

Beyond Surveys: Using Electronic Health Records to Study Immigrant Populations in Primary Care Research

Miguel Marino, PhD

Associate Professor
Director of Biostatistics Core, Department of Family Medicine
Division of Biostatistics, School of Public Health
Oregon Health & Science University
Portland, OR U.S.A.

Email: marinom@ohsu.edu

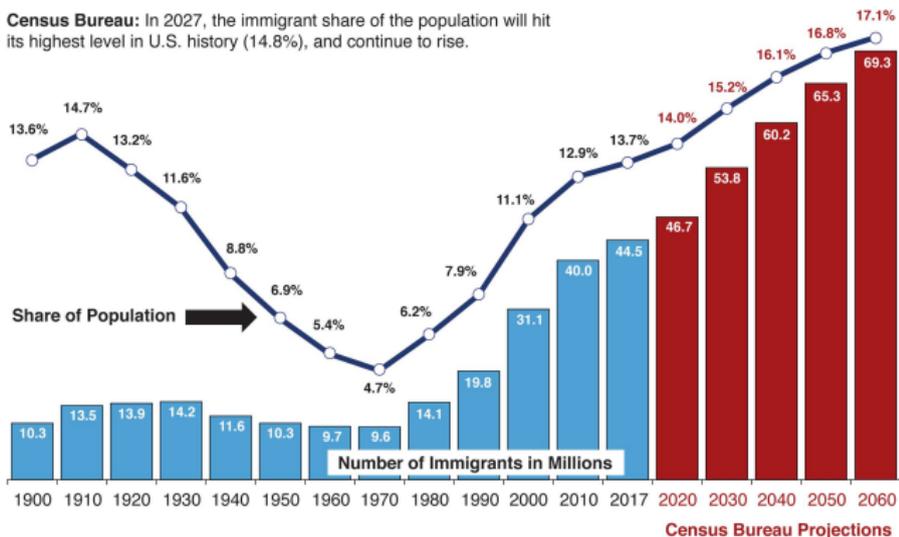
Twitter: [@MmMiguelmM](https://twitter.com/MmMiguelmM)

February 18, 2019

Immigration in the United States

Figure 1. Immigrants in the U.S., Number and Percent, 1900-2017
Plus Census Bureau Projections to 2060

Census Bureau: In 2027, the immigrant share of the population will hit its highest level in U.S. history (14.8%), and continue to rise.



Source: Decennial census for 1900 to 2000, American Community Survey for 2010 and 2017. For 2020 to 2060, see [Census projections through 2060](#). Historical numbers from the decennial censuses can be found at the Census Bureau's website. They show that in 1890 the foreign-born share reached 14.77 percent of the U.S. population and fell for a time, but again reached 14.70 percent in 1910. These two figures represent the highest share ever recorded. Table 8 of the new projections shows that the foreign-born population will reach 14.82 percent in 2027, making it the highest percentage ever recorded.

Motivating question

At a population level, are immigrants receiving appropriate healthcare and what could be drivers for disparities in care?



2018 Colorectal Cancer Screening Guideline for men and women at average risk



Ages 45 – 75

Get screened. Several types of tests can be used. Talk to your doctor about which option is best for you.



Ages 76 – 85

Talk to your doctor about whether you should continue screening. When deciding, take into account your own preferences, overall health, and past screening history.



Age 85 +

People should no longer get colorectal cancer screening.

TESTING OPTIONS

- Stool-based tests look for signs of cancer in a person's stool.
- Visual exams such as colonoscopy or CT colonography, look at the inside of the colon and rectum for polyps or cancer.
- No matter which test you choose, the most important thing is to get tested.

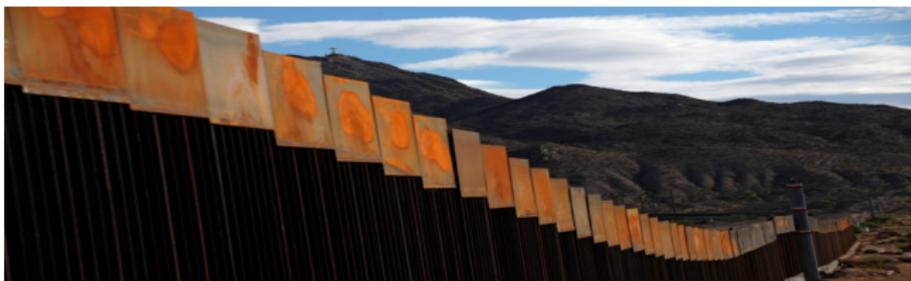
Visit cancer.org/colonguidelines to learn more.

All positive results on non-colonoscopy screening tests should be followed up with a timely colonoscopy to complete the screening process. Talk to your doctor about screening, and contact your insurance provider about insurance coverage for screening.

©2018, American Cancer Society, Inc. All rights reserved. The American Cancer Society is a qualified 501(c)(3) tax-exempt organization and donations are tax-deductible to the full extent of the law. 0803.90

Immigration status: current research

- ▶ Immigration status is believed to be a powerful social determinant of health, possibly affecting multiple generations
- ▶ Undocumented and recently “documented” immigrants (within five years of arrival) are barred from federal insurance programs, such as Medicare and Medicaid.
- ▶ Methods for studying the impact of immigration status on health utilization/outcomes are under-developed and limited.
- ▶ In the United States, Latino immigrants, mostly from Mexico, number > 19 million.



Immigration status: current research (SURVEYS)

Survey and interview methods are commonly used to determine immigration status when studying health outcomes and utilization



Why are survey methods potentially limited for this group?



Why are survey methods potentially limited for this group?

Subscribe

SCIENTIFIC
AMERICANEnglish ▾ Cart  Sign In | Register[THE SCIENCES](#) [MIND](#) [HEALTH](#) [TECH](#) [SUSTAINABILITY](#) [EDUCATION](#) [VIDEO](#) [PODCASTS](#) [BLOGS](#) [STORE](#)

THE SCIENCES

Confirmed: The U.S. Census Bureau Gave Up Names of Japanese-Americans in WW II

Government documents show that the agency handed over names and addresses to the Secret Service

By JR Minkel on March 30, 2007

Limitations of Surveys and Claims

- ▶ Labor intensive, risk social desirability bias, and may feel unsafe for participants
- ▶ Health effects may take a long time to appear
- ▶ How do we scaling up to the scope necessary for population-level research?
- ▶ Potential lack of important confounders
- ▶ Exclude the uninsured in claims

Can EHRs add to our understanding of immigrant health?

EHRs may be a source of data for studying immigrants which could overcome the challenges of scale and self-reporting bias in surveys

- ▶ Demographic data in the EHR are collected in the routine process of delivering health care
 - ▶ Often contain demographic data, such as race, ethnicity, income level, and objective measures of health (e.g. colorectal cancer screening)
- ▶ The information that is routinely collected is not directly related to immigration status, making disclosure of these demographics less risky
- ▶ Primary care clinics (in particular, Community health centers) are perceived to be a safe place to share information about one's social and economic background

Community Health Centers

WHAT DO COMMUNITY HEALTH CENTERS DO?

For more than 45 years, health centers have provided quality, comprehensive primary health care services to medically underserved communities and vulnerable populations. Health centers are community-based and patient-directed organizations that serve populations with limited access to health care.

Provide Affordable Care to the Uninsured



Community health centers provide quality, affordable care to all patients regardless of income level or insurance status.

Work with Patients to Create Better Health Outcomes



Community health centers strive to work with patients to maintain their health and have a history of producing better health outcomes.

Save Taxpayers Money



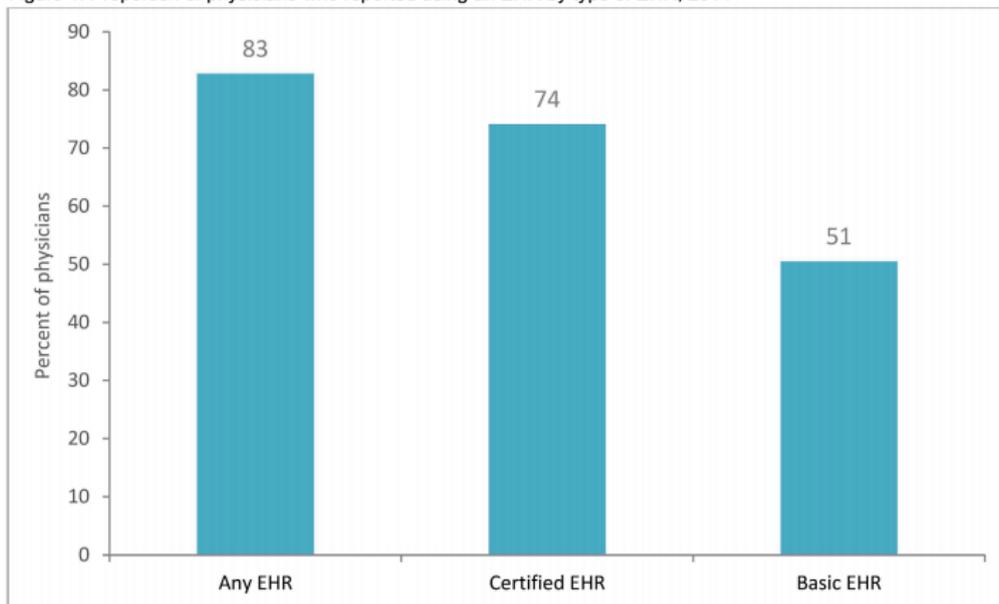
Providing affordable primary care helps prevent unnecessary emergency room visits, saving \$24 billion of taxpayer money annually.

Around 2014, CHCs provided 61 million medical care visits, of which 35% were to uninsured patients

Can EHRs add to our understanding of immigrant health?

More than 8 in 10 physicians had adopted an EHR.

Figure 1: Proportion of physicians who reported using an EHR by type of EHR, 2014



SOURCE: Jamoom E, Yang N, Hing E. Percentage of office-based physicians using any electronic health records or electronic medical records, physicians that have a basic system, and physicians that have a certified system, by state: United States, 2014 (table). 2015.

Adoption of EHRs: Small-to-medium PC practices

Data included surveys from 1,492 primary care practices across 12 states and extensive complimentary qualitative data

Surveys found that although

93% 

of practices use an EHR

81% 

of EHRs are ONC Certified

60% 

of practices participated in MU Stage 1 and 2

meaningful use compliant reports were insufficient for quality improvement work.

Practices Need



Customizable Timeframes



Simple EHR Design &
Documentation Work flows



Up to Date eCQM* Definitions



ESCALATES

Cohen D, Dorr DA, Knierim K, DuBard A, Hemler JR, Hall JD, Marino M, Solberg LI, McConnell J, Nichols LM, Nease D, Edwards ST, Wu WY, Pham-Singer H, Kho AN, Phillips Jr. RL, Rasmussen LV, Duffy D, Balasubramanian BA. Primary Care Practices' Abilities And Challenges Using Electronic Health Record Data For Quality Improvement. Health Affairs. April 2018. *Electronic Clinical Quality Measure

This research was supported by grant number R01-HS023940-01 from the Agency for Healthcare Research and Quality (AHRQ). The contents of this product are solely the responsibility of Deborah Cohen, PhD and do not necessarily represent the official views of or imply endorsement by AHRQ or the U.S. Department of Health and Human Services.

WWW.ESCALATES.ORG



@ESCALATESorg

Study Objective

In the setting of community health centers, and focusing on the Oregon Latino immigrant population:

- ▶ Using routine demographic information collected in the EHR, develop an EHR-based algorithm to serve as a proxy for immigrant status
- ▶ Evaluate the validity of the proposed EHR algorithm

Ultimate goal: Develop a proxy for immigration status in health services research in order to investigate alternatives to surveys for large-scale studies of immigrant Latino populations.

Study Objective

In the setting of community health centers, and focusing on the Oregon Latino immigrant population:

- ▶ Using routine demographic information collected in the EHR, develop an EHR-based algorithm to serve as a proxy for immigrant status
- ▶ **Evaluate the validity of the proposed EHR algorithm**

Ultimate goal: Develop a proxy for immigration status in health services research in order to investigate alternatives to surveys for large-scale studies of immigrant Latino populations.

Methods: Qualitative

- ▶ Interviews with a convenience sample of 12 CHC-based insurance eligibility specialists to
 - ▶ Assess their knowledge of immigration issues in patients and whether their knowledge can serve as the 'gold standard' for validating our EHR-based algorithm.
- ▶ 15-25 minute interview on their experiences caring for immigrant clients, with a focus on the collection of immigration information
- ▶ Analyzed by multiple faculty, with multiple crystallization-immersion cycles, using Atlas software

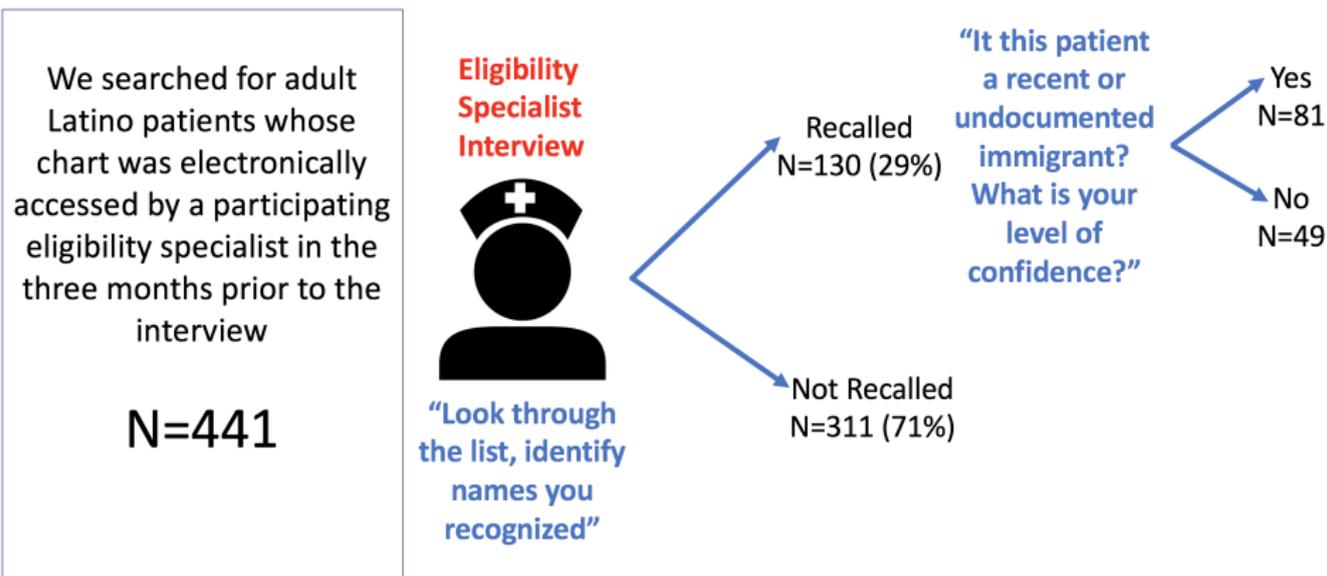
Results: Qualitative

“So, I think I feel pretty comfortable just asking straight up. If they have a hesitancy to answer, then I’ll explain to them why it’s important to know the information and what it’s for. So, just I basically ask first if they’re a U.S. citizen. And I don’t assume anything when I see somebody. **So, I’ll ask anybody, basically who’s going to be filling out an application, whether they’re a U.S. citizen.**” Yes or no? Then, no. Then I ask if they are a legal permanent resident. Then we go from there”

Results: Qualitative

“...even though I may not be enrolling them into Oregon Health Plan, I'm helping them out with financial assistance applications. So I do have to ask them that. Or if they have a medical need, then I do ask that again because it's like, are you insured? Why are you not insured? Do you qualify? **And so I end up, somehow, always asking the question** ... going back to it.”

Eligibility specialists as the gold standard



Study Objective

In the setting of community health centers, and focusing on the Oregon Latino immigrant population:

- ▶ **Using routine demographic information collected in the EHR, develop an EHR-based algorithm to serve as a proxy for immigrant status**
- ▶ Evaluate the validity of the proposed EHR algorithm

Ultimate goal: Develop a proxy for immigration status in health services research in order to investigate alternatives to surveys for large-scale studies of immigrant Latino populations.

Methods: Algorithm development and plan

Based on a knowledge of Oregon Medicaid policy, we hypothesized that a population of patients meeting each of the following 5 criteria would contain a high proportion of recent or undocumented immigrants:

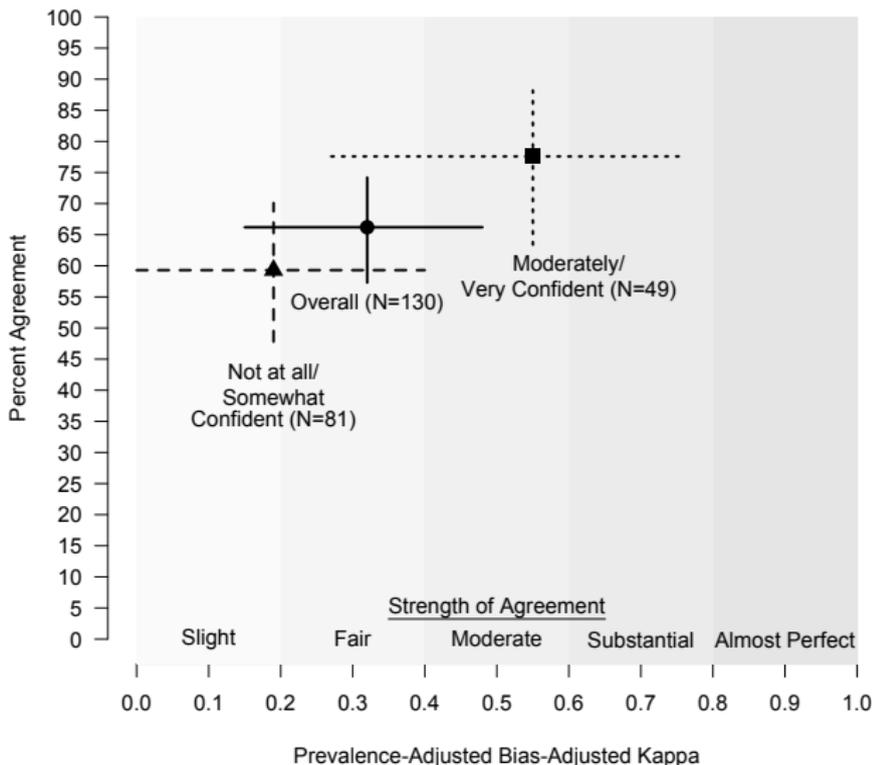
1. Oregon CHC patient
2. Household income $< 100\%$ of the Federal Poverty Level before 1/1/2014 and always $< 138\%$ on or after 1/1/2014 in all visits (income level that would correspond to Medicaid eligibility in Oregon)
3. Hispanic/Latino or primary language Spanish (both as self-identified to clinic)
4. Age > 18 years
5. Uninsured at all visits/encounters available in the record

EHR algorithm compared to this gold standard of eligibility specialist knowledge: Agreement and Kappa statistics

Results: Quantitative

Characteristic	Undocumented/recent immigrant status as denoted by the eligibility specialist (N=441)		
	Yes	No	Not recalled
N (row %)	81 (18.4)	49 (11.1)	311 (70.5)
Age based on EHR, N (%)			
18-30	13 (16.0)	23 (46.9)	93 (30.0)
31-40	23 (28.4)	9 (18.4)	67 (20.0)
41-50	23 (28.4)	10 (20.4)	89 (30.0)
51-60	13 (16.0)	6 (12.2)	36 (11.8)
61-84	9 (11.1)	1 (2.0)	26 (8.2)
Spanish Preferred Language, N(%)			
Yes	75 (92.6)	37 (75.5)	281 (90.5)
No	6 (7.4)	12 (24.5)	30 (9.5)
Hispanic/Latino, N(%)			
Yes	79 (97.5)	49 (100.0)	310 (99.7)
No	2 (2.5)	0 (0.0)	1 (0.3)
Uninsured, N(%)			
Yes	55 (67.9)	18 (36.7)	213 (68.0)
No	26 (32.1)	31 (63.3)	98 (32.0)

Results: Quantitative



Conclusion

- ▶ This study describes the development and validation of an EHR-based approach to study immigrant populations seeking care in safety-net settings
- ▶ Oregon community health center eligibility specialists reported consistent inquiries into the immigration status of their clients
- ▶ Assuming their knowledge as the gold standard, our EHR algorithm has a good agreement but moderate kappa, at best, with that gold standard.
 - ▶ Eligibility specialist only remembers about 30% of population: heavy caseload and time elapsed between client interaction and our interview
 - ▶ The EHR-based algorithm did not account for individuals without Medicaid for reason other than immigration status

Potential Discussion Topics

- ▶ Which needs refinement – the gold standard or the EHR based algorithm?
- ▶ What is safe? Population description (protection) vs. personal prediction (precision)
- ▶ EHR research is interdisciplinary... how can we build stronger connections?
 - ▶ Bioinformaticists: what are the underlying data quality issues
 - ▶ Qualitative researchers: what are they learning on the ground
 - ▶ Physicians and staff: impacts of policies on their patients
- ▶ Could we utilize both survey and EHR data sources for specific questions?
- ▶ How do we expand to more immigrant groups and larger populations?

EHR Silos



In 2014, $\approx 1,100$ different EHR vendors.

Adoption of EHRs: Small-to-medium PC practices

Data included surveys from 1,492 primary care practices across 12 states and extensive complimentary qualitative data

Surveys found that although

93% 

of practices use an EHR

81% 

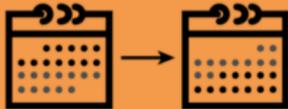
of EHRs are ONC Certified

60%  

of practices participated in MU Stage 1 and 2

meaningful use compliant reports were insufficient for quality improvement work.

Practices Need



Customizable Timeframes



Simple EHR Design &
Documentation Work flows



Up to Date eCQM* Definitions



ESCALATES

Cohen D, Dorr DA, Knierim K, DuBard A, Hemler JR, Hall JD, Marino M, Solberg LI, McConnell J, Nichols LM, Nease D, Edwards ST, Wu WY, Pham-Singer H, Kho AN, Phillips Jr. RL, Rasmussen LV, Duffy D, Balasubramanian BA. Primary Care Practices' Abilities And Challenges Using Electronic Health Record Data For Quality Improvement. Health Affairs. April 2018. *Electronic Clinical Quality Measure

This research was supported by grant number R01-HS023940-01 from the Agency for Healthcare Research and Quality (AHRQ). The contents of this product are solely the responsibility of Deborah Cohen, PhD and do not necessarily represent the official views of or imply endorsement by AHRQ or the U.S. Department of Health and Human Services.

WWW.ESCALATES.ORG



@ESCALATESorg

Leveraging the ADVANCE Network of CHCs

ADVANCE Research Data Warehouse (RDW) includes:

Demographics (DOB, sex, race)

Enrollment

Encounter

Diagnosis

Labs

Prescribing and Dispensing

Death date and cause

Vital Signs (height, weight, smoking)

Condition (incl. Problem List)

Patient Reported Outcomes

Plus additional data needed for research on the safety net:

- Federal Poverty Level (FPL)
- Household income & size
- Insurance status (incl. uninsured)
- Homeless status
- Migrant/seasonal worker status
- Veteran status
- Community Vital Signs

Acknowledgements and Funding

Study Team

- ▶ Heather Angier, MPH
- ▶ Rachel Springer, MS
- ▶ Steele Valenzuela, MS
- ▶ Nathalie Huguet, PhD
- ▶ Megan Hoopes, MPH
- ▶ Jean O'Malley, MPH
- ▶ Heather Holderness, MPH
- ▶ David Ezekiel-Herrera, MS
- ▶ Steele Valenzuela, MS
- ▶ Debbie Cohen, PhD
- ▶ Jennifer E. DeVoe, MD
- ▶ **John Heintzman, MD (PI)**

Funding Support

NIH

BACKGROUND: R01MD011404

ACCESS: R01CA204267

AHRQ

ESCALATES: R01HS024270

PCORI

ADVANCE: CDRN-1306-04716

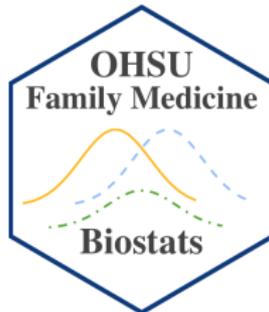
Acknowledgements

The patients, providers, and staff of the OCHIN Practice-Based Research Network. The promotoras of Next Door, Inc in Hood River Oregon.

Questions?

Email: marinom@ohsu.edu

Twitter: @MmMiguelmM



OCHIN
