Differences in health behaviours between immigrant and non-immigrant groups: a systematic review
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Review question(s)
This review article will provide the first international systematic review of empirical studies over the two decades on key health behaviours (i.e., tobacco smoking, physical activity and alcohol drinking) among immigrants as compared to non-immigrant groups.

Specifically, this systematic review aims to:

Examine the key characteristics of quantitative studies comparing health behaviours of immigrants with non-immigrants including where and when studies have been conducted, age and gender of study populations, nativity status (country of birth), study designs, sample sizes, and data sources used.

Assess the differences in health behaviour prevalence among immigrants and non-immigrants across countries.

Determine whether the duration of stay in the host country is associated with the change in health behaviours among immigrants.

Searches
The search will be conducted in English and include studies from 1994 to 2014. Studies in languages other than English language will be excluded from the review. The following databases will be used to search for relevant publications: MEDLINE, CINAHL, PsycINFO, EMBASE, Global Health, SocINDEX, and ProQuest (for dissertations/theses). Additionally, Google/Google Scholar will also be used to find the relevant studies available in full text. Manual hand-searching of reference lists from studies identified as relevant will be conducted to locate further articles and dissertations of interest. One of the authors will consult the experts in this field including the first author of the key articles to identify any other relevant studies.

Types of study to be included
Empirical research studies using quantitative study design and research methods will be included. Such studies will include cross-sectional; cohort (prospective and retrospective); case-control; longitudinal studies; experimental or interventional study designs (randomized controlled trials (RCTs), cluster-randomized trials (CRTs), quasi-randomized trials); and non-randomised controlled studies (non-randomized controlled trials, controlled before-after studies (CBAs) and interrupted time series studies (ITSs) and historically controlled studies). This systematic review will only extract the quantitative data if any study that meets our inclusion criteria has a mixed-methods design (i.e., both quantitative as well as qualitative data). Research papers based on commentaries of the literature (opinion articles), editorials, review articles, blogs, newsletters, organisation documents and government reports, book/book chapters, and conference abstracts or proceedings will be excluded.

Condition or domain being studied
Immigrants Health Behaviours.

Participants/ population
Adults aged 18 years and older will only be included in this systematic review. However, there will not be any
restrictions for the gender and the destination countries (immigrants host countries) of the participants. This study will review studies reporting an empirical analysis that involves a comparison of immigrants with non-immigrant control groups.

**Intervention(s), exposure(s)**
Reported nativity or country of birth of the study participants will be considered as a measure of exposure for this systematic review. However, studies reporting data either only on immigrant or on non-immigrant groups (i.e., not a comparative study) will be excluded. Additionally, studies focusing on internal migrants (i.e., rural-to-urban), will also be excluded for this systematic review.

**Comparator(s)/ control**
The difference of health behaviours will be compared between immigrant and non-immigrant groups as well as among immigrant subgroups.

**Outcome(s)**

*Primary outcomes*
Key health behaviours (i.e., tobacco smoking, physical activity and alcohol drinking) will be the outcome measures in this systematic review. In particular, physical activity may include leisure-time physical activities (e.g., physical exercise, swimming, cycling, sports), daily incidental physical activities (e.g., household tasks, cleaning, gardening), and other occupational-related physical activities. In case of tobacco smoking, studies focused on knowledge of and attitude towards smoking, smoking cessation or interventions will all be excluded as outcomes of interest. Other health behaviours such as health screening, sexual behaviour, diet/nutrition and seat belt use will be excluded from this systematic review.

The reported significance levels and magnitude for the associations between nativity status (exposure) and key health behaviours (outcomes), and the association between duration of stay and the change in health behaviours among immigrants will also be reported for each studies.

*Secondary outcomes*
Not applicable.

**Data extraction, (selection and coding)**
Full text studies meeting the inclusion criteria will be either directly or manually imported and stored in Endnote X7, with duplicates to be removed. An excel spreadsheet will be used for extracting data and to collect details from the publications that meet the inclusion criteria. The first author will initially extract the information from all publications with data extraction for 10 per cent of included studies conducted independently by the second, third and fourth authors. Disputes regarding data extraction will be resolved by the discussion between all the authors. The characteristics of PROGRESS-Plus framework will be considered while recording the methodological variables, sample characteristics, and the data related to the exposure and the outcome measures obtained from each selected studies. data to be extrated will include:

- Authors
- Year of publication
- Type of publication
- Study year
- Study design (including sampling procedure)
- Sampling characteristics
  1. Sample size ( including sub-groups (e.g. Asian, African, European )
  2. Study location (host country)
• Time-point (for measurement of outcomes when reported more than once)

Study participants demographics:

• Age

• Ethnicity

• Gender

• Education

• Income

• Employment status

• duration of residence in the host country for immigrants (if available)

• language use

• Immigrants generation (if available)

• Exposure measurement (nativity status or country of birth/origin reported separately by sub-groups)

• Outcome measurement for Key Health Behaviours (Prevalence of smoking, physical activity & alcohol consumption)

Risk of bias (quality) assessment
The quality of each eligible studies will be assessed using the validated critical appraisal tools adapted from the Critical Appraisal Skills Programme (CASP) questions for observational studies developed by Health Evidence Bulletin Wales. Quality for all included studies will be assessed by the first author and, for 10 per cent of included studies, checked for completeness and accuracy independently by the second, third and fourth authors. Differences in the quality assessment will be resolved by discussion between all the authors.

Strategy for data synthesis
A narrative synthesis approach will be applied to synthesising the findings. Descriptive summary statistics of study characteristics and findings will be generated, based on a framework for narrative synthesis. A formal meta-analysis will not be performed for this systematic review due to the expected diversity of studies in terms of design, study populations, exposure and outcome measures.

Analysis of subgroups or subsets
Key themes related to health behaviours (tobacco smoking, physical activity and alcohol drinking) will be reported and discussed separately for immigrant and non-immigrant groups. If available, the statistical significance (at the p < 0.05 level), for the associations between nativity status (exposure) and key health behaviours (outcomes), and the association between duration of stay and the change in health behaviours among immigrants will also be reported for each studies.

Dissemination plans
The findings from this review will be disseminated for scientific peer-reviewed publications as well as conference presentations and proceedings. The review authors will also disseminate the findings to the health researchers and academic institutions through national and international workshops/seminars.

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Ongoing

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<td>Piloting of the study selection process</td>
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