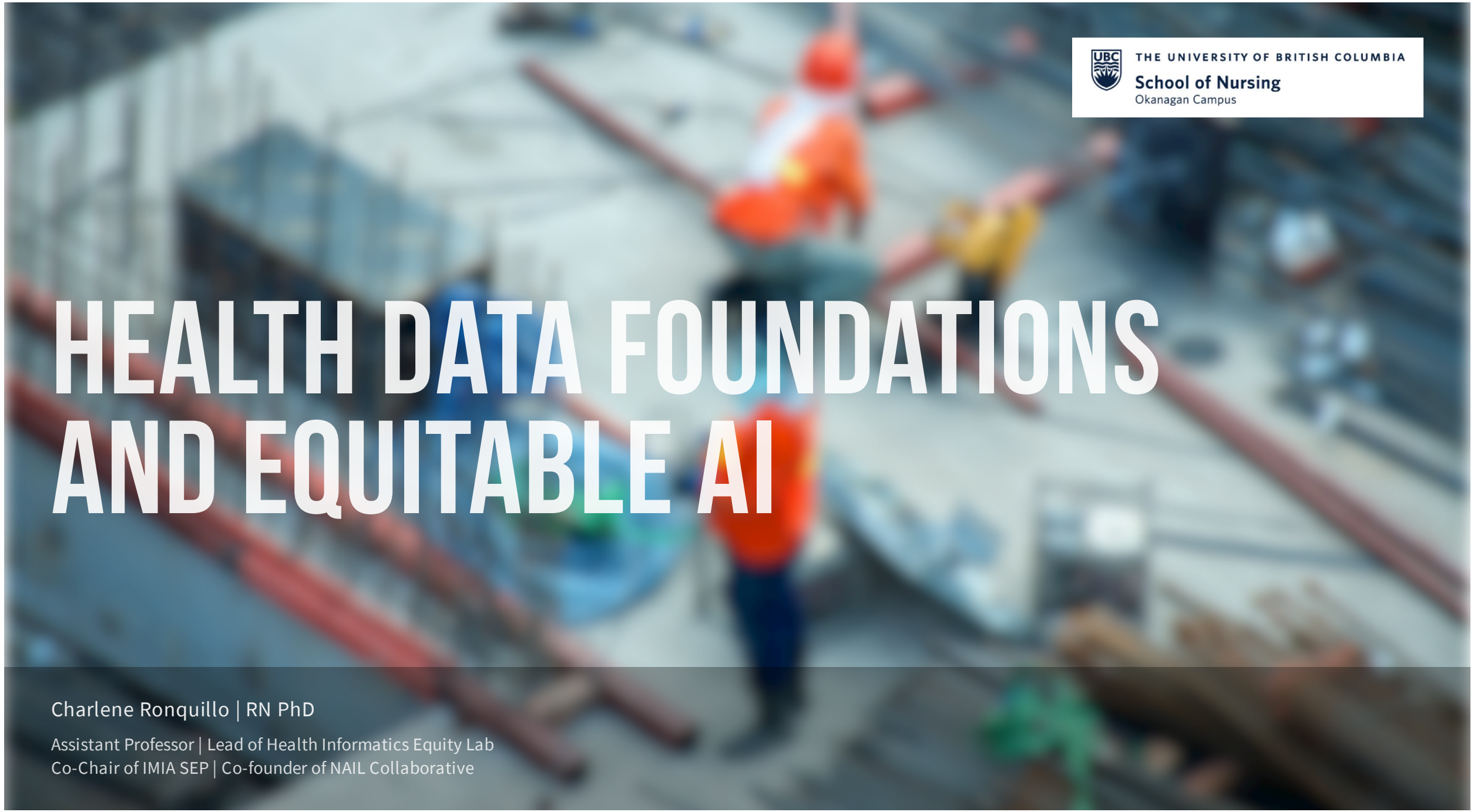


THE UNIVERSITY OF BRITISH COLUMBIA
School of Nursing
Okanagan Campus

HEALTH DATA FOUNDATIONS AND EQUITABLE AI

Charlene Ronquillo | RN PhD

Assistant Professor | Lead of Health Informatics Equity Lab
Co-Chair of IMIA SEP | Co-founder of NAIL Collaborative

TODAY, I AM PRIVILEGED TO JOIN YOU ON THE UNCEDED, OCCUPIED, AND TRADITIONAL TERRITORIES OF THE SYILX OKANAGAN.

I gratefully acknowledge the privilege we have gained as settlers we have benefited from the histories and structures of colonization on these lands and the institutions that have been built upon them.

May we commit to bettering ourselves by the ways we live and work towards truth and reconciliation.

TALK
PURPOSE

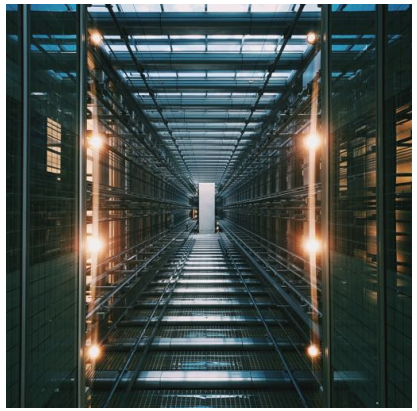
Catalyze conversations about

data quality in health systems,

how we shape data,

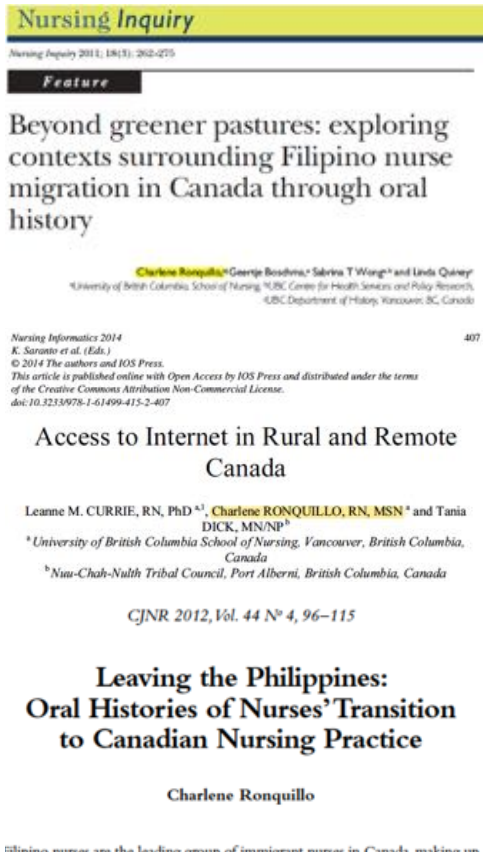
downstream implications for equitable AI development

impacts on patients, communities, clinicians



INFLUENCES

migration, health and technology-related inequities, implementation science



Nursing *Inquiry*

Nursing Inquiry 2011; 18(3): 262–275

Feature

Beyond greener pastures: exploring contexts surrounding Filipino nurse migration in Canada through oral history

Charlene Ronquillo,[a] Geertje Boschma,[a] Sabrina T Wong[a,b] and Linda Quiney[a]

[a]University of British Columbia, School of Nursing, [b]UBC Centre for Health Services and Policy Research, [c]UBC Department of History, Vancouver, BC, Canada

Nursing Informatics 2014
K. Saranto et al. (Eds.)
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doi:10.3233/978-1-61499-415-2-407

407

Access to Internet in Rural and Remote Canada

Leanne M. CURRIE, RN, PhD [a,1], Charlene RONQUILLO, RN, MSN [a] and Tania DICK, MN/NP [b]
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CJNR 2012, Vol. 44 Nº 4, 96–115

Leaving the Philippines: Oral Histories of Nurses' Transition to Canadian Nursing Practice

Charlene Ronquillo

PEN ACCESS Freely available online

PLOS MEDICI

olicy Forum

Migration and "Low-Skilled" Workers in Destination Countries

oan Benach[1,2*], Carles Muntaner[1,3], Carlos Delclos[1,4], María Menéndez[1,5], Charlene Ronquillo[6]

Public Policy & Aging Report
cite as: *Public Policy & Aging Report*, 2018, Vol. 28, No. 4, 134–139
doi:10.1093/ppar/pry032
Advance Access publication October 17, 2018

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OXFORD

Article

An Implementation Science Perspective on Deprescribing

Charlene Ronquillo, MSc,[1,2] Jo Day, PhD,[1,2] Krystal Warmoth, PhD,[1,2] Nicky Britten, PhD,[1,2] Ken Stein, MD,[1,2] and Iain Lang, PhD,[1,2,*]

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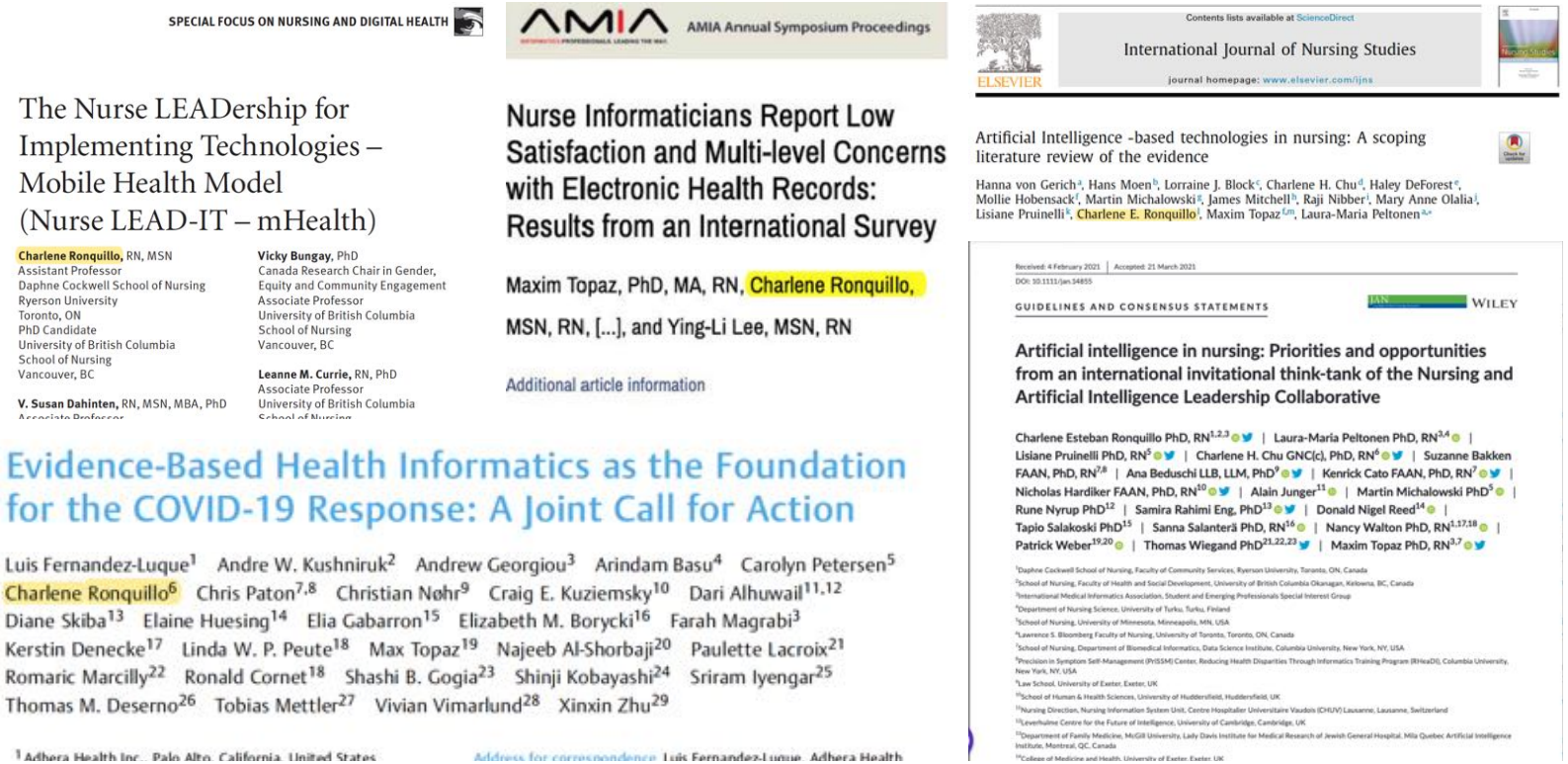
Received: July 27, 2018; Editorial Decision Date: August 8, 2018

Decision Editor: Brian Kaskie, PhD

Keywords: Deprescribing, Implementation, De-implementation

INFLUENCES

health informatics, health services research



SPECIAL FOCUS ON NURSING AND DIGITAL HEALTH

The Nurse LEADership for Implementing Technologies – Mobile Health Model (Nurse LEAD-IT – mHealth)

Charlene Ronquillo, RN, MSN
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AMIA Annual Symposium Proceedings

Nurse Informaticians Report Low Satisfaction and Multi-level Concerns with Electronic Health Records: Results from an International Survey

Maxim Topaz, PhD, MA, RN, Charlene Ronquillo, MSN, RN, [...], and Ying-Li Lee, MSN, RN

Additional article information

Contents lists available at ScienceDirect

International Journal of Nursing Studies

journal homepage: www.elsevier.com/ijns

Artificial Intelligence -based technologies in nursing: A scoping literature review of the evidence

Hanna von Gerich[a], Hans Moen[b], Lorraine J. Block[c], Charlene H. Chu[d], Haley DeForest[e], Mollie Hobensack[f], Martin Michalowski[g], James Mitchell[h], Raji Nibber[i], Mary Anne Olalia[j], Lisiane Pruinelli[k], Charlene E. Ronquillo[l], Maxim Topaz[l,m], Laura-Maria Peltonen[a,*]

Evidence-Based Health Informatics as the Foundation for the COVID-19 Response: A Joint Call for Action

Luis Fernandez-Luque[1] Andre W. Kushniruk[2] Andrew Georgiou[3] Arindam Basu[4] Carolyn Petersen[5] Charlene Ronquillo[6] Chris Paton[7,8] Christian Nøhr[9] Craig E. Kuziemsky[10] Dari Alhuwail[11,12] Diane Skiba[13] Elaine Huesing[14] Elia Gabarron[15] Elizabeth M. Borycki[16] Farah Magrabi[3] Kerstin Denecke[17] Linda W. P. Peute[18] Max Topaz[19] Najeeb Al-Shorbaji[20] Paulette Lacroix[21] Romaric Marcilly[22] Ronald Cornet[18] Shashi B. Gogia[23] Shinji Kobayashi[24] Sriram Iyengar[25] Thomas M. Deserno[26] Tobias Mettler[27] Vivian Vimarlund[28] Xinxin Zhu[29]

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GUIDELINES AND CONSENSUS STATEMENTS

JAN WILEY

Artificial intelligence in nursing: Priorities and opportunities from an international invitational think-tank of the Nursing and Artificial Intelligence Leadership Collaborative

Charlene Esteban Ronquillo PhD, RN[1,2,3] | Laura-Maria Peltonen PhD, RN[3,4] | Lisiane Pruinelli PhD, RN[5] | Charlene H. Chu GNC(c), PhD, RN[6] | Suzanne Bakken FAAN, PhD, RN[7,8] | Ana Beduschi LLB, LLM, PhD[9] | Kenrick Cato FAAN, PhD, RN[7] | Nicholas Hardiker FAAN, PhD, RN[10] | Alain Junger[11] | Martin Michalowski PhD[5] | Rune Nyrup PhD[12] | Samira Rahimi Eng, PhD[13] | Donald Nigel Reed[14] | Tapio Salakoski PhD[15] | Sanna Salanterä PhD, RN[16] | Nancy Walton PhD, RN[1,17,18] | Patrick Weber[19,20] | Thomas Wiegand PhD[21,22,23] | Maxim Topaz PhD, RN[3,7]

KEY QUESTIONS

whose needs

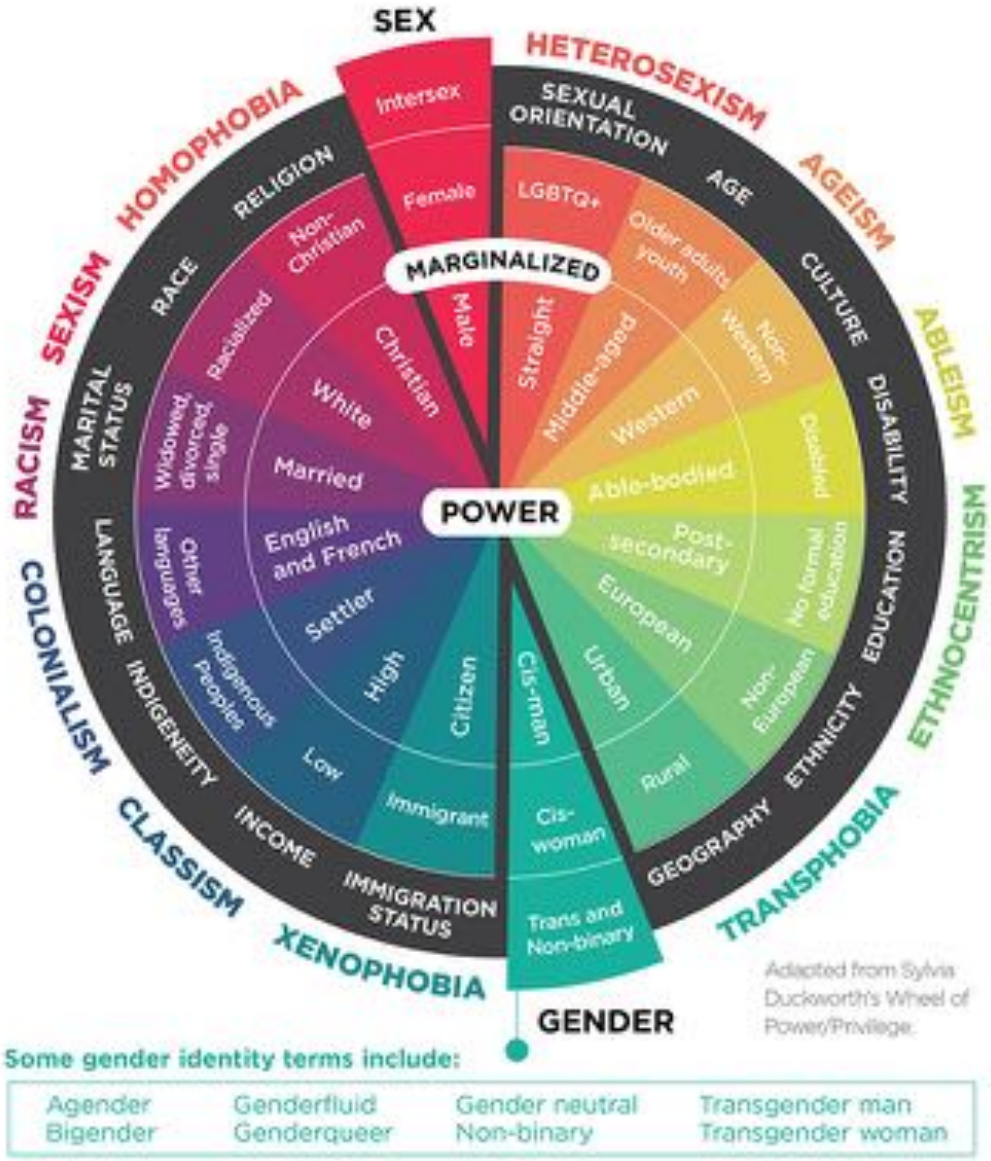
have been considered and prioritized?

who/what is driving

the technology or project

what is missing

and who is not represented



https://cihr-irsc.gc.ca/e/52352.html

AI AND FAIRNESS
FROM EQUALITY TO EQUITY?

RESEARCH ARTICLE

Dissecting racial bias in an algorithm used to manage the health of populations

ZIAD OBERMEYER, BRIAN POWERS, CHRISTINE VOGELI, AND SENDHIL MULLAINATHAN Authors Info & Affiliations

SCIENCE • 25 Oct 2019 • Vol 366, Issue 6464 • pp. 447-453 • DOI: 10.1126/science.aax2342

32,839 579

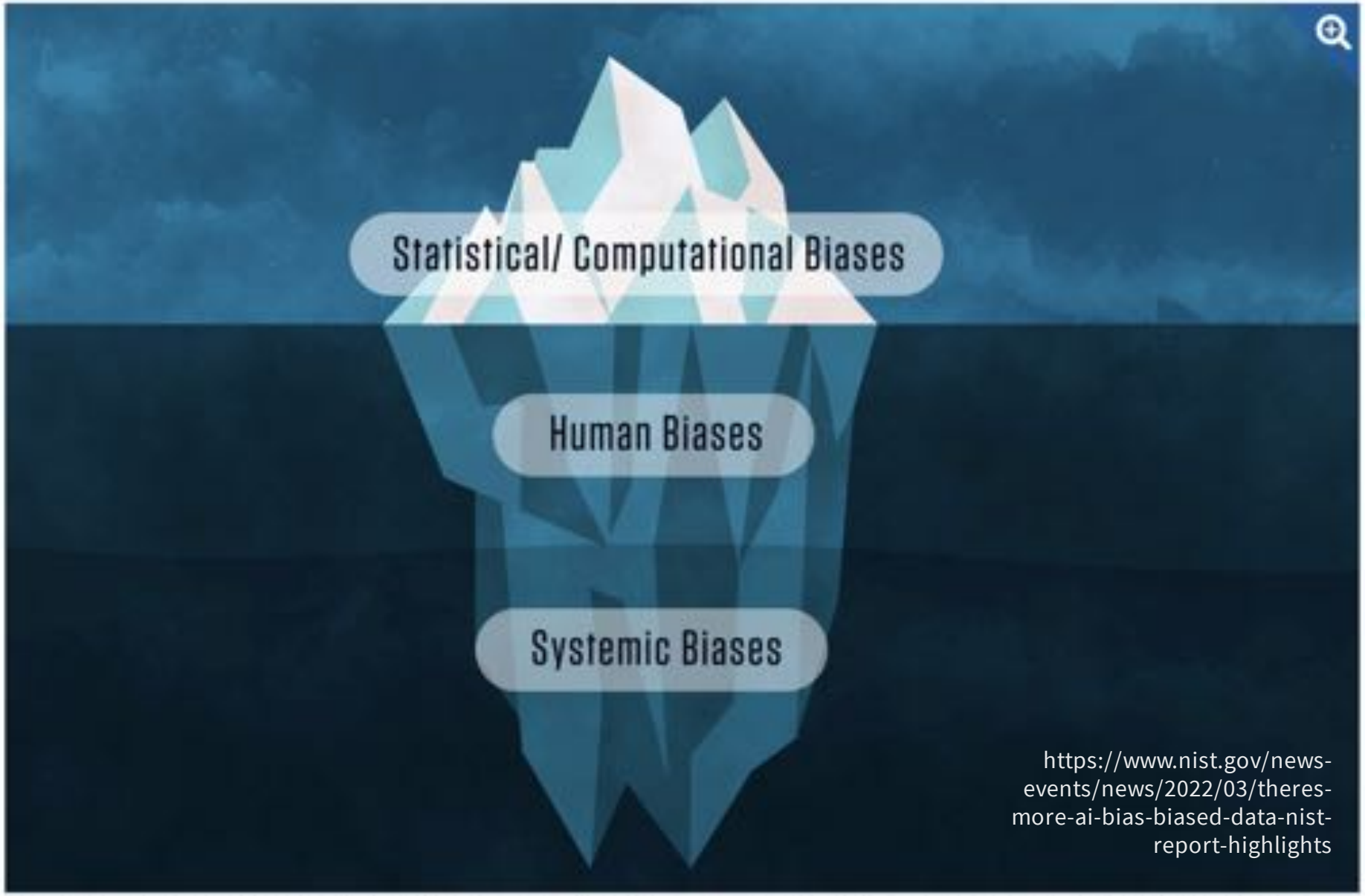
Racial bias in health algorithms

The U.S. health care system uses commercial algorithms to guide health decisions. Obermeyer *et al.* find evidence of racial bias in one widely used algorithm, such that Black patients assigned the same level of risk by the algorithm are sicker than White patients (see the Perspective by Benjamin). The authors estimated that this racial bias reduces the number of Black patients identified for extra care by more than half. Bias occurs because the algorithm uses health costs as a proxy for health needs. Less money is spent on Black patients who have the same level of need, and the algorithm thus falsely concludes that Black patients are healthier than equally sick White patients. Reformulating the algorithm so that it no longer uses costs as a proxy for needs eliminates the racial bias in predicting who needs extra care.

Science, this issue p. 447; see also p. 421

Inequity in technology development and implementation

DATA AS THE RAW MATERIAL



Bias in AI systems is often seen as a technical problem, but the NIST report acknowledges that a great deal of AI bias stems from human biases and systemic, institutional biases as well.

Credit: N. Hanacek/NIST

Table. US Patient Cohorts Used for Training Clinical Machine Learning Algorithms, by State[a]

States	No. of studies
California	22
Massachusetts	15
New York	14
Pennsylvania	5
Maryland	4
Colorado	2
Connecticut	2
New Hampshire	2
North Carolina	2
Indiana	1
Michigan	1
Minnesota	1
Ohio	1
Texas	1
Vermont	1
Wisconsin	1

[a] Fifty-six studies used 1 or more geographically identifiable US patient cohorts in the training of their clinical machine learning algorithm. Thirty-four states were not represented in geographically identifiable cohorts: Alabama, Alaska, Arizona, Arkansas, Delaware, Florida, Georgia, Hawaii, Idaho, Illinois, Iowa, Kansas, Kentucky, Louisiana, Maine, Mississippi, Missouri, Montana, Nebraska, Nevada, New Jersey, New Mexico, North Dakota, Oklahoma, Oregon, Rhode Island, South Carolina, South Dakota, Tennessee, Utah, Virginia, Washington, West Virginia, and Wyoming.

KAUSHAL, A., ALTMAN, R., & LANGLOTZ, C. (2020). GEOGRAPHIC DISTRIBUTION OF US COHORTS USED TO TRAIN DEEP LEARNING ALGORITHMS. *JAMA*, *324*(12), 1212-1213.

Geographic Distribution of US Cohorts Used to Train Deep Learning Algorithms

DATA PAUCITY ON NON-DOMINANT GROUPS IS A POVERTY THAT IS BORN OUT OF EXISTING INEQUALITIES AND COULD FOSTER FURTHER INEQUALITY

We know the most about a fairly homogeneous group

male sex and gender	young age and ability	healthy physiological norms and ability
white physiological norms and privileges	advantaged SES and education	western language and cultural norms

"We define health data poverty as the **inability** for individuals, groups, or populations **to benefit** from a discovery or innovation **due to insufficient data that are adequately representative**."

Ibrahim et al., 2021

Ahmed et al. Tropical Diseases, Travel Medicine and Vaccines (2021) 7:15
https://doi.org/10.1186/s40794-021-00138-2

Tropical Diseases, Travel Medicine and Vaccines

RESEARCH Open Access

Racial equity in the fight against COVID-19: a qualitative study examining the importance of collecting race-based data in the Canadian context

Ranie Ahmed[1,2*], Omer Jamal[1,2], Waleed Ishak[3], Kiran Nabi[1,2] and Nida Mustafa[1]

Abstract

Background: A failure to ensure racial equity in response to the COVID-19 pandemic has caused Black communities in Canada to disproportionately be impacted. The aim of the current study was to determine the needs and concerns of Black communities in the Greater Toronto Area (GTA) and to highlight the importance of collecting race-based COVID-19 data early on to address these needs.

Methods: Six qualitative interviews were conducted with local community health centre leaders who serve a high population of racialized communities within the GTA. Content analysis was used to extract the main themes and concerns raised during the interviews.

Results: The findings from this study provide further evidence of the disproportionate impact COVID-19 has had on Black and other racialized communities. Difficulty self-isolating due to overcrowded housing, food insecurity, and less social support for seniors were concerns identified by community health leaders. Also, enhanced financial support for front-line workers, such as Personal Support Workers (PSWs), was an important concern raised. In order to lessen the impact of the pandemic on these communities, leaders noted the need for greater accessibility of testing centres in these areas and a greater investment in tailored health promotion approaches.

Conclusions: Overall, our findings point to the importance of collecting race-based data to ensure an equitable response to the pandemic. The current "one size fits all" response is not effective for all individuals, especially Black communities. Not all populations have access to the same resources, nor do they live in the same conditions (Kantamneni, J Vocat Behav 119:103439, 2020). A deeper consideration of the social determinants of health are needed when implementing COVID-19 policies and responses. Also, a lack of attention to Black communities only continues to perpetuate the under-acknowledged issue of anti-Black racism prevalent in Canada.

HTTPS://ANTIRACISM.GOV.BC.CA/DATA-ACT/

Yearb Med Inform. 2022 Aug; 31(1): 94–99.
Published online 2022 Jun 2. doi: 10.1055/s-0042-1742504
PMCID: PMC9719779
PMID: 35654435

The Untapped Potential of Nursing and Allied Health Data for Improved Representation of Social Determinants of Health and Intersectionality in Artificial Intelligence Applications: A Rapid Review

IMIA Student and Emerging Professionals Group

Charlene Esteban Ronquillo,[1] James Mitchell,[2] Dari Alhuwail,[3] Laura-Maria Peltonen,[4] Maxim Topaz,[5] and Lorraine J. Block[6]

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Summary

Go to: ›

Objectives : The objective of this paper is to draw attention to the currently underused potential of clinical documentation by nursing and allied health professions to improve the representation of social determinants of health (SDoH) and intersectionality data in electronic health records (EHRs), towards the development of equitable artificial intelligence (AI) technologies.

Methods : A rapid review of the literature on the inclusion of nursing and allied health data and the nature of health equity information representation in the development and/or use of artificial intelligence approaches alongside expert perspectives from the International Medical Informatics Association (IMIA) Student and Emerging Professionals Working Group.

Results : Consideration of social determinants of health and intersectionality data are limited in both the medical AI and nursing and allied health AI literature. As a concept being newly discussed in the context of AI, the lack of discussion of intersectionality in the literature was unsurprising. However, the limited consideration of social determinants of health was surprising, given its relatively longstanding recognition and the importance of representation of the features of diverse populations as a key requirement for equitable AI.

Conclusions : Leveraging the rich contextual data collected by nursing and allied health professions has the potential to improve the capture and representation of social determinants of health and intersectionality. This will require addressing issues related to valuing AI goals (e.g., diagnostics versus supporting care delivery) and improved EHR infrastructure to facilitate documentation of data beyond medicine. Leveraging nursing and allied health data to support equitable AI development represents a current open question for further exploration and research.

AMIA Annu Symp Proc. 2016; 2016: 2016–2025.
Published online 2017 Feb 10.
PMCID: PMC5333337
PMID: 28269961

Nurse Informaticians Report Low Satisfaction and Multi-level Concerns with Electronic Health Records: Results from an International Survey

Maxim Topaz, PhD, MA, RN,[1] Charlene Ronquillo, MSN, RN,[2] Laura-Maria Peltonen, MNSc, RN,[3] Lisiane Pruinelli, MSN, RN,[4] Raymond Francis Sarmiento, RN,[5] Martha K. Badger, MSN, RN-BC, CPHIMS,[6] Samira Ali, MSN, RN,[7] Adrienne Lewis, MSc, MsN(c), RN,[8] Mattias Georgsson, MSc, RN,[9] Eunjoo Jeon, RN,[10] Jude L. Tayaben, MAN, RN,[11] Chiu-Hsiang Kuo, RN,[12] Tasneem Islam, RN,[13] Janine Sommer, RN,[14] Hyunggu Jung, RN,[15] Gabrielle Jacklin Eler, RN,[16] Dari Alhuwail, RN,[17] and Ying-Li Lee, MSN, RN[18]

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Abstract

Go to: ›

This study presents a qualitative content analysis of nurses' satisfaction and issues with current electronic health record (EHR) systems, as reflected in one of the largest international surveys of nursing informatics. Study participants from 45 countries (n=469) ranked their satisfaction with the current state of nursing functionality in EHRs as relatively low. Two-thirds of the participants (n=283) provided disconcerting comments when explaining their low satisfaction rankings. More than one half of the comments identified issues at the system level (e.g., poor system usability; non-integrated systems and poor interoperability; lack of standards; and limited functionality/missing components), followed by user–task issues (e.g., failure of systems to meet nursing clinical needs; non nursing-specific systems) and environment issues (e.g., low prevalence of EHRs; lack of user training). The study results call for the attention of international stakeholders (educators, managers, policy makers) to improve the current issues with EHRs from a nursing perspective.

INADEQUACY OF CARE-RELEVANT DATA CAPTURE

- poor collection and underuse of nursing and allied health data

- missing expertise: relational care, patient advocacy, SDoH assessment

- unable to link care interventions to outcomes

- limits possibilities of AI

The Untapped Potential of Nursing and Allied Health Data for Improved Representation of Social Determinants of Health and Intersectionality in Artificial Intelligence Applications: A Rapid Review

IMIA Student and Emerging Professionals Group

Charlene Esteban Ronquillo (first co-author)[1], James Mitchell (first co-author)[2], Dari Alhuwail[3], Laura-Maria Peltonen[4], Maxim Topaz [5], Lorraine J. Block[6]

[1] School of Nursing, University of British Columbia Okanagan, kelowna, Canada
[2] School of Computing and Mathematics, Keele University, UK
[3] Information Science Department, Kuwait University, Kuwait and Health Informatics Unit, D... Diabetes Institute, Kuwait
[4] Department of Nursing Science, University of Turku, Finland
[5] School of Nursing, Columbia University, New York, USA
[6] School of Nursing University of British Columbia Vancouver, BC, Canada

Summary

Objectives: The objective of this paper is to draw attention to the currently underused potential of clinical documentation by nursing and allied health professions to improve the representation of social determinants of health (SDoH) and intersectionality data in electronic health records (EHRs), towards the development of

given its relatively longstanding recognition and the importance of representation of the features of diverse populations as a key requirement for equitable AI.

Conclusions: Leveraging the rich contextual data collected by nursing and allied health professions has the potential to improve the capture and representation of social determinants of health

AMIA Annu Symp Proc. 2016; 2016: 2016–2025.
Published online 2017 Feb 10.
PMCID: PMC5333337
PMID: 28269961

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...ians Report Low Satisfaction and Multi-level Concerns with ...cords: Results from an International Survey

...arlene Ronquillo, MSN, RN,[2] Laura-Maria Peltonen, MNSc, RN,[3] ...nd Francis Sarmiento, RN,[5] Martha K. Badger, MSN, RN-BC, ...lenne Lewis, MSc, MsN(c), RN,[8] Mattias Georgsson, MSc, RN,[9] ...AN, RN,[11] Chiu-Hsiang Kuo, RN,[12] Tasneem Islam, RN,[13] ...N,[15] Gabrielle Jacklin Eler, RN,[16] Dari Alhuwail, RN,[17] and

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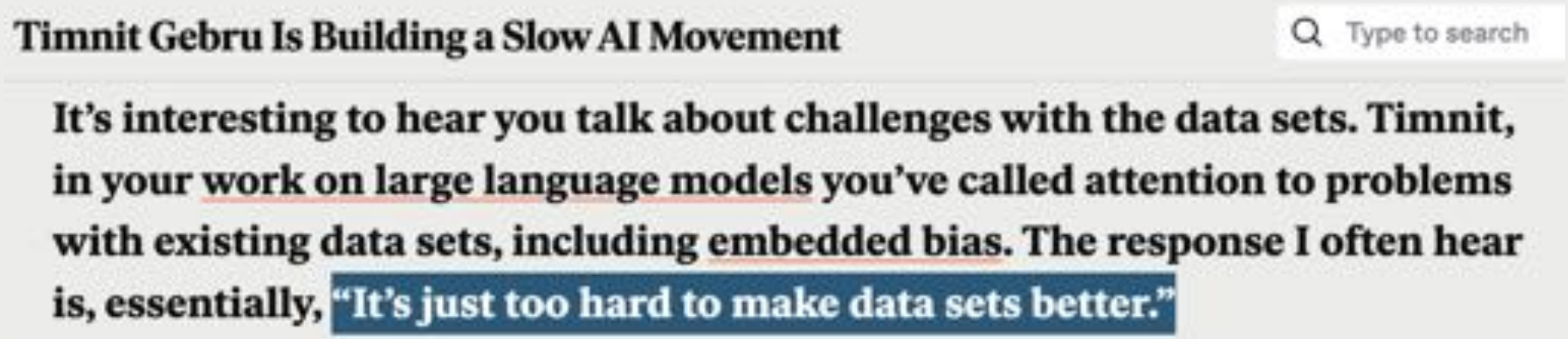
Working within non-inclusive systems

- Tendency to value and collect data on dominant groups / concerns
- Challenge in moving beyond the status quo
- Emergent understanding of what type of data are important to which groups

Implicit bias

- Clinician bias can make their way into clinical documentation
- There is evidence suggesting non-random missing data among some population groups

DATA WORK

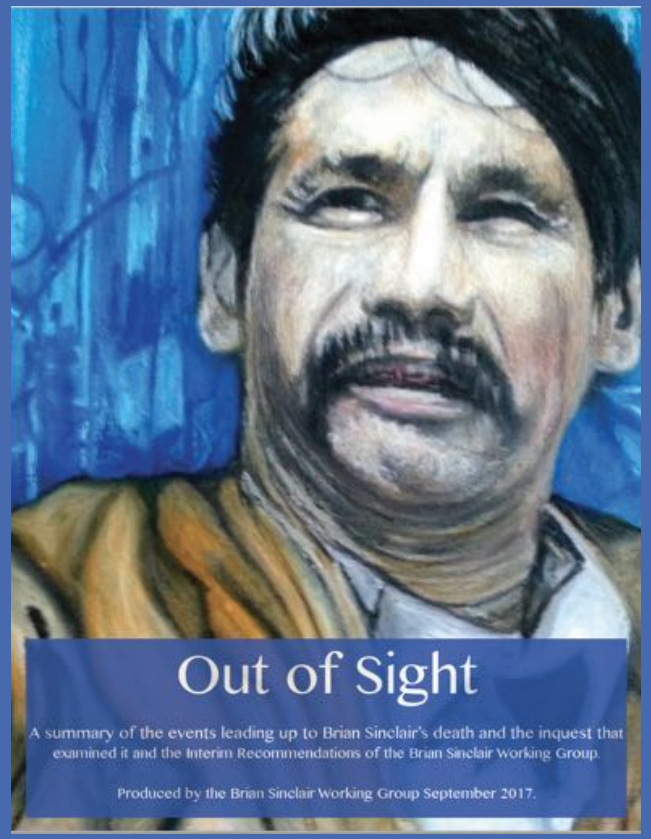


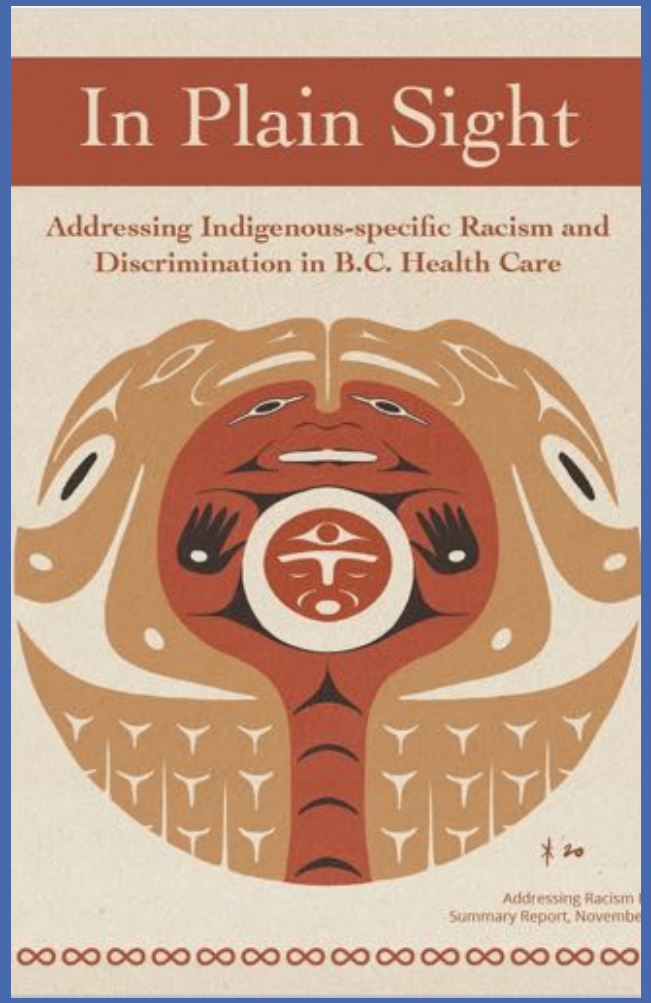
Timnit Gebru Is Building a Slow AI Movement

Type to search

It's interesting to hear you talk about challenges with the data sets. Timnit, in your work on large language models you've called attention to problems with existing data sets, including embedded bias. The response I often hear is, essentially, "It's just too hard to make data sets better."

HTTPS://SPECTRUM.IEEE.ORG/TIMNIT-GEBRU-DAIR-AI-ETHICS#TOGGLE-GDPR





Capturing complex care concepts

Patient-centered?

Equitable?

Trauma-informed?

Intersectional?

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THANK YOU.

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