Harry Reyes Nieva

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Research Overview

Building on two decades of domestic and international experience in clinical research and public health informatics, my research focuses on human-centered artificial intelligence (AI) and development of systematic, scalable data-driven approaches to promote health equity. My work usually examines and applies methods such as machine learning, natural language processing, and spatiotemporal analysis in addition to traditional biostatistics and epidemiology. I am particularly interested in using and interrogating multimodal data sources and the vast toolbox that computational learning offers to better understand, improve, and facilitate study of health in populations and communities that are marginalized. Generally, my research can be grouped into four primary domains: (i) ethical considerations in AI, clinical practice, and digital health; (ii) promoting health data equity and creating knowledge bases; (iii) elucidating health inequity and creating tools to facilitate further discovery; and (iv) enabling equitable learning health systems and precision health.

Education

Columbia University in the City of New York, New York, NY
Doctor of Philosophy in Biomedical Informatics, Expected 2024
Master of Philosophy in Biomedical Informatics, 2023
Master of Arts in Biomedical Informatics, 2021 (GPA: 4.0)
Dissertation Committee: Noémie Elhadad (advisor), Suzanne Bakken, Karthik Natarajan
Coursework included: Machine Learning for Healthcare, Symbolic AI in Healthcare, Data Science, Natural Language Processing, Computer Applications in Health Care, Intelligent Decision Systems

Beijing Language and Culture University, Beijing, China
Summer Student, Intensive Mandarin, 2019

Johns Hopkins Bloomberg School of Public Health, Baltimore, MD
Master of Applied Science in Spatial Analysis for Public Health, 2019

Harvard T.H. Chan School of Public Health, Boston, MA
Special Student, International and Population Health, 2009-2011

Yale University, New Haven, CT
Bachelor of Arts in Sociology and History, 2005

Postgraduate Training

08/2013-10/2023	Predoctoral Research Fellow	General Medicine and Primary Care	Brigham and Women's Hospital, Boston, MA
08/2013-10/2023	Visiting Postgraduate Research Fellow	Medicine	Harvard Medical School, Boston, MA
09/2019-08/2024	National Library of Medicine/ National Institute of Allergy and Infectious Diseases T15 Predoctoral Research Training Fellow	Biomedical Informatics	Columbia University Irving Medical Center, New York, NY

Other Professional Positions

2000-2001	Program Assistant	Yale International Affairs Council
2000-2001	Library Clerk	Sterling Memorial Library, Yale University
2000-2001	Reading Tutor	America Reads
2001-2002	Client Advocate	Student Health Outreach (SHOut)
2003	Paralegal	Raymond B. Schwartzberg & Associates
2003-2004	Editorial Assistant/Contributor	Yale Medicine Magazine
2004	Research Assistant	Department of Sociology, Yale University
2004-2005	Client Outreach Officer	Advanced Strategies for Healthcare Access
2005–2006	Teacher, English-as-a-Second-Language	New York City Board of Education/New York City Teaching Fellows
2006-2007	Emergency Medical Technician	Tufts Emergency Medical Services
2007-2008	Research Assistant	Division of General Internal Medicine and Primary Care, BWH
2008-2010	Data, Training, and Education Coordinator	Harvard University/U.S. President's Emergency Plan for AIDS Relief (PEPFAR)
2008-2011	Research Assistant (per diem)	Division of General Internal Medicine and Primary Care, BWH
2010-2012	Data Quality Assurance Manager	Harvard University/U.S. President's Emergency Plan for AIDS Relief (PEPFAR)
2012-2019	Research Manager	Division of General Internal Medicine and Primary Care, Brigham and Women's Hospital

Major Administrative Leadership Positions

Local

2012-2019	Network Manager, Brigham and Women's Primary Care Practice-Based Research Network	Brigham Health

Committee Service

2007–2008	Association of Multicultural Members of Partners Healthcare	Partners Healthcare
	2007–2008	Member
	2007–2008	Vice-Chair, BWH Chapter
2011–2019	LGBTQ and Allies Employee Resource Group	Brigham Health
	2011–2019	Member
	2014–2016	Co-Chair
2013–2014	Partners Human Research Committee, Insight Usability Working Group	Partners Healthcare
	2013–2014	Member
2013–2014	Partners Enterprise Research Portal Working Group	Partners Healthcare
	2013–2014	Member

2013–2015	Partners eCare Sexual Orientation and Gender Identity Working Group	Partners Healthcare
	2013–2015	Founding Member
2013–2015	Partners eCare Research Working Group	Partners Healthcare
	2013–2015	Member
2015–2016	Equity and Diversity Council	Brigham Health
	2015–2016	Founding Member
	2015–2016	Co-Chair, Data Working Group
2015–2018	Sexual Orientation and Gender Identity Working Group	Partners Healthcare
	2015–2018	Founding Member
2019–2021	Electronic Health Record Phenotyping Working Group	Columbia University
	2019–2021	Member
2020–2022	Biomedical Informatics Departmental Seminar Series Planning Committee	Columbia University
	2020–2022	Member
2021–2022	Toward Diversity, Equity, and Inclusion in Informatics, Health Care, and Society Seminar Series & Planning Committee	Columbia University
	2021–2022	Founding Member
2021–present	Department of Biomedical Informatics Diversity, Equity, and Inclusion Working Group	Columbia University
	2021–present	Founding Member

Professional Societies

2008–present	Biomedical Science Careers Program (BSCP)	
	2023–present	Member, Educational Relief Fund Review Committee
2012–2014	American Public Health Association (APHA)	
2012–2014	AcademyHealth	
2014–present	American Medical Informatics Association (AMIA)	
	2014–present	Abstract Reviewer, Annual Symposium
	2023–present	Member, Diversity, Equity, and Inclusion Recruitment Subcommittee
2017–present	Association for Computing Machinery (ACM)	
2019–present	New York Academy of Sciences	
2020–present	Latinx in AI	
2022–present	Association for Computational Linguistics (ACL)	
2022–present	Association for the Advancement of Artificial Intelligence (AAAI)	
2022–present	Machine Learning for Healthcare (MLHC)	
	2022, 2023	Submission Reviewer, Annual Meeting
2023–present	Machine Learning for Health (ML4H)	
	2023	Sub-Chair, Author Mentorship Program

Editorial Activities

Ad hoc Reviewer

American Psychologist
Applied Clinical Informatics
Health Services Research
JAMA Network Open
JAMIA Open
Journal of Biomedical Informatics
Journal of General Internal Medicine
Journal of Medical Internet Research
Journal of the American Medical Informatics Association
Medical Care
Natural Language Engineering
Open Forum Infectious Diseases

Other Editorial Roles

2021–2023 Journal of the American Medical Informatics Association (JAMIA)
2021–2023, Student Editorial Board Member
2022–2023, JAMIA Journal Club Manager

Honors and Prizes

2002	Y50K Business Plan Competition, Not-For-Profit, Second Place	Yale Entrepreneurship Society	
2004	Mellon Forum Undergraduate Thesis Research Funding Award	Yale University	
2012	Partners in Excellence Award for Leadership and Innovation	Partners HealthCare	
2014	Partners in Excellence Award for Quality Treatment and Service	Partners HealthCare	
2014	Outstanding Quality & Patient Safety Oral Presentation	Society of General Internal Medicine	Research
2015	Brigham Way honoree	Brigham and Women's Hospital	Leadership
2015	Travel Scholarship	North American Primary Care Research Group	
2016	LGBTQ Leadership Award	Brigham Health	
2016-2018	Merit Scholarship	Johns Hopkins Bloomberg School of Public Health	Academic
2017	Travel Scholarship	The Open Gate, Harvard Gender & Sexuality Caucus	Research
2018	Ford Foundation Predoctoral Fellowship, Honorable Mention	National Academies of Sciences, Engineering, and Medicine	
2018	Partners in Excellence Award for Leadership and Innovation	Partners HealthCare	
2018	Ruth and William Silen MD Award, Third Prize	New England Science Symposium	Research

2019	Dean's Fellowship	Columbia University Vagelos College of Physicians and Surgeons	Academic
2019–2022	T15 Predoctoral Research Training Fellowship	National Library of Medicine	
2021–2022	HSF Scholarship	Hispanic Scholarship Fund (HSF)	Academic
2021–2023	Hope Scholarship	Biomedical Science Careers Program	Academic
2021–2024	Computational and Data Science Fellowship	Association for Computing Machinery (ACM) Special Interest Group in High Performance Computing (SIGHPC)	
2022–2024	T15 Predoctoral Research Training Fellowship	National Library of Medicine/ National Institute of Allergy and Infectious Diseases	
2024	DAAD AInet Fellowship and Postdoctoral Networking Tour in Artificial Intelligence	German Academic Exchange Service, Deutscher Akademischer Austauschdienst (DAAD), and Federal Ministry of Education and Research	Research

Report of Funded Projects

Funding Information

Past

2007 Influenza in the Partners Primary Care Practice-Based Research Network
Roche Laboratories, RLI 06001207
Research Assistant (PI: Linder)
Aim: To measure and evaluate the appropriateness of antiviral and antibiotic prescribing for patients being treated for influenza in primary care clinics.

2007–2008 Pharmacist Intervention to Decrease Medication Errors in Heart Disease Patients
National Heart, Lung, and Blood Institute (NHLBI), R01HL089755
Research Assistant (Site PI: Schnipper)
Aim: To evaluate a literacy-focused program that provides pharmacist-led educational assistance at the time of hospital discharge to patients with heart disease.

2008–2012 President's Emergency Plan for AIDS Relief (PEPFAR)
Health Resources and Services Administration (HRSA) U51HA02522
Data Quality Assurance Manager/Data, Training, and Education Coordinator (PI: Kanki)
A $362 million grant to train health care workers, develop monitoring and evaluation systems, strengthen health care infrastructures, and collaborate with local hospitals and clinics in Nigeria, Botswana, and Tanzania that provide treatment for people living with HIV/AIDS.

2012–2014 Medical Malpractice and Patient Safety Protocol (PROMISES)
Agency for Healthcare Research and Quality (AHRQ) 1R18HS019508-01
Project Manager (PI: Schiff)
Aim: To test the impact of quality improvement techniques to improve 3 high risk ambulatory malpractice areas: 1) medication management, 2) test ordering and results management 3) follow-up and referral management.

2012–2014 Use of Behavioral Economics to Improve Treatment of Acute Respiratory Infections
National Institutes of Health/University of Southern California 1RC4AG039115-01
Data Manager/Statistical Programmer (Site PI: Linder)
Aim: To evaluate the use of behavioral economic concepts such as enhanced defaults, alternative options, and social norms to reduce inappropriate antibiotic prescribing for acute respiratory infections.

2013–2014 Acute Respiratory Infection Telephone Management Service
Brigham and Women's Physicians Organization Care Redesign Incubator and Startup Program – Round 1 and Round 2
Data Manager (PI: Linder)
Aim: To develop, implement, and evaluate an acute respiratory infection telephone management service at one of the Brigham and Women's Primary Care Practices.

2013–2015 Patient Outcomes Associated with Year-End Departure of Resident Primary Care Physicians
Support for Excellence in Educational Development (SEED) Grant, BWH
Co-Investigator (PI: Solomon)
Aim: To investigate whether acute care utilization is increased disproportionately among patients of graduating resident physicians compared to non-graduating residents.

2014 First Annual BWH DGIM Research Day
BRI/ORC Microgrant Pilot Program
Principal Investigator ($1,000)
Aim: To develop a BWH Division of General Internal Medicine and Primary Care retreat to showcase contributions of research assistants and promote their career development.

2014–2015 Are Physicians and Patients Adhering to the Published Guidelines for Fasting during Ramadan?
Martin P. Solomon Award for Primary Care Scholarship, BWH
Co-Investigator (PI: Ali)
Aim: To measure differences in rates of health care utilization for Muslim patients just prior to, during, and after Ramadan.

2014–2016 Understanding and Preventing Diagnostic Pitfalls
Risk Management Foundations of the Harvard Medical Institutions (CRICO)
Project Director (PI: Schiff)
Aim: To identify leading diagnostic pitfalls that pose safety and malpractice risks, then design and test the accuracy of electronic screens for these pitfalls in the electronic health record.

2014–2016 Evaluating Variation in Overactive Bladder Medication Use and Other Treatments
Astellas Pharma US, Inc.
Statistical Programmer (PI: Loughlin)
Aim: To develop an electronic phenotype for overactive bladder, then characterize overactive bladder treatment, medication adherence, and outcomes.

2015–2017 Clinician-Patient Relationships: Boundaries, Barriers, Breakdowns
Gold Foundation/Lucian Leape Family Foundation
Project Director (PI: Schiff)
Aim: To examine physician attitudes and practices related to caring acts that have been questioned as "inappropriate" or "unethical" crossing of professional boundaries.

2015–2018 Implementation of a Medication Reconciliation Protocol to Improve Patient Safety
Agency for Healthcare Research and Quality (AHRQ) R18 HS 023757-01A1
Project Manager/Statistical Programmer (PI: Schnipper)
Aim: To widely disseminate, implement, and evaluate sustainable medication reconciliation interventions that improve patient safety during care transitions.

2016–2018 Electronic Medication Adherence Reporting and Feedback During Care Transitions (Smart Pillbox)
Agency for Healthcare Research and Quality (AHRQ) R21 HS 024587-01
Project Manager/Statistical Programmer (PI: Schnipper)
Aim: To implement a smart pillbox intervention for patients discharged from the hospital to the community and to evaluate the effects of the intervention on post-discharge medication discrepancies, medication adherence, and chronic disease management.

2017–2018 Novel electronic health record phenotyping of LGBTQ intersectional identities and associated health disparities using natural language processing and machine learning
Harvard Catalyst
Co-Investigator (PI: Zhou)
Aim: To develop methods using machine learning and natural language processing to identify sexual and gender minority (SGM) populations from electronic health records and characterize potential healthcare disparities associated with different segments of SGM populations.

2018–2019 A Multicenter Randomized Controlled Trial of Pharmacist-Directed Transitional Care to Reduce Post-Hospitalization Utilization
National Institute on Aging (NIA) R01 AG 058911-01
Project Manager (Site PI: Schnipper)
Aim: To measure the impact of pharmacist-led discharge (PHARM-DC) interventions on post-discharge utilization within 30 days and identify patient sub-populations most likely to benefit from PHARM-DC.

Projects Submitted for Funding

2018 ARtificial Intelligence for the Study and Enhancement of Sexual and Gender Minority health
NIH/NIMHD 1R21HD097292-01
Co-investigator (PI: Zhou)
Aim: The goals of the ARISE-SGM study were to leverage advances in artificial intelligence to address logistical challenges in obtaining representative samples of sexual and gender minority (SGM) populations and characterize comorbidity prevalence and potential health disparities associated with different segments of SGM populations.
SRG Action: Impact Score: 38 Percentile: 24+

2021 Financial Toxicity and Cancer Treatment: Examining Trends and Disparities via Causal Inference
Robert Wood Johnson Foundation/AcademyHealth HD4A Award
Co-Principal Investigator (PI: Elhadad)
Aim: To apply machine learning, natural language processing, and causal inference methods to a large, longitudinal cohort to isolate factors contributing to financial toxicity following cancer diagnosis. Additionally, to identify and quantify disparities in clinical and catastrophic financial outcomes, enabling policymakers and providers to prioritize targeted interventions most likely to reduce financial toxicity and mitigate disparities in clinical outcomes.

Report of Local Teaching and Training

Teaching of Students in Courses

2016, 2017	HPM 299 Research with Large Databases Teaching Fellow Master's and PhD students	Harvard T.H. Chan School of Public Health Five 1.5-hr sessions per week for 3 weeks
2020	BINF G4011 Acculturation to Medicine & Clinical Informatics Teaching Assistant Master's and PhD students	Columbia University Graduate School of Arts and Sciences 2-hr sessions per week for 13 weeks
2021, 2022	INTC M7210 Mechanisms and Practice Preceptor in Clinical Informatics 2nd year medical students	Columbia Vagelos College of Physicians and Surgeons Two 2-hr sessions per week for 2 weeks
2022	BINF G4008 Interrogating Ethics and Justice in Digital Health Teaching Assistant Master's and PhD students	Columbia University Graduate School of Arts and Sciences 2-hr sessions per week for 13 weeks

Local Invited Presentations

No presentations below were sponsored by 3rd parties/outside entities.

2013 How Busy Clinicians Can Improve Care and Pursue Scholarship / Invited Workshop
Division of General Internal Medicine and Primary Care, Brigham and Women's Hospital

2014 SQL-based Data Management and Manipulation / Invited Presentation
Division of General Internal Medicine and Primary Care, Brigham and Women's Hospital

2014 Designing and Building Clinical Research Databases / Invited Presentation
Division of General Internal Medicine and Primary Care, Brigham and Women's Hospital

2014 The LGBTQ Data Collection Gap: Sexual Orientation and Gender Identity in the EHR / Invited Presentation
LGBTQ and Allies Employee Resource Group, Brigham Health

2017 Algorithmic Bias and Health Disparities / Invited Presentation
Machine Learning Working Group, Partners HealthCare

2017 Improving and Leveraging Sexual Orientation and Gender Identity Demographics in Epic / Invited Presentation
Sexual Orientation and Gender Identity Working Group, Partners HealthCare

2018 Documentation of Sexual Orientation and Gender Identity in the Electronic Health Record / Invited Presentation
Division of General Internal Medicine and Primary Care, Brigham and Women's Hospital

2019 LGBTQ Health - Diversity, Culture, and Inclusion Series / Invited Presentation
Division of General Internal Medicine and Primary Care, Brigham and Women's Hospital

2022 Mining the Health Disparities and Minority Health Bibliome / Invited Presentation
Biomedical Informatics Seminar Series, Department of Biomedical Informatics, Columbia University

2023 Enabling a Learning Public Health System: Enhanced Surveillance of Sexually Transmitted Infections / Invited Presentation
Division of Infectious Diseases, NewYork-Presbyterian Hospital (NYPH), New York, NY.

2023 Health Information Exchange Enables Enhanced STI Surveillance Using Electronic Health Record Data / Invited Presentation
HIV Prevention Research Working Group, NYPH, New York, NY.

2023 Development and Validation of Multimodal Deep Learning Models to Identify Human Monkeypox in the Electronic Health Record / Invited Presentation
HIV Prevention Research Working Group, NYPH, New York, NY.

2024 Elucidating Health Inequities and Research Gaps in HIV and Other Sexually Transmitted Infections Using Data Mining and a Large Language Model: A Computational Scoping Review / Invited Presentation
HIV Prevention Research Working Group, NYPH, New York, NY.

Report of Regional, National, and International Invited Teaching and Presentations

No presentations below were sponsored by 3rd parties/outside entities.

Regional

2016 Identifying and Understanding Malpractice-Prone Diagnostic Pitfalls / Invited Presentation
Risk Management Foundation of the Harvard Medical Institutions Incorporated (RMF)
CRICO Research Day
Boston, MA

2018 High physician and clinic-level variation in documentation of sexual orientation and gender identity in the electronic health record / Plenary Session (Selected Oral Abstract)
New England Science Symposium
Boston, MA
Received the Ruth and William Silen Award, Third Prize

2022 Mining the Health Disparities and Minority Health Bibliome / Invited Presentation
Biomedical Informatics Colloquium, New York City College of Technology (City Tech)
New York, NY

2023 Getting into Graduate School and Succeeding/ Invited Panelist
New England Science Symposium, Biomedical Science Careers Program
Boston, MA

National

2014 Comparing Clinicians' Perception of Their Own and Their Peers' Antibiotic Prescribing to Actual Antibiotic Prescribing for Acute Respiratory Infections in Primary Care (Selected Oral Abstract)
Society of General Internal Medicine Annual Meeting
San Diego, CA
Received the Outstanding Quality and Patient Safety Oral Presentation Award

2015 Advocacy and Implementation: Gathering SOGI Demographics in the Clinical Setting (Selected Oral Abstract)
Gay and Lesbian Medical Association Annual Conference
Portland, OR

2021 Differential Presentation and Delays in Treatment for Acute Myocardial Infarction Associated with Sex and Race/Ethnicity (Selected Oral Abstract)
American Medical Informatics Association Annual Symposium
San Diego, CA

2022 Mining the Health Disparities and Minority Health Bibliome: A Computational Scoping Review (Selected Oral Abstract)
American Medical Informatics Association Annual Symposium
Washington, DC
Spotlighted by AMIA for "demonstrating best practices in promoting diversity, equity, and inclusion through scholarly communications in biomedical informatics."

2023 Enabling a Learning Public Health System: Enhanced Surveillance of Sexually Transmitted Infections (Selected Oral Abstract)
American Medical Informatics Association Annual Symposium.
New Orleans, LA

2023 Challenges, Opportunities, and Considerations: Promoting Inclusive Research in the Era of Big Data / Invited Presentation and Panelist
American Medical Informatics Association Annual Symposium
New Orleans, LA

International

2009 Improving Understanding and Medication Adherence/ Invited Plenary Presentation
HIV Training, AIDS Prevention Initiative Nigeria Plus (APIN Plus)
Abuja, Nigeria

2011 Introduction to Data Management/ Invited Seminar
AIDS Prevention Initiative Nigeria Plus (APIN Plus)
Abuja, Nigeria

2011 Critical Elements in Database Cleaning, a Checklist/ Invited Seminar
AIDS Prevention Initiative Nigeria Plus (APIN Plus)
Abuja, Nigeria

2011 Basics of Programming and Scripting/ Invited Seminar
AIDS Prevention Initiative Nigeria Plus (APIN Plus)
Abuja, Nigeria

2011 Monitoring data and Trouble-shooting/ Invited Seminar
AIDS Prevention Initiative Nigeria Plus (APIN Plus)
Abuja, Nigeria

2011 Programming: Creating a Utility and Basics of Scripting/ Invited Seminar
AIDS Prevention Initiative Nigeria Plus (APIN Plus)
Abuja, Nigeria

2011 Programming and Trouble-shooting Databases/ Invited Seminar
AIDS Prevention Initiative Nigeria Plus (APIN Plus)
Abuja, Nigeria

2011 Cohort Analyses I: Using EHR Data/ Invited Seminar
AIDS Prevention Initiative Nigeria Plus (APIN Plus)
Abuja, Nigeria

2011 Cohort Analyses II: Using EHR Data/ Invited Seminar
AIDS Prevention Initiative Nigeria Plus (APIN Plus)
Abuja, Nigeria

2014 PBRN Organization and Governance to Promote Practice, Clinician, Researcher, and Patient Engagement / Selected Workshop
North American Primary Care Research Group Practice-Based Research Network Conference
Bethesda, MD, USA

2015 Gathering Sexual Orientation and Gender Identity Demographics in the Clinical Setting / Selected Workshop
North American Primary Care Research Group Practice-Based Research Network Conference
Bethesda, MD, USA

2023 Health Information Exchange Enables Enhanced STI Surveillance Using Electronic Health Record Data (Selected Oral Abstract)
STI & HIV 2023 World Congress
Chicago, IL, USA

Report of Clinical Activities and Innovations

Past and Current Licensure and Board Certification

2006 Certification, New York State Emergency Medical Technician (EMT-D)

Report of Teaching and Education Innovations

Creation of a JEDI-AI Case Study Series (2023-2024)	Co-developed educational case studies focused on justice, ethics, diversity, and inclusion (JEDI) in the development and use of artificial intelligence (AI) approaches in digital health. I contributed to overall design of the case book, development of the case methodology, was one of the principal authors for 3 of the 8 case studies, and revised the remaining case studies.

Report of Technological and Other Scientific Innovations

Electronic health record (EHR) adult quality improvement tool (2010)	Co-developed and evaluated a utility to extract information from data warehouse and generate measures based on 15 adult quality of care indicators at 33 Harvard PEPFAR sites in Nigeria. Module reviews continuity of care, drug therapy initiation, loss to follow-up, laboratory monitoring, disease screening based on clinical symptoms assessment, treatment failure, and treatment response.
EHR pediatric quality improvement tool (2011)	Co-developed and evaluated a utility to extract information from data warehouse and generate measures based on 23 pediatric quality of care indicators at 33 Harvard PEPFAR sites in Nigeria. Programmed module to review continuity of care, drug therapy initiation, medication adherence, loss to follow-up, laboratory monitoring, disease screening based on clinical symptoms assessment or diagnostic evaluation, treatment failure, toxicity management, nutritional assessment, and treatment response.
EHR data quality assessment tool, version 2.0 (2011)	Instituted major modifications to and evaluated a pre-existing EHR utility to incorporate expanded data quality indicators at 33 Harvard PEPFAR sites in Nigeria. With this utility, central and site-level data managers are able to better monitor and improve data completeness, validity, accuracy, and currency.
CovidWatcher (2020)	As part of a department-wide effort, my colleagues and I developed CovidWatcher, an `app` and `online portal` that surveyed users about COVID-19 exposure, symptoms, access to medical care, and impact on daily life. Data collected was used to track spread of COVID-19, giving citizens real-time information about hot spots and enabling health care officials to deploy resources where needed.
Health Equity Research Assessment (HERA) (2021)	As a member of the Elhadad lab, I co-developed the Health Equity Research Assessment (HERA), a large-scale characterization conducted across Observational Health Data Science Informatics (OHDSI) sites with heterogeneous populations and insurance coverage, allowing for identification of persistent and generalizable trends in diagnosis differences. The HERA dashboard and visualizations can be used to download study data, further investigate health differences, and generate novel hypotheses. `https://data.ohdsi.org/HERACharacterization/`
C-REACT: Contextualized Race and Ethnicity Annotations for Clinical Text (2022)	As a member of the Elhadad lab, my colleagues and I curated the C-REACT dataset, a large publicly-available corpus of sentences from clinical notes manually annotated for information related to race and ethnicity (RE) such as patient country of origin.
HDMH Monitor (2022)	HDMH Monitor is an online article repository and interactive dashboard that leverages natural language processing and machine learning methods to support scientific discovery via automated archive, search, information synthesis, and data visualization of articles concerning health disparities and minority health (HDMH). `https://hdmhmonitor.dbmi.columbia.edu/`

Report of Education of Patients and Service to the Community

Activities

2001-2005 Latino Youth Enrichment Team (LYET), New Haven, CT/Co-Director
Managed community center mentorship program and developed instructional methods for Latino youth ranging in age from 6 through 13.

2006-2016 Boston Medical Reserve Corps/Emergency Medical Technician
The Boston Medical Reserve Corps is a group of volunteers who are ready to respond should there be a public health emergency in Boston.

2007 Timmy Global Health, Dominican Republic/Medical Relief Volunteer
Helped establish temporary medical clinics along Haiti-Dominican Republic border; triaged patients, managed pharmacy, translated proper drug use and application.

2013-2016 Human Rights Commission, City of Cambridge/Commissioner, Vice Chair
Adjudicated complaints of discrimination occurring in Cambridge, MA related to housing, employment, education, and public accommodation. Lobbied the state legislature on important policies such as pay equity, protections relative to domestic violence, and anti-discrimination legislation for sexual and gender minorities.

2018 Queer Health Hackathon/Co-organizer
Co-organized 3-day collaborative event to convene software engineers, data scientists, and clinical experts to examine longitudinal clinical database for potential LGBTQ health disparities. Extracted and transformed/de-identified EHR data from health system enterprise data warehouse; loaded on Amazon Web Services Cloud platform.

2019 High School Scholars Program, American Medical Informatics Association/Mentor
Supported high school students with research projects; reviewed their work and helped them practice scientific presentations; offered career advice and encouragement.

2021 COVID-19 Vaccination Effort, New York Presbyterian Hospital/Volunteer
Verified patients had scheduled appointments prior to entrance, checked patients in for visit via Epic system, scheduled follow-up visits for second dose administration, and assisted with traffic flow as patients move through the vaccination process.

Educational Material for Patients and the Lay Community

Books, monographs, articles and presentations in other media

2012	Harvard School of Public Health/AIDS Prevention Initiative in Nigeria: Reducing the Burden of AIDS U.S. President's Emergency Plan for AIDS Relief	Co-author	Harvard PEPFAR Nigeria Program Report
2012	Harvard School of Public Health/Management and Development for Health: Reducing the Burden of AIDS in Tanzania U.S. President's Emergency Plan for AIDS Relief	Co-author	Harvard PEPFAR Tanzania Program Report
2012	Botswana-Harvard AIDS Institute Partnership: Reducing the Burden of AIDS U.S. President's Emergency Plan for AIDS Relief	Co-author	Harvard PEPFAR Botswana Program Report

Recognition

2015	Publicity for successful advocacy leading to routine collection of sexual orientation and gender identity demographics in the Mass General Brigham (formerly Partners Healthcare) EHR	Boston Magazine
2019	Interviewed for "Machine Learning and Health Equity" episode to discuss leveraging AI in health equity research	ThinkResearch Podcast
2019	Featured in article "On the Margins" about research using natural language processing to study LGBTQ health	Harvard Medicine Magazine

Report of Scholarship

Peer reviewed publications in print or other media

Research Investigations

1. Linder JA, **Reyes Nieva H**, Blumentals WA. Antiviral and antibiotic prescribing for influenza in primary care. *J Gen Intern Med.* 2009 Apr; 24(4):504-10. PMID:19225847; PMCID:PMC2659164. doi:10.1007/s11606-009-0933-9.

2. Schiff G, Griswold P, Ellis BR, Puopolo AL, Brede N, **Reyes Nieva H**, Federico F, Leydon N, Ling J, Wachenheim D, Leape LL, Biondolillo M. Doing right by our patients when things go wrong in the ambulatory setting. *Jt Comm J Qual Patient Saf.* 2014 Feb; 40(2):91-6. PMID:24716332. doi:10.1016/s1553-7250(14)40011-4.

3. Linder JA, Doctor JN, Friedberg MW, **Reyes Nieva H**, Birks C, Meeker D, Fox CR. Time of day and the decision to prescribe antibiotics. *JAMA Intern Med.* 2014 Dec; 174(12):2029-31. PMID:25286067; PMCID:PMC4648561. doi:10.1001/jamainternmed.2014.5225.

4. Chaplin B, Meloni S, Eisen G, Jolayemi T, Banigbe B, Adeola J, Wen C, **Reyes Nieva H**, Chang C, Okonkwo P, Kanki P. Scale-up of networked HIV treatment in Nigeria: creation of an integrated electronic medical records system. *Int J Med Inform.* 2015 Jan; 84(1):58-68. PMID:25301692. doi:10.1016/j.ijmedinf.2014.09.006.

5. Singer SJ, **Reyes Nieva H**, Brede N, Ling J, Leydon N, Weissman JS, Goldmann D, Griswold P, Yoon C, Orav EJ, Bates DW, Biondolillo M, Schiff GD. Evaluating ambulatory practice safety: the PROMISES project administrators and practice staff surveys. *Med Care.* 2015 Feb; 53(2):141-52. PMID:25464161. doi:10.1097/MLR.0000000000000269.

6. Solomon SR, Gooding HC, **Reyes Nieva H**, Linder JA. Acute Care Utilization by Patients After Graduation of Their Resident Primary Care Physicians. *J Gen Intern Med.* 2015 Nov; 30(11):1611-7. PMID:25896089. PMCID:PMC4617921. doi:10.1007/s11606-015-3305-7.

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International

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Narrative Report

I am currently a PhD Candidate at Columbia University where I am advised by Prof. Noémie Elhadad, Chair of the Department of Biomedical Informatics (DBMI). For most of my PhD, I was also a Visiting Postgraduate Research Fellow at Harvard Medical School. My long-term goal is to pursue a career in academia as a professor. Building on two decades of domestic and international experience in clinical research and public health informatics, my research focuses on human-centered artificial intelligence (AI) and development of systematic, scalable data-driven approaches to promote health equity. My work usually examines and applies methods such as machine learning, natural language processing, and spatiotemporal analysis in addition to traditional biostatistics and epidemiology.

My scholarship is informed by a longstanding commitment to justice, ethics, diversity, and inclusion (JEDI). This is largely demonstrated by many years of service on JEDI-oriented research studies, committees, and working groups; capacity-building efforts devoted to resource-limited settings and marginalized communities; and voluntary civil service. Among these experiences, perhaps one of the more formative was my three-year term appointment as a Commissioner of Human Rights for the city of Cambridge, Massachusetts. During that time, I presided over hearings and facilitated conciliations regarding complaints of discrimination against protected classes related to housing, employment, education, and public accommodation. I also engaged the Massachusetts state legislature on important policies such as pay equity, protections relative to domestic violence, and anti-discrimination legislation for sexual and gender minority populations (e.g., people who identify as lesbian, gay, bisexual, transgender, or queer).

I am particularly interested in using and interrogating multimodal data sources and the vast toolbox that computational learning offers to better understand, improve, and facilitate study of health in populations and communities that are marginalized. Generally, my research can be grouped into four primary domains: (i) ethical considerations in AI, clinical practice, and digital health; (ii) promoting health data equity and creating knowledge bases; (iii) elucidating health inequity and creating tools to facilitate further discovery; and (iv) enabling equitable learning health systems and precision health.

Ethical considerations in AI, clinical practice, and digital health. My research on ethical considerations, perceptions, responsibilities, and implications in the digital age of healthcare often examines stakeholders and their relationships to one another, notions of data and algorithmic justice, and transparency and trust in clinicians and AI. It also involves encoding human values and goals into AI via a process known as alignment. Among these studies, our work on ethical considerations of clinical natural language processing explored both how it may contribute to healthcare biases as well as potential applications to improve equity in healthcare.

I also led a national survey that examined physician attitudes and practices related to caring acts that have been questioned as "inappropriate" or "unethical" crossing of professional-patient boundaries. We found that the medical profession is divided on appropriate boundary setting in relationships with patients, though a majority considered many caring practices acceptable. In collaboration with a high-level consortium that included the Massachusetts Medical Society, Institute for Healthcare Improvement, and Health Care For All, my work has also led to the creation of a consensus document regarding disclosure of medical errors and, when appropriate, taking responsibility and apologizing for any resulting harm.

Most recently, I collaborated with both my doctoral advisor and Prof. Sandra Soo-Jin Lee, chair of the Division of Ethics at Columbia University Irving Medical Center, on the development of a new graduate seminar, *Interrogating Ethics and Justice in Digital Health*, for which I helped design the curriculum and course material. We also received grant funding to write a book of educational case studies focused on JEDI in health-related AI. The case book is soon to be released for wide dissemination.

Promoting data equity in healthcare and creating knowledge bases. My work promoting data equity in healthcare seeks to improve documentation of demographics and the social determinants of health to support culturally competent care and research of particular interest to minoritized populations. While I often employ advanced data science methods to extract information from existing data sources (e.g., natural language processing of clinical narratives in the electronic health record [EHR]) or integrate community-level information from large public datasets (e.g., national survey data), my work has also involved expanding primary data collection during clinical care.

While co-chair of the BWH LGBTQ and Allies Employee Resource Group, I led advocacy efforts to lobby Mass General Brigham (MGB), previously known as Partners Healthcare, to include sexual orientation and gender identity (SOGI) among the core set of demographics routinely collected in the EHR. Our campaign was successful and I served on the MGB working group that oversaw design and implementation plans impacting care for millions of patients. These efforts resulted in MGB becoming one of the first health systems in the US to collect SOGI in the EHR in a standardized, scalable fashion. Epic, the EHR vendor, would also later incorporate elements from our design into its baseline EHR platform. Subsequent research identified several independent patient, provider, and clinic-level predictors of SOGI documentation which may be used to tailor targeted interventions to improve quality of care and use of these fields.

More recently, my work has encompassed development of scalable, reproducible methods to process, characterize, and monitor trends in the literature and compare them to real-world data on population groups. While this research largely focuses on using AI/ML to build and curate health equity knowledge bases, the methods are generalizable for use on any large body of literature, regardless of domain. My latest publication in the high-impact journal, *Science Advances*, mined nearly a quarter million scientific articles and insurance claims data on 42 million Americans to spotlight less well-studied conditions, topics, and populations in health disparities and minority health (HDMH) research. To support further investigation, I also created HDMH Monitor, a publicly available interactive dashboard and article repository generated from HDMH literature found in PubMed/MEDLINE.

Elucidating health inequity and creating tools to facilitate further discovery. My research also leverages real-world data sources to conduct comprehensive large-scale characterization studies, spotlighting the myriad factors that influence the health outcomes of people from diverse backgrounds, or applies advanced data science techniques to uncover hidden areas of health inequity across intersectional dimensions of lived experience and group identity. For example, using insurance claims and EHR data for nearly 200 million Americans, we conducted a review of 112 acute and chronic diseases, highlighting systematic gender differences in patterns of disease diagnosis and suggesting that symptoms of disease are measured or weighed differently for women and men.

In another study, our investigation of patient terminations led to policy changes across MGB, including a new mandate that clinicians can no longer "fire" patients for missing or failing to cancel clinical appointments, a practice that disproportionately harms people from historically marginalized groups. Prior to the change, "no-shows" were cited as the cause for termination in more than a third of cases. Notably, the majority of terminations were also formalized via EHR functionality that made it both possible and relatively easy to prevent patients from scheduling new appointments, exacerbating barriers to healthcare access.

Enabling learning health systems and precision health. I am also eager to support efforts to transform care, both domestically and internationally, in service of the quintuple aim of improving population health, enhancing the care experience, reducing costs, addressing clinician burnout, and advancing health equity. While at the Harvard T.H. Chan School of Public Health (HSPH), I was a member of the Strategic Information division of the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) program, a $362 million grant to rapidly expand treatment and care programs for people living with HIV/AIDS in sub-Saharan Africa. In collaboration with clinical and other technical experts, I co-developed population-level dashboards and data-driven point-of-care tools to monitor and evaluate patient health in clinics and hospitals across Nigeria. To date, over 100,000 people receive life-saving HIV treatment and care at these sites. In the interest of strengthening health systems, I also supported data-related educational material development and training activities in Botswana, Nigeria, and Tanzania.

My work has also extended the learning health system paradigm to public health, leveraging alternative data sources (e.g., health information exchanges and large publicly available datasets) to perform enhanced near real-time regional disease surveillance at a level of granularity, timeliness, and complexity not typically possible using conventional public health reporting practices. In particular, these methods were especially helpful in spotlighting inequity, including incongruence between testing patterns and rates of positivity for HIV and other STIs in certain populations and neighborhoods, suggesting disparities related to under- and over-testing. This work has also involved development and monitoring of safe, reliable, fair, and robust AI in healthcare, including deep learning models to support precision health and quality improvement during the mpox outbreak.

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