HIV Testing Among Middle-Aged and Older Men Who Have Sex With Men (MSM): A Blind Spot?

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Abstract

Middle-aged and older men who have sex with men (MSM) are one of the most underestimated populations with regard to HIV/AIDS infection, despite the worldwide trend of increasing prevalence in recent years. This population also has low rates of testing, although rare studies are done exclusively with middle-aged and older MSM assessing the factors associated with this prevalence. Thus, based on data from an exclusive online survey with middle-aged and older MSM who use geolocation-based dating applications, the purpose of the study was to analyze factors associated with not taking the HIV test among middle-aged (50 years old) and older MSM in Brazil. Using a modification of time-location sampling adapted to virtual reality, 412 volunteers were approached in Grindr®, Hornet®, SCRUFF®, and Daddyhunt®. The multivariate logistic regression model was adopted to produce adjusted odds ratios (ORa), considering a significance level at .05. There were factors associated with not taking the test: being in a relationship (ORa: 0.24; 95% CI [0.10, 0.53]); knowing partner through the applications (ORa: 1.84; 95% CI [1.07, 3.15]); not knowing the serological status (ORa: 5.07; 95% CI [1.88, 13.67]); ejaculating outside of anal cavity (ORa: 1.79; 95% CI [1.04, 3.05]); practicing sex without penetration (ORa: 2.30; 95% CI [1.17, 4.50]); not taking the test as a form of prevention (ORa: 2.83; 95% CI [1.05, 7.68]); and rarely using Viagra in sexual intercourse (ORa: 1.91; 95% CI [1.20, 3.65]). There is a blind spot in the prevalence of HIV testing in older MSM because this population is not being covered by services, which compromises the overall response to HIV, the goals set for universal health coverage.

Keywords

HIV testing, men who have sex with men, social networks, geolocation-based dating applications, barriers to HIV testing, sexual behavior

The Joint United Nations Program on HIV/AIDS (UNAIDS) launched in 2015 is an ambitious plan that seeks to end the AIDS epidemic by 2030. Entitled 90–90–90, the aim of the plan is that until 2020, 90% of all people living with HIV in the world should know that they are HIV positive; 90% of all people with HIV infection who are aware of the serological status should receive antiretroviral therapy without interruption; and 90% of all people who already receive antiretroviral therapy should have viral suppression (undetectable; UNAIDS, 2014). Thus, this plan has as its first and main basis the knowledge of the HIV serological status, which depends not only on the users' search for health services to be tested, but mainly on the capacity of the services to attract these patients and perform the tests.

Brazil plays an important role in this context, since it has the largest number of people living with HIV/AIDS

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in Latin America, accounting for almost half of the number of new infections (49%) and recording a considerable increase (11%) in the new infections (WHO, 2016). This is partially explained by the substantial increase in detection rate. From 2012 to 2016, the detection rate of new cases increased by 18%, and studies estimate that, in 2016, approximately 830,000 people in Brazil were living with HIV, of which 694,000 were diagnosed (Brazil, 2017).

Infection in men aged 50 years or older continues to be underestimated and this population has a record of the lowest rates of HIV testing. Official Brazilian data report that the lowest rates of HIV detection are recorded in the male population aged 50 or older, and between 2007 and 2017 this rate has registered a slight decrease (Brazil, 2018). This situation worsens when considering key populations, such as men who have sex with men (MSM; Matos, Queiroz, Evangelista, Reis, & Sousa, 2019), because they are surrounded by issues related to homophobia, racism, and inequality associated to their sexual orientation, gender, and cultural origin (Lui et al., 2018).

In this sense, age is often associated with HIV testing because younger men seek tests more often in health services compared to older men (Knussen, Flowers, & McDaid, 2014; Redoschi, Zucchi, Barros, & Paiva, 2017). The implications of low demand lie in the false sense of security about not being infected, which places the older population at the highest risk of late diagnosis of HIV and other sexually transmitted infections (STIs; Alencar & Ciosak, 2016). This is a symptomatic aspect of the failure of health-care services to leverage opportunistically the interaction with this age group.

Most studies on HIV testing rates have few results for older MSM (50 years or older), due to the idea of asexuality associated to advanced age, as well as difficulty in recruiting these subjects for research studies (den Daas, Doppen, Schmidt, & de Coul, 2016; Matos et al., 2019; Redoschi et al., 2017). The purpose of this study was to analyze factors associated with not taking the HIV test among middle-aged (50 years old) and older MSM in Brazil, using data from an exclusive online survey with this population.

Materials and Methods

Design, Period, and Place of Study

This manuscript is part of the study "Behaviors, practices and vulnerabilities of men who have sex with men using geolocation-based applications in Brazil," developed in 2017 with representatives from all five regions of the Brazilian territory. This is an analytical study with a cross-sectional design. The subjects were reached through four location-based dating apps: Grindr®, Hornet®, SCRUFF®, and Daddyhunt®. The first three applications were chosen for being the most commonly used by MSM in Brazil (Matos et al., 2019; Queiroz et al., 2018). On the other hand, the Daddyhunt® app was chosen because it is focused on middle-aged and older MSM population (Queiroz, de Sousa, Brignol, & Evangelista, 2019). There are no official data on the range of the use of these applications in Brazil; however, some surveys indicate the expressiveness of consumption of these apps in the country (Sensor Tower, 2017).

Population, Inclusion, and Exclusion Criteria

For sample definition, a modification of Time-Location Sampling (TLS) adapted to virtual reality was used. This technique allows selecting participants with probability of selection that is known *a posteriori*, that is, a *quasi*-probability sample. Based on the mapping of the places where these men met, the day, time, and place for recruitment were randomly selected, whereas participants were systematically selected (Kendall et al., 2008). Therefore, all participants that fit in the inclusion criteria and voluntarily agreed to correctly answer the questionnaire were included. The final sample consisted of 412 MSM.

Volunteers were approached through the chosen applications and invited to respond to an online questionnaire with questions about personal, sociocultural, and health issues, as well as sexual practices (Matos et al., 2019). The inclusion criteria were: to be identified as a cisgender man, to have had at least one relationship with another man in the last 12 months, to be 50 years or older, and to be online at the time of data collection. Non-Brazilian users were excluded. If the participant expressed disinterest in participating in the research, the next online user was approached.

Study Protocol

The questionnaire consisted of mandatory and nonmandatory questions and was hosted on the Google forms website. To minimize losses and avoid errors, the form was designed to allow advancement to a new section only if all conditions (mandatory questions) were met. Thus, the questionnaire recorded only the correctly filled forms; therefore, those that were not finalized were not saved nor counted by the system.

To respond to the questionnaire, participants should inform their e-mail, avoiding duplication of entry. The e-mail address also allowed researchers to contact users in cases of "discrepant values/outliers" responses. The recruitment was carried out by two of the authors, belonging to the LGBT community, who identified themselves as cisgender men, were older than 18, had experience in

the subject studied, and signed up to the applications to approach the users, using public profile (open and with a profile picture). The collections were held daily for four consecutive months (February to May 2017), in the afternoons and evenings. Online users were chosen to enable an initial approach by researchers because offline users can indicate deactivated profiles, resulting in no answers.

Analysis of Results and Statistics

To describe the factors of interest, a descriptive analysis was performed for numerical and categorical variables. To analyze the association between not taking the test and the categorized factors of interest, the chi-square, non-parametric alternative to chi-square, and Fisher's Exact tests were used, considering a significance level at .05.

A multivariate logistic regression model was adopted to produce adjusted odds ratios (ORa) and confidence intervals were set at 95%. The outcome of interest was "non-testing in the last 12 months." Data were entered using the IBM Software Statistical Package for the Social Sciences (SPSS) version 23.0.

Ethical Aspects

The study was approved by the Research Ethics Committee (Opinion No. 1523003) and strictly complied with all the ethical precepts in Resolution 466/12, with guidelines for research with human subjects in Brazil. To participate in the research, the participants had to read the Informed Consent Form (ICF) and indicate that they agreed with the proposed objectives and participation in the study. The ICF was applied and the consent was obtained online.

Results

The study included 412 MSM aged over 50 years (Older MSM). Participants had an average of 2.7 sexual partners found through the application in the 30 days prior to the survey, with Grindr (247; 59.9%) being the most used app. Almost half of the participants (195; 47.3%) had not even once been tested in the last 12 months, although 237 (57.5%) reported being HIV negative.

Among the social, demographic, and health characteristics surveyed, factors significantly associated with not taking the HIV test were: age group; religion; current sexual partnership; to have met the partner in the apps; to use Grindr; SCRUFF, Hornet or Daddyhunt; to use app for sex; to know their own serological status for HIV; to know postexposure prophylaxis (PEP); to practice interrupted intercourse; to practice sex without penetration; to know the HIV status of their partner; number of sexual partners in 30 days; to use marijuana during sex; and to use Viagra (Table 1).

Variables statistically associated with not taking the HIV test in the bivariate analysis were included in the logistic regression analysis model, which showed that: knowing the partner through a dating application increased the chance of not being tested by 1.8 times and those who do not know the serological status of their partner had five times more chance of not being tested than those whose partner was HIV positive. In addition, avoiding ejaculation within anal cavity increased by 1.7 times the chance of not taking the test, and practicing sex without penetration increased by 2.3 times the chance of not being tested.

Using the test as a means of HIV prevention, for example by knowing the partner's serological status, increased the chance of not taking the HIV test by 2.8 times. The rare use of Viagra in sexual intercourse increased by 1.9 times the chance of not being tested. Meanwhile, not practicing a religion and being in a relationship increased the chance of taking the test in MSM aged 50 or older (ORa:4.2; Table 2).

Discussion

Older MSM users of dating apps in Brazil had low testing rates (47.3%) when compared to other app users in Los Angeles (83.1%, Winetrobe, Rice, Bauermeister, Petering, & Holloway, 2014), Washington (91.7%, Phillips et al., 2014), and Atlanta (93.5% %, Goedel & Duncan, 2015), and younger users in Brazil (61.8%; Matos et al., 2019). As for the Brazilian population in general, official data indicate lower rates than those found in the present study, which found that only 27.3% of men aged 15–64 years were tested for HIV in the last 12 months. However, when considering the age group of 50–64 years, the rate decreases to 24.9%.

The viability of using these data is questionable, since they are outdated (2013) and do not mirror the effort of the Ministry of Health of increasing the testing rates in this group, especially in the post-2015 agenda. In addition, official data consider a very limited age group for older persons (60–64 years; Brazil, 2013), reinforcing the idea of blind spot and underrepresentation of this population. The absence of these data is a frailty for public health and can be an obstacle in the goals of controlling the HIV infection. That is why this study sought to explore factors that are related to not taking the HIV test, aiming to provide a basis for future interventions and studies.

In this study, factors related to the partners (knowing the partner through the app, knowing the partner's serological status, not knowing their own serological status, and using testing as a form of prevention) and sexual practices (ejaculating outside anal cavity, practicing sex without penetration, using Viagra) considerably increase the chance of these subjects not taking the test.

Table 1. Bivariate Analysis of Factors Associated With Not Taking HIV Test in MSM Using Dating Apps in Brazil, 2017.

	Have you been tested for HIV in the last 12 months?				
	No		Yes		
Variables	*n*	%	*n*	%	*p* value*
Age group					<.001
50 to 59	53	29.9	124	70.1	
60 to 69	95	61.7	59	38.3	
70 or older	47	58.0	34	42.0	
Education					.436
Less than 9 years of study	11	39.3	17	60.7	
9 years or more	184	47.9	217	52.1	
Religion					<.001
Yes	61	36.4	124	63.6	
No	124	57.1	93	42.9	
Relationship					.357
In a relationship	51	46.0	48	54.0	
Not in a relationship/Single	144	51.5	169	48.5	
Sexual orientation					.161**
Heterosexual	2	20.0	8	80.0	
Homosexual	150	53.8	172	46.3	
Bisexual/others	43	46.6	37	53.4	
Current sexual partnership					.005
Eventual partner	138	53.1	122	46.9	
Fixed partner	15	31.3	33	68.8	
Fixed and eventual partners	42	40.4	62	59.6	
Did you meet your current partner through the app?					.005
Yes	61	36.7	105	63.3	
No	97	51.1	93	48.9	
App used					
Grindr					.002
Yes	132	53.7	114	46.3	
No	63	38.0	103	62.0	
SCRUFF					.015
Yes	86	55.1	70	44.9	
No	109	42.6	147	57.4	
Hornet					.007
Yes	102	54.8	84	45.2	
No	93	41.2	133	58.8	
Tinder					.308
Yes	31	41.9	43	58.1	
No	164	48.5	174	51.5	
Daddyhunt					.001
Yes	71	60.2	47	39.8	
No	124	42.2	170	57.8	
Reason for use					
Making friends					.516
Yes	54	44.6	67	55.4	
No	141	48.5	150	51.5	
Sex					.029
Yes	180	49.3	185	50.7	
No	15	31.9	32	68.1	
Spend time					.094
Yes	35	39.3	54	60.7	
No	160	49.5	163	50.5	

Table 1. (continued)

| | Have you been tested for HIV in the last 12 months? | | | | |
| | No | | Yes | | |
Variables	*n*	%	*n*	%	*p* value*
Relationship					.516
Yes	59	47.2	66	52.8	
No	136	47.4	151	52.6	
Time of app use					.425
12 months or less	84	49.7	85	50.3	
More than 12 months	111	45.7	132	54.3	
Had STIs in recent months ***					.237
Yes	38	41.8	53	58.2	
No	157	48.9	164	51.1	
HIV status					<.001
Positive	15	31.3	33	68.8	
Negative	94	39.7	143	60.3	
Don't know	86	67.7	41	32.3	
Knows the PEP					.013
Yes	70	40.0	105	60.0	
No	125	52.7	112	47.3	
Knows the PrEP					.102
Yes	38	39.8	58	60.4	
No	157	49.7	159	50.3	
Prevention methods					
Condom					.554
Yes	168	47.3	187	52.7	
No	27	47.4	30	52.6	
Ejaculate out of the anal cavity					.002
Yes	90	57.3	67	42.7	
No	105	41.2	150	58.8	
Sex without penetration					.029
Yes	50	58.1	36	41.9	
No	145	44.5	181	55.5	
Know partner's serological status					.015
Yes	10	27.8	26	72.2	
No	185	49.2	191	50.8	
Do you know your partner's serological status?					.001
No partner	44	44.0	56	56.0	
Yes. Positive	7	36.8	12	63.2	
Yes. Negative	27	29.7	64	70.3	
I do not know	117	57.9	85	42.1	
Number of sexual partners†					.025
No sexual partner	31	57.4	23	42.6	
One partner	46	37.7	76	62.3	
More than one partner	118	50.0	118	50.0	
Use of drugs during sex†					.050
Marijuana					
Yes	35	59.3	24	40.7	
No	160	45.3	193	54.7	
Alcohol					.098
Yes	62	41.9	86	58.1	
No	128	50.6	125	49.4	

(continued)

Table 1. (continued)

Variables	Have you been tested for HIV in the last 12 months?				
	No		Yes		
	n	%	*n*	%	*p* value*
Use of Viagra					.007
Never	96	41.2	137	58.8	
Sometimes	76	58.5	54	41.5	
Always	23	46.9	26	53.1	

Note. MSM = men who have sex with men; STIs = sexually transmitted infections; PEP = postexposure prophylaxis; PrEP: pre-exposure prophylaxis. *Statistical significance was set at .05; **Fisher's exact test; ***12 months prior to the survey. †30 days prior to the survey.

This is the first study to address the factors associated with not taking the HIV test exclusively between middle-aged and older MSM. Most investigations that approach the subject focus mainly on young people (<25 years) and young adults (<45 years; Queiroz et al., 2017; Brito et al., 2015) and tend to generalize the findings by extrapolating them, disregarding intrinsic characteristics in this segment of the population, who are constantly associated with the idea of asexuality. In general, the male population is less likely to be tested for HIV and seek treatment, are more likely to initiate treatment late, and to die from AIDS-related complications when compared to women (UNAIDS, 2017).

The problem of low testing rates in male population is often associated with the difficulty encountered by healthcare services in approaching these subjects. Different from the female population, in which the HIV test gained strength with the entry of women into basic health services, such as prenatal care, the points of entry for the male population have not yet been found, which considerably limits the acceptance of the HIV test among them (Sullivan et al., 2012; UNAIDS, 2017) and shows the existence of a blind spot in policies aimed at HIV prevention.

In Western societies, cultural factors associated with patriarchy, stereotypes, and the concept of toxic masculinity generate an unfavorable environment for openly discussing safer sex, HIV testing, and access and adherence to treatment among men (UNAIDS, 2017).

When it comes, specifically, to MSM, this unfavorable environment is even more critical due to issues of gender, sexuality, stigma, and prejudice that alienate these people from health services. Added to this situation is the absence of a discussion about the sexual health of MSM older than 50, both due to the invisibility as a member of the LGBT population and to the sexuality of older people, thus conferring a double invisibility because of the intersectionality of these subjects' vulnerability (Queiroz et al., 2019).

Unlike health care, other markets are increasingly targeting these subjects, developing products that enhance sexual performance (Viagra) and facilitate the meeting of partners (apps). The development of a geo-location-based dating application (Daddyhunt) exclusively for joining older MSMs (popularly called daddies) with younger partners (popularly called twinks) exemplifies this situation. Although these applications may have a considerable impact on the sexual life of older MSM, the lack of research addressing this issue makes it difficult to develop a further discussion. The results allow the postulation that the relationships established in these apps substantially influence the sexual health of users.

The agility and "rush" that pervades relationships in this environment may explain why knowing the partner through dating apps has been associated with less chance of testing. Because the meetings are quicker and timelier, issues related to prevention methods and serological status are scarcely addressed and hardly discussed with the partner, so there is no need for a "negotiation" on the importance of HIV testing (Queiroz et al., 2018). This situation is different for MSM with fixed partners, since in this type of relationship MSM are engaged in the negotiated safety of the relationship in which regular partners agree on not having unprotected sex with others after being tested (Hill, Bavinton, & Armstrong, 2019; Queiroz et al., 2018).

A study conducted in Japan (Hill, Bavinton, & Armstrong, 2019) corroborates these findings when reporting a correlation between higher HIV testing rates in MSM who already had fixed partners and MSM who were more willing to retake the test in the future. This may explain why "being in a fixed relationship" was a protective factor for HIV testing in this research.

The results show that MSM use a variety of important and valid prevention measures, although their effectiveness may be questionable. As discussed, "knowing the partner's serological status" and "taking the HIV test as a form of prevention" are recognized as forms of STI prevention used by participants, but can provide a false sense of security, albeit indirect.

Table 2. Multivariate Analysis of Factors Associated With Not Taking the Test Among MSM User of Apps Aged 50 or Older in Brazil, 2017.

Variable	ORa	CI 95%	*p* value*
Religion			
Practicing religion	1		
Not practicing religion	0.45	[0.26, 0.76]	.003
Current relationship			
Not in a relationship	1		
In a relationship	0.24	[0.10, 0.53]	.000
Current partner			
Not knowing the partner through app	1		
Knowing partner through app	1.84	[1.07, 3.15]	.027
Partner's serological status			
Knowing the serological status	1		
Not knowing the serological status	5.07	[1.88, 13.67]	.001
Forms of prevention adopted			
Not ejaculating outside of the anal cavity	1		
Ejaculating outside of the anal cavity	1.79	[1.04, 3.05]	.034
Not engaging in sex without penetration	1		
Engaging in sex without penetration	2.30	[1.17, 4.50]	.015
Taking the HIV test as a form of prevention against STIs			
Not taking HIV test as a form of prevention	2.83	[1.05, 7.68]	.041
Use of Viagra			
Not using Viagra	1		
Using Viagra rarely in sexual intercourse	1.91	[1.20, 3.65]	.049
Using Viagra often in sexual intercourse	0.90	[0.39, 2.11]	.825

Note. MSM = men who have sex with men; ORa = odds ratio adjusted; CI = confidence interval. *Statistical significance was set at .05.

That is, relations with a subject with a known negative serostatus for HIV can induce a false sensation of lower risk and lead to neglect of regular testing and even to neglect of using condoms (Queiroz et al., 2018), which increases their vulnerability to other STIs. However, in a context where 57.3% of respondents claim to have had more than one partner in the past 30 days, this strategy may not be completely valid, as the literature points out (Hill, Bavinton, & Armstrong, 2019). Regarding the Brazilian general male population, a study showed that only 37.4% reported having had more than one partner, even though the information refers to the last 12 months and not 30 days, as in our study (Brazil, 2018).

The finding that not knowing one's own serological status is associated with a greater chance of not being tested may be related to a number of factors that lead MSM to not test regularly for STIs. Among them: fear of diagnosis, even in situations of exposure; fear of stigma; to think that using condom most of the times during the penetration is enough; and to think that there is no need to test due to a low sexual frequency (Dowson, Kober, Perry, Fisher, & Richardson, 2012; Kellerman et al., 2002; Tillman & Mark, 2015). In this regard, UNAIDS (2017) identified that in Uganda, some men reported that they preferred not to know their HIV status and thus, not to receive treatment because they associated being HIV positive with the stigma of lack of masculinity.

The stigma of living with HIV/AIDS is still one of the greatest barriers to quality of life, drug adherence, and testing. One can see the impact of this influence when, even in the LGBT community, one is forced to cope with HIV infection since its discovery, he still has difficulty in discussing it openly among his peers (Oliveira, Queiroz, de Sousa, Moura, & Reis, 2017).

Sexual practices also significantly influence the chances of testing. In this sense, avoid ejaculating within partners' anal cavity was highlighted as increasing the chance of not taking the test. The literature points out that this is a strategy for minimizing or reducing risks and damages among seronegative and seropositive MSM, and is used to justify or enable sex without condoms (Silva, 2012). It is believed that sperm brings the greatest possibility of infection and that avoiding ejaculation within their partners minimizes the chance of having some STIs (Silva, 2012).

In fact, the concentration of virus in the semen is higher than in the blood, and the highest chances of virus infection occur in receptive anal sex (138 cases per 10,000 exposures; Patel et al., 2014) which makes the attitude valid, but not completely viable as a means of

prevention, since seminal fluid can transmit the HIV virus and anal sex without a condom can transmit other STIs (Lopez-Ruz et al., 2016). This prevention strategy should be combined with others such as PrEP.

Despite PrEP not being directly associated with our object of study, it is noteworthy that only 23.3% of the sample reported knowing this strategy. This fact may be associated with the recent implementation of the strategy in the country and the fact that it focuses, almost exclusively, on young people (Queiroz & de Sousa, 2017).

Sex without penetration (or *Gouinage*, in French) refers to the sexual practices of men who relate to other men but do not like anal penetration and opt for other practices (Dubois-Arber, Jeannin, Lociciro, & Balthasar, 2012). The risk of transmission is low or nonexistent, depending on whether or not any type of penetrative practice is performed. There are still risks since this practice does not prevent, for example, oral sex without a condom, or ejaculation in the oral cavity, practices associated with risk of transmission (Zucchi et al., 2018).

It is generally clear that MSM are using different biomedical forms of HIV prevention, other than condoms. It is important to make clear to these subjects the advantages and disadvantages of these strategies, emphasizing the importance of regular testing according to official bodies such as CDC and UNAIDS. In this sense, the use of dating applications proves to be feasible for this purpose. The CDC refers to the successful experience of using one of these applications as an intervention vehicle to increase testing for syphilis (Su et al., 2015).

In addition, integrating the STI test into immunization or diabetes related consultations could increase the rate of testing among these men (de Arruda & Marcon, 2018). Currently, there are two models of services that try to demise the gap between service and population: LGBT-specific and LGBT-embedded care. In both, the critical point of change is in the environment and in the professionals (Mcclain, Hawkins, & Yehia, 2016). An open LGBT-friendly environment, with positive posters or paintings, and qualified professionals, with knowledge about LGBT health and lifestyle, increase the search and adhesion of care in this population.

Limitations

This research has limitations. First, using self-reported data for serological status may be subject to inaccuracies, omissions, and memory bias. Second, the selection of the sample used (TLS) does not produce a probabilistic sample and restricts the generalization of the findings. This approach was used due to the absence of epidemiological information of this population in Brazil, as indicated by the literature (Matos et al., 2019).

The fact that this is a cross-sectional and analytical study restricted the determination of the cause. Finally, much of the discussion was based on research involving younger MSM, due to the lack of research of this type in the literature, which reinforces the importance and originality of the study.

Conclusion

Considering HIV prevention, there is a blind spot in HIV testing prevalence to older MSM. This population is not being covered by HIV services, as pointed by the low testing rates identified in this study, which compromises the overall response to HIV, the goals set for universal health coverage, as well as the progress for Sustainable Development Objectives (SDO) from an important country perspective.

In view of the urgency of the "90–90–90 goal" for 2020, a targeted effort is required to reach the populations of older MSM. This can be done either by traditional methods (testing services) or online (using the applications themselves) to reduce the distance between the health service and its users, thus contributing to the reduction of inequalities in access to HIV treatment and prevention.

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