OMB No. 0925-0001 and 0925-0002 (Rev. 10/2021 Approved Through 09/30/2024)

BIOGRAPHICAL SKETCH

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NAME: Douglas, Gerald P.

eRA COMMONS USER NAME: gdouglas

POSITION TITLE: Assistant Professor of Biomedical Informatics

EDUCATION/TRAINING

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| INSTITUTION AND LOCATION | DEGREE*(if applicable)* | Completion DateMM/YYYY | FIELD OF STUDY |
| University of Victoria, Victoria, Canada | BSc | 04/1995 | Computer Science |
| University of Pittsburgh School of Information Science, Pittsburgh, PA | MSIS | 12/1999 | Information Science (AOC Medical Informatics) |
| University of Pittsburgh Department of Biomedical Informatics, Pittsburgh, PA | PhD | 04/2009 | Biomedical Informatics |
| Belmont University, Nashville, TN | Certificate | 11/2013 | Lean Healthcare |

**A. Personal Statement**Since 2001, I have dedicated my career to improving healthcare delivery in low- and middle-income countries through the advancement of science and engineering. I founded Baobab Health Trust, the first health informatics organization in Malawi, which partnered with the Malawi Ministry of Health to develop the national electronic medical record system that has been deployed in more than 200 health facilities across the country. As an organization of the people, by the people and for the people, led by a Malawian board of trustees, the organization grew to employ a staff of more than 160 Malawians, and has received more than $41 million in funding since its inception in 2001, with more than $32 million in awards from the US Centers for Disease Control and Prevention to support the care and treatment of HIV through the use of health information technology.

At the University of Pittsburgh, I have had the privilege of serving as a core faculty member of the Biomedical Informatics Training Program since 2011. Through my role as course director of our graduate course, Principles of Global Health Informatics (BIOINF 2124) and, in my capacity as Director of the Center for Health Informatics for the Underserved, I have been able to develop a new area of concentration for trainees interested in the application of the principles of informatics in improving patient outcomes and reducing healthcare delivery costs in low-resource settings. I have created a Summer Internship in Global Health Informatics (BIOINF 2129) for trainees who would like to be involved in hands-on informatics work. Three NLM funded pre-doctoral trainees, one NLM funded postdoctoral trainee, and two trainees funded under the NLM Summer Short-term Trainee Program have traveled to Malawi to study and conduct research in the global health informatics space. Similarly, I have facilitated graduate training for three Malawian students at the University of Pittsburgh and served as their research advisor. As an inaugural member of the Technology Entertainment and Design (TED) Fellowship Program, I have a passion for innovation, and try to instill this in all my students, some of whom have become TED Fellows and had the opportunity to present on the TED stage themselves.

I take great pleasure in mentoring students at the graduate level, and look forward to providing continued input into the success of the Biomedical Informatics Training Program at the University of Pittsburgh.

**B. Positions and Honors
Positions and Employment**

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| --- | --- |
| 11/2010 - Present | Assistant Professor of Biomedical Informatics, Department of Biomedical Informatics, University of Pittsburgh, Pittsburgh, PA |
| 11/2010 - Present | Director, Center for Health Informatics for the Underserved, Department of Biomedical Informatics, University of Pittsburgh, Pittsburgh, PA |
| 10/2013 - Present | Assistant Professor, Health Policy & Management, University of Pittsburgh, Pittsburgh, PA |

**Other Experience and Professional Memberships**

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| 2002 - Present | Member, American Medical Informatics Association |

**Honors**

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| 1995 | Graduated with Honors (Computer Science, BSc) |
| 2003 | Best Paper Award, Health Informatics in Africa Conference, Johannesburg, South Africa |
| 2009 | Technology, Entertainment & Design (TED) Fellow |
| 2011 | University of Victoria Faculty of Engineering Distinguished Alumnus Award |

**C. Contributions to Science**

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| 1. | **Infectious Disease Management in Underserved Populations**: Chronic diseases represent a significant portion of the overall burden of disease in low-income countries. Unlike primary care, chronic disease management can be highly protocolized. We hypothesized that the management of HIV patients could be supported by a point-of-care electronic medical record system with embedded guidelines. In 2008 we developed a touchscreen-based EMR system for the Malawi Ministry of Health, which was in use in 207 hospitals and health centers in Malawi by the end of 2019. In 2010 Based on this model we extended the approach to include the management of patients with diabetes and deployed it at three tertiary hospitals in Malawi. Our work has demonstrated that co-management of chronic diseases can be supported through the use of a point-of-care electronic medical record system in a low-income country setting. |
|  | a. | Harries AD, Kumar AM, Karpati A, Jahn A, **Douglas GP**, Gadabu OJ, Chimbwandira F, Zachariah R. Monitoring treatment outcomes in patients with chronic disease: lessons from tuberculosis and HIV/AIDS care and treatment programmes. Tropical Medicine & International Health. 2015 Jul; 20 (7):961-64. doi: 10.1111/tmi.12506 PMID: 25779103 |
|  | b. | Manjomo RC, Mwagomba B, Serge A, Ben-Smith AE, Khomani P, **Douglas GP**, Tayler-Smith K, Harries AD, Gadabu OJ. Integrating non-communicable disease management into primary health care in Lilongwe, Malawi: early experience. Public Health Action. 2015. |
|  | c. | Allain TJ, van Oosterhout JJ, **Douglas GP**, Joukes S, Gadabu OJ, Darts C, Kapur A, Harries AD. Applying lessons learnt from the ‘DOTS’ Tuberculosis Model to monitoring and evaluating persons with diabetes mellitus in Blantyre, Malawi. Tropical medicine & international health: TM & IH. 2011 Jun 27; 16 (9):1077-84. PMID: 21702868 |
|  | d. | **Douglas GP**, Gadabu OJ, Joukes S, Mumba S, McKay MV, Ben-Smith A, Jahn A, Schouten EJ, Landis-Lewis Z, van Oosterhout JJ, Allain TJ, Berger SD, Harries AD, Chimbwandira F. Using touchscreen electronic medical record systems to support and monitor national scale-up of antiretroviral therapy in Malawi. PLoS medicine. 2010 Aug 10; 7 (8). PMCID: PMC2919419 |
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| 2. | **Supporting Pharmaceutical Management and Supply Chain in Low-Resource Settings**: Access to essential medicines is a key part of the right to health. In order for medicines to improve health however, they need to be both available and used effectively and safely. To ensure that medications are available, low-and middle-income countries (LMICs) must be able to forecast medication needs and to purchase appropriate medications in sufficient quantities at a reasonable and affordable price -to be able to control and manage the entire medication supply chain. To address the challenges in medication management in low-resource settings we have developed RxMAGIC, the Prescription Management And General Inventory Control system. Rx MAGIC is currently being deployed in an underserved clinic in Pittsburgh, and elements of the system have been adapted for use in clinics in both Honduras and Malawi. |
|  | a. | Mtonga TM, **Douglas GP**. Standardizing Representation of Medication in LMICs: Case of Malawi and RxNORM. Journal of Health Informatics in Africa 6 (2), 51-‌, 2019. doi: 10.12856/JHIA-2019-v6-i2-230 |
|  | b. | Fisher AM, Ding MQ, Hochheiser H, **Douglas GP**.    Measuring time utilization of pharmacists in the Birmingham Free Clinic dispensary.    BMC Health Services Research. 2016 Sept 29;16:529. doi: 10.1186/s12913-016-1787-6. |
|  | c. | Fisher A, Herbert MI, **Douglas GP**. Understanding the dispensary workflow at the Birmingham Free Clinic: A proposed framework for an informatics intervention. BMC Health Serv Res. 2016 Feb 19; 16:69. PMCID: PMC4759722. doi: 10.1186/s12913-016-1308-7 |
|  | d. | Kauffman YS, Connor SE, Jonkman L, Kane-Gill SL, Himisi T, Gillespie EM, **Douglas GP**. Retrospective Evaluation of Adverse Drug Reactions in a Central Hospital in Malawi. Enliven Archive. 2014 Nov 1; 1 (1):1-4. |
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| 3. | **Improving Clinical Laboratory Workflow in Low-income Country Settings**: Adequate laboratory infrastructure in sub-Saharan Africa is vital for tackling the burden of infectious diseases such as human immunodeficiency virus and acquired immune deficiency syndrome, malaria, and tuberculosis. Despite the need for laboratory testing in addressing the infectious disease burden, laboratories are ill-integrated into the diagnostic and care delivery process in low-resource settings. We have conducted an assessment of perceived challenges across the entire value stream at a tertiary hospital in Malawi. Results show that while there are challenges in the analytical phase, a great proportion of the challenges exist in the pre- and post-analytical phases of the diagnostic value stream. Based on this understanding we have proposed a set of health IT interventions, which we hypothesize would address many of these challenges. We have complemented the functionality of an existing lab information management system by adding lab test order-entry functionality from the bedside, and results reporting to the bedside. Our future plans include evaluating the impact of these systems on turn-around time and reduction of non-viable samples arriving at the lab. |
|  | a. | Mtonga TM, (2020). Design, Development, and Evaluation of a Laboratory Order Entry and Results Review Application for a Low-Resource Inpatient Setting. Unpublished PhD dissertation, University of Pittsburgh. (PhD Advisor: **Douglas GP**) |
|  | b. | Mtonga TM, Choonara FE, Espino JU, Kachaje C, Kapundi K, Mengezi TE, Mumba SL, **Douglas GP**. Design and implementation of a clinical Laboratory Information System. African Journal of Laboratory Medicine 8 (1), 1-7 |
|  | c. | Petrose LG, Fisher AM, **Douglas GP**, Terry MA, Muula A, Chawani MS, Limula H, Driessen J. Assessing Perceived Challenges to Laboratory Testing at Kamuzu Central Hospital. Am J Trop Med Hyg. 2016 Mar 28; 15 (0867). PMID: 27022150 |
|  | d. | Driessen J, Limula H, Gadabu OJ, Gamadzi G, Chitandale E, Ben-Smith A, **Douglas GP**, Alide N. Bridging the Gap Between Clinical and Laboratory services in a low-resolution setting: Challenges and potential informatics solutions within Kamuzu Central Hospital, A Tertiary Health facility in Lilongwe, Malawi. African Journal of Laboratory Medicine. 2015 Jun 11; 4 (1):1-7. doi: 10.4102/ajlm.v4i1.176 |
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| 4. | **Developing EMR Sustainability Models for Low-Income Countries**: Electronic medical record (EMR) systems have the potential to improve health outcomes as well as reduce healthcare delivery costs. However, little is known about the costs of implementing and operating EMRs in an LIC hospital, and the financial benefits have not been studied. We re-imagine the EMR as a series of structured, interconnected informatics interventions that can be individually modeled. Using concepts taken from the field of lean healthcare we assess waste in current processes, propose health IT solutions to reduce or eliminate the waste, and apply a net present value approach to calculating time to break-even and return on investment. Based on this approach our model has shown potential for savings generated by health IT interventions to entirely recover the cost of the intervention in less than 3 years. We believe this approach provides a model for sustainability of health IT interventions in LIC settings. We plan to apply this approach to assess the financial sustainability of our laboratory information system interventions. |
|  | a. | Driessen J, Cioffi M, Alide N, Landis-Lewis Z, Gamadzi G, Gadabu OJ, **Douglas G**. Modeling return on investment for an electronic medical record system in Lilongwe, Malawi. Journal of the American Medical Informatics Association: JAMIA. 2012 Nov 9. PMCID: PMC3721156 |
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| 5. | **Improving Civil Registration in Malawi, Africa**: In many low- and middle-income countries most people are born and die without appearing in any official statistic or record. In 2001 we stated working in Malawi, Africa, a landlocked country with a population of roughly 14 million. With no form of civil registration in Malawi patients could not be uniquely identified making continuity of care for patients with chronic illness challenging. In 2001 we started working in Kamuzu Central Hospital, a tertiary hospital in Malawi’s capital city of Lilongwe. We developed and introduced a simple electronic patient registration system to issue unique patient ID numbers to patients as they entered the hospital. By the end of 2019 this system had been expanded to more than 200 hospitals and health centers in Malawi and more than 4 million nationally unique patient IDs had been issued. Continuity of care for more than 450,000 HIV patients is provided using this ID platform. To complement this approach we started an initiative to issue ID numbers at the community level with the goal of both reducing the demand for patient registration at the health facility level and empowering community leaders through access to village census information. Built on an existing paper-based register model, in 2013 we introduced an electronic village register used by community leaders. This electronic village register has been deployed in 83 villages in Malawi Traditional Authority of Mtema covering a combined population of more than 40,000 citizens. Our work is now expanding to birth registration in rural health centers in Malawi using an integrated approach that takes data from existing electronic medical record systems to pre-populate the birth report. |
|  | a. | Gabadu OJ, Ben-Smith A, **Douglas GP**, Chirwa-Nasasara K, Manjomo RC, Harries AD, Dambula I, Kang’oma S, Chiumia T, Chinsinga FB. Scaling up electronic village registers for measuring vital statistics in rural villages in Malawi. Public Health Action. 2018 Jun 21;8(2):7984. doi: 10.5588/pha.17.0116. PMID: 29946524 PMCID: PMC6012956 |
|  | b. | Gadabu OJ, Manjomo RJ, Mwakilama S, **Douglas GP**, Harries T, Moyo C, Makonokale LD, Kang’oma S, Chitedze P, Chinsinga FB. An electronic register for vital registration in a rural village with no electricity in Malawi. Public Health Action. 2014 Sep 21; 4 (3):145-49. doi: 10.5588/pha.14.0015 PMCID: PMC4533812 |

Complete list of Published Works: https://www.ncbi.nlm.nih.gov/myncbi/1x3P7o6cxxWUtm/bibliography/public/