

**REPORT**

2018

**A SYSTEMATIC REVIEW:**

Effect of health equity  
tools for immigrants

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# Key messages

The rate of immigration has increased over recent decades. While immigration can have many benefits for a host country, it can also pose challenges for the country's healthcare system, including how to meet the needs of this heterogenous group. Immigrants may face a number of barriers to taking advantage of the full range of healthcare services available, including language or cultural barriers. The Norwegian Directorate of Health together with the Directorate of Integration and Diversity commissioned a systematic review to examine whether system-level healthcare interventions, specifically health equity tools, can improve health equity for immigrants.

We attempted to conduct an overview of systematic reviews on the effect of system-level healthcare interventions on health equity outcomes for immigrants according to the methods outlined in an approved protocol. The systematic search, however, resulted in no moderate or high quality reviews that met inclusion criteria. We thus revised the review question and conducted a systematic review of studies examining the effect of a specific system-level healthcare intervention, namely health equity tools, on health equity outcomes for immigrants.

We identified one small randomized controlled trial which examined the effect of a health equity tool (i.e. a computer-assisted psychosocial risk assessment tool) for refugees. The results showed that it is uncertain whether such a tool can improve integration of medical and social care (as measured by refugees' intention to seek psychosocial support) (very low certainty evidence). Research is needed to develop an inventory of specific interventions, including the range of health equity tools, to improve health equity outcomes for immigrants in particular.

**Title:**  
Effect of health equity tools for immigrants: a systematic review

**Type of publication:**  
**Systematic review**  
A review of a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise relevant research, and to collect and analyse data from the studies that are included in the review. Statistical methods (meta-analysis) may or may not be used to analyse and summarise the results of the included studies.

**Doesn't answer everything:**

- No outcomes related to barriers/facilitators for equitable health services
- No outcomes related to health equity for specific diseases

**Who is responsible for this publication?**  
The Norwegian Institute of Public Health completed this report, which was commissioned by the Norwegian Directorate of Health in collaboration with IMDi.

**When were the literature searched?**  
July 2016, March 2017

**Peer referees:**  
Esperanza Diaz, NAKMI (protocol only, 2016)  
Prof. Ursula Småland Goth, VID vitenskapelige høyskole  
Wenche Bekken, OsloMet - Storbyuniversitet

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# Executive summary

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## Background

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Immigration has many benefits for a host country, but can also pose new challenges. A rapid and large growth in the immigrant population may place pressure on the infrastructure, the environment, and the human capital within a healthcare system. Although the healthcare system may be well equipped and experienced enough to diagnose and treat diseases that are common among the native population, it may not necessarily be prepared to deal with the specific needs of particular immigrant groups. At last census count (2016), there were almost 700,000 immigrants living in Norway (approximately 13% of the population). Although Norway grants full equality of care and treatment to new arrivals after awarding them immigrant status, research indicates that immigrants use primary and specialty healthcare differently than ethnic Norwegians. The Norwegian Directorates of Health, and Integration and Diversity have recognized this as an area where more research is needed, specifically with respect to identifying which system-level healthcare interventions can improve health equity outcomes for immigrant populations.

We attempted to conduct an overview of systematic reviews on the effect of system-level healthcare interventions on health equity outcomes for immigrants according to the methods outlined in an approved protocol. The systematic search, however, resulted in no reviews that met inclusion criteria. We posited that the review question needed revision before proceeding and thus revisited the review question with the commissioners and, upon agreement, amended the review question to examine a specific system-level healthcare intervention, namely health equity tools, on health equity outcomes for immigrants. *Health equity tools* refer to any resource that aims to improve health equity and can include resources that assess the degree to which policies and programs promote health equity, or resources that promote the inclusion of health equity in programmes or policies.

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## Objective

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To evaluate the effect of health equity tools for immigrants (also referred to as inventories, checklists, assessments), on health equity outcomes.

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## Method

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We conducted a systematic review in accordance with the handbook used by the division for health services in the Norwegian Institute of Public Health. In March 2017, an information spe-

cialist developed and conducted a literature search in 11 databases to identify relevant randomized, and non-randomized controlled studies, interrupted time series studies and controlled before-and-after studies as well as systematic reviews of high or moderate quality. Two reviewers independently screened identified references and read in full any publications that met predefined inclusion criteria. Two reviewers critically appraised the included study independently of each other. One reviewer extracted data related to study characteristics, population, intervention and outcome. Data extraction was checked by a second reviewer. We assessed the certainty of the evidence for the primary outcome using the GRADE approach (Grading of Recommendations Assessment, Development and Evaluation).

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## Results

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We identified 16,765 unique references in our literature search to address the amended review question. We considered nine of these to be potentially relevant and read them in full. One randomized controlled trial met the inclusion criteria. This study assessed the effect of using a computer-assisted psychosocial risk-assessment (CaPRA) tool compared to usual services. The tool was developed with the objective of improving the integration of medical and social services for refugees, and the primary outcome, intention to visit psychosocial counsellor, was chosen as a proxy for measuring this objective given that previous research has indicated that intention is a good indicator of actual action. Secondary outcomes included patient acceptance of the intervention (intervention group only), and patient satisfaction. The study was conducted in a community health centre where 50 patients were randomized to receive either the intervention (n=26; CaPRA tool prior to consultation with service provider) or usual services (n=24; no risk assessment prior to consultation). The outcomes were measured in both groups immediately after the consultation using a paper-format exit-survey. The results showed that it is uncertain whether the CaPRA tool has an effect on integration of medical and social services, as measured by patients' intention to visit a psychosocial counsellor (very low certainty).

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## Discussion

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As is evident from the results of this systematic review, there appears to be little research on the effect of health equity tools for improving health equity outcomes for immigrants. We identified one small study that evaluated the effect of a health equity tool for immigrants. The evidence from this study was assessed as being of too low quality to ascertain whether a computer-assisted psychosocial risk-assessment tool has an effect on integrating medical and social services (very low certainty).

We used a comprehensive and systematic approach to searching, screening and reviewing the records found. The search strategy was developed, peer reviewed, and implemented by experienced information specialists. We used a duplicate screening and consensus process, and finally we had no language restrictions.

There are, however, some limitations to this systematic review. As evidenced by the two phase progression, there were a number of challenges in conducting this systematic review. The original review question was very broad and difficult to operationalize in terms of developing a

search strategy and inclusion criteria. Specifically, the challenges related to the search strategy were poor indexing in databases, and identifying the correct search terms that would ensure that all relevant studies were identified without being so broad as to come up with an unmanageable number of references to screen.

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## **Conclusion**

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There is little rigorous evidence available on the effect of health equity tools to improve health equity outcomes for immigrants.

### **Future research**

Given that we only identified one eligible randomized controlled study for inclusion in this review (despite two comprehensive literature searches), there is a need for more research on the effect of health equity tools for immigrants. Future research may begin by examining how health equity is defined and measured, and what is the best way by which to measure *health equity*. It would also be of interest to develop an inventory of system-level healthcare interventions that currently exist to improve health equity outcomes for immigrants.

# Hovedfunn (Norwegian)

Andelen innvandrere har økt de siste tiårene. Innvandring kan ha mange fordeler for et vertsland, men kan også ha utfordringer for landets helsevesen, slik som hvordan man skal møte behovene til denne heterogene gruppen. Innvandrere kan oppleve mange barrierer når det gjelder å nyttiggjøre seg ulike helsetjenester, for eksempel språklige eller kulturelle barrierer. Helsedirektoratet og Integrerings- og mangfoldsdirektoratet har bedt om en kunnskapsoppsummering som ser på om tiltak på helse-systemnivå, spesifikt verktøy for likeverdige helsetjenester, kan forbedre likeverdige helsetjenester for innvandrere.

Vi planla å utføre en systematisk oversikt over oversikter om effekt av tiltak på helsesystemnivå generelt for likeverdige helsetjenester for immigranter, i henhold til en godkjent prosjektplan. Vi identifiserte, imidlertid, ingen relevante systematiske oversikter av moderat eller høy metodisk kvalitet. Vi derfor justerte oversiktsspørsmålet, og utførte en systematisk oversikt over studier som ser på effekt av et bestemt systemnivåtiltak; verktøy for likeverdige helsetjenester (*health equity tools*) på utfall knyttet til likeverdige helsetjenester for innvandrere.

Vi identifiserte én liten randomisert kontrollert studie som undersøkte effekten av et verktøy for likeverdige helsetjenester for flyktninger. Det er usikkert om et slik verktøy kan forbedre integreringen av medisinske- og sosiale tjenester for flyktninger.

Fremtidig forskning er nødvendig for å utvikle et kartotek av spesifikke tiltak, inklusive *health equity tools*, for å forbedre likeverdige helsetjenester for innvandrergupper.

## **Tittel:**

Effekt av verktøy for likeverdige helsetjenester for innvandrere: en systematisk oversikt

## **Publikasjonstype:**

### **Systematisk oversikt**

En systematisk oversikt er resultatet av å

- innhente
- kritisk vurdere og
- sammenfatte relevante forskningsresultater ved hjelp av forhåndsdefinerte og eksplisitte metoder.

## **Svarer ikke på alt:**

- Ingen utfall relatert til barrierer / tilretteleggere for rettferdig helsetjenester
- Ingen utfall relatert til helse egenkapital for spesifikke sykdommer

## **Hvem står bak denne publikasjon?:**

Folkehelseinstituttet har utført denne systematiske oversikten på oppdrag fra Helsedirektoratet i samarbeid med Integrerings- og mangfoldsdirektoratet.

## **Når ble litteratursøket gjennomført:**

Juli 2016, mars 2017

## **Eksterne fagfeller:**

Esperanza Diaz, NAKMI (protocol only, 2016)  
Prof. Ursula Småland Goth, VID vitenskapelige høgskole  
Wenche Bekken, OsloMet - Storbyuniversitet

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# Sammendrag (Norwegian)

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## Bakgrunn

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Innvandring har mange fordeler for vertslandet, men kan også by på nye utfordringer. En rask og stor vekst i innvandrerbefolkningen kan sette stort press på infrastrukturen, miljøet, og de menneskelige ressursene innen helsevesenet. Selv om et helsesystem er godt utstyrt og har god erfaring med å diagnostisere og behandle sykdommer som er alminnelige i den innfødte populasjonen, er det kanskje ikke forberedt på å håndtere de spesielle behovene ulike innvandrergrupper har. Siste tall fra Statistisk Sentralbyrå (2016) viser at nesten 700 000 innvandrere bor i Norge (omtrent 13 % av befolkningen). Selv om Norge gir innvandrere like rettigheter til helsetjenester som den øvrige befolkningen, viser forskningen at innvandrere bruker primær- og spesialisthelsetjenesten annerledes enn etniske nordmenn. Helsedirektoratet og Inkluderings- og mangfoldsdirektoratet ser at ulikheter i helsetjenesten blant innvandrere er et område der det er behov for mer forskning, spesielt når det gjelder hvilke tiltak på helsesystemnivå som kan forbedre utfall knyttet til sosiale ulikheter for innvandrerbefolkningen.

Vi planla å utføre en systematisk oversikt over oversikter om effekt av tiltak på helsesystemnivå generelt for likeverdige helsetjenester for innvandrere, i henholdt til en godkjent prosjektplan. Det systematiske søket identifiserte imidlertid ingen systematiske oversikter som møtte inklusjonskriteriene. Vi tenkte at forskningsspørsmålet trengte bearbeiding, og vi tok derfor forskningsspørsmålet opp med oppdragsgiverne og endret, etter avtale, spørsmålet til å undersøke et bestemt systemnivå tiltak, nemlig verktøy for å forbedre utfall knyttet til likeverdige helsetjenester (*health equity tools*) for innvandrere. *Health equity tools* er verktøy eller ressurser som har til hensikt å forbedre likeverdige helsetjenester, eller fremme en fokus på likeverdige helsetjenester i tiltak og politikk.

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## Problemstilling

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Å evaluere effekt av verktøy for likeverdige helsetjenester (*health equity tools*) for innvandrere.

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## Metoder

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Vi gjennomførte en systematisk oversikt i samsvar med håndboken som blir brukt av område for helsetjenester i Folkehelseinstituttet. En forskningsbibliotekar planla og

gjennomførte et litteratursøk i 11 databaser i mars 2017 for å finne relevante randomiserte- og ikke-randomiserte kontrollerte studier, avbrutt tidsseriedesign og kontrollerte før-og-etter studier, og systematiske oversikter av høy eller moderat kvalitet. To forskere leste og valgt ut mulige relevante referanser uavhengig av hverandre i forhold til forhåndsdefinerte inklusjonskriterier. To forskere leste deretter uavhengig av hverandre alle referansene som så ut til å treffe inklusjonskriteriene. En forsker vurderte den metodiske kvaliteten til den ene inkluderte studien, og hentet ut data angående studiekarakteristikk, populasjon, tiltak og utfall. Den kritiske vurderingen og data-uttrekket ble dobbeltsjekket av en annen forsker. Vi vurderte vår tillit til resultatene for primærutfallet ved hjelp av GRADE-tilnærmingen (Grading of Recommendations Assessment, Development and Evaluation).

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## Resultat

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Vi identifiserte 16,765 unike referanser. Vi vurderte syv av disse til å være potensielt relevante og leste dem i fulltekst. Kun én randomisert kontrollert studie traff inklusjonskriteriene. Denne studien vurderte effekten av å bruke et Computer-assisted psychosocial risk-assessment (CaPRA) verktøy sammenlignet med vanlige tjenester for flyktninger som besøkte en poliklinikk. Verktøyet ble utviklet for å forbedre integreringen av medisinske- og sosiale tjenester for flyktninger. Forskerne valgte det primære utfallsmålet – intensjon om å kontakte en psykososial rådgiver - som det beste utfallet for å måle integrering ettersom tidligere forskning har indikert at intensjon er en god indikator på faktisk handling. Sekundære utfall inkluderte pasientaksept (kun tiltaksgruppen) og pasienttilfredshet. Studien ble gjennomført i en poliklinikk (community centre) der 50 pasienter ble randomisert til å motta enten tiltaket (n= 26, CaPRA-verktøyet før konsultasjon med tjenesteleverandøren) eller vanlige tjenester (n= 24; ingen risikovurdering før konsultasjon). Resultatene ble målt umiddelbart etter konsultasjonen i begge gruppene ved hjelp av en avslutningsundersøkelse (blyant/papir). Resultatene viste at det er usikkert om et slikt verktøy har en innvirkning på integrering av helse- og sosialtjenester, målt ved flyktningers intensjon om å kontakte en psykososial rådgiver (svært lav tillit).

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## Diskusjon

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Som resultatene fra denne systematiske oversikten viser ser det ut til å være lite forskning på effekt av verktøy for å forbedre utfall knyttet til likeverdige helse- og omsorgstjenester for innvandrere. Vi identifiserte kun én studie som traff inklusjonskriteriene. Kunnskapsgrunnet fra denne studien ble vurdert til å være av for lav kvalitet for å si noe om hvorvidt et Computer-assisted psychosocial risk-assessment (CaPRA) verktøy har effekt på integrering av helse- og sosialtjenester (svært lav tillit).

Vi brukte en omfattende og systematisk tilnærming til å søke etter og vurdere inklusjon av identifiserte studier. Søkestrategien ble utviklet, fagfellevurdert, og implementert av

erfarne forskningsbibliotekarer. To forskere leste alle referanser uavhengig av hverandre, og vi gjennomførte en konsensusprosess. Vi hadde ingen språkbegrensninger eller restriksjoner knyttet til publiseringsdato.

Det er imidlertid noen svakheter med denne systematiske oversikten. Tofasetilnæringen viser at det var en rekke utfordringer knyttet til det systematisk søket for dette prosjektet. Det overordnede spørsmålet var svært bredt og vanskelig å operasjonalisere med hensyn til utvikling av søkestrategien og inklusjonskriteriene. Særlig viste det seg å være manglende indeksering i databasene, og vi opplevde utfordringer med å identifisere de riktige søkeordene som kunne sikre at all relevant forskning ble identifisert uten at søket var så bredt at vi fikk et uhåndterbart antall referanser å lese.

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## **Konklusjon**

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Det finnes lite forskning om effekt av verktøy for likeverdige helsetjenester for å forbedre likeverdige helse- og omsorgstjenester for innvandrere.

### **Fremtidig forskning**

Siden vi kun identifiserte én relevant randomisert kontrollert studie i denne oversikten (til tross for to omfattende systematiske litteratursøk), ser det ut til at det er behov for mer forskning om effekt av tiltak på helsesystemnivå som har til hensikt å føre til likeverdige helse- og omsorgstjenester for innvandrere. Det samme gjelder verktøy for å forbedre utfall knyttet til likeverdige helse- og omsorgstjenester for innvandrere. Fremtidig forskning kan begynne med å undersøke hvordan ulikheter er definert og målt, og hva som er den beste måten å måle det på. Det hadde også vært interessant å utvikle et kartotek over hvilke tiltak på helsesystemnivå som finnes for innvandrere.

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# Preface

The division of health services (formerly called the Norwegian knowledge centre for the health services) in the Norwegian Institute of Public Health was commissioned in 2016 by the Norwegian Directorate of Health in partnership with the Norwegian Directorate for Integration and Diversity to conduct a systematic review evaluating the benefits and harms of system-level healthcare interventions for immigrants. We attempted to conduct an overview of reviews to address this question but identified no moderate or high quality systematic reviews. We thus, in collaboration with the commissioners, amended the review question to examine the effect of a specific system-level healthcare intervention, namely health equity tools for immigrants, on health equity outcomes. Health equity tools are defined as any resource that aims to improve health equity and can include resources that assess the degree to which policies and programs promote health equity, or resources that promote the inclusion of health equity in programmes or policies. In this report we discuss and present a summary of the methods and results for the first phase of the project (the overview of reviews) but the report will focus on the methods and results for the amended review question: What is the effect of health equity tools for immigrants on health equity outcomes?

## **Contributors to the project:**

Heather Menzies Munthe-Kaas, Project co-leader

Julia Bidonde, Project co-leader

Lien Nguyen, Information specialist

Gerd Flodgren, Researcher

Jose Meneses, Researcher

Gyri Straumann, Information specialist

Heid Nøkleby, Researcher

JB developed the research protocol. LN and GS developed and conducted the searches. JB and HMK screened all references for the overview of reviews. JB, HMK, JM, and GF screened references to address the amended review question addressed in this report. HMK conducted the synthesis. HMK and HN critically appraised the included study and graded the evidence. HMK and JB wrote the manuscript. All authors commented on drafts and approved the final report. The head of unit, Rigmor C Berg, commented on early versions of the manuscript and provided feedback on the final report.

We wish to acknowledge the internal peer referees Atle Fretheim, Liv Merete Reinar, Kjetil Gundro Brurberg, and Lene Kristine Juvet for peer reviewing the protocol and final report. We would like to acknowledge Gyri Straumann for her expertise and assis-

tance with the systematic search and Heid Nøkleby for her contribution to critically appraising the included study and grading the evidence. We would like to thank Esperaza Diaz, Prof Ursula Goth and Wenche Bekken for their expertise and comments as external peer reviewers.

**Declaration of interest:**

None of the authors or external peer referees state any conflicts of interest.

Kjetil Brurberg  
Acting Head of Department

Rigmor C Berg  
Head of Unit

Heather Munthe-Kaas  
Project co-leader

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# Objectives

In this systematic review we aimed to evaluate the effect of health equity tools (also referred to as inventories, checklists, assessments) for immigrants, on health equity outcomes.

For the purpose of this review, we have used Pauly's (2016) definition of a health equity tool as "a document or resource that clearly identifies improving health equity as a goal and provides a set of steps, questions, or a framework that people can follow to achieve this goal. By 'tool' we mean a document or resource that either assesses the degree to which health equity is included in policies or programs, measures health equity, or promotes the inclusion of health equity in policies or programs" (1) (p.8) (See Appendix 1 for a list of terms used in this report).

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# Background

Immigration has many benefits for a host country, but can also pose new challenges. A rapid and large growth in the immigrant population may place a great deal of pressure on the infrastructure, the environment, and the human capital within a healthcare system. Although the healthcare system may be well equipped and experienced enough to diagnose and treat diseases that are common among the native population, it may not necessarily be prepared to deal with the specific needs of particular immigrant groups. At last census count (2016), there were almost 700,000 immigrants living in Norway (approximately 13% of the population). Although Norway grants full equality of care and treatment to new arrivals after awarding them immigrant status, research indicates that immigrants use primary and specialty healthcare differently than ethnic Norwegians. The Norwegian Directorates of Health, and Integration and Diversity have recognized this as an area where more research is needed, specifically with respect to identifying which system-level healthcare interventions, or health equity tools that can improve health equity outcomes for immigrant populations.

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## Immigration

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People have always migrated within countries and between countries and continents. However, rates of migration during the last twenty to thirty years has risen quickly, and is expected to continue to rise (2). In 2015, it was estimated that 244 million people were living in a country outside of their country of birth (2).

Migration can have positive influences - demographic and economic - on the host countries. Migration can also benefit countries of origin when people return home with new skills or improved financial situations to start or invest in companies (2). However, these positive effects are dependent on successful integration in host countries as migrants cannot thrive unless they are safe and able to support themselves financially (2).

### Immigrants in Norway

Norway's reputation for humanitarian assistance and a booming labour market contributed to the country becoming a destination for migrants since the late 1960s (3). At the beginning of 2018, there were 746 661 immigrants (individuals born abroad to two foreign-born parents) in Norway (4). These immigrants came primarily from European (EU) countries (4).

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## Immigrants' healthcare use

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Migrants arrive with various health conditions, disease profiles, and different experiences with a healthcare system. This situation has implications for the health and healthcare of those who move, as well as individuals who work with the healthcare system who receive them. Immigrants may face a variety of barriers when trying to access healthcare in the host country, including barriers related to culture, communication, socio-economic status, knowledge and the structure of the healthcare system (5).

### Immigrants' health in Norway

Immigrants in Norway are a heterogeneous group with respect to ethnicity, education levels, employment prospects, and physical and mental healthcare needs. Previous research has shown that this broad group, despite multi-dimensional heterogeneity, uses primary and specialty healthcare differently than ethnic Norwegians (6-10). Healthcare use among immigrants is characterized, among other things, by over-utilizing emergency services and under-utilizing primary care (11). This type of healthcare use could result in an increased risk of developing acute and chronic conditions, which ultimately may place greater pressure on the healthcare system (11).

Norway grants full equality of care and treatment to new arrivals after awarding them immigrant status. "Equal access to healthcare of good quality" is explicitly stated in the 1999 Patient's Right Act (12). Although this is one of the most important determinants of health, a *legal right to healthcare* is not necessarily synonymous with real access to healthcare services. It is advantageous to have health coverage, but as Asaria and colleagues point out "[p]rovision of universal coverage is essential for achieving equity in healthcare, but inequalities still exist in universal healthcare systems" (13). In fact, research shows that immigrants in Norway experience barriers to accessing healthcare, due to language, lack of knowledge, or being overwhelmed by complex processes in unfamiliar communities (14, 15). Inequities do not have a single cause, but multiple, interconnected and complex pathways. The mechanisms in which health inequities materialize in the healthcare system are still imperfectly understood and evidence remains to be gathered on the effectiveness of interventions to reduce such inequalities.

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## Healthcare systems

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The term 'healthcare system' refers to "the organization of people, institutions, and resources that deliver healthcare services to meet the health needs of target populations" (16).

A rapid and large growth in the immigrant population may pose a great deal of pressure on infrastructure, the environment, and the human capital within a healthcare system. Although the healthcare system may be well equipped and experienced to diagnose and treat common diseases, it may not necessarily be prepared to deal with particular immigrant groups.

Migrants' disparities in accessing healthcare are not unique to Norway. Internationally, several strategies to address health inequity among immigrants have been proposed,

such as provision of interpretation and translation services, culturally informed care delivery, culturally tailored population programs, and the use of cultural support staff such as intercultural mediators, community health workers, and patient navigators. The need to prepare the workforce to understand and respond effectively to the needs of migrants, as well as improvement of capacity of health systems to address explicit migrants' needs has also been emphasized (17).

### **Immigrants and the Norwegian healthcare system**

The Norwegian government's 'Equitable health strategy 2013-2017' highlights some of the reasons health disparities occur among immigrants (18, 19). This includes language barriers, low levels of health literacy, unfamiliarity with the healthcare system, as well as cultural and religious beliefs. These barriers are particularly noticeable during the early stages of settlement when immigrants are more susceptible to face major socio-economic obstacles which can be seen as a limitation in accessing proper healthcare. Without comprehensive interventions to provide equitable access to healthcare, current healthcare practices may increase the risk of immigrants developing acute and chronic illnesses, including diabetes, hypertension, coronary disease and cancer (20, 21). In a study of immigrants in Norway published in 2017, twice as many immigrants report their health as poor or very poor compared to the general population (11% of immigrants contra 5% of the general population) (22). Furthermore, more than twice as many immigrants reported experiencing mental health problems during the two weeks preceding data collection compared to the general population (12% vs 6%) (22).

### **Healthcare system interventions**

System-level healthcare interventions are intervention designed to bring about healthcare changes at the delivery, financing, policy and public health levels to produce better health outcomes in a more equitable manner. System-level interventions target one or more system building blocks (see Appendix 1). For example, incorporating 'consultation fees' is a system-level intervention that affects almost all building blocks in the system. Another example of a system-level intervention targeting service delivery comes from Spain where efforts have been made to adapt facility services, products and routines to meet intercultural needs in five hospitals and 33 primary health centres (23). Finally, an example of an interventions aimed at healthcare workforce comes from Norway where staff in some hospitals have been provided with training to improve migrant-friendly services (23).

Migrants' disparities in accessing healthcare are not unique to Norway. Internationally, several strategies to address health inequity among immigrants have been proposed, such as provision of interpretation and translation services, culturally informed care delivery, culturally tailored population programs, and the use of cultural support staff such as intercultural mediators, community health workers, and patient navigators. The need to prepare the workforce to understand and respond effectively to the needs of migrants, as well as improvement of capacity of health systems to address explicit migrants' needs has also been emphasized (23).

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## Health equity

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Health equity is defined as “attainment of the highest level of health for all people. Achieving health equity requires valuing everyone equally with focus and ongoing societal efforts to address avoidable inequalities, historical and contemporary injustices, and the elimination of health and healthcare disparities” (24).

While this definition is useful in giving a broad overview of an ideal and how to achieve that ideal, how one operationalizes the term ‘health equity’ is arguably more important with respect to policy and practice. In an effort to clarify health equity and related terms (e.g. health disparities and health inequality), Braveman (2006) writes that how one defines these terms “can determine not only which measurements are monitored by national, state/provincial, and local governments and international agencies, but also which activities will receive support from resources allocated to address health disparities/inequalities and health equity” (25)(p.168).

Whitehead (1992) emphasizes that the term *health inequalities* refers only to the subset of differences in health that are “avoidable, unfair, and unjust” (26). Cuyler and Wagstaff, however, discuss four mutually incompatible definitions of health equity (equality of utilization, distribution according to need, equality of access, and equality of health), and conclude that “equality of health should be the dominant principle and that equity in healthcare should therefore entail distributing care in such a way as to get as close as is feasible to an equal distribution of health” (27) (p.431).

There appears to be common consensus among experts in the field that health equity is best measured by choosing an indicator of health (or a health-related factor) in a disadvantaged group (e.g. immigrants) and comparing that with the same indicator of health in a more advantaged group (25). However, there does not appear to be consensus on which health indicator is the most appropriate.

### Health equity tools

We have used Pauly’s (2016) definition of a health equity tool as

*a document or resource that clearly identifies improving health equity as a goal and provides a set of steps, questions, or a framework that people can follow to achieve this goal. By “tool” we mean a document or resource that either assesses the degree to which health equity is included in policies or programs, measures health equity, or promotes the inclusion of health equity in policies or programs (1)(p.8).*

A health equity tool can be used as an initial (or follow-up) assessment to improve health equity outcomes. Tools can be integrated in any area of the healthcare system (e.g. primary care, public health) to assess within country/region health inequities. It can be used to develop or adapt interventions, inform policy, design strategies for a particular area. Tools can be used at various stages including planning phase, early implementation of a program/policy/strategy phase, or after a program/strategy/policy is completed.

Pauly and colleagues (2016) have developed an inventory of health equity tools (1). However, this publication does not include any health equity tools that are described as specifically targeting health equity outcomes for immigrants. Rather, the majority of the tools described are designed to reduce health inequity for vulnerable populations in general. One example of such a tool is The Health Equity Impact Assessment (HEIA) tool which “is intended to support the integration of equity considerations into the development or evaluation of a policy, program, or initiative” (1) (p.16). Specifically, the tool can be used to support health practitioners and policy makers discover “gaps in service delivery, program planning, and health needs for marginalized groups” (1). Another example is the Rapid Assessment Methods for Health-Equity Audit used to identify inequalities in diabetes care among elderly care-home residents in the UK (1). These methods include, among other things, a rapid-evaluation method to assess quality of care-homes (1). A final example is the Participative Evaluation Framework which was based on findings from three systematic reviews commissioned by Netherlands, UK and Northern Ireland governments. The framework identified six key characteristics to successfully addressing health inequities: “(1) the importance of the healthcare setting; (2) use of pluralistic methods; (3) inter-agency and community partnerships; (4) a holistic view of health; (5) identification of minority needs; and (6) the use of health impact assessment.» (1) (p.26). This framework has been used to evaluate women’s health needs in a major city in Northern Ireland (1).

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## **Relevance of this systematic review**

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Despite the growth of scientific publications regarding immigrants’ health, knowledge about the effectiveness of interventions to address health inequity at the healthcare system-level is limited. To our knowledge, only one observational study at a system-level has been published to date (28). The study investigated the impact of the national health system resource allocation policy on health inequalities in England 2001-2011, utilizing a longitudinal ecological method. The authors concluded that increasing the proportion of resources allocated to deprived areas was associated with a reduction in absolute health inequities from causes amenable to healthcare.

Recent patterns of immigration into Norway and the resulting health disparities that have arisen (see discussion above) have prompted the Norwegian Directorate of Health, and the Norwegian Directorate of Integration and Diversity, to commission a systematic review on the effect of system-level healthcare interventions, specifically health equity tools, for supporting immigrants’ equitable healthcare. We hope that the results of this systematic review will help to inform the Directorates future work in policy making and practice related to improving health equity for immigrants.

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# Methods

This project was originally commissioned, and the project plan developed accordingly, to examine the effect of system-level healthcare interventions to improve health equity for immigrants. The project plan stipulated that the review team would first search for relevant overviews of reviews and systematic reviews, and if no eligible reviews were identified, the review team would screen identified references again for relevant primary studies. The review team began the review by conducting a systematic search to identify relevant systematic reviews (see Appendix 5 for the search strategy and list of databases). We used a filter in the search strategy to limit the search to systematic reviews (literature reviews) since the number of relevant hits without the filter was not feasible to screen in terms of time and resources. Two review authors independently screened titles and abstracts of identified references and then potentially relevant systematic reviews in full. Two reviews were identified as meeting the inclusion criteria (PICO), however, when these reviews were critically appraised by two review authors independently, they were both assessed as having low methodological quality and thus were not eligible for inclusion in the overview of reviews. Furthermore, the review questions in these two reviews (specifically the included populations and interventions) were so diverse that they highlighted a limitation of the search and our review question, which was that the intervention of interest was defined too broadly. This had two important ramifications: (1) the search strategy was so broad in its attempt to identify *any* system-level healthcare intervention that no terms for *specific* interventions that would fall under these categories were included, and thus potentially many reviews and/or primary studies evaluating specific system-level healthcare interventions (where the specific name of the intervention was included, but the generic term 'system-level healthcare intervention' was not used in the publication) were not identified by the search, and (2) the range of possible interventions that met inclusion criteria made it difficult to synthesise findings across any eventually identified primary studies. Thus the review team initiated a new round of dialogue with commissioners to (a) evaluate whether the review team should proceed to identify primary studies from the search results, or (b) attempt to refine the review question to focus on a specific system-level healthcare intervention and conduct a new systematic search to identify relevant publications on effect. The result of this communication was the latter, to refine the review question to examine the effect of health equity tools for immigrants to improve health equity outcomes.

The remainder of this section will describe methods for the systematic review to examine the effect of health equity tools for immigrants to improve health equity outcomes. The results and discussion section will also focus only on results related to the amended review question.

The original project plan is available in Appendix 3. The methods, search strategy and results for the first phase of this project (to examine the effect of system-level healthcare interventions on health equity outcomes) are reported in Appendices 4-6.

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**Objectives**

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To examine the effect of health equity tools on health equity outcomes for immigrants.

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**Methods**

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For this review question we aimed to identify and include research that examined the effect of health equity tools for immigrants in the healthcare system.

We defined inclusion and exclusion criteria, as well as primary outcomes, in collaboration with the commissioners. The inclusion criteria are described in Table 1. We only considered research published since 2000 as there was assumed to be little relevant research on this topic conducted before 2000. The amendment to the original project plan is available in Appendix 7.

**Table 1. Inclusion criteria**

	Inclusion criteria
Population	Immigrants (any age, gender or country of origin) in a developed country. For the purpose of this review, an immigrant is defined as a “person born abroad with both parents from abroad” and it refers to the following groups: migrant workers, family reunification, refugees, asylum seekers, and undocumented migrants (29).
Intervention	Health equity tool
Comparator	Any control or comparison group (for primary studies)
Outcome	Equitable health among immigrants Improved access to healthcare services (equitable access = equal access for equal need) Health outcomes (general or disease specific) Reduced length of stay and/or readmission. Equal quality / health outcome of a treatment for the same disease/diagnose. Patient satisfaction Medical errors Adverse events or harms
Study design	Systematic reviews, RCTs, non-RCTs, ITS with comparison group (and assessment at least 3 time points before and 3 after the intervention), and CBAs (with at least two intervention areas)
Timeframe	Overviews/ Systematic reviews: published between 2007 and 2017 and with a literature search that is no older than from 2007. Primary studies: published between 2000 and 2017.

## Exclusion criteria

- Systematic reviews of low methodological quality, older than 10 years, or with data that were not reported for immigrants separately
- Evaluated system-level healthcare intervention or health equity tool were not defined in accordance with the definition used in this systematic review
- Systematic reviews where it was unclear whether control groups were used in the included studies
- Clinical practice guidelines, conference abstracts and proceedings, books, book chapters, animal studies or modelling studies

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## Literature search

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The search strategy was designed, executed and peer reviewed by a team of Information Specialists. The searches were adapted for each database.

We used a combination of subject terms, text words, and (when available in the databases) filters for systematic reviews. The complete search strategy is reported in Appendix 8. We conducted a systematic search of the following databases in March 2017:

- Ovid MEDLINE
- Embase
- PsycINFO
- PubMed
- CINAHL
- Cochrane Database of Systematic Reviews (CDSR, DARE, HTA)
- Epistemonikos
- Web of Science
- Campbell Library
- Health Systems Evidence
- PROSPERO

In addition to systematically searching the databases mentioned above, we also searched reference lists of relevant publications.

We also conducted a grey literature search using the search engines Google and Google Scholar and relevant international organizations for migration such as the International Organization for Migration, Migration Policy Institute, UNESCO, the European Migration Network and others. The search strings included equity AND (immigrant OR immigrants OR immigration) AND (tool OR checklist OR assessment) AND health.

Given that the commission for this project came from Norway, we also searched specifically for publications from Scandinavian countries in November 2017. We searched Google Scholar using the search string “ulikhet AND immigrant AND verktøy AND effekt.” We searched in the database for the Swedish Agency for Health Technology As-

assessment and Assessment of Social Services using the search term “sociala ojämlikheter.” We browsed the website for the Danish Research Centre for Migration, Ethnicity and Health (MESU).

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## Article selection

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Two reviewers (JB, HMK, JM and GF) independently screened all potentially relevant records resulting from the searches. Potentially relevant references were obtained and read in full-text by at least two reviewers (JB, HMK, JM and GF). We resolved disagreements through discussion and subsequent consensus with a third reviewer when necessary.

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## Assessment of included studies

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Two reviewers (HMK & HN) independently assessed the methodological strengths and limitations of the included randomized controlled study using the Cochrane Risk of Bias tool (30), and the checklists described in the handbook used by the division of health services in the Norwegian Institute of Public Health to assess the methodological strengths and limitations of identified systematic reviews (Checklist for Systematic Reviews) (31). In the protocol we planned on using the AMSTAR checklist for assessing quality of identified relevant systematic reviews, however, the reviewers who ended up assessing the quality of identified systematic reviews were more familiar with the Checklist for Systematic Reviews (described above) and thus this checklist was used instead. We planned on using the checklists for other study designs from the same handbook to assess any other relevant study identified by the search, however this was not necessary as we did not identify such studies.

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## Data extraction

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We extracted data into a standardized data extraction form. One reviewer (HMK) extracted the data and a second reviewer (HN) confirmed the accuracy of the extracted information. We extracted the following data:

- Publication: author(s), year of publication, research question (aim of the review), comparator(s) included
- Setting (country, primary or secondary healthcare setting)
- Participants: Baseline characteristics of participants (age, gender, ethnicity, country of origin)
- Intervention characteristics (type and components, duration and follow up)
- Outcomes (results, scales and measurement tools used, analysis methods used, attrition)

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## Analysis

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If we identified existing systematic reviews or overviews that met the inclusion criteria, we planned on relaying information presented in the overviews as is (no new data extraction or re-analysis). For identified systematic reviews, we planned on summarizing each review using the approach developed by the SUPPORT Collaboration, including presenting an assessment of the certainty of the evidence for the primary outcomes for the main comparisons using the GRADE approach (see below). See the original project plan in Appendix 3 and amendments to the project plan described in Appendix 7.

For identified primary studies meeting inclusion criteria, we planned to conduct a meta-analysis if we were able to pool the results from two or more studies with similar interventions, populations and study designs. For dichotomous outcomes we planned on calculating the odds ratio/risk ratio and the 95% confidence intervals and for continuous outcomes we planned on calculating the mean or standardized difference and 95% confidence interval using Review Manager software 5 (32). We planned on employing a random-effects model and inverse-variance approach which would allow us to weight included studies according to the degree of variation in the confidence in the effect estimate.

Synthesis was not possible given that we only identified one relevant study.

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## Assessment of certainty of the evidence

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Two reviewers independently applied the GRADE approach (Grading of Recommendations Assessment, Development and Evaluation) developed by the GRADE working group (33) to assess certainty of the evidence for the primary outcome in the identified study. In the GRADE approach each outcome is assessed separately and based on evidence from the included studies. Findings from randomized controlled trials begin with a rating of high certainty evidence. This may be downgraded according to five criteria: i) methodological study quality as assessed by review authors, ii) degree of inconsistency, iii) indirectness, iv) imprecision, and v) publication bias. Certainty can also be upgraded when results from observational studies show a large effect estimate, or a dose-response gradient, or if all possible confounders would only likely diminish the observed effect. GRADE has four levels of certainty:

**High certainty:** Further research is very unlikely to change our confidence in the estimate of effect.

**Moderate certainty:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.

**Low certainty:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.

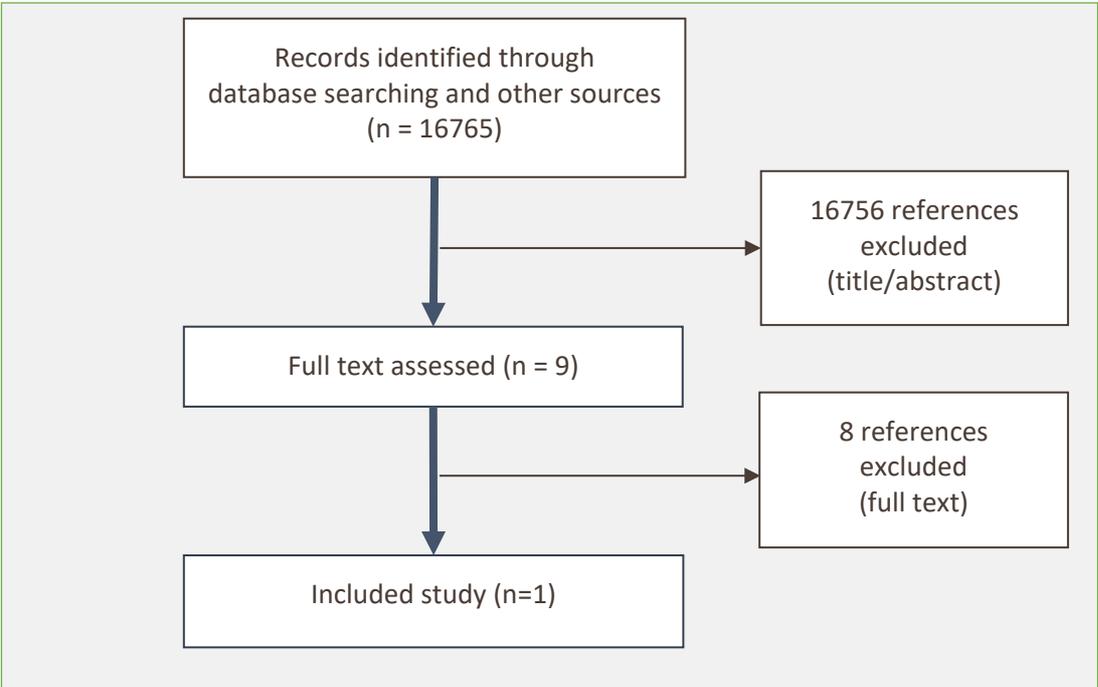
**Very low certainty:** We are very uncertain about the estimate.

For more information on GRADE visit [www.gradeworkinggroup.org](http://www.gradeworkinggroup.org), or see Balshem and colleagues 2011 (34).

# Results

The search resulted in a total of 16,765 citations after duplicates were removed (see Figure 1). Of these we excluded 16,756 irrelevant citations at title and abstract screening. We retrieved and examined nine records; we were unable to retrieve one record and seven studies were excluded because they did not meet the inclusion criteria. See Excluded studies table with reasons for exclusion (Appendix 9).

**Figure 1. PRISMA flow diagram selection process**



## Description of included studies

One randomized controlled study from Canada met the inclusion criteria and is described below (35). This study compared the effect of a computer-assisted psychosocial risk-assessment tool against usual services on refugees’ intention to visit a psychosocial counsellor. This tool is considered to be part of a larger category of eHealth tools (electronic resources for healthcare delivery) (see Table 2).

**Table 2: Description of the included study**

Study	Population	Tool	Comparator	Outcomes
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Ahmad 2012 (35)	Adult Afghan refugees	CaPRA	Usual care	Patient intention to see a psychosocial counselor, acceptance of the tool, patient satisfaction (with the tool)
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CaPRA: Computer-assisted Psychosocial risk Assessment tool

### Population and setting

The included study, which was published in 2012, was conducted at a Community Health Centre in Canada. Participants were 199 Afghan refugees (mean age of 37.6 years old). The intervention and control group participants did not differ significantly on any demographic or health characteristics, except for number of years lived in Canada (the participants in the control group had lived a mean of 3.9 (SD=1.3) years compared to 2.9 years (SD=1.1) for participants in the intervention group) (35).

### Intervention (type of equity tool) and control condition

The one included study evaluated the effects of a Computer-assisted psychosocial risk-assessment (CaPRA) tool compared to usual care. The CaPRA tool was developed as a touch-screen self-assessment survey for Afghan refugees and adapted from a tool used for the general population. The aim of the tool was to support/improve integration of medical and social services for refugees. The team that developed the tool identified key psychosocial health issues for refugees by a literature review and priority areas following the recommendations of an advisory group (35).

The intervention group participants used an iPad in Dari/Farsi language to answer the survey while waiting to see their medical healthcare provider. The CaPRA survey had question on psychosocial risks: substance use, exposure to personal violence, depressive symptoms, food and income security, employment, social network, migration status, and coping. The survey also included questions on cardiovascular risks (e.g. physical activity, weight, diabetes, and hypertension) and road and home safety (35).

The control group participants received care as usual with no risk assessment prior to the consultation. Individuals in both the intervention and the control group completed a paper-based exit survey immediately after the visit with the provider. All participants were awarded 30\$ honorarium for their participation (35).

### Outcomes

The study measured the effect of the CaPRA tool on one primary outcome: patient intention to visit a psychosocial counsellor. This outcome was chosen by the researchers because of existing research that indicates that human intention is a good predictor of action (36). The outcome was measured using a single item measurement tool (yes/no) regarding intention to visit a psychosocial counsellor. The study also reports results for two additional outcomes. The first was patient acceptance of the tool, using the Computerized Lifestyle Assessment Scale (CLAS) to measure patient acceptance (36). This scale has three subscales: (a) benefits (patient perceived benefits regarding quality of the consultation and how it is achieved), (b) privacy barrier (patient concerns about in-

formation privacy), and (c) interaction-barrier (patient concerns about potential interference in the interaction with the provider). For each subscale the patients must answer between three and six questions using a scale from one to five where five is strongly agree and one is strongly disagree. The other secondary outcome was patient satisfaction with the tool, which was measured using a five point scale (very unsatisfied, unsatisfied, neutral, satisfied, and very satisfied) (35).

Data was collected immediately following the consultation/interaction with the service provider.

### **Results for the primary outcome: Patient intention to visit a psychosocial counsellor**

The authors of the study reported that there was no difference between the intervention and the control groups for the primary outcome, *patient intention to visit a psychosocial counsellor* (RR 1.57, 95% CI 0.95 to 2.59). The findings are presented in the Summary of findings table below along with an assessment of our certainty in the evidence supporting this finding (Table 3) (35).

### **Results for the secondary outcomes**

For the outcome *patient acceptance of the tool*, the participants in the intervention group reported a generally positive attitude toward the tool. Participants agreed with the benefits of the tool (mean=4.0). Participants scored in the middle of the 5-point scale for the other two subscales, privacy-barriers (mean=2.8) and interaction-barriers (mean=2.8) (35).

For the outcome *patient satisfaction with the tool*, there was no group difference for satisfaction with interaction with the caregiver between the CaPRA and usual care group (84% of the participants in the CaPRA and 74% in the usual care) and the mean score was toward the positive end of the scale (mean=4.3, SD=1.0). The authors also treated the scores for this outcome as an ordinal variable: 84% of the participants in the intervention group and 74% in the control group were “satisfied” or “very satisfied” (35).

### **Attrition**

Of the 64 patients who met eligibility criteria for participating in this study ten did not have time and four were not interested in participating. The remaining 50 patients completed the consent process and were randomized to the intervention or control group. One patient (from the intervention group) withdrew after randomization, before completing the exit survey (35).

### **Risk of bias**

This study was assessed as having unclear risk of bias due to unclear blinding of participants to aim of study and a statistically significant baseline difference in years lived in Canada between intervention and control group.

## Certainty of the evidence

The results and critical appraisal assessments for a computer-assisted psychosocial risk-assessment tool compared to usual care for refugees are summarized in Table 3. The complete GRADE evidence profile is shown in Appendix 10, Table 10.1. Briefly, we assessed the certainty of the evidence to be very low, implying that it is unclear whether computer-assisted psychosocial risk assessment has an effect on an individual's intention to visit a psychosocial counsellor.

**Table 3. Summary of findings table, Computer-assisted psychosocial risk assessment compared to usual care for refugees (Ahmed 2012)**

Computer-assisted psychosocial risk assessment compared to usual care for refugees					
Patient or population: Refugees					
Setting: Community health centre					
Intervention: Computer-assisted psychosocial risk assessment					
Comparison: Usual care					
Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	No of participants (studies)	Certainty of the evidence (GRADE)
	Risk with usual care	Risk with Computer-assisted psychosocial risk assessment			
Patient intention to visit a psychosocial counsellor (intention) assessed with: yes/no	458 per 1 000	720 per 1 000 (435 to 1000)	RR 1,57 (0,95 to 2.59)	49 (1 RCT)	⊕○○○ VERY LOW <sup>a,b</sup>

\*The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI). CI: Confidence interval

### Explanations

- Unclear risk of bias due to unclear blinding of participants to aim of study and a statistically significant baseline difference in years lived in Canada between intervention and control group.
- Fewer than 300 participants.

## Other health equity tools

We did not identify any other studies evaluating other health equity tools that met the inclusion criteria.

## Additional relevant literature not meeting inclusion criteria

During the initial screening process (titles and abstracts) we identified 15 studies that may be relevant for decision makers, but clearly do not meet all the inclusion criteria for this review question. The details of these studies are described in Table 11.1 in Appendix 11.

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# Discussion

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## Main results

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We identified one small eligible RCT that evaluated a health equity tool for improved health equity outcomes in refugees (i.e. computer-assisted psychosocial risk-assessment tool; CaPRA). The study looked at the effect of the CaPRA tool on integration of medical and social services for refugees. However, the effect of this tool is uncertain due to very low certainty in the evidence.

The dearth of research on this topic indicates one or more of three possible scenarios: 1) very little research has been conducted on the effect of health equity tools specifically intended to improve health equity outcomes for immigrants, 2) there are no established methods for measuring health equity outcomes for immigrants and thus research is yet unable to adequately address this question, or 3) the nature of the review question made it difficult to adequately identify relevant research and a more specific review question examining the effect of one or more specific tools may have resulted in more relevant research being identified. Given the absence of specific tools aimed at immigrants identified in Pauly's 2016 inventory of health equity tools, one or both of the first two scenarios is more likely (1).

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## Health equity for immigrants

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As is evident by the results of this systematic review, there appears to be limited research on the effect of health equity tools for improving health equity outcomes for immigrants. One specific reason for this lack of research may be the lack of established specific health indicator for measuring health equity for immigrants (e.g. access to healthcare, access to/use of referrals to secondary healthcare, health outcomes). Another reason may be difficulties in measuring the effect of a health equity tool while taking into account the wide range of challenges different immigrant populations face, and the numerous confounding variables in measuring the effect of a specific tool during the course of accessing/receiving healthcare.

A research team in Canada attempted to operationalize health equity in primary healthcare services and developed four dimensions of equity-oriented services (see Figure 2) (37). This framework may be a good starting point for designing and evaluating future efforts at incorporating equity-improvement interventions in future research.

**Figure 2. Enhancing equity-oriented PHC delivery, adapted from Browne 2012 (37)**

**10 Strategies to Guide Organizations in Enhancing Capacity for Equity-Oriented Services**

- Make an explicit commitment to equity
- Develop supportive structures, policies, and processes
- Revision use of time
- Attend to power differentials
- Tailor care, programs and services to context
- Actively counter oppression
- Promote community + patient participatory engagement
- Tailor care, programs and services to histories
- Enhance access to social determinants of health
- Optimize use of place and space

Furthermore, Pauly and colleagues (2016) have developed a comprehensive inventory of existing health equity tools (1). Although none of these tools are described as specifically aiming at reducing inequity for immigrants, some of these tools may still be relevant for this population.

### **Computer-assisted psychosocial risk-assessment tools (i.e. CaPRA)**

While computer-assisted psychosocial risk-assessment tools are one example of a health equity tool, it is difficult to generalize any evidence on the effect of this tool because the evidence was considered to be of very low certainty. However, this tool is only one example of the more general eHealth mediated model of care, which may have the potential for contributing to addressing health inequalities (35). A future review could look at the effect of eHealth generally on reducing health disparities for immigrants.

### ***How the intervention might work***

EHealth includes, among other things, technology that can support an individual's ability to establish or maintain good health (prevention and illness management) (38). Research indicates that some immigrant populations may currently be unable to benefit from eHealth services in Norway (38). As Tataru and colleagues conclude in their study of eHealth use among immigrants from Pakistan in Norway, "[for] eHealth to be truly a social innovation, it should be readily accessible and useful regardless of users' ethnicity, country of residence, or primary language" (38).

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## **Strengths and weaknesses**

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There are several strengths to this systematic review. We used a comprehensive and systematic approach to searching, screening and reviewing the records found. The search strategy was developed, peer reviewed, and implemented by experienced Information Specialists. We used duplicate screening and consensus processes. We had no language restrictions or restrictions related to date of publication.

There are, however, some limitations of this review. As evidenced by the two phase progression, there were a number of challenges in conducting this systematic review. Firstly, the original review question was very broad and difficult to operationalize in terms of developing a search strategy and inclusion criteria. Specifically, the challenges

related to the search strategy were poor indexing in databases, and difficulty identifying the correct search terms that would ensure that all relevant interventions were identified without being so broad as to come up with an unmanageable number of references to screen. The resulting search thus focused on terms related to the population (immigrants, etc.), the intervention (healthcare service, delivery, access, disparity, etc.) and outcomes (healthy equity, minority health). While terms related to population are likely unproblematic, the terms related to the intervention and outcomes are so broad that we may have missed out on specific interventions that may have been relevant. This is one of the main challenges of a very broad research question.

We faced a similar challenge when searching for health equity tools. Different tools may be described differently in the effectiveness literature. Although Pauly and colleagues (2016) published a comprehensive overview of health equity tools, it was not feasible to search databases for studies conducted on each individual tool (1). One may, however, assume that proper indexing would capture any of the tools included in the Pauly (2016) inventory and thus studies evaluating the effect of such tools would have been captured by our search.

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## Future research

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Given that we only identified one eligible study for inclusion in this review (despite two comprehensive literature searches), there is a need for more research on the effect of health equity tools targeting immigrants. Although we are aware of a number of health equity tools (1), there appears to be no research on the effect or the effectiveness of these tools in improving health equity or health outcomes for immigrants.

Future research may begin by examining how health equity is defined and measured, and what the best way is by which to measure *health equity*. In addition it would be of interest to review what system-level healthcare interventions currently exist to improve health equity outcomes for immigrants? An ongoing Cochrane systematic review will hopefully provide some insight into this question as it examines methods used to assess healthy equity considerations and how they are reported in primary research studies (39).

A future systematic review could also examine the effect of eHealth mediated models of care on health equity outcomes for immigrants, and potential barriers and facilitators for implementing such interventions among immigrant populations. While such interventions were within the remit of the current review in terms of inclusion criteria, the term eHealth was not included as a search term and thus a specific search for the term 'eHealth' may result in a greater number of studies evaluating this type of intervention. Finally, a further investigation of the inventory of tools developed by Pauly and colleagues' (2016) and how some of these may be relevant for immigrant population specifically may be of interest (1).

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## **Overall completeness and applicability of the evidence**

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Very limited evidence was identified for the review question. This perhaps reflects an area that is currently under development, a topic that is not easy to address, or difficulties documenting effectiveness of this type of intervention in the traditional way. It is not possible to discuss the applicability of the evidence to the Norwegian context given the lack of identified research.

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# Conclusion

There is little rigorous evidence available on the effect of health equity tools to improve health equity outcomes for immigrants. We are unable to draw any conclusions on the effect of equity tools on health equity outcomes for immigrants based on the single study with high risk of bias that was included in this review.

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# Appendices

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## Appendix 1. Glossary

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Term	Definition
Asylum seeker	A person seeking safety from persecution or serious harm in a country other than his or her own and awaits a decision on the application for refugee status under international and national laws. In Norway asylum seekers are registered as immigrants only after having received a residence permit on settlement in a Norwegian municipality. Normally, an asylum seeker whose application has been rejected will not be registered as an 'immigrant', even if the application process has taken a long time and the return to the home country is delayed for a significant period (40)
Control group	Or sometimes refer to as comparison group, is a set of study participants not receiving the intervention under investigation. They may instead be given either a placebo or no treatment, or a different intervention
Country of origin	The country that is a source of migratory flows (regular or irregular)
Determinants of health	The range of personal, social, economic and environmental factors that determine the health status of individuals or populations. The determinants of health can be grouped into seven broad categories: socio-economic environment, physical environments, early childhood development, personal health practices, individual capacity and coping skills, biology and genetic endowment, and health services (24)
Effect size	An index of the magnitude of difference in outcome between treatment and control groups
Effectiveness	The degree to which child interventions are successful in producing desired results
Emigration	The act of departing or exiting from one state with a view to settling in another (40)
Equity	The World Health Organization defines " <i>Equity</i> as the absence of avoidable or remediable differences among groups of people, whether those groups are defined socially, economically, demographically, or geographically. <i>Health inequities</i> therefore involve more than inequality with respect to

	health determinants, access to the resources needed to improve and maintain health or health outcomes. They also entail a failure to avoid or overcome inequalities that infringe on fairness and human rights norms" (24)
Equity focused health impact assessment (EFHIA)	"Equity-focused health impact assessment (EFHIA) uses health impact assessment methodology to produce a complementary and structured way of determining the potential differential and distributional impacts of a policy or practice on the health of the population as well as on specific groups within that population and it assesses whether the differential impacts are inequitable" (41)
GRADE	Grading of Recommendations, Assessment, Development and Evaluation. A tool that is used to assess the certainty of the evidence in a systematic review (33)
Health disparities	Healthcare disparities refer to differences in access to or availability of facilities and services. Health status disparities refer to the variation in rates of disease occurrence and disabilities between socioeconomic and/or geographically defined population groups.
Health equity	Is attainment of the highest level of health for all people. Achieving health equity requires valuing everyone equally with focus and ongoing societal efforts to address avoidable inequalities, historical and contemporary injustices, and the elimination of health and healthcare disparities.(24)
Health equity impact assessment (HEIA)	HEIA has been suggested as a means to ensure that the potential impacts of a proposal on health equity is considered prior to implementation. (24)
Health equity tool	"a document or resource that clearly identifies improving health equity as a goal and provides a set of steps, questions, or a framework that people can follow to achieve this goal. By "tool" we mean a document or resource that either assesses the degree to which health equity is included in policies or programs, measures health equity, or promotes the inclusion of health equity in policies or programs" (1) (p.8).
Health Impact Assessment	HIA is a combination of procedures, methods and tools by which a policy, program or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population. Four values underpin the execution of HIA: democracy, equity, sustainable development and the ethical use of evidence (24)
Health system	Also referred to as healthcare system or health system, is the organization of people, institutions, and resources that deliver healthcare services to meet the health needs of target populations. It is "the ensemble of all public and private organizations, institutions, and resources mandated to improve, maintain or restore health."(42) The WHO states "A well-functioning health system working in harmony is built on having trained and motivated health workers, a well-maintained infrastructure, and a reliable supply of medicines and technologies, backed by adequate funding, strong health plans and evidence-based policies."

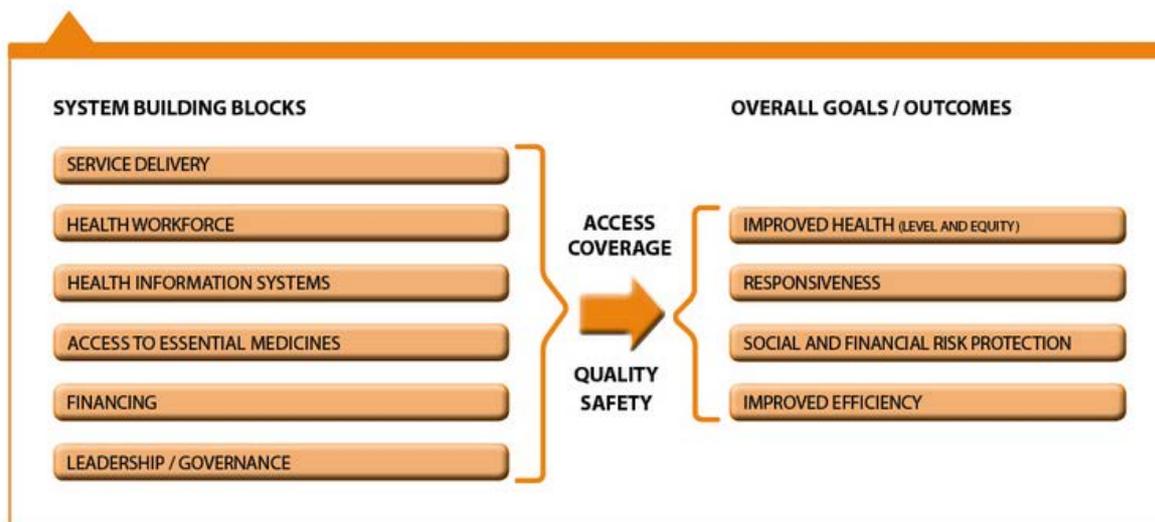
Health system building blocks	The 'blocks' help understanding the effect of the interventions upon the system – these are: service delivery (i.e, personal and non-personal), health workforce, health information (i.e., production, analysis and dissemination of information), medical technologies (i.e., medical products, vaccines), health financing, leadership and governance.
Heterogeneous	Any kind of variability among studies in a systematic review may be termed heterogeneity. Variability in the participants, interventions and outcomes studied may be described as clinical heterogeneity, and variability in study design and risk of bias may be described as methodological heterogeneity. Variability in the intervention effects being evaluated in the different studies is known as statistical heterogeneity, and is a consequence of clinical or methodological diversity, or both, among the studies. Statistical heterogeneity manifests itself in the observed intervention effects being more different from each other than one would expect due to random error (chance) alone.
Host country	Country of destination or a third country or in the case of return or repatriation, also the country of origin. Country that has accepted to receive a certain number of refugees and migrants on a yearly basis by presidential, ministerial or parliamentary decision.(40)
Immigrant	"persons born abroad with both parents from abroad", and it refers to the following groups: migrant workers, family reunification, refugees, asylum seekers, undocumented migrants. (43)
Immigration	Include persons who have legally moved to Norway with the intention of staying 6 months or more, and who are registered as such in the Central Population Register.
Imprecision	Imprecision in general, is when studies include relatively few participants, and few events, and therefore have wide confidence intervals around the estimate of effect.
Inconsistency	Inconsistency of relative (rather than absolute) treatment effects in binary/dichotomous outcomes may be determined by looking at the (dis)similarity of point estimates, extent of overlap of confidence intervals, and statistical criteria including tests of heterogeneity ( $I^2$ ).
Indirectness	Indirectness of evidence is when evidence comes from research that either does not directly compare the interventions in which we are interested with control, or when the intervention is not applied to the populations in which we are interested or if a study measures outcomes that are not direct measures important to patients but proxy measures or process measures.
Migrant	There is no consensus on a single definition of 'migrant.' However migrants can be defined as foreign-born, or foreign nationals, or people who have freely moved to the host country for 6 months or more. The UNESCO defines migrant as "any person who lives temporarily or permanently in a country where he or she was not born, and has acquired some significant

	social ties to this country." This definition does not refer to refugees, displaced or other forced to leave their homes. (44)
Migration (internal or external)	It is the movement of individuals, either across an international border, whatever its length, composition and causes. Internal migration refers to people within a country moving to another location within its borders, whereas external migration, also known as international migration, refers to the act of migration across borders from one country to another (40)
OR	An odds ratio (OR) is a measure of association between an exposure and an outcome. It represents the odds that an outcome will occur given a particular exposure, compared to the odds of the outcome occurring in the absence of that exposure (i.e. in the control group).
P value	Is the probability value of whether a statistical outcome is greater than what would occur by chance
Randomized controlled trial	Study design in which participants are randomly assigned to either one or more treatment groups and a control group to determine the efficacy of a treatment. The use of randomization ensures that known or unknown confounding factors are evenly distributed across intervention groups.
Refugee	A person who, "owing to a well-founded fear of persecution for reasons of race, religion, nationality, membership of a particular social group or political opinions, is outside the country of his nationality and is unable or, owing to such fear, is unwilling to avail himself of the protection of that country." (40)
RR	Risk ratio or relative risk. Relative risk is the ratio of the risk of disease among those exposed to a risk factor to the risk among those not exposed.
SD	The standard deviation (SD) is a measure used to quantify the amount of variation of a set of data values. If close to '0' it indicates that the data points tend to be very close to the mean of the data set, while a high standard deviation indicates that the data points are spread out over a wider range of values.
SMD	The standardized mean difference is used as a summary statistic in meta-analysis when the studies all assess the same outcome but measure it in a variety of ways (for example, all studies measure depression but they use different psychometric scales). In this circumstance it is necessary to standardize the results of the studies to a uniform scale before they can be combined. The standardized mean difference expresses the size of the intervention effect in each study relative to the variability observed in that study.
System-level healthcare intervention	System-level healthcare intervention is conceptualized following the Ministries' commission and includes any intervention designed to bring about healthcare changes at the delivery, financing, policy and public health levels to produce better health outcomes in a more equitable manner.

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## Appendix 2. WHO Health System Framework (building blocks)

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World Health Organization: <http://www.who.int/healthsystems/about/en/>.

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## Appendix 3. Project plan

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### System-level healthcare interventions to achieve equitable health among immigrants: Project protocol (project description)

The result of the project is a systematic review that examine the effectiveness of system-level healthcare interventions to decrease health inequities among immigrants.

*Published 23.09.2016 Updated 05.12.2016*

#### Purpose

In response to recent immigration to Norway since 2011 (7), Helsedirektoratet and the Directorate of Integration and Diversity (IMDi) commissioned a systematic review that would examine the effectiveness of system-level healthcare interventions to decrease health inequities among immigrants. System-level healthcare interventions are defined here as intervention designed to bring about healthcare changes at the delivery, financing, policy and public health levels to produce better health outcomes in a more equitable manner.

#### Short description/summary

Despite efforts to increase equity in healthcare systems, not all individuals have equal access to healthcare or have similar health outcomes. In Norway, a country with a universal healthcare system and a reputation for high standards of living and quality of life, health inequalities still exist (1). Health inequalities are linked to many factors, including access to healthcare. This is particularly true for some populations, including immigrants. Studies have shown barriers immigrants face upon arrival to a host country (2-6), including education, cultural differences, language difficulties, lack of financial resources, and legal issues. Strategies have been proposed to facilitate people's access to healthcare. For example, provision of interpretation and translation services, culturally informed care delivery, culturally tailored population programs, and the use of cultural support staff such as intercultural mediators, community health workers, and patient navigators. Quality of care, and whether it is lower for immigrants, is another key issue. Although immigrants are legally entitled to healthcare services when they arrive in Norway, eliminating health inequities in immigrant populations is a priority for the Norwegian directorate of health (Helsedirektoratet).

Project category and commissioner	
Product (program area):	Systematic review/overview
Thematic area:	Health Equity for immigrants
Commissioner(s):	Helsedirektoratet og Integrerings- og mangfoldsdirektoratet Christopher Le <a href="mailto:Christopher.Le@helsedir.no">Christopher.Le@helsedir.no</a> Kontor: 479 04 023 S025, 6 etg
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### **Mandate**

The Norwegian Directorate of Health is dedicated to improving public health and to driving excellence in healthcare. This commission is in partnership with IMDi, whose goal is to contribute to equality in living conditions and diversity through employment integration and participation (8, 9). The mandate of this commission is to investigate the effectiveness of system-level healthcare interventions on health inequity among immigrants.

### **Purpose**

This project will increase and improve our current knowledge about the effectiveness of system-level healthcare measures leading to equitable healthcare among immigrants.

### **Background**

Migration has always been a characteristic of human society. The global diffusion of news about life in other countries, paired with easy and affordable transportation systems, has made human mobility across borders faster than ever before. People move to attain work, join their families, escape war and torture or simply to get a better education. In 2013, there were 232 million international migrants and 740 million internal migrants around the globe. Nearly 59% lived in the developed countries (e.g., Australia, Canada, United States and several countries in Europe), while 41% were hosted by the developing countries. Europe and Asia combined hosted nearly two-thirds of all international migrants worldwide in 2013. Among those, women outnumbered men in developed regions (10). Influenced by a combination of economic, political, social and other factors, international migration has rapidly increased in European countries in the past years. At 23 million, Europe had the second largest number of international immigrants between 1990 and 2013. Of these, 43% were born in the European Union (EU), 22% in Asia, 18% in Africa and 14% in Latin America and the Caribbean.

Norway has not always been a destination country for immigrants; in fact, for many years Norwegians emigrated to foreign countries. From 1966 to 1970 the total net migration was 853 persons. Norway's reputation for humanitarian assistance and a booming labour market contributed to the country becoming a destination for migrants since the late 1960s (12). At the beginning of 2015 there were 669,400 born abroad im-

migrants in Norway. These immigrants were primarily from EU countries. Polish nationals represent the largest immigrant group in Norway, followed by Lithuanians and Swedish people (1, 13). At the beginning of 2016, there were 698,600 immigrants in Norway – 13.4% of the total population (14)

People coming from different parts of the world arrive with various health conditions, disease profiles and experiences with a healthcare system. This situation has implications for the health and healthcare of those who move, as well as those who receive them. Immigrants are faced with barriers to accessing the full range of benefits and opportunities the host country can offer, including healthcare. A person's health is not only shaped by his or her access to healthcare services, but by a multitude of factors which are known as social determinants of health (social economic status, education level, race, etc.), environmental- and community conditions, and lifestyle or behavioural factors such as diet, tobacco use, food consumption, and so on. These are the conditions in which people are born, grow, live, work and age, and which are mainly responsible for persisting health inequities within and across countries – and cities (15). Norway grants full equality of care and treatment to new arrivals after awarding them immigrant status. "Equal access to healthcare of good quality" is explicitly stated in the 1999 Patient's Right Act (16). Although this is one of the most important determinants of health, a legal right to healthcare is not synonymous with real access to healthcare services. It is advantageous to have health coverage, but as Asaria and colleagues point out "Provision of universal coverage is essential for achieving equity in healthcare, but inequalities still exist in universal healthcare systems" (17). In fact, research shows that immigrants in Norway experience barriers to accessing healthcare (5, 6, 18-20). Inequities do not have a single cause, but multiple, interconnected and complex pathways. The mechanisms in which health inequities materialize in the healthcare system are still imperfectly understood and evidence remains to be gathered on the effectiveness of interventions to reduce such inequalities.

A rapid and large growth in the immigrant population may pose a great deal of pressure on infrastructure, the environment, and the human fabric of a healthcare system. Although the healthcare system may be well equipped and experienced to diagnose and treat common diseases, it may not necessarily be prepared to deal with particular immigrant groups. Immigrants in Norway are a heterogeneous group; it has been shown they use primary and specialty care in a different way than country born individuals (21-25). This pattern of healthcare utilization, for example utilizing emergency services and under-utilizing primary care, may result in an increased chance of developing acute and chronic conditions (2), which ultimately may place pressure on the healthcare system.

The Norwegian government's 'Equitable health strategy 2013-2017' (26) highlights some of the reasons health disparities occur among immigrants. This includes language barriers, low levels of health literacy, unfamiliarity with the healthcare system, as well as cultural and religious beliefs. These barriers are particularly noticeable during the early stages of settlement when immigrants may face major socioeconomic obstacles

which can be seen as a limitation in accessing proper healthcare. Without comprehensive interventions to provide equitable access to healthcare, current healthcare practices may lead immigrants to developing acute and chronic illnesses, including diabetes, hypertension, coronary disease and cancer (27, 28).

Migrants' disparities in accessing healthcare are not unique to Norway. Internationally, several strategies to address health inequity among immigrants have been proposed, such as provision of interpretation and translation services, culturally informed care delivery, culturally tailored population programs, and the use of cultural support staff such as intercultural mediators, community health workers, and patient navigators. The need to prepare the workforce to understand and respond effectively to the needs of migrants, as well as improvement of capacity of health systems to address explicit migrants' needs has also been emphasized (15).

Some strategies have been implemented in migrant groups or other similar groups (e.g. ethnic minorities), but effectiveness of the interventions is inconsistent and likely to be context specific. Two systematic reviews on the effectiveness of culturally tailored diabetes interventions for Asian immigrants conclude that although further good quality research is required, tailored interventions which integrated elements of culture, language, religion and health literacy skills produced a positive impact on important individual outcomes (29, 30). But tailored interventions do not seem to have consistent results across health issues. Another systematic review on tailored interventions for increasing stroke awareness in ethnic minorities found inconclusive evidence about effectiveness of the interventions. The authors acknowledged that interventions operated in very complex scenarios, and several variables may have influenced their effectiveness (45). Beach et al.'s systematic review investigated healthcare providers' improvement of healthcare qualities or reduction of disparities of ethnic minorities and found several promising strategies ranging from tracking and/or reminder to bypassing the physician for particular screening while others were clearly not effective (46).

Despite the growth of scientific publications regarding health and immigrants, knowledge about interventions' effectiveness in addressing health inequity at the system-level is limited. System-level healthcare interventions are intervention designed to bring about healthcare changes at the delivery, financing, policy and public health levels to produce better health outcomes in a more equitable manner. System-level interventions target one or more system building blocks (see Appendix A). For example, incorporating 'consultation fees' is a system level intervention that affects almost all building blocks in the system. To our knowledge, only one observational study at a system-level (33) has been published to date. The study investigated the impact of the national health system resource allocation policy on health inequalities in England 2001-2011, utilizing a longitudinal ecological method. The authors concluded that increasing the proportion of resources allocated to deprived areas was associated with a reduction in absolute health inequities from causes amenable to healthcare. Considering the recent patterns of immigration into Norway and the health disparities this population presents, this project aims to summarize the empirical research literature regarding

the effectiveness of system-level healthcare interventions for supporting immigrants' equitable healthcare.

## **Methods**

### ***Inclusion criteria***

We will first screen for overviews of reviews (hereafter overviews) and systematic reviews (SRs) as these publications synthesize the evidence and present it in a condensed way. An overview is a relatively new approach to summarizing evidence, by synthesizing results from multiple SRs in a single document. This is particularly useful in areas with overlapping reviews. Overviews often identify high quality, reliable systematic reviews and explore and contrast findings across reviews (34). Overviews will be included in this project if they are published in the last 3 years.

In the event no eligible overviews are found, we will include systematic reviews. A systematic review is defined as a "review of the evidence on a clearly formulated question that uses systematic and explicit methods to identify, select and critically appraise relevant primary research, and to extract and analyse data from the studies that are included in the review" (35). We will include both Cochrane, Campbell, and other systematic reviews of randomized controlled trials (RCTs), non-RCTs, interrupted time series (ITS), and controlled before and after studies (CBAs), and possibly other designs that report numerical results of effect. To determine inclusion of SRs, we will follow the key characteristics of a systematic review as stated in the Knowledge Centre Handbook (36). To be included, a SR should have a specified search strategy, clear inclusion criteria, and an assessment of the methodological quality of included studies. Additionally, the SR must be of high or moderate methodological quality (as determined by the AMSTAR checklist), and the search must be no older than from 2006. In the event that a high number of SRs are found, the inclusion criteria will be restricted to SRs of the highest methodological quality and the newest search.

Primary studies: In the event none of the above are found, we will include primary studies of the following designs: RCTs, non-RCTs, ITS with comparison group (and assessment at least 3 time points before and 3 after the intervention), CBAs (with at least two intervention areas).

The PICO-T framework (i.e. population, intervention, comparison, outcome, and time) is shown in Table 1. The criteria stated in this table, alongside additional inclusion criteria will be used to evaluate the suitability of studies.

### *Additional inclusion criteria: studies will be included as follow:*

There is a full text publication that meets our PICO-T eligibility criteria.

The country where the intervention was conducted is a moderate to high income country according to the World Bank listing (37).

The publication is written in any language. However, for publications that are not in a language mastered by the review team (English, French, Norwegian, Swedish, Danish, Icelandic, Spanish, German), individuals proficient in the language and/or translation software will be used.

The terms ‘vulnerable’ or ‘undeserved’ or ‘ethnic minority’ could be seen used interchangeably in the literature to refer to/or include immigrants and will be accepted when it clearly relates to this group as specified above.

*Table 1. PICO-T framework (inclusion criteria)*

Population	Immigrants (any age, gender or country of origin) in a developed country
Intervention	Any health system-level intervention* (see Appendix A)
Comparison	Any control or comparison group (i.e. no intervention, waitlist, usual standard practice, another active intervention)
Outcomes	Equitable health among immigrants Other outcomes: Equal and improved access to healthcare services Quality of Life Health outcomes (general or disease specific) Self management/education Use of Services: for example medication use, hospitalizations, hospital stay Medical costs Patient satisfaction Medical errors Adverse events or harms
Time frame	Overviews: published in the last 3 years (2013-2016) and a literature search that is no older than from 2012. SRs: published in the last 10 years (2006 to 2016) and a literature search that is no older than from 2006. Primary studies: published in the last 16 years (2000-2016).

\*System-level intervention is conceptualized following the Ministries’ commission and includes any intervention designed to bring about healthcare changes at the delivery, financing, policy and public health levels to produce better health outcomes in a more equitable manner.

### ***Exclusion criteria***

- Those that do not fit PICO-T
- If data cannot be isolated for immigrants only among a mixed study population or if the mixed study population consists of less than 50% who can be considered immigrant.
- When terms such as ‘ethnic minorities’ or ‘vulnerable’ or ‘underserved’ or ‘hard to reach’ are used and a clear link to ‘immigrant’ as per this project’s definition cannot be established either after contacting first or secondary authors in the article/report.
- Studies exclusively dealing with country-born immigrants (those with one host country parent), descendants of immigrants and migrants staying in the country for less than 6 months.
- Clinical practice guidelines, conference abstracts and proceedings, books, chapters, animal- and modelling studies.
- Publications containing qualitative only information.

***Search strategy:***

An information specialist will conduct a peer reviewed comprehensive and systematic search of the literature in the following proposed databases:

- Medline,
- Embase,
- Cinahl,
- PsycInfo,
- Central,
- Web of Science,
- Cochrane Database of Systematic Reviews,
- DARE,
- HTA,
- Epistemonikos,
- Campbell Library,
- Health Systems Evidence (repository)
- Popline,
- Social Services Abstract,
- NHS EED

Other databases may be considered. We will also search PROSPERO and pop databases for ongoing and planned systematic reviews, clinicaltrials.gov and WHO registries for ongoing and unpublished studies. Identified ongoing studies will be listed in an appendix in the report. We will search for grey literature, in e.g. OpenGrey, GreyLit, Google Scholar, and BASE. In addition, we will hand-search reference lists of relevant reviews for further relevant references.

These databases will be searched from 2000 to 2016. The MeSH terms will include: delivery of healthcare, minority groups, minority health, emigrants and immigrants, refugees, cultural diversity, human migration. No restrictions will be placed on language or setting (i.e., primary care, public health, home care, hospital care).

***Selection of literature:***

Two authors will independently screen titles and abstracts to identify relevant studies. Potentially relevant full text publications will be obtained and assessed independently against inclusion criteria by two researchers. We will complete the screening process using Covidence software (38). This software aids with the production of systematic reviews and allows independent and blind screening of publications.

***Assessment of methodological quality:***

One pair of researchers will independently evaluate the risk of bias / methodological quality of each included primary study or review as appropriate. Systematic reviews: the quality of the included SRs will be assessed using the AMSTAR methodological quality measurement tool (39). The eleven AMSTAR items will be scored (yes/no) to evaluate the adequacy of the important components of the method: search, selection criteria, validity assessment, and synthesis.

### *Primary studies:*

RCTs: we will use the Cochrane Risk of Bias tool and follow the procedures recommended in the Cochrane 'Handbook for Systematic Reviews of Interventions' to assess bias (40).

For all other non-randomized studies we will use the effective practice and organisation of care group (EPOC) checklist (41).

Interrater reliability analysis using Kappa statistic (42) will be calculated using SPSS software version 20 to determine consistency among raters. The following equation will be used:

- where  $Pr(a)$  is the relative observed agreement among rater or 'reviewers', and  $Pr(e)$  is the hypothetical probability of chance agreement, using the observed data to calculate the probabilities of each observer randomly saying each category. If the raters are in complete agreement then  $\kappa = 1$ . If there is no agreement among the raters other than what would be expected by chance (as defined by  $Pr(e)$ ),  $\kappa = 0$ . We will interpret Kappa statistics using the Landis and Koch (43) approach: value of 0 = poor, 0.01 to 0.20 = slight, 0.21 to 0.40 = fair, 0.41 to 0.60 = moderate, 0.61 to 0.80 = substantial, 0.81 to 1 = almost perfect/ perfect agreement.

### ***Extraction of data and analysis:***

Data from included studies will be extracted independently by one reviewer (JB) and checked by a second one (HMK), using standard data extraction forms. In summary, at minimum, data extraction will be done for each PICO component. When available, additional data extraction will comprise detailed information on study characteristics, research aims, and domains of health or healthcare services analyzed.

### ***Synthesis***

A preliminary coding taxonomy to help with the synthesis has been adapted from Lavis and Rader and the EPOC group (44-46) for this project (see Table 3). However, the taxonomy will be completed and/or adapted after the search and inclusion of studies. The domains included are delivery arrangements, financial arrangements, governance arrangements, and implementation strategies. Categories for each domain are presented in Table 3 and a detailed explanation can be found in Appendix B. Outcomes as specified in the PICO-T table 1.

#### *Synthesis of overviews*

We will relay information from the included overviews. We will not re-extract data from SRs included in the reviews, nor will we undertake any re-analysis of data from included SRs. However, we may examine the original SRs if specific important data are missing.

#### *Synthesis of systematic reviews*

We will relay information from the included SRs. We will not re-extract data from primary studies included in the SRs, nor will we undertake any re-analysis of data from reviews. However, we may examine the original primary study reports if specific important data are missing. Following recommendations by the Cochrane Multiple Intervention Methods Group, we will integrate and synthesize the evidence based on data extracted from the original SRs and present these as tables and figures including the characteristics of included reviews. We will summarize each included SR using the approach developed by the SUPPORT Collaboration (47). Two researchers will assess the certainty of the evidence for the main comparisons using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach (48, 49). A Summary of Findings table will be created/included and we will report the results for the main outcomes and comparison. We will use the standard criteria provided by the GRADE Working Group to assess the certainty of the evidence. If SRs have used GRADE we will use their assessment as long as we deem that they are reasonable. If we judge that the original GRADE assessment is poorly or wrongly done, we will re-GRADE the outcome. We will highlight issues of low trial quality, inadequate size, and whether trials were truly valid for the particular condition in making between-group comparisons.

#### *Synthesis of primary studies*

We will extract data as specified above for each included primary study. For continuous data, we will use the group post-test means and standard deviations to calculate effect sizes using RevMan 2014 software. The effect sizes will be expressed preferentially in the form of mean differences (MD) and 95% confidence intervals (95% CI), but when different scales are used to measure the same outcome, standardized mean differences (SMD) with corresponding 95% CI will be calculated instead. We will analyze dichotomous data as risk ratios and 95% confidence intervals. We will use RevMan 2014 software to generate forest plots to display the results.

For dichotomous outcomes, the absolute risk difference (RD) will be calculated using the risk difference statistic in RevMan 2014 and the result expressed as a percentage. For continuous outcomes, the absolute benefit will be calculated as the improvement in the intervention group minus the improvement in the control group, in the original units.

The relative percentage change for dichotomous data will be calculated as the risk ratio (RR) and expressed as a percentage. For continuous outcomes, the relative difference in the change from baseline will be calculated as the MD divided by the pooled baseline mean.

When two or more studies report a similar PICO we will use RevMan 2014 to pool the data (meta-analysis). Prior to pooling the data, we will ensure the directionality of the data permit pooling; we will reverse selected scales arithmetically as required so values have the same meaning. We will present results grouped by common comparator.

#### *Summary of findings table*

We will use Grade Pro (version 3.6) to prepare 'Summary of findings' table(s) for the outcomes of interest.

In the 'Summary of findings' table, we will integrate analysis of quality of evidence and the magnitude of effect of the interventions. The GRADE quality ratings will be made separately for each of the outcomes. We will use the five (out of eight) GRADE considerations (study limitations, consistency of effect, imprecision, indirectness, and publication bias) to assess the quality of the body of evidence in one of four levels:

- high quality: We are very confident that the true effect lies close to that of the estimate of the effect; further research is very unlikely to change our confidence in the estimate of effect;
- moderate quality: We are moderately confident in the effect estimate: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different; further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate;
- low quality: Our confidence in the effect estimate is limited: The true effect may be substantially different from the estimate of the effect; further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate;
- very low quality: We have very little confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of effect; we are very uncertain about the estimate.

### *Subgroup Analysis*

We plan to employ subgroup analyses assessing:

- country of origin
- length in the country (as a proxy for social adjustment or acculturation)
- language skills (low, moderate or high)
- duration of intervention

It has been shown in the literature that among immigrants particular groups are more likely to suffer inequities than others. Subgroups for country of origin will be subdivided in three broad groups a) Western Europe and Americas, b) Eastern Europe, and c) Asia, Africa and Latin America. This is proposed based on Norwegian immigration statistics (14). Time in the country is an important predictor of health outcomes; we proposed <6 months, 7-12 months, 1-3 years, > 3 years. These times aim to capture phases of adjustment to the new environment and culture. Language skills or literacy have been mentioned repeatedly in the literature as a key factor in healthcare access and utilization; we propose low, moderate and high literacy level categories. Duration of intervention is proposed as this criteria may influence future understanding and collaboration of immigrants with healthcare system. Duration of 1 -3 weeks, 1 to 3 months, 4 to 6 months, and more than 6 months are proposed. If interventions have been targeted to specific conditions (i.e, diabetes) and ethnic groups (i.e. Asian males), the type of strategy will be considered a sub-group.

Any subgroup is exploratory in nature and we will be careful with the interpretation of results derived from this type of analysis.

For a detailed description of the Norwegian Knowledge Centre's procedures, visit <http://kilden.kunnskapssenteret.no/h%C3%A5ndb%C3%B8ker> to access our Handbook.

We will follow the PRISMA equity reporting guidelines (50) to transparent reporting of the methods and results and to emphasize health equity results contained in the evidence. Additionally, we may, if appropriate, draw from the work of international known scholars in the area (51-53) to help understand and situate the evidence from a health equity and population health perspective.

### ***Peer review process***

The project plan and the final report will be peer reviewed by two employees from the Knowledge Centre in the Norwegian Institute of Public Health and by two external reviewers.

### **Publication**

- The end product will be either a high level summary of overview(s), an overview or an SR (written in English), which will be delivered electronically to the commissioners of the report and will be available on the FHI website after final approval
- An article in a peer-reviewed journal will be considered
- The target group is the commissioners (Helsedirektoratet and IMDi), policy and decision makers at the national and local levels and other interested directorates.

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**Appendix 4. Methods used in phase 1: Effect of system-level healthcare interventions on health equity outcomes for immigrants**

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**Inclusion criteria**

For this review question we were primarily interested in identifying and including *overviews of reviews* ('overviews') and *systematic reviews* of interventions as these publications synthesize the evidence and present it in a condensed way. We decided to include overviews if they were published in the last three years. We accepted Cochrane, Campbell, and other systematic reviews of randomized controlled trials (RCTs), non-RCTs, interrupted time series (ITS), and controlled before and after studies (CBAs).

To determine inclusion of systematic reviews, we followed the key characteristics of a systematic review as stated in the methodological handbook used by researchers in the division for health services in the Norwegian Institute of Public Health (47). To be included, a review needed to have a specified search strategy, clear inclusion criteria, and an assessment of the methodological quality of included studies. Additionally, the systematic review needed to be of high or moderate methodological quality (as determined by the AMSTAR checklist), and the search needed to be no older than from 2006.

When no overviews of reviews or systematic reviews were identified we originally planned to expand inclusion to primary studies with one of the following study designs: RCTs, non-RCTs, ITS (and assessment at least 3 time points before and 3 after the intervention), and CBAs. Given the apparent lack of research on the topic (evidenced by no identified systematic reviews), we decided to first review the inclusion criteria with the commissioners before screening for primary studies. As a result of these discussions this step was not conducted.

We defined inclusion and exclusion criteria, as well as primary outcomes, in collaboration with the commissioners. The inclusion criteria is described in Table 1.

**Table 3.1. Inclusion criteria**

	Objective 1: Health-system intervention
<b>Population</b>	Immigrants (any age, gender or country of origin) in a developed country. For the purpose of this review, an immigrant is defined as a "person born abroad with both parents from abroad" and it refers to the following groups: migrant workers, family reunification, refugees, asylum seekers, and undocumented migrants (29).
<b>Intervention</b>	Any health-system-level intervention*
<b>Comparator</b>	Any control or comparison group
<b>Outcome</b>	Equitable health among immigrants Other outcomes:

	Equal and improved access to healthcare services Quality of Life Health outcomes (general or disease specific) Self-management/education Use of services: for example medication use, hospitalizations, hospital stay Medical costs Patient satisfaction Medical errors Adverse events or harms
<b>Study design</b>	Overviews of reviews, Systematic reviews of high or moderate quality
<b>Timeframe</b>	Overviews (2013-2016) Systematic reviews published between 2006 and 2016

\*System-level intervention is conceptualized following the Ministries' commission and includes any intervention designed to bring about healthcare changes at the delivery, financing, policy and public health levels to produce better health outcomes in a more equitable manner.

### ***Exclusion criteria***

- Overviews of reviews published more than three years before our search date.
- Systematic reviews of low methodological quality, older than 10 years, or with data that were not reported for immigrants separately
- Evaluated system-level healthcare intervention or health equity tool were not defined in accordance with the definition used in this systematic review
- Systematic reviews where it was unclear whether control groups were used in the included studies
- Clinical practice guidelines, conference abstracts and proceedings, books, book chapters, animal studies or modelling studies

### **Literature search**

We designed two search strategies, one for each phase. The search strategies were designed, executed and peer reviewed by a team of Information Specialists. The searches were adapted for each database.

We used a combination of subject terms, text words, and (when available in the databases) filters for systematic reviews. MEDLINE complete search strategies for each phase are available in Appendix 3 and 4.

We conducted a systematic search of the following databases in July 2016 (reported in Appendix 4):

- Ovid MEDLINE
- Embase
- PsycINFO
- CINAHL
- Cochrane Database of Systematic Reviews (CDSR, DARE, HTA)
- Epistemonikos

- Web of Science
- Campbell Library
- Health Systems Evidence
- PROSPERO

In addition to systematically searching the databases mentioned above, we also searched reference lists of relevant publications.

### **Article selection**

Two reviewers (JB & HMK) independently screened all potentially relevant records resulting from the searches. Potentially relevant references were obtained and read in full-text by at least two reviewers (JB & HMK). We resolved disagreements through discussion and subsequent consensus with a third reviewer when necessary.

### **Assessment of included studies**

Two reviewers (HMK & HN) independently assessed the methodological strengths and limitations of the identified systematic reviews using the Checklist for Systematic Reviews described in the handbook used by the division of health services in the Norwegian Institute of Public Health to assess the methodological strengths and limitations of identified systematic reviews (31). In the protocol we planned on using the AMSTAR checklist for assessing quality of identified relevant systematic reviews, however, the reviewers who ended up assessing the quality of identified systematic reviews were more familiar with the Checklist for Systematic Reviews (described above) and thus this checklist was used instead.

### **Data extraction**

We did not extract data because no moderate or high quality systematic reviews met the inclusion criteria.

### **Analysis**

If we identified existing systematic reviews or overviews that met the inclusion criteria, we planned on relaying information presented in the overviews as is (no new data extraction or re-analysis). For identified systematic reviews, we planned on summarizing each review using the approach developed by the SUPPORT Collaboration, including presenting an assessment of the certainty of the evidence for the primary outcomes for the main comparisons using the GRADE approach (see below). See the protocol for a full description of the intended synthesis methods in Appendix 8 (original plan), and the amended review question and inclusion criteria (amended plan) in Appendix 9.

### **Assessment of certainty of the evidence**

We planned on applying the GRADE approach (Grading of Recommendations Assessment, Development and Evaluation) developed by the GRADE working group (33) to

assess certainty of the evidence for the primary outcome in any included reviews. However, no reviews were included. For more information on GRADE visit [www.grade-workinggroup.org](http://www.grade-workinggroup.org), or see Balshem and colleagues 2011 (34).

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## Appendix 5. Search strategy for phase 1: Effect of system-level healthcare interventions on health equity outcomes for immigrants

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### Database: Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily and Ovid MEDLINE(R) 1946 to Present

Search date: 07.07.16

- 1 Minority Groups/ (11705)
- 2 "Emigrants and Immigrants"/ (7865)
- 3 Refugees/ (7477)
- 4 exp Human Migration/ (24175)
- 5 (refugee\* or immigrant\* or (asyl\* adj1 seek\*) or foreign\* or ethnic\* or minorit\* or racial\* or (multi adj cultural\*) or multicultural\* or (newly adj arrived) or ((family or families) adj2 reuni\*) or resettle\*).ti,ab. (254794)
- 6 or/1-5 [immigrants] (277187)
- 7 exp Delivery of Healthcare/ (890259)
- 8 Healthcare Disparities/ (10298)
- 9 ((healthcare or "healthcare") adj3 (service\* or deliver\* or access\* or disparit\* or diverse\* or diversit\* or variat\*)).ti,ab. (48154)
- 10 (inequit\* or unequal\* or nonequal or non equal or equal\* or equit\*).ti,ab. (346577)
- 11 or/7-10 [equity+healthcare] (1235394)
- 12 6 and 11 (44439)
- 13 Culturally Competent Care/ (262)
- 14 Minority Health/ (560)
- 15 health equity/ (86)
- 16 health inequalities.ti,kw. (1233)
- 17 health disparities.ti,kw. (2669)
- 18 minority health.ti,kw. (373)
- 19 migrant health.ti,kw. (115)
- 20 health equity.ti,kw. (609)
- 21 (equitable adj (healthcare or healthcare)).ti,kw. (18)
- 22 or/12-21 (48877)
- 23 meta-analysis.pt. (68035)
- 24 meta-analy\*.ti,ab. (96998)
- 25 systematic review.kw. (4676)
- 26 ((systematic\* or literature) adj3 (overview or review\* or search\*)).ti,ab. (324322)
- 27 (medline or pubmed).ab. (117362)
- 28 or/23-27 (423558)
- 29 22 and 28 (1688)
- 30 limit 29 to yr="2006 -Current" (1298)

### Database: Embase 1974 to 2016 July 06

Search date: 07.07.16

- 1 exp "ethnic and racial groups"/ (101044)
- 2 exp "ethnic or racial aspects"/ (192390)
- 3 exp migration/ (39847)
- 4 refugee/ (8666)

- 5 (refugee\* or immigrant\* or (asyl\* adj1 seek\*) or foreign\* or ethnic\* or minorit\* or racial\* or (multi adj cultural\*) or multicultural\* or (newly adj arrived) or ((family or families) adj2 reuni\*) or resettle\*).ti,ab. (308353)
- 6 or/1-5 [immigrants] (511957)
- 7 health care access/ (44321)
- 8 health care disparity/ (9145)
- 9 exp health care delivery/ (2360695)
- 10 ((healthcare or "health care") adj3 (service\* or deliver\* or access\* or disparit\* or diverse\* or diversit\* or variat\*)).ti,ab. (55889)
- 11 (inequit\* or unequal\* or nonequal or non equal or equal\* or equit\*).ti,ab. (372209)
- 12 or/7-11 (2741180)
- 13 6 and 12 (85875)
- 14 minority health/ (480)
- 15 exp transcultural care/ (3731)
- 16 health inequalities.ti,kw. (1841)
- 17 health disparities.ti,kw. (3680)
- 18 minority health.ti,kw. (572)
- 19 migrant health.ti,kw. (151)
- 20 health equity.ti,kw. (621)
- 21 (equitable adj (health care or healthcare)).ti,kw. (23)
- 22 or/13-21 (93584)
- 23 meta analysis/ (111522)
- 24 "systematic review"/ (109819)
- 25 systematic review.kw. (12254)
- 26 ((systematic\* or literature) adj3 (overview or review\* or search\*)).ti,ab. (381927)
- 27 (medline or pubmed).ab. (140475)
- 28 or/23-27 (508456)
- 29 22 and 28 (3347)
- 30 limit 29 to yr="2006 -Current" (2748)

**Database: PsycINFO 1806 to June Week 5 2016**

**Search date: 07.07.16**

- 1 exp Minority Groups/ (12215)
- 2 exp "RACIAL AND ETHNIC GROUPS"/ (107307)
- 3 IMMIGRATION/ (17639)
- 4 exp Human Migration/ (9292)
- 5 exp REFUGEES/ (4229)
- 6 (refugee\* or immigrant\* or (asyl\* adj1 seek\*) or foreign\* or ethnic\* or minorit\* or racial\* or (multi adj cultural\*) or multicultural\* or (newly adj arrived) or ((family or families) adj2 reuni\*) or resettle\*).ti,ab. (159151)
- 7 or/1-6 (230588)
- 8 exp Health Care Services/ (93650)
- 9 exp health care delivery/ (32751)
- 10 health disparities/ (5262)
- 11 ((healthcare or "health care") adj3 (service\* or deliver\* or access\* or disparit\* or diverse\* or diversit\* or variat\*)).ti,ab. (15288)

- 12 (inequit\* or inequal\* or nonequal or non equal or equal\* or equit\*).ti,ab. (103849)
- 13 or/8-12 (222372)
- 14 7 and 13 (24962)
- 15 exp Cross Cultural Treatment/ (3383)
- 16 exp Transcultural Psychiatry/ (932)
- 17 health inequalities.ti,kw. (288)
- 18 health disparities.ti,kw. (774)
- 19 minority health.ti,kw. (39)
- 20 migrant health.ti,kw. (16)
- 21 health equity.ti,kw. (135)
- 22 (equitable adj (health care or healthcare)).ti,kw. (2)
- 23 or/14-22 (29446)
- 24 (((systematic\* or literature) adj3 (review\* or search\*)) or meta-analys\* or search\*).tw. or (medline or pubmed or embase or cochrane or cinahl).ab. (165415)
- 25 meta analysis/ (3822)
- 26 (systematic review or meta analysis).md. (26781)
- 27 or/24-26 (167887)
- 28 23 and 27 (1304)
- 29 limit 28 to yr="2006 -Current" (930)

**Database: Cinahl**

**Search date: 05.07.16**

#	Query	Results
	S15 AND S19 Limiters - Published Date: 20060101-20161231; Exclude MED-	
S21	LINE records	159
S20	S15 AND S19	725
S19	S16 OR S17 OR S18	90,231
	TI ( (((systematic* or literature) N3 (overview or review* or search*)) or (meta-analys* or (meta W0 analys*) or metaanalys*)) ) OR AB ( (((systematic* or literature) N3 (overview or review* or search*)) or (meta-analys* or (meta W0 analys*) or metaanalys*)) )	78,003
S18		
S17	(MH "Systematic Review")	25,936
S16	(MH "Meta Analysis")	17,537
S15	S12 OR S13 OR S14	22,174
	TI "health inequalities" OR "health disparities" OR "minority health" OR "migrant health" OR "health equity" OR "equitable health care" OR "equitable healthcare"	4,397
S14		
S13	(MH "Transcultural Care")	2,029

S12	S7 AND S11	17,226
S11	S8 OR S9 OR S10	221,191
S10	TI ( (inequit* or inequal* or nonequal or non equal or equal* or equit*) ) OR AB ( (inequit* or inequal* or nonequal or non equal or equal* or equit*) )	31,834
S9	TI ( ((healthcare or "health care") N3 (service* or deliver* or ac- cess* or disparit* or diverse* or diversit* or variat*)) ) OR AB ( ( healthcare or "health care") N3 (service* or deliver* or access* or disparit* or diverse* or diversit* or variat*)) )	19,438
S8	(MH "Health Care Delivery+")	184,321
S7	S1 OR S2 OR S3 OR S4 OR S5 OR S6	116,877
S6	TI ( (refugee* or immigrant* or (asyl* N1 seek*) or foreign* or ethnic* or minorit* or racial* or (multi W0 cultural*) or multi- cultural* or (newly W0 arrived) or ((family or families) N2 re- uni*) or resettle*) ) OR AB ( (refugee* or immigrant* or (asyl* N1 seek*) or foreign* or ethnic* or minorit* or racial* or (multi W0 cultural*) or multicultural* or (newly W0 arrived) or ((fam- ily or families) N2 reuni*) or resettle*) )	51,513
S5	(MH "Refugees")	3,592
S4	(MH "Emigration and Immigration")	3,770
S3	(MH "Immigrants+")	8,077
S2	(MH "Ethnic Groups+")	79,094
S1	(MH "Minority Groups")	6,924

**Database: Cochrane Database of Systematic Reviews (Reviews only)**

**Search date: 07.07.16**

- #1 MeSH descriptor: [Minority Groups] explode all trees 290
- #2 MeSH descriptor: [Emigrants and Immigrants] explode all trees 124
- #3 MeSH descriptor: [Refugees] explode all trees 80
- #4 MeSH descriptor: [Human Migration] explode all trees 76
- #5 (refugee\* or immigrant\* or (asyl\* near/1 seek\*) or foreign\* or ethnic\* or minorit\*  
or racial\* or (multi next cultural\*) or multicultural\* or (newly next arrived) or ((family  
or families) near/2 reuni\*) or resettle\*):ti,ab,kw 9152
- #6 #1 or #2 or #3 or #4 or #5 9172
- #7 MeSH descriptor: [Delivery of Health Care] explode all trees 42797
- #8 MeSH descriptor: [Healthcare Disparities] explode all trees 151
- #9 ((healthcare or "health care") near/3 (service\* or deliver\* or access\* or disparit\*  
or diverse\* or diversit\* or variat\*)):ti,ab,kw 4063
- #10 (inequit\* or inequal\* or nonequal or non equal or equal\* or equit\*):ti,ab,kw 30019

- #11 #7 or #8 or #9 or #10 73233
- #12 #6 and #11 1604
- #13 MeSH descriptor: [Culturally Competent Care] explode all trees 8
- #14 MeSH descriptor: [Minority Health] explode all trees 16
- #15 MeSH descriptor: [Health Equity] explode all trees 0
- #16 ("health inequalities" or "health disparities" or "minority health" or "migrant health" or "health equity" or "equitable health care" or "equitable healthcare"):ti,ab,kw 91
- #17 #12 or #13 or #14 or #15 or #16 Publication Year from 2006 to 2016, in Cochrane Reviews (Reviews only) 27

**Database: Cochrane Database of Systematic Reviews (Protocols only), DARE, HTA, NHS EED**

**Search date: 07.07.16**

- #1 MeSH descriptor: [Minority Groups] explode all trees 290
- #2 MeSH descriptor: [Emigrants and Immigrants] explode all trees 124
- #3 MeSH descriptor: [Refugees] explode all trees 80
- #4 MeSH descriptor: [Human Migration] explode all trees 76
- #5 (refugee\* or immigrant\* or (asyl\* near/1 seek\*) or foreign\* or ethnic\* or minorit\* or racial\* or (multi next cultural\*) or multicultural\* or (newly next arrived) or ((family or families) near/2 reuni\*) or resettle\*) 12856
- #6 #1 or #2 or #3 or #4 or #5 12874
- #7 MeSH descriptor: [Delivery of Health Care] explode all trees 42797
- #8 MeSH descriptor: [Healthcare Disparities] explode all trees 151
- #9 ((healthcare or "health care") near/3 (service\* or deliver\* or access\* or disparit\* or diverse\* or diversit\* or variat\*)) 5174
- #10 (inequit\* or inequal\* or nonequal or non equal or equal\* or equit\*) 36826
- #11 #7 or #8 or #9 or #10 79677
- #12 #6 and #11 3607
- #13 MeSH descriptor: [Culturally Competent Care] explode all trees 8
- #14 MeSH descriptor: [Minority Health] explode all trees 16
- #15 MeSH descriptor: [Health Equity] explode all trees 0
- #16 ("health inequalities" or "health disparities" or "minority health" or "migrant health" or "health equity" or "equitable health care" or "equitable healthcare") 589
- #17 #12 or #13 or #14 or #15 or #16 Publication Year from 2006 to 2016, in Cochrane Reviews (Protocols only), Other Reviews and Technology Assessments 492

**Database: Epistemonikos**

**Search date: 07.07.16**

"health inequalities" or "health disparities" or "minority health" or "migrant health" or "health equity" or "equitable health care" or "equitable healthcare" 2006-2016 : 165

**Database: Web of Science**

**Search date: 07.07.16.**

# 5 193                    #4 AND #1

Timespan=2006-2016  
Search language=Auto

# 4 #3 OR #2  
1,020,516 Timespan=2006-2016  
Search language=Auto

# 3 TOPIC: ("systematic review" or "meta analysis")  
239,336 Timespan=2006-2016  
Search language=Auto

# 2 1,020,516 TOPIC: (((systematic\* or literature) AND (review\* or search\*))  
or meta-analys\* or search\*))  
Timespan=2006-2016  
Search language=Auto

# 1 5,189 TITLE: ("health inequalities" or "health disparities" or "minority  
health" or "migrant health" or "health equity" or "equitable  
health care" or "equitable healthcare")  
Timespan=2006-2016  
Search language=Auto

**Database: Campbell Library**

**Search date: 07.07.16**

"health inequalities" or "health disparities" or "minority health" or "migrant health" or  
"health equity" or "equitable health care" or "equitable healthcare" : 15

**Database: Health Systems Evidence**

**Search date: 07.07.16**

"health equity" or "equitable health care" or "equitable healthcare" 2006-2016 : 15

**Database: Popline**

**Search date: 07.09.16**

(( ("health inequalities" OR "health disparities" OR "minority health" OR "migrant  
health" OR "health equity" OR "equitable health care" OR "equitable healthcare" )))  
AND ( ( ( review OR reviewed OR searched OR "meta analysis" ) ) ) AND ( ( Years:[2006  
TO 2016] ) ) ) : 54

**Database: Social Services Abstracts**

**Search date: 07.09.16**

(SU.EXACT("Access") OR ("health inequalities" OR "health disparities" OR "minority  
health" OR "migrant health" OR "health equity" OR "equitable health care" OR "equita-  
ble healthcare")) AND (review OR reviewed OR searched OR meta-analysis) : 212

**Database: PROSPERO**

**Search date: 07.07.16**

Equity : 16

Equitable : 1



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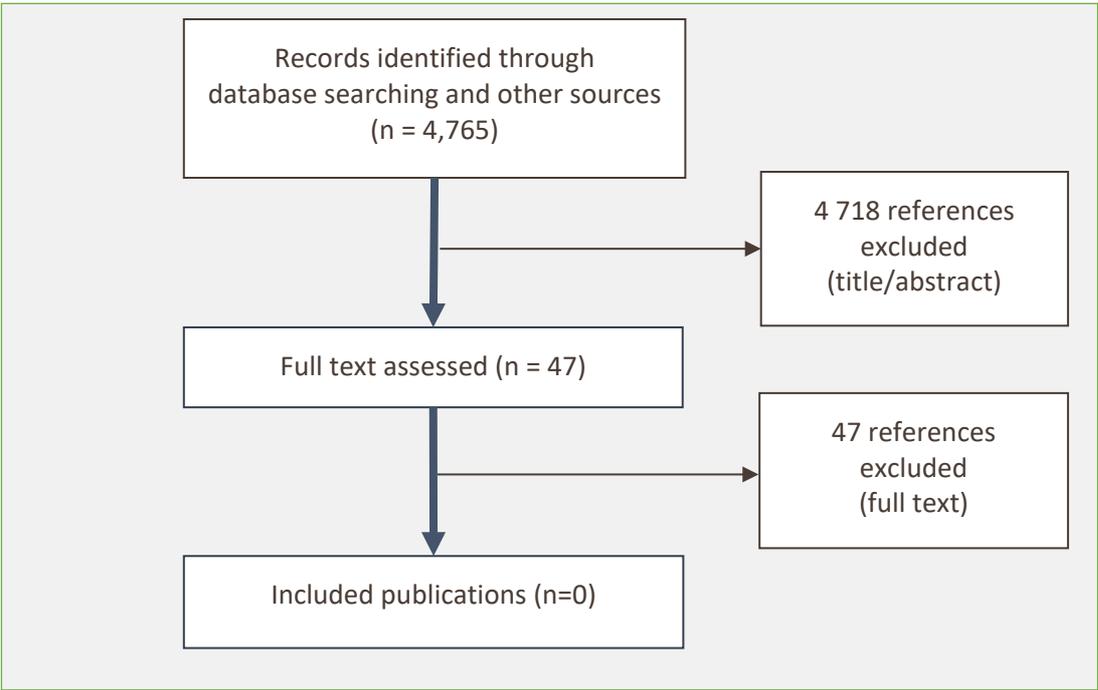
## Appendix 6. Results from Phase one of the review

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### Results

The databases search resulted in a total of 4,765 citations after duplicates were removed (see Figure 6.1). On the basis of title and abstract, we excluded 4,718 irrelevant citations. We retrieved and examined 41 publications in full. We did not identify any overviews or systematic reviews that met all of the inclusion criteria.

**Figure 6.1. PRISMA Flow diagram selection process**



We identified two systematic reviews that met most of the inclusion criteria, however, upon assessing the methodological strengths and limitations they were assessed as having low quality and were thus not included in this review. We do provide, however, a brief description of these reviews below.

### Relevant literature that did not meet inclusion criteria

Two systematic reviews met most of the inclusion criteria, however they were assessed to be of low quality due to potential selection bias (only one review author) and unclear synthesis methods (Joo 2014; (48), Tyrer 2014; (49)). In Joo (2014) the review aimed to assess the effect of culturally tailored diabetes interventions for Asian immigrants living in the USA (48). In Tyrer (2014) the review aimed to assess the effect of school interventions for refugee and asylum children on mental health outcomes (49). A description of these systematic reviews is provided below and in Table 6.1.

**Table 6.1: Identified relevant systematic reviews (low quality)**

Author (Design)	Population, Country	Intervention	Last search date	Included studies' design (N)	Outcome
Joo 2014 (48) - (SR)	Asian immigrants with type 2 diabetes, USA	Culturally tailored diabetes intervention	Not reported	RCTs and quasi randomized (N=9)	Clinical and psychobehavioural
Tyrer 2014 (49) - (SR)	Refugee and asylum children, USA, Australia, UK, Iran, Germany, Canada, Uganda, Sri Lanka, Sierra Leone, Gaza	School interventions	December 2012	RCT, controlled trial, cohort, and case control (N=21)	Mental Health

RCT: randomized control trial; SR: Systematic review

### ***Culturally tailored diabetes interventions***

The systematic review conducted by Joo and colleagues (2014) aimed to investigate the effect of culturally tailored diabetes interventions for Asian immigrants given in a community setting (48). This intervention fits under the category of “service delivery” within the context of the WHO Health System Building Blocks (see Appendix 2).

Nine included studies were conducted in the USA and were published between 2005 and 2013. The population included in the studies were adults older than 50 years of age with type 2 diabetes. The participants had immigrated to USA from Bangladesh, Philippines, Korea, or China.

The interventions in the included studies were conducted in community settings such as churches, or community agencies. Intervention duration ranged from 6 weeks to 12 months. The aim of the interventions was to enhance minority population’s accessibility to diabetes care and could be categorized as (1) care provided by bilingual professionals and (2) culturally relevant educational programs. The interventions were delivered by experienced bilingual nurses and bilingual community health workers. The education program consisted of giving participants information about access to healthcare resources and diabetes and self-management skills, counselling about culture specific myths, facts about diabetes, education about culture-specific nutrition, advice about physical activity, and help with medication adherence. The strength of these interventions was the focus on culturally specific topics.

There were three common outcomes of the programs in the studies under review: (1) improvements in objective clinical measures including A1C, blood pressure, lipid levels, and body mass index, (2) psycho-behavioural results such as knowledge of diabetes,

self-efficacy, and diabetes quality of life and (3) improved satisfaction which serve as a measure of intervention feasibility.

The authors of the review concluded that there are *positive* clinical, psycho-behavioural, and satisfaction measurements with culturally tailored diabetes programs for Asian immigrants to the United States. Although there are positive results, effectiveness results are mixed, in part due to the short duration of the interventions. Culturally tailored diabetes interventions increase access to healthcare and provide patient-centred, high quality care while simultaneously builds healthcare providers understanding of different cultural values.

### ***School interventions for refugee children***

The systematic review conducted by Tyrer and Fazel (2014) examined the effect of school interventions on the mental health of refugee children (50). This intervention fits under the category of “service delivery” within the WHO Health Systems Building Blocks (see Appendix 2). This review included 21 studies that were conducted in ten different countries and published between 2010 and 2013. Seven studies were conducted among children in refugee or internal displacement camps, and 14 studies were conducted among children living in high income countries.

Participants in the included studies were either specific refugee populations or mixed groups of migrant children, including refugees.

The authors of the review categorized the studies into three classes of interventions: (a) interventions based on the verbal processing of past experiences such as cognitive behavioural therapy and trauma focused cognitive behavioural therapy, narrative exposure therapy, eye movement desensitization and reprocessing and trauma systems therapy and (b) creative art techniques like music therapy, creative play, drama and drawing (c) combination of both. Services were delivered in the school, community or refugee camps with groups or individual children.

The included studies included outcomes related to mental health, including symptoms related to hopelessness, depression, anxiety, PTSD and functional impairment, emotional, behavioural, or conduct problems and anger. It was not possible to pool the findings from the included studies given the wide variation in terms of setting, target population and the type of outcomes measured.

The authors concluded that limited evidence is available for school and community interventions to support children’s mental health. However, even when evidence is limited, authors’ state these type of interventions will likely benefit newly arrived children. Schools seem to be a natural fit for setting the interventions for children and families; both individual and group interventions were effective.

During the initial screening process (titles and abstracts) we identified 16 publications that may be of interest to decision makers, but that clearly do not meet the inclusion criteria for this review question. These publications are listed in Table 6.2.

**Table 6.2. Relevant studies not meeting inclusion criteria (identified through title/abstract screening)**

Study	Population	Intervention	Comparator or design	Outcomes*
Beehler 2012 (51)	Immigrant children and youth (school intervention)	Cultural adjustment and Trauma services (CATS)	n/a	Functioning, PTSD symptoms
Chepo 2016 (52)	Immigrants in primary care	Introducing migrants to the healthcare system pilot programme	Before and after	Satisfaction, (Chilean healthcare system structure and processes, rights and duties, referrals)
Conn 2014 (53)	Underrepresented adults	Cultural Relevance Strategies	SR	Medication adherence
Cortinois 2012 (54)	Immigrant	Toronto 2-1-1 healthcare services	Survey	Reaching and supporting immigrants, understand immigrants needs
Garcia 2013 (55)	Low literate, low SES, racial/ethnic minority	Talking Touchscreen Kiosk (TT Kiosk)	Paper booklets	Feasibility of the TTKiosk in oncology patients
Griffith 2010 (56)	Rural public health department and urban medical system	Dismantling (undoing) racism	n/a	Elimination of healthcare disparities
Griner 2006 (57)	Disadvantaged racial and ethnic groups	Culturally adapted mental Health intervention	SR	Effectiveness
Heuer 2004 (58)	Rural Hispanic migrant	Migrant Health Service, Inc Diabetes Program	n/a	Barriers to care
Jewell 2000 (59)	Racial and ethnic minority women	Minority Health coalition's early pregnancy project	Women not in the project	Increasing access to prenatal care
Joshi 2013 (60)	Refugees		Narrative Review	Components of primary care services
Klein 2009 (61)	Non-Swedish speaking patients	eHealth – ICT tools	n/a	Information sharing and conversion
Manias 2010 (62)	Culturally and linguistically diverse backgrounds	Bilingualism, translated materials, conceptual model	SR	Medication adherence
Martel 2015 (63)	Newly arrived refugees (acute care)	The refugee health passport	n/a	Refugee support, MD students' cultural competency, collaboration with community partners

McBride 2016 (64)	Asylum seekers and refugees	Refugee Health Nurse Liaison	n/a	Capacity building in the health sector
Samkange-Zeeb 2015 (65)	Turkish migrants	Internet-based intelligent health assistant	n/a	Participant satisfaction
Shommu 2016 (66)	Immigrant and ethnic minority	Community Navigator	Scoping Review	Disease management and access to healthcare

MD: medical doctor; n/a: none available; PTSD: post-traumatic stress disorder; SES: Socio-economic status; SR: Systematic review

Below is a full list of excluded publications and reasons for exclusion for publications read in full text (Table 6.3).

**Table 6.3 List of excluded publications and reasons for exclusion (after full-text screening)**

Reference	Reasons for exclusion
<b>Objective 1</b>	
Cimas 2016	Wrong outcome
Aldridge 2014	Wrong intervention
Bambra 2014	Wrong population
Bollini 2009	Wrong study design
Butler 2016 (KQ 4)	Wrong setting/population
Carosi 2011	Unclear
Daponte 2014	Wrong study design
Ehiri 2014	Wrong intervention
Eike 2010	Wrong population
El-Haddad 2014	Wrong population
Fouskas 2014	Wrong study design
Gil Gonzalez 2015	Not a SR
Griner 2006	Not a SR, wrong population
Gucciardi 2013	Full text not available
Hacker 2015	Population unclear
Hardy 2010	Wrong outcomes
Harris 2015	Wrong study design
Joo 2014	Low quality SR
Karliner 2007	Wrong population

Klinkenberg 2009	Unclear population
Ku 2007	Wrong study design
Kunkel 2013	Wrong study design
Liu 2010	Wrong study design
Lu 2012	Wrong population
Mackenback 2011	Unclear intervention
Meyer 2011	Wrong population
Mukherjea 2013	Wrong study design
Salmi 2015	Full text unavailable
Sarte 2012	Wrong intervention
Schneider 2014	Unclear population
Schoueri Mychasiw 2013	Wrong population
Sirotin 2013	Wrong population
Slobodin 2015	Wrong study design
Tankimovich 2013	Wrong intervention
Thomson 2007	Wrong population
Thomson 2016	Wrong population
Truman 2009	Wrong study design
Tyrer 2014	Low quality SR
Williams 2011	Wrong setting
Wong 2011	Wrong intervention
Zeng 2014	No intervention

Table 6.2 Potentially relevant publications that did not meet inclusion criteria (from title/abstract screening)

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## **Appendix 7. Amendment to the project plan**

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The project plan has been amended to examine the following review question: What is the effect of health equity tools for immigrants on health equity outcomes. The search strategy has been redesigned to address this review question. Table 7.1 describes the inclusion criteria for the amended review question.

**Table 7.1. Inclusion criteria for the amended review question**

Population	Immigrants (any age, gender or country of origin) in a developed country
Intervention	Health equity....adj checklist, tool, list, listing, inventory, assessment, assessment tool, audit
Comparison	Any comparison group (i.e. no intervention, waitlist, usual standard practice, another active intervention)
Outcomes	Equitable health among immigrants Improved access to healthcare services (equitable access = equal access for equal need) Health outcomes (general or disease specific) Reduced length of stay and/or readmission. Equal quality / health outcome of a treatment for the same disease/diagnose. (may be difficult to find a precise definition for this?) Medical errors Adverse events or harms Patient satisfaction
Time frame	Overviews/ SRs: published in the last 10 years (2007 to 2017) and a literature search that is no older than from 2007. Primary studies: published in the last 16 years (2000-2016).

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## Appendix 8. Search strategy

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### Database: Ovid MEDLINE(R) Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily and Ovid MEDLINE(R) 1946 to Present

Dato: 10.03.2017

Treff: 6700

#### Search Strategy:

#	Searches	Results
1	Minority Groups/	12106
2	Ethnic Groups/	54842
3	"Emigrants and Immigrants"/	8713
4	Refugees/	8044
5	Undocumented Immigrants/	78
6	"Emigration and Immigration"/	24299
7	Human Migration/	564
8	Vulnerable Populations/	7848
9	(refugee* or immigrant* or migrant* or (asyl* adj1 seek*) or foreigner* or ((ethnic* or racial*) adj1 (group* or minorit*)) or (minorit* adj1 (group* or population*)) or multi-cultural* or multicultural* or newly arrived or ((family or families) adj2 reuni*) or resettle*).ti,ab,kf.	89781
10	or/1-9 [population]	161324
11	"Delivery of Healthcare"/	76182
12	Culturally Competent Care/	455
13	Health Services Accessibility/	62122
14	Healthcare Disparities/	11222
15	Health Status Disparities/	11074
16	Healthcare Reform/	30858
17	Health Services/ut [Utilization]	7491
18	"Health Services Needs and Demand"/	49522

19 Social Determinants of Health/ 1100  
20 Minority Health/ 595  
21 Health Equity/ 204  
22 (healthcare or health care or ((care or health service\* or medical service\*) adj2  
(access\* or deliver\* or system? or utili\*)) or (health\* adj3 (equal\* or unequal\* or  
non equal\* or nonequal\*))).ti,ab,kf. 477101  
23 ((health or healthcare or social or ethnic or racial) and (equit\* or equalit\* or  
inequit\* or disparit\*)).ti,ab,kf. 45098  
24 or/11-23 [health equity] 633848  
25 10 and 24 [population AND health equity] 29950  
26 Checklist/ 4236  
27 Health Impact Assessment/ 374  
28 Needs Assessment/ 26683  
29 "Outcome Assessment (Healthcare)"/ 60316  
30 (assess\* or audit or checklist\* or check-list\* or framework\* or guidanc\* or  
guide? or indicator\* or instrument? or inventor\* or manual? or monitoring or  
questionnaire\* or recommendation\* or standard\* or strateg\* or tool\*).ti,ab,kf.  
5190773  
31 or/26-30 [tools] 5231373  
32 25 and 31 [population AND health equity AND tools] 13039  
33 Meta Analysis.pt. 76523  
34 Meta-Analysis as Topic/ 15724  
35 Review.pt. and (pubmed or medline).ti,ab. 91792  
36 ((systematic\* or literature) adj3 (overview or review\* or search\*)).ti,ab,kf.  
355224  
37 (meta-anal\* or metaanal\* or meta-regression\* or umbrella review\* or overview  
of reviews or review of reviews or (evidence\* adj2 synth\*) or synthesis re  
view\*).ti,ab,kf. 116628  
38 or/33-37 461562  
39 limit 38 to yr="2007-current" 304160  
40 32 and 39 [systematic reviews] 639  
41 Randomized Controlled Trial/ 456185  
42 Non-randomized controlled trials as topic/ 130  
43 Controlled Clinical Trial/ 93310  
44 Controlled Before-After Studies/ 223  
45 Multicenter Study/ 222565  
46 Pragmatic Clinical Trial/ 530  
47 Interrupted Time Series Analysis/ 250  
48 (randomis\* or randomiz\* or random or randomly or trial or intervention? or ef  
fect\* or impact? or multicenter or multi center or multicentre or multi centre or  
controlled or control group? or (before adj5 after) or (pre adj5 post) or ((pre  
test or pre test) and (posttest or post test)) or quasiexperiment\* or quasi expe  
riment\* or evaluat\* or time series or time point? or repeated measur\*).ti,ab.  
9065975  
49 or/41-48 9161784  
50 limit 49 to yr="2000-Current" 6153392  
51 32 and 50 [primary studies] 6556  
52 40 or 51 6722  
53 exp Animals/ 21006376  
54 Humans/ 16647232  
55 53 not (53 and 54) 4359144  
56 (news or editorial or comment).pt. 1154623  
57 52 not (55 or 56) 6700

**Database: PsycINFO 1806 to March Week 1 2017**

Dato: 10.03.2017

Treff: 5710

#	Searches	Results
1	minority groups/	12744
2	"racial and ethnic groups"/	11626
3	immigration/	18580
4	human migration/	5607
5	refugees/	4505
6	asylum seeking/	291
7	at risk populations/	34469
8	(refugee* or immigrant* or migrant* or (asyl* adj1 seek*) or foreigner* or ((eth- nic* or racial*) adj1 (group* or minorit*)) or (minorit* adj1 (group* or popula- tion*)) or multi-cultural* or multicultural* or newly arrived or ((family or fami- lies) adj2 reuni*) or resettle*).ti,ab,id.	75708
9	or/1-8	122836
10	health care delivery/	19074
11	health care reform/	1966
12	health care utilization/	13767
13	health disparities/	5834
14	health service needs/	5030
15	cross cultural treatment/	2178
16	sociocultural factors/	39687
17	(healthcare or health care or ((care or health service* or medical service*) adj2 (access* or deliver* or system? or utili*)) or (health adj3 (equal* or inequal* or non equal* or nonequal*))).ti,ab,id.	128393
18	((health or healthcare or social determinant*) and (equit* or inequit* or dis- parit*).ti,ab,id.	15256
19	or/10-18	192573
20	9 and 19	16801
21	"checklist (testing)"/	3449
22	measurement/	45687
23	inventories/	9045
24	questionnaires/	16292
25	needs assessment/	3816
26	(assess* or audit or checklist* or check-list* or framework* or guidanc* or guide? or indicator* or instrument? or inventor* or manual? or monitoring or ques- tionnaire* or recommendation* or standard* or strateg* or tool*).ti,ab,id.	1545103
27	or/21-26	1557133
28	20 and 27	7886
29	Meta Analysis/	3970
30	Systematic Review.md.	15887
31	Meta Analysis.md.	16186
32	(review and (pubmed or medline)).ti,ab.	11687

- 33 ((systematic\* or literature) adj3 (overview or review\* or search\*)).ti,ab,id.  
96100
- 34 (meta-anal\* or metaanal\* or meta-regression\* or umbrella review\* or overview of  
reviews or review of reviews or (evidence\* adj2 synth\*) or synthesis re-  
view\*).ti,ab,id. 27922
- 35 or/29-34 120466
- 36 limit 35 to yr="2007-Current" 66556
- 37 28 and 36 [systematic reviews] 367
- 38 ("0400" or "0451" or "1800" or "2000").md. [empirical study/ prospective study/  
quantitative study/ treatment outcome/clinical trial/] 2119166
- 39 Experimental Design/ 10455
- 40 Between Groups Design/ 107
- 41 Quantitative Methods/ 2906
- 42 Quasi Experimental Methods/ 143
- 43 (randomis\* or randomiz\* or random or randomly or trial or intervention? or ef-  
fect\* or impact? or multicenter or multi center or multicentre or multi centre or  
controlled or control group? or (before adj5 after) or (pre adj5 post) or ((pre-  
test or pre test) and (posttest or post test)) or quasiexperiment\* or quasi exper-  
iment\* or evaluat\* or time series or time point? or repeated measur\*).ti,ab.  
1849301
- 44 Experiment Controls/ 875
- 45 Pretesting/ 234
- 46 Posttesting/ 135
- 47 Time Series/ 1778
- 48 Repeated Measures/ 635
- 49 or/38-48 2839093
- 50 limit 49 to yr="2000-Current" 1872970
- 51 28 and 50 [primary studies] 5631
- 52 37 or 51 5713
- 53 remove duplicates from 52 5710

**Database: Embase 1974 to 2017 March 09**

Dato: 10.03.2017

Treff: 3215

#	Searches	Results
1	ethnic group/	72171
2	minority group/	14260
3	migrant/	3815
4	emigrant/	279
5	immigrant/	16154
6	migrant worker/	1419
7	refugee/	9793
8	migration/	36181
9	asylum seeker/	379
10	undocumented immigrant/	54

11 vulnerable population/ 13731

12 (refugee\* or immigrant\* or migrant\* or (asyl\* adj1 seek\*) or foreigner\* or ((eth-  
nic\* or racial\*) adj1 (group\* or minorit\*)) or (minorit\* adj1 (group\* or popula-  
tion\*)) or multi-cultural\* or multicultural\* or newly arrived or ((family or fami-  
lies) adj2 reuni\*) or resettle\*).ti,ab. 98324

13 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 188079

14 health care/ 198231

15 health care delivery/ 154855

16 transcultural care/ 3570

17 health care system/ 91620

18 health care access/ 48767

19 health care disparity/ 10564

20 health care policy/ 174651

21 "social determinants of health"/ 2950

22 minority health/ 827

23 health equity/ 522

24 (healthcare or health care or ((care or health service\* or medical service\*) adj2  
(access\* or deliver\* or system? or utili\*)) or (health\* adj3 (equal\* or inequal\* or  
non equal\* or nonequal\*))).ti,ab. 595215

25 ((health or healthcare or social or ethnic or racial) and (equit\* or equalit\* or inequ-  
uit\* or disparit\*).ti,ab.49252

26 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 937521

27 13 and 26 34669

28 checklist/ 23917

29 health impact assessment/ 2925

30 health assessment questionnaire/ 6364

31 questionnaire/ 585493

32 standard/ 353498

33 (assess\* or audit or checklist\* or check-list\* or framework\* or guidanc\* or guide?  
or indicator\* or instrument? or inventor\* or manual? or monitoring or ques-  
tionnaire\* or recommendation\* or standard\* or strateg\* or tool\*).ti,ab.  
6703575

34 28 or 29 or 30 or 31 or 32 or 33 6999006

35 27 and 34 15943

36 Meta Analysis/ 160547

37 Systematic Review/ 157593

38 (review and (pubmed or medline)).ti,ab,kw. 114164

39 ((systematic\* or literature) adj3 (overview or review\* or search\*).ti,ab.  
420425

40 (meta-anal\* or metaanal\* or meta-regression\* or umbrella review\* or overview of  
reviews or review of reviews or (evidence\* adj2 synth\*) or synthesis re-  
view\*).ti,ab. 148929

41 36 or 37 or 38 or 39 or 40 574369

42 limit 41 to yr="2007-current" 389604

43 35 and 42 816

44 Randomized Controlled Trial/ 484282

45 Controlled Clinical Trial/ 481210  
46 Quasi Experimental Study/ 4498  
47 Pretest Posttest Control Group Design/ 358  
48 Time Series Analysis/ 24533  
49 Experimental Design/ 25862  
50 Multicenter Study/ 166929  
51 Pretest Posttest Design/ 2452  
52 (randomis\* or randomiz\* or random or randomly or trial or intervention? or effect\* or impact? or multicenter or multi center or multicentre or multi centre or controlled or control group? or (before adj5 after) or (pre adj5 post) or ((pretest or pre test) and (posttest or post test)) or quasiexperiment\* or quasi experiment\* or evaluat\* or time series or time point? or repeated measur\*).ti,ab.  
11279601  
53 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 11386252  
54 limit 53 to yr="2000-current" 8122156  
55 35 and 54 8518  
56 43 or 55 8723  
57 exp animals/ or exp invertebrate/ or animal experiment/ or animal model/ or animal tissue/ or animal cell/ or nonhuman/ 24603749  
58 human/ or normal human/ or human cell/ 18689895  
59 57 not (57 and 58) 5960693  
60 (news or editorial or comment).pt. 536155  
61 56 not (59 or 60) 8698  
62 limit 61 to embase 3262  
63 remove duplicates from 62 3215

### Database: Cochrane Library (CDSR, Trials)

Dato: 10.03.2017

Treff: 607

ID	Search	Hits
#1	[mh ^"Minority Groups"]	315
#2	[mh ^"Ethnic Groups"]	804
#3	[mh ^"Emigrants and Immigrants"]	147
#4	[mh ^Refugees]	87
#5	[mh ^"Undocumented Immigrants"]	0
#6	[mh ^"Emigration and Immigration"]	78
#7	[mh ^"Human Migration"]	0
#8	[mh ^"Vulnerable Populations"]	219
#9	(refugee* or immigrant* or migrant* or (asyl* near/1 seek*) or foreigner* or ((ethnic* or racial*) near/1 (group* or minorit*)) or (minorit* near/1 (group* or population*)) or multi-cultural* or multicultural* or newly-arrived or ((family or families) near/2 reuni*) or resettle*):ti,ab,kw	3680
#10	[or #1 - #19]	3887
#11	[mh ^"Delivery of Health Care"]	911

#12 [mh ^"Culturally Competent Care"] 25  
 #13 [mh ^"Health Services Accessibility"] 720  
 #14 [mh ^"Healthcare Disparities"] 171  
 #15 [mh ^"Health Status Disparities"] 141  
 #16 [mh ^"Health Care Reform"] 34  
 #17 [mh ^"Health Services"/UT] 498  
 #18 [mh ^"Health Services Needs and Demand"] 420  
 #19 [mh ^"Social Determinants of Health"] 11  
 #20 [mh ^"Minority Health"] 18  
 #21 [mh ^"Health Equity"] 2  
 #22 (healthcare or health-care or ((care or health-service\* or medical-service\*)  
 near/2 (access\* or deliver\* or system\* or utili\*)) or (health\* near/3 (equal\* or  
 inequal\* or non-equal\* or nonequal\*)):ti,ab,kw 47790  
 #23 ((health or healthcare or social or ethnic or racial) and (equit\* or equalit\* or ineq-  
 uit\* or disparit\*)):ti,ab,kw 1629  
 #24 (14 - #23) 49013  
 #25 #10 and #24 933  
 #26 [mh ^Checklist] 165  
 #27 [mh ^"Health Impact Assessment"] 11  
 #28 [mh ^"Needs Assessment"] 386  
 #29 [mh ^"Outcome Assessment (Health Care)"] 6564  
 #30 (assess\* or audit or checklist\* or check-list\* or framework\* or guidanc\* or guide  
 or guides or indicator\* or instrument or instruments or inventor\* or manual or  
 manuals or monitoring or questionnaire\* or recommendation\* or standard\* or  
 strateg\* or tool\*):ti,ab,kw 424150  
 #31 (48 - #30) 424150  
 #32 #25 and #31 Publication Year from 2007 to 2017 [in Cochrane Reviews (Reviews  
 only)] 24  
 #33 #25 and #31 Publication Year from 2000 to 2017, in Trials 583  
 #34 #32 or #33 607

**Database: Cochrane Library (DARE, HTA, Economic evaluations, Cochrane Proto-  
 cols)**

Dato: 10.03.2017

Treff: 154

ID	Search	Hits
#1	[mh ^"Minority Groups"]	315
#2	[mh ^"Ethnic Groups"]	804
#3	[mh ^"Emigrants and Immigrants"]	147
#4	[mh ^Refugees]	87
#5	[mh ^"Undocumented Immigrants"]	0
#6	[mh ^"Emigration and Immigration"]	78
#7	[mh ^"Human Migration"]	0
#8	[mh ^"Vulnerable Populations"]	219

- #9 (refugee\* or immigrant\* or migrant\* or (asyl\* near/1 seek\*) or foreigner\* or ((ethnic\* or racial\*) near/1 (group\* or minorit\*)) or (minorit\* near/1 (group\* or population\*)) or multi-cultural\* or multicultural\* or newly-arrived or ((family or families) near/2 reuni\*) or resettle\*) 4723
- #10 [or #1-#9] 4923
- #11 [mh ^"Delivery of Health Care"] 911
- #12 [mh ^"Culturally Competent Care"] 25
- #13 [mh ^"Health Services Accessibility"] 720
- #14 [mh ^"Healthcare Disparities"] 171
- #15 [mh ^"Health Status Disparities"] 141
- #16 [mh ^"Health Care Reform"] 34
- #17 [mh ^"Health Services"/UT] 498
- #18 [mh ^"Health Services Needs and Demand"] 420
- #19 [mh ^"Social Determinants of Health"] 11
- #20 [mh ^"Minority Health"] 18
- #21 [mh ^"Health Equity"] 2
- #22 (healthcare or health-care or ((care or health-service\* or medical-service\* near/2 (access\* or deliver\* or system\* or utili\*)) or (health\* near/3 (equal\* or inequal\* or non-equal\* or nonequal\*))) 65495
- #23 ((health or healthcare or social or ethnic or racial) and (equit\* or equalit\* or inequit\* or disparit\*)) 2576
- #24 (14 - #23) 66889
- #25 #10 and #24 1678
- #26 [mh ^Checklist] 165
- #27 [mh ^"Health Impact Assessment"] 11
- #28 [mh ^"Needs Assessment"] 386
- #29 [mh ^"Outcome Assessment (Health Care)"] 6564
- #30 (assess\* or audit or checklist\* or check-list\* or framework\* or guidanc\* or guide or guides or indicator\* or instrument or instruments or inventor\* or manual or manuals or monitoring or questionnaire\* or recommendation\* or standard\* or strateg\* or tool\*) 465703
- #31 (48 - #30) 465703
- #32 #25 and #31 Publication Year from 2007 to 2017, in Other Reviews, Technology Assessments and Economic Evaluations 154

**Database: EBSCO CINAHL**

Dato: 10.03.2017

Treff: 965

#	Query	Results
1	(MH "Minority Groups")	7,102
2	(MH "Ethnic Groups")	13,83
3	(MH "Immigrants")	7,914
4	(MH "Immigrants, Illegal")	515
5	(MH "Refugees")	3,74

6 (MH "Emigration and Immigration") 3,854

7 TI ( (refugee\* or immigrant\* or migrant\* or (asyl\* N0 seek\*) or foreigner\* or ((ethnic\* or racial\*) N0 (group\* or minorit\*)) or (minorit\* N0 (group\* or population\*)) or multi-cultural\* or multicultural\* or newly-arrived or ((family or families) N1 reuni\*) or resettle\*) ) OR AB ( (refugee\* or immigrant\* or migrant\* or (asyl\* N0 seek\*) or foreigner\* or ((ethnic\* or racial\*) N0 (group\* or minorit\*)) or (minorit\*y N0 (group\* or population\*)) or multi-cultural\* or multicultural\* or newly-arrived or ((family or families) N1 reuni\*) or resettle\*) )  
23,085

8 S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 44,407

9 (MH "Health Care Delivery") 26,161

10 (MH "Transcultural Care") 2,09

11 (MH "Health Services Accessibility") 47,569

12 (MH "Healthcare Disparities") 2,993

13 (MH "Health Status Disparities") 2,416

14 (MH "Health Care Reform") 21,781

15 (MH "Health Services/UT") 2,057

16 (MH "Health Services Needs and Demand") 13,202

17 (MH "Social Determinants of Health") 1,019

18 TI ( (healthcare or health-care or ((care or health-service\* or medical-service\*) N1 (access\* or deliver\* or system# or utili\*)) or (health\* N2 (equal\* or unequal\* or non-equal\* or nonequal\*))) ) OR AB ( (healthcare or health-care or ((care or health-service\* or medical-service\*) N1 (access\* or deliver\* or system# or utili\*)) or (health\* N2 (equal\* or unequal\* or non-equal\* or nonequal\*))) )  
175,473

19 TI ( ((health or healthcare or social or ethnic or racial) and (equit\* or equalit\* or inequit\* or disparit\*)) ) OR AB ( ((health or healthcare or social or ethnic or racial) and (equit\* or equalit\* or inequit\* or disparit\*)) ) 14,741

20 S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19  
257,375

21 S8 AND S20 12,27

22 (MH "Checklists") 13,707

23 (MH "Questionnaires") 205,829

24 (MH "Outcome Assessment") 19,948

25 (MH "Health Impact Assessment") 230

26 (MH "Needs Assessment") 9,765

27 TI ( (assess\* or audit or checklist\* or check-list\* or framework\* or guidanc\* or guide# or indicator\* or instrument# or inventor\* or manual# or monitoring or questionnaire\* or recommendation\* or standard\* or strateg\* or tool\*) ) OR AB ( (assess\* or audit or checklist\* or check-list\* or framework\* or guidanc\* or guide# or indicator\* or instrument# or inventor\* or manual# or monitoring or questionnaire\* or recommendation\* or standard\* or strateg\* or tool\*) )  
712,259

28 S22 OR S23 OR S24 OR S25 OR S26 OR S27 823,31

29 S21 AND S28 5,188

30 PT systematic review 38,807

- 31 (MH systematic review) OR (MH meta analysis) 39,398
- 32 TI ( ((systematic\* or literature) N2 (overview or review\* or search\*)) or meta-anal\* or metaanal\* or meta-regression\* or umbrella-review\* or "overview of reviews" or "review of reviews" or (evidence\* N1 synth\*) or synthesis review\* ) OR AB ( ((systematic\* or literature) N2 (overview or review\* or search\*)) or meta-anal\* or metaanal\* or meta-regression\* or umbrella-review\* or "overview of reviews" or "review of reviews" or (evidence\* N1 synth\*) or synthesis review\* ) ) 81,41
- 33 S30 OR S31 OR S32 98,654
- 34 S29 AND S33 Limiters - Exclude MEDLINE records; Published Date: 20070101-20170331 52
- 35 (PT randomized controlled trial) OR (PT clinical trial) OR (PT research)996,198
- 36 ((MH randomized controlled trials) OR (MH clinical trials) OR (MH intervention trials) OR (MH nonrandomized trials) OR (MH experimental studies) OR (MH pretest-posttest design+) OR (MH quasi-experimental studies+) OR (MH multicenter studies) OR (MH "Repeated Measures") OR (MH Controlled Before-After Studies) OR (MH Quantitative Studies) OR (MH Control Group) 218,785
- 37 TI ( (randomis\* or randomiz\* or random or randomly or trial or intervention# or effect\* or impact# or multicenter or multi-center or multicentre or multi-centre or controlled or control group# or (before N4 after) or (pre N4 post) or ((pretest or pre-test) and (posttest or post-test)) or quasiexperiment\* or quasi-experiment\* or evaluat\* or time-series or time point# or repeated-measur\* ) OR AB ( (randomis\* or randomiz\* or random or randomly or trial or intervention# or effect\* or impact# or multicenter or multi-center or multicentre or multi-centre or controlled or control group# or (before N4 after) or (pre N4 post) or ((pretest or pre-test) and (posttest or post-test)) or quasiexperiment\* or quasi-experiment\* or evaluat\* or time-series or time point# or repeated-measur\* ) ) 847,894
- 38 S35 OR S36 OR S37 1,356,724
- 39 S29 AND S38 Limiters - Exclude MEDLINE records; Published Date: 20000101-20170331 965
- 40 S34 OR S39 975

### Database: Web of Science Core Collection

Dato: 10.03.2017

Treff: 5100

### Search

- # 1 TOPIC: ((refugee\* or immigrant\* or migrant\* or (asyl\* NEAR/0 seek\*) or foreigner\* or ((ethnic\* or racial\*) NEAR/0 (group\* or minorit\*)) or (minorit\* NEAR/0 (group\* or population\*)) or "multi cultural\*" or multicultural\* or "newly arrived" or (("family" or "families") NEAR/1 reuni\*) or resettle\*)) 132,231
- # 2 TOPIC: (("healthcare" or "health care" or (("care" or "health service\*" or "medical service\*") NEAR/1 (access\* or deliver\* or system\$ or utili\*)) or (health\* NEAR/2 (equal\* or inequal\* or non-equal\* or nonequal\*)))) 364,937

- # 3 TOPIC: (((("health" or "healthcare" or "social" or "ethnic" or "racial") and (equit\* or equalit\* or inequit\* or disparit\*))) 65,704
- # 4 #3 OR #2 410,636
- # 5 #4 AND #1 15,928
- # 6 TOPIC: ((assess\* or "audit" or checklist\* or check-list\* or framework\* or guidanc\* or guide\$ or indicator\* or instrument\$ or inventor\* or manual\$ or "monitoring" or questionnaire\* or recommendation\* or standard\* or strateg\* or tool\*)) 7,194,968
- # 7 #6 AND #5 8,112
- # 8 TS=(((systematic\* or "literature") NEAR/2 ("overview" or review\* or search\*) or meta-anal\* or metaanal\* or meta-regression\* or umbrella-review\* or "overview of reviews" or "review of reviews" or (evidence\* NEAR/1 synth\*) or synthesis-review\*)) 365,060 [limited to year > 2007]
- # 9 #8 AND #7 504 [Systematiske oversikter]
- # 10 TOPIC: ((randomis\* or randomiz\* or "random" or "randomly" or "trial" or intervention\$ or effect\* or impact\$ or "multicenter" or "multi-center" or "multicentre" or "multi-centre" or "controlled" or control-group\$ or ("before" NEAR/4 "after") or ("pre" NEAR/4 "post") or (("pretest" or "pre-test") and ("posttest" or "post-test")) or quasiexperiment\* or quasi-experiment\* or evaluat\* or "time-series" or time-point\$ or repeated-measur\*)) 9,813,119 [limited to year > 2000]
- # 11 #10 AND #7 3,840
- # 12 #11 OR #9 4,596 [Primærstudier]

**Database: PubMed**

Dato: 10.03.2017

Treff: 238

[Search PubMed:] (("minority groups" OR "ethnic" OR "racial" OR "immigrants" OR "refugees" OR "asylum seekers" OR migrants) AND (equity OR equitable OR disparity OR disparities OR inequity OR inequitable) AND (assess\* OR audit OR checklist\* OR check-list\* OR framework\* OR guidanc\* OR guide OR guides OR indicator\* OR instruments OR inventor\* OR manuals OR monitoring OR questionnaire\* OR recommendation\* OR standard\* OR strateg\* OR tool\*)) AND pubstatusaheadofprint

**Database: Epistemonikos**

Dato: 10.03.2017

Treff: 87

[Title/Abstract:] (("minority groups" OR "ethnic" OR "racial" OR "immigrants" OR "refugees" OR "asylum seekers" OR migrants) AND (equity OR equitable OR disparity OR disparities OR inequity OR inequitable) AND (assess\* OR audit OR checklist\* OR check-list\* OR framework\* OR guidanc\* OR guide OR guides OR indicator\* OR instruments OR

inventor\* OR manuals OR monitoring OR questionnaire\* OR recommendation\* OR  
standard\* OR strateg\* OR tool\*))

## Appendix 9. Excluded studies and reasons for exclusion

Author, yr	
Kutob 2013	Wrong population
Thaker 2008	Wrong study design
Baril 2011	Wrong population
Yasui 2015	Wrong population
Lorig 2007	Wrong population
Bagachi 2012	Wrong population
De Arellano	Wrong population
Olaussen 2016	Wrong study design

## Appendix 10. GRADE Evidence Profile

**Table 10.1**

Author(s): HMK

Date: 08.12.2017

Question: Computer-assisted psychosocial risk assessment (CaPRA) tool compared to usual care for refugees

Setting: Community health centre

Bibliography: Ahmad 2012

Certainty assessment							№ of patients		Effect		Certainty
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Computer-assisted psychosocial risk assessment	usual care	Relative (95% CI)	Absolute (95% CI)	
Patient intention to visit a psychosocial counsellor (assessed with: yes/no)											
1	randomised trials	serious <sup>a</sup>	not serious	not serious	very serious <sup>b</sup>	none	18/25 (72.0%)	11/24 (45.8%)	not estimable		⊕○○○ VERY LOW

CI: Confidence interval

### Explanations

a. Unclear risk of bias due to unclear blinding of participants to aim of study and a statistically significant baseline difference in years lived in Canada between intervention and control group.

b. Fewer than 300 participants.

## Appendix 11. List of relevant literature that did not meet inclusion criteria

**Table 11.1. Relevant studies not meeting inclusion criteria**

Study	Population	Tool	Comparator or design	Outcomes*
Asamani-Asante 2015 (67)	West African Immigrants	CAHPS, CAHPS-ASF-WAI-26	n/a-Cross-sectional design	Predictors of immigrants' satisfaction with healthcare providers
BARHI	Organization	Organizational self assessment toolkit	n/a	Assist in development of greater capacity to address health inequities / workforce and organizational characteristics
Congress 2014 (68)	Immigrants	Family assessment tool culturagram	n/a - Case example	Increase understanding of families from different cultural backgrounds
Dhand 2016 (69)	Ethno-racial people with mental health disabilities	CAT	n/a – Tool development	Culture and equity
Disley 2013 (70)	Intellectual disability (ID) staff	EPS-ID	n/a - Survey	Staff equity perception in services for people with ID
Hosseinpoor 2016 (71)	Country level	HEAT	n/a-Software	Health inequality monitoring (WHO equity monitor database)
Keating 2009 (72)	Immigrants	Immigrant barriers to healthcare scale	n/a –Tool development	Barriers beyond the issue of insurance
Kemp 2016 (73)	Migrants	TransMedD	n/a – Tool development	Compliance, disease management and enhanced patient safety. Professional and patient satisfaction
Lobo 2013 (74)	Participants >18 years using the health centre	Equity tool 1-5 Likert scale	n/a - Cross-sectional design	Perception of equity in healthcare
Maxwell 2015 (75)	Immigrant farm workers	Survey	n/a	Basic needs (household, food, transportation, safety and education, health services, discrimination)
Signal 2008 (76)	Country level	Health equity Assessment Tool: A user's guide	n/a	Health policies, programmes and services to promote health equity
Task Force on Migrant-friendly and Culturally Competent Healthcare (77)	Staff and services working with migrants and other vulnerable groups	Standards	n/a	Monitoring and measuring equity  Conceptual Framework
Ontario Ministry of Health and Long Term Care	Vulnerable and marginalized groups	HEIA	n/a	Potential health impacts of a policy, program or initiative on vulnerable or marginalized groups

Pauly 2016 (1)	Varied	Several tools	n/a	Inventory of health equity tools
USAID and CHIP (78)	Health equity programming	Checklist for Health Equity Programming	n/a	Use when designing a program or as part of the process

CAHPS (or CAHPS-ASF-WAI 26): consumer assessment of healthcare providers and systems tool; CAT: cultural analysis tool; EPS-ID Equity perception scale; HEAT: Health Equity Assessment; WHO: World Health Organization; HEIA Health equity impact assessment; USAID: United States Agency for International Development; CHIP: Maternal and Child Health Integrated program.

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