

Effects of a multimedia campaign on HIV self-testing and PrEP outcomes among young people in South Africa: a mixed-methods impact evaluation of 'MTV Shuga Down South'

Isolde Birdthistle ¹, Sarah Mulwa,¹ Sophie Sarrasat,¹ Venetia Baker,¹ David Khanyile,² Dominique O'Donnell,² Cherie Cawood,² Simon Cousens¹

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CC and SC contributed equally.

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¹Faculty of Epidemiology and Population Health, London School of Hygiene & Tropical Medicine, London, UK

²AIDS Risk Management, Epicentre Health Research, Hillcrest, Durban, South Africa

Correspondence to

Dr Isolde Birdthistle;
Isolde.Birdthistle@lshtm.ac.uk

ABSTRACT

Introduction Innovative HIV technologies can help to reduce HIV incidence, yet uptake of such tools is relatively low among young people. To create awareness and demand among adolescents and young adults, a new campaign of the pan-African MTV Shuga series ('Down South 2'; DS2), featured storylines and messages about HIV self-testing (HIVST) and pre-exposure prophylaxis (PrEP) through television, radio and accompanying multimedia activities in 2019–2020.

Methods We conducted a mixed-methods evaluation of the new MTV Shuga series among 15–24 years old in Eastern Cape, South Africa, in 2020. Quantitative and qualitative methods were used to investigate complementary evaluations questions, namely, whether and how the DS2 campaign works. A web-based survey, promoted via social media platforms of schools, universities and communities, assessed exposure to MTV Shuga and knowledge of HIV status; secondary outcomes included awareness and uptake of HIVST and PrEP. We used multivariable logistic regression to estimate associations between exposure to DS2 and each outcome, adjusting for sociodemographic factors, media assets and exposure to other media campaigns. An embedded qualitative evaluation explored mechanisms of DS2's impact through deductive and inductive thematic analysis of in-depth individual and group interviews.

Results Among 3431 online survey participants, 43% had engaged with MTV Shuga and 24% with DS2 specifically. Knowledge of HIV status was higher among those exposed to DS2 (71%) vs those who were not (39%; adjusted OR=2.26 (95% CI 1.78 to 2.87)). Exposure was also associated with increased awareness of HIVST (60% vs 28%; aOR=1.99 (1.61 to 2.47)) and use of HIVST (29% vs 10%; aOR=2.49 (1.95 to 3.19)). One-third of respondents were aware of PrEP, with higher proportions among those exposed versus non-exposed to DS2 (52% vs 27%; aOR=1.90 (1.53 to 2.35)). Qualitative insights identified mechanisms by which DS2 increased awareness, confidence and motivation to use HIVST and PrEP, but had less influence on service access.

Conclusions We found evidence consistent with a positive causal impact of the MTV Shuga DS2 campaign

WHAT IS ALREADY KNOWN ON THIS TOPIC

- ⇒ Young people have a high need for HIV prevention yet relatively low uptake of testing and pre-exposure prophylaxis (PrEP).
- ⇒ Identifying ways to expand the reach and engagement of young people in HIV prevention, particularly testing services and PrEP, has become a priority for HIV epidemic control.

WHAT THIS STUDY ADDS

- ⇒ Exposure to a multi-media edutainment campaign was strongly associated with increased awareness and use of HIV self-testing and knowledge of PrEP, and with young people's knowledge of their HIV status.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE AND/OR POLICY

- ⇒ As HIV testing and PrEP options diversify, and digital connectivity expands globally, there is an important role for immersive multi-media campaigns in helping to accelerate HIV prevention among young people.

on HIV prevention outcomes among young people in a high-prevalence setting. As diverse testing and PrEP technologies become accessible, an immersive edutainment campaign can help to expand HIV prevention choices and close age and gender gaps in HIV testing and prevention goals.

INTRODUCTION

Biomedical innovations in HIV prevention are expanding the options and tools to avoid HIV acquisition and accelerate declines in HIV incidence. By diversifying HIV testing choices, HIV self-test (HIVST) kits have enabled more people to know their HIV status and access pathways into treatment and prevention.¹

Confirmation of positive status can link those living with HIV/AIDS to life-saving treatment, viral suppression and improved health, while reducing onward transmission.² Knowledge of negative HIV status can link individuals to prevention services, including highly efficacious pre-exposure prophylaxis (PrEP).

New tools like HIVST and PrEP can be particularly valuable for young people aged 15–24 years, an important demographic group for the global goal to end AIDS as a public health threat by 2030, who are less likely than older adults to know their HIV status.^{2–4} As yet, no country in sub-Saharan Africa has achieved the first step of the UNAIDS ‘90:90:90’ targets for the HIV treatment cascade (90% knowledge of status) among 15–24 years olds, despite significant gains in diagnostic coverage overall.⁵ Regionally, less than half of 15–24 year-olds are aware of their HIV status.⁶ This represents a missed opportunity for early diagnosis to avoid illness and transmission, and for more young people to avail themselves of high-impact prevention options like PrEP.^{7,8}

When offered HIVST in the context of research studies, young people have welcomed the opportunity to test in private, without the judgement, stigma or discrimination they often face in facility-based services.^{9–11} In real-world conditions, relatively few young people are aware of or using HIVST.¹² Similarly, while research has shown PrEP to be an acceptable HIV prevention method for young men and women, awareness and uptake of PrEP via national programmes is lower than expected, and annual growth has slowed over time since 2016.^{13–16} Identifying ways to expand the reach and engagement of young people in HIV prevention, particularly testing services and PrEP, has become a priority for HIV epidemic control.¹⁵

MTV Shuga is a multimedia campaign based around a popular dramatic series that promotes HIV prevention and positive sexual health messaging with entertaining storylines and characters. Since the first series based in Nairobi in 2009, MTV Shuga has been broadcast on 179 terrestrial channels reaching an estimated 719 million households. All episodes are available rights-free on internet platforms and MTV Staying Alive Foundation estimates 42 million people have been reached through social media.¹⁷

In 2019–2020, a new MTV Shuga series entitled ‘Down South 2’ was produced in South Africa and incorporated storylines designed to increase awareness and demand for HIV testing, including self-testing and PrEP in ways that resonate with young people. As with all previous series, the producers conducted initial formative work to develop and validate storylines and scripts with young people through focus group discussions. The show was complemented by wrap-around, ‘360-media’ activities including a radio series, documentary films and online resources¹⁷ (online supplemental figure 1). In the town of Mthatha in Eastern Cape, South Africa, peer-education and community events and a graphic novel distributed through schools enabled opportunities for offline

engagement among those underserved by television and internet.

To date, the efficacy of MTV Shuga has been demonstrated in a cluster-randomised trial of community viewings in Nigeria, which showed a positive impact on HIV and STI testing.¹⁸ Published evidence of effectiveness in non-trial conditions is limited but recent studies indicate that MTV Shuga influences positive sexual health behaviours among viewers, through observational learning and modelling, consistent with social learning theory.^{19,20} We sought to evaluate the impact of MTV Shuga Down South on HIV prevention outcomes, including awareness and uptake of HIVST and PrEP, among young people in South Africa.

METHODS

A mixed-methods evaluation was conducted in 2020 to determine whether and how MTV Shuga Down South 2 (DS2) impacted HIV prevention outcomes among young people. Using a triangulation design to mix separate but complementary methods, a structured survey was designed to identify an effect of DS2 exposure on key outcomes, while embedded qualitative activities were designed to identify mechanisms of DS2 influence on viewers’ knowledge, motivation and opportunity to adopt the key outcomes.²¹ All research activities were conducted remotely to avoid risk of SARS-CoV-2 transmission.

First, an online survey was hosted on a website, free of charge for users through reverse-charging arrangements with the service provider. Those who completed the survey received mobile data credit of SAR50 (approximately US\$5) transferred to a phone number provided for this purpose only. The survey was open to 15–24 year old males and females and promoted through virtual marketing on Facebook, Instagram and social media platforms of schools, universities, community groups and clinics in Mthatha, Eastern Cape. This setting was targeted due to: recent distribution of HIV self-testing kits and availability of oral PrEP (ensuring a supply to meet any demand generated by the DS2 campaign)²²; availability of the offline components of the DS2 campaign, described above; less HIV prevention research and lower HIV testing levels in Eastern Cape relative to other provinces; and the recommendation of the South African Department of Health. We sought to enrol a minimum sample of 2250 young people (with equal numbers by sex and age-group), in order to identify a minimum 10% difference in the primary outcome between those exposed and not exposed to MTV Shuga DS2. In scenarios assuming between 20% and 50% of the target population are exposed to DS2, estimated study power ranged from 88% to 99%.

The self-administered questionnaire (online supplemental file 1) was anonymised with no name or other personal identifying information requested and questions designed to measure exposure to the MTV Shuga DS2 campaign (primary exposure) and any other MTV

Shuga campaign (secondary exposure). The primary outcome was knowledge of HIV status, that is, the proportion who tested for HIV in the past year and received the result, or ever tested HIV positive.

Secondary outcomes included awareness, willingness to use and uptake of HIVST and PrEP. Awareness and willingness were measured through self-reported responses to single-item questions, asking ‘Have you ever heard about (HIV self-screening/PrEP) ...?’ (or ever used an HIVST kit); ‘Would you be willing to take PrEP every day if it reduces your chances of contracting HIV?’; and participants reporting they would be somewhat or very interested in (screening themselves for HIV) (giving a self-screen kit to a sexual partner) if a free kit was available. Uptake of HIVST was defined as reported use of a self-test kit ever or in the past year (online supplemental file 1). For comparability with other research, these questions were drawn from measures validated and used by the Self-Testing Africa Initiative, where possible.²³

We constructed a directed acyclic graph (DAG) to represent the hypothesised causal relationship between intervention exposure, the study outcomes and other sociodemographic characteristics²⁴ (online supplemental figure 2). The DAG was interrogated to identify the minimum set of constructs needed to control for confounding, which included such factors as age, sex, location of residence, home language, schooling and employment status, household and individual media assets, food security, sexual behaviours and exposure to other HIV media campaigns. Residence was measured by province and also urban or rural location. Food security was defined categorically by frequency of going to bed hungry in the past month (often, sometimes, never/rarely). Principal component analysis was used to create media asset indices at the household level (inputting household-level ownership of five assets: radio, television, computer/device, internet, TV subscription) and individual level (with three personally owned assets: radio, smartphone or computer/device). Both indices were split into asset scores representing low, medium, or high.

We calculated the proportion of respondents who knew their HIV status, and each secondary outcome, by exposure to DS2, and estimated associations between the intervention and outcomes using multivariable logistic regression to adjust for confounding variables informed by the DAG. Interaction terms were included where there was evidence of effect modification by age or gender. Each logistic regression model was restricted to individuals with non-missing responses for each outcome of interest.

A sample of participants who reportedly engaged with DS2 (watched or listened to at least one episode on TV, internet or radio) and opted into further research were invited to participate in an embedded qualitative evaluation to explore mechanisms of MTV Shuga’s impact. Qualitative research activities included in-depth interviews (18 females, 13 males) and six focus group discussions, held in age- and gender-specific groups of 4–6

participants. Topic guides (online supplemental files 4 and 5) were based on the ‘COM-B’ behavioural wheel model to explore MTV Shuga DS2’s influence on participants’ capability, opportunity and motivation to adopt attitudes and behaviours supportive of HIVST and PrEP.²⁵ Video clips with DS2 scenes about HIVST and PrEP were shown to generate discussion. Trained researchers who were bilingual (in either isiXhosa or Zulu and English), and aged under 30 years, facilitated the individual and group interviews via phone, Zoom or WhatsApp. Participants received data transfers in advance, to facilitate participation, and SAR100 airtime credit on completion. Researchers transcribed all interviews into English and transcripts were analysed (by VB) using a hybrid (deductive and inductive) thematic coding process.²⁶ Deductive codes were generated around the three conditions of the COM-B behavioural framework. A stage of open coding was conducted to allow other mechanisms of influence to emerge inductively. The analyst discussed findings with the data collectors and transcribers to ensure findings reflected the data collected.

We applied a realist evaluation approach to triangulate findings across methods, to understand both whether and how MTV Shuga DS2 works.^{27 28} We explored how contextual factors influence mechanisms of change (identified in the qualitative research) to bring about the resulting outcomes (observed in the quantitative survey).

Research statement

Ways to promote equity in the research partnership were considered at the proposal and design stage and summarised in a Reflexivity Statement (online supplemental file 4).

Patient and public involvement

Members of the public are engaged in the dissemination and discussion of results, via social media platforms and a public webinar on MTV Shuga evidence.

RESULTS

Online survey

Characteristics of the survey sample

The web-based survey was available online from September to December 2020, during which 4145 records were created. After removing records without full consent (n=407) or gender (n=144), and likely duplicates (n=163), 3431 (83%) records were taken forward for analysis (table 1). Of those, respondents were predominantly female (59%), aged 20–24 years (69% vs 31% aged 15–19), and spoke isiXhosa at home (80%). Most respondents (83%) were enrolled in education, including 34% in university, 28% in technical/vocational college and 21% in primary or secondary school, while 3.1% were employed and 10.4% unemployed. The majority resided in urban settings (85%), primarily in Mthatha town (72%) or elsewhere in Eastern Cape province (11%), while 16% lived in other provinces of South Africa (6%, 4% and 3% in Western Cape, Gauteng and

Table 1 Sociodemographic characteristics of online survey participants, overall and by age group (N=3431)

	Age group					
	15–19 years (N=1079)		20–24 years (N=2352)		Total (N=3431)	
	n	%	N	%	n	%
<i>Socio-demographic characteristics</i>						
Gender						
Male	372	34.5	945	40.2	1317	38.4
Female	656	60.8	1364	58.0	2020	58.9
Other (transgender or prefer not to say)	51	4.7	43	1.8	94	2.7
Current schooling/employment status						
In school (primary/secondary)	597	55.3	129	5.5	726	21.2
TVET	144	13.3	823	35.0	967	28.2
University	228	21.1	936	39.8	1164	33.9
Employed	12	1.1	94	4.0	106	3.1
Unemployed	49	4.5	308	13.1	357	10.4
Unknown	49	4.5	62	2.6	111	3.2
Language spoken at home						
English	99	9.2	160	6.8	259	7.5
IsiXhosa	798	74.0	1947	82.8	2745	80.0
Zulu	100	9.3	124	5.3	224	6.5
Other	72	6.7	119	5.1	191	5.6
Unknown	10	0.9	2	0.1	12	0.3
Province						
Eastern Cape (EC)—Mthatha	716	66.4	1746	74.2	2462	71.8
Eastern Cape—O.R. Tambo	24	2.2	46	2.0	70	2.0
Eastern Cape—other EC	102	9.5	192	8.2	294	8.6
Western Cape	57	5.3	157	6.7	214	6.2
Kwa-Zulu Natal	65	6.0	38	1.6	103	3.0
Gauteng	56	5.2	80	3.4	136	4.0
Other provinces	36	3.3	47	2.0	83	2.4
Unknown	23	2.1	46	2.0	69	2.0
Urban/rural residence*						
Urban setting	891	82.6	2032	86.4	2923	85.2
Rural setting	95	8.8	192	8.2	287	8.4
Unknown	93	8.6	128	5.4	221	6.4
Food insecurity						
Never/rarely	610	56.5	1268	53.9	1878	54.7
Sometimes	319	29.6	820	34.9	1139	33.2
Often/always	72	6.7	146	6.2	218	6.4
Unknown	78	7.2	118	5.0	196	5.7
Called a helpline or searched for information on HIV on the internet†						
No	485	44.9	1182	50.3	1667	48.6
Yes	422	39.1	930	39.5	1352	39.4
Unknown	172	15.9	240	10.2	412	12.0

*Coding Mthatha to urban setting

†This measure includes the following sites/helplines: Bwise, Loveline, Childline, but excludes MTV Shuga website
TVET, Technical Vocational Educational and Training colleges.

KwaZulu-Natal, respectively). About 40% of participants reported experiencing food insecurity (going to bed hungry in the past month) either sometimes, often or always.

Most participants lived in a household with a television (TV; 83%), internet (75%), radio (72%) and a computer or other digital device (57%); household ownership of all these was higher among older (20–24 years old) than younger respondents (15–19 years old) (table 2). Most respondents owned their own smartphone (85% for both age groups), while about half owned their own computer and fewer (35%) owned a radio. Digital media engagement was high with 86% using the internet and social media platforms at least once a week, most commonly Facebook (72%), YouTube (44%) and Instagram (37%). Fewer than 1% reported never using the internet or social media. Most watched TV (74%) and listened to the radio (62%) at least weekly. Use of all media types was higher among older than younger respondents, although data were more often missing among the younger group.

Reported sexual experience

Similarly, younger respondents were more likely to skip questions about sex and relationships: 31% of younger and 20% of older participants did not answer if they had ever had sex (table 2). Of those who responded, 43% of younger and 53% of older respondents reported ever having had sex, and 38% of younger and 47% of older respondents were currently in a relationship. A small minority (3%) had ever been married or co-habited with a partner. Among those who answered the questions, females were more likely than males to report ever having had sex (54% vs 45%), and being in a relationship (48% vs 41%). However, female respondents were more likely than males to skip questions about sex and relationships: 21% of female participants and 16% of males did not answer both questions.

Exposure to MTV Shuga Down South 2 and other MTV Shuga campaigns

Almost one-quarter (24%) of all respondents reported engagement with the campaign linked to the most recent MTV Shuga series: ‘Down South Season 2’ (DS2): 29% of the younger and 22% of older respondents (table 3). Engagement most often involved attending a peer educator-led group discussion about DS2 (15%), followed by watching the affiliated ‘In Real Life’ documentary (11%), reading the DS2 graphic novel (10%), attending a DS2 community event (9%), and watching DS2 on TV or the internet and identifying it as season 2 (7%). Only a small proportion reported listening to DS2 on the radio (2%).

Overall, 43% (50% of the younger and 40% of the older respondents) had engaged with any MTV Shuga campaign (table 3). This included 30% of all respondents who ever watched ‘MTV Shuga Down South’ (either season 1 or 2) on TV or internet; 25% who watched the MTV preview show ‘16 and Pregnant’; 17% who watched MTV public service announcements related to Down

South; as well as those who listened to either season 1 or 2 of Down South on the radio (10%), watched the COVID-19 related ‘Alone Together’ mini-series (8%), or interacted with the campaign by posting comments about an episode on social media (9%), answering a phone-based polling question (8%) or searching the MTV Shuga website (6%).

Engagement with MTV Shuga was higher among younger respondents (15–19 years old vs 20–24 years old) for the DS2 series specifically and any MTV Shuga campaign more broadly, and for all media formats and engagement activities (table 4, online supplemental table 1). Exposure to MTV Shuga was also higher among females versus males, and to a lesser extent, those in school or university compared with those in technical/vocational colleges or out-of-school; and those who speak English or Zulu at home, compared with isiXhosa. Exposure was much higher among those who had ever been sexually active compared with those who had not, and for those currently in a relationship (for both DS2 and any MTV Shuga campaign).

HIV outcomes and associations with MTV Shuga exposure

About 47% of respondents said they were aware of their HIV status, either because they had ever tested HIV-positive (~11%; 136 out of 1294 who knew their status) or because they had tested in the past year and received their result (table 5). Knowledge of HIV status was higher among those who were exposed to MTV Shuga DS2 (71%) compared with those who were not (39%) (adjusted OR (aOR)=2.26 (95% CI 1.78 to 2.87)), after controlling for possible confounders, including alternative sources of HIV information (table 5, figure 1A, online supplemental table 2). The association between DS2 exposure and knowledge of HIV status was stronger among older respondents (aOR=3.03) than younger respondents (aOR=1.47; $p<0.001$ for test of interaction by age group).

The proportion of respondents who had ever heard of HIVST was also higher among those exposed to DS2 versus the non-exposed (60% vs 28%; aOR=1.99 (1.61 to 2.47)), with a stronger effect size among older vs younger respondents ($p<0.001$) (table 5, figure 1A). The proportions who had used an HIV self-test, either ever in their lifetime (29% vs 10%; aOR=2.49 (1.95 to 3.19)) or within the past year (21% vs 7%; aOR=2.61 (1.97 to 3.47)) were higher among those exposed versus non-exposed to DS2, with no evidence of a difference by age group. Among those who had never used an HIV self-test before, interest in using a self-test was high overall (83%), and association with DS2 exposure differed by age group: specifically, exposure to DS2 was associated with more interest in HIVST among younger respondents (aOR=1.66 (1.05 to 2.64)) and with less interest among older respondents (aOR=0.50 (0.34 to 0.72)). Similarly, interest in giving an HIV self-test kit to a partner was high, with DS2 exposure associated with more interest among younger respondents (aOR=1.84 (1.13 to 3.0)) and with less interest

Table 2 Media ownership and sexual experiences reported by online survey participants, overall and by age group and gender (N=3431)

	15-19 years						20-24 years									
	Male (N=372)		Female (N=656)		Other (N=51)		Total (N=1079)		Male (N=945)		Female (N=1364)		Other (N=43)		Total (N=2352)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
<i>Media assets</i>																
<i>Household ownership</i>																
Radio	240	64.5	463	70.6	17	33.3	720	66.7	727	76.9	1002	73.5	15	34.9	1744	74.1
Television (TV)	291	78.2	533	81.3	19	37.3	843	78.1	811	85.8	1160	85	18	41.9	1989	84.6
Computer/device	200	53.8	334	50.9	11	21.6	545	50.5	589	62.3	801	58.7	14	32.6	1404	59.7
Internet	270	72.6	464	70.7	18	35.3	752	69.7	752	79.6	1038	76.1	20	46.5	1810	77.0
TV subscription	184	49.5	352	53.7	10	19.6	546	50.6	428	45.3	657	48.2	9	20.9	1094	46.5
Unknown	33	8.9	51	7.8	1	2.0	85	7.9	47	5.0	84	6.2	2	4.7	133	5.7
<i>Household media assets index</i>																
Low	125	33.6	245	37.3	40	78.4	410	38	294	31.1	453	33.2	26	60.5	773	32.9
Medium	111	29.8	168	25.6	2	3.9	281	26	330	34.9	433	31.7	8	18.6	771	32.8
High	103	27.7	192	29.3	8	15.7	303	28.1	274	29.0	394	28.9	7	16.3	675	28.7
Unknown	33	8.9	51	7.8	1	2.0	85	7.9	47	5.0	84	6.2	2	4.7	133	5.7
<i>Personal ownership</i>																
Radio	133	35.8	215	32.8	3	5.9	351	32.5	373	39.5	455	33.4	10	23.3	838	35.6
Smartphone	322	86.6	573	87.3	18	35.3	913	84.6	813	86.0	1179	86.4	17	39.5	2009	85.4
Computer/device	166	44.6	265	40.4	6	11.8	437	40.5	540	57.1	755	55.4	12	27.9	1307	55.6
Unknown	32	8.6	51	7.8	1	2.0	84	7.8	899	95.1	1279	93.8	41	95.3	2219	94.3
<i>Individual media assets index</i>																
Low	133	35.8	249	38	44	86.3	426	39.5	291	30.8	453	33.2	27	62.8	771	32.8
Medium	125	33.6	246	37.5	5	9.8	376	34.8	342	36.2	500	36.7	6	14	848	36.1
High	82	22	110	16.8	1	2.0	193	17.9	266	28.1	326	23.9	8	18.6	600	25.5
Unknown	32	8.6	51	7.8	1	2.0	84	7.8	46	4.9	85	6.2	2	4.7	133	5.7
<i>How often do you watch TV</i>																
Never	8	2.2	17	2.6	3	5.9	28	2.6	21	2.2	20	1.5	3	7	44	1.9
Less than weekly	46	12.4	105	16	6	11.8	157	14.6	125	13.2	169	12.4	4	9.3	298	12.7
At least once per week	274	73.7	453	69.1	16	31.4	743	68.9	727	76.9	1058	77.6	14	32.6	1799	76.5
Unknown	44	11.8	81	12.3	26	51.0	151	14	72	7.6	117	8.6	22	51.2	211	9
<i>How often do you listen to the radio</i>																
Never	45	12.1	79	12	6	11.8	130	12	55	5.8	113	8.3	6	14	174	7.4
Less than weekly	57	15.3	154	23.5	7	13.7	218	20.2	128	13.5	244	17.9	2	4.7	374	15.9
At least once per week	225	60.5	341	52	13	25.5	579	53.7	682	72.2	865	63.4	15	34.9	1562	66.4
Unknown	45	12.1	82	12.5	25	49.0	152	14.1	80	8.5	142	10.4	20	46.5	242	10.3
<i>How often do you use the internet</i>																

Continued

Table 3 Proportions exposed to MTV Down South 2 and any MTV Shuga campaign, overall and by age group

	Age group					
	15–19 years (N=1079)		20–24 years (N=2352)		Total (N=3431)	
	n	%	n	%	n	%
<i>MTV Shuga Down South 2 (MTV DS2)</i>						
Ever watched MTV DS2 on TV, MTV website or YouTube	100	9.3	138	5.9	238	6.9
Ever listened to MTV DS2 on the radio	29	2.7	42	1.8	71	2.1
Read the MTV Shuga DS2 graphic novel	140	13.0	204	8.7	344	10.0
Watched the documentary called MTV Shuga in real life that was broadcast at the end of DS2	144	13.3	242	10.3	386	11.3
Attended small group discussion facilitated by a peer educator (at a clinic, school, university, TVET or somewhere else) on DS2 anywhere	182	16.9	331	14.1	513	15.0
Attended a community event on DS2 anywhere	107	9.9	185	7.9	292	8.5
Exposure to MTV DS2: said yes to at least one of the above (primary exposure measure)	309	28.6	518	22.0	827	24.1
<i>Any MTV Shuga campaign</i>						
Ever watched MTV Shuga: Down South 1 or 2 on TV, MTV Shuga website or YouTube	368	34.1	666	28.3	1034	30.1
Ever listened to MTV Shuga: Down South on the radio	132	12.2	201	8.5	333	9.7
Read the MTV Shuga DS2 graphic novel	140	13.0	204	8.7	344	10.0
Watched the documentary called MTV Shuga in real life that was broadcast at the end of DS2	144	13.3	242	10.3	386	11.3
Attended small group discussion facilitated by a peer educator (at a clinic, school, university, TVET or somewhere else) on DS2 anywhere	182	16.9	331	14.1	513	15.0
Attended a community event on DS2 anywhere	107	9.9	185	7.9	292	8.5
Watched the MTV preview show called 16 and Pregnant	329	30.5	527	22.4	856	24.9
Watched MTV PSA spots (Public Service Announcements) short MTV videos with health messages	215	19.9	381	16.2	596	17.4
Watched any MTV Shuga Alone Together episodes on YouTube or the MTV Shuga website	79	7.3	201	8.5	280	8.2
Searched for information on HIV on the MTV Shuga website (since this was a multiple choice question, any selection of MTV Shuga website implies exposure)	79	7.3	131	5.6	210	6.1
Answered a polling question about an MTV Shuga: Down South episode	110	10.2	157	6.7	267	7.8
Ever posted any comments about an episode of MTV Shuga: Down South Season 2	119	11.0	175	7.4	294	8.6
Watched/accessed/participated in any MTV Shuga videos/shows/resources (secondary exposure measure)	539	50.0	948	40.3	1487	43.3
TVET, Technical and Vocational Education and Training.						

among the older (aOR=0.52 (0.36 to 0.77)), compared with the non-exposed.

One-third of respondents were aware of PrEP, with higher proportions aware of PrEP among those exposed versus not exposed to DS2 (52% vs 27%; aOR=1.90 (1.53 to 2.35)). Demand for PrEP (ie, willingness to take PrEP every day) was high overall with weak evidence of higher demand among those exposed to DS2 (85% vs 80% among non-exposed; aOR=1.31 (0.97 to 1.76)), and no

differences by age group (table 5, online supplemental table 2).

Respondents who were exposed to DS2 were more likely to have had sex, ever in their lifetime (74% vs 44% of the non-exposed; aOR=2.86 (2.19 to 3.72)) and in the past 12 months (64% vs 37%); aOR=2.13 (1.65 to 2.74)), than non-exposed respondents. This was particularly true for older respondents, with those exposed to DS2 much more likely to have ever had sex than those not exposed



Table 4 Factors associated with exposure to MTV Down South 2 and any MTV Shuga campaign

	Exposure to Down South 2				Exposure to any MTV Shuga campaign			
	Total	Outcome	Row % outcome	Age-adjusted OR	Total	Outcome	Row % outcome	Age-adjusted OR
	N	n	%	aOR (95% CI)	N	n	%	aOR (95% CI)
Overall	3198	805	25.2		3198	1458	45.6	
Age group								
15–19	988	300	30.4	1	988	527	53.3	1
20–24	2210	505	22.9	0.68	2210	931	42.1	0.64
Gender								
Male	1233	257	20.8	1	1233	455	36.9	1
Female	1874	538	28.7	1.50	1874	984	52.5	1.86
Other	91	10	11.0	0.42	91	19	20.9	0.39
Current schooling/employment status								
In school (primary/secondary)	653	223	34.2	1	653	386	59.1	
TVET	921	120	13.0	0.31	921	196	21.3	0.2
University	1094	369	33.7	1.06	1094	646	59	1.08
Other	428	78	18.2	0.47	428	191	44.6	0.61
Unknown	102	15	14.7	0.35	102	39	38.2	0.45
Language spoken at home								
English	231	74	32.0	1	231	133	57.6	1
isiXhosa	2563	629	24.5	0.71	2563	1129	44.0	0.6
Zulu	216	65	30.1	0.89	216	116	53.7	0.83
Other*	188	37	19.7	0.52	188	80	42.6	0.54
Urban/rural residence								
Urban setting	2741	686	25.0	1	2741	1232	44.9	1
Rural setting	255	81	31.8	1.37	255	152	59.6	1.78
Unknown	202	38	18.8	0.66	202	74	36.6	0.66
Province								
Eastern Cape (EC)—Mthatha	2305	573	24.9	1	2305	969	42.0	1
Eastern Cape—O.R. Tambo or other EC	321	94	29.3	1.22	321	189	58.9	1.93
Other provinces	509	120	23.6	0.89	509	265	52.1	1.43
Unknown	63	18	28.6	1.18	63	35	55.6	1.68
Food insecurity								

Continued

Table 4 Continued

	Exposure to Down South 2				Exposure to any MTV Shuga campaign			
	Total	Outcome	Row % outcome	Age-adjusted OR	Total	Outcome	Row % outcome	Age-adjusted OR
	N	n	%	aOR (95% CI)	N	n	%	aOR (95% CI)
Never/rarely	1785	371	20.8	1	1785	735	41.2	1
Sometimes	1048	321	30.6	1.71	1048	550	52.5	1.61
Often/always	204	77	37.7	2.31	204	121	59.3	2.09
Unknown	161	36	22.4	1.05	161	52	32.3	0.65
Household media assets index								
Low	1176	320	27.2	1	1176	570	48.5	1
Medium	1048	217	20.7	0.72	1048	439	41.9	0.79
High	974	268	27.5	1.03	974	449	46.1	0.92
Individual media assets index								
Low	1190	250	21.0	1	1190	503	42.3	1
Medium	1218	341	28.0	1.50	1218	638	52.4	1.54
High	790	214	27.1	1.47	790	317	40.1	0.96
Relationship status								
Not in a relationship	1453	287	19.8	1	1453	528	36.3	1
In a relationship	1221	313	25.6	1.45	1221	604	49.5	1.80
Ever married/lived with someone	96	24	25.0	1.45	96	45	46.9	1.68
Unknown	428	181	42.3	2.96	428	281	65.7	3.34
Ever had sex								
No	1291	162	12.5	1	1291	286	22.2	1
Yes	1330	453	34.1	3.84	1330	868	65.3	7.52
Prefer not to say	172	12	7.0	0.48	172	27	15.7	0.57
Unknown	405	178	44.0	5.41	405	277	68.4	7.78
Called a helpline or searched for information on HIV on the internet								
No	1667	296	17.8	1	1667	495	29.7	1
Yes	1352	456	33.7	2.35	1352	888	65.7	4.57
Unknown	179	53	29.6	1.84	179	75	41.9	1.59

*Includes five respondents whose language was unknown TVET, Technical and Vocational Education and Training.



Table 5 Associations between exposure to MTV Down South 2 (A) and any MTV Shuga campaign (B) with HIV self-testing and PrEP outcomes

	Exposed		Total		Outcome		Age adjusted OR		Fully adjusted* OR (overall)		
	N	n	N	n	%	aOR	(95% CI)	P value	aOR	(95% CI)	P value
<i>(A) MTV Down South 2</i>											
HIV status											
Knowledge of HIV status (N=2768)	No	2113	828		39.2	1			1		
	Yes	655	466		71.2	4.06	3.34 to 4.92	<0.001	2.26	1.78 to 2.87	<0.001
HIV self-testing/screening outcomes											
Ever heard about HIV self screening kit (N=2727)	No	2077	589		28.4	1			1		
	Yes	650	387		59.5	3.90	3.24 to 4.70	<0.001	1.99	1.61 to 2.47	<0.001
Ever tested for HIV using HIV self screening kit (N=2694)	No	2049	211		10.3	1			1		
	Yes	645	186		28.8	3.65	2.92 to 4.57	<0.001	2.49	1.95 to 3.19	<0.001
Tested for HIV using HIV self screening kit in the last 12 months (N=2689)	No	2044	132		6.5	1			1		
	Yes	645	136		21.1	4.12	3.17 to 5.35	<0.001	2.61	1.97 to 3.47	<0.001
Demand for HIV self screening – to screen oneself (N=2213)†	No	1786	1498		83.9	1			1		
	Yes	427	335		78.5	0.78	0.60 to 1.02	0.069	0.80	0.59 to 1.09	0.156
Demand for HIV self screening – willing to give kit to partner (N=2188)†	No	1774	1502		84.7	1			1		
	Yes	414	330		79.7	0.79	0.60 to 1.04	0.092	0.86	0.63 to 1.17	0.326
PrEP outcomes											
Ever heard about PrEP (N=2649)	No	2023	548		27.1	1			1		
	Yes	626	323		51.6	2.93	2.43 to 3.53	<0.001	1.90	1.53 to 2.35	<0.001
Demand for PrEP – willing to take PrEP everyday (N=2284)	No	1747	1394		79.8	1			1		
	Yes	537	457		85.1	1.54	1.17 to 2.01	0.002	1.31	0.97 to 1.76	0.079
Sexual behaviour outcomes											
Ever had sex (N=2621)	No	2006	877		43.7	1			1		
	Yes	615	453		73.7	3.95	3.22 to 4.85	<0.001	2.86	2.19 to 3.72	<0.001
Had sex in the past 12 months (N=2492)	No	1918	717		37.4	1			1		
	Yes	574	366		63.8	3.25	2.66 to 3.96	<0.001	2.13	1.65 to 2.74	<0.001
Condom use at last sex with current or last partner (in the last 12 months) (N=1056)	No	699	410		58.7	1			1		
	Yes	357	234		65.5	1.35	1.03 to 1.76	0.028	1.42	1.07 to 1.89	0.014
<i>(B) Any MTV Shuga campaign</i>											
HIV status											
Knowledge of HIV status (N=2768)	No	1535	431		28.1	1			1		

Continued

Table 5 Continued

	Exposed	Total		Outcome		Row % outcome %	Age adjusted OR		Fully adjusted* OR (overall)		
		N	n	n	%		aOR	(95% CI)	P value	aOR	(95% CI)
	Yes	1233	863	70.0		6.62	5.58 to 7.85	<0.001	2.58	2.08 to 3.20	<0.001
HIV self-testing/screening outcomes											
Ever heard about HIV self screening kit (N=2727)	No	1509	284	18.8		1			1		
	Yes	1218	692	56.8		6.12	5.12 to 7.31	<0.001	3.00	2.45 to 3.68	<0.001
Ever tested for HIV using HIV self screening Kit (N=2694)	No	1483	115	7.8		1			1		
	Yes	1211	282	23.3		3.75	2.97 to 4.74	<0.001	2.15	1.64 to 2.81	<0.001
Tested for HIV using HIV self screening kit in the last 12 months (N=2689)	No	1478	70	4.7		1			1		
	Yes	1211	198	16.4		4.19	3.14 to 5.58	<0.001	2.23	1.61 to 3.07	<0.001
Demand for HIV self screening—to screen oneself (N=2213)†	No	1342	1143	85.2		1			1		
	Yes	871	690	79.2		0.74	0.59 to 0.92	0.008	0.73	0.55 to 0.97	0.031
Demand for HIV self screening—willing to give kit to partner (N=2188)†	No	1338	1145	85.6		1			1		
	Yes	850	687	80.8		0.78	0.62 to 0.99	0.041	0.87	0.65 to 1.17	0.364
PrEP outcomes											
Ever heard about PrEP (N=2649)	No	1469	251	17.1		1			1		
	Yes	1180	620	52.5		5.63	4.7 to 6.74	<0.001	2.8	2.26 to 3.47	<0.001
Demand for PrEP—willing to take PrEP everyday (N=2284)	No	1292	1011	78.3		1			1		
	Yes	992	840	84.7		1.65	1.32 to 2.06	<0.001	1.26	0.96 to 1.65	0.095
Sexual behaviour outcomes											
Ever had sex (N=2621)	No	1467	462	31.5		1			1		
	Yes	1154	868	75.2		7.85	6.53 to 9.45	<0.001	4.29	3.36 to 5.48	<0.001
Had sex in the past 12 months (N=2492)	No	1419	377	26.6		1			1		
	Yes	1073	706	65.8		6.21	5.18 to 7.46	<0.001	3.03	2.39 to 3.84	<0.001
Condom use at last sex with current or last partner (in the last 12 months) (N=1056)	No	365	206	56.4		1			1		
	Yes	691	438	63.4		1.34	1.04 to 1.74	0.025	1.61	1.21 to 2.13	0.001

*All models (except models on sexual behaviours) include the following variables: main exposure, age, gender, schooling, home language, rural/urban setting, province, food insecurity, household media index, individual media index, relationship status, ever had sex and exposure to other non-MTV resources; models for sexual behaviours include all the above variables except ever had sex
 †Among those who had never used an HIV self-test before.
 PrEP, pre-exposure prophylaxis.

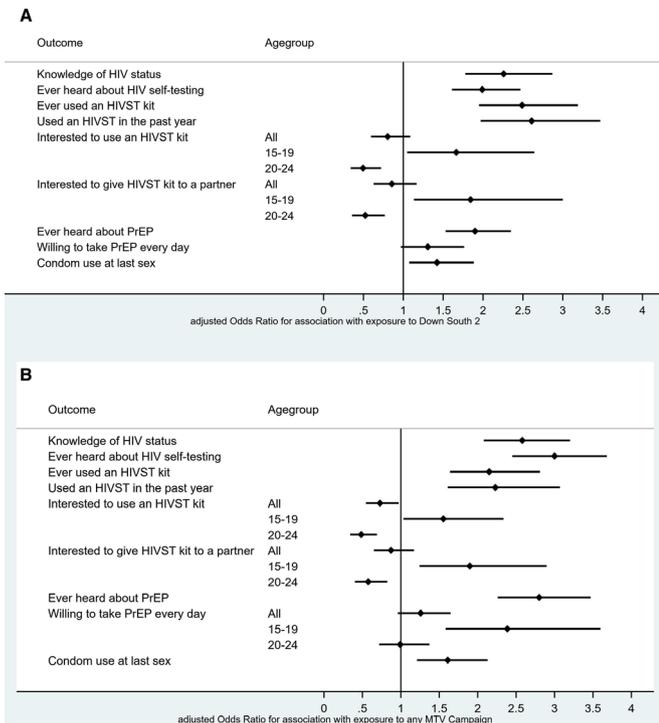


Figure 1 Associations between key study outcomes and exposure to MTV Shuga Down South 2 (A) and any MTV Shuga campaign (B). HIVST, HIV self-testing; PrEP, pre-exposure prophylaxis.

(aOR=8.05 (5.57 to 11.65)). Among those who reported sex within the past 12 months, DS2 audiences were more likely to report condom use at last sex than those not exposed to DS2 (66% vs 59%; aOR=1.42 (1.07 to 1.89)) (table 5, online supplemental table 2).

In sensitivity analyses in which multiple imputations were conducted for all participants with missing values, results were consistent with the complete case analysis (online supplemental table 4). In analysis of the secondary exposure measure (exposure to any MTV Shuga campaign, including but not limited to DS2), most outcomes were more common among those exposed to any MTV Shuga compared with those with no MTV Shuga exposure of any kind, and associations between exposure and outcomes were similar to those observed with exposure to MTV Shuga DS2 specifically (table 5B, figure 1B).

In more detailed reports of HIV testing experiences, those exposed to DS2 accessed HIV testing services more frequently than those not exposed (ever and within the past year) (online supplemental table 4). This was true of HIVST as well as testing with a community health worker and within ante-natal care services (for females). HIV self-test kits were accessed from a range of outlets, most often government clinics, community health centres, or hospitals, and university/Technical Vocational Educational and Training colleges settings. Pharmacies were also a common source, particularly for younger (15–19 years old) participants, and more so among young DS2 audiences (27%) than those not exposed (17%). DS2 viewers were also more likely to have paid fees for their

last self-test (36% vs 21% of non-exposed), among both age groups. Respondents cited a range of reasons for their last HIV self-test, with the most common motivation being to learn their HIV status (>80% of those who self-tested). Of those exposed to DS2, 32% of the younger respondents and 18% of older respondents cited MTV Shuga as the reason they got their most recent HIV self-test. Following their self-test, DS2 viewers were more likely than non-viewers to seek a laboratory test to confirm the result (66% vs 56% of self-testers).

Qualitative research

In analysis of qualitative data, themes emerged about the behavioural mechanisms through which MTV Shuga DS2 influenced participants’ capability, motivation and opportunity related to HIVST and PrEP outcomes (online supplemental table 5). *Awareness* (an aspect of capability) of HIVST and PrEP was enhanced by watching the show, with some learning about these resources for the first time from DS2:

Honestly speaking, I didn’t know about the self-testing until I watched the show now. I now know that you can test yourself. (male, 15–19)

Others gained a greater understanding through the show:

Before seeing the show, PrEP was just something I saw in books. I didn’t know that it is actually out there. (female, 20–24)

Participants expressed ways in which this understanding, and storylines (about Bongzi and Arrabella living with HIV), helped to reduce their fear about HIV and knowing their own status:

The show showed me that knowing your status is better than just living with an unknown status ... [it] won’t mean the end of the world. (female, 15–19)

Some also gained *confidence* to enquire and learn more, for example, from internet searches and approaching health service staff. Young people described how scenes and storylines from DS2 helped them feel more *prepared* to access HIV services:

I know what I will be experiencing from the whole situation. (male, 20–24)

This included participants who were not yet sexually active and felt better prepared for future relationships:

Now that I have information about PrEP, it will help me when I meet someone. I will know what I need to do and know how PrEP will help me. (male, 20–24)

Scenarios presented through the show also helped young people to *reflect* on their own needs and preferences for HIV prevention options, at different times of their life. After watching the show, some realised they prefer self-testing at home, for the privacy and convenience, while others would be more anxious testing at home and would prefer the support available at a clinic:

For me, this thing of testing at home really scared me ... At home, there will be no one to help you [after getting the results]. (male, 20–24)

Participants were also able to imagine scenarios in which they could use PrEP, for example,

I like the fact that it protects you from getting HIV when your partner has tested positive. (female, 15–29)

However, some preferred to rely on condoms for HIV prevention. While capability and motivation were clearly enhanced for many, the show had less influence on *opportunity to access* services like HIVST and PrEP. While they saw ways in which they could get such resources, from the show, many doubted the availability in their own setting, especially during closures related to COVID-19 lockdowns:

I wouldn't be confident that if I go to the hospital, I'd get them. The hospitals here are not the same as those in Joburg. (female, 15–19)

The qualitative data also illustrated ways in which DS2 had a broader influence, beyond its immediate audience (online supplemental table 6). It helped some viewers initiate conversations and discussion with partners and parents, with whom they said conversations about sex are often avoided or awkward, although some remained hesitant to engage in such discussions. Some young males described ways in which the show changed the tone of conversations with peers, to more substantive discussions about PrEP and contraception. Many felt enlightened by the show and wished more young people would have access to the information about PrEP and HIV self-screening. Some felt that this should be done through more government and health campaigns, and many saw the role they themselves could play as educators and advocates for HIV testing and prevention, in their community and their own family:

People are usually afraid of the pain and pricking when it comes to taking HIV test. So, I'll definitely be an advocate for the self-screening HIV test now because of the show. (male, 20–24)

I can be able to give my little brother advice on when he wants to date ... Now I can explain to him how to be safe when he's having sex, testing, everything. (male, 20–24)

Some participants said they were unaffected by the show and did not learn anything about PrEP and HIVST. These topics featured in four different scenes (8 min of content) in the 10 episodes of the DS2 series, and some viewers missed those scenes, or were distracted at the time. Some were confused by the scenes and did not gain confidence or motivation to use PrEP or self-testing:

Since they say HIV is something that is tested through blood, I kind of don't understand what they are doing there [with HIV self-screening] 'cause there's only saliva inside the mouth. (male, 15–19)

DISCUSSION

Our findings from a mixed-methods evaluation of MTV Shuga's multimedia edutainment campaign are consistent with a causal impact of the campaign on important HIV prevention outcomes among young people in South Africa. However, other explanations for the observed associations such as unmeasured confounding cannot be ruled out. Among 3431 15–24 years old participants of an online survey, based predominantly in Eastern Cape province, substantial proportions had been exposed to MTV Shuga: one-quarter had engaged with the most recent MTV Shuga series (Down South 2; DS2) and 43% with any component or past series of the MTV Shuga campaign. Exposure to DS2 and the wider MTV Shuga campaign was strongly associated with the primary outcome of the study, knowledge of HIV status, as well as increased awareness and use of HIVST and knowledge of PrEP. Respondents' interest to use HIVST and PrEP was very high overall; it was higher among MTV Shuga audiences for the younger (15–19 years old) but not among older respondents aged 20–24 years.

An embedded qualitative study offered insights into the contexts and mechanisms by which MTV Shuga DS2 may have influenced these outcomes. DS2 enhanced young people's capability and motivation to adopt HIV prevention behaviours, while its influence on opportunity (eg, to access prevention services) was more limited.²⁵ Some viewers were introduced to HIVST and PrEP for the first time through the show, and greater awareness helped to reduce fear and boost confidence to learn their HIV status and seek further HIV information and services. For others, HIV information that had previously seemed abstract or academic was made real and relevant in DS2 scenarios and storylines, with viewers given an opportunity to observe behaviours that were typically kept private, for example, couples self-testing together at home. This was evidence of observational learning, consistent with social learning theory.²⁹ While not all felt they currently needed to use resources like HIVST and PrEP, they imagined future circumstances in which they would benefit from them. Some reflected on options presented by DS2 storylines, to think through their personal preferences for HIV prevention, and this may help to explain the differences in demand for HIVST by age group, for example, if older viewers generally value the support available from provider-led testing and younger adolescents prefer the privacy of self-testing at home. For some, the scenes on HIVST and PrEP were too short or unclear to have any influence.

The findings suggest ways in which a popular, immersive multimedia campaign like MTV Shuga can accelerate achievement of HIV prevention goals for young people. MTV Shuga's influence is consistent with a person-centred approach to HIV prevention: through engaging storylines and characters, young people are offered accurate and relevant information on HIV prevention options and enabled to make their own choices (in contrast to assuming that young people are 'passive beneficiaries').³⁰

Respecting personal choice and agency in this way can help people to adopt HIV prevention choices at different time points, as their needs and situations change, analogous to offering a ‘contraceptive method mix’ reflecting users’ diverse preferences and circumstances.³¹ This can help young people to prepare for changes that may increase their HIV risk, for example, to know prevention options before their first sexual experience. In southern Africa, many young people do not engage with sexual and reproductive health services until they are already sexually active, pregnant or married, at which point many are already at risk for HIV/STI (in settings where HIV incidence escalates from an early age).^{32 33} The first sexual experience is often one in which young people are not well prepared, for example, with information, contraception, condoms or HIV/STI testing.³⁴ While MTV Shuga audiences were more likely to have had sex than those who never engaged with the campaign, viewers who had never had sex felt more aware and prepared for HIV prevention choices once they became sexually active. Acquiring a new sexual partner is another high-risk transition point for young people, for which they can be prepared in advance, and MTV Shuga viewers anticipated prevention choices they could make with new partners, for example, to use PrEP with a partner who is living with HIV.

The benefits of MTV Shuga may be greatest for those who are most connected to digital media for access to the dramatic television series with high production values, and the ability to be immersed in all episodes. However, in the study setting of Mthatha, more respondents reported experiencing ‘offline’ components of the DS2 campaign than the televised or internet-streamed episodes. Many had engaged with community-based viewing events, peer-led Shuga discussions, and the DS2 graphic novels distributed through schools. Our qualitative research found that Shuga opened up dialogue about sex and HIV with peers, parents and partners, and this ability for Shuga to stimulate real-life discussions can happen across all its formats. Also, some viewers were inspired to become ‘advocates’ for the new HIV prevention information they learnt via DS2, suggesting that, by reaching the most digitally connected young people, MTV Shuga can inspire early adopters of HIV preventive innovations, who are well placed to diffuse those messages to peers online and in real life.³⁵

An important limitation to a multimedia campaign like MTV Shuga is its lack of influence on supply of services, either actual or perceived supply, including the HIV prevention technologies it promoted through DS2. Viewers were typically sceptical about the opportunity to access HIVST and PrEP in their area of Eastern Cape, despite recent investments in HIV self-test and PrEP distribution.²² The survey showed that DS2 viewers were more likely than non-viewers to have paid a fee for their last HIV self-test kit, suggesting that the ability to pay or access a pharmacy may help to explain the observed differences in use of self-testing, even if MTV Shuga

boosted motivation for HIV testing. To ensure equitable access to prevention tools and services, media campaigns that generate demand should be directly linked to distribution efforts that are available and acceptable to young people.

The findings are consistent with a small but growing number of studies that demonstrate benefits of MTV Shuga. The afore-mentioned trial in Nigeria found increases in HIV and STI testing in communities randomly selected to receive group showings of MTV Shuga episodes.¹⁸ Among a cohort of adolescent girls and young women in rural KwaZulu, exposure to MTV Shuga was relatively low by 2019 (~15% of randomly sampled 15–24 years old females), but associated with a range of sexual and reproductive health benefits (although not with HIV testing, perhaps due to regular HIV surveillance in the study area).²⁰ In this study, the higher prevalence of exposure to MTV Shuga (>40%) may be due to better media access as well as more concerted efforts to offer MTV Shuga activities offline, through schools and communities in Eastern Cape.

Our study had a number of limitations. It is likely that the sample does not represent the general population of Eastern Cape, but is skewed in favour of those young people who frequently engage with digital media. Compared with a representative sample in urban areas of Eastern Cape in 2016, cell-phone ownership was similar among 20–24 years old, but higher among our younger respondents (15–19 years).³⁶ This may reflect recent growth in phone ownership among teenagers, throughout South Africa and Mthatha. Only 1% of our study participants reported that they never used the internet. This may reflect the virtual, internet-based study methods we used to comply with COVID-19 restrictions in South Africa and avoid SARS-CoV-2 transmission risk, however, connectedness and social media use is rapidly growing across South Africa. A recent study in Mthatha described young people’s social media use as ‘pervasive’.³⁷ We tried to minimise cost barriers to participation, by making the internet survey free to access (through reverse-charging) and providing data credit to all participants, however, participation was most likely easier for those with digital devices, more reliable internet access and greater literacy.

Our design also relied on self-reported measures of MTV Shuga engagement and misclassification may have under-estimated or over-estimated exposure. Many respondents opted not to answer some questions, particularly the questions on sexual experiences, suggesting that online surveys are not ideal for collecting such private information from young people, even if anonymised. However, the study findings were largely unchanged in sensitivity analyses with imputation of missing values. Another limitation is that the increased associations observed may be explained by unknown or unmeasured confounders, especially as the questionnaire length was kept as short as possible for online use. Nevertheless, associations remained strong after accounting for numerous

potential confounders, including other sources of HIV prevention information and campaigns, and were strong and consistent across multiple outcomes.

CONCLUSIONS

As new HIV testing and PrEP options become available, we sought evidence of a multimedia edutainment campaign's influence on awareness and demand for such tools, among young men and women in a high-prevalence setting of South Africa. Together, findings from a large online survey and embedded qualitative research are consistent with a causal impact of MTV Shuga on young people's awareness and use of HIVST and PrEP, and knowledge of their own HIV status, although we cannot exclude other possible explanations for the observed associations. With online and offline components, the '360-degree' media campaign reached sizeable proportions of young people through TV, internet, schools and community events, especially adolescent girls—a group at particularly high risk of HIV acquisition in high-burden countries. Positive effects were equally strong for females and males, and the diverse characters and storylines enabled MTV Shuga viewers to reflect on their personal needs and HIV prevention choices. With stronger, more direct links to the supply and distribution of prevention tools like self-test kits and PrEP, growing use of digital media among young people, and the potential for early adopters to diffuse innovation, a popular edutainment campaign like MTV Shuga has an important role to play in closing age and gender gaps in HIV testing and prevention goals.

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Contributors IB, SC, SS, CC, DK, VB codesigned the study protocol and CC, DK, DOD and VB managed the data collection. SS led the survey questionnaire development and DOD programmed the questionnaire. SM led the management and analysis of survey data, VB led the analysis of qualitative data and IB led the triangulation. IB wrote the first draft, all authors contributed to revisions and reviewed the final draft. CC and SC contributed equally for shared last authorship. IB had full access to all the data in the study, and had final responsibility for the decision to submit for publication.

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Patient consent for publication Consent obtained directly from patient(s).

Ethics approval This study involves human participants and ethics approvals were received by the University of KwaZulu-Natal, London School of Hygiene & Tropical

Medicine and the WHO. Participants provided voluntary and informed online consent and parents or guardians provided informed consent for participants under 18 years.

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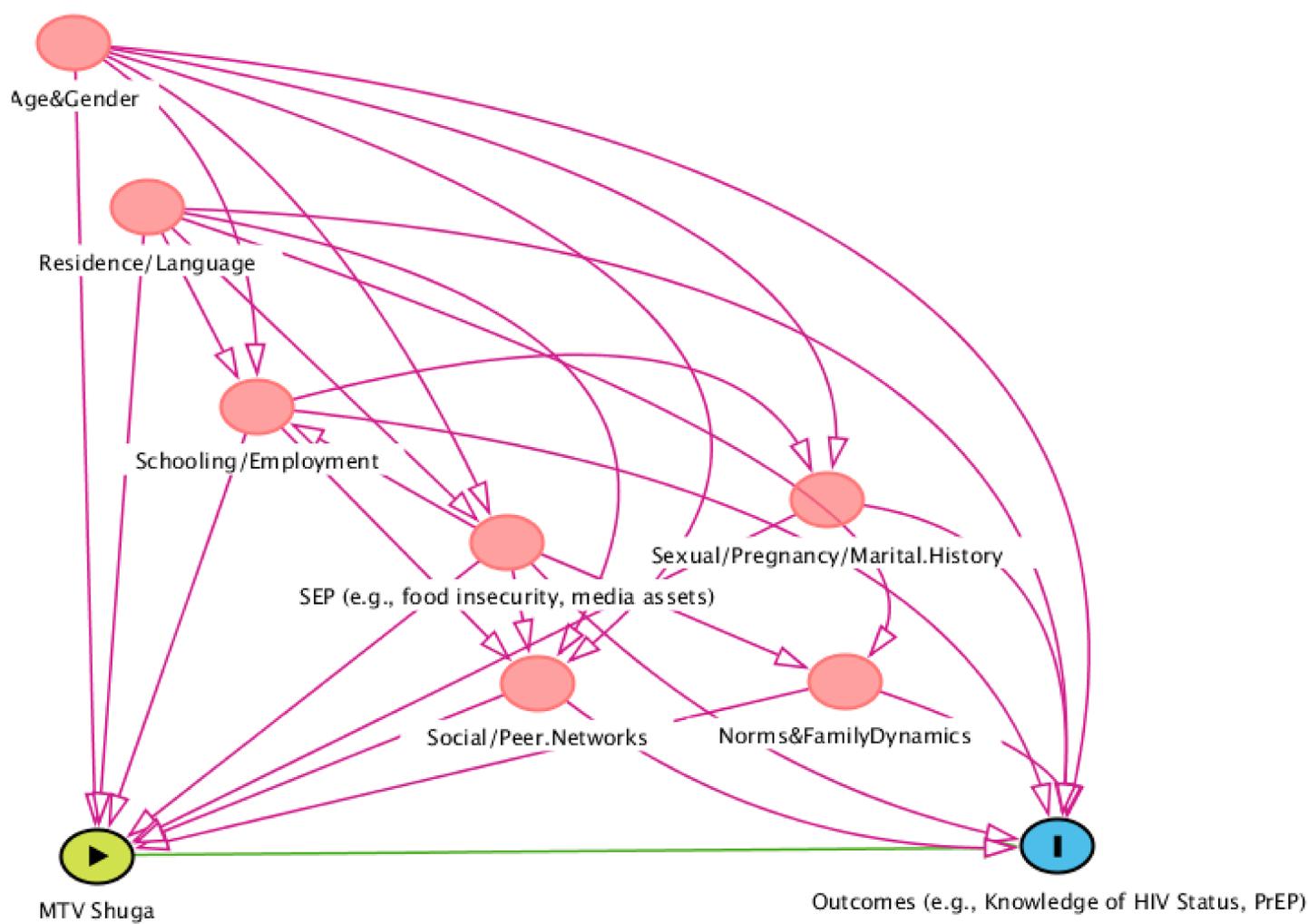
Isolde Birdthistle <http://orcid.org/0000-0001-5742-6588>

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Page 1

Youth, Health & Media

Permissions

Date and time of interview:

Welcome to the Youth, Health & Media Survey for young people, like YOU, Living in South Africa who are between the ages of 15 and 24!

How did you hear about this survey?

Google Ad
 Youtube
 Facebook
 Instagram
 Twitter
 Whatsapp
 Through a friend/family member
 Other, Please specify

If Other, please specify:

Do you know your date of birth?

Yes
 No
 Prefer not to say

What is your date of birth?

 ((DD-MM-YYYY))

How old are you?

- Younger than 15
 15 Years old
 16 Years old
 17 Years old
 18 Years old
 19 Years old
 20 Years old
 21 Years old
 22 Years old
 23 Years old
 24 Years old
 Older than 24
 Do not know
 Prefer not to say

Actual age:

(Hidden Calculation field based on Date of Birth)

Thank you for showing interest in our YOUTH, HEALTH & MEDIA survey:

 Okay!

Unfortunately, you do not meet the criteria to continue answering the rest of the survey. This survey is specifically aimed at youth between the ages of 15 and 24 years old.

PLEASE SELECT 'END SURVEY NOW' WHEN THE PROMPT APPEARS

Please ask your parent/ guardian to complete the following 3 questions before you proceed:

Yes

No

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I have read the information concerning this study or viewed the information video on the website, and understand the purpose and procedures.

I have been given the opportunity to ask questions through the live-chat feature or by contacting the study team by phone, text or email.

I agree that my child/ward can take part in the study.

You have answered 'NO' to "I have read the information concerning this study or viewed the information video on the website"

 Okay!

Please return to our website and read over our participant information sheet & video.

You have answered 'NO' to 'I have been given the opportunity to ask questions to the study team'

Please contact our chat feature on the side of our web page to assist you with your queries and then come back to this survey.

Thank you parents for allowing your child/ward to participate! All the following questions are for your child/ ward. We ask that from now they fill out the questionnaire alone to maintain their privacy.

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For young people who are ready to begin , please confirm each of the following:

	Yes	No
I have read the information concerning this study or viewed the information video on the website.	<input type="radio"/>	<input type="radio"/>
I have been given the opportunity to ask questions to the study team.	<input type="radio"/>	<input type="radio"/>
I understand the purpose and procedures of the study and that my participation is voluntary (my own choice)	<input type="radio"/>	<input type="radio"/>
I agree to take part in this study	<input type="radio"/>	<input type="radio"/>

You have answered 'NO' to "I have read the information concerning this study or viewed the information video on the website" Okay!

Please return to our website and read over our participant information sheet & video.

You have answered 'NO' to 'I have been given the opportunity to ask questions to the study team' Okay!

Please contact our chat feature on the side of our web page to assist you with your queries.

You have answered 'NO' to 'I understand the purpose and procedures of the study and that my participation is voluntary (my own choice)' Okay!

Please read over the participant information sheet & re-watch the video and then come back to complete the survey.

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DEMOGRAPHICS**In this section, we ask a little bit about your background and your living situation**

Please confirm your sex/gender.

 Male Female Transgender Prefer not to say

What language do you speak the most at home?

- English
- isiXhosa
- Sotho
- Tswana
- Zulu
- Other: Specify: _____
- Prefer not to answer

If Other, Please Specify: _____

Do you Live in Mthatha (Eastern Cape)?

 Yes No Prefer not to say

Do you live in OR Tambo District in Eastern Cape?

 Yes No Prefer not to say

What is the name of the town/village where you live?

- Bedford Convent
- De Colligny Mission Station
- Efata
- Fortgale
- Highbury
- Hillcrest or Hillcrest Ext
- Ikwezi
- Maiden Farm
- Mbuqu
- Mthatha Central (CBD)
- Mthatha Police Camp
- Myezo Park
- Ncambedlana
- Nduli Wildlife Sanctuary
- Ngangelizwe
- Northcrest
- Norwood
- Phola Park
- Ramaphosa
- Sidwadwa
- Silverton
- Southernwood
- Southridge Park
- Tipini
- Waterfall A or Waterfall B
- Wellington Prison
- Other: Specify
- Prefer not to say

If Other, please specify _____

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Do you live in Eastern Cape Province?

Yes No Prefer not to say

Which Province do you live in?

- Western Cape
 Northern Cape
 North West
 Free State
 Kwa-Zulu Natal
 Gauteng
 Limpopo
 Mpumalanga
 Prefer not to say

Do you live in an urban or rural setting?

Urban setting Rural setting Do not know Prefer not to say

Are you currently at school, TVET or University?

No Primary school High school (secondary) TVET University Other: Specify:
 Prefer not to say

If 'Other', please specify: _____

Have you ever been in school?

Yes No Prefer not to say

What is your highest level of education completed?

Grade R/pre-school Primary Secondary Tertiary Do not know Prefer not to say

What is your highest completed grade in primary level?

Grade 1 Grade 2 Grade 3 Grade 4 Grade 5 Grade 6 Do not know
 Prefer not to say

What is your highest completed grade in secondary level?

Grade 7 Grade 8 Grade 9 Grade 10 Do not know Prefer not to say

How would you describe your present employment situation?

- Full time student
 Work in informal sector
 Employed part-time
 Employed full-time
 Self-employed part-time
 Self-employed full-time
 Housewife/ homemaker
 Unemployed
 Unable to work (sickness or disability)
 Full time student
 Other: Specify: _____
 Prefer not to say

If 'Other', please specify: _____

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In the past 4 weeks, how often did you go to sleep feeling hungry because of lack of food?

Never Seldom/Rarely Sometimes Often Always Do not know Prefer not to say

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MEDIA**In this section, we ask about your ownership and use of media**

Does your HOUSEHOLD have any of the following in working condition?

	Yes	No	Do not know	Prefer not to say
Radio?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Television?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Desktop computer, laptop computer or tablet/iPad?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Internet? (using mobile data or wifi)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
TV subscription? For instance. DSTV or Netflix?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Do you personally own any of the following in working condition?

	Yes	No	Prefer not to say
A radio?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A mobile Smartphone? A smartphone is a mobile phone that typically has a touchscreen, internet access and it capable of downloading and running applications	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Desktop computer, laptop computer or tablet/iPad?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Most days	At least once per week	At least once per month	Less than once a month	Never	Do not know	Prefer not to say
How often do you watch TV?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How often do you listen to the radio?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How often do you use the internet?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How often do you use social media platforms? Examples of social media platforms are Facebook, Youtube, Instagram, Twitter, WeChat, TikTok, SnapChat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Which social media platforms do you use?

You can choose multiple answers

- Facebook
 Instagram
 Twitter
 WeChat
 TikTok
 SnapChat
 YouTube
 Other: Specify
 Do not know
 Prefer not to say

If Other, please specify;



Have you ever watched 'MTV Shuga: Down South' on TV, MTV Shuga website or YouTube?

MTV Shuga is a TV drama and media campaign about young people in Africa, There have been 2 seasons of Shuga based in South Africa, called MTV Shuga Down South, The show features a group of young people who are students, artists and musicians living in or around Johannesburg,

The first series of MTV Shuga aired on SABC 1 Fridays 10pm in 2017 the second series aired on SABC 1 Tuesdays 9,30pm, repeats Sundays 7pm in 2019 & 2020, The series is also available online, Shuga also has an radio campaign that was featured on channels YFM, Jozi FM, Alex FM, Voice of Wits, Gagasi FM, Cliff Central, Transafrica radio and NMU FM,

- Yes
 No
 Do not know
 Prefer not to say

Which season of 'MTV Shuga: Down South' did you watch?

You can choose multiple answers

- Season 1
 Season 2
 Do not know
 Prefer not to say

What year did you start to watch the season 2 of MTV Shuga Down South series?

- 2019
 2020
 Do not know
 Prefer not to say

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Which media did you use to watch the season 2 of 'MTV Shuga: Down South' and/or its preview show?
You can choose multiple answers

- TV YouTube MTV Shuga website Facebook Other: Specify Do not know
 Prefer not to say

If Other, please specify.

How many episodes of the season 2 of 'MTV Shuga: Down South' did you watch?

- Only 1 episode Between 2 and 4 episodes Between 5 and 7 episodes Between 8 and 10 episodes
 Do not know Prefer not to say

Did any episodes you watched, include a storyline or message about any of the following topics?

	Yes	No	Do not know	Prefer not to say
HIV testing?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
HIV self-screening?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PreP (Pre-exposure prophylaxis)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Have you ever listened to 'MTV Shuga: Down South' on the radio?

- Yes No Do not know Prefer not to say

Which season of 'MTV Shuga: Down South' did you listen to on the radio?

You can choose multiple answers

- Season 1 Season 2 Do not know Prefer not to say

How many episodes of the season 2 of 'MTV Shuga: Down South' did you listen to on the radio?

- Only 1 episode Between 2 and 4 episodes Between 5 and 7 episodes Between 8 and 10 episodes
 Do not know Prefer not to say

Did any of the episodes you listened include a storyline or message about any of the following topics...

	Yes	No	Do not know	Prefer not to say
HIV testing?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
HIV self-screening?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PreP (Pre-exposure prophylaxis)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Have you watched the MTV preview show called "16 and Pregnant" that was broadcast before the season 2 starts?

- Yes No Do not know Prefer not to say

Have you watched the documentary called "MTV Shuga in real life" that was broadcast after the end of season 2?

- Yes No Do not know Prefer not to say

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Have you watched MTV PSA spots (Public Service Announcements) short MTV videos with health messages?

Yes No Do not know Prefer not to say

Have you read a graphic novel or comic book about 'MTV Shuga: Down South' Season 2?

Yes No Do not know Prefer not to say

Have you ever posted any comments about an episode of 'MTV Shuga: Down South' Season 2, on Social media, MTV website or YouTube?

Yes No Do not know Prefer not to say

Have you ever answered a polling question about a 'MTV Shuga: Down South' episode by SMS or text, phone call or on the internet?

Yes No Do not know Prefer not to say

Where did you usually watch or listen to MTV Shuga Shuga Down south season 2?

Select the main place where you usually watched or listen to MTV Shuga Down South season 2

Bars Clinic Community event Friend's house Home School University/TVET
 Small group discussion (i.e, peer education session) Other: Specify Prefer not to say

If Other, please specify.

Did you usually watch or listen to 'MTV Shuga: Down South' Season 2 on your own or with someone?

On my own With someone Both Do not know Prefer not to say

With whom did you usually watch or listen to 'MTV Shuga: Down South' Season 2?

You can choose multiple answers

Friends Partner (Boyfriend/Girlfriend/Spouse) Brother Sister Father
 Mother Grandparents Other: Specify Prefer not to say

If Other, please specify.

Have you attended a small group discussion facilitated by a peer educator (at a clinic, school, university, TVET or somewhere else) in Mthatha where an episode of 'MTV Shuga: Down South' Season 2 was screened?

No Yes, at a clinic Yes, at a school, university or TVET Yes, elsewhere: Specify
 Do not know Prefer not to say

If 'Yes, Elsewhere', please specify.

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Have you attended a community event (gathering a large number of people in a public place) in Mthatha (EC) where an episode of 'MTV Shuga: Down South' Season 2 was screened?

- Yes No Do not know Prefer not to say

Where did Ipeleng and Daniel use the self-screen test for HIV?

- At Daniel's home At Ipeleng's home At a clinic At work Do not know
 Prefer not to say

What type of body sample (specimen) did Ipeleng and Daniel use for the self-screen?

- Saliva swab Blood sample (finger prick) Urine sample Do not know Prefer not to say

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Lovelifeline Helpline & websites

Have you called a helpline to get information on HIV prevention, testing or treatment?

Yes No Do not know Prefer not to say

Which helpline have you called?

You can choose multiple answers

Bwise AIDS helpline 0800 012 322 Lovelifeline Childline Other: Specify Do not know
 Prefer not to say

If Other, please specify.

Have you ever searched for information on HIV on the internet?

Yes No Do not know Prefer not to say

What websites have you used to search for information on HIV?

You can choose multiple answers

Bwise website MTV Shuga website She Conquers website Other: Specify
 Do not know Prefer not to say

If Other, please specify.

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MTV SHUGA: 'Alone Together'

In this section, we ask about the impact of the Covid-19 pandemic on your access to services, We also ask about 'MTV Shuga AloneTogether', the mini-series about Coronavirus (Covid-19) that started in April 2020



Since the Covid-19 pandemic caused by Coronavirus began, have you experienced more difficulty getting the following services?

	Yes	No	Does not apply to me	Do not know	Prefer not to say
HIV testing services?	<input type="radio"/>				
HIV self-screening kits?	<input type="radio"/>				
PrEP?	<input type="radio"/>				
Condoms?	<input type="radio"/>				
Anti-retroviral treatment for HIV?	<input type="radio"/>				
Contraception?	<input type="radio"/>				
Ante-natal care?	<input type="radio"/>				
Domestic violence services?	<input type="radio"/>				

How has the Covid-19 pandemic affected your access to these health services?

Have you watched any MTV Shuga 'Alone Together' episodes on YouTube or the MTV Shuga website?
<https://mtvshugaalonetogether.com>

Yes No Do not know Prefer not to say

Approximately how much time did you spend watching MTV Shuga 'Alone Together'?

Less than 5 minutes 5-10 minutes 20-30 minutes More than 30 minutes
 I don't know Prefer not to say

We would like to know what you thought of the AloneTogether series on Covid-19, in the following questions.

Did you think that the series was...

	Yes	No	Do not know	Prefer not to say
Entertaining?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Realistic?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Informative?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Memorable?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How else would you describe it?

We would like to understand what kind of impact 'AloneTogether' had on your knowledge of Coronavirus and Covid-19, in the following questions...

	Yes	No	Do not know	Prefer not to say
Did you learn new facts about coronavirus, that you did not know before?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Did you learn about how coronavirus spreads, which you did not know before?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Did you learn about symptoms of Covid-19, which you did not know before?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Did you learn new ways to protect yourself and others from coronavirus?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Did you learn where to go for more information about coronavirus and Covid-19?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Was there other information about COVID-19 that you learned from the show?

After watching 'AloneTogether', did you take any actions or adopt new behaviours, to keep yourself and others safe from coronavirus?

Yes No Do not know Prefer not to say

What actions or new behaviours did you take or adopt to keep yourself and others safe from Coronavirus?

Tick all that apply

I looked for more information and facts about coronavirus I stayed at home more
 I washed my hands more often I kept a distance from other people I contacted friends & family more often by phone Other, please specify

Please specify what other actions or new behaviors you adopted

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HIV TESTING AND TREATMENT HISTORY

We would like to know whether you ever tested for HIV with a healthworker who collected a blood sample from you, either in a health facility or in your community, the number of times you did so, and, in particular, we would like to know more about your LAST experience of testing for HIV with a health worker.

Have you ever tested for HIV with a healthworker in a health facility or in your community?

Yes No Do not know Prefer not to say

In the last 12 months, have you tested for HIV with a healthworker?

Yes No Do not know Prefer not to say

In the last 12 months, how many times have you tested for HIV with a healthworker in a health facility or in your community?

()

If you can't remember, try give your best guess or estimate. Enter the number only.

In total, in your lifetime, how many times have you tested for HIV with a healthworker in a health facility or in your community?

()

If you can't remember, try give your best guess or estimate as to how many times you tested.

When was the last time you tested for HIV?

If you can't remember, try give your best guess or estimate as to when you tested.

In the last year 1 to 2 years ago More than 3 years ago Do not know Prefer not to say

Was your last HIV test offered during an ante-natal care visit?

Yes No I have never been pregnant (non applicable) Do not know Prefer not to say

The last time you tested for HIV with a health worker, where did you do your test?"

- Government hospital
 Government clinic/ community health centre
 University/TVET/school clinic
 Mobile HIV testing services
 New Start testing site
 Pharmacy/ chemist Private hospital/clinic/doctor
 Other: Specify
 Do not know Prefer not to say

If Other, please specify:

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What was the reason for your last HIV test?

You can choose multiple answers

- I wanted to know my HIV status I heard about HIV testing in MTV Shuga Down South
 I heard about HIV test in another TV/radio broadcast I had sex without a condom I was sick and worried
 I was tested while pregnant I was referred for HIV testing by a Health Care Worker
 I had to confirm my HIV status to get PrEP My partner/husband wanted to know my HIV status
 My partner tested positive My client wanted to know my HIV status The migration office required my HIV status
 My employer required my HIV status I wanted to get circumcised Other: Specify
 Do not know Prefer not to say

If Other, please specify: _____

Did you receive the result of your last HIV test done by a healthworker?

- Yes No Do not know Prefer not to say

Now we would like to know more about the number of times you used a HIV Self Screening Test and your last HIV Self Screening Test.

Have you ever tested for HIV using a 'HIV self-screening' test ?

This test requires you to collect your own saliva or blood in order to get your result. This test can be conducted at home or somewhere private.

- Yes No Do not know Prefer not to say

In the last 12 months, have you tested for HIV using a HIV self-screening test?

- Yes No Do not know Prefer not to say

In the last 12 months, how many times have you used a HIV self-screening kit?

_____ ()

If you can't remember, try give your best guess or estimate. Enter the number only.

In total, in your lifetime, how many times have you used a HIV self-screening kit?

_____ ()

If you can't remember, try give your best guess or estimate. Enter the number only.

When was the last time you used a HIV Self Screening kit?

If you can't remember, try give your best guess or estimate as to when you tested.

- In the last year 1 to 2 year ago More than 3 years ago Do not know Prefer not to say

Was your last HIV Self screening test offered during an ante-natal care visit?

- Yes No I have never been pregnant (non applicable) Do not know Prefer not to say

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The last time you used a HIV self-screening test, WHERE did you get the kit from?

- Government hospital
- Government clinic/ community health centre
- University / TVET / school
- Mobile HIV testing services
- New Start testing site
- Pharmacy/ chemist
- Private hospital/clinic
- Workplace
- Vending machine
- Other: Specify
- Do not know
- Prefer not to say

If Other, please specify:

The last time you used a HIV self-screening test, WHO did you obtain the kit from?

- Health care worker
- Community health care worker
- Community-based distribution agent
- Voluntary Medical Male Circumcision agent
- Chief/Headmen (head of the village)
- Pharmacist/ chemist
- Private doctor
- Friend
- Partner/Spouse
- Family member
- Workplace/Employer
- Religious leader
- Other: Specify
- Do not know
- Prefer not to say

If Other, please specify:

Did you have to pay any fees to get the self-screening kit?

This may include the cost for consultation, registration or the kit itself.

- Yes No Do not know Prefer not to say

How much did you pay to get the self-screening kit?

If you can't remember, try give your best guess or estimate

Remember this amount can include the cost for consultation, registration and the test kit its self.

- Between R1,00 and R50 Between R51,00 and R100 Between R101,00 and R150
 Between R151,00 and R200 More than R201,00 Do not know Prefer not to say

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The last time you used a HIV self-screening test, where did you do use your self-screening test?

- Ante-natal care visit
 Government hospital (not ante-natal care)
 Government clinic/ community health centre (not ante-natal care)
 University / TVET / school
 Mobile HIV testing services
 New Start testing site
 Pharmacy/ chemist
 Private hospital/clinic/doctor
 Home
 Friend's home
 Partner/Spouse's home
 Workplace
 Other: Specify
 Do not know
 Prefer not to say

If Other, please specify: _____

What was the reason for your last HIV self-screening test?

You can choose multiple answers

- I wanted to know my HIV status I heard about HIV self-screening in MTV Shuga Down South
 I heard about HIV self-screening in another TV/radio broadcast I had sex without a condom
 I was sick and worried I was tested while pregnant I was offered HIV self-screening by a Health Care Worker
 I had to confirm my HIV status to get PrEP My partner/husband wanted to know my HIV status
 My partner tested positive My client wanted to know my HIV status The migration office required my HIV status
 My employer required my HIV status I wanted to get circumcised Other: Specify
 Do not know Prefer not to say

If Other, please specify: _____

Did you go to a health facility to confirm the result of your HIV self-screening test, through a laboratory test?

- Yes No Do not know Prefer not to say

Result of the last HIV test, either performed by a healthworker or self-test

Are you willing to share the result of your most recent HIV test, for this research (and not for sharing with others)?

Remember, this survey is private, we will not share your answer with anyone.

- Yes No

What was the result of your last HIV test?

Remember, this survey is private, we will not share your answer with anyone. (Thank you for sharing your status with us!)

- Negative Positive Indeterminate Other: Specify

If Other, please specify: _____

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Which of the following are reasons why you have never tested for HIV?

You may choose multiple answers.

- I have never thought about testing for HIV I'm not at risk of being HIV positive or contracting HIV infection I'm too young to test I'm not yet sexually active I don't want to know my HIV status
 I don't feel sick enough to test for HIV I'm afraid of testing positive I'm afraid of what others will think if I take an HIV test My partner won't let me test My family members won't let me test
 I'm afraid of the consequences of testing on my relationships I'm afraid that my test result will not be kept private A HIV test is too expensive HIV treatment is too expensive I don't know where to go or how to get tested The place where I can go for testing is too far away I don't have the time to go for testing Other: Specify: _____

If Other, please specify: _____

The following questions ask about where you obtained information about HIV self-screening & your knowledge of where to go to get a self-screening kit.

A HIV Self Screening test requires you to collect your own saliva or blood in order to get your result. This test can be conducted at home or somewhere private.

Have you ever heard about HIV self-screening as a method to test for HIV, before today?

- Yes No Do not know Prefer not to say

Where have you heard about HIV self-screening? Or who told you about it?

Print media includes: Newspaper, magazine, leaflet/brochure

Social media include: Facebook, Twitter, Instagram, ...

National events include: VCT day, health week, world AIDS day.

You can choose multiple answers.

- By a health care worker By a community health care worker By a community-based distribution agent By a Voluntary Medical Male Circumcision agent By a family member By a friend
 By a peer educator at workplace By a peer educator at school/university/TVET By a professional educator or teacher at school/university/TVET By watching TV By listening to radio
 By reading a graphic novel or magazine On the internet or social media During a community event
 During a national event Other: Specify Do not know Prefer not to say

If Other, please specify: _____

What was the name of the program which told you about HIV self-screening (on TV, radio, print or social media)?

You can choose multiple answers.

- MTV Shuga Down South 2 B-Wise PrEPWatch MyPrEP She Conquers
 DREAMS LoveLife Other: Specify Do not know/ remember Prefer not to say

If Other, please specify: _____

Do you know where to go to get a HIV self-screening kit?

- Yes No Prefer not to say

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Where would you go to get a HIV self-screening kit?

You can choose multiple answers.

- Community Based Distribution Agent
 Community Health Worker
 Government hospital
 Government clinic/ community health centre
 Ante-natal care visit
 University/TVET/school clinic
 Mobile HIV testing services
 New Start testing site
 Pharmacy/ chemist
 Private hospital/clinic/doctor
 Voluntary Medical Male Circumcision agent
 Vending machines
 Other: Specify
 Prefer not to say

If Other, please specify: _____

With the next questions, we would like to know more about your interest in HIV Self screening.

If a free HIV self-screening kit was available to you, how interested would you be in:

For each statement, select the box that corresponds to your answer.

	Not at all interested	Somewhat interested	Very interested	Do not know	Prefer not to say
In (re-) screening yourself for HIV?	<input type="radio"/>				
In giving this HIV self-screen kit to a sexual partner?	<input type="radio"/>				

In this section, we ask about your HIV/AIDS care.

Have you ever tested positive for HIV?

- Yes No Prefer not to say

You have previously answered that your last HIV test was 'Positive'

You have selected 'No' in the above question stating that you have never tested Positive for HIV. These answers are conflicting.

Please scroll up and correct your answer before continuing with the survey.

HIV is a type of virus called a retrovirus, and the combination of drugs used to treat HIV is called antiretroviral therapy (ART) or antiretrovirals (ARV) and this is known as "HIV treatment". ART/ARVs works by keeping the level of HIV in your body low.

Have you ever taken ART/ARVs?

- Yes No Prefer not to say

Are you currently taking ART/ARVs as treatment?

- Yes No Prefer not to say

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In this section, we ask your uptake of Pre-Exposure Prophylaxis (PrEP).

Pre-Exposure Prophylaxis (PrEP) are tablets that someone who does not have HIV can take to prevent HIV.

Have you ever heard about PrEP as a method to reduce a person's chance of contracting HIV?

Yes No Do not know Prefer not to say

Have you ever taken PrEP to reduce your chance of contracting HIV?

Yes No Do not know Prefer not to say

Are you currently taking PrEP?

Yes No Do not know Prefer not to say

Individuals who never took PrEP

Have you ever been offered PrEP to reduce your chance of contracting HIV?

Yes No Do not know Prefer not to say

In the last 12 months, were you offered PrEP after HIV testing?

Yes No Do not know Prefer not to say

Why did you not take PrEP when you were offered it?

You can choose multiple answers

I am not at risk of getting HIV I do not think PrEP works to prevent HIV I am worried about side effects I am worried people may see me with HIV medicine I am worried others will think I am HIV+ I do not want to be seen at the clinic The transport to the clinic costs too much There were charges that I could not afford It is inconvenient PrEP is not meant for people like me Other: Specify Do not know Prefer not to say

If Other, please specify:

Individuals who have taken PrEP in the past or who are currently taking PrEP

When was the last time you took PrEP?

In the last year 1 to 2 year ago More than 3 years ago Do not know Prefer not to say

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Why are you not currently taking PrEP?

You can choose multiple answers

- I do not think I need PrEP anymore
 I forgot to take the pills
 I got side effects from the pills
 I did not always have food to take with the pills
 I was worried others will think I am HIV+
 I do not want to be seen at the clinic
 The transport to the clinic costs too much
 My partner does not approve
 Other: Specify
 Do not know
 Prefer not to say

If Other, please specify:

How long have you been taking PrEP?

- Less than a month
 1 to 5 months
 6 months to 12 months
 More than a year
 Do not know
 Prefer not to say

The last time you were taking PrEP, where were you receiving PrEP from?

- Pregnancy or baby care visit (ante-natal or post-natal)
 Government hospital (not ante/post natal care)
 Government clinic/ community health centre (not ante/post natal care)
 University/TVET/School clinic
 Mobile HIV testing services
 New Start testing site
 Pharmacy/ chemist
 Private hospital/clinic/doctor
 Other: Specify
 Do not know
 Prefer not to say

If Other, please specify:

Where are you receiving PrEP from?

- Pregnancy or baby care visit (ante-natal or post-natal)
 Government hospital (not ante/post natal care)
 Government clinic/ community health centre (not ante/post natal care)
 University/TVET/School clinic
 Mobile HIV testing services
 New Start testing site
 Pharmacy/ chemist
 Private hospital/clinic/doctor
 Other: Specify
 Do not know
 Prefer not to say

If Other, please specify:

The following questions ask about where you obtained information about PrEP & your knowledge of where to go to get PrEP

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Where did you hear about PrEP? Or who told you about PrEP?

You can choose multiple answers

- By a Health Care Worker By a Community Health Worker By a Community Based Distribution Agent
 By a Voluntary Medical Male Circumcision agent By a family member By a friend
 By a peer educator at workplace By a peer educator at school/university/TVET By a professional educator or teacher at school/university/TVET By watching TV By listening to radio
 By reading a graphic novel or magazine On internet or social media During a community event
 During a national event Other: Specify Do not know Prefer not to say

If Other, please specify.

What was the name of the program which told you about PrEP (on TV, radio, print or social media)?

You can choose multiple answers

- MTV Shuga Down South B-Wise PrEPWatch MyPrEP SheConquers DREAMS
 LoveLife Other: Specify Do not know/ remember Prefer not to say

If other, please specify.

Do you know where someone can go to get PrEP if s/he would like to?

- Yes No Prefer not to say

Where this person could go to get PrEP?"

You can choose multiple answers

- Government hospital Government clinic/ community health centre Pregnancy or baby care visit (ante-natal or post-natal) University/TVET/School clinic Mobile HIV testing services
 New start testing site Pharmacy/ chemist New Start Clinic Private hospital/clinic/doctor
 Other: Specify Do not know Prefer not to say

If Other, please specify.

Would you be willing to take PrEP everyday if it reduces your chances of catching HIV?

- Yes No Do not know Prefer not to say

What is the main reason you would not be interested in taking PrEP?

- I am not at risk of getting HIV
 I do not think PrEP works to prevent HIV
 I am worried about side effects
 I am worried others will think I am HIV+
 I do not want to be seen at the clinic
 The transport to the clinic costs too much
 Other: Specify
 Do not know
 Prefer not to say

If Other, please specify.

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Relationships

In this section, we ask about romantic and sexual relationships & condom use. Please remember that your answers will be kept private and anonymous.

What is your current relationship status:

- Single
 Dating someone
 Living with partner
 Married
 Widowed
 Divorced
 Separated
 Prefer not to say
 (Married includes those in civil, customary and/or religious marriages)

Have you ever had sex?

Remember, this survey is PRIVATE, we will not show your answers to anyone.

- Yes No Prefer not to say

The next questions ask about your current partner or, if you are not currently in a relationship, your last (most recent) partner.

Thinking of your current sexual partner, what is your relationship to this person?

- Husband/wife
 Live-in partner
 Regular partner (but do not live together)
 Casual partner (Khwapeni)
 Once-off / one-night partner
 Blesser
 Client (s/he paid for sex)
 Sex worker (I paid for sex)
 Other: Specify _____
 Prefer not to say

Or, if you are not currently in a relationship:
Thinking of your most recent sexual partner, what was your relationship to that person?

If Other, please specify. _____

When was the last time you had sex with this person?

If you can't remember, try give your best guess or estimate as to when you last had sex with this person.

Remember this survey is private, we will not show your answers to anyone.

- Less than 12 months OR 1 year ago More than 1 year ago Do not know Prefer not to say

In the last 12 months, the last time you had sex with this person, was a condom used?

- Yes No Do not know Prefer not to say

The next questions ask about your other partners (other than your current or last partner) in the last 12 months

In the last 12 months, have you had sex with another partner (other than your current/last partner)?

- Yes No Prefer not to say

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In total, in the last 12 months, with how many different people have you had sex, EXCLUDING your current/last partner?

()

If you can't remember, try give your best guess or estimate as to how many different people you have had sex with in the last 12 months.

Remember this survey is private, we will not show your answers to anyone.

Are you currently trying to avoid getting pregnant?

Yes No Prefer not to say

What method(s) are you currently using to try avoid getting pregnant?

You can choose multiple answers

- The Pill (oral contraceptive pill) Diaphragm Implant Injection Intra-Uterine Device (IUD)
 Male condom Female condom Sterilization (vasectomy for males or tubal ligation for females)
 Partner's sterilization (vasectomy for males or tubal ligation for females) Morning-after pill (emergency contraception) Traditional medicine (herbs, drinks, charms) Periodic abstinence (also called the rhythm or calendar or standard days method) Anal sex Withdrawal (coitus interruptus)
 Breastfeeding Other: Specify Prefer not to say

If Other, please specify.

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You have reached the end of the Survey!

If there are any comments you would like to share about your experience, please enter them in the text box.

Are you interested in participating in a follow-up interview?

We want to learn more about your experience with MTV Shuga. You will be compensated R100 for participating in a group interview or R150 for participating in an individual interview.

The interviews will be led by a member of the research team. There will be no data/phone charges for your participation. If you are interested, we will need your contact information so we can give you more information (e.g, phone number, email).

Yes No Prefer not to say

Please provide contact information so that we can arrange the follow-up interview, We will not share your contact information with any other parties, and we will delete it after use.

Contact number Alternate contact number Email

As a token of our appreciation, we would like to offer you air-time to say thank you for your participation and providing us with some useful insight!

If you would like to receive this credit, please provide us with the number you want to receive airtime on. We will use this number only for this purpose only and deleted after use.

Contact number Confirm number Network

PLEASE ENSURE THIS NUMBER IS CORRECT

If Other, please specify network:

Time at the end of the interview.

(HH:MM)

Individual interviews with young people

Time: 2 hours

Objective: To conduct individual interviews with young people who have engaged with MTV Shuga DS2

Participants: Young people aged 15-24 living in the Mthatha who have completed the MTV Shuga DS2 questionnaire

Venue: A private space – over the phone

Preparations: Tablet, smartphone, or laptop to watch scenes, voice recorder, notebook, pencil/pen.

Part 1. How do young people engage with MTV Shuga Down South 2 (DS2)?

Explore how MTV Shuga DS2 is experienced by young people (in their own words & experiences)

- Tell me how you interacted with DS2, through watching the show, listening to the radio, interacting online?
 - How many episodes did you watch or listen to?
- Why did you watch/listen to DS2?
 - What do you like about DS2?
 - How did MTV Shuga make you feel? Did those feelings make you want to engage more or less with the show?
 - What storylines or characters were the most important to you?
 - What kept you engaged in the show?
 - Was there anything that you didn't like about the show?

- Where did you watch/listen to DS2?
 - When you were watching/ listening, could you describe what was usually going on around you?
 - Did you do any other things while you were watching or listening to DS2. (prompts; doing chores, homework, or talking on the phone)
 - What made it difficult to watch/ listen to the show?
- Did you watch/ listen to DS2 with anyone?
 - What was that experience like to watch it with them?
 - If you watched it on your own, why?
 - Is there anyone with who you wouldn't want to watch/listen to DS2 with? Why?
 - Would you feel comfortable watching/listening to DS2 with a guardian or parent?
- Did you discuss MTV Shuga DS2 with anyone (prompts; friends, family, peers), or did anyone discuss it with you?
 - What did you discuss? Could you give me some examples of scenes or episodes or characters?
 - How did the discussions make you feel?
 - Did you learn or were you influenced by anything in these discussions? (*Probe for examples*)
 - Did people learn from you or did you influence anyone in these discussions? (*Probe for examples*)
- How did you interact with MTV Shuga DS2 besides listening or watching?

- Did you participate in polls, or post or read conversations online? (*Probe for examples*)
 - What did you like or dislike about interacting online?
- How did discussing with people/interacting with the content online impact your overall experience of Shuga down south 2?
 - Did it change the way you saw characters or their stories? How?
 - Did it make you feel more engaged with the main content? How?
 - Did discussing and engaging with DS2 make you feel supported by the people you discussed with?

Part 2. If and how DS2 led to change in their lives (based on their memory)

In this section, we are want to ask you about how Shuga might have changed your behaviour?

Knowledge / Capability

- What did you learn about HIV self-screening from the series?
- What did you learn about PrEP (pre-exposure prophylaxis) from the series?

If they don't remember anything

- HIVSS: “If you think back to DS2 can you remember the scenes about HIV self-screening? In one of the scenes, Ipeleng and Daniel take a HIV self-test together in her room. In another scene Reggie and Kwanele go to the Taxi Rank and Kwanele privately gets tested.
- PrEP: “If you think back to the show can you remember the scenes about PrEP? One of the scenes Odirile discusses prep with Reggie. In another scene Dineo goes to the clinic and the nurse gives here PrEP.”

If they still don't remember then skip to part 3.

- Do you trust the information in the show? (*probe why or why not*)

- Do you think the stories about PrEP and HIV self-screening are believable? Would they happen in real life? (*Probe for examples*)
- After watching the show, would you feel confident that you know what HIV self-screening and PrEP are and how they work? (*probe for an explanation*)
 - Did DS2 make you feel more confident about knowing how and where to access PrEP or self-screening? *How did it make you feel more confident? Could you tell me where you could access PrEP?*
 - Did DS2 make you feel more confident in knowing who would benefit from taking PrEP? (*Could you explain that?*)

Motivation

Next, we want to ask you about your motivation for accessing HIV self-screening and PrEP

HIV self-screening.

If you think back to DS2 can you remember the scenes about HIV self-screening?

- How did the scenes about HIV self-screening make you feel? (*probe for emotions*)
- How are your decisions-and motivations for HIV self-screening different from before you saw the show?
- Did DS2 make you feel more motivated to get tested? Why/why not?
- Have you been tested because of the show?
- Has the show influenced the way you would like to take an HIV test? (i.e. at home, in a clinic, on your own, etc.)

PrEP

Can you remember the scenes about PrEP?

- How did the scenes about PrEP make you feel?

- How are your decisions and motivations for PrEP different from before you saw the show?
- Do you think DS2 makes people more motivated to take or enquire about PrEP? (could you explain?)
- Did DS2 make you think PrEP might be appropriate for you? *If so-* Have you enquired about prep? Why or why not.

Opportunity

Next we want to ask you about your opportunity for accessing HIV self-screening and PrEP

- Did DS2 give you an opportunity to discuss (in person or online) things that you wouldn't have talked about before watching the show? Examples?
- Did you have any discussions around HIV self-screening or PrEP?
 - Does DS2 make it easier to talk to your partner about HIV self-screening or PrEP?
 - Does DS2 make it easier to talk to your family about HIV self-screening or PrEP?
- Has DS2 made it easier for you to access PrEP or HIV self-screening? (*Probe beyond motivation and knowledge*)
- Has DS2 made it more difficult for you to access PrEP or HIV self-screening?

Part 3. Show the DS2 scenes (the edited package):

I am now going to send you some clips of the show. You might remember them.

1. *The scene where Ipeleng & Daniel learn about HIV self-screening, decide to use it, test themselves, and what they do next.*
2. *The scene about Reggie and Kwanele going to get tested in the Taxi Rank.*

3. *The scene about Odirile discussing PrEP with Reggie.*

4. *Dineo's story about PrEP*

- What did you think about these scenes?
- Do you remember seeing these scenes when you watched the show initially?
 - If no, why do you think you don't remember it?
- Did you learn anything new from these scenes?
 - Was the message clear?
- What would you change about these scenes?
 - How could it be better?
- What did you like about these scenes?
- What are your feelings about HIV self-screening and Prep?
- Do these scenes motivate you to use PrEP or Self Screening?

One of the things we want to understand is the elements in the show that make young people want to keep watching the show and what makes them want to tune into the next episode. So, I just want to ask you about certain elements of MTV Shuga, and I want you to tell me how important they were in making you want to engage in the show.

The characters
The actors
The storyline
Engagement with MTV (polls, social media)
Tailored to SA context

Education value
The music
Production value

End

- We are now at the end of this interview. Is there anything you want to add before we end?

Thank you so much for answering my question.

Focus groups with young people

Time: 3 hours (including a 20 min break)

Objective: To conduct focus group discussions with young people who have engaged with MTV Shuga DS2

Participants: Young people aged 15-25 living in the Mthatha who have complete the MTV Shuga DS2 questionnaire

Venue: Over the Zoom

Preparations: Voice recorder, mobile phone, Airtime/ Data, Vimeo clips, notebook, ground rules. All participants should have filled out the consent forms before the focus groups.

Part 1. How do young people engage with MTV Shuga Down South 2 (DS2)?

Explore how MTV Shuga DS2 is experienced by young people (in their own words & experiences)

Go around the room and introduce ourselves.

- How many episodes of MTV Shuga did you see and where did you see it?
- What do you like about the series?
-
- What storylines or characters were the most important to you?
- Was there anything that made it difficult to watch/ listen to the show?
- Did you watch/ listen to DS2 with anyone?
 - Would you feel comfortable watch/listen to DS2 with a guardian or parent?
- Did you discuss DS2 with anyone (i.e. friends, family, peers), or did anyone discuss with you?
 - What did you discuss? Give examples of scenes or episodes, characters.
- Did you participate in polls, or post or read conversations online? Examples.

Part 2. If and how MTV Shuga DS2 led to change in their lives... (based on their memory)

Knowledge / Capability

- What did you learn about HIV self-screening from the series?

- Prompt- if they say they didn't learn anything: Do you remember the scenes where they discuss self-screening? Can you describe what happened in those scenes?
- What did you learn about PrEP from the series?
 - Prompt- if they say they didn't learn anything: Do you remember the scenes where they discuss prep? Can you describe what happened in those scenes?
- Do you trust the information in the show?
- Do you think the stories about PrEP and HIV self-screening are believable? Would it happen in real life? Explain.

Motivation

- Did the show change your attitudes of behaviours around HIV self-screening?
- Did the show change your attitudes of behaviours around PrEP different from before you saw the show?

Part 3. Show the DS2 scenes (the edited package):

1. *The scene where Ipeleng & Daniel learn about HIVST, decide to use it, test themselves, and what they do next...*
2. *The scene about Reggie and Kwanele going to get tested in the Taxi Rank.*

Ask all the below questions then send this second

3. *The scene about Odirile discussing PrEP with Reggie.*
4. *Dineo's story about PrEP*

- What did you think about the scenes?
- Do you remember seeing these scenes when you watched the show initially?
- Did you learn anything new from these scenes?
- What would you change about this scene?
- What are your feelings about HIV self-screening /Prep?

Part 4

What did you think about the music in the show?

What did you think about the show being set in a South African context?

Supplementary File 4. Reflexivity Statement

Study conceptualisation

1. How does this study address local research and policy priorities?

The study seeks solutions to redress the gaps in HIV testing and disproportionate HIV risk among young people in Eastern Cape. The study setting was requested by the Ministry of Health of South Africa to address a research inequity within South Africa, namely, the shortage of HIV research in Eastern Cape relative to other provinces, despite high HIV burden and low HIV testing levels.

Advance consultations were held with provincial representatives of the Department of Education, in addition to school headteachers and representatives of universities, technical colleges and clinics in Mthatha, Eastern Cape, to enhance the relevance and acceptability of the research.

2. How were local researchers involved in study design?

The study was co-designed by researchers based in South Africa (CC, DK, DOD in KwaZulu-Natal, VB in Eastern Cape) and the UK (IB, SC, SS), in weekly planning meetings throughout 2019 and 2020. CC and DK applied lessons learned from extensive experience in public health research in South Africa, including in Eastern Cape, to propose sampling and recruitment strategies, survey methods and protocols, and question phrasing. DK led the consultations with provincial and local stakeholders in Eastern Cape, to gain permissions and inform the design with regard to acceptability and legal requirements. SC, SS, IB applied experience from HIV prevention with young people and multimedia evaluations in West and Eastern Africa, and VB drew on experience from living and working on HIV prevention in Eastern Cape. For the qualitative research activities, Xhosa-speaking interviewers and transcribers originated from the Eastern Cape.

3. How has funding been used to support the local research team?

Approximately USD\$295,000 was raised to support the work of Epicentre in managing and conducting the study, including training, equipment and salaries for all research team members in South Africa.

4. How are research staff who conducted data collection acknowledged?

DOD, DK, VB and CC are included as authors. Contributions of the interviewers and transcribers are acknowledged in the manuscript.

5. Do all members of the research partnership have access to study data?

All members of the partnership have access to data.

6. How was data used to develop analytical skills within the partnership?

An analysis plan for mixed methods research was co-designed by members of the research team, at the time of study design and proposal development. Team members were split into working groups to execute the plan. DOD prepared the survey dataset; SM led the survey data management and coding with support from DOD and SC; SM led the survey data analysis with regular support from SC and IB; VB led the qualitative data analysis with support from IB and validation from interviewers. IB worked with VB, SM, SC in the triangulation of data. Progress with data analysis was shared and discussed in regular team meetings, for guidance and feedback.

7. How have research partners collaborated in interpreting study data?

All partners contributed to the interpretation of results. Two results workshops were held with all members of the research team, along with the MTV Shuga producers and campaign coordinators in South Africa, and funders at Unitaid and WHO. The first workshop was held to share preliminary

findings and next steps for the analysis. A second workshop was held to discuss more complete analyses and reflect on the implications. This was followed by a public webinar to share and compare results with other researchers, for broader implications.

During the collection of qualitative data, weekly meetings were held with VB and interviewers to discuss and check the quality of the data. Audio recordings were transcribed by interviewers and quality checked by a translator from the Eastern Cape. Findings from the qualitative analysis were shared with the interviews and transcribers for input and validation of the interpretation.

8. How were research partners supported to develop writing skills?

A writing workshop was held with early career researchers, followed by weekly check-in via a 'Writers corner' WhatsApp group for ongoing peer support and support with writing and editing from senior researchers. Grammar software was utilised by team members with language-based learning disabilities.

9. How will research products be shared to address local needs?

Findings have been made available prior to peer review as an open access pre-print manuscript and summarised in slide decks on the internet [<https://www.mtvstayingalive.org/impact/>]; through the BBC 'Africa Today' podcast and social media and mainstream news outlets; and a public webinar jointly hosted by the research team and MTV Shuga producers and actors. Final results will be shared in a webinar with national, provincial and district-level stakeholders in South Africa; and an online media event for young people in Eastern Cape (with an open invitation to schools, universities, clinics and community groups in Mthatha), to discuss implications for local research and policy.

10. How is the leadership, contribution and ownership of this work by LMIC researchers recognised within the authorship?

The shared contribution of CC and SC as senior authors (from the global south and north, respectively), is recognised as joint last authors listed in alphabetical order. The list of authors has a balance of researchers originating from high income countries (IB, VB, SC, SS) and low- and middle-income countries (CC, DOD, DK, SM). SM, of Kenyan origin and based in Kenya, led the statistical analysis of survey data and her leadership in this area is recognised as second author.

11. How have early career researchers across the partnership been included within the authorship team?

SM and VB are early career researchers and led the quantitative and qualitative data analysis, respectively, with input from all members and supervisory support from IB and SC. Their leadership and contribution is reflected in the authorship, and they are subsequently leading related manuscripts as first authors. They have also led presentations of their analyses and results in workshops and webinars.

12. How has gender balance been addressed within the authorship?

We acknowledge the overrepresentation of authors who identify as female.

13. How has the project contributed to training of LMIC researchers?

LMIC researchers in the study team have extensive experience in public health research, however, this project contributed to capacity building of all the study researchers in two new ways: (1) in new ways of conducting recruitment and data collection virtually, to avoid risks to researchers and participants during the first wave of the COVID-19 pandemic. This involved using social media to promote study information and participation, providing online information videos and consent procedures, hosting an online survey via reverse-charging website, and transferring data credit to all participants; (2) dedicated training was developed by VB on virtual methods of qualitative research via a range of

online platforms (live and asynchronous), and delivered to facilitators of the in-depth interviews and group discussions.

14. How has the project contributed to improvements in local infrastructure?

This project has not directly contributed to improvements in local infrastructure. It is hoped that the findings will lead to investments in digital equity in Eastern Cape and elsewhere, and the incorporation of MTV Shuga within schools and health programmes, so that more young people can access the multi-media components of HIV prevention campaigns like MTV Shuga.

15. What safeguarding procedures were used to protect local study participants and researchers?

All data collection was conducted virtually to avoid risk of the novel coronavirus, to researchers and participants. To protect the anonymity of participants, no personal identifying information was collected and we did not have access to the IP addresses of survey participants. Participants could withdraw at any time, or skip any questions they preferred not to answer. A telephone contact number was requested for data transfers and to opt into further qualitative research. Privacy was enhanced by self-administration of the survey questionnaire, and participants of both the survey and qualitative research activities were encouraged to use a private and safe space. Participants in virtual focus groups could choose to turn their camera on and were not asked to display or say their name. Information videos and written information sheets were made available to prospective participants and guardians, with contact information for reporting adverse events or unanticipated problems, or requests for counselling or referrals. A list of referral organisations and contact information for the research team was provided with the survey questionnaire.

Table S1: Factors associated with exposure to MTV Down South 2 and any MTV Shuga campaign, among 15-19 year-olds (A) and 20-24 year-olds (B)

A: 15-19 years

	Exposure to Down South 2					Exposure to any MTV Shuga campaign				
	Total	Outcome		Age Adjusted OR ^a	Fully Adjusted OR ^b	Total	Outcome		Age Adjusted OR ^a	Fully Adjusted OR ^b
		n	%				n	%		
Overall	888	100	100.0			888	100	100.0		
Gender										
Male	337	82	24.3	1		337	156	46.3	1	
Female	601	218	36.4	1.71	1.27	2.3	362	137	1.32	2.27
Other	50	5	0	0.35	0.34	1.05	50	11	0.31	0.34
Current schooling/employment status										
In school (primary/secondary)	536	193	36	1		536	328	61.2	1	
Tertiary	137	22	16.1	0.34	0.21	0.55	137	32	23.4	0.33
University	214	71	33.2	0.88	0.63	1.23	214	131	61.2	1.00
Other	15	6	100	0.22	0.09	0.52	15	15	100	0.24
Unknown	46	8	17.4	0.37	0.17	0.82	46	21	45.7	0.53
Language spoken at home										
English	88	27	30.7	1		88	46	51.1	1	
isiNdebele	729	228	31.3	1.03	0.64	1.66	729	402	55	1.17
Zulu	97	31	32	2.86	0.37	1.58	97	31	34.6	2.15
Other ^c	74	14	18.9	0.53	0.25	1.1	74	26	37.8	0.58
Urban/rural residence										
Urban setting	834	205	24.6	1		834	493	59.7	1	
Rural setting	87	25	28.7	0.84	0.54	1.36	87	47	54	0.94
Unknown	87	10	11.5	0.27	0.14	0.53	87	27	31	0.36
Province										
Eastern Cape (EC) - Mthatha	600	217	36.1	1		600	352	58.7	1	
Eastern Cape - OR Tambo or other EC	113	31	27.4	0.75	0.48	1.18	113	64	56.6	1.11
Other provinces	203	46	22.7	0.58	0.41	0.84	203	98	48.3	0.79
Unknown	22	6	27.3	0.75	0.29	1.94	22	13	59.1	1.22
Food insecurity										
Never/usually	561	158	28.2	1		561	302	53.8	1	
Sometimes	294	91	31	1.14	0.84	1.56	294	135	45.9	1.06
Often/always	67	34	60.7	2.63	1.57	4.89	67	47	70.1	2.62
Unknown	66	17	25.8	0.88	0.49	1.58	66	23	34.8	0.46
Household media assets index										
Low	406	117	28.8	1		406	201	49.7	1	
Medium	280	74	26.4	0.89	0.63	1.25	280	161	57.5	1.32
High	302	109	36.1	1.4	1.01	1.92	302	175	57.9	1.35
Individual media assets index										
Low	422	110	26.1	1		422	208	49.3	1	
Medium	373	117	31.4	1.1	0.95	1.76	373	222	59.5	1.31
High	393	78	20.8	1.73	1.2	2.48	393	97	24.7	1.04
Relationship status										
Not in a relationship	494	128	25.9	1		494	224	45.3	1	
In a relationship/lived with someone	333	104	31.2	1.1	0.96	1.77	333	102	30.7	1.04
Unknown	161	68	42.2	2.09	1.44	3.03	161	111	68.9	2.68
Ever had sex										
No	427	114	26.7	1		427	187	43.8	1	
Yes	322	113	35.1	1.48	1.08	2.03	322	216	67.1	2.62
Prefer not to say/unknown	139	75	53.5	1.21	0.85	1.71	139	124	89.2	1.38
Called a helpline or searched for information on HIV on the internet										
No	485	125	25.8	1		485	204	42.1	1	
Yes	402	137	34.1	1.21	1.29	2.37	402	204	50.7	1.26
Unknown	81	18	22.2	0.62	0.47	1.44	81	39	48.0	0.77

^aAge group specific Odds Ratios (OR); ^bonly variables associated with the outcome at p<0.1 were included in the fully adjusted model; ^cTVET=Technical and Vocational Education and Training; ^dincludes 4 respondents whose language was unknown

B: 20-24 years

	Exposure to Down South 2					Exposure to any MTV Shuga campaign				
	Total	Outcome		Age Adjusted OR ^a	Fully Adjusted OR ^b	Total	Outcome		Age Adjusted OR ^a	Fully Adjusted OR ^b
		n	%				n	%		
Overall	2,220	100	100.0			2,220	100	100.0		
Gender										
Male	896	175	19.5	1		896	299	33.4	1	
Female	1,273	325	25.5	1.41	1.15	1.74	1,273	624	49	1.92
Other	41	5	12.2	0.57	0.22	1.48	41	8	19.5	0.48
Current schooling/employment status										
In school (primary/secondary)	117	30	25.6	1		117	58	49.6	1	
Tertiary	766	98	12.8	0.41	0.76	0.56	766	164	21.3	0.27
University	880	298	33.9	1.48	0.96	2.3	880	515	58.5	1.44
Other	373	72	19.1	0.69	0.49	1.13	373	176	47.2	0.91
Unknown	56	7	12.5	0.41	0.17	1.01	56	18	32.1	0.48
Language spoken at home										
English	140	47	33.9	1		140	88	62.5	1	
isiNdebele	1,834	401	21.9	0.57	0.4	0.82	1,834	728	39.7	0.41
Zulu	119	34	28.6	0.82	0.48	1.39	119	63	53.0	0.7
Other ^c	144	23	16.0	0.52	0.29	0.92	144	52	36.1	0.52
Urban/rural residence										
Urban setting	1,927	421	21.8	1		1,927	779	40.4	1	
Rural setting	168	56	33.1	1.79	1.28	2.51	168	100	60.1	2.86
Unknown	115	28	24.3	1.15	0.74	1.79	115	47	40.9	1.02
Province										
Eastern Cape (EC) - Mthatha	1,605	356	22.3	1		1,605	617	37.3	1	
Eastern Cape - OR Tambo or other EC	208	63	30.3	1.59	1.15	2.18	208	125	60.1	2.53
Other provinces	306	74	24.2	1.16	0.87	1.55	306	167	54.6	1.61
Unknown	41	12	29.3	1.51	0.76	2.99	41	22	53.7	1.95
Food insecurity										
Never/usually	1,224	213	17.4	1		1,224	631	51.4	1	
Sometimes	754	230	30.5	2.08	1.68	2.58	754	395	52.4	2.01
Often/always	117	43	36.4	2.17	1.47	3.33	117	74	63.3	2.15
Unknown	95	19	20.0	1.19	0.70	2.00	95	29	30.5	0.8
Household media assets index										
Low	770	203	26.4	1		770	379	49.2	1	
Medium	768	147	19.1	0.64	0.5	0.81	768	282	36.7	0.59
High	672	159	23.7	0.87	0.68	1.1	672	274	40.8	0.71
Individual media assets index										
Low	768	140	18.2	1		768	295	38.4	1	
Medium	845	224	26.5	1.62	1.27	2.05	845	416	49.2	1.55
High	597	141	23.6	1.39	1.07	1.68	597	200	33.5	0.94
Relationship status										
Not in a relationship	959	159	16.6	1		959	304	31.7	1	
In a relationship	905	312	34.5	1.54	1.22	1.94	905	417	46.1	1.44
Ever married/lived with someone	79	21	26.6	1.82	1.08	1.09	79	40	50.6	2.21
Unknown	207	113	42.1	3.69	2.74	4.97	207	170	82.1	3.78
Ever had sex										
No	864	48	5.6	1		864	99	11.5	1	
Yes	1,038	440	42.7	8.65	6.29	11.98	1,038	647	62.4	14.11
Prefer not to say/unknown	318	117	36.6	9.00	6.23	11.00	318	180	56.3	8.8
Called a helpline or searched for information on HIV on the internet										
No	1,182	171	14.5	1		1,182	291	24.6	1	
Yes	1,020	299	29.2	2.80	2.26	3.47	1,020	564	55.3	5.41
Unknown	88	15	16.9	0.77	0.31	1.17	88	46	52.3	1.19

^aAge group specific Odds Ratios (OR); ^bonly variables associated with the outcome at p<0.1 were included in the fully adjusted model; ^cTVET=Technical and Vocational Education and Training; ^dincludes 4 respondents whose language was unknown

Table S2. Associations between exposure to MTV Down South 2 (A) and any MTV Shuga campaign (B) with HIV self-testing and PrEP outcomes: Age specific estimates

	Exposed	Row %			Fully adjusted ^a age specific Odds Ratios (OR)											
		Total	Outcome	Outcome	Fully adjusted ^a OR (overall)			15-19 year olds			20-24 year olds					
		N	n	%	aOR	(95% CI)	p value	aOR	(95% CI)	p value	aOR	(95% CI)	p value			
(A) MTV Down South 2																
HIV Status																
Knowledge of HIV status (N=2,768)	No	2,113	828	39.2	1											
	Yes	655	466	71.2	2.26	1.78	2.87	<0.001	1.47	1.01	2.14	0.047	3.03	2.20	4.16	<0.001
HIV Self Testing/Screening outcomes																
Ever heard about HIV Self Screening Kit (N=2,727)	No	2,077	589	28.4	1											
	Yes	650	387	59.5	1.99	1.61	2.47	<0.001	1.87	1.31	2.68	0.001	2.96	2.29	3.84	<0.001
Ever tested for HIV using HIV Self Screening Kit (N=2,694)	No	2,049	211	10.3	1											
	Yes	645	186	28.8	2.49	1.95	3.19	<0.001	No evidence of age/DS2 interaction (p=0.160)							
Tested for HIV using HIV Self Screening Kit in the last 12 months (N=2,689)	No	2,044	132	6.5	1											
	Yes	645	136	21.1	2.61	1.97	3.47	<0.001	No evidence of age/DS2 interaction (p=0.219)							
Demand for HIV Self Screening - to screen oneself (N=2,213)	No	1,786	1,498	83.9	1											
	Yes	427	335	78.5	0.80	0.59	1.09	0.156	1.66	1.05	2.64	0.031	0.50	0.34	0.72	<0.001
Demand for HIV Self Screening - willing to give kit to partner (N=2,188)	No	1,774	1,502	84.7	1											
	Yes	414	330	79.7	0.86	0.63	1.17	0.326	1.84	1.13	3.00	0.014	0.52	0.36	0.77	0.001
PrEP Outcomes																
Ever Heard About PrEP (N=2,649)	No	2,023	548	27.1	1											
	Yes	626	323	51.6	1.90	1.53	2.35	<0.001	No evidence of age/DS2 interaction (p=0.764)							
Demand for PrEP - willing to take PrEP everyday (N=2,284)	No	1,747	1,394	79.8	1											
	Yes	537	457	85.1	1.31	0.97	1.76	0.079	Weak evidence of age/DS2 interaction (p=0.080)							
Sexual behaviour outcomes																
Ever had sex (N=2,621)	No	2,006	877	43.7	1											
	Yes	615	453	73.7	2.86	2.19	3.72	<0.001	1.49	1.02	2.18	0.038	8.05	5.57	11.65	<0.001
Had sex in the past 12 months (N=2,492)	No	1,918	717	37.4	1											
	Yes	574	366	63.8	2.13	1.65	2.74	<0.001	1.39	0.94	2.06	0.098	4.24	3.08	5.82	<0.001
Condom use at last sex with current or last partner (in the last 12 months) (N=1,056)	No	699	410	58.7	1											
	Yes	357	234	65.5	1.42	1.07	1.89	0.014	No evidence of age/DS2 interaction (p=0.503)							
(B) Any MTV Shuga campaign																
HIV status																
Knowledge of HIV status (N=2,768)	No	1,535	431	28.1	1											
	Yes	1,233	863	70.0	2.58	2.08	3.20	<0.001	1.44	1.01	2.06	0.045	3.47	2.66	4.51	<0.001
HIV Self Testing/Screening outcomes																
Ever heard about HIV Self Screening Kit (N=2,727)	No	1,509	284	18.8	1											
	Yes	1,218	692	56.8	3.00	2.45	3.68	<0.001	No evidence of age/MTV interaction (p=0.123)							
Ever tested for HIV using HIV Self Screening Kit (N=2,694)	No	1,483	115	7.8	1											
	Yes	1,211	282	23.3	2.15	1.64	2.81	<0.001	No evidence of age/MTV interaction (p=0.429)							
Tested for HIV using HIV Self Screening Kit in the last 12 months (N=2,689)	No	1,478	70	4.7	1											
	Yes	1,211	198	16.4	2.23	1.61	3.07	<0.001	No evidence of age/MTV interaction (p=0.128)							
Demand for HIV Self Screening - to screen oneself (N=2,213)	No	1,342	1,143	85.2	1											
	Yes	871	690	79.2	0.73	0.55	0.97	0.031	1.55	1.03	2.34	0.034	0.49	0.34	0.69	<0.001
Demand for HIV Self Screening - willing to give kit to partner (N=2,188)	No	1,338	1,145	85.6	1											
	Yes	850	687	80.8	0.87	0.65	1.17	0.364	1.90	1.24	2.90	0.003	0.58	0.40	0.82	0.003
PrEP Outcomes																
Ever Heard About PrEP (N=2,649)	No	1,469	251	17.1	1											
	Yes	1,180	620	52.5	2.8	2.26	3.47	<0.001	No evidence of age/MTV interaction (p=0.834)							
Demand for PrEP - willing to take PrEP everyday (N=2,284)	No	1,292	1,011	78.3	1											
	Yes	992	840	84.7	1.26	0.96	1.65	0.095	2.39	1.58	3.60	<0.001	0.99	0.72	1.37	0.960
Sexual behaviour outcomes																
Ever had sex (N=2,621)	No	1,467	462	31.5	1											
	Yes	1,154	868	75.2	4.29	3.36	5.48	<0.001	2.46	1.71	3.55	<0.001	11.38	8.49	15.27	<0.001
Had sex in the past 12 months (N=2,492)	No	1,419	377	26.6	1											
	Yes	1,073	706	65.8	3.03	2.39	3.84	<0.001	2.14	1.46	3.14	<0.001	6.44	4.93	8.41	<0.001
Condom use at last sex with current or last partner (in the last 12 months) (N=1,056)	No	365	206	56.4	1											
	Yes	691	438	63.4	1.61	1.21	2.13	0.001	No evidence of age/MTV interaction (p=0.142)							

^aall models (except models on sexual behaviours) include the following variables: main exposure, age, gender, schooling, home language, rural/urban setting, province, food insecurity, household media index, individual media index, relationship status, ever had sex, and exposure to other non-MTV resources; models for sexual behaviours include all the above variables except ever had sex.

Table S3. Results from multiple imputation with primary exposure (Down South 2): m=10 imputations

All variables included in the complete case analysis were included in the imputation models

		Age Adjusted OR			p value	Fully adjusted OR		
		aOR	(95% CI)			aOR	(95% CI)	
HIV status	Knowledge of HIV status (N=3,431)	1				1		
		3.71	3.05	4.53	<0.001	2.17	1.71	2.76
HIV Self-Screening/Testing outcomes	Ever heard about HIV Self Screening Kit (N=3,431)	1				1		
		3.64	3.03	4.36	<0.001	2.46	2.01	3.02
	Ever tested for HIV using HIV Self Screening Kit (N=3,431)	1				1		
		3.53	2.83	4.42	<0.001	2.51	1.96	3.21
	Tested for HIV using HIV Self Screening Kit in the last 12 m	1				1		
	4.00	3.09	5.20	<0.001	2.56	1.94	3.39	
	Demand for HIVSS - to screen oneself (N=3,034)	1				1		
		0.79	0.61	1.03	0.086	0.78	0.56	1.08
	Demand for HIVSS - willing to give kit to partner (N=3,034)	1				1		
		0.85	0.60	1.20	0.343	0.87	0.59	1.28
PrEP Outcomes	Ever Heard About PrEP (N=3,431)	1				1		
		2.81	2.35	3.36	<0.001	1.86	1.49	2.32
	Demand for PrEP - willing to take PrEP everyday (N=3,431)	1				1		
		1.62	1.17	2.24	0.005	1.37	0.94	1.99
Sexual behaviour outcome	Ever had sex (N=3,431)	1				1		
		3.46	2.88	4.17	<0.001	2.87	2.22	3.70
	Had sex in the past 12 months (N=3,431)	1				1		
		2.72	2.23	3.31	<0.001	2.10	1.64	2.68
	Condom use at last sex with current or last partner (in the l	1				1		
		1.69	1.29	2.21	<0.001	1.80	1.37	2.36

p value (LR test)	Fully adjusted OR for 15-19 yr olds			p value (LR test)	Fully adjusted OR for 20-24 yr olds			p value (LR test)
aOR	aOR	(95% CI)			aOR	(95% CI)		
<0.001	1	1.43	0.99 2.08	0.056	2.92	2.12	4.03	<0.001
<0.001	1	1.73	1.27 2.34	<0.001	1	2.91	2.28 3.72	<0.001
<0.001	*No evidence of age/DS2 interaction (p=0.202)							
<0.001	*No evidence of age/DS2 interaction (p=0.114)							
0.127	1	1.24	0.80 1.94	0.327	1	0.52	0.35 0.76	<0.001
0.468	1	1.43	0.94 2.19	0.097	1	0.58	0.41 0.83	0.003
<0.001	*No evidence of age/DS2 interaction (p=0.776)							
0.098	*No evidence of age/DS2 interaction (p=0.144)							
<0.001	1	1.10	0.77 1.57	0.599	1	6.48	4.37 9.63	<0.001
<0.001	1	0.98	0.66 1.45	0.914	1	3.26	2.37 4.49	<0.001
<0.001	*No evidence of age/DS2 interaction (p=0.327)							

Table S5. Mechanisms by which MTV Shuga Down South 2 influenced behaviours through Capability, Motivation and Opportunity to improve HIV self-testing and PrEP outcomes: themes emerging from deductive analysis of qualitative research in Mthatha, Eastern Cape

Themes [COM-B* drivers]	Findings	Sample quotations for HIV Self Screening	Sample quotations for PrEP
Awareness of HIVST & PrEP [Capability]	<ul style="list-style-type: none"> For those who remembered DS2 scenes featuring PrEP and HIV self-testing, awareness and understanding of both increased. For many, DS2 was the first time they heard about HIV ST and PrEP. Some participants missed or did not remember relevant scenes or were distracted while viewing and did not gain awareness. 	<p><i>"Honestly speaking, I didn't know about the self-testing until I watched the show now. I now know that you can test yourself." - Male, 15-19</i></p> <p><i>"Sometimes I'd be on my WhatsApp or cooking. So, during breaks, I'd go to the kitchen and come back." - Female, 15-19</i></p>	<p><i>"Yoh! I was very shocked that there something called PrEP. Nobody told us about that. I didn't know that you can get pills that can prevent HIV." -Female, 20-24</i></p> <p><i>"I do not know PrEP. I don't remember it from the show." -Female, 15-19</i></p>
Confidence [Capability & Motivation]	<ul style="list-style-type: none"> Knowledge gained through DS2 about HIV testing and PrEP, and storylines about people living and thriving with HIV, reduced the fear of knowing their HIV status. Some participants gained confidence from DS2 to enquire and learn more about HIV ST and PrEP. Some were more confident about enquiring about HIV ST than PrEP as they were already familiar with screening and testing for HIV, whereas PrEP was an innovation that they had never heard of before. 	<p><i>"I saw how Bongji [a DS2 character who learns she is HIV positive] accepted herself. So, knowing [my status] won't mean the end of the world, I'll just know." - Female, 15-19</i></p> <p><i>"I know what to say when I go get it [HIV self-screening and PrEP], and I know what will be given to me. So, it [DS2] made it easier, because I actually understand what I will be experiencing and the whole situation." - Male, 20-24</i></p> <p><i>"They say HIV is something that is tested through blood so, I kind of don't understand like what they are doing there [with HIV self-</i></p>	<p><i>"It [DS2] made me want to enquire. I also did a google search on PrEP. I didn't go, you know, like to the health institution to find out, but google-searched it just to know how safe it is and side effects, stuff like that. Just general information about Prep and how to use it." -Male, 20-24</i></p> <p><i>"I would not really be confident talking to people because I don't have a personal experience with it [PrEP], unlike HIV testing. It would be a lot easier to talk about HIV self-testing than PrEP." - Female, 15-19</i></p>

	<ul style="list-style-type: none"> A few participants said they lacked confidence in HIV ST and PrEP because they were confused by scenes in <i>MTV Shuga</i>. 	<p><i>screening]. Cause there is only saliva inside the mouth, so I don't understand."</i>- Male 15-19</p>	
<p>Reflection</p> <p><i>[Motivation]</i></p>	<ul style="list-style-type: none"> Watching different scenarios with <i>MTV Shuga</i> characters using PrEP and HIV ST helped participants reflect on their preferences for using these tools at different times of their life. For some, the show generated interest using HIV ST because ST is convenient, private, and uses saliva only. Though some participants were worried about the side effects of PrEP, most were excited to learn about a new way to protect themselves against HIV. A few participants decided after watching the show that HIV ST / PrEP was not appropriate for them and they would prefer to use other HIV testing and prevention options. 	<p><i>"I didn't know it [HIV self-testing] existed before I watched the show. I also learnt that it is easy. Listen, some people are scared of needles, and it becomes their reason for not wanting to test. They will be like 'no I'm afraid of needles' so now it's very easy, you just swab in your mouth, then it's done."</i>- Female, 20-24</p> <p><i>"After watching the show, I prefer [testing] at home, because if you can't cope, you can even have a friend there. Testing at a clinic would make me feel anxious."</i> – Female, 15-19</p> <p><i>"This thing of testing at home really scared me a lot. I prefer to go to the clinic, because from the clinic, if you find yourself positive, you will get counselling at the same time."</i> – Male, 20-24</p>	<p><i>"The show teaches people about PrEP. It's appropriate for me too, because I will be faced with things in my life, so knowing that there is PrEP, at least I'll be safe."</i> – Female, 15-19</p> <p><i>"I think it [DS2] shows that when you're with someone, you shouldn't trust that person so much with your life. It's like with Dineo; she tells her partner how important it is to take PrEP and to use a condom regardless of whether you are in a committed relationship. You shouldn't trust your partner so much so that you don't use protection."</i> -Female, 20-24</p> <p><i>"I do prefer to use PrEP, but I do not like the side effects of it. But I also like the fact that it protects you from getting HIV when your partner has tested positive."</i> – Female, 15-19</p>
<p>Preparation</p> <p><i>[Motivation]</i></p>	<ul style="list-style-type: none"> The series helped participants, some of whom were not currently sexually active, to plan for scenarios and relationships where they might use PrEP and HIV ST to protect themselves and their partners against HIV in the future. 	<p><i>"I was not actually active before I watched it, so after I watched it, then I became sexually active, then that's when I felt like going for HIV screening, without having to go like, [to the] doctors. You know? Like, I realised that I actually should know my status."</i>– Male, 15-19</p>	<p><i>"Life is life. Things do happen, so now that I have information about PrEP, it will help me when I meet someone. I will know what I need to do and know how PrEP will help me."</i> -Male, 20-24</p>

		<p><i>"It [the show] made me feel more motivated to get tested because I do have a partner. I'm just motivated for us to test together. It made me feel confident to be open about my status."</i></p> <p>– Female, 20-24</p>	<p><i>"I now know that if I slept with someone who has HIV, it wouldn't be the end of the world; I could use PrEP to prevent me from getting the virus. Before seeing the show, PrEP was just something I saw in books. I didn't know that it is actually out there. But after seeing the show, I see that it is something that actually helps a lot of people."</i></p> <p>Female, 20-24</p>
<p>Access to services</p> <p><i>[Capability & Opportunity]</i></p>	<ul style="list-style-type: none"> • The series made some participants more aware of where they might access HIV ST and PrEP. • However, some doubted that they could access these services, or information about PrEP in Mthatha (where participants were based), which they considered to have different resources than Johannesburg (<i>slang: Joburg</i>) the setting of DS2. 	<p><i>"I watched the show and saw how to get it [a self-test kit], but I wouldn't be confident that if I go to the hospital, I'd get them. The hospitals here are not the same as those in Joburg."</i></p> <p>- Female, 15-19</p> <p><i>"I think most clinics are closed right now due to this COVID-19 thing" – Female, 15-19</i></p>	<p><i>"I will go to the clinic. It's where most people go to in the show Shuga. So, I'll go to a local clinic and consult with a nurse or whichever doctor there is and ask them how can I get PrEP. I believe they will explain what the side effects are."</i></p> <p>-Male, 20-24</p> <p><i>"The nurses at our school don't even know about it [PrEP]. Even when you getting HIV test, and ask about this PrEP, they don't know about it."</i></p> <p>- Male, 20-24</p>

*COM-B: Capability, Opportunity, Motivation [reference]

Table S6. Evidence of broader social mechanisms by which MTV Shuga DS2 influenced HIV self-testing and PrEP outcomes: themes emerging from open code analysis of qualitative research in Mthatha, Eastern Cape

Themes	Findings	Sample quotations
DS2 inspires and facilitates supportive conversations about sex and HIV	<ul style="list-style-type: none"> • Participants shared that young people (their peer group) often avoid or find it difficult to talk about sexual health, especially with partners and parents. • Watching the show with friends, partners and parents made it easier to initiate discussions around sexual health, including PrEP and ST. • Discussions about the series triggered open dialogue about young people's sexual relationships, their individual needs and preferences, moral beliefs and decision-making. • Participants felt supported after engaging in conversations about DS2 with others. Some participants said if they need support and advice in the future, they could seek it from the person[s] with whom they watched DS2. • However, some participants did not want to watch DS2 with others, especially parents, because they felt uncomfortable, embarrassed or worried about how they might react to the sexual content. 	<p><i>"It did [make me want to discuss HIV and PrEP with my partner]. Us, as youth, we tend to duck conversations especially important conversations. So, if it's playing on TV, we would actually want to discuss it." -Female, 20-24</i></p> <p><i>"Our parents do not teach us about HIV, pregnancy, when we start engaging with sexual intercourse. So, I learnt a lot about those things from MTV Shuga, because our parents run away from those things. I would like to watch the show with my mother so that she can learn that being honest and talking about these things will make us more aware of what is going on." - Female, 20-24</i></p> <p><i>"I personally, generally observed a paradigm shift from speaking about alcohol, girls, sex, and hangovers to speaking about things like contraceptive methods, how we can organise PrEP, and how we can expand the knowledge we got from the show. So you assisted us to tap into a different perspective of things we would not have spoken about had we not watched the show." - Male, 20-24</i></p> <p><i>"After watching the show, my partner and I discussed the importance of knowing about each other's statuses. Also, that if he is not being honest and has other girlfriends, he needs to take PrEP so that we are protected." -Female, 20-24</i></p> <p><i>"I saw how my friends were [when watching the show] and that God forbid I would find myself in such a situation where I am HIV positive, I know that I can tell my friends, and they will be very supportive and will make jokes about it and they'll always be there." - Female, 15-19</i></p> <p><i>"My friend and I would discuss specific scenes [...] and the characters reactions during the show. It made me feel like I can ask advice from her and also that we can help each other when in certain situations." – Female, 20-24</i></p>

		<p><i>"I can't be comfortable [watching the show with my parents] because I get shy with some of the things that are happening there, especially if there are people around me. I am a shy person. Not because... Like, it's alright that they watch, but when they watch, they must alone, not with me, they must do it by themselves, and I will watch it alone..." – Male, 20-24</i></p>
<p>DS2 viewers wanted DS2 and its content on HIVST and PrEP to be more widespread</p>	<ul style="list-style-type: none"> Because many participants learned about PrEP and HIV ST for the first time from DS2, they felt that more people in their community should know about these resources (PrEP in particular). 	<p><i>"Yes, Dineo going to the clinic to talk about PrEP with the nurse. That is when I got to realise that there was something called PrEP because I didn't know about it. [...] I feel like [The Department of Health] should be motivating the youth to take part in it. Like I said, I've never heard about it before." - Female, 15-19</i></p> <p><i>"I feel like people are not really informed about it [PrEP] and that they need to know about it in order to be able to use it." - Female, 20-24</i></p> <p><i>"I just wish that lot of young people could watch the show. I just wish a lot of people will know about the PrEP, know about the HIV self-screening." -Female, 15-19</i></p> <p><i>"They [HIV SS and PrEP]are both important, but in terms of PrEP, there should be more awareness campaigns, especially in the rural areas. – Female, 20-24</i></p>
<p>DS2 viewers become advocates for HIV testing & prevention</p>	<ul style="list-style-type: none"> Knowledge and confidence gained from MTV Shuga about HIV prevention and testing emboldened some young people to share and educate friends, family and partners about HIV ST and PrEP and engaging in safe sex. 	<p><i>"It [the show] made me aware and able to talk about HIV self-screening. Yes, it's something that I can confidently talk about only because of the show now. Because people are usually afraid of the pain and pricking when it comes to taking an HIV test. So, I'll definitely be an advocate for the self-screening HIV test now because of the show."- Male, 20-24</i></p> <p><i>"The show made me feel like I could share information with others, especially on preventing risky issues from not happening. I could give knowledge with regards to that." - Female, 15-19</i></p> <p><i>"Now that I know more about PrEP from the show, I would suggest it to my girl or my partner, whoever I am having, an encounter with." – Male, 15-19</i></p>

		<p><i>"I can be able to give my little brother advice on when he wants to date. So, now I can [after watching the show] explain to him how to be safe when he's having sex, testing, everything." – Male, 20-24</i></p>
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