Intersectional Stigma and Prevention Among Gay, Bisexual, and Same Gender–Loving Men in New York City, 2020: System Dynamics Models

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Objectives. To create causal loop diagrams that characterize intersectional stigma experiences among Black, gay, bisexual, same gender–loving, and other men who have sex with men and to identify intervention targets to reduce stigma and increase testing and prevention access.

Methods. Between January and July 2020, we conducted focus groups and in-depth interviews with 80 expert informants in New York City, which were transcribed, coded, and analyzed. These qualitative insights were developed iteratively, visualized, and validated in a causal loop diagram (CLD) using Vensim software.

Results. The CLD revealed 3 key feedback loops—medical mistrust and HIV transmission, serosorting and marginalization of Black and gay individuals, and family support and internalized homophobia—that contribute to intersectional HIV and related stigmas, homophobia, and systemic racism. On the basis of these results, we designed 2 novel intervention components to integrate into an existing community-level anti-HIV stigma and homophobia intervention.

Conclusions. HIV stigma, systemic racism, and homophobia work via feedback loops to reduce access to and uptake of HIV testing, prevention, and treatment.

Public Health Implications. The CLD method yielded unique insights into reciprocal feedback structures that, if broken, could interrupt stigmatization and discrimination cycles that impede testing and prevention uptake. (*Am J Public Health*. 2022;112(S4):S444–S451. https://doi.org/10.2105/AJPH.2022.306725)

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Gay, bisexual, same gender–loving, and other men who have sex with men (SGL/MSM) are disproportionately affected by HIV in the United States.[1] In 2018, over two thirds of new HIV cases were attributed to male-to-male sexual contact, and SGL/MSM make up about 40% of new HIV cases nationwide.[2,3] Geographic hotspots in urban areas of northeastern states report new case rates among Black SGL/MSM that are equal to those of some southern states.[4] New York City (NYC) is the metropolitan area with the largest number of new HIV infections among MSM, with prominent racial disparities in HIV infection.[5]

Increasing uptake of postexposure and preexposure prophylaxis (PEP/PrEP) is critical to ending the HIV epidemic in the United States,[6] especially among Black SGL/MSM, but prescribing data reveal that Black and Latinx SGL/MSM make up just 25% of PrEP users[7,8] and are 6 times less likely to be prescribed PrEP as White MSM. HIV testing is crucial to access, and infrequent testing delays diagnosis, contributing to morbidity and mortality.[9] Approximately 80% of new infections are transmitted from the 40% of people living with HIV but undiagnosed or not in care.[10] Thus, consistent testing is now recommended for MSM.[11]

Black SGL/MSM are more likely than White MSM to be living with undiagnosed HIV.[12,13] Although HIV testing has increased among Black and Latinx MSM,[14] health care access and quality,[15] lack of structurally or culturally competent services,[16] low risk perception[17,18] and fear of a positive result[19] present multilevel barriers to testing among Black SGL/MSM.[20] Barriers to PrEP use are also multilevel,[21] and include health care system–level factors (e.g., funding or health insurance, access to settings with PrEP, messaging), provider-level factors (e.g., inadequate knowledge, discomfort discussing sexual behavior, cultural competency, and bias),[22–24] and individual-level factors (e.g., cost, stigma, lack of awareness, and low risk perception).[22,25–27]

HIV-related stigmas (e.g., HIV stigma, HIV testing stigma, and PrEP stigma)[28,29] and homophobia act independently and in combination to reduce prevention and treatment access among MSM. HIV stigma is a key barrier to HIV testing,[30,31] care engagement,[32] antiretroviral therapy use,[33] and intention to use PEP/PrEP.[34] HIV testing stigma also impedes self-testing.[35] Additionally, PrEP/PEP stigma,[36] which emerged in the early days of PrEP,[37] continues to be reported by MSM,[38] and community-level and anticipated PrEP stigma[39] influences uptake of biomedical prevention.[40] Homophobia is a barrier to prevention[41,42] and is negatively associated with PEP awareness and use.[43] Although associations between homophobia and HIV testing are mixed,[44] internalized homophobia has been associated with never testing among Black MSM.[45]

HIV-related stigma and homophobia are often racialized, exacerbating barriers to testing, prevention, and treatment among MSM of color.[42,46,47] The intersections among systemic racism, HIV stigma, HIV-related stigmas, and homophobia particularly affect MSM of color, as systemic racism, manifest in discriminatory policies and practices,[48,49] blocks opportunities and produces stratification.[50] Medical racism[51] is of particular importance to Black SGL/MSM[52–54] and, together with medical mistrust, is a barrier to testing, care, and prevention independently and in interaction with HIV-related stigmas and homophobia.[55–58] This intersectional interaction among systems of oppression fundamentally condition how stigmatized individuals experience their social worlds.[59] Combined, they interact to drive fear and anxiety (e.g., fear of positive HIV test results or being identified as gay), avoidant coping (e.g., HIV- or sexual health–related service aversion), and medical mistrust or medication skepticism (e.g., selective communication, side effect concerns), which reduce testing and PEP/PrEP uptake.[28]

Social policies as well as community-level and multilevel interventions can reduce experienced stigma and support individuals in responding to and resisting stigma and discrimination.[60–62] However, the knowledge base upon which to build complex anti-intersectional stigma and discrimination interventions is sparse. To address this gap, we applied a qualitative system dynamics (SD) modeling approach to create causal loop diagrams (CLDs) that characterize the dynamic interactions among intersecting stigmas and systems of oppression, including HIV stigma, homophobia, and racism, among Black SGL/MSM in NYC. SD modeling is a systems science approach that has been used to study the dynamic behavior of complex systems and problems in health care, engineering, and social work and provides a framework to develop insights into potential interventions.[63] SD allows researchers to represent complex systems, including modifying and mediating factors.[64,65] The primary aim of the CLD development process here was to identify intervention targets to reduce intersectional stigma and increase HIV testing and prevention uptake. Thus, as a qualitative SD model, our model formalizes feedback loops, but does not yield a simulation of a mathematical SD model. In this article, we present the results of the CLD development process and application of these results to intervention component design; next, the components will be pilot tested and integrated into an existing community-level intervention.[62]

METHODS

System dynamics modeling provides a systematic method for description, exploration, and analysis about the dynamic behavior of intersectional stigma experiences among Black SGL/MSM. We generated CLDs based on analysis of transcripts and notes from a series of focus groups (n = 11 groups; n = 59 participants) and in-depth interviews (n = 21) with 80 expert informants, comprising Black SGL/MSM (n = 59) and HIV and social service professionals of color (n = 21) between January and July 2020. We conducted both individual and group interviews because each inquiry method yields different insights (e.g., social interactions critical to norm formation may be observed in groups, whereas individual interviews may yield personal information). Participants were recruited online (e.g., Facebook and Instagram), in person, and via word of mouth; allies and community leaders shared promotional materials on personal pages. All participants self-identified as male and 96%

self-identified as Black or African American; participants ranged in age from 24 to 61 years and half self-reported living with HIV. All participants identified their gender as male; 95% identified as gay, SGL, or homosexual. Two thirds reported having an undergraduate degree or higher. All participants lived in the NYC metropolitan area. Our groups and interviews used scripts that elicited "systems thinking" (e.g., vignettes, presentation of simplified CLDs) to explore the roles of HIV stigma, homophobia, and racism on sexual behavior, partnering, HIV-related prevention and care access, family and community experiences, and other relevant and emergent areas. Our scripts evolved as data began to accrue and emergent focal areas were identified.

The analysis used text data ("quotes") from the interviews and groups, which were digitally recorded, professionally transcribed, and coded in an Airtable—a cloud collaboration service that we designed to organize the data for creating CLDs. The table included 14 columns: interview and group number, coder, quotes, and quote summary, among others. The first and second author (P. L. and D. W. M.) read and coded all transcripts in waves. First, we applied 5 "tags" or broad codes or areas of focus, including stigma, homophobia, racism, pandemic (COVID-19/SARS-CoV-2) and PEP/PrEP. Next, we coded several "causes," including internalized homophobia, HIV stigma, medical mistrust, intersectionality, and PrEP education and marketing. We then coded primary, secondary, and tertiary "effects," based on the content of individual participant quotes, including PrEP usage, HIV stigma, HIV transmission, access to HIV care, mental health (including self-esteem), internalized homophobia, concealing of sexual identity, and medical mistrust. Finally, we coded the "relationship" or the direction of the relationship. We instructed the coders to code the same quote twice if more than 1 cause and effect was described in the quote. Coders were also instructed not to code previous paragraphs (to the focal quote) to give context to quotes. In-depth interviews were coded by 3 analytic team members; focus groups were coded by 2 members of the same team. Select focus groups and interviews were double coded to enhance consistency. The analytic team developed codes for variables and initial and plausible relationships (linkages), with the full study team meeting weekly to discuss the coding process, develop the CLD, and resolve coding discrepancies. A designated column in the Airtable ("dataset item") served as means to reference the variables that were added to the CLD.

We developed the CLD using these data in Vensim modeling software. Members of the analytic team read each transcript and generated relevant queries. Numerous rereadings of the quotes occurred during meetings and relabeling of variables, and new variables were added through this iterative process. The analytic team led a series of structured discussions designed to validate the CLD, which visualizes the processes, or feedback structures, using positive (+) and negative (–) signed links that form either "reinforcing" or "balancing" loops. Reinforcing loops explain exponential growth or decline, and balancing loops bring variables into steady states and stabilize the system. We identified feedback processes that represented narratives reflected in the text data, beginning with the dynamics of stigma, then layering in homophobia, racism, PrEP, and HIV testing. Collectively, the resultant CLD represents a dynamic hypothesis, or statement, about a given problem of focus. CLDs often serve as a formative step in building formalized SD models for mathematical simulation. Here, we used the models to develop novel anti-intersectional stigma intervention components. Thus, the CLD was presented in a series of meetings with study advisors, including members of MOBI (Mobilizing Our Brothers Initiative) and academic intervention design and analysis experts, where we focused on select loops within the CLD, identifying theoretical intervention targets and brainstorming interventions. The process resulted in the novel anti-intersectional stigma intervention components.

RESULTS

Through this analytic process, we identified individual, community, and social constructs (termed "variables" in the CLD) and connections among them, resulting in a synthesized CLD that illustrates the entirety of the structures of a system and their causal relationships based on the data we collected. Our synthesized CLD contains several hundred loops and dozens of variables, including broad systems, such as HIV stigma, racism, and homophobia, as well as smaller systems (subsystems) embedded within the broader systems. A simplified version of the synthesized CLD is illustrated in Figure A (available as a supplement to the online version of this article at http://www.ajph.org), depicting medical mistrust (red), mental health (green), and serosorting (blue). We also identified loops that combined subsystem loops that are not color coded. Because of the complexity of the synthesized CLD, we isolated subsystems for further analysis. Specific variables and connections from those isolated subsystems are described below, first using the language of the

"story" or narrative that the loops "tell" and then as applied to the theoretical and conceptual factors that could be targeted in various intervention components.[61] Table A (available as a supplement to the online version of this article at http://www.ajph.org) displays key variables and selected participant quotes that informed the identification of the variable and the polarity of the links in 2 focal loops.

Feedback Loop 1

Medical mistrust and HIV transmission. This feedback loop depicts the medical mistrust and HIV transmission variables and connections (Figure B, available as a supplement to the online version of this article at http://www.ajph.org). The "story" of this reinforcing loop suggests that decreased trust in medical professionals among Black and gay patients reduces sexual identity and orientation disclosure and increases sexuality hiding to health care providers, among others, which subsequently decreases patients' HIV testing and knowledge—and therefore disclosure of their HIV status to sexual partners. This increases the likelihood of sexual contact between people living with HIV and those who are not, which can increase HIV transmission. More infections drive further HIV stigma among all community members, including physicians who may stereotype and label patients. With more labeling of patients, Black gay men have more stigmatizing experiences with medical professionals. In sum, this sequence leads to continuous reduction in patients' trust in their medical professionals, in a vicious cycle, where the problem worsens over time at an increasing rate of speed.

In reinforcing loops, the cause-and-effect relationships perpetuate growth and repeatedly reinforce one another. This loop can be a virtuous cycle, with all its variables positively supporting each other, or a vicious cycle where a decline in 1 variable is propagated throughout the loop into a downward spiral. As indicated by the polarity of the arrows, some connections reinforce the direction of change, whereas others balance and oppose the direction of change. Notably, the loop adjacent to the medical mistrust and HIV transmission loop depicts the influence of representation in the health care of Black SGL/MSM ("Black gay representation in health care") on patient–provider interaction ("physicians disclosing similar experiences with patients") and on the quality of health care ("quality of care, humanizing and culturally competent care"), which links back to the focal loop via comfort with health care providers ("Black gay patients being uncomfortable at doctor's appointment").

Application to intervention component design. This loop informed our intervention component design by focusing us on the roles of patient–provider interactions and mistrust of biomedicine due to medical racism and lack of representation of people of color and of gay, lesbian, and bisexual people in health care provision. Thus, our component design targeted theory of change factors, such as provider disclosure of shared sexual and other behaviors and identities that increase feelings of connectedness and solidarity between the provider and patient, which in turn encourages patient disclosure of behaviors and conditions that are relevant to maintenance of sexual health and well-being. Representation in medicine may also be related to increased culturally and structurally competent health care provision (by all providers) via pathways external to this model, including increased emphasis in training on issues related to diversity, equity, and inclusion, as well as antiracist practices. The resultant component is a dramatization of a telehealth visit depicting patient–provider interaction in a clinical encounter; the component, implemented via videoconferencing technology because of the COVID-19 pandemic, is followed by a structured discussion with participants, both providers and potential patients, in break-out rooms.

Feedback Loop 2

Serosorting and marginalization of Black, gay, lesbian, and bisexual people. Our second potential focal area of intervention is a reinforcing feedback loop, representing the dynamics of within-community serosorting and marginalization among Black SGL/MSM (Figure C, available as a supplement to the online version of this article at http://www.ajph.org). This loop may be interpreted as follows: higher levels of HIV stigma (particularly experienced and perceived community stigma) increase serosorting—the practice of selecting sexual partners based on HIV status—which increases disclosure of HIV status, which in turn ultimately results in an increase of marginalization of Black SGL/MSM within the Black community. This results in negative mental health effects, which stimulate the growth of internalized and enacted stigma. This vicious cycle connects experienced stigma to mental health effects and to enacted stigma, which then drives generalized stigma.

Application to intervention component design. Applying the same approach as described for feedback loop 1, we

developed a scenario that depicts an attempted disclosure of a recent HIV diagnosis by a young Black man to his older "mentor." The conversation also includes another individual, who is older than the mentor and was present during the early days of the HIV epidemic. Within the scenario, the oldest participant describes how they would not date someone with HIV because of the burden that the disease places on the caregiver. Here, the impact of community-level norms around respect for age and experience collides with more modern understandings of both HIV care and how sexual exclusion based on status (serosorting) can be experienced as stigmatizing. Communication style and content are also theoretical targets. Finally, effective strategies to interrupt stigmatization by addressing the use of language is 1 focus of the postdramatization debrief, which was designed to include a role play and practice of stigma interruption skills.

Family Support and Internalized Homophobia Feedback Loop

From online Figure A, the feedback loop depicted in green was a key focus in the CHHANGE community-level intervention; this loop illustrates how family support and internalized homophobia operate to influence disclosure, self-acceptance, and internalized homophobia. The loop may be interpreted as follows: low or absent family support of gay, lesbian, and bisexual people increases opportunities for experiencing trauma, which can reduce self-esteem and self-love and can increase internalized homophobia. Higher levels of internalized homophobia decrease individuals' self-acceptance of their own sexual orientation, which leads to a corresponding drop in disclosure of sexual orientation. Participants described family dynamics in which gay, lesbian, and bisexual people expect that the disclosure of their sexual orientation will lead to a loss of family support. This sequence reduces self-acceptance and disclosure of sexual orientation. In this feedback loop, the impact of both may serve to support a higher level of internalized homophobia. Unlike reinforcing loops, which cause an acceleration of change, balancing loops usually serve to stabilize and slow the rate of change in the system to not only oppose initial changes in variables but also to drive the system toward a stable goal. This loop (online Figure C) is disconnected visually to improve readability. We focused intensively on this loop in the CHHANGE intervention as described previously,[66] and thus we do not discuss its integration into the novel components.

Combined Loops

The interaction of the 3 feedback loops is depicted in online Figure C. The medical mistrust and HIV transmission loop is in red and connects with other loops present in online Figure A through the variables HIV stigma, disclosure of sexual orientation, and disclosure of HIV status. The purpose of these loops was to illustrate the intersectional effects of stigma and related variables. The variables colored gray were variables that, although connected to the feedback loops in question, did not necessarily form a feedback loop themselves. The balancing loop of family support and internalized homophobia (online Figure A, green) illustrates a force that brings stasis to the system. Through this loop, we expect meaningful changes in the current rate of disclosure of gay sexual orientation to be less likely to occur within the Black community. In other words, the rate of disclosure of gay sexual orientation is not expected to increase exponentially because it tends to reach an equilibrium. As reflected by participants' stories, disclosure of gay sexual orientation within the Black community is considered consistently low, which in turn reinforces lower rates of HIV testing, more transmission of new HIV infections, and increased HIV stigma in the reinforcing loop of medical mistrust and HIV transmission (Figure A, red). Finally, the rate of disclosure of HIV status interacts with the reinforcing loop of serosorting and marginalization of Black gay, lesbian, and bisexual people (blue). Serosorting ultimately increases HIV stigma, which in turn escalates the transmission of new infections among Black MSM in a feedback loop that includes medical mistrust and HIV transmission.

DISCUSSION

We developed a CLD grounded in participant stories that identified feedback loops highlighting broader systems affecting the health and well-being of SGL/Black MSM. The modified qualitative SD methodology encouraged significant engagement from participants during data collection and resulted in data adequate to characterize the complex system that Black SGL/MSM face that is consequential to HIV prevention and treatment. The resultant CLD reveals how various subsystems interact with and influence each other, sets of relations that are dynamic and change over time. Because CLDs are living models, we expect that as new information, data, and interpretation emerge, the model may be enhanced.

On the basis of the CLD that emerged, we identified 2 key loops that could be realistically centered for

intervention components to complement our existing CHHANGE community-level anti-HIV stigma and anti-homophobia intervention.[62,66] Because of the COVID-19 pandemic, we imagined our novel components as being virtually delivered and in partnership with community members expert in delivering relevant and engaging content to Black SGL/MSM via digital formats. The components that eventually emerged, through input from a panel of expert advisors and a series of meetings with the MOBI team, included a theatrical presentation of dramatizations of technology-mediated social interactions where intersectional stigma unfolds. The postdramatization break-out activities and discussion are designed to unpack the issues and provide alternative ways of communicating and behaving to reduce experienced intersectional stigma.

The advantage of our approach, using the CLD rather than a matrix to map theoretical targets, is that the CLD isolates feedback loops and how the loop "behaves" in manifesting the dynamics of stigma, homophobia, and racism. Another advantage is that the full CLD is complex, multifaceted, and dynamic, making clear that effective interventions must also be multilevel and adaptive to achieve and sustain desired outcomes over time. This is a particularly important advantage as it forces the interventionist to face the complexity and dynamism of intersectional of oppression and privilege systems. Additionally, although the whole system can be taken into account, it is also possible to evaluate the impact of interventions based on specific subsystems. Understanding the whole system clarifies how a subsystem-focused intervention component may interrupt a specific feedback loop while another loop blocks its impact on the whole system. Because public health is conditioned by and the product of intersectional systems of oppression and privilege, the method can be applied to a range of public health concerns.

We applied a CLD to develop a better understanding of the complex system involving HIV stigma, HIV-related stigmas, homophobia, and systemic racism, as they influence access to and uptake of HIV testing and biomedical prevention among Black SGL/MSM living in an urban area. Results were used to design novel intervention components to interrupt feedback loops in the whole system and to complement our existing community-level anti-HIV stigma and anti-homophobia intervention. Piloting the novel components will yield information on their feasibility and acceptability. The next steps will include integrating the new components into the existing intervention and evaluating its impact using methods optimized for estimating the impact of community-level and multilevel interventions on intersectional stigma-related outcomes. AJPH

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CONTRIBUTORS

All authors contributed to the conceptualization and revision of the work as a part of the CHHARGE project collaboration led by V. Frye, D. W. Matthews, and M. Paige. M. Paige, V. Frye, and D. Matthews conducted all individual and group interviews. P. Lutete developed the causal loop diagram and wrote the first draft of the article with V. Frye, N. S. Sabounchi, M. Paige, A. Dickerson, and J. Hillesheim. D. W. Matthews, A. Dickerson, N. Rodriguez, N. Echevarria, and J. Hillesheim provided invaluable assistance to the causal loop analysis, review, and coding process. D. W. Lounsbury, N. S. Sabounchi, D. Usher, and J. J. Walker provided critical feedback and edits to drafts, and all authors approved the final version.

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CONFLICTS OF INTEREST

The authors have no potential conflicts of interest to declare.

HUMAN PARTICIPANT PROTECTION

The City University of New York institutional review board reviewed and approved the study (IRB# 2019-0398).

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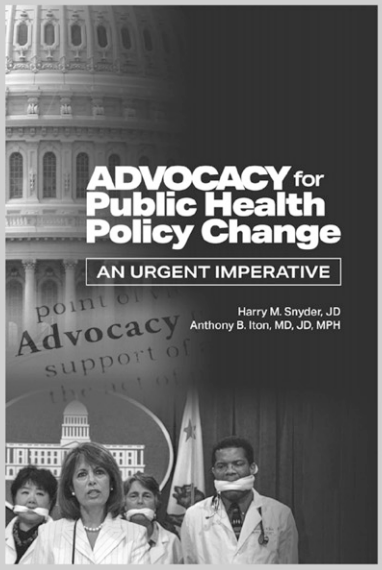

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