

**BIOGRAPHICAL SKETCH**

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NAME: Goodman, David C.

eRA COMMONS USER NAME (credential, e.g., agency login): DCGOODMAN

POSITION TITLE: Professor of Pediatrics and of Health Policy at The Dartmouth Institute for Health Policy & Clinical Practice, Geisel School of Medicine at Dartmouth

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

| INSTITUTION AND LOCATION                                   | DEGREE<br>(if applicable) | Completion Date<br>MM/YYYY | FIELD OF STUDY               |
|------------------------------------------------------------|---------------------------|----------------------------|------------------------------|
| University of Vermont, Burlington, VT<br>(Magna Cum Laude) | B.A.                      | 05/1977                    | Biochemistry                 |
| SUNY, Upstate Medical Center, Syracuse, NY                 | M.D.                      | 05/1981                    | Medicine                     |
| The Johns Hopkins Hospital, Baltimore, MD                  |                           | 06/1984                    | Pediatric Residency          |
| Dartmouth College, Hanover, NH                             | M.S.                      | 06/1995                    | Medical Care<br>Epidemiology |

**A. Personal Statement**

My role of the proposed project is that of PI. Over the course of my career, my primary research interest has been investigating the causes and consequences of geographic and hospital variation in health system performance using large administrative datasets. My descriptive and inferential studies have examined the epidemiology of medical care from the beginning to the end of life through the use of diverse and challenging data sources (e.g. U.S. Vital Records, All Payer Claims Datasets (MA, ME, NH, VT), commercial claims, Medicaid and Medicare claims, and PRAMs data). In addition to peer reviewed papers, I have led the development or authored 20 *Dartmouth Atlas of Health Care* reports of our research findings to accelerate clinical improvement and policy development. Given my research expertise, I am also a methodological expert and collaborator on an international portfolio of population-based studies of health care quality and efficiency.

While my current primary research interests are in newborn care and outcomes, I have extensive experience in leading and collaborating in studies of the medical and surgical care of adults through the use of Medicare datasets available at The Dartmouth Institute. This expertise led to mentoring numerous trainees and faculty in the methodologies of measuring medical care with Medicare claims data. In 2007, I accepted the position as the Co-PI of the Dartmouth Atlas of Health Care where I focused on expanding the scope of peer reviewed research conducted under the Atlas auspices. These have included studies of cancer, end-of-life, surgical, and pediatric care, and highlight the experience of this team in using claims data in conjunction with other data for research purposes.

- a. Wennberg JE, Skinner J, Fisher E, Bronner K, **Goodman DC**. Inpatient Care Intensity And Patients' Ratings Of Their Hospital Experiences *Health Affairs* 2009;28:103-112.
- b. Weeks WB, West AN, Wallace AE, Lee RE, **Goodman DC**, Dimick JB, Bagian JP. Reducing avoidable deaths among veterans: directing private-sector surgical care to high-performance hospitals. *Am J Public Health*. 2007 Dec;97(12):2186-92. PubMed PMID: 17971543; PubMed Central PMCID: PMC2089101
- c. Deyo RA, Mirza SK, Martin BI, Kreuter W, **Goodman DC**, Jarvik JG. Trends, major medical complications, and charges associated with surgery for lumbar spinal stenosis in older adults. *JAMA*. 2010. 303(13):1259-1265. PMID: 20371784; PMCID: PMC2885954.

- d. Brown JR, Chang CH, Zhou W, MacKenzie TA, Malenka DJ, **Goodman DC**. Health system characteristics and rates of readmission after acute myocardial infarction in the United States. *Journal of the American Heart Association*. Jun 2014;3(3):e000714. PMID: 24847032 PMCID: PMC4309053

## **B. Positions and Honors**

### **Positions and Employment**

- 1984-1988 National Health Service Corp; Clinic director and pediatrician, Colebrook, NH  
1988-1995 Asst. Prof. of Pediatrics and of Community & Family Medicine, Dartmouth Medical School  
1988-2002 Section of Pediatric and Adolescent Medicine, Dartmouth-Hitchcock Clinic, Lebanon, NH  
1989-2007 Associate, The Center for the Evaluative Clinical Sciences, Dartmouth Medical School  
1993-2007 Investigator, Dartmouth Atlas of Health Care Working Group  
1995-2004 Associate Prof. Pediatrics and Community & Family Medicine, Dartmouth Medical School  
2002-2006 Chief, Section of Allergy and Clinical Immunology, Dartmouth-Hitchcock Medical Center  
2004-present Professor of Pediatrics, of Community & Family Medicine, and of The Dartmouth Institute for Health Policy & Clinical Practice, Geisel School of Medicine at Dartmouth, Hanover, NH  
2007-present Co-PI, The Dartmouth Atlas of Health Care Project  
2007-2009 Associate Director, Center for Health Policy Research, The Dartmouth Institute for Health Policy & Clinical Practice, Geisel School of Medicine at Dartmouth College  
2009-2013 Director, Center for Health Policy Research, The Dartmouth Institute for Health Policy & Clinical Practice, Geisel School of Medicine  
2010-present Founder, The Wennberg International Collaborative ([www.wennbergcollaborative.org](http://www.wennbergcollaborative.org))  
2013-present Adjunct Professor of Health Services Research, Institute of Social and Preventive Medicine, University of Bern, Switzerland  
2018-present Adjunct Professor of Pediatrics, University of Texas, McGovern Medical School, Houston

### **Honors**

- 1981-present Alpha Omega Alpha Medical Honorary Society  
2006-present American Pediatric Society  
2017 Delta Omega Public Health Honor Society, Delta Iota Chapter  
2018 John M. Eisenberg Article-of-the-Year Award, *Health Services Research*. Chang CH, O'Malley AJ, Goodman DC. Association between temporal changes in primary care workforce and patient outcomes. *Health Serv Res*. 2017 Apr;52(2):634-655. doi:10.1111/1475-6773.1251 PMID: 27256769; PMCID: PMC5346500.

### **National and International Committees**

- 1995 Member, Special Emphasis Panel - National Cooperative Inner-City Asthma Study, NIAID  
1997-2010 US delegate and planning committee member, International Medical Workforce Conference  
1999 Member, Specialty Physician Workforce Advisory Committee, COGME  
1999-2002 Member, Health Systems Research Study Section – Agency for Health Research and Quality  
2000-2006 Member, Committee on the Pediatric Workforce, American Academy of Pediatrics  
2001-2003 Member, National Committee for Quality Assurance, HEDIS asthma medical advisory panel  
2004-2008 Member, Editorial Board, *Pediatrics*  
2006-2014 Member, Editorial Board, *Health Services Research*  
2009-2011 Member, Institute of Medicine, Committee on the Future of Nursing  
2010-2014 Member, External Advisory Committee NIH/NIDDK Central Repositories  
2010-2012 Member, Negotiated Rulemaking Committee for the Designation of Medically Underserved Areas and Health Profession Shortage Areas. HRSA, DHHS.  
2010-2014 Chair, U.S. Council on Graduate Medical Education  
2012-2014 Member, Editorial Board, *Journal of Pediatrics*  
2012-2014 Expert Advisor, Medical Practice Variation Project, Organisation for Economic Cooperation and Development (OECD), Paris  
2014-present Swiss National Science Foundation, National Research Programme on “Health Care in Switzerland” (Gesundheitsversorgung in der Schweiz), steering committee member

## **C. Contribution to Science**

1. Identifying factors related to effective and efficient neonatal intensive through population-based cohorts. My initial studies of neonatal intensive care investigated the distribution of NICU capacity (e.g. neonatologists and NICU beds) in relation to perinatal need, and then the association of capacity with neonatal and infant mortality.(1,3) In a recent project supported by the Charles H. Hood Foundation, we reported on secular trends in the composition of NICU admissions.(2) In the past three years, I conceived and led a study of newborn care in Texas Medicaid-insured newborns which developed, in conjunction with the TX Health and Human Services Commission (HHSC), a five-year Medicaid claims file linked to maternal claims and to natality and mortality records that was used in extensive descriptive analyses of TX Medicaid newborn care (AKA Texas NICU Project).(4) Dr. Leyenaar joined the project with Dartmouth internal funding to examine one-year outcomes of opioid exposed newborns.

- a. **Goodman DC**, Fisher ES, Little GA, Stukel TA, Chang C, Schoendorf KS. The relation between the availability of neonatal intensive care and neonatal mortality. *N Engl J Med.* 2002 May 16;346(20):1538-1544. PMID: 12015393.
- b. Harrison W, **Goodman D**. Epidemiologic trends in neonatal intensive care, 2007-2012. *JAMA Pediatr.* 2015 Sep;169(9):855-862. PMID: 26214387.
- c. Harrison WN, Wasserman JR, **Goodman DC**. Regional variation in neonatal intensive care admissions and the relationship to bed supply. *J Pediatr.* 2018. 192:73-79 e74. PMID: 28969888.
- d. **Goodman DC**, Ganduglia-Cazaban C, Franzini L, Stukel TA, Wasserman JR, Murphy MA, Kim Y, Mowitz ME, Tyson JE, Doherty JR, Little GA. Neonatal intensive care variation in Medicaid-insured newborns: A population-based study. *J Pediatr.* 2019 Jun;209:44-51. Epub 2019 Apr 5. PMID: 30955790.

2. Advancing the understanding of pediatric care through spatial and provider variation. Using population-based datasets, we developed a series of novel studies that expanded the use of population and health care variation to investigate health care experiences and outcomes in reproductive health,(a) early life,(b,c) and childhood.(d). Many of these methods are foundational to the Texas NICU Project. The findings show the dependencies of mother and children's outcomes on complex individual characteristics interacting with health care contextual factors.

Ralston SL, Harrison W, Wasserman J, **Goodman DC**. Hospital variation in health care utilization by children with medical complexity. *Pediatrics.* 2015. 136(5), 860-867. PMID: 26438701.

3. Identification of effective pediatric asthma medical care and its determinants. Asthma is a common chronic illness of childhood that requires longitudinal evidence-based care. In my early career, I received an NIH/NHLBI FIRST award (R29) to study the epidemiology of asthma hospitalization(a,b,c) and associated care through the use of hospital discharge abstract and a pre-prepaid group practice (Group Health Cooperative of Puget Sound) databases.(d) These studies revealed important deficiencies in the use of inpatient care and outpatient medication use and sharpened my methodologic skills in using the natural experiment of health care regional and provider variation to study the effectiveness and efficiency of care.

- a. **Goodman DC**, Fisher ES, Gittelsohn A, Chang C, Fleming C. Why are children hospitalized? The role of non-clinical factors in pediatric hospitalizations. *Pediatrics.* 1994. 93(6 Pt.1), 896-902. PMID: 8190573.
- b. **Goodman DC**, Littenberg B, O'Connor GT, Brooks JG. Theophylline in acute childhood asthma: A meta-analysis of its efficacy. *Pediatr Pulmonol.* 1996. 21(4), 211-218. PMID: 9121849.
- c. **Goodman DC**, Stukel TA, Chang C. Trends in pediatric asthma hospitalization rates: Regional and socio-economic differences. *Pediatrics.* 1998. 101(2):208-213. PMID: 9445493.
- d. **Goodman DC**, Lozano P, Stukel TA, Chang C, Hecht J. Has asthma medication use in children become more frequent, more appropriate, or both? *Pediatrics.* 1999.104(2Pt.1):187-194. PMID:10428993.

4. Developing empirical evidence to support evidence-based physician workforce policy. During my tenure as a rural National Health Service Corp I became interested in the relationship of physician supply to population utilization and outcome, leading to a research portfolio of 25 population-based studies that intersected with other research contributions discussed in this biosketch. These studies challenged the assumptions that the U.S. physician workforce is rationally distributed, and that greater physician supply is dominant determinant of better population outcomes. This required developing new epidemiologic methods(a) in measuring physician



The major goal of this first population-based study of newborn and neonatal intensive care for total live birth cohorts of four states (ME, VT, NH, MA) and commercially-insured singleton newborns in Texas is to examine overall and regional variation in newborn care, focusing on the illness-adjusted (e.g. birth weight and other perinatal risk factors and diagnoses) use of intensive care (i.e. defined as Levels II, III, IV care) by different newborn conditions and associated utilization and health outcomes. Patient and provider factors associated with the variation in NICU use will also be studied to reveal potential opportunities for improvement in care.

P01 AG019783  
NIH/NIA

Skinner (PI)

09/15/2001-11/30/2017

#### Causes and Consequences of Healthcare Efficiency

The major goal of this project is to improve understanding of the causes and consequences of regional variations in health care intensity, which could have important implications for the health and well-being of the elderly, for addressing health disparities and for the financial health of the Medicare trust funds. In the current project period, we will seek to shed light on the following key clinical and policy questions: (a) Who can reasonably be held accountable for the care of high-need patients? (b) Can the value of pharmaceutical treatments in Medicare Part D be improved? (c) Is better surgical quality more costly? (d) How can we identify efficient health care providers – and are Canadian providers less efficient than those in the U.S? (e) Can we measure health outcomes reliably enough to use in rewarding efficient providers?

Role: Co-Investigator

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Goodman (PI)

04/01/2015-10/31/2017

Robert Wood Johnson Foundation

#### Updating Dartmouth Atlas Measures for AF4Q Evaluation

The Aligning Forces for Quality Project (AF4Q) is a multi-year effort by the Robert Wood Johnson Foundation to improve quality, reduce racial and ethnic disparities, and develop delivery models that might be applied nationwide. The main goals of this project are to update the Dartmouth Atlas measures that are being used in the AF4Q evaluation, continue to collaborate on the use of these measures with regards to hypothesis testing and manuscript preparation, and calculate rates with these measures and post them to the Dartmouth Atlas web site.