The diffusion of scientific knowledge on family planning behavior: when, where, how and by whom is research being done?

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Extended Summary

Theoretical focus

Over the past several decades, the reduction of unwanted fertility in the poorest countries of the world occupied a central place in the agendas of multilateral organizations and national governments. Some of these efforts were the focus of the FP2020 initiative, an outcome of the 2012 Family Planning Summit and with a goal of enabling 120 million more women and girls to use contraceptives by 2020 and achieve universal access to sexual and reproductive health services and rights by 2030 (Brown et al. 2014). However, despite rising numbers of women using modern contraceptive methods in lower-middle income countries, in an analysis of recent family planning behavior trends, the demand for contraception has risen at a faster pace than the uptake in modern contraceptives (Slaymaker et al. 2020). Furthermore, a recent analysis of the estimates and projections of contraceptive use and unmet need in the FP2020 countries finds that, while progress has been made, the rate of change in new users of contraception is not at the pace necessary to meet the FP2020 goals (Cahill et al. 2018). Thus, while there are success stories from countries that have made great progress towards FP2020 goals, such as Sierra Leone, Mozambique and Kenya, there are other countries that have had lower levels of contraceptive prevalence relative to expectations, such as Burundi and Gambia (Cahill et al. 2018). These disparities can also be found at the subnational level in some countries, as it is for the case of India, where regional differences in contraceptive uptake are as large as 55 percentage points (New et al. 2017). Some of these pervasive disparities in contraceptive use and unmet need across geographic, economic and sociocultural lines remain unexplained (Ahmed et al. 2019, Sedgh and Hussain 2014).

Given the reasons outlined above, scientific inquiry on the determinants of family planning behavior is both current and crucial, and thus actively taken up by researchers all over the world. Additionally, governments, organizations, practitioners and funders alike rely on the steady production and promotion of data, performance monitoring, and the dissemination of knowledge, evidence and up-to-date innovative studies on contraceptive use, non-use and unmet need. Widespread dissemination of scientific knowledge is a crucial contributor towards

translating knowledge into action, but the distribution of knowledge in many areas of human concern is understood to be uneven, hindering effective progress (Adriansen 2020).

The body of research on family planning behaviors and their determinants is no different than other fields of knowledge. That body of research is remarkably heterogeneous in its topics, conceptual definitions and methodological approaches. While this diversity and abundance has certainly contributed rich insights for scholars and practitioners in the field, the accumulation of empirical evidence without some epistemological guidance runs the risk of piling up without generating systematically obtained deeper insights on crucial empirically substantive concerns. Such insights can come from systematic reflection and reconstitution of the lessons learned regarding how knowledge in a field is being produced (Hobcraft 2002, Portes 1997). An important step towards this reflection is to provide a clearer understanding of the state of the field and its evolution.

Our study advances such reflection in two key ways. First, it provides an expert analysis of the literature by carefully selecting, hand coding and categorizing published research in terms of study characteristics and geographic location (FP2020 countries) along three different dimensions of family planning behavior, i.e., contraceptive use, non-use, and unmet need. Second, it offers an empirical analysis of the content and metadata of the literature in our curated database using bibliometric tools and techniques, allowing us to present geographic and temporal trends in the production of scientific knowledge on the determinants of family planning behaviors.

Our comprehensive examination of when, where, how, and by whom research is being done applies a new set of methodological tools to assess how knowledge is produced, reproduced and evaluated in this field of inquiry. These findings shed light into our practice as social scientists and the strengths and weaknesses in the field. In our review of the literature, we identify patterns in the distribution of research and our analyses reveal why there are considerable blind spots in our knowledge about the determinants of family planning.

Research Questions
1. What are the characteristics of research published on the determinants of family planning behavior?
2. What is the distribution of author affiliations at the national level?
3. What are the characteristics of research and researchers that are associated with higher impact and greater attention from the scientific community in the short and long term?

Data and Research Methods

A systematic literature review is a "comprehensive search for relevant studies on a specific topic, [where] those identified are then appraised and synthesized according to a predetermined explicit method" (Klassen et al. 1998: 701). A key to this process, as mentioned by Weed (2006), is that the criteria for the inclusion and exclusion of studies is explicit from the outset. We limited our search to articles published in English between January 1, 2000 and December 31, 2016 in order to capture research produced after the signing of the MDGs in

September 2000. Furthermore, we restricted the inclusion of articles to those that focused on FP2020 countries, which are sites receiving significant policy and program investments seeking to improve women's universal access to sexual and reproductive health services. FP2020 regional categories were also matched with search terms to capture multi-national and comparative studies in cases where specific country names were not specified in the title or abstract.

We used the PubMed, Embase, and POPLINE electronic research databases to identify relevant studies. The selected databases were recommended by global health librarians and family planning experts, and are consistent with other literature reviews examining contraceptive use. Used in conjunction, these databases capture the full range of research in the public health and social science fields. A summary of the full methodological process undertaken in this review is summarized by the PRISMA flow diagram in **Figure 1**.

In the identification phase, articles were retained if:
1. The title and/or abstract included "contraception" OR "contraceptive use" OR "contraceptive prevalence rate" OR "family planning" OR "unmet need AND family planning"
AND
2. The title and/or abstract included the name of the regions of interest/country
AND
3. The date of publication was between January 1, 2000 and December 31, 2016.

We assigned each article a database identification code based on location from which it was downloaded and removed article duplicates across databases. We then separated out comparative articles or those that focused on more than one country; these "multi-country" articles were moved to a separate database and will be examined in the next phase of our analysis. After removing duplicates and pulling out multi-country studies, researchers reviewed the abstracts to determine whether the article would be kept for the secondary review using inclusion/exclusion criteria, which was inductively determined through an iterative process after coders read several articles and discussed their content as a research team. Articles were included if the outcome variable was classified as determinants of use, non-use, or unmet need; any outcome variables unrelated to behavior (e.g. knowledge, attitudes) were excluded. Only studies that looked at contraceptive use among women were included (or studies where women's contraceptive behavior was distinguishable from male's or couple's use). We further limited the inclusion of articles to those with sample populations that were relatively representative of the whole population, and thus excluded those that looked at women with specified occupations (e.g. sex workers), job categories (e.g. health professionals), or health statuses (e.g. HIV). A minimum of two researchers reviewed each article to ensure intercoder reliability and any disagreements about article coding were discussed and resolved by the research team for final decisions.

To complement our systematic review data, we used Digital Object Identifiers (DOI) of the selected publications (N = 602) and queried a 2020 snapshot of Elsevier's Scopus provided to

us by the German Competence Centre for Bibliometrics[1] for further meta-data (N matched = 406) on authors, organizations, countries and impact (i.e., citations). This bibliometric analysis allowed us to study geographic and temporal trends in the production of scientific knowledge on the determinants of family planning behaviors.

Expected findings

Our findings to date suggest that there are significant gaps in a shared scientific approach, both conceptual and empirical. Despite the availability of rich sources of evidence from around the globe for multiple time periods, we found that research on the determinants of family planning behaviors is largely concentrated in a few countries. **Figure 2** and **Figure 3** demonstrate that where people were studying is not necessarily where the total fertility rate or modern contraceptive prevalence rates are highest. **Figure 4** provides a preliminary answer to our second research question regarding the countries contributing to the published literature, versus the geographic regions studied in them. Countries in the Global North have no representation among the studied regions (Y axis), but most of the authors are affiliated with these countries (X axis). Authors affiliated to institutions in the U.S. and the UK show extremely high productivity in the number of publications, while studying many of the FP2020 countries.

Figure 5 provides a preliminary answer to our third research question on whose research receives more attention by the other members of the scientific community. We use citations in the first three years after publication to allow for comparisons between different publications, rather than the aggregated count of citations, which is time dependent. First, we see that studies with contraceptive use as an indicator are the most cited ones. Second, when looking at geographic distribution, we see that authors from the U.S. have received the highest citation numbers. In addition, we see that some of the studies by authors from the Global South (e.g., Ethiopia, Ghana, India, Kenya, Nigeria and Pakistan) received relatively high citations.
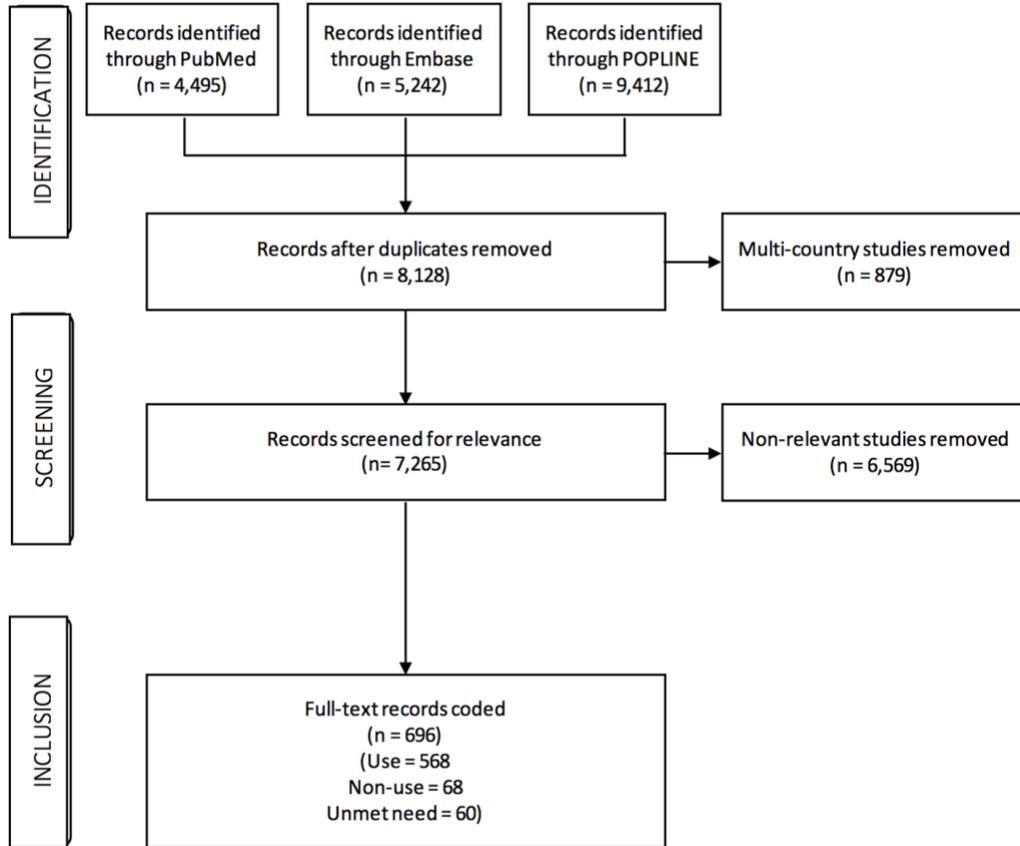
Appendix

Figure 1. PRISMA flow chart diagram detailing article identification, screening, and review
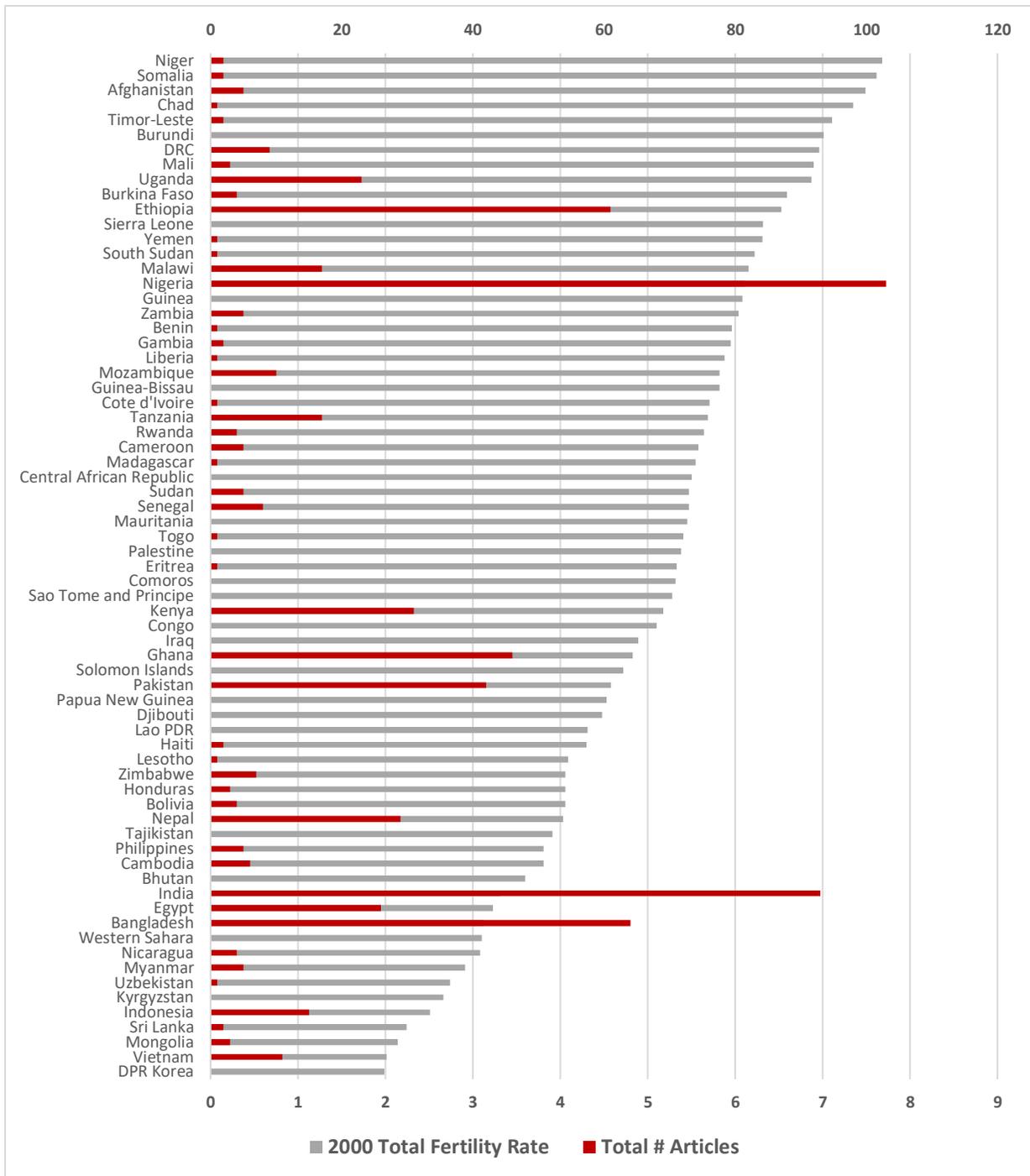
Figure 2. Distribution of Studies on Determinants of Family Planning (Use, Non-Use, Unmet Need), Published between 2000 - 2016, Ordered by 2000 Total Fertility Rates
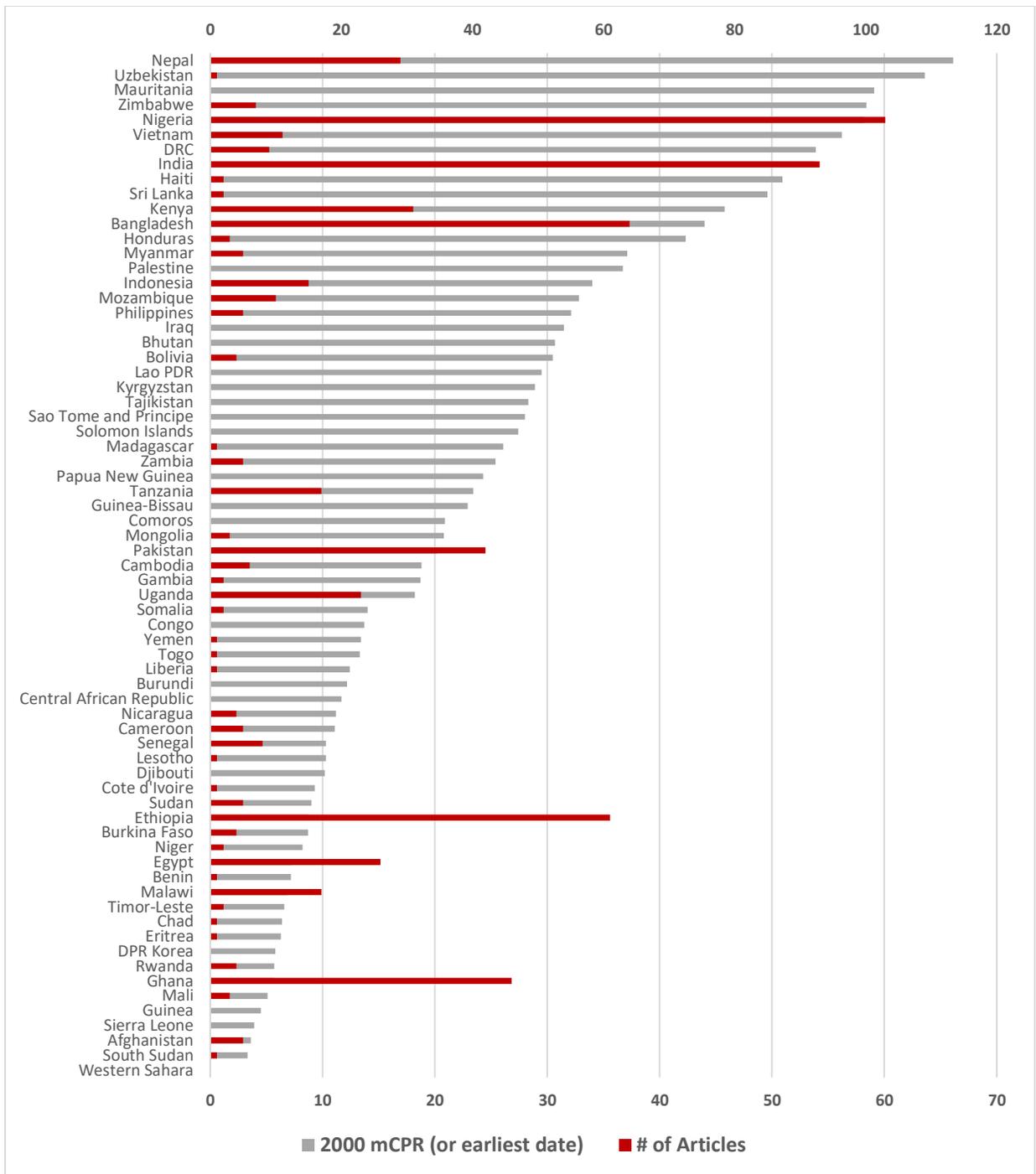
Figure 3. Distribution of Studies on Determinants of Family Planning (Use, Non-Use, Unmet Need), Published between 2000 - 2016, Ordered by 2000 Modern Contraceptive Prevalence Rate

Figure 4. Country of affiliation of authors (X axis) versus country under study (Y axis)
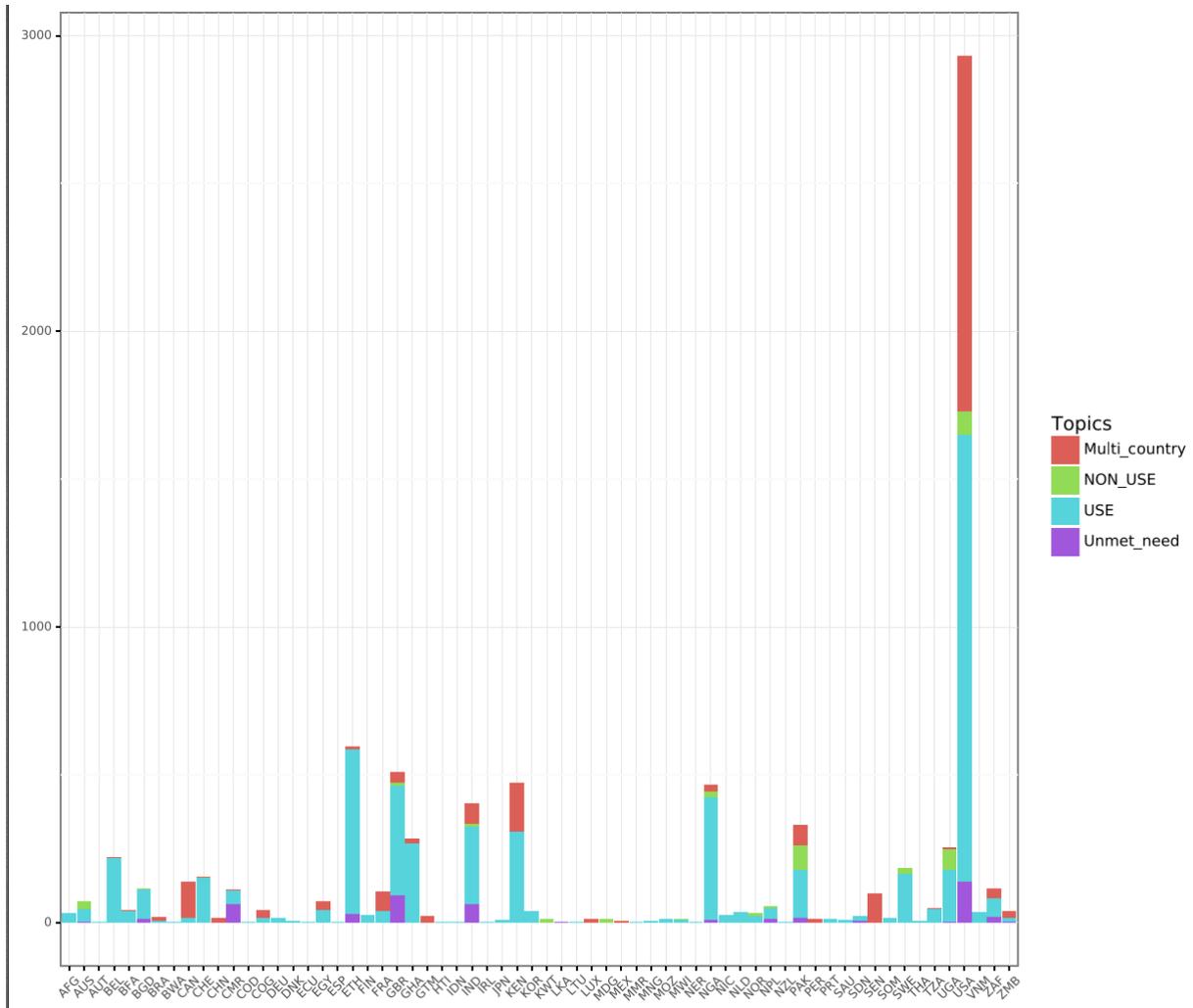
Figure 5. Country of affiliation of authors (X axis) versus number citations received in the first three years after publication (Y axis) by indicator

References

Adriansen, Hanne Kirstine. 2020. "Materialities and Mobilities in Transnational Capacity Building Projects: Uneven Geographies of Knowledge Production." *Population, Space and Place* 26(3):e2294.

Ahmed, Saifuddin, Yoonjoung Choi, Jose G. Rimon, Souleymane Alzouma, Peter Gichangi, Georges Guiella, Patrick Kayembe, Simon P. Kibira, Fredrick Makumbi, and Funmilola OlaOlorun. 2019. "Trends in Contraceptive Prevalence Rates in Sub-Saharan Africa since the 2012 London Summit on Family Planning: Results from Repeated Cross-Sectional Surveys." *The Lancet Global Health* 7(7):e904–11.

Brown, Win, Nel Druce, Julia Bunting, Scott Radloff, Desmond Koroma, Srishti Gupta, Brian Siems, Monica Kerrigan, Dan Kress, and Gary L. Darmstadt. 2014. "Developing the '120 by 20' Goal for the Global FP2020 Initiative." *Studies in Family Planning* 45(1):73–84.

Cahill, Niamh, Emily Sonneveldt, John Stover, Michelle Weinberger, Jessica Williamson, Chuchu Wei, Win Brown, and Leontine Alkema. 2018. "Modern Contraceptive Use, Unmet Need, and Demand Satisfied among Women of Reproductive Age Who Are Married or in a Union in the Focus Countries of the Family Planning 2020 Initiative: A Systematic Analysis Using the Family Planning Estimation Tool." *The Lancet* 391(10123):870–82.

Hobcraft, John. 2002. "Moving beyond Elaborate Description: Towards Understanding Choices about Parenthood." *Dynamics of Fertility and Partnership in Europe: Insights and Lessons from Comparative Research* 1:131–43.

Klassen, Terry P., Alejandro R. Jadad, and David Moher. 1998. "Guides for Reading and Interpreting Systematic Reviews: I. Getting Started." *Archives of Pediatrics & Adolescent Medicine* 152(7):700–704.

New, Jin Rou, Niamh Cahill, John Stover, Yogender Pal Gupta, and Leontine Alkema. 2017. "Levels and Trends in Contraceptive Prevalence, Unmet Need, and Demand for Family Planning for 29 States and Union Territories in India: A Modelling Study Using the Family Planning Estimation Tool." *The Lancet Global Health* 5(3):e350–58.

Portes, Alejandro. 1997. "Immigration Theory for a New Century: Some Problems and Opportunities." *International Migration Review* 31(4):799–825.

Sedgh, Gilda, and Rubina Hussain. 2014. "Reasons for Contraceptive Nonuse among Women Having Unmet Need for Contraception in Developing Countries." *Studies in Family Planning* 45(2):151–69.

Slaymaker, Emma, Rachel H. Scott, Melissa J. Palmer, Luigi Palla, Milly Marston, Lianne Gonsalves, Lale Say, and Kaye Wellings. 2020. "Trends in Sexual Activity and Demand for and Use of Modern Contraceptive Methods in 74 Countries: A Retrospective Analysis of Nationally Representative Surveys." *The Lancet Global Health* 8(4):e567–79.

Weed, Mike. 2006. "Sports Tourism Research 2000–2004: A Systematic Review of Knowledge and a Meta-Evaluation of Methods." *Journal of Sport & Tourism* 11(1):5–30.