

An overview of tobacco control interventions in the Global South

Navin Kumar, Kamila Janmohamed, Jeannette Jiang, Jessica Ainooson, Ameera Billings, Grace Q. Chen, Faith Chumo, Lauren Cueto and Amy Zhang

Abstract

Purpose – *The Framework Convention on Tobacco Control (FCTC) has been broadly successful but less so in the Global South. This paper aims to effectively design interventions that to mitigate tobacco-related harms in the Global South, further understanding of interventions in this environment will be helpful, in line with FCTC recommendations. The first objective was to locate and review all published literature relating to tobacco control interventions in the Global South. The second objective was to provide information on research trends within Global South tobacco control interventions.*

Design/methodology/approach – *A literature search was conducted across six databases.*

Findings – *Despite the FCTC detailing the significance of the research, studies are still lacking in the Global South. There are significant research gaps such as longitudinal studies, harm reduction and randomized controlled trials.*

Research limitations/implications – *Limitations arose from differences in study designs of reviewed studies, making it more complex to assess all studies under the same rubric.*

Practical implications – *Results indicate significant potential for tobacco control interventions in the Global South, potentially moving toward FCTC goals, but also highlight several areas of concern.*

Originality/value – *There is much evidence on the effectiveness of tobacco control in the Global North, especially in some parts of Europe and the USA. However, the evidence base in the Global South is far more limited. This paper provides an overview of Global South tobacco control interventions and suggests areas of concern, in line with the FCTC 15 years on.*

Keywords *Gender gap, Tobacco control, Bibliometric analysis, Global South, Tobacco harm reduction, Tobacco interventions, FCTC*

Paper type *Research paper*

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Expression of concern: The publisher of the journal *Drugs and Alcohol Today* is issuing an Expression of Concern for the following article Kumar, N., Janmohamed, K., Jiang, J., Ainooson, J., Billings, A., Chen, G. Q., Chumo, F., Cueto, L. and Zhang, A. (2020), "An overview of tobacco control interventions in the Global South", published in *Drugs and Alcohol Today*, Vol. 20 No. 3, pp. 207-218, to inform readers that credible concerns have been raised regarding the editorial process for this article. An investigation is ongoing and is currently unresolved. Further information will be provided by *Drugs and Alcohol Today* as it becomes available.

Introduction

Tobacco consumption is the main cause of preventable death worldwide (Ghebreyesus, 2019). Most of the global mortality burden of tobacco use lies in the Global South (Sinha *et al.*, 2018). The Global South is experiencing a growing epidemic of tobacco use (Sreeramareddy *et al.*, 2018). Tobacco control is key to any nation's public health strategy (Goodchild and Zheng, 2018). Tobacco control, such as cessation interventions, should thus be a priority for policymakers in the Global South to mitigate the effects of tobacco-related morbidity and mortality (Ghebreyesus, 2019). 2020 is the 15th anniversary of the 2005 World Health Organization (WHO) Framework Convention on Tobacco Control (WHO FCTC). The WHO FCTC has played a key role in declining tobacco use prevalence (Chung-Hall *et al.*, 2019). However, several nations, especially in the Global South, are not on track to accomplish WHO targets (Bilano *et al.*, 2015).

There are stark differences between the Global North and Global South regarding the proportion of smokers who want to quit (Saqib *et al.*, 2019). Intention to quit smoking in the Global North is about 75% (CDC, 2012), whereas the Global South still lags far behind. For

example, 41% of Indian smokers and smokeless tobacco users did not want to quit (Singh *et al.*, 2020). In the Global North, prevalence has significantly declined (Feliu *et al.*, 2019). For example, Australia has witnessed an annualized rate of change in male smoking prevalence of -2.2% from 1990 to 2015 (Reitsma *et al.*, 2017). Global South smoking rates still persist (Hughes *et al.*, 2016), with Bangladesh seeing an annualized rate of change in male smoking prevalence of +0.3% from 1990 to 2015 (Reitsma *et al.*, 2017).

To effectively design interventions that mitigate tobacco-related harms in the Global South, further understanding of interventions in this environment will be helpful. Such efforts to bolster knowledge on tobacco control are in line with the FCTC's recommendations around scientific research (Giovino *et al.*, 2013). A tobacco control intervention is an approach that removes social barriers to tobacco control or promotes behavior adoption that increases the efficacy of tobacco control (Hargreaves, 2015). Such interventions can act at the health policy level to support the delivery of tobacco control tools, at the health system level to support the integration of tobacco control with other health services and at the community level to promote peer-based tobacco control interventions (Hargreaves, 2015). The first objective was to locate and review all published literature relating to tobacco control interventions in the Global South. Literature was reviewed across all topics, including medical and legal areas. In selecting interventions, the authors focused on where the intervention was conducted, e.g. intervention in the Global South conducted by individuals in the Global North would be included. The second objective was to provide information on research trends, such as the authors' gender and institution within Global South tobacco control interventions.

Methods

A literature search was conducted across six databases from inception, including MEDLINE, Embase, PsycINFO, Global Health, Web of Science and Sociological Abstracts, using the search terms indicated in Appendix. No language restrictions were imposed. This study was not a formal systematic or scoping review but a literature review to identify research trends. Thus, our search scope was broad and not all included studies were cited. Reference lists of the papers were used to identify more studies. Only studies involving adults (aged >18 years) were included. A grey literature search using Google Scholar, clinical trials registries and governmental websites was conducted. The authors also spoke with leading tobacco control experts to identify any relevant studies. Global South and Global North were defined based on the World Bank's per capita gross national income metric FIX (Bank, 2017). Global South was defined as nations falling under the categories: low income; lower-middle income; and upper-middle income. Global North represents high-income nations. Studies were excluded if they were conducted in the Global North. Six independent reviewers, in groups of two, screened each title and abstract as per inclusion/exclusion criteria:

1. Inclusion criteria:

- Research was conducted in the Global South.
- Research investigating an intervention to improve tobacco control in adults, including interventions that reduced tobacco exposure.
- Original quantitative research of any level of rigor and style.

2. Exclusion criteria:

- Any commentaries, editorials, or opinion pieces.
- Research conducted in the Global North.

- Qualitative studies.
- Nonintervention studies.
- Studies involving only children or adolescents (studies focusing on both youth and young adult populations were included, wherever possible reporting data for the adult population only).

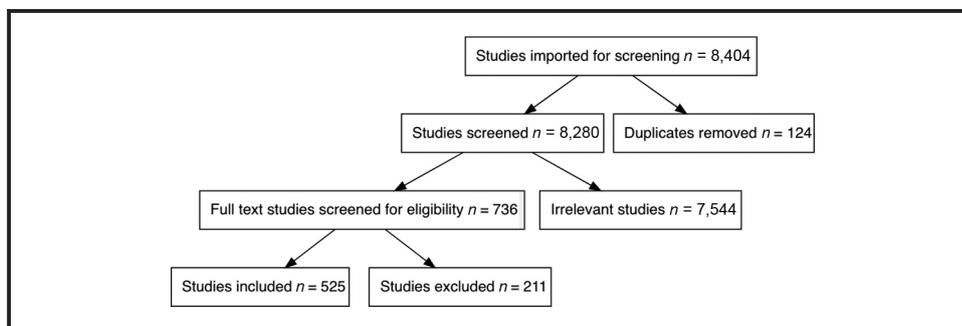
Full-texts papers were screened as per [Figure 1](#) below. A total of 525 papers met inclusion criteria, given our broad search on Global South tobacco control interventions. A broad inclusion criterion also allowed for the sample size to conduct the data analysis. The final search was conducted in August 2019. Once all articles had been selected, the authors analyzed and collected the data. The authors extracted study data such as author gender, harm reduction focus, study type and location. Special attention was paid to the gender of the first and last authors, commonly considered dominant authorship positions ([Larivière et al., 2016](#)). The author's gender was determined with a gender assignment algorithm ([Larivière et al., 2013](#)). The authors determined study and institution location through author information in the paper. Author's institutional location was assigned based on the author's primary location, e.g. university or research institute. For example, if a researcher was trained in Nepal but employed in India, India was assigned as the institutional location. If a US professor located in the USA conducted a study in India, the USA was assigned as the institutional location.

Results

From 2014-2019, there were 533 tobacco control interventions conducted in the Global North. In comparison, there were 435 tobacco control interventions conducted in the Global South during the same period. Studies were conducted across 63 countries. The majority of studies were conducted in Latin America and Asia. Studies conducted in India, China, and Brazil accounted for 47% of all research (21%, 17%, and 10%, respectively). When exploring the last author's institutional location, most came from India, China, the USA, Brazil or Iran (17%, 13%, 13%, 10% or 9%, respectively). The most common first author institutional locations reported were India, China, Brazil, the USA and Iran (20%, 15%, 10%, 10% and 8%, respectively).

Most (83%) authors who conducted research in the Global South were primarily affiliated with institutions in the Global South. Studies with all authors having Global South primary affiliations were Bahrain, Bosnia and Herzegovina, the Czech Republic, Fiji, Iraq, Kyrgyzstan, Micronesia, Nigeria, Slovenia, Sudan and Tunisia. Countries, where studies were conducted with the least proportion of authors with Global South primary affiliations, were the Dominican Republic (0%), Mauritius (12.5%), Nepal (%) and Samoa (25%). The

Figure 1 Screening methodology for tobacco control intervention studies within the Global South



largest number of studies were conducted in China and India, where on average 73% and 92% of authors were from the Global South, respectively.

Most studies (78%) reported the last author's affiliations in the Global South, with the remaining interventions indicating the last author's affiliation in the Global North. The vast majority (88%) of first author institutional affiliations were research institutions, which included hospitals, academic institutions and government-affiliated research groups. The vast majority (89%) of the last author's institutional affiliations were also research institutions.

As per Figure 2, tobacco control interventions with generic smokers were largely conducted in India (38%). Generic smokers referred to broad smoking populations, i.e. there was no subgroup within smokers that was of interest. Interventions in hospitals were disproportionately conducted in China (39%). Studies with women were mostly conducted in Iran (31%). Studies with college students (43%) were disproportionately conducted in Malaysia.

The first paper on tobacco control interventions in the Global South was published in India in 1986, followed by South Africa in 1988 and Mexico in 1989. Countries that have had interventions on tobacco control published more recently include Nepal (2019), Micronesia (2018) and Bahrain, Bolivia, Iraq and Paraguay, all in 2017). Although 17% of all interventions were conducted in China, these did not begin till 2000–2020, 24 years after India.

A minority of interventions (39%) were randomized control trials (RCTs). All studies in Bosnia and Herzegovina, the Czech Republic, Iraq, Syria, and Venezuela were RCTs, as with Figure 3. None of the studies in 17 countries (e.g. Armenia, Guatemala and Sudan) were RCTs. Ten countries had an even mix of RCT and other study designs, e.g. Argentina, Iran, and Nigeria.

Figure 4 illustrates the populations engaged within Global South interventions. The most frequently engaged group was generic smokers (61%). Other significant groups were smokers in the health-care system with HIV, TB or cardiovascular disease, men, women and

Figure 2 Target population for tobacco control interventions by country, within the Global South

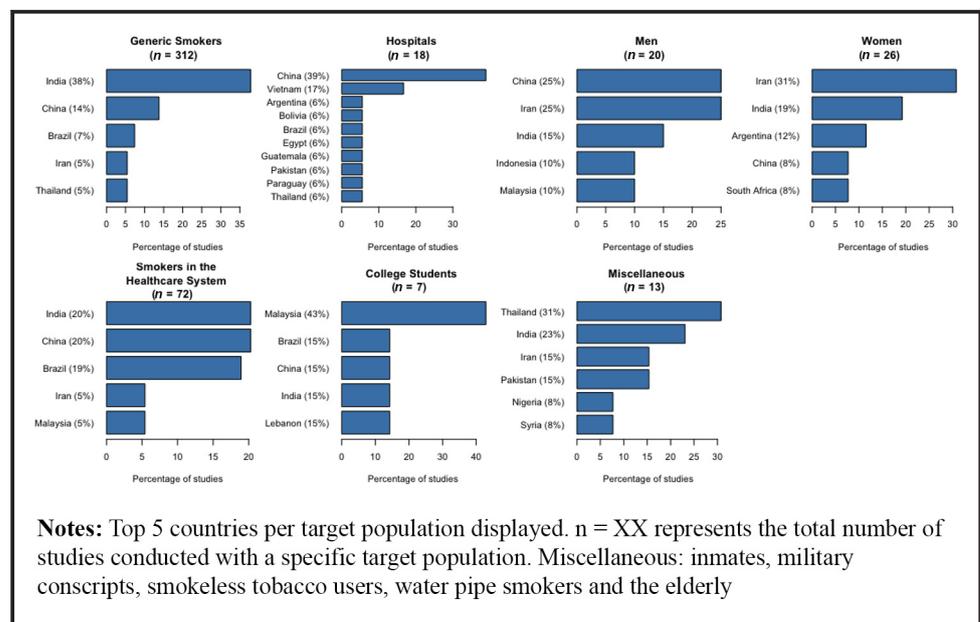


Figure 3 Percentage of tobacco control interventions that were randomized controlled trials, in each country within the Global South

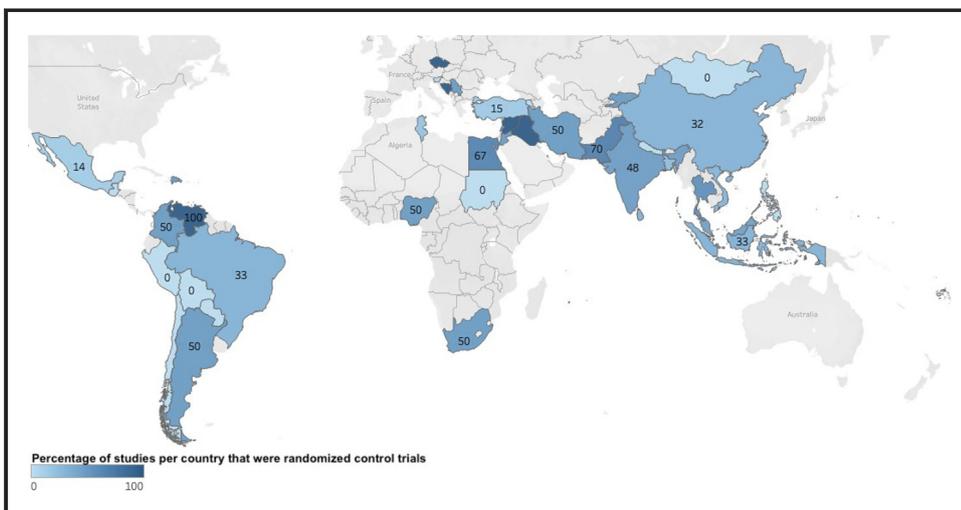
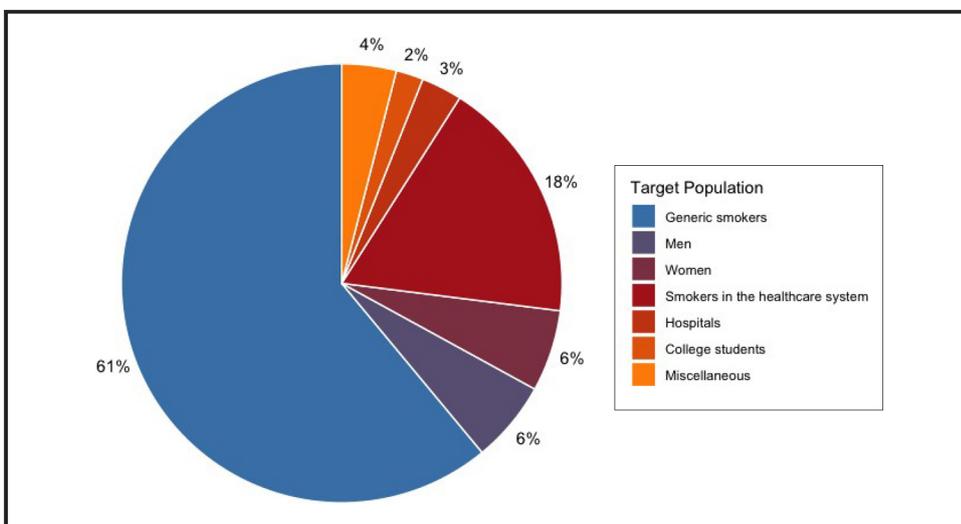


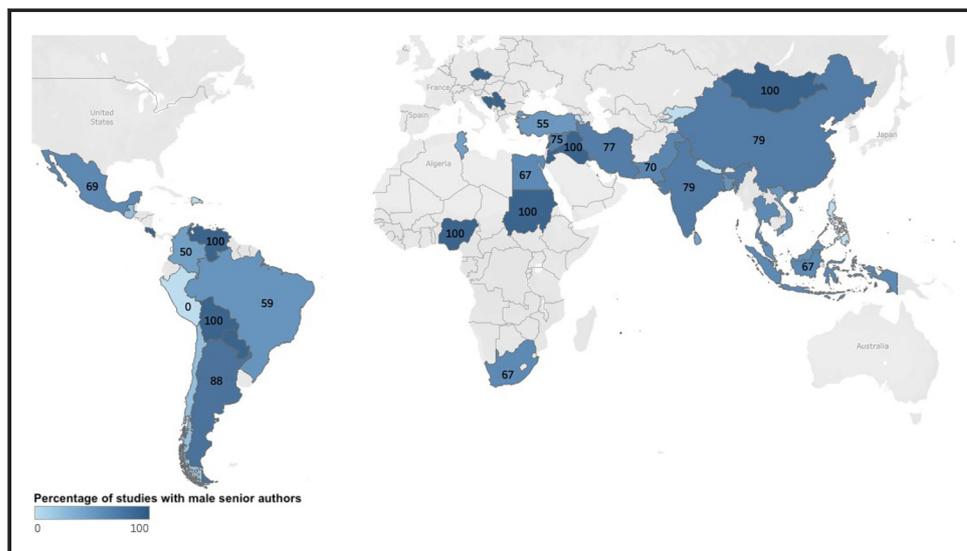
Figure 4 Target populations of interest for tobacco control interventions in the Global South



a miscellaneous group consisting of inmates, military conscripts, smokeless tobacco users, waterpipe smokers and the elderly. There were 10 studies where health-care professionals were engaged, accounting for 3% of all studies.

Most (57%) authors were male. When exploring the first author’s gender, most (57%) were male. For authors listed last, most (67%) were also male. Most (73%) RCTs also had a male last author. As per Figure 5, 33 countries (72%) had more than 50% male senior authors. Only three countries had an evenly balanced gender ratio: Colombia, Sri Lanka and Tunisia. A minority of nations (37%), including Bolivia, Jordan and Nigeria, had only male senior authors. A smaller minority (17%), including Bahrain, the Dominican Republic and the Philippines, had only female senior authors.

Figure 5 Percentage of tobacco control interventions in the Global South with male senior authors



In [Figure 6](#), the average percentage of male authors and male senior authors varied over time. The average percentage of male authors seems to be tending toward equity, with a median of 58.6%. The median percentage for male senior authors is greater than the median percentage for male authors.

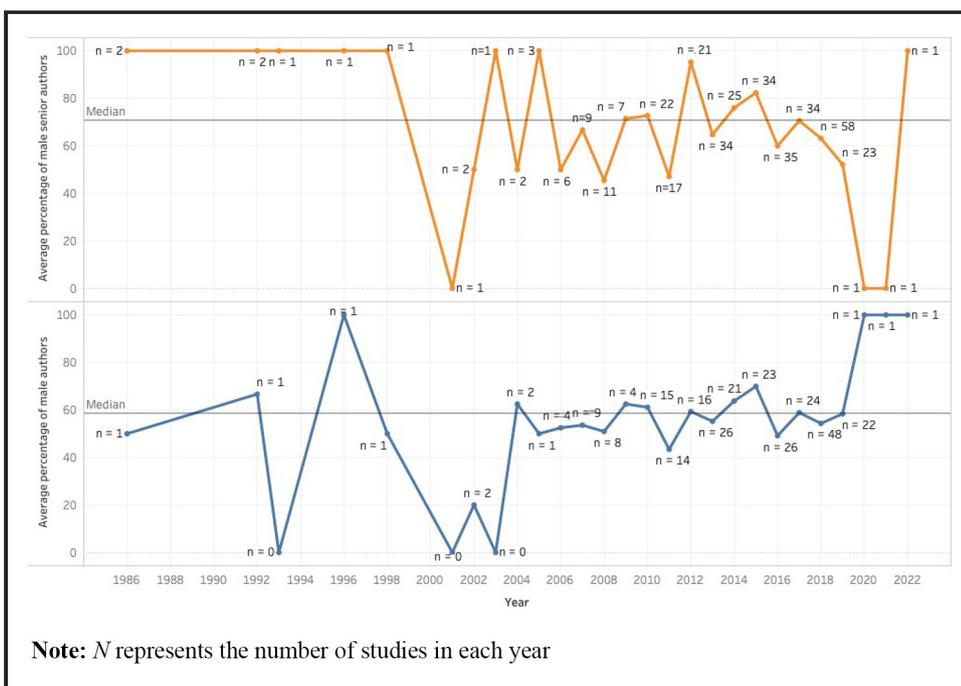
Men tended to research all target populations, also conducting the majority of research with female smokers ([Figure 7](#)). A minority (17 studies, 4%) of interventions concerned with harm reduction, which included switching to nicotine replacement therapy and snus. A minority (46%) of harm reduction interventions were RCTs. As per [Figure 8](#), the first paper on harm reduction in the Global South was published in South Africa in 1988, followed by Iran in 2003 and Brazil in 2006. Although India was the first country to publish an intervention on tobacco control in the Global South (1986), no harm reduction studies were conducted there until 2014 – 28 years later.

Discussion

The key finding is the insufficient locally driven tobacco control research in the Global South. From 2014 to 2019, the majority of tobacco control interventions were conducted in the Global North, despite most of the mortality burden being in the Global South ([Sinha et al., 2018](#)). There has been an increase in tobacco control research by scholars from the Global South and about the Global South ([Warner et al., 2014](#)). Our findings extend the literature by suggesting that while there has been an increase in research in line with the FCTC ([Willemssen and Nagelhout, 2016](#)), the overall body of work on Global South tobacco control interventions is still lacking. We suggest further scholarship in this environment, especially on how nations can share and learn from each other, in line with FCTC goals¹[1].

India, China and Brazil accounted for 47% of Global South tobacco control interventions. India and China were the most common institutional locations for both the first and last authors. India and China were disproportionately responsible for tobacco control interventions in the Global South, likely due to these nations being the largest and having the most research facilities. Other Global South countries engaging in tobacco control may thus be understudied. China conducted the bulk of research on

Figure 6 Average percentage of male senior authors (orange line) and male authors (blue line) for Global South tobacco control interventions

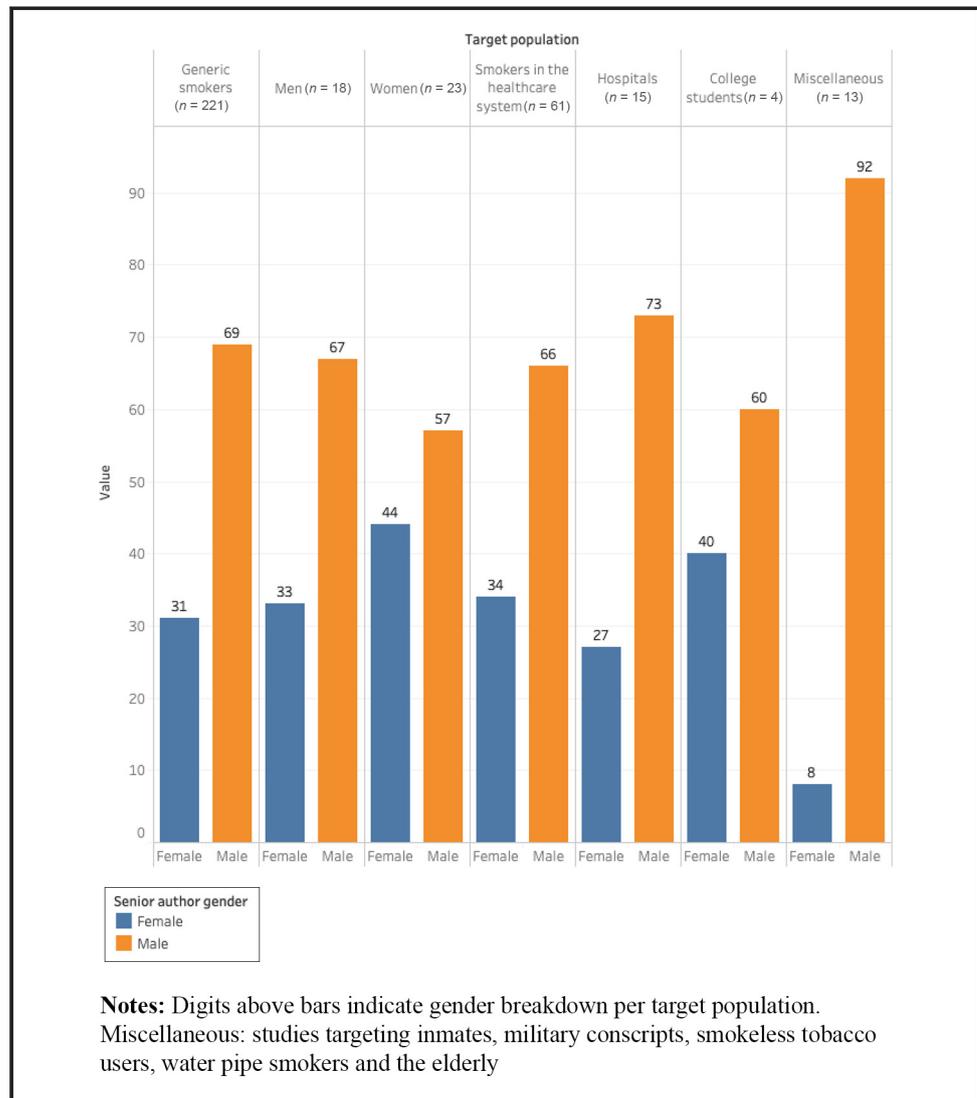


hospitals and male smokers (Figure 2). China's focus on male smokers may be due to their high male smoking prevalence and low prevalence of female smokers (Lv *et al.*, 2015). Research on college students was primarily conducted in Malaysia. Because smoking is prevalent among all genders (Perez-Warnisher *et al.*, 2018), countries should ensure a broader spectrum of research. The low emphasis on the college student smoking population may be a missed opportunity in enacting early-stage interventions (Bennett *et al.*, 2017).

Several nations began tobacco control interventions after 2015 including Nepal, Micronesia and Bahrain. Most interventions (61%) were RCTs. However, several (17) countries had no RCTs within their tobacco control portfolio (Figure 3). The growth of tobacco control interventions in the Global South is encouraging. However, several countries in the Global South are still absent from knowledge production in this arena, most notably countries in Sub-Saharan Africa. Most interventions conducted in the Global South focused on the generic smoking population (Figure 4), with a minority centered on college students, inmates or smokeless tobacco users. To diversify the growing body of knowledge, researchers can study underresearched populations (Spence and Zhu, 2017; Murphy *et al.*, 2019). Similarly, nations that have begun to conduct tobacco control interventions can center on RCTs.

Variations in percentages of male authors in recent years (Figure 6) suggests that female authors are playing an increasing role, as per other fields (Bushyhead and Strate, 2020; Miller *et al.*, 2020). However, most tobacco control interventions are still conducted by male authors. Furthermore, male authors conduct most of the research across all target populations, including female smokers (Figure 7). Tobacco consumption in the Global South is disproportionately among males (Sreeramareddy *et al.*, 2018), which may explain the greater proportion of male authors. However, given that some Global South nations have high rates of female smokers (Sreeramareddy *et al.*, 2018), researchers should be more reflective of the gendered demographics they

Figure 7 Target population of research by last author gender for Global South tobacco control interventions.



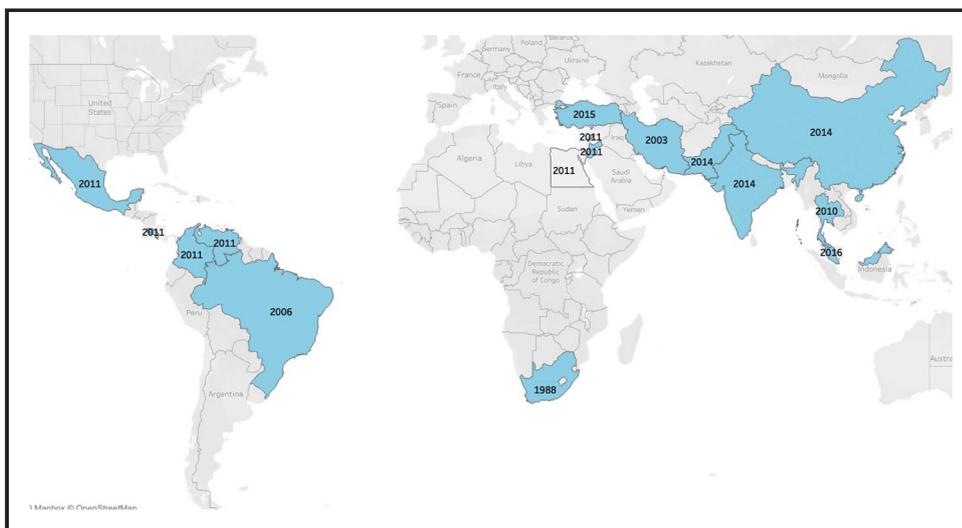
study (Nielsen and Borjesson, 2019; Greider *et al.*, 2019) and to ensure a broader range of scholarship (Nielsen *et al.*, 2017).

Only 4% of tobacco control interventions detailed harm reduction. Of these interventions, 46% were RCTs. Harm reduction scholarship is quite recent (Warner, 2019), as most such studies in the Global South commenced in the early 2000s (Figure 8), limiting insights around long-term impacts. Researchers and policymakers should broaden scholarship around harm reduction to enhance tobacco control efforts (Warner, 2019; Notley *et al.*, 2018).

Limitations

Limitations included the insufficient number of studies to facilitate statistical analysis. Limitations also arose from differences in study designs of reviewed studies, making it more complex to assess or synthesize all studies under the same rubric. As no language restrictions were imposed, papers not in a language familiar to the authors may have been missed.

Figure 8 Date of first harm reduction-centric tobacco control intervention within the Global South



Conclusion

We found multiple tobacco control interventions conducted in the Global South. However, despite the FCTC detailing the significance of scientific research (Willemsen and Nagelhout, 2016), studies are still lacking in the Global South. India, China and Brazil have driven tobacco control interventions in the Global South. There are still significant research gaps such as longitudinal studies, harm reduction and RCTs. Overall, results indicate significant potential for tobacco control interventions in the Global South, potentially moving toward FCTC goals (Chung-Hall *et al.*, 2019) but also highlight several areas of concern.

Note

1. Senior author determination: M, F = F; NULL, M = M; F, NULL = F.

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Appendix

Medline search example

1. (afghanistan or africa or Agalega Island* or algeria or angola or Anguilla or antigua or argentina or Armenia or Armenian or Aruba or Asia or Azerbaijan or bahamas or bahrain or bangladesh or barbados or barbuda or Basutoland or belarus or belize or Belorussia or Belorussian or benin or bhutan or bolivia or borneo or bosnia or botswana or Bouvet Island* or Brasil or brazil or brunei or burkina faso or Burkina Fasso or Burma or burundi or Byelarus or Byelorussian or cabo verde or cambodia or Camerons or Cameroon or Cameroons or cape verde or caribbean or cayman or central african republic or central america or Ceylon or chad or chile or china or Christmas Island* or Cocos Island* or colombia or Comores or Comoro Island* or comoros or congo or Cook Island* or costa rica or cote d'ivoire or cuba or democratic people's republic of korea or djibouti or dominica or dominican republic or dprk or East Timur or ecuador or egypt or el salvador or eritrea or ethiopia or falkland island* or fiji or french guiana or French Polynesia or French Somaliland or gabon or Gabonese Republic or gambia or gaza or Georgia or ghana or Gold Coast or grenada or grenadines or guadeloupe or guam or guatemala or Guiana or guinea or guyana or haiti or Heard Island* or Hercegovina or herzegovina or honduras or Ifni or india or Indian ocean or indochina or indonesia or iran or iraq or ivory coast or jamaica or jordan or Kampuchea or katanga or Kazakh or kazakhstan or Keeling island* or kenya or Khmer Republic or Kirghiz or Kirghizia or Kirgizstan or kiribati or Korea or Kosovo or kuwait or Kyrgyz Republic or kyrgyzstan or Lao PDR or laos or latin america or lebanon or lesotho or liberia or libya or madagascar or Malagasy Republic or malawi or Malay or Malaya or malaysia or maldives or mali or malvinas or marshall island* or martinique or mauritania or mauritius or Mayotte or McDonald Island* or mekong valley or melanesia or mexico or micronesia or middle east or mongolia or montserrat or morocco or mozambique or Muscat or Myanma or myanmar or namibia or nauru or Navigator Island* or near east or nepal or Netherlands Antilles or nevis or new caledonia or New Hebrides or nicaragua or niger or nigeria or Niue or Norfolk Island* or north korea or Northern Mariana Island* or Nyasaland or oman or pakistan or Palau or palestine or Palestinian or panama or papua new guinea or paraguay or peru or Philipines or philippines or Phillipines or Phillippines or pitcairn island* or puerto rico or qatar or reunion or Rhodesia rio muni or Ruanda or rwanda or Sabah or Saint

Barthelemy or Saint Helena or saint kitts or saint lucia or Saint Martin or saint vincent or samoa or samoan island* or Sandwich Island* or sao tome or Sarawak or saudi arabia or senegal or seychelles or sierra leone or sikkim or solomon island* or somalia or south africa or south America or sri lanka or St Barthelemy or St Helena or St Kitts or St Lucia or St Martin or St Vincent or sudan or Surinam or suriname or swaziland or syria or syrian arab republic or Tadjikistan or Tadjhik or Tadjhikistan or tajikistan or tanzania or thailand or tibet or timor or tobago or togo or Togolese Republic or Tokelau or tonga or trinidad or tunisia or Turkmen or turkmenistan or "turks and caicos" or Tuvalu or uganda or ukraine or united arab emirates or United Arab Republic or Upper Volta or uruguay or Urundi or Uzbek or uzbekistan or vanuatu or venezuela or viet nam or vietnam or virgin island* or "Wallis and Futuna" or West Bank or West Indies or yemen or Yugoslavia or zaire or zambia or Zimbabwe).hw,ti,ab,cp.

2. Developing Countries.sh,kf.
3. ((southeast or southeastern or western) adj asia).tw,kw.
4. ((developing or less* developed or under developed or underdeveloped or middle income or low* income) adj (economy or economies)).tw,kw.
5. (low* adj (gdp or gnp or gross domestic or gross national)).tw,kw.
6. (low adj3 middle adj3 countr*).tw,kw.
7. (Imic or Imics or third world or lami countr*).tw,kw.
8. transitional countr*.tw,kw.
9. or/1-8
10. exp "tobacco use cessation"/or exp smoking cessation/or exp smoking reduction/or exp harm reduction/or ((argileh or beedis or betel or chhutta or chillum or cigar* or cigarette* or cigarillo* or dhumti or dokha or e-cigarette* or e-cig* or e-hookah* or gutka or hookah or hookli or imqmik or khaini or kiseru or kizami or makla or midwakh or mishri or mu'assel or narghile or naswar or nicotania or nicotine or paan or pan masala or perique or shisha or smoking or snuff or snus or thoc lao or tobacco or vape or vaping) adj5 (abstinence or cessation or decrease or harm reduc* or harm minimiz* or stop or stopping or withdrawal or quit or quitting)).tw,kw. (49363)
11. 9 and 10

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