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Remaking the Technosubject: Kenyan Men Contextualizing HIV Self-Testing Technologies

Matthew Thomann\textsuperscript{a,}\textsuperscript{*}, Bernadette Kombo\textsuperscript{b}, Helgar Musyoki\textsuperscript{i}, Kennedy Masinya\textsuperscript{d}, Samuel Kuria\textsuperscript{e}, Martin Kyana\textsuperscript{c}, Janet Musimbi\textsuperscript{g}, Lisa Lazarus\textsuperscript{d}, James Blanchard\textsuperscript{d,}\textsuperscript{b}, Parinita Bhattacharjee\textsuperscript{b,}\textsuperscript{d,}\textsuperscript{g}, and Robert Lorway\textsuperscript{b,}\textsuperscript{d,b}

\textsuperscript{a}University of Maryland, College Park, Maryland, USA; \textsuperscript{b}University of Manitoba, Winnipeg, Canada; \textsuperscript{c}Ministry of Health, Nairobi, Kenya; \textsuperscript{d}Men Against AIDS Youth Group, Kisumu, Kenya; \textsuperscript{e} Minority Person’s Empowerment Program, Thika, Kenya; \textsuperscript{f}HIV & AIDS People’s Alliance of Kenya, Mombasa, Kenya; \textsuperscript{g}Partners for Health and Development in Africa, Nairobi, Kenya

\textbf{ABSTRACT}

The Kenyan government offers free HIV self-testing kits to men who have sex with men. The value of self-testing is based on the imaginary of an autonomous technosubject empowered to independently control testing services, thereby “freed,” through technology, from the social conditions that might inhibit health services utilization. Following a community-centered collaborative approach, community researchers interviewed their peers who examined and reacted to the technology. Participants reframed the technosubject as intertwined with the social world and the testing kit itself as an object that exerts agency and possesses affective potential. Attending to these socio-material relationalities offers insights into program planning.

\textbf{KEYWORDS}

HIV self-testing; Kenya; men who have sex with men; science and technology studies; community-based research; sex work

In the wake of the 2008–2009 financial crisis, a “new prevention rationale” (Monteiro \textit{et al.} 2019) emerged in global AIDS policy focused on the diversification of strategies for identifying, testing, and treating HIV among “key populations.”\textsuperscript{1} The narrative and policy shift from the so-called treatment era to “the end of AIDS” (El-Sadr \textit{et al.} 2014; Moyer 2015; Kenworthy \textit{et al.} 2018; Leclerc-Madlala \textit{et al.} 2018; Moyer and Igonya 2018; Sangaramoorthy 2018; Thomann 2018; Sangaramoorthy and Benton 2021) has led to an array of ambitious targets that now structure prevention strategies, particularly in the Global South. For example, UNAIDS’ 90–90–90 strategy has led to an expansion of targeted testing strategies among groups imagined to be “hidden” and undiagnosed, including men who have sex with men (MSM) (Mora \textit{et al.} 2018). Estimated high proportions of people living with HIV who do not know their status, reduced funding, and ambitious testing goals have resulted in a preoccupation with achieving a promising “yield,” meaning the proportion of positive results among those tested (De Cock \textit{et al.} 2019). This preoccupation, that measures HIV test results like it would a rate of return, is fed by technocratic logics that drive the development of cost-effective ways to identify the “undiagnosed” while diverting attention from more comprehensive approaches to prevention (Monteiro \textit{et al.} 2019). HIV self-testing (HIVST) has shown promising efficacy in increasing HIV testing frequency, and there is hope it will be a key strategy for reducing the number of undiagnosed cases (Frye and Koblin 2017).

In May 2017, the Kenyan government approved OraQuick\textsuperscript{*} HIV self-testing kits (see Figure 1) as an over-the-counter product available in most pharmacies. HIV prevalence in Kenya is nearly three times higher among MSM than in the general population at approximately 18% (NACC 2018) and despite

\textbf{CONTACT} Matthew Thomann mthomann@umd.edu Department of Anthropology, University of Maryland, Woods Hall 0111, 4302 Chapel Drive, College Park, MD 20742, USA.

\textbf{Media teaser:} We argue that the technosubject targeted for the Kenyan government’s rollout of free HIV self-testing kits is intertwined with social worlds and that the kit itself is an object that exerts agency and possesses affective potential.

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the scale-up of community-based testing services, only an estimated 53% of HIV positive MSM are known to community-based organizations (CBOs) set up to provide HIV services tailored to their needs (NASCOP 2018b). Citing stigma, fear of disclosing ones’ sexual orientation, and confidentiality as concerns that likely contribute to such gaps, the Kenyan government has recognized HIVST as a promising pathway for scaling-up HIV status awareness among MSM. While there have been a number of studies on the feasibility of HIVST scale-up among serodiscordant couples and female sex workers in Kenya (Gichangi et al. 2016; Masters et al. 2016; Mugo et al. 2017; Ngure et al. 2017), relatively little research has been conducted on the perspectives of MSM. Furthermore, there is little evidence to inform the manner and contexts in which HIVST can be best rolled out to increase HIV status awareness and, ultimately, to improve linkage to care for HIV positive Kenyans. Our research team undertook a qualitative study in three distinct socio-cultural contexts with the overarching goal of informing national guidelines for the roll-out of the technology. In this paper, we discuss findings from interviews conducted by community researchers (CRs) with MSM in Kisumu, Kiambu, and Mombasa counties between May and August 2019. Specifically, we show how participants reacted to the kits as they examined, handled, and imagined using them. Because HIVST kits, at the time of our study, were available only in pharmacies and presented out-of-pocket costs, there were relatively few participants who had used them. For this reason, we focus on “imagined users” – that is, those who had not (yet) tried the technology but who were asked to speculate on how it might fit into their social worlds. Narratives captured in this anticipatory moment reveal the limitations of an idealized technosubject rooted in assumptions regarding autonomy and choice in healthcare. They also show a great deal of attention to the affective potential of the kit itself, emphasizing the importance of the social and material infrastructures in which HIVST occurs.

**Framing the ideal HIVST technosubject**

Public health discourse tends to emphasize the privacy, convenience, and control HIVST affords the individual, as suggested in its very naming as a self-administered diagnostic tool (Greaney et al. 2012; Kearns et al. 2010). HIVST is framed as an especially promising technology for scaling-up testing among MSM as it allows for the circumvention of the stigmatizing social conditions that inhibit health
services utilization (Monteiro et al. 2019; Mora et al. 2018). These assertions are based on a narrow view of autonomy that does not take into account context-specific constraints, nor the ways in which choice is shaped by an individual’s relationship to others (Greaney et al. 2012; Kearns et al. 2010). Such framings of the HIVST technosubject also reflect middle-class values of individuality, responsibility, and distinctions between public/private spheres. Take the example of an instructional video created by “BeSureKenya” (http://www.besure.co.ke/Home/), the campaign promoting the kit to the Kenyan public (see Figure 2). A young man dressed in khaki pants and a short-sleeve button down shirt enters an airy living room carrying a yellow plastic bag and takes a seat on a cushy, modern loveseat. An ambient piano plays in the background as the man follows the instructions of an unseen narrator.

He removes the kit from his shopping bag and tears open its packaging. First, he removes a test tube and gently places it on a coffee table before removing the test stick. Per the narrator’s instructions, he is careful not to touch the flat pad at the top of the stick, gripping the device at its base instead. The camera captures a tight shot as he presses the pad against his upper gumline and runs it from left to right before doing the same along his lower gumline. He then places the testing stick inside the test tube, pad-side first, and sets a 20-minute timer on his Blackberry. The shot cuts away to a close-up view of the kit’s test window showing first positive, then negative, and finally inconclusive results. Now knowing his test results, the man follows the narrator’s instructions for proper disposal of the kit, removing the device from the test tube and placing both back into the packaging. The narrator explains that the kit and its packaging should be thrown away “in the normal rubbish” as the man leans over to an empty mesh wastebasket that sits next to his sofa. Then, he settles into the loveseat, leaning back into fur pillows, a slight smile on his face as the narrator says, “Thank you for using the OraQuick HIV self-test. Now you know your HIV status.”

Like the broader public health discourse on self-testing, the BeSureKenya campaign frames the technosubject as an individual, autonomous agent who is middle-class (indexed by home decor and clothing) and who possesses the financial resources to secure enough living space and privacy to discretely dispose of the kit. The campaign also treats the kit itself as a kind of bounded object and its potential users as fully in control of its material features and discursive significance. The participant narratives presented below unsettle this view, reframing the technosubject as an individual embedded in particular socio-material infrastructures that shape how they imagine the kit’s potential. In their framing, the kit is not a bounded, immutable technology but an “ambivalent object” (Russell and Widger 2018) holding agentive potential in their social world and far more porous and “leaky” (de Laet and Mol 2000) than the BeSureKenya campaign suggests. While participants regularly invoked many of the perceptions popularized in public health discourse regarding the kit’s potential for self-
management of one’s own health, they also spoke of its agitative potential in ways that cast the technosubject not as an individual achieving greater autonomy through a technology that allows them to circumvent social conditions but as an individual accessing a technology whose potential is shaped by particular social and material infrastructures. As we demonstrate, the kit’s social entanglements may even lead to the failure of intended use – that is, to provide safe and discreet testing.

Drawing on theoretical discussions in science and technology studies, we view this technology as a kind of vital nonhuman “actant” (Latour 1996), to be analyzed on equal ground with humans in exerting agency and possessing potentiality in social fields. Rather than viewing agency as the sole territory of human self-potential and intentionality – an assumption that features prominently in neoliberal empowerment approaches advanced in health promotion (Lupton 1995; Nauta 2010; Rushing 2016) – we pursue a more symmetrical analytic of agency as co-produced and emergent in and through human-technological interactions in context. This conceptual approach frames the OraQuick HIV self-testing kit not as an unmarked “thing” but an object laden with meaning, entangled in broader socio-material relationalities, and capable of “doing” (Barad 2003; Mol 2010; Russell and Widger 2018; Biruk and McKay 2019). By focusing on the perspective of potential users, this article contributes to the growing social science engagement with global health technologies and the technologization of healthcare more generally.

Methods

Study design and setting

The criminalization of homosexuality in Kenya, which the Supreme Court upheld in May 2019, makes it difficult to deliver HIV related and other sexual health services to MSM in the public system (Doshi et al. 2020; Onyango-Ouma et al. 2005, 2009; Sanders et al. 2015; Shangani et al. 2018). In response, an array of civil society actors have established specialized clinics for MSM, often with adjoined drop-in centers where these men can safely gather. Although many of these organizations are governed by North American and Kenyan health scientists, in the urban centers where we conducted our study, Kenyan LGBTQ rights activists ran the HIV programs. When our study began, global funding for targeted HIV prevention had already begun to dwindle as policies concentrated on finding new infections were put in place – an agenda that CBOs were required to adopt in order to maintain the funding on which they had come to rely.

The term MSM, which has traveled from Euro-American contexts (Boellstorff 2011), has been employed in public health research and programs in Kenya for more than two decades. As a standardizing category that casts geographically and socially diverse groups of people in universally comparable and decontextualized terms of behavior, the term is amenable to forms of intervention, measurement, and public health infrastructural development (Biruk 2019, Lorway 2019, 2020; Fan et al. 2019, Parker 2019). Although it has been argued that the term flattens the diversity of the groups it describes (Garcia et al. 2016; Meyer et al. 2010; Muñoz-Laboy 2004; Parker et al. 2016; Thomann 2016), it is widely used in Kenya by scientists, health officials, and community health workers and activists alike to maintain the policy boundaries between global health (and its disbursement of international aid) and LGBT rights. We employ the term MSM neither as an attempt to uphold these policy boundaries nor to contribute to the erasure of Kenyan sexual and gender diversity, but with a recognition that the term itself is heavily implicated in the makings of the technosubjectivities we describe.

Our qualitative study was nested within a larger HIVST demonstration program in the districts of Kisumu, Mombasa, and Kiambu between 2019 and 2020. According to the 2017 annual outcome survey (NASCOP 2018a), self-reported HIV prevalence among MSM in these regions were 13% (Kisumu), 19% (Mombasa) and 23% (Kiambu). A consortium of public health actors – which included health officials from the Government of Kenya, academics from the University of Manitoba’s Institute of Global Public Health, and sexual health activists from CBOs – initiated the larger HIVST program
in each of the three sites. In keeping with a “program science” approach (Blanchard and Aral 2011), the intervention embedded quantitative and qualitative research activities across the life course of the program so that the intervention itself could be studied to understand broader, generalizable questions around program impact and more locally situated questions around the experiences of MSM with the introduction of a new technology over time (for further details see: Bhattacharjee et al. 2019).

Our qualitative study, which was ongoing at the time of writing, was driven by the active participation of three CBOs in each county. Community leaders provided key insights at every stage of the larger intervention research program, including the development of the protocol and its key objectives, recruitment, intervention design, implementation, and monitoring and evaluation. With respect to the qualitative cohort study, a team of CRs selected by CBO leaders (Olango, Kuria, and Kyana) conducted interviews and participated directly in thematic data analysis, as described in the next section. All CRs were paid a salary for their work based on the salary scale recommended by each organization.

**Community-based research: training, cohort assembly, interviewing and analysis**

The qualitative research coordinating team (Thomann, Kombo, and Lorway) led a qualitative research and ethics training process with CRs in May of 2019. During the training workshop, the CRs played a crucial role in refining the data collection tools, including the interview guide. Following the training workshop, the research coordinating team traveled to each of the field sites to work with the CRs to construct a site-specific sampling plan. Each CR listed potential participants, using pseudonyms, to form the qualitative cohort. We aimed to recruit 20 participants at each of the three sites but exceeded the target number by 12 participants (four per site) to account for the likely attrition among the cohort participants over time. We adhered to the following inclusion criteria for the cohort participants: (1) assigned male at birth, (2) had sex with men in the last 12 months, (3) 18+ years old, and (4) willing to be followed over a period of one year, participating in a total of three in-depth interviews. Participants were selected to ensure equal age distribution, as well as to account for the experiences of MSM who were enrolled in CBO programming and those who were not. Furthermore, to ensure representation of different socio-sexual networks, participants were selected based on their involvement in sex work and their socio-economic status. Once they had constructed their site-specific sampling plans, each CR conducted a mock interview with a member of the CBO staff. This method not only enabled a pilot testing of the interview guide but allowed the CRs to safely practice and receive feedback from members of the research team. During the first time point, CRs conducted a total of 71 interviews from the three research sites.

The qualitative interviews presented here captured participants’ reactions to being given a sample HIV self-testing kit to examine (but not to use). Although HIV self-testing kits were available in local pharmacies in Kenya prior to our study, these initial interviews provided most of the participants with their first actual exposure to the technology. They were asked to comment on the design, packaging, clarity of instructions, and to provide their perspective and feelings on the technology’s intended application. Participants were also asked to share their thoughts on how CBOs could best distribute the technologies in each of the three sites. The CRs conducted the interviews in the language (either English or Kiswahili) most comfortable to the participants. The interviews were audio recorded, transcribed, and translated (if needed) verbatim in English. Ethical clearance was gained from research ethics boards of Kenyatta National Hospital in Kenya and the University of Manitoba.

In August of 2019, the CRs received additional training on how to conduct basic thematic analysis from an interpretivist perspective (Ryan and Sfar-Gandoura 2018). Our team helped to guide this participatory analytic process, which began with a two-day training workshop focused on the foundational aspects of qualitative analysis. The research coordinating team led the group through a detailed process on how to review transcripts, memoing, constructing coding schemes, reconciling coding schemes, and composing findings sections. Upon completion of the training workshop, analysis began with CRs and their supervisors from each site being grouped into coding teams. This
was then followed by the grouping of codes and code definitions – a process during which the separate site teams regrouped to unite their analytic insights. The process concluded with the extraction of excerpts from the transcripts for each of the parent codes and the writing up of interpretations into preliminary findings sections (for further details see Kombo et al. under review), enabling the synthesis of the analytic work from the different sites and the integration of multiple interpretations of the data.

Many research participants viewed the kit as a tool of self-determination that would allow them to circumnavigate the health system while being afforded a service they viewed as important. However, during group analysis with the CRs, it became clear that study participants imagined the benefits and potential problems resulting from introducing the testing kits in their communities in ways that have not been well documented in the HIVST literature. Specifically, CRs highlighted that participants regularly re-oriented discussion of the technology as one focused on the individual to one that considered the technology’s potential in relation to the world around them. To further frame the CR’s analytic insights, the authors drew broader linkages with contemporary discussions in science and technology studies to help portray how the agency depicted in participant interview narratives took form as a product of human-technological entanglements.

**Results**

**Participants**

CRs conducted a total of 71 interviews: 24 in Kiambu, 22 in Kisumu and 25 in Mombasa. Participants were purposively selected to equally represent three different age categories. Twenty-five participants (35.2%) were aged 18–24 years, 22 (31%) were selected among those aged 25–34, and 34 (33.3%) were aged 35 years and older. Additionally, two (2.8%) were recruited who were over the age of 45 years. Fifty-one participants (72.9%) identified as men and 44 (62.9%) identified as gay. Although the project aimed to recruit men who have sex with men, the term “MSM” often serves as an umbrella term that references a range of genders and sexualities. To reveal forms of gender and sexual diversity, we asked participants about their sense of gender identity and 10 (15.3%) identified as women, 7 (10%) as “both man and woman,” and two identified as “neither man nor woman.” One participant responded to the open response option “other” for sexual identity with the term “transgender,” challenging the delineation of gender identity from sexuality. Nearly two-thirds of the participants (63.4%) were single. Slightly more than half of the participants (54.3%) were enrolled in an MSM program and 12 (17.1%) participants stated that sex work was their primary source of income.

**(Re)framing HIVST and the technosubject**

Participant narratives emphasized two interrelated versions of agency with respect to the self-management of health and risk through HIVST. First, they expressed ideas of self-determination as emerging from the kit’s material features, which affords the technosubject a kind of mastery over a health service independent from the health system. These reactions reflect the dominant reading of the technosubject as rooted in individualized notions of bodily autonomy, self-control, and choice. Second, and more vitally, participant narratives regularly re-oriented discussions of the technology’s impact on individual autonomy toward its potential to shape the world around them. This attention to the relational dimensions of personhood (Kearns et al. 2010) highlights moments in which an individual’s choices are intertwined with and contingent on their relationship to broader socio-material infrastructures. As participants consistently positioned the HIVST kit as both an individualizing and relational technology, they illustrated one example of the “disconnect between biomedical rationality and the lifeworlds of those who might benefit from technology” (Davis and Rasmussen 2015: 395) by placing them within particular socio-, sexual, and economic contexts. In the sections that follow, we present narratives in which participants imagine the multi-dimensional and socially-
contingent nature of the HIV self-testing kits. When participants actually held the technology, turning the packaging and its contents over in their hands, they anticipated the new possibilities it would afford themselves and others while raising important considerations of how the materiality of the technology might function in the daily lives of those it targets. In other words, they treated the kit itself as a crucial source of action (Verbeek 2005), in that its “doings” implicate other social actors while mediating connections between them. In doing so, they offer an alternative reading of the technosubject, illustrating that these are not entirely autonomous phenomena that unfold in isolation, but are intertwined with and productive of sociality.

“It has become a part of me:” HIVST, bodily autonomy, and self-control
Most participants viewed the kits, and the confidentiality and convenience they afforded, as amplifying the capacity to self-manage health by freeing users from risks associated with facility-based testing. The kits’ properties, which most considered to create convenience, were perceived as enabling them to more easily navigate their own health protection through the short time commitment, rapidity with which results were delivered, and the ability to test in a setting of ones’ own choosing. Pius, a 19-year old from Kiambu explained, “It is saving my time; there is no need going to the VCT [voluntary counseling and testing site], where I have to wait and then have to listen to so many stories. They keep telling me the obvious. [HIVST] it’s at my leisure, anytime I need it.” Others highlighted the long-wait times regularly experienced in the Kenyan healthcare system and having to travel long distances to health facilities. Bravo, a 22-year-old from Mombasa, mentioned how HIVST would eliminate the cost of travel to health facilities. He explained, “You don’t have to use your fare to go and get tested, and also to be able to avoid a long queue. You have to wait for the ones ahead of you to be served before your turn and that wastes a lot of time. But for this one, you just take it home and you can test at any time you want to.”

Participants framed the technosubject as one that internalizes recommendations to test regularly and recognizes themselves as at risk of HIV infection. Kevin, a 24-year-old sex worker from Kisumu, suggested users would adhere to the testing guidelines found in the kit’s instructions, describing how the technology would become a self-extension of the commitment to knowing one’s HIV status. “It has become part of me. I have to know my HIV status each and every three months. That means if I have the kit then I’ll be making use of it to know my HIV status more frequently, after every three months.” Kasim, a 26-year old from Kisumu, made connections to wider public health mantras on the benefits of early detection. “It’s for me to know my status. I want to live a healthy life and this will make me use it. Because when there’s early detection of HIV, before the body gets affected, one is entitled to a healthy life. OST [oral self-testing] will help in the early detection.” While Bravo and Pius highlighted the kit’s convenience and Kasim and Kevin envisioned the kits as helping to internalize the need of taking control of one’s own health, others articulated the kit as entangled within a larger social context.

“A tool of the trade:” HIVST, relationality, and protection
Although many participants reacted to the kit by foregrounding its independence from the clinic, they also reflected on how its introduction would affect their social and erotic lives. They made explicit reference to the technology as a protective and mobile device that carried a relationship to the health and well-being of others and to existing health services. In other words, they contextualized the technology’s “convenience” as enabling a new relationship between themselves and existing opportunities for testing, as well as between themselves and their sexual partners. They framed the technology as offering respite from stigmatizing clinical settings, with particular significance for individuals who avoid CBO testing sites known to be “gay spaces.” Brayo, a 35-year-old from Mombasa, explained how HIVST would address the fear of being labeled with his partner when they visit a testing clinic.
A few years back, my partner and I used to fear walking to a testing center. The fear of saying that this is my partner and we want to test. So you know, other people still have that fear even though now we have friendly facilities. Also, there are those people who never want it to be known they are gay or to be having anything to do with gay people because they have secluded themselves. So, for them having this [HIVST kit] and they do it [test] secretly the same way they have sex with gay people secretly. It will be good for them . . . they can test secretly and know their results. It’s only between the two.

While Brayo no longer fears testing because of the creation of MSM “friendly facilities,” others remain wary of these spaces. His comments reveal the ways in which the targets of HIVST in Kenya conceive of the technology as opening new opportunities to maintain discretion during partner-testing. Similarly, Kings, a 35-year old sex worker from Kisumu, explained how a couple may opt for the kit rather than testing at a health facility where they may face stigma and potential exposure of their sexual preferences. “You know, let’s say if you go . . . like if you go to the queue with your partner that might expose your sexual behavior.”

Participants who engaged in sex work also frequently framed the potential of HIVST in terms that extended beyond the opportunity for self-management of their HIV status. Instead, they conceived of the technology’s mobile quality as creating new chances to test with clients. For example, Isiah, a 35-year old sex worker from Kisumu suggested the kit’s mobility would make it a “tool of trade.” He explained, “[It] is a good thing that you can carry it along with you wherever you go. And for us, as sex workers, we can carry for sex work and it can help you know your status and your partner’s status.” Imagining the mobility of sex workers like himself, Isiah framed the kit as possessing the potential not just for knowing one’s own status but also that of a potential client. Dion, a 37-year-old sex worker from Mombasa, considered self-testing as occurring not in social isolation but as embedded within the political economy of sex work. “I will [use the kit] because I want to know my status every now and then. Because if I’m doing sex work, then every time it should be healthy for me to get a good client. They say that a big cow is the one that’s eaten and slaughtered. So, when I’m eaten, I want I get more money because I’m healthy and I look good.” While Dion imagines the kit as a tool that would facilitate HIV status awareness and overall health, he also gestures toward the relational dimensions of the technosubject that reimagine the kit beyond its influence on autonomous dimensions of the self.

In addition to HIVST being seen as a conduit to facilitate increased partner or client testing among MSM, participants addressed its potential to maintain confidentiality of HIV test results and facilitate HIV status disclosure among partners. Omosh, a 19-year-old from Mombasa, foregrounded the kit’s confidentiality and suggested that it places disclosure in the hand of the user. “On the confidentiality issue of this kit, I find that the kit is the best because after testing and knowing your status, you disclose your status to whoever you want. Your HIV status will remain safe and secure as you are the only one who knows it.” Participants regularly contrasted this increased control over HIV status confidentiality and disclosure with the existing conditions of facility-based HIV testing. Joe, a 20-year old from Kiambu, highlighted the doctor-patient relationship as a barrier to clinic-based testing and suggested that the testing kit held the potential to render this barrier irrelevant. “It is a revolution in HIV. Although they say there is privacy when at the VCT, there is nothing like privacy between two people. That is a fact. But the moment you take such a kit and go home with it, you will realize that you are the only one who will know if you are positive or negative.”

Despite participants’ overall positive responses regarding the potential of HIVST to improve rates of partner-testing and to increase individual autonomy over confidentiality and disclosure of HIV status and sexual orientation, many participants raised concerns regarding the lack of posttest counseling services. Kevin, a 24-year-old from Kisumu, felt using HIVST with a partner without pre- and posttest counseling would leave users unprepared to receive the result. He remarked, “It can also bring issues between you and your partner if you went ahead and tested together. I think testing also needs the counseling part of it. Somebody needs to prepare you psychologically at least to receive the result.” In Kevin’s scenario, the kit enacts a testing modality in which the long-standing service of posttest counseling would be absent, suggesting an unease with the reduction of comprehensive services enabled by the kit. Feshal, a 35-year-old from Kisumu, also raised ethical concerns regarding
the lack of posttest counseling, imagining a relational scenario in which one partner tests positive and the other tests negative. “This self-test kit, in my opinion, I feel there is something bad about it. Because I take it, and I’m with my client or maybe my boyfriend. We go and take the test then one of us comes out to be HIV positive, and I’m negative. What is the outcome? It will be just the two of us there nobody counseling us.”

“This bulky thing:” HIVST kits as a thing-in-the-world
Reflecting on the materiality of the kit – particularly its size and packaging – participants raised questions regarding how it might compromise discretion and disrupt their social relationships. They grounded these discussions in the context of their daily social interactions and the conditions in which they live. For example, participants regularly described the risk of unintended status disclosure if a used kit was discovered after disposal. When asked if she had any concerns about using the kit, Shakira, a 24-year old transgender sex worker from Mombasa said:

If I dispose it wrongly and my neighbors had probably seen me carry it into my house or when disposing it. Once they open it they can see my status. For instance, if I am infected, the kit will have two stripes. If the results are unfavorable to me, and my neighbors get to open and see the kit, they can know that I, their neighbor, is infected. Soon everyone in the area will know. They will disclose to other people. Maybe that’s the harm it can pose.

Shakira imagines a situation in which, after receiving a positive test result, a neighbor discovers the disposed test and learns her status. From there, as the neighbor holds the technology in their hands and ascertains what the “two stripes” indicate, news of Shakira’s serological status could spread throughout the neighborhood. Rather than an individualized moment of realized autonomy, Shakira’s narrative suggests that self-testing takes place “in a complex web of relationships” (Kearns et al. 2010:202). In her telling, the physical properties of the kit become entangled with the socio-material infrastructures of her everyday life in ways that undermine its promise of increased autonomy and confidentiality.

Participants sometimes related their concerns around disposal to the kit’s instructions, which recommended the use of an ordinary waste bin. After reviewing the instructions, Mark, a 24-year-old from Kiambu, offered what he felt was a better alternative. “It’s better if you dispose it somehow in an exclusive way other than with other garbage. So, like this one you can wrap it in a unique way and dispose it.” While the kit might be framed by the BeSureKenya campaign as a bounded object under the control of an autonomous technosubject, Shakira and Mark’s concerns reveal that the kit is perceived as a “doing” thing whose social itineraries may diverge from an idealized path for its use. For participants, it was not always clear when the kit begins (or is done) acting.

In addition to concerns about inadvertent disclosure of ones’ HIV status, disposal of the kit also raised discussions of conflict over perceived mistrust of one’s partner. Omosh, a 19-year-old from Mombasa, explained, “Maybe your partner for instance, you may have the self-test kit but did not inform your partner. So if they see the kit, they may think that you are suspecting them or you are not trusting him. They may wonder ‘what does my partner think of me?’” Omosh expressed ambivalence toward the kit’s material presence, imagining its significance as extending beyond an individual desire to self-test to affect the textures of trust within an intimate relationship.

In addition to the discussions of the kit itself, participants from all sites were preoccupied with the kit’s packaging, expressing both positive reactions to its design, as well as concerns about how the packaging could undermine discretion. Most participants reported that they liked the packaging and found it attractive and tamper proof. Bruce, a 22-year-old from Mombasa, compared the physicality of the kit’s packaging as similar to other, ordinary objects. “The package itself, the cover, they designed a very good cover. When somebody looks at it, he may think it is something like a chocolate or something like a milk paper bag [packaging for liquid milk]. It’s white in color so nobody will notice easily that it’s a self-test kit.” Other research participants focused on the size of the kit and how it facilitated portability, often drawing positive associations between this quality of the technology and the highly mobile nature of their daily lives. Most participants felt that the size of the kit was appropriate
and could easily fit in a pocket. Kelvin, a 24-year-old from Kisumu, suggested that the pocket-sized kit made it portable and discreet. “The packaging is well, is not bad … Cuz it can fit in a pocket, someone cannot notice that you have it so you can use it either at home, in the office, or any place that you feel it’s ok.” Kelvin and others imagined the size of the kit as permitting MSM to navigate their social world without drawing the attention of others. In his view, the technology is not merely a thing that enables the individual to engage in a health protective act in isolation from the social world but, being an inconspicuous thing, aligns with the desire to maneuver discretely in that world.

Despite these general endorsements, concern regarding the size, shape, and packaging of the kit emerged among participants in Kisumu where participants felt the kit was too large and worried that this would create a particular barrier for MSM engaged in sex work. Tonny, a 35-year-old sex worker, expressed his disdain for the “bulky” kit, remarking, “The packaging is good, though it’s not pocket-friendly because it’s too big in our pockets. [laughs] And some of us sex workers, we don’t need to carry this bulky thing while at the same time you need to carry a condom. So I don’t like the packaging.” Kings, a 35-year-old from Kisumu, suggested that the kit’s shape was awkward and its plastic packaging could be noisy when stored in pants or a bag, thereby undermining the privacy and discretion it promotes. “Aah, like this thing is too bulky, it’s not pocket-friendly, it makes too much noise. Maybe you don’t want somebody to know what you are carrying in your pocket.” Similarly, Emmanuel, a 37-year-old from Kisumu, paid detailed attention to the noise that might be caused by the wrapping rustling (koro koro) while going about one’s daily life, even comparing it to the jingling of ARV pills (kolo kolo kolo) in a bottle.

The wrapping … if you are a very discrete person, and maybe you wanted to do it in a place that people don’t want you or you don’t want anyone to notice, this noisy nature of the juala (polythene cover) on the cover koro koro is going to attract attention. [laughs] So it’s not good just like some people want to take ARV’s in discrete and then when they go with that tin, it’s a kolo kolo kolo then somebody says “Ai!” It it’s the noise. It’s so distinct everybody would know that is the noise of that.

**Discussion**

Since the US Federal Drug Administration approval of OraQuick® self-testing kits in 2012, there has been a renewed interest in public health research seeking to understand the factors associated with acceptability and uptake of HIVST among target populations. Key findings from this literature are that individuals view HIVST as increasing patient confidentiality and privacy, as a convenient and time-saving alternative to facility-based testing, and as a tool of patient empowerment (Krause et al. 2013; Lyons et al. 2013; Kelvin et al. 2016; Lippman et al. 2016, Nguye et al. 2017; Medline et al. 2017; Pando et al. 2017; Harichund and Moshabela 2018; Qin et al. 2018; Liu et al. 2019). This work frames the technology as holding great promise for reaching global testing targets, particularly among “hard to reach populations” that have achieved limited testing in healthcare facilities. In short, public health research has posited that HIVST is a promising technology, giving individual patients a tool to manage their own health while also meeting public health targets and reducing costs (Greaney et al. 2012; Kearns et al. 2010).

Our research suggests that the kits themselves hold an agential potentiality that is socially contingent and often contextually fraught. Building on work in critical public health and science and technology studies, we highlight the limitations of an imagined autonomous individual for making sense of what such diagnostic technologies might actually do. While self-testing devices in general are premised on the idea that increased patient autonomy in the management and assessment of their health is a social good, such a framing ignores the relational aspects of personhood (Greaney et al. 2012; Kearns et al. 2010) and does not account for how particular socio-material infrastructures shape one’s relationship to human and nonhuman actors alike. Banda (2015) has conceived of HIVST as a “new practice of biocitizenship” in the “end of AIDS” era, uncovering how such self-diagnostics are rooted in assumptions regarding the autonomous individual’s responsibility for the management of risk. Furthermore, he argues that while it
may appear that HIVST represents the weakening of biomedical authority as testing becomes decentralized, it also constitutes the creep of biomedical authority into the private domain, a process he refers to as symbolic demedicalization (2015: 30). The set of participant narratives we present help to unsettle many of the assumptions that the technology has come to embody in public health discourse, including the promise of independence, agency, and responsibility – ideologies which, we argue, are founded in late liberal and class-based notions of privacy, bodily autonomy, and control over self-risk (Crittenden 1992). Our study is illustrative of how a neoliberalizing technology advances while also giving rise to technosubjects firmly rooted in particular social and material infrastructures. As participants describe what "sorts of doings" (Mol 2010) they imagine HIVST to be involved in, they reveal the ways in which the kit itself functions as a non-human actor through which agency is exerted and socially contingent. While HIVST is regularly conceived of as hermeneutically sealed from stigmatizing social barriers to HIV testing by facilitating autonomy, respondents articulated a technosubject whose agency emerges out of the co-production of technology and their imaginings of how it might exist within their social worlds.

**Conclusion**

As the momentum of “test and treat” and other biomedically-focused strategies to HIV epidemic mitigation accelerates 90–90-90 targets to 95–95-95 (Granich et al. 2018), HIV self-testing diagnostic technologies take on greater and greater importance. As global public health policies constitute MSM as ideal users of self-testing kits, our findings contextualize and complicate claims regarding the convenience, privacy, and independence of HIVST and reveal conflicts between the (real and assumed) desire for individual autonomy and the relational aspects of personhood (Greaney et al. 2012). Depicted as equipping users with “self-controlled” access to health services at a distance from health services and the stigmatizing conditions that occlude access, HIVST can be viewed as creating and tethering the technosubject to policy imperatives, while keeping those most vulnerable to HIV infection “on track” with these globally defined goals. However, our findings suggest that the eventual rollout of such self-diagnostic devices will be subject to semiotic-material contingencies and limits. In particular, we have argued that teleological framings of the individual and the technology itself as liberating marginalized people from health services access barriers, may compromise efforts at scaling-up HIVST. In pursuing a conceptual approach that views agency as co-produced and emergent in and through human technological entanglements, we have argued that the design and implementation of programs that employ the device must consider how such interactions unfold in particular socio-material contexts. Although HIVST use among MSM in Kenya has become quite routine since the study conclusion, our findings point to the methodological importance of focusing on the smaller and ephemeral initial moments of hesitation, fear, and interest surrounding contact with a new health product and underscores the careful contextual work that public health planners need to consider when introducing an unknown technology.

**Note**

1. Key populations are groups assumed to be the most vulnerable to HIV infection such as sex workers, people who inject substances, and men who have sex with men.

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Notes on contributors

Matthew Thomann is an Assistant Professor in the Department of Anthropology at The University of Maryland, College Park.

Bernadette Kombo is a qualitative research manager with Partners for Health and Development in Africa, a Kenyan NGO based in Nairobi and a PhD candidate at The University of Manitoba.

Helga Musyoki holds an MPH and leads the HIV prevention unit within the division of National AIDS and STIs Control Programme (NASCOP) at the Kenyan Ministry of Health.

Kennedy Masinyu is an activist who leads the organization, Men Against AIDS Youth Group (MAAYGO), an MSM-led organization based in Kenya.

Samuel Kuria is the Founder and Director of Minority Person’s Empowerment Program (MPEG), an MSM-led organization based in Kenya.

Martin Kyana is the Founder and Director of HIV & AIDS People’s Alliance of Kenya (HAPA), an MSM led-organization based in Kenya.

Janet Musimbi has an MPH and works as the Technical Manager with Partners for Health and Development in Africa. Lisa Lazarus is Research Associate at the University of Manitoba, where she completed a PhD in Community Health Sciences.

James Blanchard is a medical epidemiologist who leads the University of Manitoba Institute of Global Public Health.

Parinita Bhattacharjee is a social scientist and leads program delivery in the University of Manitoba Institute of Global Public Health and Senior Technical Advisor with Partners for Health and Development in Africa.

Robert Lorway is Professor of Community Health Sciences in the University of Manitoba Institute for Global Public Health where he holds the Canada Research Chair in Global Intervention Politics and Social Transformation.

ORCID

Matthew Thomann http://orcid.org/0000-0003-0754-3254
Bernadette Kombo http://orcid.org/0000-0003-1808-4356
Janet Musimbi http://orcid.org/0000-0001-7071-3063
Lisa Lazarus http://orcid.org/0000-0002-7673-4671
James Blanchard http://orcid.org/0000-0002-4701-590X
Parinita Bhattacharjee http://orcid.org/0000-0003-3277-7695
Robert Lorway http://orcid.org/0000-0001-6923-8832

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