

A decade of PrEP: the evolution of HIV pre-exposure prophylaxis content and sentiments in South African print news media, 2012-2021

Running head: PrEP content and sentiments in South African print media

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List of abbreviations

| | |
|--------|--------------------------------------|
| AGYW | Adolescent girls and young women |
| CAB-LA | Long-acting cabotegravir-rilpivirine |
| FSW | Female sex workers |
| MSM | Men who have sex with men |
| PrEP | HIV pre-exposure prophylaxis |

Word Counts

Abstract: 198/200

Main Text: 7,497/7,500

Abstract

After nearly a decade of HIV pre-exposure prophylaxis (PrEP) rollout in sub-Saharan Africa, there has been limited study of PrEP messaging in news media. We selected twenty South African newspapers with the highest circulation volumes to retrieve articles published in 2012-2021 mentioning PrEP ($N = 249$). Using inductive content analysis, we developed a structured codebook to characterise PrEP-related content and sentiments, as well as their evolution over time, in the South African press. Many articles espoused favourable attitudes towards PrEP (52%), but a sizeable fraction espoused unfavourable attitudes (11%). Relative to PrEP-favourable articles, PrEP-unfavourable articles were significantly more likely to emphasise drawbacks/consequences of PrEP use, including adherence/persistence requirements (52% vs. 24%, $p=0.007$), cost (48% vs. 11%, $p<0.001$), and risk compensation (52% vs. 5%, $p<0.001$). Nevertheless, the presence of these drawbacks/consequences in print media largely declined over time. Key populations (e.g., adolescents, female sex workers) were frequently mentioned potential PrEP candidates. Despite message variations over time, prevention effectiveness and adherence/persistence requirements were the most widely cited PrEP benefits and drawbacks, respectively. Study findings demonstrate the dynamic nature of PrEP coverage in the South African press, likely in response to PrEP scale-up and real-world PrEP implementation during the study period.

Keywords: HIV prevention, key populations, mass media, content analysis, South Africa

Introduction

Pre-exposure prophylaxis (PrEP) is a self-managed, biomedical HIV prevention tool with established potential to reduce the risk of HIV acquisition. Daily oral PrEP formulations, including emtricitabine and either tenofovir alafenamide or tenofovir disoproxil fumarate, have demonstrated up to 99% protective efficacy against sexually acquired HIV infection (Baeten et al. 2012; Grant et al. 2010; Thigpen et al. 2012). Newer longer-acting PrEP formulations, specifically bimonthly injectable cabotegravir-rilpivirine (CAB-LA), have exhibited protective efficacy superior to daily oral PrEP formulations in some trials (Landovitz et al. 2021; Delany-Moretlwe et al. 2022), availing critical opportunities to reach persons at-risk for HIV for whom daily oral PrEP is undesirable or infeasible. Mathematical modelling studies have demonstrated the potential population-level impacts of PrEP scale-up in generalised HIV epidemic settings throughout East and Southern Africa, predicting that optimal PrEP uptake and prevention-effective adherence in HIV-impacted populations could yield significant reductions in HIV incidence (Roberts et al. 2022; Smith et al. 2023). PrEP scale-up is, therefore, a public health imperative for accelerating momentum towards HIV epidemic control in high-burden settings worldwide.

Despite PrEP's promise as a user-controlled HIV prevention strategy, rates of PrEP uptake and persistence fall far short of globally established targets for reducing new HIV infections to below 370,000 annually (Joint United Nations Programme on HIV/AIDS 2022). Since the 2016 public rollout of PrEP in South Africa (Bekker et al. 2016), where one in every five adults are estimated to be living with HIV (Zuma et al. 2022), observational studies have demonstrated challenges to optimising PrEP uptake, continuation, and adherence in priority populations like female sex workers (FSW) and adolescent girls and young women (AGYW)

(Bekker et al. 2022; Celum et al. 2022; Rao et al. 2022; 2023). Overlapping personal (e.g., anticipated/experienced side effects, perceived HIV risk), social (e.g., HIV stigma, privacy/disclosure concerns), systemic (e.g., service availability, provider competencies), and structural (e.g., competing survival needs/priorities, enabling policy environment) factors have been shown to attenuate PrEP willingness, uptake, and persistence across settings, including South Africa (Koechlin et al. 2017; Glick et al. 2020; Muhumuza et al. 2021).

There is growing recognition of the role of mass media in shaping public sensibilities and attitudes towards the HIV epidemic and prevention technologies like PrEP (French et al. 2014; LaCroix et al. 2014). Digital and print media, from newspapers to entertainment, have been shown to influence perceptions of HIV risk, attitudes towards HIV prevention, as well as values and preferences related to HIV prevention commodities (Brown and Basil 1995; Babalola, Fatusi, and Anyanti 2009; Wang, Duke, and Schmid 2009; Johnson 2013; Rudrum 2020). Historically, print and broadcast media have played instrumental roles in shaping public HIV/AIDS discourses in South Africa, especially in the post-apartheid era (Jacobs and Johnson 2007). HIV press coverage in the Southern Africa has helped advance HIV advocacy by emphasizing the effectiveness of novel technologies (i.e., combination antiretrovirals, PrEP), combating politicised AIDS denialism (Fassin and Schneider 2003; Mbali 2004; Malan 2006); simultaneously, it has also hindered efforts to achieve HIV epidemic control vis-à-vis messages shifting the onus of HIV response away from the government to civil society organizations and implicit use of a “victim-perpetrator” narrative when framing social consequences of the pandemic, like children orphaned by AIDS (Meintjes and Bray 2005; D’Angelo et al. 2013). Media can also be leveraged as a tool for countering misinformation related to HIV and cultivating demand for HIV prevention strategies like PrEP, as illustrated from evaluations of

multichannel mass media interventions like MTV Shuga in South Africa (Birdthistle et al. 2022; Baker et al. 2022; Kyegombe et al. 2022; Chimbindi et al. 2023) and the #PrEP4Love campaign in the United States (Dehlin et al. 2019; Keene et al. 2021; Phillips, Raman, et al. 2020; Phillips, McCuskey, et al. 2020). Importantly, the relationship between media discourses and social attitudes/norms is not unidirectional, as media coverage is itself shaped by market pressures to align narratives with the perceived expectations, preferences, and values of consumers—a phenomenon known as confirmation bias (Kott and Limaye 2016; Xu et al. 2023).

Studies of PrEP-related coverage in news media have demonstrated the role of narrative and visual heuristics (e.g., centering LGBTQIA+ personas in PrEP communications) in shaping public perceptions of PrEP, including the perceived relevance of PrEP to specific audiences and the (de)construction of PrEP stigma (Jaspal and Nerlich 2017; Card et al. 2019; Jones and Collins 2020; Mowlabocus 2020; Niedt 2020; Young et al. 2021; Collins 2022; Rosen et al. 2023; Espejord and Sandset 2022). These studies, however, have been exclusively conducted in high-income countries with concentrated HIV epidemics, where PrEP coverage in the news media may be less salient and emphasise PrEP's relevance to only specific populations (e.g., FSW, men who have sex men [MSM], transgender women) compared to media from countries with generalised HIV epidemics. There is an absence of studies to date examining PrEP-related discourse in news media from high-burden countries in East and Southern Africa, including South Africa—where media may play a vital role in disseminating PrEP information, shaping PrEP-related attitudes and norms, and dismantling PrEP stigma.

Accordingly, we examined the evolution of PrEP-related messaging in the South African print news media over the past decade, characterising the content and tone of PrEP-focused news coverage. An improved understanding of PrEP-related discourses in the South African press may

help illuminate public perceptions, attitudes, and norms towards PrEP—further contextualizing suboptimal rates of PrEP uptake and persistence observed programmatically.

Materials and Methods

Newspaper and Article Selection

A multi-step selection process was used to identify South African newspapers with high print circulation volumes and relevant articles for study inclusion. Between May and July 2021, South African digitised print newspapers were screened for circulation distribution volume, or “hard copies” sold of a given edition of a publication over a specific time period. Circulation distribution volume metrics were obtained from the Audit Bureau of Circulations of South Africa (ABC South Africa 2018), which provides measurement for several forms of media by offering compliance and auditing services to the media industry. From the 159 unique digitised print newspapers identified, overall (2012-2021) and quarterly (every three months) circulation mean statistics were calculated for each newspaper. After excluding duplicate newspapers and newspapers published in other languages, newspapers were ranked by overall circulation averages, and the 20 newspapers with the highest mean circulation volume were included.

Following newspaper selection, digitised newspaper articles were identified and screened for study inclusion. Four discrete search terms were used to retrieve PrEP-related articles from websites of included newspapers: “pre-exposure prophylaxis”, “PrEP,” “pill to prevent HIV”, “Truvada”, and “HIV pill”. For non-English newspapers, search terms were translated into local languages to identify potentially relevant articles, and retrieved non-English articles were translated into English for subsequent inclusion assessment. Media retrieved from the search strategy were included if articles made any references to PrEP, whether explicitly (e.g., “PrEP,”

“pre-exposure prophylaxis”) or implicitly (e.g., “a pill to prevent HIV”). Two coders (SMC, GS) working independently assessed retrieved articles’ relevance to PrEP and established consensus on article inclusion through discussion and resolution of any discrepant assessments of article eligibility. Articles that were duplicate publications across newspapers, did not explicitly or implicitly mention PrEP, and published before 2012 were excluded.

Codebook Development and Measures

Guided by the principles of inductive content analysis (Elo and Kyngäs 2008), we developed a structured codebook to synthesise PrEP-related discourses, sentiments, and messaging present in the article corpus through an iterative, multi-step process. To develop the codebook, two coders (SMC, GS) began by reading articles line-by-line and independently documenting themes and sub-themes emerging saliently in the texts. Through ongoing memo-writing and continuous discussion amongst the investigative team, an exhaustive list of concepts and constructs was generated and consolidated into standalone codes. The burgeoning codebook was further refined through review of the extant literature using comparable methods to characterise health-related content/sentiments in news media (McGinty et al. 2018; Barry et al. 2019).

A primary construct included in the codebook was article tone, which corresponded to an article’s explicit or implicit attitude or orientation towards PrEP. By default, articles were assumed to be PrEP-neutral. Articles employing rhetoric that principally communicated support, acceptance, or promotion of PrEP were deemed PrEP-favourable (e.g., “*Life after PrEP: How one magical pill saved our lives and our marriage,*” “*Study shows drugs can help HIV discordant couples conceive safely,*” “*How a drug can help prevent 5000 girls being infected*

with HIV every week”). By comparison, articles dominated by narratives of scepticism or opposition towards PrEP were deemed PrEP-unfavourable (e.g., “*We cannot afford to rollout AIDS drug,*” “*HIV pill could be fuelling risky sex,*” “*Technology to prevent HIV could be abetting spread of STIs*”). Article texts with mixed rhetoric (i.e., including perspectives of support and opposition/scepticism towards PrEP) were classified as neutral.

Codes measuring articulated PrEP benefits included prevention effectiveness, expanded choice over HIV prevention, tool for self-improvement, reduced HIV transmission, and safety profile. Conversely, measures of articulated PrEP drawbacks/consequences included adherence/persistence requirements, stigma, cost, side effects, and risk compensation. Other measures of PrEP content and sentiments included in the final codebook were PrEP modalities discussed (oral tablets, injectables, rings, topical); articulated populations for whom PrEP is indicated (AGYW, FSW, MSM, persons in serodifferent partnerships, people who inject drugs, pregnant or breastfeeding persons); and sources cited/quoted in the article text (academics/researchers, health institution representatives, government officials, advocates, basic/bench scientists).

Other production characteristics included in the final codebook were article publication year; article publication type (news story, opinion/commentary, review article); publication language (English, isiZulu, Afrikaans); and article PrEP centrality, for which articles mentioning PrEP only once or twice were considered PrEP-passing, and articles with three or more mentions of PrEP were considered PrEP-focused.

Analysis

After finalising the codebook, all articles and the preliminary codebook were imported into ATLAS.ti version 9 (Scientific Software Development GmbH, Berlin, Germany) to facilitate data management and textual analysis. Three coders (SMC, GS, KM) pilot tested the codebook by independently coding 11 articles in triplicate, then comparing coded text segments, resolving discrepancies in code applications, and revising the codebook. After establishing intercoder consistency, the remaining articles were single coded by one independent coder.

Once all articles were coded, a line list of coded text segments and corresponding applied codes were exported and merged with production characteristics for each article in Stata/IC 15.1 (StataCorp LLC, College Station, Texas), generating a database summarising the presence or absence of PrEP content codes across articles. Article production characteristics were descriptively summarised using frequencies, proportions, and measures of dispersion. Next, to assess whether PrEP discourse varied by article tone, Fisher's exact tests of association were implemented to compare statistically significant differences ($p < 0.05$) in the distribution of content codes applied to articles that were deemed neutral, favourable, or unfavourable towards PrEP. Lastly, to examine temporal shifts in PrEP content and sentiments, the fraction of PrEP-focused articles articulating specific PrEP benefits and consequences/drawbacks was calculated and compared over time (by publication year).

Results

Overall, 267 digitised newspaper articles were retrieved and met criteria for study inclusion. Following translation and deduplication, 249 unique articles from 13 newspapers were included in the final sample and subsequently coded (7 newspapers published no PrEP-related articles). Table 1 descriptively summarises production characteristics for included articles. Most

articles were published after 2016 (71.1%). The largest fraction of included articles was published in *The Daily Nation* (33.7%), followed by *The Times* (16.5%) and *The Sunday Times* (9.6%). Most articles were news stories (89.2%) and written in English (98.4%). Half of articles were PrEP-focused (50.2%).

PrEP Content by Article Tone

Table 2 presents the distribution of PrEP-related content across coded articles, by deciphered tone. Across articles ($N = 249$), aside from oral tablets (42.2%), mentions of PrEP formulations were rare. Key and priority populations—specifically AGYW (39.0%), MSM (37.8%), and FSW (28.9%)—were frequently characterised as populations for whom PrEP is indicated. The most frequently cited PrEP benefits were expanded choice over HIV prevention (39.4%) and prevention effectiveness (39.0%). By comparison, the most cited PrEP drawbacks or consequences were adherence/persistence requirements (31.7%) and stigma (30.9%); cost (18.5%), side effects (12.9%), and risk compensation (10.0%) were less frequently articulated. Over half of articles cited or quoted academics/researchers (64.3%) and representatives from major health institutions (55.4%). Advocates were cited or quoted in fewer than one-fifth of articles (13.3%).

Over half of articles were deemed PrEP-favourable (52.2%), and over a third were PrEP-neutral (37.0%). Approximately one in 10 included articles were deemed PrEP-unfavourable (10.8%). Relative to PrEP-favourable articles, PrEP-unfavourable articles were significantly more likely to identify specific populations as ideal PrEP candidates, including AGYW (48.2% vs. 31.5%, $p=0.040$), MSM (59.3% vs. 27.7%, $p=0.001$), and persons in serodifferent partnerships (51.9% vs. 18.5%, $p=0.002$). Likewise, PrEP-unfavourable articles were

significantly more likely than PrEP-favourable articles to mention numerous PrEP-related drawbacks or consequences, specifically adherence/persistence requirements (51.9% vs. 23.9%, $p=0.007$), stigma (37.0% vs. 23.9%, $p=0.037$), cost (48.2% vs. 10.8%, $p<0.001$), side effects (14.8% vs. 7.7%, $p=0.027$), and risk compensation (51.9% vs. 5.4%, $p<0.001$).

PrEP Content and Sentiments over Time

Figure 1 displays the distribution of articles sentiments by publication year. Over time, the fraction of PrEP-unfavourable articles declined, from 37.5% in 2012 to 3.3% in 2021. This corresponded with increases in the proportion of PrEP-favourable (2012: 50.0%, 2021: 63.3%) and PrEP-neutral articles (2012: 12.5%, 2021: 33.3%) over the study period.

Figure 2A and 2B illustrate the presence of articulated PrEP benefits and drawbacks/consequences, respectively, among PrEP-focused articles ($n = 125$) over time. While the articulated PrEP benefits varied year-to-year in PrEP-focused media, prevention effectiveness remained among the most widely cited benefits of PrEP over time. Expanded choice over HIV prevention, a widely cited PrEP benefit early in the study period, exhibited noteworthy declines in media coverage from 2013 (100%) to 2019 (11.0%) but began increasing in 2020 (40.6%) and 2021 (57.1%). Likewise, adherence/persistence requirements was the most widely cited PrEP drawback/consequence articulated in PrEP-focused media over time. Media coverage of other PrEP-related drawbacks and consequences, however, varied substantially over time. Of note, risk compensation exhibited striking declines in media coverage from 2012 (75.0%) to 2021 (0%), while stigma exhibited noteworthy increases in media coverage over the same period (2012: 0%, 2021: 57.1%).

Discussion

Our content analysis of 249 digitised newspaper articles from 2012 to 2021 highlighted the principally favourable attitude of the South African press towards PrEP as an HIV prevention strategy. Just over half (52%) of included articles were deemed supportive or endorsing of PrEP, indicating predominantly favourable coverage of novel biomedical HIV prevention technologies in the South African print media over the past decade. Nearly one in 10 articles (11%), nevertheless, contained content or language communicating skepticism or opposition to PrEP, which could arguably shape public sentiments towards PrEP users and PrEP writ large. Importantly, the proportion of articles deemed unfavourable towards PrEP declined over time, potentially coinciding with PrEP scale-up in Southern Africa and resultant shifts in social norms towards user-controlled HIV prevention strategies (Claassen et al. 2021; Schaefer et al. 2021; Taylor et al. 2022). This finding reaffirms reciprocal relationship between media discourse and consumer values/preferences, suggesting that while media narratives can shape attitudes and norms, press coverage itself also reflects the dynamic PrEP information landscape and the evolving nature of HIV prevention attitudes and norms of its readership.

While most articles were population-agnostic (i.e., emphasized behavioral indications rather than social identities of prospective PrEP users) in their depictions of potential PrEP benefactors, a noteworthy fraction of media identified specific key and priority populations as appropriate PrEP candidates. Across articles, AGYW (39%), MSM (38%), and FSW (29%) were the most frequently cited populations for whom PrEP was potentially indicated. While aligned with normative clinical guidelines to prioritise PrEP for populations with outsized HIV burdens and potentially reflective of early PrEP rollout efforts concentrated in these key and priority populations, the saturation of specific communities in public-facing communications related to

PrEP may inadvertently contribute to the “othering” of HIV risk, potentially amplifying HIV- and PrEP-related stigma. Studies have demonstrated how centering specific populations in PrEP media can cultivate misconceptions about PrEP’s relevance and, at worst, reinforce harmful stereotypes of potential PrEP candidates as promiscuous and sexually deviant (Keene et al. 2021; Young et al. 2021). Messages emphasising PrEP’s complementarity with other HIV prevention strategies and its relevance to *anyone* seeking protection against HIV infection, not simply communities disproportionately impacted by HIV, have great potential in destigmatising PrEP.

Articles espousing unfavourable attitudes towards PrEP were also significantly more likely to emphasise specific shortcomings of PrEP relative to articles with more favourable attitudes towards PrEP. Approximately half of these unfavourable articles mentioned risk compensation (52%), adherence/persistence requirements (52%), and cost (48%) as barriers or consequences of PrEP use, compared to significantly smaller fractions of favourable articles. While some of these limitations are grounded in the everyday realities of PrEP users (i.e., daily pill burdens), others are arguably subjective (i.e., cost) (Meyer-Rath et al. 2019; Peebles et al. 2021) and potentially inaccurate (i.e., risk compensation) (Rojas Castro, Delabre, and Molina 2019; Quaife et al. 2020; Murchu et al. 2022). Unsurprisingly, the proportion of PrEP-focused articles mentioning risk compensation declined substantially over time, coinciding with a growing body of evidence reporting negligible changes to sexual behaviors following PrEP initiation (Marcus et al. 2013; Giguère et al. 2019; Ortblad et al. 2020). Nevertheless, the historical presence of risk compensation narratives in PrEP-focused media may have lasting effects on public attitudes towards PrEP. Efforts to normalise PrEP use could, therefore, benefit from media discourse that unpacks the concept of “risk compensation” in the context of PrEP use, effectively decoupling PrEP from unfounded claims of increased sexual risk-taking.

In addition to risk compensation, our content analysis uncovered other shifts in PrEP-related content in the South African print news media over the last decade. Although prevention-effectiveness was among the most frequently cited benefits of PrEP, other perceived benefits experiencing early declines in media coverage, specifically expanded choice over HIV prevention, are rebounding—potentially attributed to increased public attention to other PrEP modalities that have recently (i.e., CAB-LA) or Dapivirine ring) become available in South Africa (Bhavaraju et al. 2021; Jenkins et al. 2023). Likewise, adherence/persistence requirements remained the most cited drawback of PrEP over time, but the proportion of articles identifying stigma as a barrier to PrEP use has increased since 2012. Real-world implementation of PrEP in South Africa has likely heightened visibility of stigma as a potential barrier to and consequence of PrEP use (Velloza et al. 2020; Rousseau et al. 2021; Nyblade et al. 2022), offering a potential explanation for increased attention to stigma in PrEP-related media over time.

Limitations

There are several limitations of our study. First, our search strategy was restricted to digitised print news articles from 20 high-circulating publications in South Africa. Our final sample, therefore, may not be representative of the constellation of digital, audio, and visual media consumed by the South African public, in particular broadcast, radio, and social media. Future research should investigate the dissemination of PrEP-related communications on social media platforms (e.g., Twitter/X, Instagram, TikTok), which have increasing penetration rates in South Africa (Kubheka, Carter, and Mwaura 2020; Mazonde and Goldstein 2023). Second, restriction of article retrieval to the 20 publications with the highest circulation volume may have excluded publications with more niche readership or accessible to a readership that does not

consume media content in isiZulu, Afrikaans, or English. Findings may, thus, only represent PrEP-related content and sentiments from print media consumed by English, isiZulu, or Afrikaans-speaking readership. Third, terminating our search in 2021 likely excluded content pertaining to newer longer-acting PrEP formulations (i.e., CAB-LA, Dapivirine ring), which could be subject to different media coverage in South Africa compared to more established oral PrEP formulations. Fourth, while use of a structured codebook and establishment of intercoder consistency early in the coding process helped enhance the credibility of our findings (Guest and MacQueen 2008), applications of content and sentiment codes to news articles were subject to coder interpretation and may not align with the intended sentiment of the publisher or the perceived sentiment by consumers, which were not assessed in the present study. Fifth, despite the breadth of our codebook, our findings do not necessarily exhaust all possible PrEP-related content areas emerging in South African print news media over the last decade. Finally, given our narrow focus to characterize the PrEP-related news media landscape in South Africa, study findings cannot be used to infer relationships between media coverage and PrEP-related attitudes, norms, and practices in the South African public, which could be a focus of future scholarship.

Conclusions

PrEP coverage in the South African print media has been primarily positive over the last decade, though depictions of appropriate PrEP candidates based on social identities (rather than behavioral indications) and emphasis on PrEP drawbacks/shortcomings could inadvertently reinforce stigma and attenuate demand. Our findings also illustrate the dynamic nature of PrEP coverage in the South African press, likely in response to PrEP scale-up and real-world PrEP

implementation during the study period. As PrEP formulations and implementation strategies evolve, so too should the media coverage accompanying their rollout. South African media can be more responsive to the dynamic nature of HIV prevention science and the shifting terrain of public attitudes/norms towards PrEP by amplifying the voices of critical HIV stakeholders (including PrEP users and people living with HIV) who are insufficiently represented in media coverage of PrEP; sharing timely updates of the evolving research and development pipeline for HIV prevention commodities; and emphasizing the relevance/value of PrEP to all people with specific indications (rather than social identity). Given that supply constraints are predicted to limit the availability of newer PrEP formulations like CAB-LA in sub-Saharan Africa (Meyer-Rath, Jamieson, and Pillay 2023; Mgodhi et al. 2023), it is critical for CAB-LA demand-generation efforts to tap into salient media discourses related to oral PrEP, emphasising potential benefits relative to the drawbacks or consequences emphasised for oral PrEP.

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Declaration of Interests

The authors have no competing interests to disclose.

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Availability of Data and Material

Replication data for the manuscript is available upon request from the corresponding author.

Authors' Contributions

SMC, GS, LS, CS, KW, AB, JM, and SRS conceptualised the study and developed the methodology. MM, HH, CB, SDB, and SRS secured funding for the study. SMC, GS, and KM executed the article search strategy and coded news articles, with administrative support and supervision from LS, KW, and SRS. SMC and JGR conducted descriptive/univariate data analysis and prepared the first draft of the manuscript. All authors contributed to, reviewed, and approved the final manuscript submitted for publication.

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Table 1. Descriptive production characteristics of South African digitised print media mentioning PrEP, 2012–2021 ($N = 249$).

| Production characteristics | Number (<i>n</i>) | Percent (%) |
|---|--------------------------|--------------------|
| Publication year (<i>median, IQR</i>) | 2018 | 2016–2020 |
| Newspaper | | |
| The Daily Nation | 84 | 33.7 |
| The Times | 41 | 16.5 |
| The Sunday Times | 24 | 9.6 |
| The Star | 23 | 9.2 |
| Sunday Tribune | 22 | 8.8 |
| City Press | 21 | 8.4 |
| Sowetan | 17 | 6.8 |
| Daily Sun | 10 | 4.0 |
| Die Burger | 3 | 1.2 |
| Isolezwe | 1 | 0.4 |
| Rapport | 1 | 0.4 |
| Die Son | 1 | 0.4 |
| Sunday World | 1 | 0.4 |
| Publication type | | |
| News story | 222 | 89.2 |
| Opinion/commentary | 18 | 7.2 |
| Review article | 9 | 3.6 |
| Language | | |
| English | 245 | 98.4 |
| Afrikaans | 3 | 1.2 |
| isiZulu | 1 | 0.4 |
| PrEP centrality | | |
| PrEP-focused | 125 | 50.2 |
| PrEP-passing | 124 | 49.8 |

Table 2. Frequency (i.e., presence) of PrEP-related content in South African digitised print newspaper articles, by coded article tone ($N = 249$).

| Content characteristics (n, %) | Total $N = 249$ | Favourable $n = 130$ (52.2%) | Neutral $n = 92$ (37.0%) | Unfavourable $n = 27$ (10.8%) | Fisher's exact p -value |
|--|---------------------------|--|------------------------------------|---|-------------------------------------|
| <i>PrEP modalities discussed</i> | | | | | |
| Oral tablet | 105 (42.2%) | 43 (33.1%) | 49 (53.3%) | 13 (48.2%) | 0.009 |
| Injectable | 40 (16.1%) | 14 (10.8%) | 24 (26.1%) | 2 (7.4%) | 0.005 |
| Ring | 31 (12.5%) | 9 (6.9%) | 21 (22.8%) | 1 (3.7%) | 0.001 |
| Topical | 8 (3.2%) | 4 (3.1%) | 4 (4.4%) | <i>n/a</i> | 0.674 |
| <i>Populations for whom PrEP is indicated</i> | | | | | |
| Adolescent girls and young women | 97 (39.0%) | 41 (31.5%) | 43 (46.7%) | 13 (48.2%) | 0.040 |
| Men who have sex with men | 94 (37.8%) | 36 (27.7%) | 42 (45.7%) | 16 (59.3%) | 0.001 |
| Female sex workers | 72 (28.9%) | 32 (24.6%) | 30 (32.6%) | 10 (37.0%) | 0.255 |
| Persons in serodifferent partnerships | 59 (23.7%) | 24 (18.5%) | 21 (22.8%) | 14 (51.9%) | 0.002 |
| People who inject drugs | 38 (15.3%) | 17 (13.1%) | 17 (18.5%) | 4 (14.8%) | 0.567 |
| Pregnant or breastfeeding persons | 28 (11.2%) | 14 (10.8%) | 12 (13.0%) | 2 (7.4%) | 0.805 |
| <i>PrEP benefits</i> | | | | | |
| Prevention effectiveness | 107 (43.0%) | 44 (33.9%) | 49 (53.3%) | 14 (51.9%) | 0.010 |
| Expanded choice over HIV prevention | 98 (39.4%) | 50 (38.5%) | 41 (44.6%) | 7 (25.9%) | 0.224 |
| Tool for self-improvement | 37 (14.9%) | 13 (10.0%) | 20 (21.7%) | 4 (14.8%) | 0.053 |
| Reduced HIV transmission | 29 (11.7%) | 14 (10.8%) | 12 (13.0%) | 3 (11.1%) | 0.918 |
| Safety profile | 26 (10.4%) | 8 (6.2%) | 16 (17.4%) | 2 (7.4%) | 0.023 |
| <i>PrEP drawbacks/consequences</i> | | | | | |
| Adherence/persistence requirements | 79 (31.7%) | 31 (23.9%) | 34 (37.0%) | 14 (51.9%) | 0.007 |
| Stigma | 77 (30.9%) | 31 (23.9%) | 36 (39.1%) | 10 (37.0%) | 0.037 |
| Cost | 46 (18.5%) | 14 (10.8%) | 19 (20.7%) | 13 (48.2%) | <0.001 |
| Side effects | 32 (12.9%) | 10 (7.7%) | 18 (19.6%) | 4 (14.8%) | 0.027 |
| Risk compensation | 25 (10.0%) | 7 (5.4%) | 4 (4.4%) | 14 (51.9%) | <0.001 |
| <i>Sources cited or quoted</i> | | | | | |
| Academics/researchers | 160 (64.3%) | 81 (62.3%) | 60 (65.2%) | 19 (70.4%) | 0.724 |
| Health institution representatives | 138 (55.4%) | 72 (55.4%) | 48 (52.2%) | 18 (66.7%) | 0.421 |
| Government officials | 65 (26.1%) | 31 (23.9%) | 25 (27.2%) | 9 (33.3%) | 0.554 |
| Advocates | 33 (13.3%) | 11 (8.5%) | 17 (18.5%) | 5 (18.5%) | 0.060 |
| Basic/bench scientists | 22 (8.8%) | 9 (6.9%) | 8 (8.7%) | 5 (18.5%) | 0.163 |

Notes: Frequencies and proportions represent column percentages, or the fraction of articles (overall and by tone) where PrEP-related content was present. **Bolded** values represent statistically significant differences at the $p < 0.05$ level in content characteristics by article tone, ascertained from Fisher's exact tests of association.

Figure 1. Sentiment distribution of South African digitised print newspaper articles over time, 2012-2021 ($N = 249$).

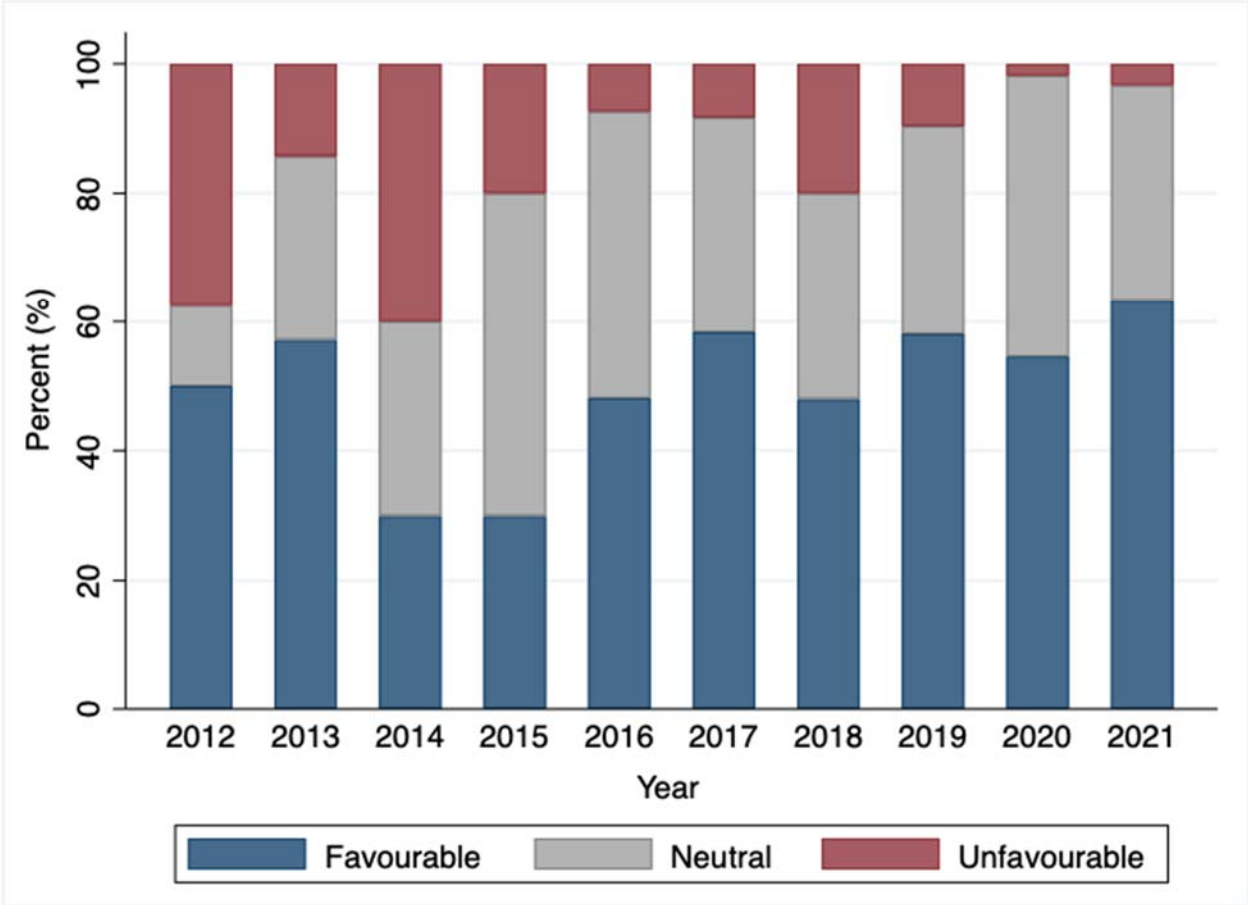


Figure 2. Distribution of PrEP benefits (Panel A) and drawbacks/consequences (Panel B) in PrEP-focused South African digitised print news media over time, 2012-2021 ($N = 125$).



Notes: PrEP was first approved by the U.S. Food and Drug Administration in 2012 and was rolled out in South Africa beginning in 2016. Early piloting and rollout of long-acting injectable cabotegravir-ripivirine began in 2020 in South Africa.