

## **Syndemics, STI and HIV in Black Men who Have Sex with Men and Women**

**SPECIFIC AIMS.** Using prospective data from the HIV Prevention Trials Network 061 (HPTN061) study, a large, multi-site study conducted to determine the feasibility and acceptability of a multi-component intervention for Black men who have sex with men (BMSM) including Black men who have sex with men and women (BMSMW), we propose to characterize syndemics affecting BMSMW and to measure associations between syndemics and high-risk sex partnerships and sexually transmitted infections (STIs) and HIV.

HIV persists as an important public health concern in the United States (US). The epidemic has disproportionately impacted BMSM. BMSM represent an estimated 72% of new infections among all Black men and 25% of new HIV infections in the US annually.<sup>1,2</sup> The dual “minority” status experienced by BMSM - based on both race and sexual identity,<sup>3,4</sup> - may help explain elevated HIV risk in this group. Dual minority status is associated with real and perceived discrimination, stigmatization, and internalized homophobia.<sup>5-7</sup> It is therefore not surprising that BMSM experience high levels of victimization including intimate partner violence<sup>8-12</sup> and subsequently, stress,<sup>8,13-16</sup> depression,<sup>8,17-20</sup> and substance use.<sup>6,8,21-23</sup> Victimization, stress, depression, and substance use are well-documented HIV risk factors among men including among MSM.<sup>5-23</sup> Another adverse experience that is disproportionately concentrated in Black men<sup>24-27</sup> including BMSM and is a risk factor for HIV<sup>28-34</sup> is incarceration. While some BMSM may be exposed to any one of these factors that increase vulnerability to HIV—stress, depression, victimization, substance use, or incarceration—these factors are highly correlated. Multiple factors may work in tandem to increase HIV risk among many BMSM.

Syndemic theory posits that two or more vulnerability factors (e.g., stress, victimization, depression) work synergistically to diminish health.<sup>35,36</sup> Syndemics had been used successfully to explain HIV risk among White MSM in the US<sup>35</sup> and MSM in Thailand and China.<sup>37-40</sup> We applied syndemic theory to explain, for the first time, HIV risk among Black men who have sex with men (BMSM) in the US. We found that stress, depression, partner violence, sexual compulsiveness, and substance use co-occur, and that increasing exposure to multiple factors was linked to increasing HIV risk.<sup>8</sup> These findings highlighted the utility of using syndemic theory to predict HIV risk among BMSM and highlighted the need for research in more representative samples.

BMSMW, often omitted from HIV prevention studies among BMSM, occupy a position of epidemiologic importance given their elevated risk of HIV infection and their potential to bridge infection to female partners.<sup>41,42</sup> BMSMW experience increased risk of victimization,<sup>43</sup> stress,<sup>44,45</sup> depression,<sup>46</sup> substance use,<sup>46</sup> and incarceration<sup>47</sup> compared with BMSM. Syndemic theory may be an important construct for predicting HIV in BMSMW, yet understanding of syndemics and HIV in this group is limited. For example, depression and substance use may be common, yet the syndemic of substance use with incarceration may strongly predict HIV. Data on how factors converge to heighten HIV risk are needed to plan prevention efforts in BMSMW.

The current study proposes to utilize prospective data from HPTN 061 to describe the prevalence at baseline of BMSMW who experience at least one syndemic, defined as exposure to two or more of the five HIV vulnerability factors of interest (e.g. victimization, stress, depression, substance use and incarceration) *versus* zero or one factor. We will describe the vulnerability factors most likely to co-occur in the population, or the most common “types” of syndemics. We also will explore cumulative syndemic dose, as indicated by a four-level variable defined as exposure to two, three, or four or more vulnerability factors *versus* zero or one factor. We will measure the prospective association between baseline exposure to syndemics and 12 month risk of high-risk sex partnerships (e.g. unprotected anal and/or vaginal intercourse, sex while under the influence of drugs and/or alcohol, sex exchange, partner concurrency, multiple partnerships, unprotected sex with an HIV positive or unknown status partner), STIs, and HIV prevalence and incidence. Among BMSMW we aim to:

**Aim 1:** Measure exposure to at least one syndemic and cumulative syndemic dose; examine correlations among vulnerability factors, describe common syndemic “types,” identify BMSMW at high risk of syndemics.

**Aim 2:** Measure longitudinal associations between syndemics at baseline and 12 month risk of high-risk sex partnerships and sexually transmitted infections (STIs).

**Aim 3:** Measure associations between syndemics at baseline and HIV prevalence at baseline and HIV incidence at 12-month follow-up.

This application seeks funding to support an accelerated and comprehensive analysis of a novel definition of syndemics as it applies to the lived experiences of high-risk BMSMW. Findings from this support are vital to quickly and efficiently informing HIV prevention interventions with BMSMW and their male and female partners. This effort represents an important mid-stage step that furthers initial efforts by the proposal PI in this area.