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The motivational PrEP cascade guides interpretation of early PrEP linkage to care for young black men who have sex with men: The Case of Chicago's PrEPLine

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Abstract

Pre-Exposure Prophylaxis (PrEP) uptake remains low among black men who have sex with men (BMSM). PrEPLine, launched in August of 2015, based in Chicago, was designed to support PrEP linkage among BMSM. PrEPLine moves clients through the Motivational PrEP Cascade, addresses barriers, and tracks outcomes.

Study findings suggest that three variables (i.e., being gay/same gender loving, living more than 15 miles from a clinic location, rescheduling an appointment) demonstrated a significant positive association with initiating PrEP. A sub-analysis of BMSM found two variables (i.e., living on the West Side of Chicago relative to those living on the South Side, and among those living in communities with a higher rate of poverty (more than 30%) relative to those living in communities with a lower rate of poverty (less than 20%)) demonstrated a significant negative association with initiating PrEP.

Keywords

Pre-Exposure Prophylaxis; HIV prevention; PrEP; PrEP outcomes; Stages of change; motivational PrEP cascade

Pre-Exposure Prophylaxis (PrEP) is an effective biomedical intervention that can prevent HIV acquisition. Daily antiretroviral medication (ARV), specifically Tenofovir-Emtricitabine (brand name Truvada), reduces sexual acquisition of HIV by more than 90% and the risk of acquisition among individuals who inject drugs is reduced by more than 70% (HIV.gov, 2018). Tenofovir-Emtricitabine used as PrEP was approved by the FDA in 2012 and within the first year more than 1,500 individuals received a PrEP prescription in the United States (US) (Eaton, Driffin, Bauermeister, Smith, & Conway-Washington, 2015). Truvada for PrEP was also approved for adolescents in May, 2018 (Gilead, 2018). National

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estimates indicate that almost 500,000 gay, bisexual and other men who have sex with men (MSM) are eligible for PrEP (Dawn K. Smith, 2015).

Young, Black, gay and bisexual men and other men who have sex with men (YBMSM) are disproportionately impacted by HIV in the US and Chicago (“HIV and African American Gay and Bisexual Men,” 2016; HIV/STI Surveillance Report, 2017) Getting to Zero (G2Z), Illinois’ statewide initiative to end HIV calls for an increase of PrEP uptake by 20% over the next 5 years (Livak et al., 2013). Out of 30,000 people eligible for PrEP in Illinois, an estimated 10% of have received prescriptions for PrEP (“Getting to Zero: A framework to eliminate HIV in Illinois,” 2017). Specifically on the South Side of Chicago, there are an estimated 5,578 YBMSM eligible for PrEP (Livak et al., 2013) and PrEP uptake among this group continues to be low (“Getting to Zero: A framework to eliminate HIV in Illinois,” 2017).

Several factors have been shown to limit PrEP uptake among YBMSM. They include decreased access and involvement with the health care system, low rates of providers prescribing PrEP, (Eaton et al., 2015; “Getting to Zero: A framework to eliminate HIV in Illinois,” 2017; Lancki, Almirol, Alon, McNulty, & Schneider, 2018) lack of PrEP awareness, perceived impact of side effects, perceived inability to pay for PrEP, along with social barriers such stigma around PrEP (“Getting to Zero: A framework to eliminate HIV in Illinois,” 2017; Mustanski et al., 2018). Some of these barriers may be due to the disconnect between the CDC’s PrEP guidelines and YBMSM. One study showed that nearly half of black, gay and bisexual men and other men who have sex with men (BMSM) who seroconverted did not meet CDC’s PrEP eligibility criteria (Lancki et al., 2018). This is concerning because BMSM are reported to be equally or more willing to utilize PrEP for HIV prevention than their white counterparts (Lelutiu-Weinberger & Golub, 2016). Finally, there are systematic and institutionalized forms of racism that limit PrEP uptake with BMSM. For example, unaddressed issues that directly impact quality of life such as intergenerational poverty, incarceration rates among black men, and inadequate housing (Collins, 2004; Schneider, Bouris, & Smith, 2015; Wheeler et al., 2018). Racism and homophobia cause physical and psychological stress, negatively impacting health outcomes, lowering awareness of and access to HIV prevention and treatment options (Arnold, Rebchook, & Kegeles, 2014). The inherent mistrust of the medical system among people of color also negatively affects outcomes among this population pertaining to HIV testing, regular engagement in medical care, and willingness to use PrEP as an HIV prevention tool (Cahill et al., 2017). Additionally, the stigma BMSM face around their sexuality adds an additional layer of discrimination, which can increase their vulnerability to HIV acquisition (Parker et al., 2017).

While there is limited data on linkage to PrEP care for YBMSM, linkage to care represents one of the first steps in the PrEP care continuum and has a number of behavioral steps in the process (Flash et al., 2018). Prochaska and DiClemente’s transtheoretical model stages of change (TMC) was used to describe behavior change for over 30 years (J. Prochaska & Diclemente, 1982). TMC identifies five Stages: precontemplation, contemplation, preparation, action, and maintenance in a cyclical format for individuals who are modifying behaviors (J. O. Prochaska, DiClemente, & Norcross, 1992). TMC has been adapted to

understand other public health concerns (Basta, Reece, & Wilson, 2008; Chang et al., 2006; Naar-King et al., 2006; Rhodes & Hergenrather, 2003) and has specifically been tailored to understand behaviors related to HIV prevention (Naar-King et al., 2006) and highly active antiretroviral therapy (HAART) adherence (Parsons et al., 2017). TMC implies motivation and access as an individual moves through the Stages, which is essential when evaluating where participants are in the PrEP linkage to care process (Parsons et al., 2017).

TMC was integrated with the PrEP care continuum and named the Motivational PrEP Cascade which can be used to identify the different thresholds an individual passes through to be successfully linked to PrEP care (Parsons et al., 2017): (1) PrEP Precontemplation, PrEP-eligible individuals that are unwilling or unaware of their HIV vulnerability; (2) PrEP Contemplation, individuals are willing to initiate PrEP and are aware of their HIV vulnerability; (3) PrEP Preparation, individuals take steps to engage in PrEP care; (4) PrEP Action & Initiation, individuals initiate PrEP; and (5) PrEP Maintenance, or PrEP adherence (Parsons et al., 2017). The purpose of aligning TMC with the PrEP care continuum is to identify gaps when moving individuals through the Stages with the goal of initiating PrEP (Figure 1). Understanding gaps in the Motivational PrEP Cascade is essential to provide additional support to PrEP-eligible individuals, especially among those who have lower rates of PrEP engagement, namely BMSM. In previous studies, high rates of inactivity in the initial Stages of the PrEP care continuum were reported with approximately half of PrEP-eligible MSM, including self-identified black men, never taking steps to move through the continuum (Kelley et al., 2015; Parsons et al., 2017).

Methods

Program Description - PrEPLine

PrEPLine, developed in 2015 in Chicago, was established as the main information and support call line as part of a city-wide social marketing and community mobilization campaign, PrEP4Love, to increase awareness and encourage PrEP uptake among Chicago's gay, black men and black women, inclusive of transgender women. PrEPLine served as a liaison between PrEPLine clients and PrEP providers via the provision of linkage-to-care services. PrEPLine's core objective is to move people through the Motivational PrEP Cascade. PrEPLine is staffed by staff who provide information about PrEP, schedule PrEP appointments and conduct reminder and follow up communications with PrEPLine clients. PrEPLine's role includes connecting PrEPLine clients to clinics that are best matched to the clients' needs, geography and insurance status. PrEPLine staff ensure PrEPLine clients can access PrEP care, actively schedule appointments for PrEPLine clients, follow-up with PrEPLine clients at each Stage of the referral process and respond to new barriers or concerns (e.g., scheduling, insurance, co-payment issues, etc.) within 24-hours. PrEPLine staff are responsible for assessing the level of support that PrEPLine clients may require to successfully attend a first appointment. If any additional services are needed that PrEPLine staff are not able to provide, PrEPLine clients may be referred to other Supportive Services programs at the University of Chicago.

PrEPLine staff adopted the Motivational PrEP Cascade to identify barriers that PrEPLine clients encounter when moving through the Stages. The Stages that aligned with the

PrEPLine's scope of work included (Parsons et al., 2017): Stage 2 (PrEP Contemplation): all PrEPLine clients who engaged with PrEPLine staff through phone calls, text messages, Facebook messages and in-person encounters; Stage 3 (PrEP Preparation): PrEPLine clients who scheduled a PrEP appointment during their PrEPLine encounter; and Stage 4 (PrEP Action & Initiation): PrEPLine clients that initiated PrEP. The data collected through the PrEPLine was used to identify trends of both the entire cohort, and within a BMSM sub-cohort. We wanted to be able to develop hypotheses and draw conclusions as to why PrEPLine clients scheduled a PrEP appointment (Stage 3), but did not initiate PrEP (Stage 4) by identifying factors significantly associated with reaching Stage 4.

Sampling and recruitment

Data was collected between August 12th, 2015 and March 31st, 2018 through the PrEPLine program. PrEPLine clients in Stage 3 (PrEP Preparation phase: made a PrEP appointment) was determined to be the main sample for analysis as it had the least amount of missing data. For PrEPLine clients in Stage 3, PrEPLine staff followed them throughout the linkage process to assist in rescheduling appointments, captured and addressed barriers for missed appointments, and identified outcomes. Sociodemographic data collection was conducted during initial and scheduling encounters. Outcome data, as described below, was collected at confirmation calls scheduled one week after the PrEPLine clients' PrEP appointment. A sub-sample of BMSM PrEPLine clients in Stage 3 was also analyzed. Data collected was stored in REDCap (Harris et al., 2009).

Measures

Demographic characteristics: We assessed age, gender, race, ethnicity, sexual orientation and address with each PrEPLine client during their initial phone call. Sociodemographic, scheduling information, addresses, and outcome data was abstracted from the PrEPLine for all PrEPLine clients in Stage 3 from August 15, 2015 through March 31, 2018. PrEPLine clients' home addresses and their scheduled clinic location were geocoded using the ggmap software package in R (Kahle & Wickham, 2013). The resulted XY coordinate pair for each address was then used to calculate the travel distance to the clinic (in miles) and the travel time to the clinic (in minutes).

Neighborhood poverty (NP): NP was acquired from the American Community Survey (ACS) 2012–2016 by ZCTA and assigned it based on PrEPLine clients zip codes of residence during the time of their appointments (“American Community Survey 2016,” 2016).

Poverty level (PL): PL was defined as the percentage of residents in each zip code with incomes below the federal poverty threshold and were categorized as: 0%–19.99% (low/medium poverty), 20%–29.99% (high poverty), and 30%–100% (very high poverty) (Toprani & Hadler, 2013).

Study Outcomes

PrEP Action and Initiation (Stage 4) information was collected in a subsequent follow up call with PrEPLine clients to confirm their PrEP visit outcome (initiated PrEP or did not initiate PrEP). We also did this for a subsample, made up of BMSM.

Statistical Analysis

Descriptive analyses for the entire PrEPLine cohort and the BMSM sub-sample was completed. Comparisons were made between Stage 3 and Stage 4 of the PrEP care continuum. Chi-square or Fisher's exact tests were used to assess differences of predictors in these two groups.

Subsequently, univariate and multivariable logistic regression analyses were performed to address our objective of identifying factors significantly associated with reaching Stage 4 – PrEP Action & Initiation. Univariate analyses were conducted to shortlist variables for the multivariable model; all variables that were significantly associated with the outcome (level of significance=0.20) were included in the multivariable model. Time to clinic was not included in the final model because it was closely correlated with distance to clinic ($r=0.86$). There were 43 PrEPLine clients in our sample who had missing data. These individuals were excluded from the original multivariable model (data not shown), yet the final model imputed the value for each variable by the median of that variable and conducted the same multivariable analysis without any missing data, and yielded the same results as the original model. The same imputation technique was done with the sub-cohort and repeated the multivariable analysis. All statistical analyses were conducted in Stata 14.0 ("Stata Statistical Software: Release 14," 2015).

Results

Demographic Characteristics

There were 566 unique PrEPLine encounters between August 12th, 2015 and March 31st, 2018. PrEPLine clients who were solely seeking general PrEP information accounted for 31% (178) of PrEPLine clients who engaged with PrEPLine and 68% (386) of PrEPLine clients showed interest in initiating PrEP (Stage 2). Of the latter, 67.4% (260) scheduled a PrEP appointment through the PrEPLine (Stage 3). Of the 178 PrEPLine clients in Stage 2 and indicated that they were solely seeking general information, 155 individuals identified the reason(s) for their call and were able to choose more than one response. Almost half of the responses (48%, 99) indicated a desire to increase PrEP knowledge, while 17% (35) sought information on financial assistance and insurance coverage for PrEP, 9% (19) provided feedback for the PrEP4Love campaign (positive and negative), 9% (19) were organizations or providers seeking information about PrEP, 6% (13) were seeking out of state resources, 5% (11) were looking for resources for postexposure prophylaxis (PEP) and PrEP refills and 5% (10) were categorized as "other." Our main analytic sample consisted of 256 individuals in Stage 3 with the intention of initiating PrEP.

Most of the PrEPLine clients in Stage 3 ($n=256$) identified as YBMSM with 80% (206) of individuals under the age of 35, 78% (199) identified as Black, 88% (225) identified as male

and 80% (204) as gay/same gender loving or bisexual. Among this sample, 41% (104) also lived on the South Side of Chicago and 42% (107) living in very high poverty areas. More than a third (38%, 97) lived within 5 miles of the Federally Qualified Health Center (FQHC) at which they were linked for PrEP care. Almost half came from internal referrals (48%, 123), meaning individuals were identified as PrEP-eligible through other programming at the community space, showed interest in receiving PrEP care, and were subsequently connected to the PrEPLine. Among the PrEPLine clients cohort, Chi-square or Fisher's exact tests were conducted and identified 5 variables that have a significant relationship with initiating PrEP: gender, race, sexual orientation, poverty level and if PrEPLine clients rescheduled a PrEP appointment (Table 1). Most PrEPLine clients (77.4%, 198) in Stage 3 scheduled a PrEP appointment at the main PrEP providing site on the South Side of Chicago.

Among the cohort of BMSM PrEPLine clients in Stage 3 (n=150), 98% (147) identified their gender identity as male and 2% (3) identified as genderqueer, transgender or other. 89% (133) were under the age of 35, 49% (73) resided on the South Side of Chicago. Of the BMSM cohort, 54% (73) living in very high poverty areas. 41% (62) lived within 5 miles of the clinic at which they were scheduled for their PrEP appointment and 65% (98) were internal referrals to PrEPLine. Chi-square or Fisher's exact tests were also ran for the BMSM PrEPLine clients sub-sample and significant relationships were found between poverty level and initiating PrEP.

Multivariable analysis

The multivariable model of all PrEPLine clients in Stage 3 assessed significant correlates of PrEP initiation which included 6 variables: gender, race, sexual orientation, neighborhood, poverty level and rescheduled a PrEP appointment (Table 2). In the final multivariable model, the following variables demonstrated significant positive association with our sample initiating PrEP in Stage 3: Identifying as gay/same gender loving (aOR: 4.05, 95% CI: 1.56–10.54) and bisexual (aOR: 3.54, 95% CI: 1.18–10.60) relative to heterosexual men, living more than 15 miles away from clinic relative to less than 5 miles away (aOR: 6.53, 95% CI: 1.14–37.40), and rescheduling an appointment relative to not rescheduling (aOR: 0.04, 95% CI: 0.19–0.86). These data outcomes are interpreted as the adjusted odds ratios as men who identified as gay/same gender loving reported 4.05 more likelihood to reach Stage 4 (PrEP Action & Initiation) compared to men who identify as heterosexual; men who identified as bisexual reported 3.54 more likelihood to reach Stage 4 (PrEP Action & Initiation) compared to men who identify as heterosexual; men living more than 15 miles away from a clinic reported 6.53 more likelihood to reach Stage 4 compared to men who live less than 5 miles away from a clinic; and men rescheduling an appointment reported 0.04 more likelihood to reach Stage 4 compared to men not rescheduling an appointment.

The sub-sample of BMSM multivariable model included age, neighborhood, poverty level, and rescheduled a PrEP appointment (Table 3). Compared with BMSM living on the South side, those living on the West side were less likely to initiate PrEP (aOR: 0.32, 95% CI: 0.14–0.77). Residential poverty level was also found to be associated with PrEP initiation; BMSM PrEPLine clients who lived in communities with more than 30% of the population

below U.S. poverty level were less likely to initiate PrEP relative to those who lived in communities with less than 20% of the population below the U.S poverty level (aOR: 0.07, 95% CI: 0.01–0.81). These data outcomes are interpreted as the adjusted odds ratios as men who identified as BMSM living on the West side reported 0.32 less likelihood to reach Stage 4 (PrEP Action & Initiation) compared to BMSM living on the South Side; BMSM who lived in communities with more than 30% of the population below U.S. poverty level reported 0.07 less likelihood to reach Stage 4 compared to those who lived in communities with less than 20% of the population below the U.S poverty level.

Discussion

The multivariable analysis of PrEPLine clients who have scheduled a PrEP appointment (Stage 3) indicates that gay/ same gender loving, bisexual individuals, and those who lived more than 15 miles away from the clinic at which they were scheduled for a PrEP appointment have higher rates of reaching PrEP action & initiation (Stage 4). In addition, among the BMSM PrEPLine clients sub-sample, those who lived on the West side, and those resided in an area with very high poverty were less likely to be successfully linked to care.

Gay/ same gender loving individuals and bisexual individuals were more likely to reach Stage 4 compared with their heterosexual counterparts. We hypothesize that this may be related to the PrEP4Love campaign reach which is designed to attract gay/ same gender loving, bisexual, and transgender people of color.

Our analysis also found that those who lived further away from a PrEP clinic were more likely to reach Stage 4 (PrEP Action & Initiation). This was a surprising finding that we hypothesize may be aligned with the stages of change model because it may be indicative that individuals who are ready to change their behavior are willing to act regardless of potential obstacles. On the other hand, this could also be indicative of PrEPLine clients who live more than 15 miles from their clinic and are initiating PrEP have access to reliable transportation, such as a car, which increases access to the PrEP clinic at which they were scheduled for a PrEP appointment. Whereas those who live closer to a PrEP clinic may have to take public transportation, posing barriers such as not having bus fare, weather and safety.

While PrEP uptake was higher among BMSM compared with other groups, further analysis revealed that BMSM have significant barriers in moving from scheduling a PrEP appointment (Stage 3) to initiating PrEP (Stage 4). BMSM living on the West Side were less likely to reach Stage 4 Stage than those living on the South Side. There are historic differences between the two neighborhoods: Black individuals resided mainly on the South Side's Bronzeville neighborhood as a result of The Great Migration which took place between 1915 and 1970 (Layson & Warren). During this time the black population in Chicago increased from making up 2% of the city's population to about a third (Layson & Warren). When public housing projects began to expand on the West Side of Chicago, Black families living in the city began to move to those areas ("The Slums of Chicago," 2017). White flight and redlining perpetuated the confinement of Black residents to the projects and slums on the west side ("The Slums of Chicago," 2017). The construction of a major highway in the city created a structural barrier between the impoverished West Side and the

White Central/ North Sides, exacerbating the racist housing system the city holds (“The Slums of Chicago,” 2017). Since most of the appointments (84.5%) of BMSM PrEPLine clients were scheduled for a PrEP appointment on the South Side of Chicago, individuals that reside on the West Side (30%) might have additional barriers to PrEP care. After our initial analysis, the main west side PrEP clinic has become a linkage to care partner. Our analysis also suggested that BMSM PrEPLine clients in Stage 3 were less likely to reach Stage 4 if they resided in an area with very high poverty. Finding that low income neighborhoods and community areas have lower PrEP uptake represents an important structural barrier to PrEP access; this barrier exists despite widespread Medicaid expansion in this community and PrEP availability at no added cost. Individuals in low income neighborhoods may also be experiencing competing needs, such as not being able to take time off work to see a PrEP provider, for example.

It is important to note the differences between the entire sample of PrEPLine clients and the BMSM sub-sample. Within our entire sample, the associations found were expected due to the PrEP4Love campaign marketing PrEP for gay/ same gender loving men, especially on the South and West Sides of Chicago. In contrast, within the BMSM sub-sample there was more indication of barriers in PrEP access, such as neighborhood area and poverty level. This aligns with the increased need for accessible PrEP care, especially among communities of color.

Limitations

There were two significant limitations observed. First, as a result of missing demographic data among those who expressed an interest in PrEP (Stage 2), we decided to focus on the Stage 3 population (scheduled a PrEP appointment), because the demographic data in this population were almost completely accounted for. Due to the nature of data collection during the PrEPLine process (obtaining several demographics once interest in PrEP was elicited), we were unable to examine demographic factors associated among PrEPLine clients who were not ready to schedule a PrEP appointment, but were engaging with PrEPLine to learn more about PrEP (Stage 2). Missing data remained among other variables used in our analysis, but this was resolved by imputing data into those missing fields. Models with imputed data found comparable results with models that had missing data included in the model. Second, almost half of our sample (48%) and almost two-thirds (65%) of our BMSM sub-sample were referred internally which could introduce bias. This could have skewed our sample towards successfully initiating PrEP because of previous contacts. Comparisons of different forms of engagement with PrEPLine did not differ with respect to successful initiation of PrEP (data not shown).

Future research

Future research should include instituting assessments that can determine if our interpretations of the outcomes found in this study are true. For example, including assessment questions to see how clients are getting to clinic, specific barriers they encounter, and their level of motivation to more directly determine their location within the Motivational PrEP Cascade. Currently, we are determining their level of motivation based on behavior and hypotheses, but it would be best practice to assess further using evidence-based

practices to conduct an initial assessment and to see PrEPLine clients move through the Motivational PrEP Cascade.

Another area for future research is within the PrEP care continuum in order to best understand and address the barriers BMSM face in engaging PrEP care. One area of future investigation is an examination of PrEP engagement as it relates to Chicago's Getting to Zero framework by increasing PrEP care from the current rate (10%) to 30%, in conjunction with increasing treatment from 50% (current) to 70%, it is predicted that new HIV cases will be fewer than 100 cases per year by 2026 ("Getting to Zero: A framework to eliminate HIV in Illinois," 2017). For example, 46 BMSM initiated PrEP in 2017 through PrEPLine which is 4% of the city's goal. PrEPLine's goal over the next 4 years would be to then to maintain that 4% effort as the city's goals increase by 4% each year from 2018–2030. This increases PrEPLine's PrEPLine clients successfully linked to PrEP care by about 20 individuals per year. With this information, PrEPLine can better assess marketing, outreach efforts, and capacity to ensure all of these individuals can be properly supported. If other organizations also map out their efforts, as a city we would be able to see if this goal is attainable and if not where there are opportunities for expanding PrEP programming to fill the gaps. We can also use the outcomes found by this study to inform the populations that need the most support. BMSM on Chicago's West side and those living in communities with higher rates of poverty are populations that would need additional supportive programming to keep them engaged and retained in PrEP care.

Another area for future research would be a more in-depth cost analysis of programs such as PrEPLine and in particular a cost analysis for PrEPLine clients who reached Stage 4 through different community-based programming. PrEPLine's engagement efforts with PrEPLine clients in Stage 4 ranged from 1–9 different encounters (data not shown). It would be valuable to compare these rates of engagement efforts to other PrEP linkage programs and identify the most cost effective and efficient way to successfully link YBMSM to PrEP. Such information would also be helpful in determining if the G2Z framework is possible in the current PrEP funding landscape.

Lastly, while this project has followed the Motivational PrEP Cascade, PrEPLine's scope of work did not allow us to get a clear picture of the PrEP Precontemplation (Stage 1: HIV-risk unaware) or PrEP Maintenance (Stage 5: PrEP retention). Individuals eligible for PrEP in Illinois is estimated at 30,000 broadly and 5,578 for YBMSM on the South Side of Chicago ("Getting to Zero: A framework to eliminate HIV in Illinois," 2017; Livak et al., 2013; Smith, 2018) but we are unsure if those who are engaged in PrEPLine's Stage 2 are a direct result from the city's estimated PrEP Precontemplation Stage. PrEPLine staff links all interested PrEPLine clients to PrEP if they report a negative HIV status, regardless of the behavioral indicators to determine PrEP-eligibility at the city level. This is because there may be a discord with what PrEPLine clients are disclosing to PrEPLine staff and their actual behaviors, or perceived HIV vulnerability may be lower than tangible vulnerability. PrEP maintenance (Stage 5) is also an essential component of the Motivational PrEP Cascade that can help establish measurable goals for PrEP adherence within the G2Z framework. PrEP retention is assumed to be at 50% due to the HIV care's retention rate, but it is unclear what the difference are between measuring retention in HIV care and retention

in PrEP care for YBMSM (HIV/STI Surveillance Report, 2017). PrEP retention is also not monolithic, because it is susceptible to changes in behavior and life circumstances which may make retention in PrEP care more variable. Looking into statistical models that account for the fluctuation of PrEP retention rates would be helpful when community based organizations and other community entities establish PrEP linkage and retention goals.

Conclusions

Overall, we were able to identify obstacles BMSM customers faced when moving through the Motivational PrEP Cascade. BMSM are faced with a considerable number of challenges regarding PrEP uptake, and future research needs to further illuminate the specific barriers that prohibit moving through the Motivational PrEP Cascade. By continuing to explore potential PrEP linkage programs through this lens, we can get a better sense of how to support and increase access for those who are most vulnerable to HIV exposure, as well as how to successfully advance YBMSM from PrEP Precontemplation to PrEP Maintenance.

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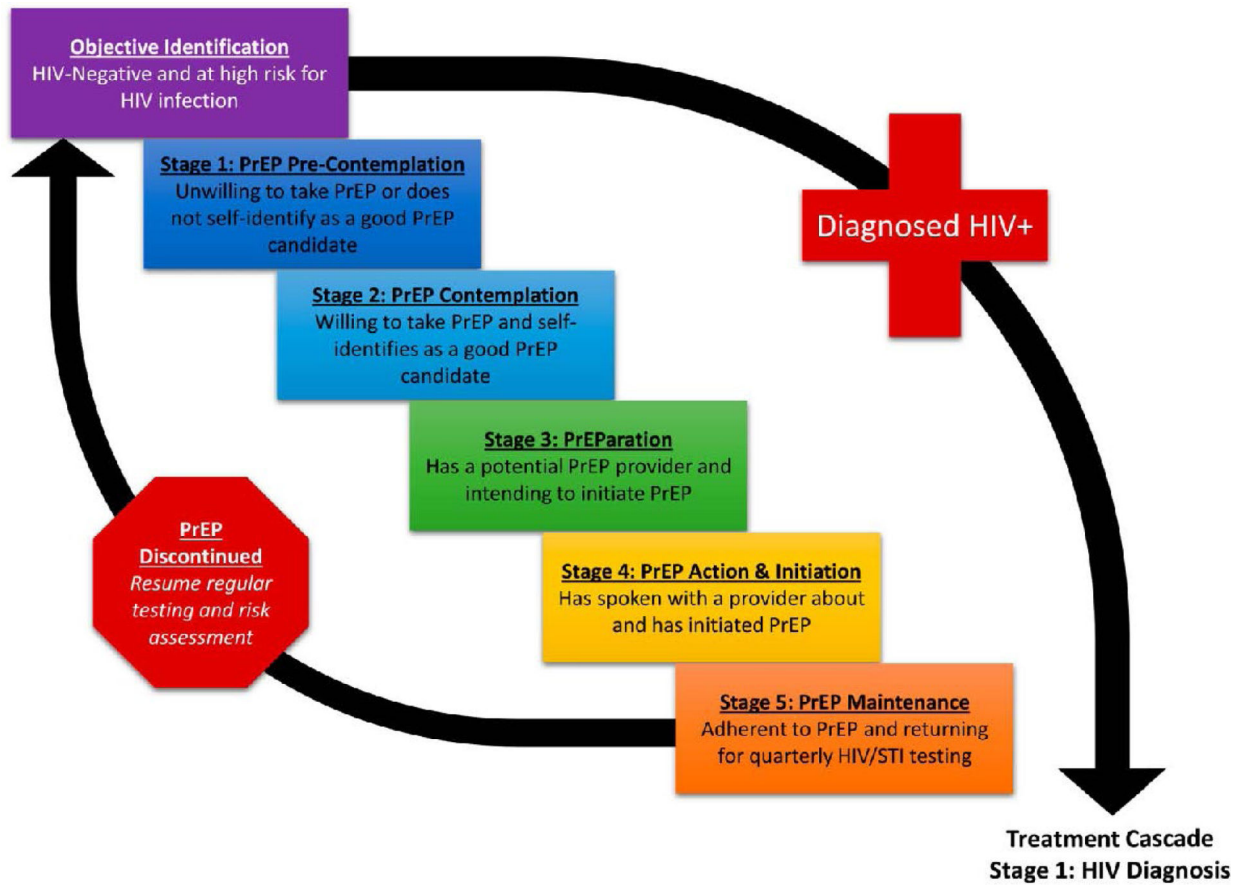


Figure 1.
Parsons et al., 2017 Motivational PrEP Cascade

Table 1:

Sociodemographic characteristics by PrEP Outcome Status of callers who scheduled a PrEP appointment (n=256**)

	Total (n=256) n (%) ^a	Did Not Initiate PrEP (n=86) n (%)	Initiated PrEP (n=170) n (%)	p Value
Age				
<20	27 (11)	13 (15)	14 (8)	0.47
20–24	72 (28)	24 (28)	48 (29)	
25–29	74 (29)	21 (24)	53 (32)	
30–34	33(13)	12 (14)	21 (13)	
35	48 (19)	16 (19)	32 (19)	
Gender				
Male	225 (88)	67 (79)	158 (93)	*<0.001
Female	24 (9)	17 (20)	7 (4)	
Genderqueer/Trans/Other	6 (2)	1 (1)	5 (3)	
Race/Ethnicity				
Black	199 (78)	74 (87)	125 (74)	*0.047
Latin(x)	25 (10)	7 (8)	18 (11)	
White	25 (10)	3 (4)	22 (13)	
DK/Other	6 (2)	1 (1)	5 (3)	
Sexual Orientation				
Gay/SGL	161 (65)	41 (50)	120 (72)	*0.001
Bisexual	43 (17)	14 (17)	29 (17)	
Heterosexual	45 (18)	27 (33)	18 (11)	
Neighborhood				
North Side	39 (17)	7 (9)	32 (21)	0.06
West Side	59 (26)	26 (33)	33 (22)	
South Side	104 (45)	38 (48)	66 (44)	
Outside of Chicago	27 (12)	9 (11)	18 (12)	
Poverty Level				
<20%	48 (21)	12 (15)	36 (24)	*0.01
20.0 – 29.9%	74 (32)	19 (24)	55 (37)	
30%	107 (47)	49 (61)	58 (39)	
Distance to Clinic (Miles)				
<5	97 (45)	34 (48)	63 (43)	0.29
5–9.9	60 (28)	23 (32)	37 (25)	
10–14.9	22 (10)	6 (8)	16 (11)	
15	38 (18)	8 (11)	30 (21)	
Time to Clinic (Minutes)				
<10	37 (17)	10 (14)	27 (18)	0.24
10–19	97 (45)	36 (51)	61 (42)	

	Total (n=256)	Did Not Initiate PrEP (n=86)	Initiated PrEP (n=170)	p Value
	n (%) ^a	n (%)	n (%)	
20–29	52 (24)	19 (27)	33 (23)	
30	31 (14)	6 (8)	25 (17)	
Referral				
Outside	52 (20)	14 (16)	38 (22)	0.51
Internal	123 (48)	44 (51)	79 (46)	
No Referral	81 (32)	28 (33)	53 (31)	
Rescheduled Appointment				
No	212 (83)	64 (74)	148 (87)	*0.01
Yes	44 (17)	22 (26)	22 (13)	

^aMay not sum to 100% due to rounding.

* - p<0.05

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Table 2.

Multivariable model for correlates of PrEP outcome among PrEPLine clients who scheduled a PrEP appointment in Chicago, PrEPLine 2016–2018 (n=256)

	n (%)	aOR [95% CI]	p Value
Gender			
Male	226 (88)	1.46 [0.51, 4.15]	0.48
Female/Trans/Other	30 (12)	ref	
Race			
Latin (x)	25 (10)	0.90 [0.29, 2.77]	0.85
Black	200 (78)	ref	
White	25 (10)	3.06 [0.71, 13.12]	0.13
Other	6 (2)	2.71 [0.26, 28.76]	0.41
Sexual Orientation			
Gay/SGL	168 (66)	4.05 [1.56, 10.54]	*0.004
Bisexual	43 (17)	3.54 [1.18, 10.60]	*0.02
Heterosexual	45 (18)	ref	
Neighborhood			
North Side	39 (15)	1.60 [0.40, 6.32]	0.50
West Side	59 (23)	0.73 [0.35, 1.53]	0.41
South Side	131 (51)	ref	
Outside of Chicago	27 (11)	0.16 [0.02, 1.08]	0.06
Poverty Level			
<20%	48 (19)	ref	
20.0 – 29.9%	101 (39)	2.51 [0.71, 8.93]	0.16
30%	107 (42)	0.91 [0.25, 3.36]	0.89
Distance to Clinic (Miles)			
<5	97 (38)	ref	
5–9.9	99 (39)	0.56 [0.27, 1.17]	0.13
10–14.9	22 (9)	1.32 [0.39, 4.42]	0.66
15	38 (15)	6.53 [1.14, 37.40]	*0.04
Rescheduled Appointment			
No	212 (83)	ref	
Yes	44 (17)	0.40 [0.19, 0.86]	*0.02

* Significant at p<0.05

Table 3.

Multivariable model for correlates of PrEP outcome among BMSM PrEPLine clients who scheduled a PrEP appointment in Chicago, PrEPLine 2016–2018 (n=150)

	n (%)	aOR [95% CI]	p Value
Age			
<20	20 (13)	0.25 [0.04, 1.53]	0.13
20–24	48 (32)	0.34 [0.06, 1.83]	0.21
25–29	49 (33)	0.31 [0.06, 1.68]	0.17
30–34	16 (11)	0.17 [0.03, 1.09]	0.06
35	17 (11)	ref	
Neighborhood			
North Side	9 (7)	0.31 [0.04, 2.48]	0.27
West Side	40 (30)	0.32 [0.14, 0.77]	*0.01
South Side	73 (54)	ref	
Outside of Chicago	13 (10)	0.25 [0.05, 1.26]	0.09
Poverty Level			
<20%	14 (10)	ref	
20.0 – 29.9%	48 (36)	0.18 [0.02, 1.91]	0.15
30%	73 (54)	0.07 [0.01, 0.81]	*0.03
Rescheduled Appointment			
No	121 (81)	ref	
Yes	29 (19)	0.59 [0.24, 1.47]	0.26

*Significant at p<0.05