Mapping the current knowledge in syndemic research applied to Men who have Sex with Men : a Scoping Review

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# 1 Results

## 1.1 Literature search

The electronic search identified 769 citations and our handsearch of reference lists resulted in the addition of the seminal study by Stall and colleague[[1](#ref-Stall2003)] . After duplicates removal, 277 unique references were left to be screened for inclusion.

Among these references, 109 were excluded after reading the title and abstract. The two main reasons for exclusion at this stage were that MSM were not the main population of the study (n=46) or that syndemic was not the main focus of the paper (n=34). 29 additional studies were excluded because the type of publication did not meet our inclusion criteria.

The full texts of the 168 remaining references were obtained and read, which lead to the exclusion of 59 citations. During the previous step, we decided to include papers in which the sample was not entirely comprised of MSM. After reading the full paper, we opted to exclude the studies if the MSM data was aggregated with data from another population (n=9), most commonly transgender women. The rationale for this decision was to keep the focus clearly on MSM.

The PRISMA flowchart generated by DistillerSR can be found in Figure 1.1

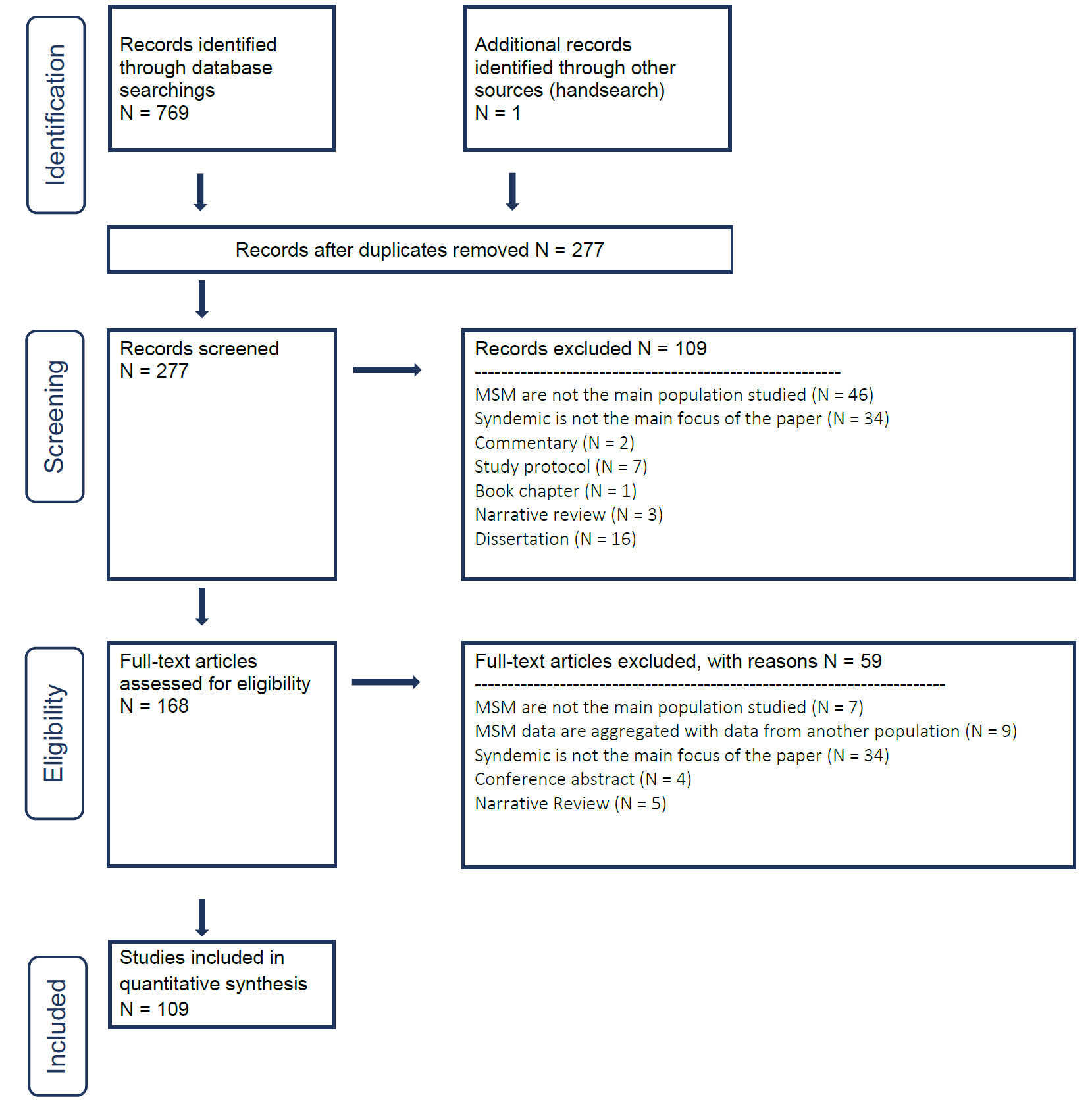


Figure 1.1: PRISMA flowchart of the included search strategy

## 1.2 How are studies concerning Syndemic Theory applied to MSM conducted?

### 1.2.1 General characteristics of included studies

The publication date of the studies range from 2003 to 2021 with a marked increase in the number papers published yearly from 2013 onward as illustrated in Figure 1.2. Apart from the quantitative increase in the number of studies, there’s also a qualitative increase in the diversity of the studies, both in the type of design used and the countries where the studies are conducted.

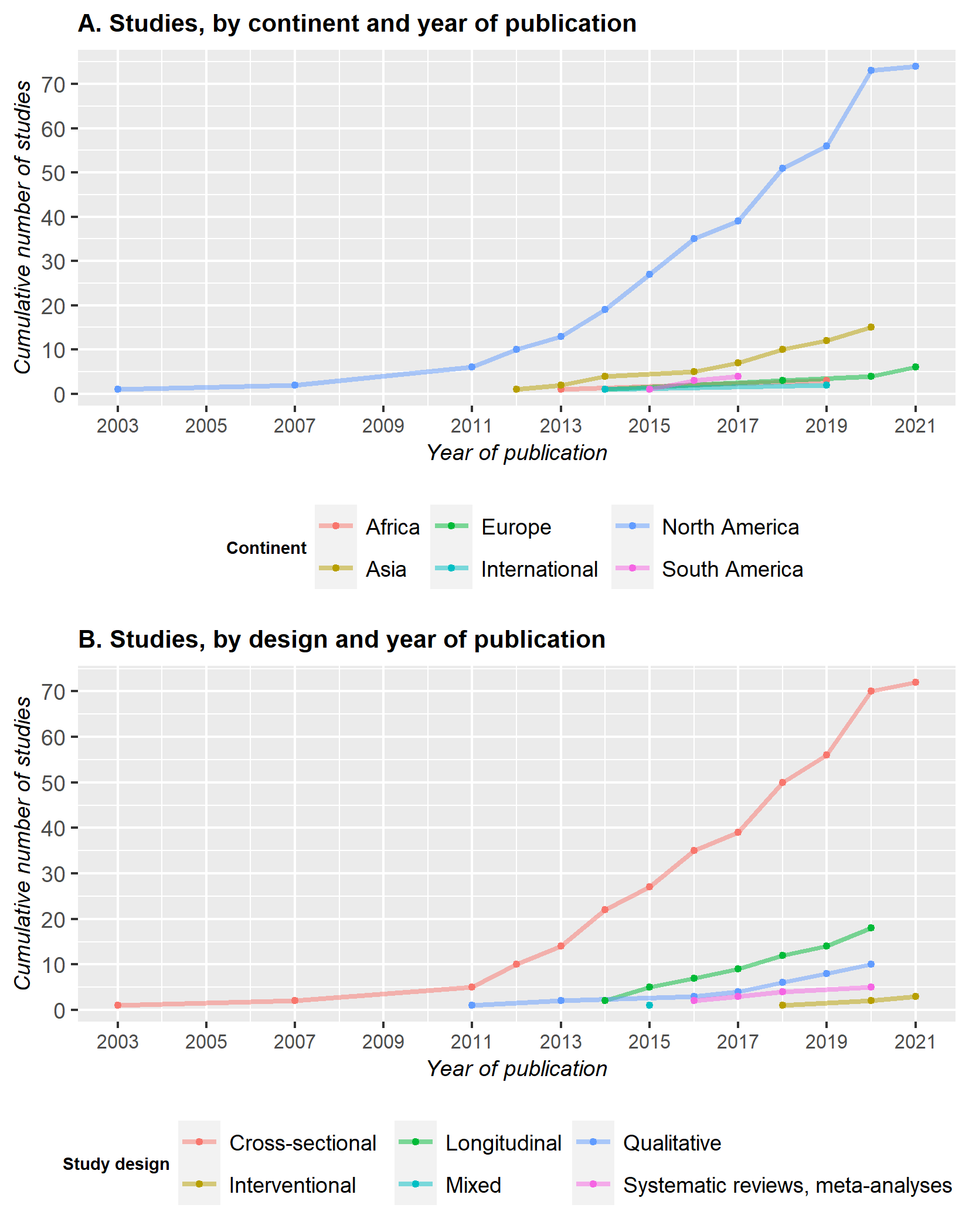


Figure 1.2: Plot of the cumulative number of studies published yearly, grouped by continent (A) and design (B)

However, despite this growing diversity, the vast majority of studies are conducted in North America (N = 74), with a large predominance of studies in the United States of America (N= 62). The majority of the remaining studies were then located in Asia (N = 15) or in Europe (N = 6). South America and Africa were the least represented continents, with only 4 and 3 studies respectively.

In terms of design, a similar pattern appears, with most of the studies employing a cross-sectional design (N = 72). The number of longitudinal studies steadily grew since 2014 but only represents 17% of the papers to this day. Qualitative studies are also under-represented, with only 10 papers. Of note, we only identified 1 mixed design[[2](#ref-buttram2015)] ; this study employed a cross-sectional design for the quantitative part and in-depth interviews analyzed through grounded theory for the qualitative part. The first systematic reviews and meta-analyses were published recently, in 2016 while the first interventional studies were published in 2018.

Finally, the median sample size of the studies was 450 (range : 15 - 24 274) and the mean age of the participants, when reported ranged from 16 to 57.89.

### 1.2.2 Subpopulations studied

A bit less than half of the studies (N = 48 ) focus on a subpopulation of MSM. In this review, we identified 6 kind of MSM subpopulations studied in syndemic literature : (a) young MSM and older MSM ; (b) MSM from a racial/ethnic minority ; (c) MSM living with HIV ; (d) MSM engaged in sex work ; (e) Men who have Sex with Men and Women (MSMW) ; and (f) transgender MSM.

Among studies focusing on a specific age group, 12 studies focus on young adults, 2 studies focus on older MSM[[3](#ref-zepf2020),[4](#ref-Halkitis2012)] and 1 study focuses on adolescents[[5](#ref-Perry)]. Of note, the two studies on older MSM are both entirely composed of a sample of older MSM living with HIV.

Black MSM (BMSM) are the most studied MSM from a racial/ethnic minority (N= 14) but studies focusing on them still represent only 13% of our sample. Among these studies, 2 studies are composed of young BMSM[[6](#ref-Maiorana),[7](#ref-Reed2016)] and 1 study focuses on Black MSM engaged in sex work[[8](#ref-chandler2020)].  
Only (N= 7) studies focus on Latino MSM (LMSM) and 1 of these studies focus on Latino MSMW[[9](#ref-Munoz-Laboy2018)]. Furthermore, 1 study focus on both BMSM and LMSM[[10](#ref-cassels2020)].

Concerning the serologic status of MSM in syndemic literature, 13 studies are entirely comprised of a sample of MSM living with HIV. Apart from the aforementioned studies on older MSM living with HIV, 2 studies focus on young MSM living with HIV[[11](#ref-Lyons2013),[12](#ref-Bruce2011)] . Notably, we identified no studies conducted on racial minority MSM living with HIV.

Finally, the least represented subpopulation of MSM in this review are MSMW (N = 2), MSM engaged in sex work (N = 2) and transgender MSM (N = 1). Strikingly, transgender MSM, in addition to being the focus of only one study[[13](#ref-Reisner2016a)] are, by design, excluded from every other study whereas other MSM subpopulation are at least partially represented in most of the samples.

Figure 1.3 gives a visual representation of MSM subpopulation’s representation in the studies included in this paper.

In order to have the most comprehensive knowledge of the representation of MSM subpopulations in syndemic literature, we also measured took into account studies who did not focus on any subpopulation in particular but who presented disaggregated data and analyses for one or more MSM subpopulation.  
8 studies presented such data : 1 for Black MSMW[[14](#ref-dyer2020)], 4 for MSMW[[15](#ref-branstrom)–[18](#ref-ferlatte2018)], 2 for MSM living with HIV[[19](#ref-Kurtz2012),[20](#ref-ng2020)] and 1 for Latino and Black MSM[[21](#ref-Mustanski2017)].

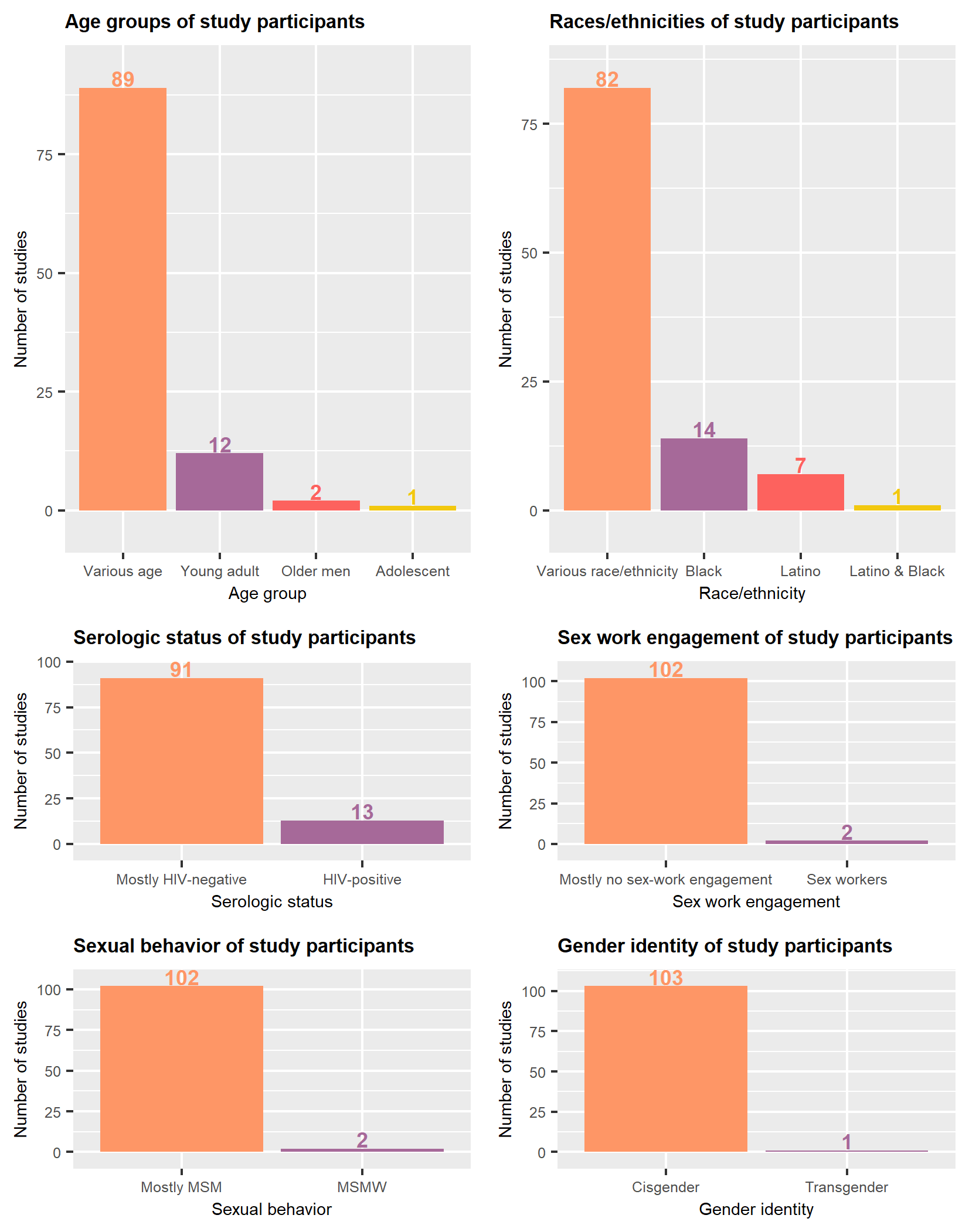


Figure 1.3: Number of studies focusing on a MSM subpopulation, by kind of subpopulation

### 1.2.3 Syndemic conditions and their measurement

### 1.2.4 Outcomes and their measurement

### 1.2.5 Interventions

## 1.3 How is the concept of interaction explored in syndemic research applied to MSM?

### 1.3.1 Statistics used to show an interaction

### 1.3.2 Proposed mechanisms of interaction

## 1.4 What were the key findings of these studies?

# 2 Discussion

# 3 Conclusion

# 4 References

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