1) Background/Significance

Stigma remains a pernicious impediment to health for gay, bisexual, and other men who have sex with men (MSM), discouraging their disclosure of health-related conditions and sexual activities; deterring their access to HIV prevention tools; and impinging on their psychological wellbeing. During healthcare encounters in particular, stigma confronts MSM with a vexing dilemma: disclose sexual activity to access MSM-specific care or conceal it to avoid discrimination but remain distanced from the HIV interventions and services they desperately need. Engaging at-risk MSM requires that healthcare workers (HCWs) communicate in ways that mitigate rather than exacerbate pervasive stigma toward their sexual behavior, and specifically toward anal sex, the most proximate risk factor for HIV infection among MSM. HCWs report a lack of knowledge and skill assessing MSM's sexual behavior and, unsurprisingly, discomfort conducting sexual histories, thereby missing opportunities to triage for HIV/STI interventions. Multicomponent, intersectional strategies can train HCWs to prevent enacting stigma, but are also needed to help HCWs proactively inoculate MSM against internalized and anticipated stigma that otherwise would continue to deter care. To date, however, there are no tested, evidence-based programs to mitigate stigma toward anal sexuality. Consequently, MSM remain deterred from discussing the very sexual activity that places them at greatest risk of HIV acquisition and transmission. Through this study, we intend to develop, pilot, and evaluate a new behavioral HIV intervention for HCWs to mitigate anal sex stigma, in order to improve both the quality of care and HIV-related outcomes among MSM.

2) Study Design

We describe study design for Aim 1 and Aim 2, because we are awaiting approval from an NIMH program officer for Aim 3 study design changes to the funded protocol. An amendment will be submitted prior to conducting any activities for Aim 3.

Aim 1: Explore drivers that perpetuate and techniques and mechanisms that mitigate anal sex stigma during healthcare encounters by interviewing a diverse sample of HCWs (N = 20) and MSM (N = 20) in the US.

Aim 2: Develop an intersectional stigma-mitigation intervention with mHealth, workshop and coaching components, in collaboration with an 8-person Advisory Board of MSM/healthcare consumers and HCWs and informed by Aim 1, to improve HCW competence to discuss anal health and sexuality and thereby promote HIV prevention.

Aim 3: Pilot the intervention in a pre-post, sequential explanatory mixed method design among 120 HCWs who do not specialize in MSM care, working in two regions where HIV incidence among MSM remains high. Longitudinal surveys and select follow-up interviews will evaluate: (a) implementation outcomes (i.e., acceptability, feasibility, and appropriateness) and (b) preliminary impact on mechanisms of action (e.g., knowledge, skills, intention, resources) as well as HIV/STI screening activities (e.g., initiating assessment of sexual behavior).

In Aim 1, we conducted a mixed-methods sequential explanatory design. This involved an online survey to screen and purposively sample 20 cisgender MSM and 20 HCWs, followed by a onetime, hourlong in-depth interview with these same participants. To be eligible, MSM needed to report: being aged 18 or older, identifying as male, residing in the US, being able to read and communicate in English, and having had anal intercourse with a man in the past year or intend to in the next year. HCWs needed to report: being aged 18 or older, being able to read and communicate in English, bearing a role responsibility for HIV-related screening and referral (e.g., as a peer/outreach worker, test counselor, case manager, social worker, medical assistant, nurse, physician assistant, physician). The primary outcome of Aim 1 is to identify qualitatively a set of techniques and mechanisms that could mitigate anal sex stigma during clinical encounters between HCWs and MSM and that would be acceptable, feasible and appropriate for both HCWs and MSM populations. We conducted rapid qualitative analysis, using debriefing forms after each interview and then templates to extract constructs from our qualitative inquiry guide. These were then added to a spreadsheet that also contained survey responses, and then a matrix analysis was conducted to establish themes for barriers, facilitators, techniques and mechanisms of action.

In Aim 2, we are consulting with an Advisory Board of up to 8 adult MSM/healthcare consumers and HCWs to develop the content of an intervention for HCWs, which is likely to comprise an online informational component, an in-person skills workshop, and coaching calls after the workshop. This involves periodic 60- to 90-minute online meetings with members of the Advisory Board to discuss their feedback about findings in Aim 1 and to provide guidance as we develop the intervention. To be eligible, MSM/consumers need to report the same criteria as Aim 1, altered to allow for more gender inclusion: identifying as cisgender male/female/nonbinary/transgender. The gender criterion was expanded based on feedback from Aim 1, with participants recommending the development of an intervention that did not singularly address stigma among cisgender MSM. HCWs needed to report the same eligibility criteria as Aim 1. The primary outcome of Aim 2 is to elicit feedback from the Advisory Board and to develop the intervention. Data analysis involves taking notes based on each Advisory Board meeting and then consulting within the research team to revise plans for intervention development based on the Advisory Board's recommendations.

In Aim 3, we will pilot the intervention in two region where HIV incidence is high among MSM, the US Northeast and Southeast. In collaboration with two regional AETCs (AIDS Education and Training Centers), we will recruit HCWs from clinical sites that are under-engaging MSM in HIV services. A link to an online Information Statement will describe study procedures and follow with demographic and psychosocial questions. To be eligible for participation in Aim 3, HCWs need to (1) bear a role responsibility for screening, referral or delivery of HIV services (e.g., education, counseling, testing, PrEP/ART); (2) be 18 or older; (3) read, speak, write English; and (4) be new to the study. Those who consent will be prompted to create a unique identification number (PTID). Select in-depth interviews prior to the implementation of the intervention will inform tailoring the intervention within the region. The intervention will then be delivered during a two-day in-person workshop, where HCWs will be introduced to a website of resources. Participants will retain access to the website after the workshop and HCWs who work at a specific target site will receive additional coaching sessions. Baseline and follow-up surveys and

in-depth individual interviews will be administered to evaluate the intervention. The goal of Aim 3 is to assess the acceptability, feasibility, and appropriateness as well as preliminary impact on HCW's ability to discuss anal sexuality and thereby to promote status neutral HIV/STI prevention among MSMs.

3) Study Population

a) In Aim 1, we sought to enroll a geographically, racially and ethnically diverse 250-person sample of cisgender MSM living in the US, who report variable comfort discussing anal health and sexuality during healthcare encounters. For HCWs, we are likewise seeking to enroll a geographically, racially and ethnically diverse sample of 250 HCWs, including women and MSM HCWs, as well as limited enrollment of publicly recognized experts living outside the US in order to learn about stigma mitigation practices introduced in other contexts that may be relevant to evaluate in the US context. For HCWs, we also seek variable expertise working with MSM as well as variable comfort and frequency broaching anal health and sexuality in clinical encounters with their male clients.

For in-depth interviews with 20 MSM and 20 HCWs, we intend to purposively sample from each of the 250-person samples, seeking representative of geographic, racial and ethnic diversity and variability in comfort discussing and broaching anal health and sexuality during clinical encounters. For HCWs, sampling will also seek to establish diversity in expertise working with MSM based on service population and specialty (e.g., LGBTQ/HIV/MSM services; anal health; general hospital).

In Aim 2, we have sought to enroll healthcare consumers and healthcare workers to serve on an Advisory Board of up to 8 participants. The population of healthcare workers in Aim 2 remains the same as described above in Aim 1. In the funded proposal, we planned for Aim 2 consumers to reflect the same population of cisgender MSM as described above under Aim 1. However, Aim 1 feedback from participants included the recommendation that the intervention in Aim 2 should include content that is broadly relevant not just to serving cisgender MSM but also to serving additional populations (e.g., transgender and nonbinary people). We therefore added the option to expand the Advisory Board beyond cisgender MSM, so that the intervention reflects the recommendation of including content for HCWs that is more broadly applicable across patient populations. We received approval from the NIMH program officer.

For both Aim 1 and Aim 2, participants needed to be 18 years or older for both Aim 1 and Aim 2. We also purposefully sampled for participants living with HIV to ensure that we collected data on the lived experience of people living with HIV for the intervention. The sample sizes for Aim 1 and Aim 2 were established based on an estimate of saturation of qualitative themes, for Aim 1, and based on the likelihood of sustained engagement and group cohesion during meetings, for Aim 2.

For Aim 3, a total of 120 HCWs will be recruited in two regions. To yield n = 60 intervention participants per region, we will aim for n ~90 consented, estimating a conservative 70% retention rate based on the AETC and similar procedures in Ohio and China. Prior to implementation of the intervention, we plan to interview approximately 5 clinic staff within each region, to inform tailoring the intervention to their local context. A subset of 15 HCWs in each region will be purposively sampled for post-intervention interviews based on initial observations, survey responses and reactions during intervention, racial/ethnic diversity, and diversity of professional role.

b) Inclusion criteria are the same as those stated in (2) Study Design.

c) Minors were not included because a separate, age-specific study in adolescent cisgender males who have sex with males is warranted and preferable. Non-English speaking people were excluded due to limitations in the study team's ability to conduct surveys, interviews and Advisory Board meetings in languages other than English. There were no exclusion criteria.

Please note that the Inclusion Enrollment Reports in the original K23 proposal (a resubmission) mistakenly did not include women, even though the initial proposal did include women. The correct gender, racial and ethnic breakdown is below.

Women are overrepresented in the field of healthcare but will comprise ~40% of HCW interviews. The remaining ~60% of HCWs will be among men and other gender identities, some of whom identify as MSM themselves. We are targeting enrollment of more men and other gender identities than women in order to include MSM HCWs, who will likely have valuable insights to share in their dual role as both a sexual minority male and a HCW.

Special efforts will be made to ensure the participation of individuals from diverse ethnic and racial backgrounds. Black/African American and Hispanic/Latino populations account for approximately 13% and 17% of the U.S. population, but 37% and 30%, respectively, of new HIV diagnoses. There are also significant differences in the extent to which racial and ethnic minority MSM conceal their sexual orientation and sexual behavior during healthcare encounters, and these differences are associated with compromised engagement in services. The intervention seeks to address intersectional stigmas that influence both HCW and MSM behavior during healthcare encounters. Therefore Black/African American, Hispanic/Latino MSM, and additional ethnic/racial minority populations will be oversampled in order to increase the likelihood that the proposed intervention will be acceptable, feasible, appropriate and ultimately effective for those MSM who experience the greatest disparities in the HIV epidemic.

d) Subjects who do not have the capacity to consent were not enrolled in Aim 1 or Aim 2 and will not be enrolled in Aim 3.

e) Materials will be obtained from individually identifiable living human subjects through typed responses to online surveys, audio recorded and transcribed in-depth interviews, and audio recorded and transcribed Advisory Board meetings.

4) Participant Recruitment

Aim 1: Recruitment occurred online through distribution of a link to an online screening, consent and demographic survey**,** hosted by Qualtrics. The PI and study staff distributed a study link through electronic announcements to listservs of professional groups; online interest groups and social networking sites; email (including through the Qualtrics survey platform and direct outreach to potential participants known in the field); as well as paid advertisements through men-seeking-men sites and geolocating applications (e.g., Grindr, Scruff) to encourage snowball sampling of online screening survey participants.

Interested HCWs and MSM who clicked on the study link were shown an eligibility screening survey and asked to complete the entire screening regardless of their eligibility for any specific criteria. Those who consent by clicking past an Information Statement were asked to create a personal participant ID number (PTID) and to respond to questions about their demographics, their comfort and willingness to discuss anal health and sexuality during healthcare encounters, experience working with MSM (for HCWs), and preferences for communication by email, telephone voicemail, or text message. MSM respondents were offered the option to choose a pseudonym and to create an alternate email address for future contact. Based on these responses, we purposively sampled MSM and HCWs for in-depth interviews. Among consented HCW and MSM respondents purposively sampled for diversity, the PI/study staff called to schedule an interview or emailed or texted a link to a HIPAA-secure online scheduling platform for participants to select an interview time. Those who received a link to schedule were asked to reenter their PTID to link their survey data to their scheduled interview.

Recruitment materials and the eligibility screener will not indicate the full requirements for eligibility, in order to minimize the potential for deceptive enrollment. To ensure ethnic and racial diversity, electronic announcements will be adjusted to oversample racial/ethnic minority participants, as needed, with images and language specific to these groups. After completing the online survey, whether eligible and ineligible, respondents will be shown a screen at the end of the survey to forward the survey link to other potentially eligible respondents.

Aim 2: Recruitment has occurred through telephone, email and text message outreach, including through REDCap. Within the Aim 1 online survey, participants were asked if they would like to be contacted about future research and, during Aim 1 in-depth interviews, the PI (Dr. Kutner) asked participants about their interest in serving on an Advisory Board. Those who assented orally to follow up contact for inclusion in the Advisory Board had a note attached to their PTID in the data repository, assenting to future contact for recruitment. The PI/study staff have called, emailed or texted these participants, based on the preferences documented in their study record, to update them about the formation of the Advisory Board and to gauge

their interest in participation. This same process has been used to approach and recruit additional Advisory Board members who did not participate in Aim 1, with a slightly adapted message to introduce the study.

For previous participants, no advertising or publicity is necessary; we will simply follow up with them about their interest in participating in Aim 2's Advisory Board. For the additional Advisory Board members who did not participate in Aim 1, we do not plan advertising or publicity, except to consult within professional networks of healthcare providers and colleagues who collaborate with scholars and providers of nonbinary and transgender participants and patients, to develop a list of potential Advisory Board members.

For both Aim 1 and Aim 2: Prior to interviews and Advisory Board meetings as well as during both of these procedures, participants were reminded that their participation is voluntary and that they could decline to answer any question posed during the course of the study and could decline to participate any further at any point during the study.

For Aim 3, recruitment will be done in collaboration with two AETC regional collaborators. These AETC collaborators report sufficient community interest in this topic to feasibly recruit 120 HCWs and will introduce study staff to local healthcare leaders and community-based organizations to cultivate partnerships. Recruitment will occur through regional outreach, using the existing infrastructure and relationships of the AETC. Potential participants will then receive an email invitation, citing these partnerships. A link to an online Information Statement will describe study procedures and follow with demographic and psychosocial questions as part of the baseline assessment.

5) Informed Consent

Aim 1 Information Statement. Interested HCWs and MSM who click on the Qualtrics study link were prompted to answer eligibility questions in an online survey and, if eligible, shown an Information Statement describing study procedures and including a HIPAA form. The Information Statement detailed the purpose, procedures, benefits, and risks of participation and the right to withdraw from the study at any time. Eligible respondents who wished to consent could do so by clicking "Yes" in response to the question "Do you want to be part of this research study?" on the Information Statement. Respondents could also click "I'm not sure" and be prompted to enter a phone number or email or to contact the Principal Investigator to further discuss their concerns prior to consenting. All participants were provided with a copy of the Information Statement, which included contact information for the Principal Investigator and for the NYSPI IRB, as a downloadable PDF. Each page of the subsequent online survey of demographic characteristics also included the ability to email or call voicemail of the study PI directly through a hyperlink. Before each in-depth interview, the PI also confirmed informed consent, provided time for questions from the participant, and provided any answers to questions that arose.

Aim 2 Information Statement. Interested healthcare consumers and HCWs were sent a study link as in Aim 1, but hosted on REDCap instead of Qualtrics, with a modified

eligibility survey and modified Information Statement that includes a HIPAA form. The procedure in Aim 2 has been the same as in Aim 1, except that study staff (Rebecca Giguere and Baichun Hou) have confirmed informed consent, on an individual basis with each Advisory Board member, and provided time for questions from the participant, and provided any answers to questions that have arisen.

Aim 3 Information Statement. HCWs will be sent the Information Statement within an online survey hosted by REDCap or Qualtrics, which will include contact information for the Principal Investigator as well as a downloadable PDF of the Information Statement. The Aim 3 Information Statement describes the same components of Aim 1 and Aim 2, except that the study procedures and study compensation are specific to Aim 3 procedures.

In Aim 1, we conducted interviews by telephone or video through Zoom Pro. In Aim 2, Advisory Board participants may choose to keep their cameras off and/or to change their screen name, if they would like to remain more anonymous to their fellow Advisory Board members. In Aim 3, telephone or video through Zoom Pro will also be used. Written consent is the only link between the subject's identity and the research data, so we have requested a waiver of documentation of consent in order to remove the risk of a breach of confidentiality for research participants during their participation in all aims of the study.

Aim 1 participants were compensated for their time completing hourlong interviews with a $50. Aim 2 Advisory Board members are being compensated $100 for participation in each of six to eight ~90-minute meetings over the course of nine months, of which two have already occurred. Aim 3 participant compensation will vary depending on their participation in each assessment, ranging between $90 and $190 ($50 for each in-depth interview, with a maximum participation of two interviews per participant, and $30 for each survey, with a maximum participation of three surveys).

6) Risk/Benefit

The risks are the same in Aim 1, Aim 2 and Aim 3:

a) The main risk of study participation is loss of confidentiality and potential consequences thereof. An unintended person (e.g., family members, employers) could find out about a participant's sexual identity, sexual behavior, HIV status as well as their stigmatized or stigmatizing behavior. Unintentional disclosure of sexual minority status may place participants at risks for social harm such as exclusion from family, job loss, harassment, and discrimination.

b) Additional risk for participants includes distress when discussing issues related to stigma during healthcare encounters. The MSM population and other healthcare consumer populations who practice anal sex engage in behavior that is socially stigmatized and HCWs may themselves experience embarrassment with regard to the sexual subject matter, whether or not they engage in similar behavior. HCWs may also experience distress at the recognition, during assessments, that their own beliefs and actions could be perceived as perpetuating stigma toward their

clients. It is possible that participants may experience feelings of embarrassment, discomfort or distress when answering questions concerning sexuality, disclosure of sexuality or sexual behavior, experiences of stigma, and related stressful events.

To minimize the risk of a breach of confidentiality, in addition to a waiver of documentation of consent:

- Participants have received a downloadable PDF of their Information Statement and been instructed to keep any forms private, because if discovered by others, these might disclose their participation in the study to others.
- Any identifying information within survey data (e.g., email address, telephone number) are removed from downloaded datasets and stored in a separate password protected file, linked only by the PTID. A list linking survey PTID and scheduled interview date is kept in a password protected file on OneDrive for Business, which holds a HIPAA Business Associate Agreement with the New York State Psychiatric Institute. This will be transferred to SharePoint at Einstein, upon approval of a data sharing agreement.
- IP addresses are deleted immediately from any downloaded data set, after completing analyses for potentially duplicate respondents in online surveys.
- Data have been deleted permanently from the online survey platforms after all data collection has ended.
- MSM and healthcare consumer participants are being asked about various ways through which they can safely be contacted, including the option to use a pseudonym and an alternate email address.
- All interviews and Advisory Board meetings have been and will continue to be conducted in private spaces. Interviews only include the participant(s) and the interviewer/research staff.
- During interviews/Advisory Board meetings, only audio is saved. Some video conferencing platforms automatically record video along with audio; participants are forewarned of this limitation as well as of the option to rename themselves and to turn off their cameras; video files are deleted immediately after sessions are completed. File transfer of audio recordings for third-party transcription occurs through a secure file transfer protocol (FTP). Any identifying information recorded during qualitative interviews is removed during transcription. All audio-recordings has been and will be destroyed after final transcription and analysis.
- All qualitative data (digital recordings, transcriptions, and data bases) and quantitative data is coded with PTIDs and stored in password protected files on HIPAA-secure servers, as appropriate.
- All study staff have sign confidentiality pledges and are required to receive training on confidentiality issues.
- The PI, primary mentor, co-mentors and advisors all must complete NIH training in Human Subjects Protections. New staff will be required to do the same.
- Data summaries are written in such a way that they do not identify individuals but summarize findings. No individual identities will be used in any reports or publications.

- Additionally, as NIMH is funding the study, a Certificate of Confidentiality will be awarded, pro forma.

To minimize the risk of discomfort participants have been informed that their participation in this study is voluntary and reminded that they do not have to answer any questions that they do not want to answer, that they are free to refuse to participate or leave the study at any time. Information Statements highlight the potential risk of disclosure of sexual minority status, sexual behavior, HIV status, and involvement in stigmatized or stigmatizing behavior, and its consequences due to participation in the study.

This study has not been designed for the direct benefit of the participants. However, there are several ways in which participants may derive benefit. First, participants may benefit from disclosing their perceptions of stigma that occurs during healthcare encounters. Participants might feel relief in discussing a topic which is rarely discussed with another person. Participants may indirectly benefit by providing information that may contribute to knowledge about intervention development to improve the quality of care and engagement of MSM.

7) Data Analysis

Only univariate statistics are planned for quantitative data from Aim 1 and Aim 2. Aim 3 will involve both univariate statistics as well as inferential statistics.

The primary outcome of Aim 1 is qualitative, to identify a set of techniques and mechanisms that could mitigate anal sex stigma during clinical encounters between HCWs and MSM and that would be acceptable, feasible and appropriate for both HCWs and MSM populations. We conducted rapid qualitative analysis, using debriefing forms after each interview and then templates to extract constructs from our qualitative inquiry guide. These were then added to a spreadsheet that also contained survey responses, and then a matrix analysis was conducted to establish themes for barriers, facilitators, techniques and mechanisms of action.

The primary outcome of Aim 2 is to elicit feedback from the Advisory Board and to develop the intervention. Data analysis involves taking notes based on each Advisory Board meeting and then consulting within the research team to revise plans for intervention development based on the Advisory Board's recommendations.

The primary outcomes of Aim 3 are both qualitative and quantitative, to assess implementation outcomes as well as preliminary effects of the intervention among healthcare workers. As in Aim 1, for Aim 3 we will conduct rapid qualitative analysis, using debriefing forms after each interview and then templates to extract constructs from our qualitative inquiry guide. These will then be added to a spreadsheet that also contains survey responses, and then a matrix analysis will conducted to establish themes. For quantitative data, we will assess implementation outcomes using descriptive statistics and assess changes in mechanisms of action, behavior and quality of care using paired *t*-tests.

8) Data quality control and database management.

For Aim 1 and Aim 2, quantitative data have been collected via online surveys, downloaded and imported into SPSS and then stored on SharePoint in password-protected files. Audio files are downloaded and stored on OneDrive for Business along with transcripts, all in password protected files. The Principal Investigator conducts data quality control and checking and editing quantitative data. In Aim 2, data has been been stored in REDCap and managed on a daily basis by the study's research coordinator, Baichun Hou, with oversight by the PI. All data are stored only on password protected, HIPAA-secure websites. Aim 3 will continue the same data collection and storage procedures as Aim 2.

Aim 1 and Aim 2 data are currently stored in SharePoint and REDCap at Einstein, where Aim 3 data will also be stored. Data for Aim 3 may also be stored in Qualtrics at Einstein.

9) Data Safety Monitoring

This study is scheduled for review by the Performance and Safety Monitoring Board of the HIV Center for Clinical and Behavioral Studies at New York State Psychiatric Institute and Columbia University. The most recent review was on November 11, 2022 and there were no concerns regarding the performance, monitoring and safety of the study and recommended the continuation of the study as planned.

10) References: None