughlin B, Morris NE, Vazquez GV, Luepker RV, Anderson DC. A Cluster-Randomized Trial to Improve Stroke Care in Hospitals. *Neurology*. 2010 74(20): 1634-1642
Role: Validated data, defined quality of care indicators, collaborated on analysis, interpreted results, and wrote and revised manuscript with input and intellectual contribution from co-authors and statistical analysis by Vazquez.

22. **Lakshminarayan K**, Anderson DC, Jacobs DR, Barber CA, Luepker RV. Stroke Rates 1980-2000: The Minnesota Stroke Survey. *American Journal of Epidemiology*. 2009; 169(9) 1070-8.
Role: Validated data, adjudicated outcomes, directed analysis, interpreted results and wrote manuscript with input and intellectual contributions from co-authors.
23. Maud A, **Lakshminarayan K**, Suri MFK, Vazquez G, Lanzino G, Qureshi AI. Cost-effectiveness Analysis of Endovascular versus Neurosurgical Treatment for Ruptured Intracranial Aneurysms. *J of Neurosurgery*. 2009; 110(5) 880-886.
Role: Contributed to methods and statistical analysis and manuscript review and editing.
24. Georgiadis AL, Memon AZ, Shah QA, Vazquez G, Suri MF, **Lakshminarayan K**, Qureshi AI. Comparison of Partial (0.6 mg /kg) versus Full-Dose (0.9 mg/kg) Intravenous Recombinant Tissue Plasminogen Activator Followed by Endovascular Treatment for Acute Ischemic Stroke: A Meta-Analysis *J Neuroimaging*, 2011 21(2); 113-20.
Role: Contributed to methods and manuscript review and editing.
25. Tonarelli SB, Vazquez G, Peacock JM, Luepker RV, Tsai AW, Zacharatos H, **Lakshminarayan K**. Stroke Prevention: The Best Outcome after a Transient Ischemic Attack. Results from the Minnesota Stroke Registry and Opportunities to Improve Care. *Journal of Vascular and Interventional Neurology*. 2008; 1(4): 87-88.
Role: Participated in analysis, manuscript review and editing.
26. Vazquez G, Suri MF, **Lakshminarayan K**, Memon MZ, Ezzeddine M, Qureshi AI. Prevalence of elevated blood pressure in adult patients presenting to the emergency department. *Journal of Vascular and Interventional Neurology*. 2008; 1(2): 46-49.
Role: Contributed intellectually and to manuscript review and editing.
27. **Lakshminarayan K**, Peacock JM, Luepker RV, Tsai AW. Thrombolytic Treatment after Acute Ischemic Stroke. Results from the Minnesota Stroke Registry and Opportunities to Improve Care. *Journal of Vascular and Interventional Neurology*. 2008; 1(3): 87-88
Role: Directed analysis and wrote manuscript.
28. Suri MF, **Lakshminarayan K**, Qureshi AI. Catheter-based Angiography in Patients with Cervical Internal Carotid Artery Occlusion: Is it Worth the Cost? *J Neuroimaging*. 2008 18(4): 353-354
Role: Contributed intellectually and to manuscript review and editing.
29. Burns TC, Rodriguez GJ, Patel S, Hussein H, Georgiadis AL, **Lakshminarayan K**, Qureshi AI. Endovascular interventions following intravenous thrombolysis may

improve survival and recovery in patients with acute ischemic stroke. *Am J Neuroradiol.* 2008 Nov;29(10):1918-24.

Role: Contributed to methods and manuscript review and editing.

30. **Lakshminarayan K**, Anderson DC, Herzog CA, Qureshi AI. Clinical Epidemiology of Atrial Fibrillation in the United States and Related Cerebrovascular Events. *The Neurologist.* 2008; 14(3):143-50.

Role: Reviewed literature, wrote manuscript.

31. Suri MF, Ezzeddine MA, **Lakshminarayan K**, Divani AA, Qureshi AI. Validation of two different grading schemes to identify asymptomatic carotid artery stenosis in general population. *J Neuroimaging.* 2008; 18 (2): 142-7.

Role: Contributed to methods, manuscript review and editing.

32. **Lakshminarayan K**, Anderson DC, Borbas C, Duval S, Luepker RV. Blood Pressure Management in Acute Ischemic Stroke. *J Clinical Hypertension* 2007; 9(6) 444-53.

Role: Data validation, performed design of study and data analysis, wrote manuscript.

33. **Lakshminarayan K**, Solid CA, Collins AJ, Anderson DC, Herzog CA. Atrial fibrillation and stroke in the General Medicare Population: A Ten-Year Perspective (1992-2002). *Stroke.* 2006 37(8): 1969-74.

Role: Directed modeling and data analysis, wrote manuscript.

34. **Lakshminarayan K**, Anderson DC, Gensinger RA. Using a stroke database to develop an optimal vascular imaging protocol for ischemic stroke. *Journal of Stroke and Cerebro-vascular Diseases*, 2004; 13(3): 113-117. Impact Factor: Citations:

Role: Performed data analysis, conceived design, wrote manuscript.

35. Hooker J, Eccher M, **Lakshminarayan K**, Souza-Lima FC, Rejdak K, Kwiecinski H, Corea F, Lima JM. Neurology training around the world. *Lancet Neurology* 2003; 2(9): 572-9. Impact Factor: 13.251 Citations: 8

Role: Wrote one section of the manuscript.

36. **Lakshminarayan K**, Anderson DC. Reducing the risk of stroke [Comment]. *JAMA* 2003; 289(15): 1928.

Role: Wrote comment.

37. **Lakshminarayan K**, Holloway S, Muley S. Recurrent orthostatic numbness with carotid stenosis and beta-blocker use. *Journal of Stroke and Cerebrovascular Diseases*, [Case Report] 2003; 12(3): 160-161.

Role: Wrote report.

38. Rehm K, **Lakshminarayan K**, Frutiger S, Schaper KA, Sumners DW, Strother SC, Anderson JR, & Rottenberg DA. A symbolic environment for visualizing activated foci in

functional neuroimaging datasets, *Medical Image Analysis* 1998; 2(3): 215-226.
Role: Ran the experiment, wrote the report.

39. **Lakshminarayan K**, Harp SA, Samad T. Imputation of missing data in industrial databases, *Applied Intelligence* 1999; 11(3):259-275.

Role: Conducted analysis, wrote report.

Consortium Contributions

1. Multiple Authors. NHLBI Grand Opportunity Exome Sequencing Project. Whole-exome sequencing identifies rare and low frequency coding variants associated with LDL cholesterol. *Am J Hum Genet.* 2014 94(2):233-45.
2. Rosenthal EA, Ranchalis J, Crosslin DR, Burt A, Brunzell JD, Motulsky AG, Nickerson DA; NHLBI GO Exome Sequencing Project, Wijsman EM, Jarvik GP. *Am J Hum Genet.* 2013 93(6):1035-45. Joint linkage and association analysis with exome sequence data implicates SLC25A40 in hypertriglyceridemia.
3. Guo DC, Regalado E, Casteel DE, Santos-Cortez RL, Gong L, Kim JJ, Dyack S, Horne SG, Chang G, Jondeau G, Boileau C, Coselli JS, Li Z, Leal SM, Shendure J, Rieder MJ, Bamshad MJ, Nickerson DA; GenTAC Registry Consortium; National Heart, Lung, and Blood Institute Grand Opportunity Exome Sequencing Project, Kim C, Milewicz DM. Recurrent gain-of-function mutation in PRKG1 causes thoracic aortic aneurysms and acute aortic dissections. *Am J Hum Genet.* 2013;93(2):398-404.
4. O'Connor TD, Kiezun A, Bamshad M, Rich SS, Smith JD, Turner E; NHLBIGO Exome Sequencing Project; ESP Population Genetics, Statistical Analysis Working Group, Leal SM, Akey JM. Fine-scale patterns of population stratification confound rare variant association tests. *PLoS One.* 2013; 8(7):e65834.
5. Johnsen JM, Auer PL, Morrison AC, Jiao S, Wei P, Haessler J, Fox K, McGee SR, Smith JD, Carlson CS, Smith N, Boerwinkle E, Kooperberg C, Nickerson DA, Rich SS, Green D, Peters U, Cushman M, Reiner AP; NHLBI Exome Sequencing Project. Common and rare von-Willebrand factor (VWF) coding variants, VWF levels, and factor VII levels in African Americans: the NHLBI Exome Sequencing Project. *Blood.* 2013; 122(4):590-7.
6. Norton N, Li D, Rampersaud E, Morales A, Martin ER, Zuchner S, Guo S, Gonzalez M, Hedges DJ, Robertson PD, Krumm N, Nickerson DA, Hershberger RE; National Heart, Lung, and Blood Institute GO Exome Sequencing Project and the Exome Sequencing Project Family Studies Project Team. Exome sequencing and genome-wide linkage analysis in 17 families illustrate the complex contribution of TTN truncating variants to dilated cardiomyopathy. *Circ Cardiovasc Genet.* 2013; 6(2):144-53.
7. Fu W, O'Connor TD, Jun G, Kang HM, Abecasis G, Leal SM, Gabriel S, Rieder MJ, Altshuler D, Shendure J, Nickerson DA, Bamshad MJ; NHLBI Exome Sequencing Project, Akey JM. Analysis of 6, 515 exomes reveals the recent origin of most human protein-coding variants. *Nature.* 2013;493(7431):216-20.
8. Boileau C, Guo DC, Hanna N, Regalado ES, Detaint D, Gong L, Varret M, Prakash SK, Li AH, d'Indy H, Braverman AC, Grandchamp B, Kwartler CS, Gouya L, Santos-Cortez RL, Abifadel M, Leal SM, Muti C, Shendure J, Gross MS, Rieder MJ, Vahanian A, Nickerson DA, Michel JB; National Heart, Lung, and Blood Institute (NHLBI) Go Exome

Sequencing Project, Jondeau G, Milewicz DM. TGFB2 mutations cause familial thoracic aortic aneurysms and dissections associated with mild systemic features of Marfan syndrome. Nat Genet. 2012;44(8):916-21.

9. Emond MJ, Louie T, Emerson J, Zhao W, Mathias RA, Knowles MR, Wright FA, Rieder MJ, Tabor HK, Nickerson DA, Barnes KC; National Heart, Lung, and Blood Institute (NHLBI) GO Exome Sequencing Project; Lung GO, Gibson RL, Bamshad MJ. Exome sequencing of extreme phenotypes. Exome sequencing of extreme phenotypes identifies DCTN4 as a modifier of chronic *Pseudomonas aeruginosa* infection in cystic fibrosis. Nat Genet. 2012; 44(8):886-9.

Book Chapters

1. Luepker RV, **Lakshminarayan K**. Cardiovascular and Cerebrovascular Diseases. Oxford Text Book of Public Health, 2009.
2. **Lakshminarayan K**, Gilson F. An application of a stochastic knowledge structure model, [Chapter] In: Dowling, Theuns, Roberts (eds.) Recent Progress in Mathematical Psychology New Jersey, Lawrence Erlbaum Associates, 1998, 155-172.

Abstracts/Posters/Oral Conference Presentations

1. **Lakshminarayan K**, Larson J, Virnig B, Burwen D. Comparison of Medicare Claims vs. Physician Adjudication for Identifying Acute Strokes in the Women's Health Initiative. Accepted. International Stroke Conference 2014.San Diego CA. Moderated Poster Presentation.
2. Fuller C, Banerjee A, Pankow JS, **Lakshminarayan K**. Algorithms for Identification of Acute Stroke Hospitalizations in Medicare Data. Accepted. International Stroke Conference 2014.San Diego CA. Moderated Poster Presentation.
3. Asaithambi G, Tong X, George MG, Tsai AW, Peacock JM, Luepker RV, **Lakshminarayan K**. Acute Stroke Reperfusion Therapy Trends in the Expanded Time Window Era. International Stroke Conference 2014.San Diego CA. Oral Presentation.
4. Wang SS, **Lakshminarayan K**, Elkind ME, Voutsinas J, Lacey J, Zhong C, Ma Huiyan, Woo D, Bernstein L. Physical Activity Reduces Stroke Risk Among Women in the California Teachers Study Cohort. International Stroke Conference 2014.San Diego CA. Moderated Poster Presentation.
5. Burwen DR, Anderson G, Cirillo D, Hlatky M, Lakshminarayan K, Larson J, Limacher M, Margolis K, Mell M, Pettinger M, Prentice R, Ray R, Virnig B, Wu C, Rossouw JE. Comparison of Medicare claims vs. physician adjudication for identifying cardiovascular outcomes in the Women's Health Initiative. Abstract presented at the WHI Investigator Meeting, Seattle, WA, May 2-3, 2013.

6. Burwen DR, Anderson G, Cirillo D, Hlatky M, Lakshminarayan K, Larson J, Limacher M, Margolis K, Mell M, Pettinger M, Prentice R, Ray R, Virnig B, Wu C, Rossouw JE. How well do Medicare Claims Identify Cardiovascular Outcomes in the Women's Health Initiative. Presented at the MESA Steering Committee Meeting, April 24-26 2013.
7. Schissel C, Berger AK, Luepker RV, Steffen LM, Sillah A, Jacobs DR, Anderson DC, **Lakshminarayan K**. Trends in Nine-year Survival of Stroke Patients between 1980 and 2000, The Minnesota Stroke Survey. Epidemiology and Prevention Nutrition, Physical Activity and Metabolism Scientific Sessions 2012, San Diego CA. Moderated Poster Presentation.
8. Filion KB, Sillah A, Luepker RV, **Lakshminarayan K**. Age-Specific Stroke Trends from 1980 to 2000: The Minnesota Stroke Survey. American Heart Association Sessions 2011, Orlando FL; Poster Presentation
9. **Lakshminarayan K**, Schissel C, Berger AK, Qureshi AI, Luepker RV, Anderson DC. Mortality and Rehospitalization Outcomes After Acute Ischemic Stroke: A Comparison to Outcomes After Acute Myocardial Infarction. This is an invited presentation at Best of AHA Specialty Conferences November 2011 in Orlando FL; Chosen as among the top 10% of presentations from the ISC 2011. Poster Presentation.
10. **Lakshminarayan K**, Schissel C, Berger AK, Qureshi AI, Luepker RV, Anderson DC. Mortality and Rehospitalization Outcomes After Acute Ischemic Stroke: A Comparison to Outcomes After Acute Myocardial Infarction. International Stroke Conference 2011, Los Angeles CA. Oral Presentation.
11. **Lakshminarayan K**, Anderson DC, Vazquez GV, Schissel C, Jacobs DR, Luepker RV, Virnig BA. A Comprehensive Profile of Outcomes After Acute Ischemic Stroke. This was an invited presentation at Best of AHA Specialty Conferences November 2010 in Chicago; Chosen as among the top 10% of presentations from the ISC 2010. Poster Presentation.
12. **Lakshminarayan K**, Anderson DC, Vazquez GV, Schissel C, Jacobs DR, Luepker RV, Virnig BA. A Comprehensive Profile of Outcomes After Acute Ischemic Stroke. International Stroke Conference 2010, San Antonio TX. Oral Presentation.
13. **Lakshminarayan K**, Qureshi AI, Tsai AW, Peacock JM, Vazquez GV, Luepker RV. Endovascular Treatment for Acute Ischemic Stroke in general Practice: Practice Patterns and Outcomes.
14. Tonarelli SB, Tibbs M, Vazquez G, Qureshi AI, Rodriguez GJ, **Lakshminarayan K**, Qureshi AI. Accuracy Of The New ICD-9 Code For "Drip-and-ship" Thrombolytic Treatment In Patients With Acute Ischemic Stroke. Presented at the International Stroke

Conference, February 23-26, 2010. San Antonio, Texas, USA. And at the 62nd Annual meeting of the American Academy of Neurology, April 10-17, 2010 Toronto, Canada.

15. Khatri R, Vazquez G, Suri MFK, **Lakshminarayan K**, Qureshi AI. A National Study Comparing Carotid Artery Stent Placement With Carotid Endarterectomy In Octogenarians And Non-Octogenarian Population. Presented at the International Stroke Conference, February 23-26, 2010. San Antonio, Texas, USA. And at the 62nd Annual meeting of the American Academy of Neurology, April 10-17, 2010 Toronto, Canada.
16. Zacharatos H, Khatri R, Qureshi MH, **Lakshminarayan K**, Suri MFK, Qureshi AI. Is Acute Hospitalization Needed for Patients with Transient Ischemic Attacks? Presented at the 62nd Annual meeting of the American Academy of Neurology, April 10-17, 2010 Toronto, Canada.
17. Pawar SA, Suri MFK, **Lakshminarayan K**, Qureshi AI, Ezzeddine MA. Level of Evidence in Current American Stroke Association Guidelines. Presented at the 62nd Annual meeting of the American Academy of Neurology, April 10-17, 2010 Toronto, Canada.
18. Aggarwal HR, Hassan AE, Rodriguez GJ, Suri MFK, **Lakshminarayan K**, Taylor RA, Ezzeddine MA, Qureshi AI. Borderline Elevation of International Normalized Ratio and Use of Intravenous Recombinant Tissue Plasminogen Activator. Presented at the 62nd Annual meeting of the American Academy of Neurology, April 10-17, 2010 Toronto, Canada.
19. Feng W, Vazquez G, Suri MFK, **Lakshminarayan K**, Qureshi AI. Augmented treatment effect: A repeated measure analysis of NINDs rtPA study. Presented at the 62nd Annual meeting of the American Academy of Neurology, April 10-17, 2010 Toronto, Canada.
20. **Lakshminarayan K**, Peacock JM, Luepker RV, Krier BW, Tsai AW. Does Dysphagia Screening Prevent Aspiration Pneumonia after Stroke? International Stroke Conference 2009, San Diego CA. Oral Presentation.
21. **Lakshminarayan K**, Vazquez GV, Borbas C, Luepker RV, Duval S, Anderson DC. A Group-Randomized Trial to Improve Stroke Care in the Community. International Stroke Conference 2009, San Diego CA. Oral Presentation.
22. Maud A, Suri FK, **Lakshminarayan K**, Qureshi AI. Cost-effectiveness analysis of endovascular treatment versus neurosurgical treatment for ruptured intracranial aneurysms in the United States. Stroke 2008; 39(2); 535. International Stroke Conference 2008, New Orleans LA, Oral Presentation; American Academy of Neurology Annual Meeting 2008.

23. **Lakshminarayan K**, Barber CA, Qureshi AI, Ezzeddine MA, Luepker RV. Unchanged Short and Long-term Survival following Sub-arachnoid Hemorrhages Over Two Decades. Results from Minnesota Stroke Survey. *Stroke* 2008; 39(2) 698. International Stroke Conference 2008.
24. Rodriguez GJ, Patel S, Duplessis-Tchida M, Anderson DC, Qureshi AI, **Lakshminarayan K**. Impact of a dedicated stroke response system on in-hospital assessment and outcomes of patients with acute ischemic stroke. *Stroke* 2008; 39(2). 539. International Stroke Conference 2008 New Orleans LA, Oral Presentation; American Academy of Neurology Annual Meeting 2008.
25. Vazquez G, **Lakshminarayan K**, Suri FK, Ezzeddine ME, Qureshi AI. Prevalence of elevated blood pressure in adult patients presenting to the emergency department in the United States. American Academy of Neurology Annual Meeting 2008.
26. Muzaffar SM, Saqqur M, **Lakshminarayan K**, Duplessis-Tchida M, Salam A, Anderson DC. Clinical and Radiographic Predictors of Herniation in Malignant MCA Stroke. [Abstract]. *Stroke* 2006; 37(2): 692. International Stroke Conference 2006.
27. **Lakshminarayan K**, Solid C, Anderson DC, Herzog CA. Validation of the CHADS2 Stroke Risk Classification in Medicare Data. [Abstract]. *Stroke* 2006; 37(2): 671. International Stroke Conference 2006.
28. **Lakshminarayan K**, Zhou X, Barber CA, Steffen LM, Anderson DC, Luepker RV. Trends in Stroke Subtypes: The Minnesota Stroke Survey. *Stroke*. 2005; 36(2): 505. International Stroke Conference, 2005.
29. Steffen LM, **Lakshminarayan K**, Zhou X, Anderson DC, Luepker RV. Trends in seven-year survival of stroke patients: The Minnesota Stroke Survey. *Stroke* 2005; 36(2): 504-505. International Stroke Conference, 2005.
30. **Lakshminarayan K**, Barber CA, Anderson DC, Shahar E, Steffen LM, Luepker RV. Trends in Heparin use after acute ischemic stroke: The Minnesota Stroke Survey. *Stroke*. 2004; 35(1): 335. International Stroke Conference, 2004.
31. **Lakshminarayan K**, Morris N, Boese A, McLaughlin B, Anderson DC, Borbas C, Duval SJ, Luepker RV. Management of hypertension in acute stroke: How often are guidelines followed? *Neurology* 2003; 60: A226. American Academy of Neurology, Annual Meeting, 2003.
32. **Lakshminarayan K**, Anderson DC, Duplessis-Tchida ML, Murakami MM, Apple FS. Association between cardiac troponin I concentration and discharge outcomes in patients

with acute ischemic stroke, Neurology 2002; 58(7), supplement 3. American Academy of Neurology, Annual Meeting, 2002.

33. **Lakshminarayan K**, Harp SA, Samad T, (1999). Imputation of missing data using machine learning techniques, Proceedings of Knowledge Discovery and Data Mining Conference 1996; 140-145.

Patents

Content-based retrieval of series data (Honeywell)
2004 United States Patent 6754388

TEACHING AND ADVISING University of Minnesota

2012 – continuing. Program Director MS in Clinical Research

Course Co-instructor
2011, 2012, 2013 – PubH 6301 Fundamentals of Clinical Research

Course Instructor
2010 – PubH 6305 Introduction to Clinical Research for Healthcare Professionals

Vascular Neurology Curriculum Lecture
2010 – Evidence-base Underlying Stroke Care Performance Measures
2012 – Migraine
2013 – Minnesota Stroke Registry – Opportunities for Research

Vascular Neurology Review Course Lecture
2008, 2009, 2010, 2011 - Epidemiology and Risk Factors for Stroke.

Advances in Cerebrovascular Diseases Lecture
2007 - Neuroepidemiology of stroke.

Stroke – Current Concepts in Medical Management Lecture
2007 - Continuing Dental Education.

Evidence-Based Practice – Course Module
2006 - Developed online EBM course module for Neurology residents.

Pathophysiology of Human Disease Lecture
2004-2007 - PubH 5355: Lecture on Pathophysiology of Stroke

Neurology Resident Stroke Course – Course Module
2004 - Stroke Seminar Organizer

Internal Medicine Resident Stroke Lecture

2004 - Acute Management of Stroke

Neurology Resident Stroke Course Lecture
2003 - Diagnosis of Mechanism in Ischemic Stroke

Internal Medicine Resident Stroke Lecture
2003 - Stroke and the Internist

Physical Medicine and Rehabilitation Lecture
2003 - Stroke Prevention & Treatment

Trauma Tactics Conference Lecture
2002 - Management of Acute Ischemic Stroke

Medical student research projects

Derek Johnson

Medical resident / fellow research projects

Alberto Maud
Sheetal Patel
Gustavo Rodriguez
Haitham Hussain
Ganesh Asaithambi

Masters Thesis Advisor

Lisa Calhoun – Masters Public Health

Masters Thesis Committee

Warren Manyara – Masters Health Service Research & Policy
Young Kwon – MS in Clinical Research

MS Clinical Research Academic Advisor

Terrence Adam
Meredith Adam
Nadir Demirel
Michelle Gleason
Tanya Halvorson
Sameh Hozayen
Renuka Jain
Y Kwon
A Naik
M Partington
P Portschy
Scott Reule
Deanna Teoh

Corrie Vihstadt
Muna Sunni

PhD Thesis Primary Advisor/Co-Advisor
Candace Fuller

PhD Thesis Committee
Preethi David

SERVICE TO THE DISCIPLINE/PROFESSION

Professional Organizations

2014 – Moderator of the Outcomes & Policy Track of the International Stroke Conference (2014)
2011-2013 Abstract Grader American Heart Association/International Stroke Conference
2004-cont. American Heart Association – Stroke Council
2004-cont. American Academy of Neurology
2004-2007 American Medical Informatics Association
2004-2008 Society for Medical Decision Making

Professional Consulting

St. Jude Medical – Adverse Events Committee
CVRx – Adverse Events Committee
NORC at University of Chicago – Evaluator of Healthcare Innovation Awards (HCIA) for Stroke & Dementia
Women's Health Initiative – Ohio State University

Working Groups & Committees

2013 – Methods Work Group of the Twin Cities Alzheimer's Research (T-CAR)
2013 – SPS3 – Secondary Prevention of Small Subcortical Strokes – Manuscript Writing Committee
2011 – Continuing. Minnesota Stroke System Council Member - Goal of Council is to promote Stroke Systems of Care in MN
2011 American Academy of Neurology Registry Task Force
2010 - Exome Sequencing Project – Committee (Provided Expertise on Phenotypic Classification of Stroke)
2009 – 2010 Regional Stroke Clinical Advisory Team for Great Lakes Regional Stroke Network
2008 – CDC Expert Panel on Stroke Outcomes
2007 – cont. – Outcomes Adjudication Committee for Women's Health Initiative
2007 – 2011. Minnesota Heart Disease and Stroke Prevention Steering Committee. - Minnesota Department of Health
2004 - 2011. Institute for Clinical Systems Improvement (ICS), Stroke guideline development group)
2005-2007. HCMC Electronic Health Record Clinician Group

Grant Reviewer

2009 – Indo-US Science & Technology Forum

SERVICE TO THE UNIVERSITY/COLLEGE/DEPARTMENT

2012 – Program Director MS in Clinical Research (School of Public Health)

2013 – CTSI-ED Multidisciplinary Advisory Committee (MAC)

2013 – Surgical Outcomes Center Committee

2013 – Eco-Epidemiology Post-doctoral interview committee

2013 – School of Public Health Research Day Abstract Grader

2013 – Resident Research Scholarship Committee (Neurology)

2012 – cont. Program Director of the MS in Clinical Research

2012 – Program in Translational Research – Part of Team

2011 - Clinical Research Certificate Development – Part of Team

2010 – Graduate Faculty of MS in Clinical Research

2009 – Faculty member Epidemiology & Community Health

2008-2009 - Mentoring coordinator for junior faculty in Department of Neurology
Division of Epidemiology & Community Health

OTHER SERVICE

2011 – Invited Speaker: American Academy of Neurology Registry Task Force

2011 – Invited Speaker: Minnesota Stroke Conference Sponsored by American Heart Association and Minnesota Department of Health “What Happens After Stroke? Long Term Stroke Outcomes”

2011 – Invited Speaker Sanford Tracy Stroke Collaborative Workshop “What Happens After Stroke? What can we do about it?”

2009 – Invited Grand Rounds to St. Cloud Hospital System on “Evidence Underlying Stroke Care Performance Measures”

2009 – Great Lakes Regional Stroke Network – Invited Presentation: “Maximizing Opportunities for tPA Administration”