

MICHAEL A. GRAVEN, MD MSc MPH FRSPH

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PERSONAL DATA

Citizenship: Canada, United States
Languages: American English (primary), Norwegian, Swedish, Danish (some Arabic, Kiswahili, multiple computer languages)

Currently Retired from Dalhousie University

RECENT POSITIONS

Director of Medical Informatics, Division of Medical Education
Dalhousie University Faculty of Medicine, Halifax, Nova Scotia

**Assistant Professor, Pediatrics, Division of Neonatal Pediatrics Jointly Appointed in
Computer Science Faculty**
Dalhousie University, Halifax, Nova Scotia

Practicing Clinical Neonatologist
IWK Health Centre, Halifax, Nova Scotia

Assistant Professor, Faculty of Graduate Studies
Dalhousie University, Halifax, Nova Scotia

Senior Advisor for Health Affairs, Governments of Belize and St. Lucia
Appointed to Minister of Health

Member of Steering Committee, Ethiopian Medan Acts PMTCT Program

EDUCATION

1994-1997 Fellowship in Neonatology, University of South Florida, Department of Pediatrics, Division of Neonatology, Tampa General Hospital, Tampa, Florida.

1991-1994 Residency in Pediatrics, Dartmouth Medical Centre, Lebanon, New Hampshire.

1987-1991 Doctor of Medicine, University of Florida, College of Medicine, Gainesville, Florida. Graduating with Honors for Special Achievement.

1984-86. Master of Public Health, Major Emphasis in Health Policy and Health Management, Minor Emphasis in Epidemiology, College of Public Health, University of South Florida, Tampa, Florida. Thesis: Population Biology of Filariasis.

1981-84 Master of Science, Applied Statistics (Ecology and Applied Statistics), Rutgers, The State University of New Jersey, New Brunswick. Thesis: Population Structure in Egyptian Biomphalaria alexandrina.

1977-81 Bachelor of Science, Biology, Pacific Lutheran University, Tacoma, Washington. Magna Cum Laude.

LICENSURE

Currently Retired From Clinical Practice.

Have Held Medical Licenses in Nova Scotia, Indiana, Arkansas, Florida

AWARDS

Professional: Pacific Lutheran University Mission Award 2017 (Alumni)
Nova Scotia Discovery Award Professional of Distinction 2013
Fellow, Royal Society for Public Health, UK (FRSPH)
Fellow, American Academy of Pediatrics (FAAP)
Delta Omega Public Health USA National Honor Society
Listed in America's Top Pediatricians 2002, 2003, 2004

Graduate: University of South Florida Graduate Council Fellowship, 1985-86
National Science Foundation Fellowship, 1981-84
Busch Memorial Fellowship, 1981-84

Undergraduate: Arete Society (PLU equivalent to Phi Beta Kappa), 1981
Who's Who in American Colleges & Universities, 1981
Faculty Merit Scholarship, 1980-81
Undergraduate Biology Fellowship, 1980-81
International Youth in Achievement, 1981
National Deans List, 1979
Cheany Merit Scholarship, 1979-80

NATIONAL COMMITTEES

2012-2016 Editorial Board Paediatrics and Child Health, Canadian Paediatric Society

2005-2010 Canadian Perinatal Surveillance Committee, Public Health Agency of Canada

2004-2007 Steering Committee, Prevention of Mother to Child Transmission of HIV (PMTCT) National Program, Ministry of Health, Federal Republic of Ethiopia

PUBLICATIONS

1. Miller MK, Barton MJ, Cuddeback JK, Dame DA, Gallo JM, Graven MA, McDonald SA, Nissen D, Treloar RW. Severity of Illness Measures for Acute-Care Hospitals. Florida Health Care Cost Containment Board Report, January, 1990.

2. Mergerian J, Klein R, Graven MA, Rozicky A. Intraoperative anaphylactic reaction due to latex hypersensitivity. *Urology* 1991;18(4):301-304.

3. Vrijenhoek R, Graven MA. Population genetics of Egyptian Biomphalaria alexandrina (Gastropoda, Planorbidae). *Journal of Heredity* 1992;83:255-261.

4. Hakim A, Graven MA, Alsaied K, Ayoub E. Obturator internus abscess in children. *Pediatric Infections Disease Journal* 1993;12(2):166-168.

5. Graven MA, Cuddeback JK, Wyble L. Readmission for Group B Strep or E. Coli sepsis among full term, singleton, vaginally delivered neonates after early discharge. *Journal of Perinatology* 1999;19(1):19-25.

6. Vincer MJ, Cake H, Graven MA, Dodds L, McHugh S, Faboni T. A population-based study to determine the performance of the Cognitive Adaptive Test/Clinical Linguistic and Auditory Milestone Scale to Predict the Mental Developmental Index at 18 Months on the Bayley Scales of Infant Development-II in very preterm infants. *Pediatrics* 2005 Dec 116(6): E864-7.

7. Spurr KF, Graven MA, Gilbert RW. Prevalence of unspecified sleep apnea and the use of continuous positive airway pressure in hospitalized patients, 2004 national hospital discharge survey. *Sleep Breath* 2008: Aug;12(3):229-34.

8. Spurr, KF, Morrison, DL, Graven MA, Webber, A, Gilbert, RW. Analysis of Hospital Discharge Data to Characterize Obstructive Sleep Apnea and its Management in Adult Patients Hospitalized in Canada: 2006 to 2007. *Canadian Respiratory* 2010: Sep-Oct;17(5):213-8.

9. MacDonald NE, Smith J, Graven MA. The Vaccine Uptake Research Gap in Low- and Middle-Income Countries. *Evidence - Based Child Health* 2012; 7: 1013-1014.

10. Graven MA, Allen P, Smith I, Allen VM MacDonald NE. Achievement of the 2015 Millennium Maternal Mortality Goal (5A) by Belize in 2011. *J Obstet Gynaecol Can* 2012;34(10): 913-916.

11. Graven MA. Decline in mortality with the Belize Integrated Patient-Centred Country Wide Health Information System (BHIS) with Embedded Program Management. *IJMI* 2013; 82: 954–963.

PUBLISHED ABSTRACTS

1. Graven MA. Pediatric bacterial meningitis and hearing loss: Florida 1988-91. *Pediatric Research* 1993;33(4):169.

2. Graven MA, Cuddeback JK, Nelson RM. Day of discharge for Florida Neonates, January 1992 to September 1994. *Pediatric Research* 1996;39(4):266A.

3. Graven MA, Graven SN. Frequency of Intraventricular Hemorrhage (IVH) in Prematurity: Inborn Vs. Early Transport. *Pediatric Research* 1999;45(4):244A.

4. Graven MA. Consequences of Early Infant Discharge: Matching Readmission Hospital Discharge Records in Florida UHDDS Datasets Using a Multivariate Probabilistic Matching Technique. National Centre for Health Statistics/Centre for Disease Control National Conference on Health Statistics, Washington DC, August 4, 1999.

5. Graven MA. Collection of Public Health Data with Limited Public Health Resources. AmFiTan (Joint America, Finland, Tanzania) Conference on Ethics in International Development, Dar es Salaam, Tanzania, February 6, 2000.

6. Graven MA. Ethical Use and Constraints in the Use of Identified Health Data for International Development Programs. AmFiTan (Joint America, Finland, Tanzania) Conference on Ethics in International Development, Tampa Florida, USA, February 18, 2001.

7. Graven MA. Ethical Judgment and the Use of Public Health Data: Stakeholder Disagreement in the Setting of International Development. AmFiTan (Joint America, Finland, Tanzania) Conference on Ethics in International Development, Helsinki Finland, August 15, 2002.

8. Sauve RS, Liu S, Graven MA, Kramer M, Joseph KS, Evans J, Allen A. Neonatal Readmissions for serious conditions not recognized at birth (Poster), Pediatric Academic Society Annual Meeting, San Francisco, California, May 2, 2006.

9. Sauve RS, Liu S, Graven MA, Kramer M, Joseph KS, Evans J, Allen A. Neonatal Readmissions for serious conditions not recognized at birth (Poster), Canadian Pediatric Society, St Johns, Newfoundland, June 15, 2006 (Abstract Number 50)

10. Graven MA, Ghebrehiwot H, Hagos S. Sustainability: Translation and use of African Languages for development and deployment of Health Informatics Initiatives in Ethiopia,

HELINA 2007: eHealth in Africa, Bamako, Mali, January 10, 2007

11. Graven MA. Informatics Issues in the Use of Neonatal Brain Monitoring, 3rd International Conference on Brain Monitoring and Neuroprotection, Vienna, Austria, January 16, 2008.

12. Graven MA and King, S. Age and Gender Distribution of Diabetes Incidence in St Lucia., 136th Annual Conference of the American Public Health Association, San Diego, October 25-29, 2008.

13. Graven MA and Allen P. Role of Country-Wide Health Information System in Decreasing the Intensity of Service Required to Manage Hypertension Among Belizeans 65 or Older., Public Health Informatics (PHIN) Conference, Atlanta Georgia, September 1, 2009.

14. Graven MA, Smith I, and Allen P. Implementing, national - one patient one record integrated comprehensive health information system in Belize. WHO Global Health Information Systems Forum, Prince Mahidol Award Conference, Bangkok Thailand, January 28, 2010.

15. Graven MA. Belize Health Information System (BHIS). IDRC Workshop on Enterprise Architecture in Health, June 3, 2010.

16. Graven MA, Smith I, and Allen P. The Belize Health Information System: Design, Deployment and Impact on Health Outcomes. AIDS2010, Vienna Austria, July 17, 2010.

17. Graven MA, MacDonald N and Allen P. Metazoan Infections in Belize Children 2008-2009 Diagnosed in the Outpatient Setting, Studied Using the Belize Health Information System (BHIS) Data. Academic Pediatric Societies Annual Meeting, May 1, 2011.

INVITED PRESENTATIONS (Partial List).

1. Graven MA. Invited presentation to Director of Maternal-Child Health Bureau, US Department of Health and Human Services. Washington, D.C. Study of Early Infant Discharge and Medical Consequences, February 1997.

2. Graven MA. Critical Issues in the Development of Public Health Information Systems First AMFITAN Conference: Ethics in International Development, Dar Es Salaam, February 2000.

3. Graven MA. Risks of Maldevelopment: Public Health Information Systems in Developing Countries Second AMFITAN Conference, Tampa, Florida, January 2001.

4. Graven MA and Allen P. Belize NHISS: Observations on Development and Early Analytical Uses. UWI Country-Wide Conference, Belize City, November, 2001.

5. Graven MA. Ethical Framework for Developing Public Health Information Systems in Developing Countries, Third AMFITAN Conference, Helsinki, August 2002.
6. Graven MA, Allen P., Rutter N. Equity and development of Health Information Systems. Second International Society for Equity in Health Conference, Durban South Africa June 2004.
7. Graven MA. Health Informatics Training in the Caribbean Basin. Belize Minister of Health Manpower Development Forum, Belmopan Belize Central America, December 2004.
8. Graven MA. Potential Uses of Province-Wide Health Information in New Brunswick. Memramcook Leaders Forum, Memramcook New Brunswick May 28 2005.
9. Graven, MA. Readmission Risks after Early Neonatal Discharge From Hospital. Canadian Public Health Agency, Ottawa, Ontario, Canada, July 28, 2005.
Graven, MA.
10. Graven, MA (Hon. Keith Mondesir, St Lucia Minister of Health Delegation). Potential for Integrated Country-Wide Health Information Systems in the Caribbean. CARICOM Health Ministers Summit (COHSOD), July 14, 2008. Port of Spain, Trinidad.
11. Paterson G, Cameron S, Soroka S, Cheng C, Graven MA, Mensink N, Delva D and Brar R: Summer Institute in Health Informatics (SIHI): An Educational Initiative for Faculty Development in Medical Education. *ITCH 2009 Revolutionizing Healthcare with Informatics: From Research to Practice*. Victoria, BC. February 18-22, 2009.
12. Graven, MA and Allen, P. (Hon. Pablo Marin, Belize Minister of Health's Delegation). Model for Harmonization of Health Information Systems for the CARICOM Community. CARICOM Health Ministers Summit (COHSOD), February 4, 2010. Port of Spain, Trinidad.
- 13 Graven, MA. Belize Health Information System: An Example of "Getting It Right". IDRC invited workshop on Enterprise Architecture in health information systems, Vancouver, June 3, 2010.
- 14 Graven, MA. Integrated Patient-Centered Health Information Systems. International Pediatric Association Congress, Vancouver, August 19, 2016.

INTERNATIONAL PROJECTS RELATED TO HEALTH INFORMATICS

Health Metrics Network, World Health Organization. Senior Advisor for the Secretariat in Geneva, Switzerland, 2008-2010. 9 official missions.

Belize Health Information System (BHIS). Volunteer for the Ministry of Health in Belize since 1998 and ongoing. **Co-designer and Chief Architect of the BHIS.** Wrote some of the source code for the system. The BHIS has been recognized as best of its kind by the Gates Foundation- Vital Wave Consulting May 2009; identified by PAHO as the regional standard for country-wide health information systems for the Caribbean region in July 2009.

Developed all algorithms for the 8 areas of disease prevention and then embedded them into the BHIS. Results published in 2012 for MCH, and 2013 for all 8 disease management areas.

St Lucia Health Information System (SLU-HIS). Volunteer for the Ministry of Health in St Lucia since 2007 and ongoing. **Co-designer and Chief Architect of the SLU-HIS.** Served as volunteer support for the Ministry of Health for Diabetes and Hypertension Disease Management Program. Provided data entry and analytical support for review 32,000 records. The findings were reported in April 2007 and lead to a nation-wide St Lucia Disease Management program with the goal to achieve dramatic improvement in diabetes incidence and outcomes.

St Vincent and The Grenadines Health Information System (SVG-HIS). Volunteer for the Ministry of Health in St Vincent and The Grenadines since 2010 and ongoing. **Co-designer and Chief Architect of the SVG-HIS.**

South Africa. Health Information support for development and deployment of an integrated health information system with disease management protocols embedded initiative in KwaZulu Natal Province 2012-2014.

Ethiopia. Volunteer to Medan ACTS PMTCT Program since 2004- 2008; volunteer to Federal Ministry of Health from 2005-2008; two areas: PMTCT and Health Information Systems. Developed and wrote the code for the entire information system for PMTCT in all of Ethiopia. Through 2009, this program has prevented an estimated 22,000 HIV infections in babies born to HIV+ mothers (reduction in incidence from 45% to 12%). Also delivered large scale training in PMTCT services for healthcare professionals, data entry clerks and IT support staff 2005-2007. Developed a consortium of Ethiopian Universities (Addis Ababa U, Debub U, and Gondor U) for a PhD programs in Health Informatics that lead to 3 universities in Ethiopia offering a PhD program. As a member of the planning committee, wrote the first draft of the course curriculum. From 2005 onwards, have episodically taught lectures in Health Informatics at Addis Abba University.

INTERNATIONAL HEALTH CARE EXPERIENCE

Voluntary, unpaid public health work in 44 countries, mostly as informatics support for specific disease management programs.

Schistosomiasis Control Team Member, Qalyub Bilharziasis Program, Egypt, and Blue Nile Health Program, Gezira, Sudan, December 1979-May 1984. Served in a volunteer capacity during Undergraduate (PLU) and Graduate (Rutgers) education programs. Activities involved field work with collection of vector snails, including those infected with schistosomiasis, defining and evaluating human infection rates, designing multistage disease control programs. In Sudan, these activities were conducted under circumstances of very high personal risk.

Team Leader, Childhood Immunization Survey, Minnehaha County South Dakota Health Department, June 1976-August 1976. Activities included conducting door-to-door survey administration, planning and assigning survey grids to 5 other surveyors in the team, gathering completed survey forms, data entry, and analysis of survey results.

UNITED STATES HEALTH INFORMATICS EXPERIENCE (Partial List)

Information Services Department (DSS), Shands Hospital at the University of Florida, Gainesville, Lead Information Systems Analyst August 1986 to June 1991. Worked with all levels of administration, from unit managers to the Executive Staff and Hospital Governing Board in respect to health information. Activities included data acquisition, analysis, statistics and experimental design development, both financial and clinical audit, system development, and graphics production. Shands serves the entire state of Florida as the referral quaternary care centre and serves well over 78,000 patients admitted to hospital, 153,000 emergency room visits and in 929,000 outpatients per year.

Chief Information Officer and Chief Medical Officer at Phymatrix Consulting and Managed Care, Inc. (PCMC, Palm Beach Gardens, Florida) July 1998-June 1999. Under contract to University of Arkansas for Medical Sciences, Department of Pediatrics. Served as corporate officer with both CIO and CMO portfolios for Physician Network Management business unit (largest in Phymatrix Corporation). Managed nearly 4,000 physicians of all specialties for 10 million covered lives in 27 states for service contracts with all major health insurers in the US, including CIGNA, Prudential, etc. Activities included credentialing and discipline for providers, patient and provider satisfaction surveys, managing healthcare encounters of all types, processing payments for both fee-for-service and capitation to contracted physicians. Lead design and deployment of health information systems throughout 27 states for hospitals, clinics, and physician offices. Developed and ran disease management system for diabetes for ~500,000 type II diabetics, which resulted in reduced hospitalization and complication rates.

Analyst Hillsborough County Hospital Authority, Tampa Florida, Marketing and Public Relations Department January 1986-July 1986. Served all departments of Hillsborough County Hospital Authority, including Tampa General Hospital which is the largest hospital in the Tampa Bay area. Worked with all levels of administration, including multiple presentations to the Hospital Board of Directors. Lead multiple projects that gave rise to millions in cost savings for the hospital. Participated in several hundred successful contract negotiations with health insurers for defined services plans for health plans and HMO's.