

APPLICATION OF AI IN COMMUNITY BASED PRIMARY CARE

A systematic scoping review and critical appraisal

The purpose of this review, informed by JBI scoping review framework, was to identify and evaluate published papers which tested and/or implemented artificial intelligence (AI) in community based primary health care (CBPHC).

What databases were used?



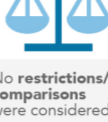
Eligibility Criteria



All **populations** who provide care, receive services and point-of-care from CBPHC were included. Studies conducted in emergency departments were excluded.



Studies that evaluated AI techniques were included. Studies that tested or implemented AI **interventions** in a CBPHC setting were included. Studies related to robot-assisted cares were excluded.

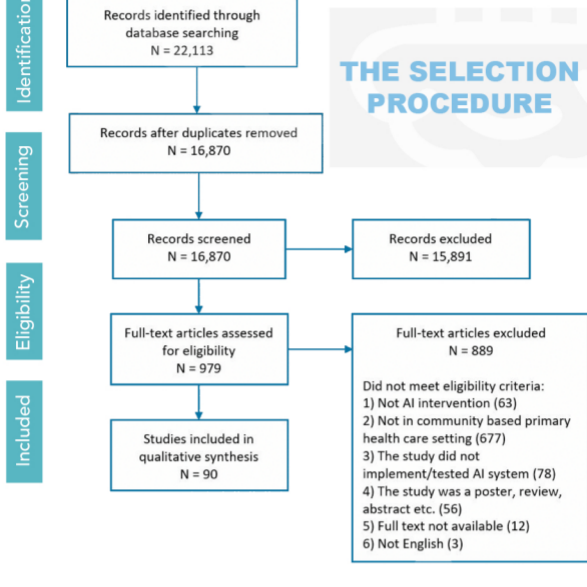


No **restrictions/comparisons** were considered.

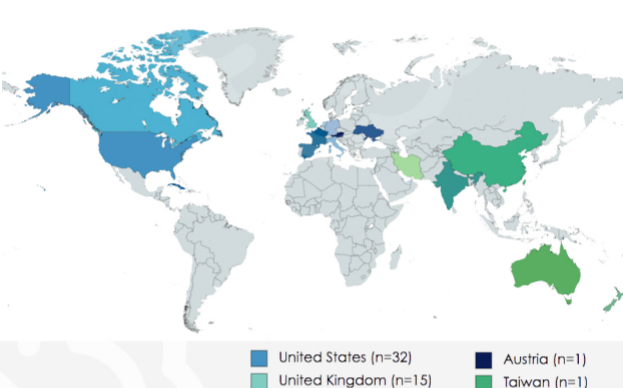


Outcomes related to individuals receiving care, providers of care, and health care systems. Outcomes of AI systems were analyzed for accuracy and impact on the outcomes of care.

PRISMA Flowchart



Countries of included studies



LEGEND

- United States (n=32)
- United Kingdom (n=15)
- China (n=12)
- Australia (n=6)
- Canada (n=4)
- New Zealand (n=4)
- Spain (n=3)
- India (n=2)
- Netherlands (n=2)
- Iran (n=1)
- Austria (n=1)
- Taiwan (n=1)
- Italy (n=1)
- France (n=1)
- Germany (n=1)
- UAE (n=1)
- Ukraine (n=1)
- Israel (n=1)
- Cuba (n=1)

Countries of included studies created with mapchart.net

Characteristics

88%
(n=79) of 90 studies reported the sample size of patients

58%
(n=46) of 90 studies reported on sex distribution of patients

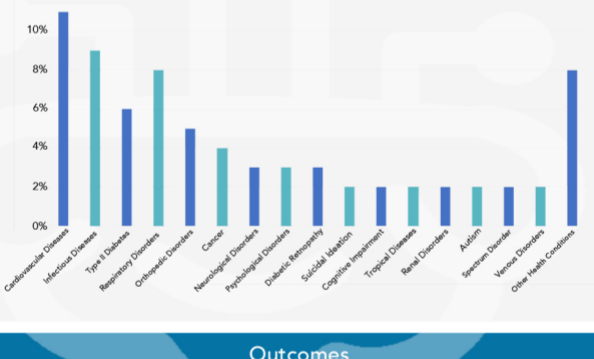
0%
(n=0) of 90 studies reported on gender relevant indicators of patients

41%
(n=32) of 90 studies reported mean age and standard deviation (60.68 (±12.15) years) of patients

22%
(n=19) of 90 papers reported ethnic origins of patients

61%
(n=55) of 90 papers reported the involvement of primary health care providers

Types of Diseases



Outcomes

Benefits

Patients

- Adherence to treatment
- Person-centered care
- Improved quality of life
- Early identification of patients
- Fast screening and cost effectiveness
- Enhanced predictability of morbidities
- Enhanced predictability of risk factors
- Benefits related to early diagnosis and prevention of diseases for elderly
- Facilitated referrals

Primary Care Givers

- Enhanced interprofessional communication
- Enhanced quality of primary care
- Reduced workload
- Facilitate referrals and patient-centered care
- Include/document aspects of medication options
- Inform commissioning priorities
- Quality improvement intervention
- Facilitated disease monitoring
- Prioritization of pediatrician advice for reducing health risks

Health System

- Improving individual patient care and population-based surveillance
- Assisting policy makers in managing hospitals effectively
- Benefits to community-level care
- Benefits related to cost effectiveness
- Facilitating decision making and reduced burden in system level

Challenges

Increased variability in the existing datasets and combination of different data types that acted as barriers for the utilization of AI

Lack of digital/computer literacy among the primary health care providers

Misclassification of data

Noisy and biased dataset that can negatively bias the models and can contain non-generalizable relationships

Quality of data and lack of representative data

Complications related to the health care system included problems with respect to the way information is recorded, such as use of abbreviations in medical records

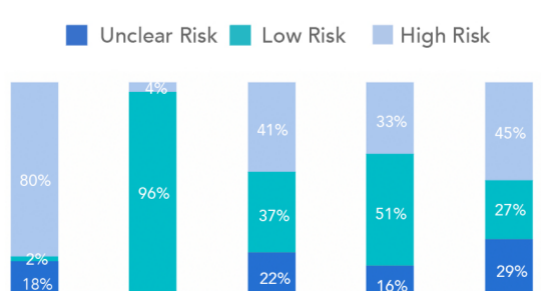
Functioning of AI systems with respect to a lack of data and the need for more data to improve the robustness and accuracy of their system

Restricted medical resources and administrative aspects (i.e. legislations and administrative approvals)

Complications related to the data variability of the patients' characteristics as barriers to use AI and/or to be involved in AI related research, such as age and cognitive ability

Risk of Bias: Assessing Risk of Bias in Five Categories

Unclear Risk Low Risk High Risk



Citation

Abbasgholizadeh Rahimi S, Légaré F, Sharma G, Archambault P, Zomahoun HTV, Chandavong S, Rheault N, Wong S, Langlois L, Couturier Y, Salmeron JL, Gagnon MP, Légaré J Application of AI in community based primary health care: Systematic Scoping Review and critical appraisal J Med Internet Res 2021;0(0):e0 URL: <https://www.jmir.org/2021/0/e0/>