
BIOGRAPHICAL SKETCH

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NAME

Martin Were, MD MS

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MWERE08

POSITION TITLE

Associate Professor of Biomedical Informatics
Associate Professor of Medicine

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

INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	MM/YY	FIELD OF STUDY
Harvard College	BA	05/97	Biochemistry
Harvard Medical School	MD	05/01	Medicine
Indiana University School of Medicine	MS	06/08	Clinical Research

A. Personal Statement

I am currently an Associate Professor of Biomedical Informatics and Associate Professor of Medicine at Vanderbilt University. I have over 9 years of experience in developing, implementing and evaluating a range of health information systems that are relevant to resource-limited settings. I am also the Founding Director of the Institute of Biomedical Informatics (IBMI) at Moi University in Kenya, which offers postgraduate education and short courses in health informatics, conducts a range of health informatics research, and develops a range of health information systems to serve the global community.

I completed a B.A. in Biochemistry at Harvard University, went on to attend Harvard Medical School, and completed Internal medicine residency at the Brigham and Women's Hospital & Harvard Medical School. In 2006, I joined the Regenstrief Institute, Inc. for an NLM-sponsored Medical Informatics fellowship. During this time, I also received a Master of Clinical Research degree. I joined the faculty at Indiana University in 2008 as Assistant Professor of Medicine and was promoted to Associate Professor of Medicine in 2014. In 2015, I helped to establish the IBMI at Moi University, and moved to my current position at Vanderbilt University in 2016. I have served as the Chief Medical Information Officer for the AMPATH program, as co-chair of the mHealth Alliance Evidence Working Group, and on the Board of Scientific Counselors at Lister Hill Center of the National Library of Medicine (NLM). I am the Founder and Project Lead of the mUzima mobile Health initiative that has capabilities for data collection, retrieval, biometrics, tele-consultation, media management, among others, and which interoperates well with the OpenMRS platform.

Over the years, I have led a team to develop several other mHealth applications beyond mUzima, including: data collection applications for home-based counseling and testing (HCT) the *Shahidi* media management and education application, and the KenyaMedicine mLearning application. In 2011, I was recognized as one of the top mHealth Innovators by the UN Foundation / Rockefeller Foundation / mHealth Foundation for mobile-based computerized decision support work. I have also conducted extensive research and evaluations in the mHealth and EHRs domains, with over 30 peer-reviewed publications. Over the last 8 years, I have mentored 16 post-graduate health informatics and internal medicine trainees. I intend to bring my experience in mHealth, eHealth, implementation research and capacity building to contribute to the mPHR project. As the Principal Investigator, I will be involved in all aspects of development, evaluation, and implementation of the mPHR project.

Below are select mHealth publications:

- a. **Were MC**, Kariuki J, Chepng'eno V, Wandabwa M, Ndege S, Braitstein P, Wachira J, Kimaiyo S, Mamlin B. Leapfrogging paper-based records using handheld technology: Experience from Western Kenya. *Stud Health Technol Inform*. 2010;160(Pt 1): 525-9. PMID: 20841742.
- b. Rajput ZA, Mbugua S, Saleem JJ, Anokwa Y, Hartung C, Mamlin BW, Ndege SK, **Were MC**. Evaluation of an Android-based mHealth system for population surveillance in developing countries. *J Am Med Inform Assoc*. 2012 Jul-Aug;19(4):655-659. PMCID: PMC3384107.
- c. Anokwa Y, Ribeka N, Parikh T, Borriello G, **Were MC**. Design of a Phone-Based Clinical Decision Support System for Resource-Limited Settings Information and Communication Technologies and Development ACM International Conference Proceeding Series 2012:13-24.
- d. Blank E, Tuikong N, Misoi L, Kamano J, Hutchinson C, Kimaiyo S, Fustera V, Were M, Vedanthan R. Usability of implementing a tablet-based decision support and integrated record-keeping (DESIRE) tool in the nurse management of hypertension in rural Kenya. *Stud Health Technol Inform*. 2013;192:1002. PMCID: PMC4074025.

B. Positions and Honors

Positions and Employment:

2004 – 2006	Instructor in Medicine, Hospitalist, Internal Medicine, Emory University School of Medicine
2006 – 2008	Fellow, Medical Informatics, Regenstrief Institute/Indiana University
2008 – 2014	Assistant Professor, Department of Internal Medicine & Geriatrics, Indiana University
2011 – 2014	Scholar, Harold Amos Faculty Development Program of the RWJF
2010 – 2014	Editorial Board, Journal of American Medical Informatics Association
2008 – 2015	Research Scientist, Regenstrief Institute, Inc.
2011 – 2015	Board of Scientific Counselors, Lister Hill Center of the National Library of Medicine
2014 – 2015	Associate Professor, Department of Internal Medicine & Geriatrics, Indiana University
2015 – Present	Visiting Associate Professor of Medicine, Moi University
2015 – Present	Acting Director, Institute of Biomedical Informatics, Moi University
2016 – Present	Associate Professor of Biomedical Informatics, Vanderbilt University
2016 – Present	Associate Professor of Medicine, Vanderbilt University

Other Experience and Professional Memberships

Licensure and Certification

1998 – 2002	USMLE Step 1, 2 and 3
2004 – 2006	Georgia Medical License
2004 – 2014	American Board of Internal Medicine
2006 – present	Indiana Medical License

Professional Societies

2000-Present	American Medical Association
2003-Present	American College of Physicians, Associate
2011-Present	Society for General Internal Medicine
2006-Present	American Medical Informatics Association

Honors:

1991	Top National Student in the Kenya Certificate of Secondary Education
1994	Howard Hughes Foundation Award for summer research
1997	W. Barry Wood Scholar for academic achievement
1997	Ford Foundation Baccalaureate Incentive Award for senior biochemistry thesis
2007	NIH Loan Repayment Program Award
2007	Distinguished Paper Award Finalist, AMIA 2007 Annual Symposium
2008	1 st Place Student Paper, AMIA 2008 Annual Symposium
2010	Best Paper Selection (Health & Clinical Management), IMIA Yrbook of Medical Informatics, 2010.
2011	Scholar, The Harold Amos Medical Faculty Development Program of the RWJF
2011	Notable Paper, Informatics Year in Review, AMIA Symposium 2011

2011 Top 11 mHealth Innovator in 2011, Rockefeller/UN Foundation/mHealth Alliance
2011 Gold Star Poster, International AIDS Society 2011
2013 Top Junior Research Faculty, Indiana University (Medicine)

C. Contributions to Science

1. Evaluating implementation models for digital record systems: I have led in the implementation science for digital record systems within resource-limited settings, providing guidance on best approaches for ensuring successful implementations of these systems.
 - a. **Were MC**, Emenyonu N, Achieng M, Shen C, Ssali J, Masaba JP, Tierney WM. Evaluating a scalable model for implementing electronic health records in resource-limited settings. *J Am Med Inform Assoc.* 2010 May 1;17(3):237-44. PMID: PMC2995711.
 - b. Blank E, Tuikong N, Misoi L, Kamano J, Hutchinson C, Kimaiyo S, Fustera V, **Were M**, Vedanthan R. Usability of implementing a tablet-based decision support and integrated record-keeping (DESIRE) tool in the nurse management of hypertension in rural Kenya. *Stud Health Technol Inform.* 2013;192:1002. PMID: PMC4074025.
2. Mobile health technologies for resource-limited settings: Over the years, I have led the development, implementations of mobile health technologies. Our mobile technologies have primarily targeted providers, and have been used for home-based counseling and testing for HIV, for chronic disease management including hypertension and diabetes, and for cervical cancer care.
 - a. **Were MC**, Kariuki J, Chepng'eno V, Wandabwa M, Ndege S, Braitstein P, Wachira J, Kimaiyo S, Mamlin B. Leapfrogging paper-based records using handheld technology: Experience from Western Kenya. *Stud Health Technol Inform.* 2010;160(Pt 1): 525-9. PMID: 20841742.
 - b. Rajput ZA, Mbugua S, Saleem JJ, Anokwa Y, Hartung C, Mamlin BW, Ndege SK, **Were MC**. Evaluation of an Android-based mHealth system for population surveillance in developing countries. *J Am Med Inform Assoc.* 2012 Jul-Aug;19(4):655-659. PMID: PMC3384107.
 - c. Anokwa Y, Ribeka N, Parikh T, Borriello G, **Were MC**. Design of a Phone-Based Clinical Decision Support System for Resource-Limited Settings Information and Communication Technologies and Development ACM International Conference Proceeding Series 2012:13-24.
3. Computerized decision support systems: I have led some of the ground-breaking work in rigorous evaluation of computerized decision support (CDSS) in resource-limited settings for HIV care. Using CDSS, we have demonstrated improved quality of care by providers. Systems have been adopted on mobile health platforms.
 - a. **Were MC**, Shen C, Tierney WM, Mamlin JJ, Biondich PG, Li X, Kimaiyo S, Mamlin BW. Evaluation of computer-generated reminders to improve CD4 laboratory monitoring in sub-Saharan Africa: A prospective comparative study. *J Am Med Inform Assoc.* 2011 Mar 1;18(2):150-5. PMID: PMC3116261.
 - b. **Were, M**; Nyandiko, W; Huang, K; Slaven, J; Shen, C; Tierney, W; Vreeman, R. Computer-Generated Reminders and Quality of Pediatric HIV Care in a Resource-Limited Setting. *Pediatrics.* 2013 ME;131(3):E789-96. PMID: PMC4535055.
4. Global Health Informatics Training & Capacity building: Over the years, I have served in several roles to improve training experience in Health Informatics and the rigor of evidence in the field. This is evident from my leadership at the IBMI at Moi University. I also served as co-chair at the mHealth Alliance Evidence Working Group, and the implementation science lead at the Regenstrief Institute Global Health Informatics core. I have mentored several global health informatics trainees and published 11 articles with them.
 - a. **Were MC**, Siika A, Ayuo PO, Atwoli L, Esamai F. Building Comprehensive and Sustainable Health Informatics Institutions in Developing Countries: Moi University Experience. *Stud Health Technol Inform.* 2015: 216: 520 - 4. PMID: 26262105.

- b. Mohammed-Rajput N, Ribeka W, **Were MC**. Creating and Evaluating a Dynamic Study Randomization and Enrollment Tool within a Robust EHRs. *AMIA Annu Symp Proc*. 2010 Nov; 517-21. PMID: PMC3041308. (Publication with trainee)
 - c. Rajput ZA, Mbugua S, Saleem JJ, Anokwa Y, Hartung C, Mamlin BW, Ndege SK, **Were MC**. The Development and implementation of a medical record system based population surveillance system in Rural Kenya. *J Am Med Inform Assoc*. 2012 Jul-Aug;19(4):655-659. PMID: PMC3381407.(Publication with trainee)
 - d. Keny A, Wanyee S, Kwaro D, Mulwa E, **Were MC**. Developing a national-level concept dictionary for EHRs implementations in Kenya. *Stud Health Technol Inform*. 2015; 216:780-4 PMID: 26262158. (Publication with trainee)
5. Ethics of implementing electronic record systems: The ethics of implementing electronic record systems in developing countries are often under emphasized. I have conducted work on approaches for ensuring that these systems are ethically implemented, outlining considerations for various stakeholders in this area.
- a. **Were MC** and Meslin, EM. Ethics of implementing electronic health records in developing countries: Points to Consider. *AMIA Annu Symp Proc*. 2011:1499-505. Epub 2011 Oct 22. PMID: PMC3243215.

Complete List of Published Work in MyBibliography:

<http://www.ncbi.nlm.nih.gov/myncbi/collections/bibliography/49899646/>

D. Research Support

Ongoing Research Support

- | | | |
|--|-------------------|-------------------------|
| Norad: QZA-0484 | Were, (PI) | 01/01/2013-12/31/2019 |
| Health Informatics Training and Research in East Africa (HI-TRAIN) | | |
| The goal is to develop capacity for Health Informatics and conduct research in the field in partnership with Makerere University (Uganda) and University of Bergen (Norway) | | |
| Role: PI | | |
| Astra Zeneca | Kamano, (PI) | 01/11/2014 – 04/30/2017 |
| Health Hearts Africa | | |
| The goal is to conduct population level research on hypertension in Western Kenya. Project employs use of mUzima and OpenMRS. | | |
| Role: Co-Investigator. | | |
| No Grant number,
CDC-GAP | Shade , PI (UCSF) | 05/01/2015- 04/30/2020 |
| Strengthening Mozambican Capacity in Strategic Information Systems under the President’s Emergency Plan for AIDS Relief (PEPFAR). | | |
| Under this award VIGH will be subcontracted by UCSF to provide technical assistance to the Mozambican Ministry of Health related to roll-out of its electronic patient tracking system as well as in-country capacity to conduct implementation science research and quality assurance. Role: PI of VU Subcontract from UCSF | | |
| Role: Co-Investigator | | |
| 1U2GGH000812-03,
CDC/Global AIDS Program (PEPFAR) | WESTER, (PI) | 09/30/2012-09/29/2017 |
| <i>Avante Zambézia</i> : Technical Assistance to the Ministry of Health (MOH) for HIV Services and Program Transition in Zambézia | | |
| This initiative entitled supports comprehensive HIV services (including the provision of cART including ART for PMTCT) to HIV-infected persons residing in 10 of Zambézia provinces 17 districts. My role as co-Investigator concentrates on challenges of maternal and child recruitment, testing, linkage, retention, and adherence to antiretrovirally-based HIV health care and prevention programs. | | |
| Role: Co-Investigator | | |

Completed Research Support

CDC Foundation

Were (PI)

05/04/2012 – 12/31/2015

Rapid Baseline Situational Assessments for Improving Data for Decision-Making in Global Cervical Cancer Programs

This project supported rapid baseline situational assessments of data and data systems related to Cervical Cancer screening in six countries.

Role: Co-Investigator.

AbbVie Foundation

Were (PI)

07/01/2015 – 12/31/2015

mHealth and CDSS technologies to support Find, Link, Treat, Retain HIV program at AMPATH

This project helped develop, implement and evaluate digital health solutions for HIV care.

Role: PI.

U01 HL114200-01

Fuster (PI)

05/04/2012 – 03/31/2017

Optimizing linkage and retention to hypertension care in rural Kenya

The goal of this research is to evaluate strategies for linking and retaining patients with hypertension into care.

Project employs use of mUzima and OpenMRS.

Role: Co-Investigator.