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Is hope associated with HIV-acquisition risk and intimate partner violence amongst young women and men? A cross-sectional study in urban informal settlements in South Africa

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ABSTRACT

Hope is a concept that may mediate between the structural constraints people live under and their HIV-acquisition risk behaviours/experiences. Drawing on data collected as the baseline for an intervention trial between September 2015 and September 2016, among young (18–30-year-old), out-of-school women and men in urban informal settlements in Durban, South Africa, we assess whether hope, assessed by the Snyder Hope Scale, is associated with HIV-risk behaviours/experiences. 677 women (35.5%; 33.7%; 30.9%; low, medium, and high hope scores respectively) and 668 men (40.6%; 32.8%; 26.7%; low, medium, and high hope scores respectively) were included. Among women, adjusted analyses showed high levels of hope, compared to low levels, were associated with greater modern contraceptive use (aOR1.57, 1.04–2.37). For men, medium or high levels of hope, compared to low levels, were associated with reduced physical and/or sexual IPV perpetration (med: aOR0.55, 0.38–0.81, high: 0.38, 0.25–0.57), emotional IPV perpetration (med: aOR0.54, 0.36–0.80, high: aOR0.62, 0.41–0.94) and transactional sex (med: 0.57, 0.38–0.84, high: aOR0.57, 0.39–0.86) respectively. For men, hope potentially captured a pathway between an individual's structural context and their HIV-risk behaviour. Yet this was not the case for women. It may be the Snyder Hope Scale does not adequately capture localised meanings of hope.

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Background

People living in urban informal settlements in southern and eastern Africa have much higher HIV-prevalence and incidence than the general population (Habitat & UNAIDS, 2015). In South Africa, where approximately one in seven households reside in informal settlements, nationally representative data from 2002 to 2012 demonstrated how people (aged 15–49) in those locations have the highest HIV-prevalence of all settlement types (Gibbs et al., 2020), likely driven by poverty, high levels of intimate partner violence (IPV) and limited access to services.

While it is clear that structural inequalities in wealth, gender equality, and security shape HIV-related incidence and prevalence, the mechanisms mediating between these structural characteristics/processes and the individual are less clear (Desmond et al., 2019; Lane et al., 2004). One potential strategy to clarify these relationships is to focus on emergent properties, things that emerge as products of the interaction of high-level systems, but have qualities possessed by none of the individual factors (Desmond et al., 2019; Lakoff & Johnson, 2008; Wilson & Carston, 2006).

Hope has been described as an emergent property, broadly capturing people's experience of their agency, ability, or resilience, and their understanding of the extent they believe they can navigate the structural constraints in which they live. This approach assumes that levels of hope for individuals and socio-economic groups are influenced by the wider structural (social, economic and cultural) environments. This has been described by Bourdieu through the concept of *habitus*

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(Bourdieu, 2007). The general theoretical hypothesis and policy-related assumption are that for a given set of structural contextual, differences in individual and group responses may be shaped by individual perceptions and interpretations of this reality, which shapes their response to their structural context. This means that the group and individual interpretation of the structural contexts, summarised to an extent by how hopeful they are, plays a role in determining the response to that context. Research using qualitative methods has used hope as a theoretical concept to consider how marginalised groups navigate their daily structural constraints and build a sense of future orientation (Boyce, 2013; Bryant & Ellard, 2015; Desmond, 2019; Desmond et al., 2019; Hansen et al., 2020).

Understanding whether there is an association between hope and health behaviours is important because if such an association exists, it may be possible to evaluate interventions that try and address structural contexts, which often take many years to demonstrate behavioural change, through a more proximate measure – hope. This would enable us to capture changes in individual's perceptions and ability to navigate their structural contexts by exploring their sense of the future. Additionally, it may be another "target" for interventions, around how people understand themselves and understand their future.

In relation to HIV acquisition, hope has been described as mediating the relationship between the wider structural risk context and HIV-prevention behaviours (Barnett et al., 2015; Barnett & Weston, 2008). While there is some evidence of hope being associated with improved health outcomes among people living with HIV (Scioli et al., 2012), there is more mixed evidence in terms of behaviours related to HIV-prevention. In 2015, in a small sample ($n = 79$) assessing the relationship between hope and HIV-risk behaviour among women and men in Uganda, weak evidence was found in support of this hypothesis, but nonetheless hope was consistently lower among those reporting behaviours associated with the risk of HIV-acquisition (Barnett et al., 2015). In South Africa, among adolescent girls, hope was found to be associated with delayed sexual debut, but not condom use (Abler et al., 2017). Hope was also found to mediate the relationship between household environment and adolescent girls' sexual behaviour, higher levels of hope being protective (Hill et al., 2018). While among adolescents in rural South Africa, higher levels of hope were associated with lower alcohol use (Desmond et al., 2019).

In this paper, we assess whether hope is independently associated cross-sectionally with HIV-risk behaviour/experience among young women and men living in urban informal settlements in South Africa. We hypothesised that higher levels of hope would be associated with lower levels of Intimate Partner Violence (IPV) by (men) and against women, and with lower levels of HIV-risk-related behaviours.

Methods

Data came from the baseline of women and men participating in the Stepping Stones and Creating Futures cluster randomised controlled trial, undertaken in urban informal settlements in Durban, South Africa. Data were collected between September 2015 and September 2016 (Gibbs et al., 2017).

Women and men not in work or school, aged 18–30 and resident in urban informal settlements were eligible. We recruited 16–21 men and 19–21 women per cluster, with 34 clusters in all. Recruitment was in conjunction with Project Empower, a non-governmental organisation who delivered the intervention.

Ethical approval

Ethical approval for the study came from the University of KwaZulu-Natal, and the South African Medical Research Council. All participants provided informed consent before participation. Detailed methods can be found elsewhere (Gibbs et al., 2017).

Data

Questionnaires were self-completed on cellphones, using an App (Mobenzi Researcher), with inbuilt skip patterns, range and logic checks. Questionnaires were available in English, Zulu or Xhosa. Research staff were available to support and undertake face-to-face interviews if needed. This occurred in <5% of respondents.

Measures

Our independent variable was six items from the Snyder Hope Scale (Snyder et al., 1996). The scale was developed and validated in US populations (Snyder et al., 1996). Items on this scale cluster into two components: *pathways* (e.g., I can think of many ways to get out of a difficult situation), and *individual agency* (e.g., I put lots of energy into pursuing my goals). Responses are on a four-point, Likert scale: "definitely false", "mostly false", "mostly true", or "definitely true". Items were summed and higher scores indicated greater individual hope. The Cronbach Alpha for women $\alpha = 0.83$ and $\alpha = 0.84$ men (range 6–24) was good and factorial analysis was satisfactory (all >0.3), loading on one factor. On

visual inspection of the scale scores, it was evident that many men and women had responded "definitely true" to all items. As hope was not normally distributed, we adopted a tertile transformation (low; medium; high, levels of hope).

We selected measures of factors associated with HIV-acquisition risk. Specifically, we assessed past year IPV by men against women using the WHO's Violence Against Women Scale (Garcia-Moreno et al., 2006), which asks behaviourally specific questions and has been shown to be associated with HIV-acquisition. Physical and/or sexual IPV (five and three items respectively) were assessed, with responses recoded into a binary (yes/no) if men reported perpetrating, or women experiencing, any item. A separate five items assessed past-year emotional IPV perpetration (men) and experience (women), again recoded into a binary (yes/no). Finally, past-year economic IPV perpetration (men) and experience (women) was assessed with four items and a positive response to any of these items, led to a coding of "yes' in the summarised variable. The scales had been extensively adapted and validated in South Africa prior to this study (Jewkes et al., 2006).

Three measures assessed other HIV-risk behaviours/experiences. Past year transactional sex with a casual or one time sexual partner was measured using a five-item scale developed in South Africa (Dunkle et al., 2004). The scale asked women whether in the past year they had started, or continued, a relationship because they received goods or items, cash, drugs or alcohol, or a place to stay. Men were asked whether they thought any casual or one-time sexual partner had started a relationship or stayed with them in the past year for the same reason. We asked about condom use in the last year (never, sometimes, often or always) and recoded as inconsistent (never, sometimes or often), compared to always. For women, we asked about any current contraceptive use, first with a screening question: "Are you currently doing something or using any method to delay or avoid getting pregnant?" With "yes', "no" responses. Those who answered yes were asked an additional question as to method, with responses: "injection", "pill", "condom", "IUD", "herb/other traditional method", "condom & pill/injection", "implant" or "other". We coded these as "modern contraceptive" or "no" and included those who did not use any method in the category "no".

We also asked about age, education level completed, food insecurity (Coates et al., 2007) recoded into a three-level score (none, medium, high); depression was assessed using the 20-item CESD scale (Radloff, 1977) previously used in South Africa ($\alpha = 0.85$ women; $\alpha = 0.86$ range: 0–40) and recoded with ≥21 as possible depression. We asked eight items about men's controlling behaviours towards their main partner ($\alpha = 0.76$ women; $\alpha = 0.67$ men, range: 0–24), using a modified sexual relationship power scale (Pulerwitz et al., 2000), with higher scores indicating greater male power in relationships (compared to female power).

Statistical analyses

We first present descriptive statistics of the sample, and then compare these to the hope tertile, presenting percentages and N's for binary variables and means and 95% confidence intervals (95% CIs) for continuous variables, and *p*-values (chi-squared or *t*-tests). We then modelled associations between hope and HIV-risk and IPV measures, as unadjusted and then adjusted associations, adjusting for age, education, depression, controlling behaviours, and food insecurity, presenting odds ratios (ORs) and 95% CI. All analyses are stratified by sex as outcomes had different framing (e.g., Men's perpetration and women's experience), and account for data clustering.

On visual inspection, many participants had responded "definitely true" on all items. As such we undertook a sensitivity analysis excluding these participants. We also did a sensitivity analysis with hope as a continuous scale using the full sample.

Results

Women

In total 677 women were recruited. Women were young (Table 1), with just under half (44.8%) aged 20–24 years, and 1 in 10 (12.6%) 18 or 19. Only a third (30.4%) had completed high school, and many were food insecure, with a third (31.3%) reporting high, and half (50.12%) medium levels of food insecurity, and depressive symptoms were common (45.2%). Women experienced high levels of IPV in the past year (65.1% physical and/or sexual IPV, 78.1% emotional IPV, and 52.4% economic IPV), and engagement in transactional sex in the past year was common (40.6%). There were low levels of consistent condom use (25.6%), but two-thirds (68.5%) reported "modern contraceptive" use.

Overall, 35.5% of women reported low levels of hope, a third (33.7%) medium levels, and 30.9% high levels. Overall mean hope scores and the range of scores for each tertile are reported in Table 1. A greater proportion of those reporting "modern contraceptive" use reported high levels of hope, and this was sustained in unadjusted

Table 1. Sample description and distribution of socio-demographic factors and HIV-risk behaviours by levels of hope, for women and men.

	Men					Women				
	Overall % (*n*)/mean (95% CI)	Low hope % (*n*)/mean (95% CI)	Medium hope % (*n*)/mean (95% CI)	High hope % (*n*)/mean (95% CI)	*p*-value	Overall % (*n*)/mean (95% CI)	Low hope % (*n*)/mean (95% CI)	Medium hope % (*n*)/mean (95% CI)	High hope % (*n*)/mean (95% CI)	*p*-value
	668	40.6 (271)	32.8 (219)	26.7 (178)		677	35.5 (240)	33.7 (228)	30.9 (209)	
Hope (range, min–max)	6–24	6–18	19–21	22–24		6–24	6–18	19–21	22–24	
Hope (continuous)	19.1 (18.7, 19.4)	14.7 (14.3, 15.1)	20.7 (20.5, 29.8)	23.7 (23.6, 23.8)		19.5 (19.1, 19.8)	14.6 (14.2, 15.1)	20.7 (20.5, 20.8)	23.7 (23.6, 23.8)	
Age										
18/19	10.8 (72)	10.7 (29)	12.3 (27)	9.0 (16)	0.543	12.6 (85)	12.9 (31)	10.1 (23)	14.8 (31)	0.016
20/24	52.0 (347)	53.9 (146)	52.1 (114)	48.9 (87)		44.8 (303)	52.1 (125)	43.4 (99)	37.8 (79)	
25/30	37.3 (249)	35.4 (96)	35.6 (78)	42.1 (75)		42.7 (289)	35.0 (84)	46.5 (106)	47.4 (99)	
Education										
Primary or less	11.2 (75)	10.7 (29)	10.1 (22)	13.5 (24)	0.0416	8.3 (56)	12.1 (29)	5.3 (12)	7.2 (15)	0.05
Secondary not complete	57.9 (387)	64.2 (174)	53.0 (116)	54.5 (97)		61.3 (415)	60.0 (144)	60.1 (137)	64.1 (134)	
Secondary complete	30.8 (206)	25.1 (68)	37.0 (81)	32.0 (57)		30.4 (206)	27.9 (67)	34.7 (79)	28.7 (60)	
Food insecurity										
Low	18.4 (123)	17.0 (46)	19.2 (42)	19.7 (35)	0.803	18.6 (126)	18.3 (44)	17.5 (40)	20.1 (42)	0.312
Medium	56.8 (379)	59.3 (160)	56.6 (124)	53.4 (95)		50.1 (339)	54.6 (131)	50.0 (114)	45.0 (94)	
High	24.7 (165)	23.7 (64)	24.2 (53)	27.0 (48)		31.3 (212)	27.1 (65)	32.5 (74)	34.9 (73)	
Controlling behaviours (>=more)	10.2 (10.6, 11.2)	11.2 (10.2, 11.6)	10.4 (9.9, 10.9)**	11.1 (10.6, 11.7)		10.3 (10.0, 10.6)	10.5 (10.0, 11.0)	9.9 (9.3, 10.5)	10.5 (9.9, 11.1)	
Depression (20/21)	46.9 (313)	48.3 (131)	47.5 (104)	43.8 (100)	0.622	45.2 (306)	43.8 (105)	47.4 (108)	44.5 (93)	0.713
HIV-risk behaviours/experiences										
Past year physical/sexual IPV	57.2 (382)	68.3 (185)	53.0 (116)	45.5 (81)	<0.001	65.1 (441)	67.1 (161)	65.4 (149)	62.7 (131)	0.617
Past year emotional IPV	65.7 (439)	73.4 (199)	58.9 (129)	62.4 (111)	0.002	78.1 (529)	77.1 (185)	79.8 (182)	77.5 (162)	0.745
Past year economic IPV	47.2 (315)	52.4 (142)	46.1 (101)	40.5 (72)	0.044	52.4 (355)	54.2 (130)	53.1 (121)	49.8 (104)	0.631
Transactional sex casual partner past year	56.6 (367)	65.1 (170)	50.7 (108)	51.2 (89)	0.002	40.6 (275)	37.5 (90)	39.9 (91)	45.0 (94)	0.263
Condom use consistency (always, past year)	33.6 (218)	33.0 (86)	34.7 (74)	33.3 (58)	0.915	25.6 (151)	25.6 (52)	27.8 (57)	23.8 (42)	0.569
Modern contraceptive use	xx	xx	xx	xx	xx	68.5 (457)	63.2 (151)	70.0 (156)	73.2 (150)	0.066

Note: *p*-values for continuous variables: *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$ with comparison to "low hope".

Table 2. Unadjusted and adjusted associations for hope as an independent risk factor for HIV-risk practices/experiences for women and men.

	Hope levels	Past year physical and/or Sexual IPV		Past year emotional IPV		Past year economic IPV		Past year transactional sex (casual/once off partner)		Condom use consistency (past year)		Modern contraceptive use (current)	
		OR (95% CI)	aOR (95% CI)	OR (95% CI)	aOR (95% CI)	OR (95% CI)	aOR (95% CI)	OR (95% CI)	aOR (95% CI)	OR (95% CI)	aOR (95% CI)	OR (95% CI)	aOR (95% CI)
Men	Low	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	xx	xx
	Medium	**0.52 (0.36, 0.76)**	**0.55 (0.38, 0.81)**	**0.52 (0.35, 0.76)**	**0.54 (0.36, 0.80)**	0.78 (0.54, 1.11)	0.86 (0.59, 1.26)	**0.55 (0.38, 0.80)**	**0.57 (0.38, 0.84)**	1.08 (0.74, 1.59)	1.01 (0.69, 1.50)	xx	xx
	High	**0.39 (0.26, 0.57)**	**0.38 (0.25, 0.57)**	**0.60 (0.40, 0.90)**	**0.62 (0.41, 0.94)**	**0.62 (0.42, 0.91)**	**0.62 (0.41, 0.95)**	**0.56 (0.38, 0.83)**	**0.57 (0.39, 0.86)**	1.02 (0.68, 1.53)	1.00 (0.66, 1.51)	xx	xx
Women	Low	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
	Medium	0.93 (0.63, 1.35)	0.96 (0.63, 1.45)	1.18 (0.76, 1.83)	1.30 (0.91, 2.09)	0.96 (0.66, 1.38)	0.92 (0.61, 1.36)	1.11 (0.77, 1.60)	1.14 (0.77, 1.67)	1.12 (0.72, 1.73)	1.01 (0.64, 1.60)	1.36 (0.92, 2.01)	1.30 (0.87, 1.95)
	High	0.82 (0.56, 1.21)	0.77 (0.50, 1.18)	1.02 (0.66, 1.60)	1.00 (0.62, 1.61)	0.84 (0.58, 1.22)	0.76 (0.51, 1.13)	1.36 (0.93, 1.99)	1.36 (0.91, 2.03)	0.87 (0.54, 1.40)	0.82 (0.50, 1.34)	**1.59 (1.07, 2.37)**	**1.57 (1.04, 2.37)**

Note: Bold face values indicate no overlap of 95 percent confidence intervals with zero.

and adjusted (aOR1.57, 1.04–2.37) analyses (Table 2). In both sets of sensitivity analyses there were no meaningful differences to the main results (Supplementary Tables 1 and 2).

Men

We recruited 674 men. Among men half (52.0%) were aged 20–24, and a third (37.3%) aged 25–30. Men reported low levels of education, with only a third (30.8%) having completed high school, and food insecurity was common (24.7% high; 56/8% medium; 18.4% low). Almost half (48.2%) reported depressive symptoms (Table 1).

In terms of hope scores: 40.6% had low, 32.8% medium, and a quarter (26.7%) high levels, with mean scores and ranges reported in Table 1. Men reported high levels of HIV-risk behaviours. Over half (56.6%) reported transactional sex in the past year with a casual partner, and limited condom use consistency in the past year (33.6%). Men's perpetration of IPV against their partners was high (Table 1).

Descriptively, a higher proportion of those with high hope levels had completed high school (32.0%), compared to those with low hope levels (13.5%). Low levels of hope were descriptively associated with higher risk behaviour, specifically transactional sex, and perpetration of emotional IPV, physical and/or sexual IPV, and economic IPV, compared to medium, and high levels of hope (Table 1).

In adjusted analyses for men (Table 2), compared to those with low levels of hope, men with medium levels of hope reported less physical and/or sexual IPV (aOR0.55, 0.38–0.81), emotional IPV (aOR0.54, 0.36–0.80) and less transactional sex (aOR0.57, 0.38–0.84). While those with high levels of hope, compared to low levels, reported less physical and/or sexual IPV (aOR0.38, 0.25–0.57), emotional IPV (aOR0.62, 0.41–0.94), economic IPV (aOR0.62, 0.41–0.95) and transactional sex (aOR0.57, 0.39–0.86). Sensitivity analyses showed no significant differences to these relationships (Supplementary Tables 1 and 2).

Discussion

Among a group of young people who had self-selected into an intervention trial, who lived in contexts characterised by high levels of poverty, limited government support and widespread community and inter-personal violence, there was variation in the relationship between the construct of hope as captured by the Snyder Hope Scale, and HIV-risk and IPV experiences for both women and men. For women, hope was only associated

with "modern contraceptive" use, but no other behaviours/experiences, while for men there was a consistent association whereby higher levels of hope were associated with reduced HIV-risk behaviours, and IPV perpetration.

Descriptively, while mean scores for hope were similar for women and men, more men than women (40.6% compared to 35.5%) were in the lowest tertile for hope and the reverse was seen for high levels of hope. This potentially suggests men see the world in less positive ways.

For men, the data supported the hypothesis that those with greater levels of hope had fewer HIV-risk behaviours, specifically less transactional sex, and reduced IPV perpetration. Qualitative and quantitative research on men's perpetration of IPV and transactional sex suggests these behaviours are part of how men construct their masculinities (Gibbs et al., 2014), and these masculinities emerge at the intersection of poverty, gender inequalities, and experiences of trauma (Bourgois, 2002; Gibbs et al., 2019). In the present analysis, after controlling for many of these variables, higher levels of hope remained associated with a reduction in IPV and transactional sex, suggesting that hope may be an important factor in understanding individual level agency and response to wider structural contexts, and how these structural contexts shape HIV-risk behaviour and IPV perpetration. If this is the case the Snyder Hope Scale does appear to capture some aspect of positive future orientation and a way to understand variation in different individual's responses to a broader structural context. Thus it may be that there is an indication that, for men, hope as measured here can be considered as an outcome variable for interventions tackling structural constraints such as gender attitudes, poverty, and more widely improving opportunities (Bernays et al., 2007).

There was no association for men between hope scores and consistent condom use in the past year. Condom use is shaped by questions of trust and intimacy between partners (Bauman & Berman, 2005) and previous studies suggest that the relationship type shapes condom use, more established relationships including higher trust making condom use less likely (Bauman & Berman, 2005). As we assessed an overall measure of condom use in the past year, we cannot be sure what types of sexual relationships men were reporting.

Among women the only association between hope and HIV-risk behaviour or experience of IPV was with modern contraceptive use. One explanation is that the other HIV-risk behaviours assessed in this study were primarily those where women had limited control as they were substantially driven either by poverty, such as transactional sex (Dunkle et al., 2004; Zembe et al., 2013), or else men's behaviours (particularly IPV). "Modern contraceptives" are potentially primarily a woman's decision in these contexts and may give women some autonomy, especially if they are using covert methods (Gibbs & Hatcher, 2020). If this is the case, hope can only be used to capture the relationship between structural contexts and behaviours where people have agency to affect the behaviour. In this situation, the HIV-risk behaviours which women reported were those over which they had little individual agency.

Another explanation for the lack of association is that the Snyder Hope Scale may well be inadequate to measure hope in this context, particularly it might not be equally appropriate for women. Initial pilot testing found women and men understood the scale, but in the study many people reported the highest scores. This is similar to a recent study using the Snyder Hope scale among women in Tanzania, which found scores highly skewed towards respondents being very hopeful and concluded the scale may not function in this population in the same way as it did in the US (Hansen et al., 2020). Furthermore, two recent qualitative studies of hope, conducted after the data were collected for this study, found the Snyder scale's orientation did not resonate with South African's conceptualization of future orientation, and hope (Abler et al., 2017; Desmond et al., 2019). As such, while people may understand the questions asked, these may not reflect local understandings of hope, suggesting that within specific and local structural constraints, hope has particular manifestations, rather than having universal properties. Further work on scale properties and local adaptations is clearly required, probably requiring concentrated preparatory ethnographic investigation.

This study has a number of limitations: data were cross-sectional and the variables could have a bidirectional relationship; in the primary analysis we used hope as a tertile, as it was non-normally distributed; while we did sensitivity analyses which confirmed the findings, it suggests the scale may not have functioned as anticipated; the sample was limited to a narrow group of out-of-school people aged 18–30 and is thus not representative of the South African population, but this could also limit variability in responses.

Conclusion

In this sample of young South Africans living in urban informal settlements higher levels of hope among men were associated with less IPV perpetration and less transactional sex, but higher levels of hope were only

associated with "modern contraceptive" use for women, but not with HIV-risk behaviours/experiences. Typically, men have slightly greater agency and economic and social power in these settings (though still highly constrained) and hope potentially captured a pathway between an individual's structural context and their HIV-risk behaviour. However, given the overall lack of association for women, it appears that the Snyder Hope Scale does not adequately capture localised manifestations of hope in these contexts. Development of a locally appropriate form of hope scale will be important to capture how individual's respond to socio-economic structures.

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Data availability statement

Data are freely available in a public, open-access repository. De-identified data sets for the project are available from http://medat.samrc.ac.za/index.php/catalog/WW managed by the South African Medical Research Council.

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