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Changes in HIV-related stigma among young adults in Cape Town, South Africa

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Abstract

Background: *Stigma is a recognised problem for effective prevention, treatment and care of HIV/AIDS. However, few studies have measured changes in the magnitude and character of stigma over time. This paper provides the first quantitative evaluation in Africa of the changing nature of stigma and the potential determinants of these changes. More specifically, it evaluates the dynamic relationship between stigma and (1) increased personal contact with people living with HIV/AIDS (i.e., the contact hypothesis) and (2) knowing people who died of AIDS.*

Methods: *Panel survey data collected in 2003 and 2006 for 1074 young adults (54% women, 46% men) is used to evaluate changes in three distinct dimensions of stigma: behavioural intentions towards people living with HIV/AIDS, instrumental stigma (inflated fear of infection) and symbolic stigma (expressions of negative moral judgement). Individual fixed effects regression models are used to evaluate factors that influence stigma over time.*

Results: *Each dimension of stigma increased in the population as a whole, and for all racial and gender sub-groups. Symbolic stigma increased most significantly, followed by instrumental stigma, while negative behavioural intentions showed a modest increase. Knowing someone who died of AIDS was significantly associated with an increase in instrumental stigma ($p < 0.01$) and symbolic stigma ($p < 0.001$). Increased personal contact with people living with HIV/AIDS was not significantly associated with changes in stigma. Importantly, increases in instrumental stigma ($p < 0.001$) predicted increases in negative behavioural intentions.*

Conclusion: *Stigma increased despite interventions, such as public sector provision of HAART (which some hoped would have reduced stigma), and among a sample highly targeted with HIV-prevention messages. These findings emphasise that changes in stigma are difficult to predict and thus important to monitor. They also indicate an imperative for renewed efforts to reduce stigma, perhaps through interventions to weaken the association between HIV/AIDS and*

death, to reduce fear of HIV/AIDS, and to recast HIV as a chronic manageable disease.

Introduction

HIV-related stigma is "universally pervasive, occurring in every country and region of the world" (Aggleton & Parker, 2002: 4). Stigma is associated with negative attitudes towards HIV testing and discourages people from being tested (Chesney & Smith, 1999; Hamra *et al.*, 2006; Herek *et al.*, 2003; Hutchinson & Mahlalela, 2006; Kalichman & Simbayi, 2006; Lee *et al.*, 2005; Lindberg *et al.*, 2006; Liu *et al.*, 2005; Mathole *et al.*, 2006; Wolfe *et al.*, 2006). For those already diagnosed with HIV, fear of stigma may impede access to treatment and other health care services; undermine adherence to treatment; and discourage disclosure to sexual partners and drug-use partners (Cao *et al.*, 2006; Clark *et al.*, 2003; Derlega *et al.*, 2002; Holzemer & Uys, 2004; Nachega *et al.*, 2005; Rao *et al.*, 2007; Simbayi *et al.*, 2007; Skhosana *et al.*, 2006; Ware *et al.*, 2006; Wolfe *et al.*, 2006; Yang *et al.*, 2006). Combating stigma is thus widely recognised as a key ingredient in the struggle against HIV and AIDS, and for improvements in public health in general (Aggleton & Chase, 2001; Aggleton *et al.*, 2003; Bond & Nyblade, 2006; Brown *et al.*, 2003; Herek *et al.*, 1996; Malcolm *et al.*, 1998; Piot, 2001; Piot & Seck, 2001). This is especially pertinent in sub-Saharan Africa (SSA), the epicenter of the disease, where prevalence rates are the highest in the world (UNAIDS, 2006; Whiteside, 2008).

However, "despite extensive knowledge regarding the consequences of stigma and discrimination, comparatively little progress has been made in systematically addressing these in public health programmes" (van Brakel, 2006: 308). In particular, very little is known about how stigma changes over time and the factors that might influence such change. This information is important as stigma intervention strategies need to be cognisant of, and responsive to, the changing social context for people living with HIV or AIDS (PLWHA). As the epidemic matures the social context will change as a result of social responses to HIV prevention and treatment interventions. Research into the dynamics of such changes is rare (see Herek & Capitanio, 1999 for one example in the United States) and in sub-Saharan Africa it is virtually non-existent. There is clearly an urgent need to evaluate changes in the magnitude and character of social attitudes towards PLWHA (Weiss *et al.*, 2006).

The only previous research conducted in South Africa that claimed to assess changes in HIV-related stigma produced the following recommendation:

> *Stigmatising attitudes are decreasing*
> As South Africans are becoming more accepting of HIV/AIDS as a reality in South Africa, and accepting of people and family members living with HIV/AIDS, it is critical that service providers capitalise on this window of opportunity to encourage disclosure of HIV-status (Shisana *et al*., 2005, p. xxxix).

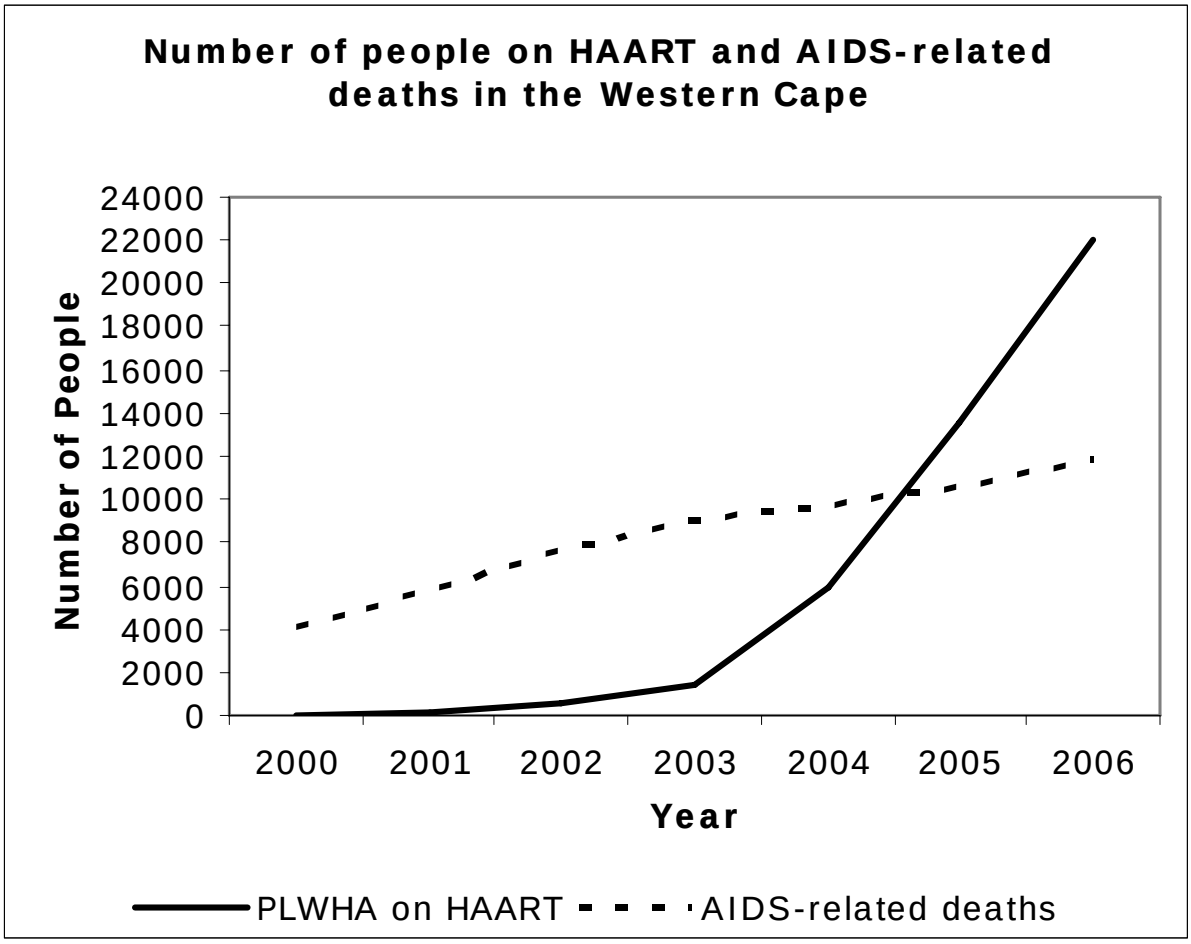
But the methods used to draw these conclusions are highly questionable as two cross-sectional surveys were analysed (when a panel study would have been more appropriate) and different sets of stigma questions were asked in the 2002 (Shisana & Simbayi, 2002) and 2005 (Shisana *et al.*, 2005) surveys. In other words, attitudes and behavioural intentions could not be reliably monitored over time and drawing firm conclusions and making strong recommendations on the basis of responses to these questions was therefore inappropriate.

As a social construct, HIV-related stigma is amenable to change because the meanings attached to HIV/AIDS and its symbolic representations shift over time. There are many theories and counter-theories about the effects of particular interventions or social change on stigma. The development of efficacious treatment has, for example, been seen as contributing to the reduction in health-related stigmatising attitudes and behaviours (Weiss & Ramakrishna, 2006). HAART has the potential to change the perception of AIDS as a death sentence, and thereby reduce stigma (Preston-Whyte, 2003). Access to HAART is believed, for example, to have lessened HIV-related stigma in Haiti (Farmer *et al.*, 2001), among adolescents in Brazil (Abadía-Barrero & Castro, 2005) and in villages in rural China (Cao *et al.*, 2006).

Figure 1 displays HAART coverage and AIDS-related deaths in the Western Cape, one of the nine provinces in South Africa. Approximately 65% of the population of the Western Cape reside in Cape Town. Figure 1 illustrates that HAART coverage has increased substantially each year in the Western Cape since 2003. South Africa's public-sector HAART programme was launched in most provinces in 2004 and had been piloted in the Western Cape since 2001. By 2006, HAART coverage in the Western Cape was at 55.7% of the number of people estimated to need HAART (Nattrass, 2007, p. 131).

One would thus expect this to have had some impact on HIV-related stigma over time – especially between 2003 and 2006. Given the purported positive impact of HAART in terms of reducing stigma argued above, one might have hoped stigma would have decreased sharply over the period.

Figure 1. Number of people on HAART and AIDS deaths in the Western Cape



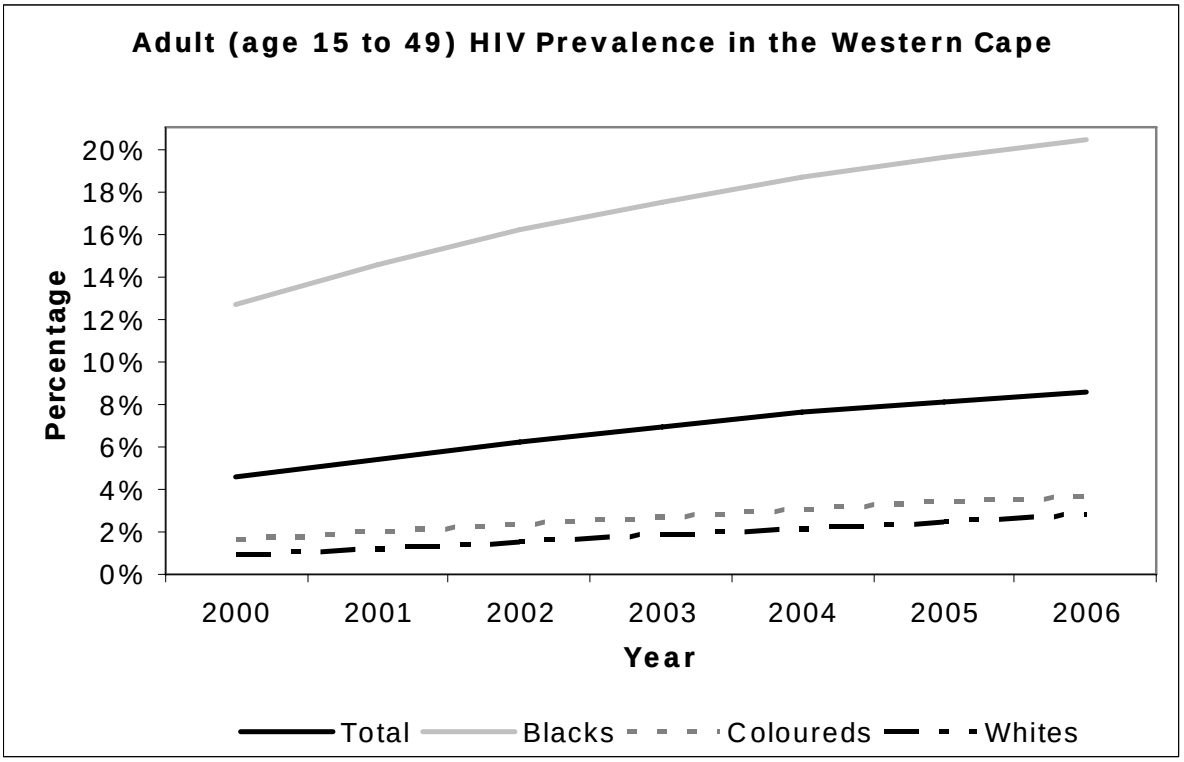
Note: Data from the ASSA2003 model (available on www.assa.org.za)

However, Herek (2002) warns that, while disease stigma historically decreases as the disease is better understood and as treatment becomes available, this appears not always to be the case with regard to HIV/AIDS. This may well be the situation in South Africa where access to HAART is only a recent phenomenon and not available to everyone who needs it. Lack of full HAART coverage in South Africa has resulted in continual increases in AIDS deaths. As shown in Figure 1, AIDS-related deaths have continued to rise alongside the increase in the number of PWLHA on HAART. This trend in AIDS-related deaths could reinforce the associations between HIV and death and lead to increases in stigma – even in the presence of a partial HAART roll-out.

Alternatively, another theory is that levels of stigma will be associated with HIV prevalence levels: based on the contact hypothesis (see Herek & Capitanio, 1997) prejudice is believed to decrease with increased direct contact with members of the stigmatised group. A study conducted in rural China found supporting evidence for this theory: villages where HIV-prevalence was high

were associated with lower levels of stigma (Cao *et al.*, 2006). In Kenya, Hamra *et al.* (2006) also found that personal acquaintance with PLWHA was associated with fewer manifestations of HIV-related stigma. Given that HIV prevalence has increased in the Western Cape since 2000 (see Figure 2) stigma should, according to this theory, have decreased as a result. This would be the case among the black population in particular as prevalence rates among this group increased the most.

Figure 2. Adult (15 to 49) HIV prevalence in the Western Cape



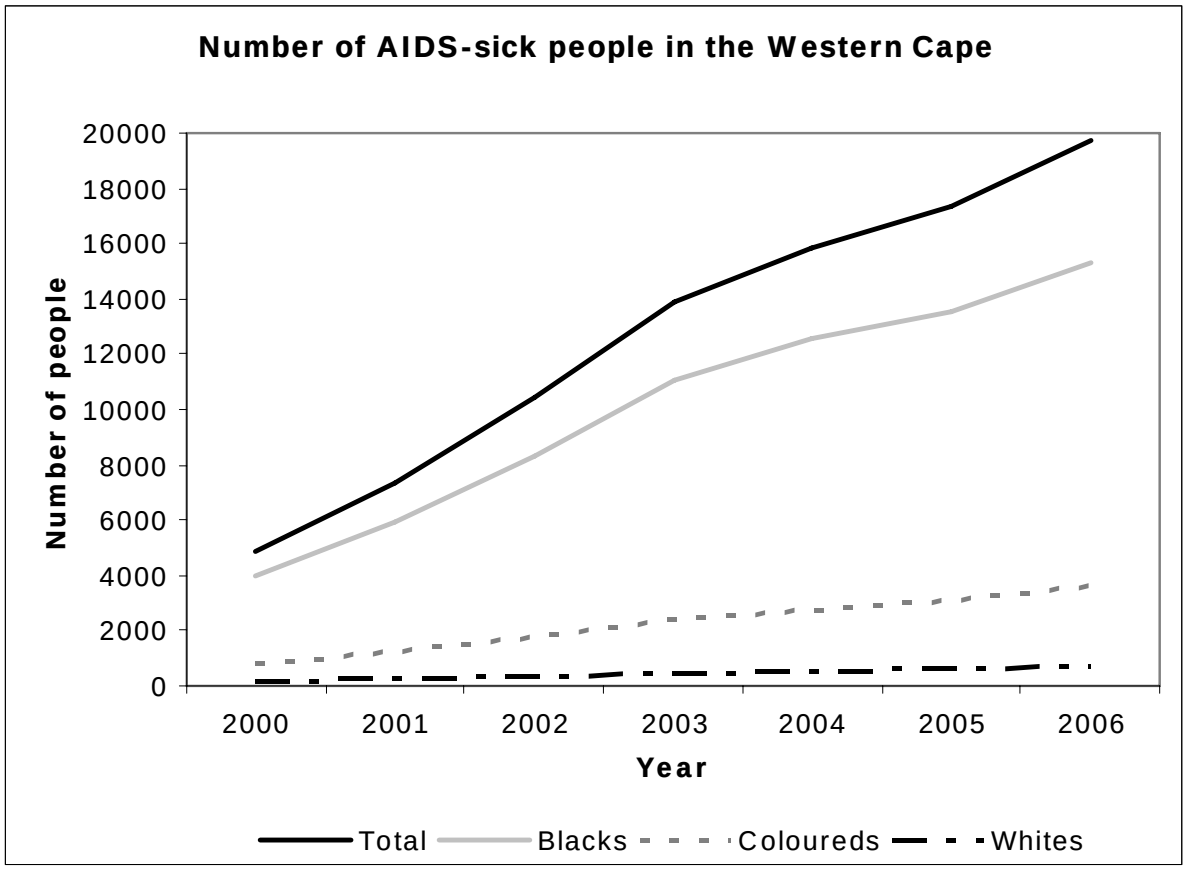
Note: Data from the ASSA2003 model (available on www.assa.org.za)

However, Almeleh's (2006) finding that PLWHA in South Africa generally do not disclose until they are manifestly sick raises the possibility that the increase in the number of AIDS-sick people, especially among blacks (see Figure 3), results in more people becoming aware of the negative aspects of HIV, and this could result in the perpetuation of stigmatising ideas. The South African National HIV Prevalence, HIV Incidence, Behaviour and Communication Survey in 2005 found some evidence for this: "higher levels of negative attitude were related to close contact to people living with HIV/AIDS" (Shisana *et al.*, 2005, p. 96).

It is clear that the social context surrounding HIV/AIDS in the Western Cape has changed considerably in the past few years, primarily as a result of the HAART roll-out. It is not clear, however, how stigmatising attitudes and behaviours have changed in response. This paper fills an important gap in

research on HIV-related stigma by using individual-level panel data to discern and quantify trends in stigma among young adults in Cape Town, and by examining potential determinants of these changes.

Figure 3. Number of AIDS-sick people in the Western Cape



Note: Data from the ASSA2003 model (available on www.assa.org.za)

Method

This paper uses panel data from the Cape Area Panel Study (CAPS).[1] CAPS is a longitudinal study of young adults in Cape Town, South Africa. The first wave of CAPS, conducted in 2002, interviewed 4,701 young adults, aged between 14 and 22 years. CAPS has a complex survey design. The sample was stratified by race (black, coloured and white).[2] The primary sampling units (PSUs) were the enumeration areas, comprising clusters of households, from the 1996 general census.[3] Four hundred and forty PSUs, about 10% of the enumeration areas in

[1] Detailed information about CAPS, including survey instruments and public datasets can be found at http://www.caps.uct.ac.za/

[2] 'Coloured' is a common term in South Africa for individuals of mixed race.

[3] An enumeration area is the geographical area enumerated by one census representative. An EA is the smallest geographical area for which census data are reported.

Cape Town in the 1996 census, were selected based on probabilities proportional to size. Simple random sampling, using aerial photographs of each enumeration area, was then used to select 25 households within each PSU. Finally, a maximum of three individuals between the ages of 14 and 22 were selected from each household. It was uncommon for more than three individuals to reside in one household, but when it occurred, the three individuals with the most recent birthday were selected. This wave of CAPS collected demographic, behavioural and attitudinal information.

In 2003, the second wave of CAPS re-interviewed 1,371 of the original respondents. Selection of respondents for the second wave was based on systematic selection of clusters within the black and coloured strata, and systematic selection of individuals in the white strata. In each case a random starting point was chosen and every third unit was selected. The second wave included a module of questions probing attitudes and behavioural intentions towards PLWHA.

The next year in which CAPS included stigma question was 2006, when the fourth survey wave re-interviewed 1,075 of the 1,371 second wave respondents. [4] This survey contained a module designed to evaluate changes in stigma since the 2003 survey. The stigma module repeated eight questions verbatim from the 2003 survey to enable direct comparisons. These questions were selected to cover behavioural intentions towards PLWHA and the two main dimensions of stigma identified after detailed analysis of the CAPS wave 2 stigma module: instrumental stigma and symbolic stigma (see Maughan-Brown, 2006, for further details). Table 1 displays the eight panel questions asked and the dimension of stigma each probes.

In order to examine trends in HIV-related stigma, descriptive statistics were calculated for the eight stigma questions for both survey waves. T-tests were then used to assess differences in the average scores for each question. The Stuart Maxwell test for homogeneity was then conducted to evaluate whether stigma trends identified represented real changes in stigma or systematic survey effects. Finally, an attrition test was done to examine any potential bias caused by attrition between the survey waves. Potential determinants of stigma, in particular whether an individual reported meeting someone living with HIV or knowing someone who died of AIDS, were assessed using individuals fixed effects regression models.

[4] Seven of the 1075 participants in wave 4 self-reported being HIV positive, these individuals were excluded from this analysis.

Table 1. Stigma questions asked in 2003 and 2006 CAPS

Please respond to the following questions by answering "Yes" or "No". If you are not sure, chose the "Probably Yes" or "Probably No" response. If you are quite sure chose the "Definitely Yes" or "Definitely No" response. ***Interviewer: Do not read the "don't know" option***	***Dimension of stigma***
1. Imagine that you find out that one of your friends is HIV infected. Would you still be friends with them?	Behavioural intentions
2. If you knew that a shopkeeper had HIV/AIDS, would you buy fresh vegetables from him or her?	Behavioural intentions
3. Do you think a school pupil with HIV should be allowed to attend school?	Behavioural intentions
4. Would you drink from the same bottle of water as an HIV infected friend?	Instrumental stigma
5. Would you rather not touch someone with HIV/AIDS because you are scared of infection?	Instrumental stigma
6. Do you worry that HIV is much easier to catch than we are told?	Instrumental stigma
7. Do you think HIV/AIDS is a punishment for sleeping around?	Symbolic stigma
8. Do you think that many people who get HIV infected through sex have only themselves to blame?	Symbolic stigma

Analysis & Results

The analysis & results section of this paper is divided into 3 sections: (1) changes in reported stigma; (2) changes in stigma by gender, race and age; and (3) determinants of stigma transitions.

Changes in reported stigma

This section evaluates transitions that occur within the panel between 2003 and 2006 (i.e. among the individuals who were interviewed in both the surveys). Descriptive statistics (percentage response to each question) provide an initial indication of change. The main part of Table 2 displays the response frequencies for each question for 2003 and 2006. At first glance, shifts in response frequencies suggest an increase in stigma for the majority of questions. In particular it is noted that, with the exception of Question 3, there is a significant movement away from the least stigmatising response. In addition, an increase in uncertainty is noted as more respondents answered "don't know" in 2006.

Response options were then coded to enable changes in averages to be tested. The response options ("definitely yes", "probably yes", "probably no" and "definitely no") were coded from 1 to 4 for each question: a score of 1 for the lowest level of stigma and a score of 4 for the highest.

The increase (up to 8% in 2006 for Question 6) in "don't know" responses raised a difficult methodological question about how to use this information. The easiest solution was to exclude the "don't know" responses. This seemed unsatisfactory because someone who, for example, thinks in 2003 that HIV is definitely *not* a punishment for "sleeping around," but in 2006 is uncertain ("don't know") could reasonably be regarded as having developed a more negative attitude. In other words, the "don't know" responses have valuable content that should be captured in any empirical work. Accordingly, the analysis coded the "don't know" response as a mid-point (2.5) between yes and no.[5]

T-tests were conducted to assess whether the mean score for each question was significantly different in 2003 as compared to 2006. The T-tests were conducted so that a positive sign indicates an increase in stigma.[6] T-test 2.1 in Table 2 shows that a significant increase in mean stigma scores for the majority of items and no items showed a significant decrease. The behavioural intentions items (which showed low levels of stigma in 2003) changed the least, with a significant increase for Question 1 only. In other words, on average, respondents were more likely to say they would not remain friends with a PLWHA in 2006 than 2003, but attitudes were unchanged about pupils attending school and buying fresh vegetables from an HIV-positive shopkeeper. Two of the instrumental stigma questions (Questions 4 and 5) showed a significant increase in stigma between 2003 and 2006, while the increase for Question 6 was non-significant. The symbolic stigma questions showed the greatest average increases in stigma.

[5] The mid-point was selected as it gives less weight to transitions to or from "don't know" than from transitions between stigmatising and non-stigmatising responses. For example, a response shift from definite stigma to "don't know" equates to a drop in stigma by 1.5. A response shift from definite stigma to probably no stigma equates to a drop in stigma of 2. The larger decrease in stigma in the latter scenario seems appropriate due to the uncertainty in the first scenario. It is important to note that sensitivity analysis excluding the "don't know" option yielded results with the same sign and significance, and only marginal changes in the coefficients.

[6] Higher scores for the first four items in Table 7.2 indicate greater levels of stigma. The T-test for the first four items subtracted the 2003 average from the 2006 average. In other words if the 2006 average was higher (more stigma) than the 2003 average then the T-test score will be positive to indicate an increase in stigma. The opposite process for the second four items ensured a similar outcome.

The Stuart Maxwell test for homogeneity of the marginal distributions was then used to validate the interpretation of the T-tests. The Stuart Maxwell test assesses whether two samples are independent (Stuart, 1955). It is used to test whether individual responses to questions changed unsystematically and significantly between 2003 and 2006. It is useful for two main reasons. First, a systematic survey effect, rather than real changes in stigma, could cause the majority of answers to shift in one direction.[7] If this has happened the T-test will identify a significant difference in the averages between the years and lead us to the wrong conclusion. A significant coefficient on the Stuart Maxwell test informs us that significant and unsystematic changes have occurred, giving us confidence that the T-test is picking up real changes. Second, a non-significant T-test does not necessarily indicate that no changes have taken place; it could be that the net result had merely lead to a small change in the average. In other words, a significant Stuart Maxwell coefficient for questions with a non-significant T-test score indicates that significant changes in responses occurred, but that almost the same degree of change happened in both directions. Larger Stuart Maxwell coefficients indicate greater changes between the years.

The Stuart Maxwell coefficients displayed in Table 2 were significant for all questions apart from Question 3 (which was the only item in which almost no changes in responses were reported). This validates the T-test results as being indicative of changes in stigmatising attitudes and behaviours rather than simply reflecting any potential survey effects. The significant Stuart Maxwell coefficient for Questions 2 and 6, which showed no significant change in mean response over time, indicates that the distribution of responses to these questions changed significantly. In fact, the largest Stuart Maxwell coefficient is recorded for Question 6, indicating that responses to this question changed the most.

Finally, it was important to consider potential effects of survey attrition between 2003 and 2006 as 296 respondents were not re-interviewed in 2006. The 2003 sample was selected to be representative of the young adult population of Cape Town. If the 296 individuals who were not re-interviewed experienced a change in attitude that differed significantly from the rest of the sample then the results reported above might not be representative. In other words, if these 296 individuals had reported a decrease in stigma (by contrast with the increase in stigma reported by the 2006 sample) then the aforementioned results would be biased.

[7] A systematic survey effect occurs when changes in the survey process affect responses (for example, if fieldworkers were trained to be friendlier and establish greater rapport in the 2006 survey then this in and of itself could have changed responses).

An attrition test was conducted to assess whether the aforementioned results changed in a hypothetical scenario in which stigma was assumed to decrease among the 296 missing 2006 respondents. In other words, the attrition test assesses whether the 296 respondents would have made a difference to the results if stigma trends among this group had run counter to the current findings. A hypothetical sample was created for 2006 by including the attritors as respondents in the 2006 sample. It was then assumed that all the attritors reported lower levels of stigma in 2006 than they did in 2003, i.e. a score of one was subtracted from their 2003 scores. T-tests were used to assess changes in the stigma reported by the 2003 sample and the hypothetical 2006 sample. T-test 2.2 indicated the average change in stigma for this scenario. The results were consistent with T-test 2.1: significant increases in stigma were found for the same questions. Therefore, as far as these attitudes were concerned we can conclude that there was no discernable attrition bias.

Table 3 provides a summary of the changes in responses to the stigma questions between 2003 and 2006. The 'stigma change' column shows the difference between the percentage of respondents reporting an increase in stigma and those reporting a decrease. The largest difference is noted for Question 7, with almost a quarter of respondents reporting an increase in stigma. For this question, 45% of respondents reported a more stigmatising response in 2006 than 2003, while only 21% reported a less stigmatising response. The 'transition' columns table reveal that although there were overall increases in stigma, many respondents also reported a decrease in stigma.

Table 2. Changes in stigma between 2003 and 2006

	2003					2006					T-test 2.1	Stuart Maxwell test	T-test 2.2 (attrition test)
	Definitely yes	Probably yes	Probably no	Definitely no	Don't know	Definitely yes	Probably yes	Probably no	Definitely no	Don't know			
1. Imagine that you find out that one of your friends is HIV infected. Would you still be friends with them? **Behavioural intentions**	92% (982)	5% (56)	1% (11) [stigma]	1% (15)	0% (0) n = 1064	81% (864)	13% (148)	0% (5) [stigma]	4% (41)	1% (6) n = 1064	+0.16***	70***	+12***
2. If you knew that a shopkeeper had HIV/AIDS, would you buy fresh vegetables from him or her? **Behavioural intentions**	66% (701)	17% (179)	4% (47) [stigma]	12% (124)	1% (11) n = 1062	60% (638)	23% (240)	7% (69) [stigma]	8% (90)	2% (25) n = 1062	+0.02	29***	-0.02
3. Do you think a school pupil with HIV should be allowed to attend school? **Behavioural intentions**	87% (918)	7% (73)	2% (16) [stigma]	5% (49)	0% (3) n = 1059	87% (925)	7% (73)	1% (7) [stigma]	5% (50)	0% (4) n = 1059	-0.01	4	-0.03
4. Would you drink from the same bottle of water as an HIV infected friend? **Instrumental stigma**	63% (668)	16% (165)	6% (63) [stigma]	15% (159)	1% (9) n = 1064	45% (474)	19% (199)	11% (120) [stigma]	20% (216)	5% (55) n = 1064	+0.36***	111***	+27.8***
5. Would you rather not touch someone with HIV/AIDS because you are scared of infection? **Instrumental stigma**	15% (163) [stigma]	5% (58)	12% (130)	66% (705)	1% (6) n = 1062	14% (145) [stigma]	11% (119)	20% (212)	51% (544)	4% (42) n = 1062	+0.19***	100***	+12.8***

Table 2 continued. Changes in stigma between 2003 and 2006

	2003					2006					T-test 2.1	Stuart Maxwell test	T-test 2.2 (attrition test)
	Definitely yes	Probably yes	Probably no	Definitely no	Don't know	Definitely yes	Probably yes	Probably no	Definitely no	Don't know			
6. Do you worry that HIV is much easier to catch than we are told? **Instrumental stigma**	41% (440) [stigma]	13% (142)	8% (85)	35% (375)	2% (19)	30% (319) [stigma]	25% (261)	19% (198)	19% (203)	8% (80)	+0.08	179***	-0.1
	n = 1061					n = 1061							
7. Do you think HIV/AIDS is a punishment for sleeping around? **Symbolic stigma**	18% (188) [stigma]	11% (116)	12% (129)	58% (613)	2% (17)	22% (235) [stigma]	18% (195)	19% (199)	33% (356)	7% (78)	+0.43***	147***	+33.8***
	n = 1063					n = 1063							
8. Do you think that many people who get HIV infected through sex have only themselves to blame? **Symbolic stigma**	28% (296) [stigma]	14% (145)	12% (129)	45% (482)	1% (10)	30% (321) [stigma]	22% (236)	16% (171)	25% (270)	6% (64)	+0.36***	137**	+25.4***
	n = 1062					n = 1062							

Notes: *10% significance level **5% and ***1%
Numbers in () denote number of respondents
Total percentages may not equal 100% due to rounding errors

Table 3. Summary of stigma changes within the panel between 2003 and 2006

	Transition			Stigma change
	-	0	+	
1. Imagine that you find out that one of your friends is HIV infected. Would you still be friends with them? (Behavioural intentions)	6%	77%	17%	+11%***
2. If you knew that a shopkeeper had HIV/AIDS, would you buy fresh vegetables from him or her? (Behavioural intentions)	22%	53%	26%	+4%
3. Do you think a school pupil with HIV should be allowed to attend school? (Behavioural intentions)	12%	77%	11%	-1%
4. Would you drink from the same bottle of water as an HIV infected friend? (Instrumental stigma)	18%	42%	40%	+22%***
5. Would you rather not touch someone with HIV/AIDS because you are scared of infection? (Instrumental stigma)	21%	45%	35%	+14%***
6. Do you worry that HIV is much easier to catch than we are told? (Instrumental stigma)	35%	28%	37%	+2%
7. Do you think HIV/AIDS is a punishment for sleeping around? (Symbolic stigma)	21%	34%	45%	+24%***
8. Do you think that many people who get HIV infected through sex have only themselves to blame? (Symbolic stigma)	26%	32%	42%	+16%***

Notes: *10% significance level **5% and ***1%

'-'; '0' & '+' transitions represent the percentage of respondents in 2006 who reported less stigma, equal levels and more stigma respectively

Changes in stigma by gender, race and age

The nature and determinants of stigma in South Africa have been found to vary by race, gender and age (Maughan-Brown, 2006; Shisana & Simbayi, 2002; Shisana *et al.*, 2005). This section assesses whether variation in stigma over time among young adults was affected by these variables too. Following the analysis conducted by Maughan-Brown (2006), the eight stigma questions used in this paper were grouped into three indices. Questions 1 to 3 were summed to form an indicator of behavioural intentions. Question 4 to 6 made up an instrumental stigma indicator and Questions 7 and 8 were combined as an indicator of symbolic stigma.

Table 4 displays T-test results for the difference in average scores between 2003 and 2006 and the percentage of respondents reporting a change in stigma by gender, race and age. Age is split into those who were 18 or younger in 2003 and those 19 or older in 2003.

Table 7.4. Stigma transitions by gender, race and age

	Behaviour intentions			Instrumental stigma			Symbolic stigma		
Women		+0.12			+0.24***			+0.88***	
	25%$^{-}$	46%^{0}	29%$^{+}$	36%$^{-}$	20%^{0}	44%$^{+}$	25%$^{-}$	20%^{0}	55%$^{+}$
Men		+0.20*			+0.65***			+0.69***	
	27%$^{-}$	40%^{0}	33%$^{+}$	29%$^{-}$	16%^{0}	55%$^{+}$	29%$^{-}$	21%^{0}	50%$^{+}$
Blacks		+0.11			+0.42***			+1.14***	
	24%$^{-}$	54%^{0}	22%$^{+}$	33%$^{-}$	19%^{0}	48%$^{+}$	21%$^{-}$	22%^{0}	57%$^{+}$
Coloureds		+0.23**			+0.42***			+0.36***	
	27%$^{-}$	29%^{0}	44%$^{+}$	33%$^{-}$	18%^{0}	49%$^{+}$	36%$^{-}$	16%^{0}	48%$^{+}$
Whites		+0.10			+0.62***			+0.20	
	32%$^{-}$	29%^{0}	39%$^{+}$	29%$^{-}$	10%^{0}	61%$^{+}$	27%$^{-}$	23%^{0}	50%$^{+}$
<= 18yrs in 2003		+0.08			+0.49***			+0.84***	
	29%$^{-}$	39%^{0}	32%$^{+}$	33%$^{-}$	17%^{0}	50%$^{+}$	24%$^{-}$	22%^{0}	54%$^{+}$
> 18yrs in 2003		+0.24***			+0.37***			+0.74***	
	22%$^{-}$	47%^{0}	31%$^{+}$	33%$^{-}$	20%^{0}	47%$^{+}$	30%$^{-}$	18%^{0}	52%$^{+}$

Notes:

T-test *10% significance level **5% and ***1% ; '+' = more stigma on average

$\%^{-}$ $\%^{0}$ $\%^{+}$ Percentage of respondents becoming less stigmatising, overall no change and more stigma respectively

Table 4 reveals that although a significant minority reported a decrease in stigma an average increase in stigma was reported by all groups for each dimension of stigma. With respect to gender, men showed a greater average increase for instrumental stigma than women, while symbolic stigma increased more among women than men. In other words, fear of infection increased for everyone, but the increase was greater among men; and negative moral judgements increased for everyone, but the increase was greater among women. The increase in average negative behavioural intentions was non-significant among women and only marginally significant among men.

By race, coloureds were the only group to express an increase in negative behavioural intentions. All groups showed an increase in instrumental stigma, with whites showing the greatest increase. Symbolic stigma increased most significantly among blacks and also among coloureds, while the increase among whites was non-significant. The most notable change in stigma by race was the increase in symbolic stigma among blacks.

Relatively small variation was found between the age groups for each dimension of stigma. The older group reported a significant increase in negative behavioural intentions, while the increase for the younger group was non-significant. On the other hand, the younger group reported slightly larger increases in both instrumental stigma and symbolic stigma compared to the older group.

Determinants of stigma transitions

We now turn to an exploration of the potential determinants of changes in stigmatising attitudes and behavioural intentions. We consider in particular, the effect on stigma of knowing someone living with HIV/AIDS or someone who had died of AIDS. In this regard, the sample was restricted to respondents who reported not knowing someone living with HIV/AIDS or someone who had died of AIDS in 2002. The impact on stigma of subsequently meeting someone living with HIV or knowing someone who died of AIDS between the baseline 2002 and 2006 was assessed.

The reader is reminded that the stigma questions were first asked in 2003. This means that some of the new experiences reported may have occurred before stigma was measured at baseline. Thus, some of the effect on stigma of these

experiences with HIV/AIDS may have occurred before 2003. This would lead to an underestimation of the relationship between these variables in this analysis.

Table 5 displays the percentage of CAPS respondents who experienced either event between 2002 and 2006. The table shows that significantly more young black adults than either whites or coloureds living in Cape Town reported knowing PLWHA (36%) and knowing someone who died of AIDS (43%). This was expected, as more than 95% of new AIDS cases and AIDS deaths over the intervening period were amongst blacks (see Table 6). After excluding missing data, there were insufficient observations to conduct the analysis for all race groups. Given that the majority of new experiences with HIV/AIDS in the intervening period were amongst blacks it is reasonable to conduct the analysis with only the black individuals from the sample.

Table 5. New contact with HIV/AIDS between 2002 and 2006

	Number of respondents who first met PLWHA between 2002 & 2006	Percent of group who first met PLWHA between 2002 & 2006	Number of respondents who first knew someone to die of AIDS between 2002 & 2006	Percent of group who first knew someone to die of AIDS between 2002 & 2006
Black	124	36%	149	43%
Coloured	26	8%	21	7%
White	5	9%	4	7%
Total	155		174	

Table 6. New AIDS cases and AIDS deaths in South Africa between 2002 and 2006

	Black	Coloured	White	Total
New AIDS cases	178,170	5,789	1,526	186,517
Percentage of total	95.5%	3.1%	0.8%	100%
AIDS deaths	111,873	3,736	692	116,944
Percentage of total	95.6%	3.2%	0.6%	100%

Source: Estimates from the 2003 ASSA HIV/AIDS projection models (ASSA, 2005)

As it was impossible to control for all factors that might have influenced changes in stigma, this analysis should be seen as an initial exploration of the potential effect of knowing someone living with HIV/AIDS and knowing someone who died of AIDS on changes in stigma. Individual fixed effects

regression models were used.[8] (Individual random effects models were also considered, but the Hausman test suggested that they were inconsistent and gave biased parameter estimates.)

Three different dependent variables were used: behavioural intentions, instrumental stigma and symbolic stigma. The main independent variables of interest were: 'contact with PLWHA' and 'knowing someone who died of AIDS'. The models also included the variable 'contact with PLWHA and knowing someone who died of AIDS' to control for the effect of having both of these experiences.

The following variables controlled for other factors that might influence changes in stigma. Increases in years of education were captured by the variable 'increased education'. The overall trend between the surveys is accounted for by 'survey year'. This variable accounted for factors that might have influenced changes in stigma between 2003 and 2006 that were not controlled for in the model. Four variables measured at baseline (in 2003) were included.[9] The variable '2003 HIV knowledge' was included because knowledge about HIV transmission was found to influence fear of HIV infection in 2003 (see Maughan-Brown, 2006).[10] Such fears may influence interactions with PLWHA. The variable '2003 general bigotry', measured attitudes towards other groups and was included on the premise that holding prejudiced attitudes towards different groups of people could predispose someone to developing negative attitudes about PLWHA.[11] Age and gender were included given that the previous analysis had shown that changes in stigma varied by gender and, albeit it slightly, by age.

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[8] Individual-fixed effects estimators use the difference in scores for the variable of interest between the different time periods. The power of using panel data and fixed effects estimators is that any variable that does not change between the years will have a difference of 0 (2003-2006 = 0) and will not affect the model. Therefore, any factors influencing stigma that can be thought of as static will not bias the model, even if they have not been measured in the survey. See Wooldridge (2006) for a full discussion about individual-fixed effects.

[9] The baseline variables were interacted with the time trend variable, 'survey year'.

[10] Knowledge is measured based on whether the respondent thought people can get HIV by (1) "using a public toilet"; (2) "sharing a bath"; (3) "sharing a bottle of water"; (4)" kissing on the lips"; (5) "deep kissing? (Putting your tongue in their mouth?)"; (6) "touching someone's genitals"; (7) "shaking hands"; and (8) "having oral sex."

[11] An 11-point scale measures like or dislike towards whites, coloureds, Indians, Jews, Muslims, illegal immigrants and homosexuals. The first 6 groups are selected as the black respondents are not part of these groups themselves. It is not known for certain whether any of the black respondents are homosexual, but as the vast majority of them have reported sexual relations with the opposite sex the error is assumed to be low.

The model for behavioural intentions also included instrumental stigma and symbolic stigma as independent variables. This is because individuals who expressed these stigmatising attitudes in 2003 were more likely to express negative behavioural intentions towards PLWHA (*ibid.)*. The analysis presented here tests whether changes in instrumental stigma or symbolic stigma affected changes in behavioural intentions.

Table 7 displays the regression results. The results indicate that, controlling for the other variables in the model, having met someone living with HIV/AIDS between 2003 and 2006 was not a significant predictor in changes in any dimension of stigma. Controlling for everything else, personally knowing someone who had died, or was thought to have died of HIV/AIDS, was associated with increases in instrumental stigma and symbolic stigma. Importantly, increased negative behavioural intentions were significantly associated with increased instrumental stigma. In other words, increased fear of infection appeared to decrease tolerance towards PLWHA.

Another interesting finding displayed in Table 7 involves levels of HIV knowledge in 2003. The results show that, controlling for the other variables in the model, individuals with better knowledge of HIV transmission in 2003 showed greater increases in instrumental stigma and symbolic stigma between 2003 and 2006. This is probably a product of the fact that individuals with better knowledge of HIV transmission in 2003 expressed significantly lower levels of stigma than others (*ibid.*), and hence changes in reported attitudes represent a greater shift in stigma for these respondents. This does not, however, explain why, despite having good knowledge of HIV, symbolic stigma and especially instrumental stigma (fear of HIV infection) increased for these individuals. Finally, controlling for the other variables, men showed greater increases in instrumental stigma than women.

Table 7 Individual-fixed effects (FE) regression models for changes in stigma among young black individuals in Cape Town

	Behavioural intentions	Instrumental stigma	Symbolic stigma
Model	**7.7.1**	**7.7.2**	**7.7.3**
Regression	**FE**	**FE**	**FE**
Know someone with HIV	0.48	0.71	0.42
	[0.38]	[0.64]	[0.48]
Know someone who died of AIDS	-0.49	**0.66***	**1.20*****
	[0.35]	**[0.39]**	**[0.42]**
Know someone with HIV and know someone who died of AIDS	-0.18	-0.74	-0.89
	[0.53]	[0.78]	[0.66]
Increased education	0.05	0.07	**-0.32****
	[0.12]	[0.21]	**[0.15]**
2003 HIV knowledge	0.16	**0.38*****	**0.25*****
	[0.11]	**[0.13]**	**[0.09]**
2003 general bigotry	0.01	-0.01	**-0.02****
	[0.01]	[0.01]	**[0.01]**
Age	0.09	-0.03	-0.07
	[0.06]	[0.17]	[0.06]
Gender (base=women)	-0.16	**0.94*****	0.45
	[0.26]	**[0.37]**	[0.29]
Survey year	**-2.69****	-1.85	1.45
	[1.29]	[1.98]	[1.37]
Change in instrumental stigma	**0.17*****	n/a	n/a
	[0.05]	n/a	n/a
Change in symbolic stigma	-0.06	n/a	n/a
	[0.06]	n/a	n/a
n	607	608	610
R-sqaured	0.10	0.12	0.28
Prob > F	0.000	0.000	0.000

Note: *10% significance level **5% significance level and ***1% significance level
n/a: Not applicable

Discussion

Overall, stigma increased among young adults in Cape Town between 2003 and 2006. Behavioural intentions became slightly more negative over time, but overall, levels of this manifestation of stigma remained relatively low. This does not necessarily mean, however, that discrimination (or enacted stigma) towards PLWHA is not a problem, or is not increasing, as the more subtle manifestations of enacted stigma, such as gossip or hand signals, may be more prevalent than the overt and extreme manifestations captured by typical survey questions. For example, 60% of CAPS respondents in 2006 reported that they had personally heard other people saying nasty things about PLWHA. Unfortunately, this question was asked only in 2006 so we do not know how this more subtle measure of stigma may have changed over time.

The significant increases in instrumental stigma and symbolic stigma are alarming – especially considering that the respondents were in an age group highly likely to be targeted with HIV prevention messages. In addition, the increases in stigma were measured over the same period that South Africa started providing antiretroviral treatment through the public sector – a process that began in Cape Town in 2001. This suggests that any potential reduction in stigma achieved through AIDS prevention and treatment initiatives either had no effect on reducing stigma or was overwhelmed by other factors.

Importantly, the analysis reported on in this paper found no evidence for the contact hypothesis, i.e. that direct contact with members of the stigmatised group will normalise the disease and decrease stigma towards the group. The nature of the interaction between the respondents and PLWHA is, however, not known. As mentioned earlier, Almeleh (2006) found that in Cape Town HIV status disclosure is most common when people are sick and have no choice other than to disclose to potential care-givers and assistants. Consequently, HIV/AIDS is so strongly associated with illness and death that people whose health has been restored by HAART are regarded by some as no longer being HIV positive (*ibid.*).

This suggests that in the minds of respondents, interactions with PLWHA probably refer to extremely sick individuals who were dying of AIDS rather than individuals who were living healthy, productive lives with HIV. Instead of normalising the disease, interactions with PLWHA when they are sick with AIDS might perpetuate associations between HIV and illness, perpetuate fears

of HIV/AIDS, and perpetuate negative moral judgement towards those affected, i.e. perpetuate stigma.

This paper has identified two factors that potentially contributed to increased levels of stigma. The first is knowing someone who had died of AIDS. The public sector provision of HAART had only reached 55.7% of those in need of treatment by 2006 (Nattrass, 2007). This meant that despite the HAART roll-out, the numbers of annual AIDS-related deaths increased between 2003 and 2006. It is thus to be expected that a significant number of respondents reported knowing someone who died of AIDS over this period. This may well have reinforced associations between HIV/AIDS and death, increased fears of HIV/AIDS and increased moral judgement towards those affected, i.e. increased stigma.

Second, increases in instrumental stigma were significantly associated with an increase in negative behavioural intentions towards PLWHA. It is reasonable to suppose that if individuals become more fearful of HIV infection over time their willingness to interact with PLWHA might decrease. This finding indicates the direct negative effect that increases in instrumental stigma may have for PLWHA. We know that HIV education is still necessary to reduce stigma (Maughan-Brown, 2006). There is also evidence that interacting with PLWHA is associated with increased fears of infection (Maughan-Brown, 2008). The findings in this paper, especially as stigma increased among individuals with good knowledge of HIV transmission, also suggest the need to weaken associations between HIV and death – by, *inter alia*, steadily expanding the HAART roll-out and by providing more explanation to people about the ways of avoiding HIV-infection and about the potential to live long and healthy lives on HAART.

Conclusion

Stigma is a complex social construct that is influenced by many factors and difficult to predict. Assumptions, such as HIV-related stigma will decrease as soon as treatment is provided, should therefore not be made about the effect on stigma of a particular intervention. Instead, it is necessary to use a multi-dimensional approach to monitor stigma over time in order to understand how stigma changes and what shapes such changes. The increases in HIV-related stigma identified by this research paper highlight the imperative for renewed efforts to be made to reduce stigma, perhaps through interventions to weaken the

association between HIV/AIDS and death, to reduce fear of HIV/AIDS, and to recast HIV as a chronic manageable disease. The identified increases in stigma highlight the importance of further research to determine the factors influencing such changes, especially if these undermine any positive gains achieved through treatment provision.

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