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**HIV, AIDS and Conflict in Africa: Why Isn't It (Even) Worse?**

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**Abstract**

The argument that there is a link between conflict and the spread of HIV has become commonplace in both the academic and policy world. This is particularly so for sub-Saharan Africa given the combination of an HIV pandemic in the region and high levels of violent conflict and state instability. However the link is not straightforward. Crucially, despite significant risk factors indicating a relationship between conflict and the spread of HIV, empirical evidence exists that HIV does not always increase in times of conflict, and that in some conflicts prevalence has decreased. This suggests a more complex relationship than originally envisaged. This paper does four things. First, it examines the risk factors identified in the early years of this decade which indicated a relationship between conflict and the spread of HIV. Second, it discusses how empirical evidence began to emerge suggesting a more complex relationship and how a number of conflicts demonstrated reduced HIV prevalence despite these risk factors. The third section moves beyond risk factors to suggest a framework based on susceptibility and vulnerability which explains under what circumstances HIV might - and might not - be spread, despite the presence of risk factors. The final section examines four cases - Sierra Leone, Angola, Rwanda and the DRC - where conflict did not lead to a significant increase in the prevalence of HIV, using the previous framework as the basis to explain this phenomenon. The paper concludes that, despite the fears of a few years ago, conflict does not readily act as a vector for HIV, though the potential for this to occur does still exist under certain circumstances.

## **HIV, AIDS and Conflict in Africa: Why Isn't It (Even) Worse?<sup>1</sup>**

AIDS<sup>2</sup> continues to be one of the most significant causes of non-natural death worldwide. In its 2008 report on the pandemic, UNAIDS estimated that 2 million people died of AIDS in 2007, and that a further 33 million people were living with HIV, including 2 million children under 15. The disease however is not evenly spread. By far the largest concentration is in sub-Saharan Africa, home to 67% of all those living with HIV and 90% of children with HIV.<sup>3</sup> Understanding the social as well as biological determinants for the spread of this disease has therefore become a priority, not least for sub-Saharan Africa.

The early years of this decade saw the emergence of a consensus that conflict acted as a vector for the spread of HIV. This was particularly so for sub-Saharan Africa: the first major epidemic of HIV and AIDS, in Uganda, coincided with the invasion of that country; and the combination of high HIV prevalence<sup>4</sup> with political instability and violence appeared more than coincidental.<sup>5</sup> Perhaps the most significant

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<sup>1</sup> I am grateful to Marie Woodling for her assistance in researching the case studies for this paper.

<sup>2</sup> AIDS is a syndrome of infections and diseases which develops in human immune systems weakened by the virus HIV. Although often linked in the literature as one (typically 'HIV/AIDS'), for this paper it is appropriate to separate them. It is HIV which is spread by human-to-human contact and the article is concerned with the potential for conflict to accelerate this spread; but it is AIDS which kills.

<sup>3</sup> UNAIDS, *2008 AIDS Epidemic Update* (Geneva: UNAIDS/WHO, 2008): 32-3.

<sup>4</sup> High prevalence is defined as a rate above 3% in the general population. See UNAIDS, *2008 AIDS Epidemic Update*, p.34.

<sup>5</sup> Paul B. Spiegel, Anne Rygaard Bennedsen, Johanna Claas, Lauire Bruns, Njogu Patterson, Dieudonne Yiweza, Marian Schilperoord, 'Prevalence of HIV infection in conflict-affected and displaced people in seven sub-Saharan African countries', *The Lancet* 369 (June 2007): 2187 and 2191; Jeff Gow, 'The HIV/AIDS epidemic in Africa: implications for US policy', *Health Affairs* 21 (May/June 2002): 65; Stefan Elbe, 'HIV/AIDS and the changing landscape of war in Africa', *International Security* 27 (Fall 2002):174; Dennis Altman, 'AIDS and security', *International Relations* 17 (December 2003): 421. See also for example Duane Bratt, 'Blue condoms: the use of international peacekeepers in the fight against AIDS', *International Peacekeeping* 9 (Autumn 2002): 72; Peter Fourie and Martin Schonteich, 'Africa's new security threat: HIV/AIDS and human security in Africa', *African Security Review* 10 (2001):6, available at: <http://www.iss.co.za/Pubs/ASR/10No4/Fourie.html>, subsequent page references are to online version; NA Betsi, BG Koudou, G Cisse, AB Tschannen, AM Pignol, Y Ouattara, Z Madougou, M Tanner and J Utzinger, 'Effect of an armed conflict on human resources and health systems in Cote d'Ivoire', *AIDS Care* 18 (May 2006): 36; S. Versteegen, *HIV/AIDS: Waking up to the Challenge* Working document prepared by Conflict Research Unit, Clingendael Institute for the Netherlands Ministry of Foreign Affairs Special Ambassador for HIV/AIDS, March 2005: 24; Vinh-Kim Nguyen and Katherine Stovel, *The Social Science of HIV/AIDS: A Critical Review and Priorities for Action* Report Prepared by the Social Science Research Council Working Group on HIV/AIDS, October 2004: 11-12; Nancy B Mock, Samba

endorsement of this link came from the UN and especially the Security Council. On 10 January 2000, at its first meeting of the new millennium, the UN Security Council met to discuss the 'impact of AIDS on peace and security' in Africa.<sup>6</sup> Six months later it passed Resolution 1308, arguing that the spread of HIV was 'exacerbated by conditions of violence and insecurity'.<sup>7</sup>

This paper does four things. First, it examines the risk factors identified in the early years of this decade which indicated a relationship between conflict and the spread of HIV. Second, it discusses how empirical evidence began to emerge suggesting a more complex relationship and how a number of conflicts demonstrated reduced HIV prevalence despite these risk factors. The third section moves beyond risk factors to suggest a framework based on susceptibility and vulnerability which explains under what circumstances HIV might - and might not - be spread, despite the presence of risk factors. The final section examines four cases - Sierra Leone, Angola, Rwanda and the DRC - where conflict did not lead to a significant increase in the prevalence of HIV, using the previous framework as the basis to explain this phenomenon.

### **Identifying risk factors**

The relationship between conflict and the spread of HIV was supported by the identification of a number of risk factors. Perhaps the most commonly expressed of these concerned HIV and the military. In a widely cited report in 2001, the International Crisis Group (ICG) stated that it had become an 'accepted assumption ... that the rates of HIV are higher among the military and other uniformed forces than among the general population'.<sup>8</sup> Working in the military creates an environment

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Duale, Lisanne F Brown, Ellen Mathys, Heather C O'Maonaigh, Nina KL Abul-Husn and Sterling Elliott, 'Conflict and HIV: A framework for risk assessment to prevent HIV in conflict-affected settings in Africa', *Emerging Themes in Epidemiology* 1 (October 2004), available from BioMed Central, subsequent page references from the open access version; Timothy Docking, *AIDS and Violent Conflict in Africa* USIP Special Report 75 available at <http://www.usip.org>, 7.

<sup>6</sup> UN Security Council [UNSC] Press Release SC/6781, 10 January 2000 available at <http://www.un.org/News/Press/docs/2000/20000110.sc6781.doc.html>.

<sup>7</sup> UNSC Resolution [UNSCR] 1308, July 2000, 2, available at [http://www.un.org/Docs/sc/unsc\\_resolutions.html](http://www.un.org/Docs/sc/unsc_resolutions.html).

<sup>8</sup> International Crisis Group, *HIV/AIDS as a Security Issue in Africa: Lessons from Uganda* (Kampala/Brussels: ICG, 2004), 1. For a more extensive discussion on this and the reasons behind it, see McInnes, 'HIV/AIDS and security' and 'HIV/AIDS and national security'. See also Eric G. Bing, Daniel Ortiz, Ricardo E. Ovalle-Bahamon, Karen G. Chen, Fannie H. Huang, Francisco Ernesto and Naihua Duan, 'HIV/AIDS behavioural surveillance among Angolan military men', *AIDS Behaviour*, accessed from PubMed PMID 17641966; A. Pistorius, G. Gergen and B. Willershausen, 'Survey about the knowledge of the HIV infection

where risk taking is endemic due to the nature of the profession, and this is reflected in attitudes towards sex. This attitude may well increase in times of conflict. Moreover deployments away from home – again more often in conflict situations - create loneliness, stress and the build-up of tensions which may seek release in casual or commercial sex.<sup>9</sup> Significantly of course, deployment away from home implies human mobility which, when linked to high risk sexual practices and greater frequency of sexual encounters, suggests an increased risk of HIV being spread. However there is no evidence that those militaries engaged in conflict acquire significantly higher HIV prevalence as a consequence,<sup>10</sup> suggesting that the risk is to populations encountering militaries rather than to militaries. The figures most often cited for prevalence rates amongst militaries (not least by UNAIDS) were between two and five times those of the general population.<sup>11</sup> In sub-Saharan Africa in particular, infection rates amongst the military were often cited as being especially high, with claims that a number of militaries are experiencing rates above 50%.<sup>12</sup> Figures are still not available for many rebel groups, but these were generally believed to be similarly high if not higher,<sup>13</sup> while concern was also expressed over the vulnerability

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amongst recruits of the German military' *European Journal of Medical Research* 30 (April 2003): 154-60; E. van der Ryst, G. Joubert, F. Steyn, C. Heunis, J. Le Roux, and C. Williamson, 'HIV/AIDS related knowledge, attitudes and practices among South African military recruits', *South African Medical Journal* 91(July 2001): 587-91 ; Harley Feldbaum, Kelley Lee and Preeti Patel, 'The national security implications of HIV/AIDS', *PLoS* 3 (June 2006), e171; and Elbe, 'HIV/AIDS and the changing landscape of war'.

<sup>9</sup> UNAIDS, *Uniformed Services Programming Guide*, pp7-10 and *On The Front Line* 3rd edition, 12 and 26-37; NIE 99-17D, *The Global Infectious Disease Threat*; ICG, *HIV/AIDS as a Security Issue*, pp.20-1; Ostergard, 'Politics in the hot zone', 343; Peter Chalk, 'Infectious disease and the threat to national security', *Jane's Intelligence Review* September 2001, 49; Alan du Pont, *HIV/AIDS: A Major International Security Issue*, Asia Pacific Ministerial Meeting October 2001 (Canberra: Commonwealth of Australia, 2001), 7; Verstegen, *HIV/AIDS*, 16; Bratt, 'Blue condoms', 71; Schneider and Moodie, *The Destabilising Impact*, 6; Tripodi and Patel, 'The global impact of HIV/AIDS', 54-7; Elbe, 'HIV/AIDS and the changing landscape of war', 164.

<sup>10</sup> Ba and others, 'HIV/AIDS in African militaries'.

<sup>11</sup> For example, UNAIDS, *Technical Update: AIDS and the military*, May 1998 (Geneva/New York, UNAIDS, 1998); UNAIDS, *HIV/AIDS Prevention and Care among Armed Forces and UN Peacekeepers: the Case of Eritrea* (Geneva/New York: UNAIDS, 2003), 8.

<sup>12</sup> UNAIDS, *On the Front Line* 1st edition (Geneva/New York: UNAIDS, 2003), 5-6; US National Intelligence Council, *The Global Infectious Disease Threat and Its Implications for the United States*, National Intelligence Estimate NIE99-17D (Washington: CIA, 2000), available at: <http://www.cia.gov/cia/publications/nie/report/nie99-17d.html>; Lindy Heinecken, 'Facing a merciless enemy: HIV/AIDS and the South African armed forces', *Armed Forces and Society* 29 (winter 2003), 784; Robert L. Ostergard Jr., 'Politics in the hot zone: AIDS and national security in Africa', *Third World Quarterly*, 23 (April 2002), 343; International Crisis Group (ICG), *HIV/AIDS as a Security Issue* (Brussels: ICG, 2001), ii and *Lessons from Uganda*, 2-3; Mark Schneider and Michael Moodie, *The Destabilising Impact of HIV/AIDS* (Washington: Center for Strategic and International Studies, 2002), 2; Paolo Tripodi and Preeti Patel, 'The global impact of HIV/AIDS on peace support operations', *International Peacekeeping*, 9 (Autumn 2002), 54 table 1;

<sup>13</sup> For example Docking, *AIDS and Violent Conflict*, 7. But in contrast see de Waal, 'HIV/AIDS

of child soldiers to HIV infection.<sup>14</sup>

Conflict can also lead to the mass movement of people as they attempt to flee violence. Since human mobility is a key vector for the spread of HIV, analysts initially drew a straightforward link: conflict can lead to the spread of the disease through human migration.<sup>15</sup> Kalipeni et al for example argued that 'There is little doubt that the transmission of HIV in east Africa is related to patterns of population movements and interpersonal relations in the region'.<sup>16</sup> Refugee camps in particular were highlighted as a key concern for the spread of HIV. Health education, including HIV awareness, and more general support may be lacking in such camps. In the Goma refugee camp in Zaire for example, Bennett argues that the immediate concerns of a cholera outbreak and the high death tolls in the camp meant that health workers had little spare capacity in which to promote HIV awareness.<sup>17</sup> People in camps are also usually at a socio-economic disadvantage and women in particular may be forced into sex for food, water or other means of survival (what is sometimes referred to as 'transactional sex', often involving multiple partners). Moreover the weak position in which women may find themselves in refugee camps means that they are also vulnerable to rape and other forms of sexual violence.<sup>18</sup>

Conflict can also cause changes in sexual behaviour. One report by the UNAIDS/WHO sponsored Global Coalition on Women and AIDS for example stated starkly that sexual violence against women is a 'feature of all recent conflicts'.<sup>19</sup> A 2002 Human Rights Watch report on the DRC argued that the conflict there had

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and the military', 7.

<sup>14</sup> For example KS Subramanian, *Impact of Conflict on HIV/AIDS in South Asia* (2002), 50, available at <http://aidsportal.org/store/770.pdf>. See also PW Singer, 'AIDS and international security', *Survival* 44 (Spring 2002), 150-1. Though Ciantia sounds a note of caution, Filippo Ciantia, 'HIV seroprevalence in northern Uganda', *Journal of Medicine and the Person* 2 (December 2004), 174.

<sup>15</sup> Bratt, 'Blue condoms', 71; UNAIDS, 'AIDS and conflict: a growing problem worldwide' in *2004 Report on the Global AIDS Epidemic* (Geneva: UNAIDS/WHO, 2004), available at [http://www.unaids.org/bangkok2004/GAR2004\\_html/GAR2004\\_12\\_en.htm#P1704\\_379265](http://www.unaids.org/bangkok2004/GAR2004_html/GAR2004_12_en.htm#P1704_379265); Rene Bennett, *The Correlation between Conflict and the Spread of HIV/AIDS to Women* available at [http://www.sit-edu-geneva.ch/conflicthiv\\_and.htm](http://www.sit-edu-geneva.ch/conflicthiv_and.htm), 14.

<sup>16</sup> Quoted in Bennett, *Correlation*, 14.

<sup>17</sup> Bennett, *Correlation*, 23.

<sup>18</sup> Bennett, *Correlation*, 14. See also below.

<sup>19</sup> Global Coalition on Women and AIDS, 'Sexual violence in conflict settings and the risk of HIV', *Violence Against Women and HIV/AIDS Information Bulletin Series no.2* (2004), 1. See also UNICEF, *Children, Armed Conflict and HIV/AIDS* (New York: UNICEF, 2003), 2-3; Mock and others, 'Conflict and HIV', 7; Subramanian, *Impact of Conflict on HIV/AIDS*, 49; Nguyen and Stovel, *The Social Science of HIV/AIDS*, 11; Mbow and Webb, 'HIV/AIDS affected children', 50.



created a situation where abusive sexual relationships were more acceptable and that men regarded sex as a service obtainable by force.<sup>20</sup> This has been linked to a growing concern that rape is being used as a weapon of war. A variety of conflicts, including Bosnia-Herzegovina, Rwanda, the DRC and Liberia, all demonstrated evidence of this. As Singer wrote in 2002, 'AIDS has created a new tie between rape and genocide. Rape itself is certainly nothing new to warfare... [But] the introduction of AIDS makes such programs a genocidal practice.'<sup>21</sup> Perhaps the most heavily cited conflict in this respect was Rwanda. In 2003 for example UNICEF reported a study of 2000 women raped during the conflict, of whom 80% were HIV positive five years later.<sup>22</sup> The violence of the act of rape, making bleeding more likely, and the probability that a condom will not be used, heightens the risk of transmission. These concerns were also linked to the strong probability that if rape was a feature of a conflict then the militaries would be involved. Given the perception of a high HIV prevalence amongst militaries, the risk factors appeared to be piling up, suggesting a link between conflict, rape and the spread of HIV.

Another commonly cited risk factor concerned health systems. The destruction or degradation of health services is common in conflict, and their reconstruction afterwards is often slow. The conflict in Sierra Leone left only 38% of its health units working; in Rwanda the number of health workers was reduced by four-fifths through death, injury, or flight. In addition to the impact on health workers, buildings may be destroyed, drug supplies plundered, and supply routes interrupted preventing the distribution of new drugs. The result for HIV is a potentially dramatic reduction in HIV education, prevention and treatment. The capacity to recognise HIV may be significantly affected if trained personnel or specialised diagnostic kits are not available, while utilisation of health services may be affected if people are unwilling or unable to visit health centres either because of the dangers of moving in a conflict area, or because they do not trust the health workers. Moreover there is evidence that in conflicts health systems adapt to reduce the emphasis on primary care, focusing instead on secondary and tertiary care, while available resources become

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<sup>20</sup> Human Rights Watch, *The War within the War: Sexual Violence against Women and Girls in Eastern Congo* (New York: Human Rights Watch, 2002).

<sup>21</sup> Singer, 'AIDS and international security', 152-3. See also Dan Thomas, 'AIDS 2006: conflict makes girls and women even more vulnerable to HIV', available at [http://www.unicef.org/aids/index\\_35317.html](http://www.unicef.org/aids/index_35317.html), accessed 12 May 2008; UNAIDS, 'AIDS and conflict'; Bennett, *Correlation*, 13; Versteegen, *HIV/AIDS*, 4; [No author] 'The Democratic Republic of Congo [DRC]: a country raped by all types of men', *Womens World* 34 (1999), 22-3.

<sup>22</sup> UNICEF, *Children, Armed Conflict*, op cit. But see also the case study on Rwanda below.

more concentrated in urban areas at the cost of rural. The result is a reduction in general health care and education, with evidence pointing to high regional variations in knowledge of HIV as a consequence of changes in health provision.<sup>23</sup>

Conflict may also affect the care of people living with HIV and AIDS. In particular current treatment regimes prescribe a 'cocktail' of drugs (ARTs) which need to be precisely sequenced. Vulnerability of supply places those individuals on ARTs at high risk, while drug resistance may develop if treatment programmes are poorly managed.<sup>24</sup> In their study of the impact of the 2002 conflict in Cote d'Ivoire on health care systems, for example, Betsi et al concluded that the prevention and care of HIV was significantly reduced as a direct result of conflict, further evidenced by the increase in STIs after the conflict (albeit with regional variations).<sup>25</sup>

Although there was evidence from some conflicts that once conflict ended then the spread of HIV was reduced,<sup>26</sup> concerns were also expressed that the end of a conflict may introduce new risk factors. In particular, communities protected from HIV because of isolation during a conflict may be exposed as they are reintegrated; as freedom of movement returns so human mobility may increase, risking the spread of HIV;<sup>27</sup> refugees may develop high HIV prevalence rates, and bring this back with them on their return; and soldiers may also return with higher rates of infection, as was seen with Ugandan soldiers returning from the DRC.<sup>28</sup> Probably the greatest focus of interest however was on the relationship between HIV and peacekeeping, not least in discussions of the UNSC in 2000 and 2001, and in UNSCR 1308.<sup>29</sup> Two concerns are prominent: that peacekeepers may be at increased risk from HIV if deployed to regions with a high prevalence of HIV; and that peacekeepers may act

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<sup>23</sup> See for example Mock and others, 'Conflict and HIV'; Bennett, *Correlation*, 15; Subramanian, *Impact of Conflict*, 51; Anthony B. Zwi, Antonio Ugalde and Patricia Roberts, 'Effect of war and political violence on health services', *Encyclopedia of Violence, Peace and Conflict Vol. 1* (Academic Press, 1999), 683-5; Bratt, 'Blue condoms', 71-2; Elbe, 'HIV/AIDS and the changing landscape of war', 172.

<sup>24</sup> Ellman and others, 'Treatment of AIDS', 2 and 4, although the authors also point out that the movement of people living with HIV or AIDS to refugee camps may make ARTs easier to administer. See also Tony Barnett, 'Mapping the future of HIV/AIDS, Security and Conflict in Africa', paper presented to Justice Africa/LSE AIDS Joint NGO/Academic Seminar, King's College London 6 December 2005, 1.

<sup>25</sup> Betsi and others, 'Effect of armed conflict', 359-64.

<sup>26</sup> Betsi and others, 'Effect of armed conflict', 363.

<sup>27</sup> Mock and others, 'Conflict and HIV'.

<sup>28</sup> Versteegen, *HIV/AIDS*, 5. See also Fourie and Schonteich, 'Africa's new security threat', 7.

<sup>29</sup> 'Peacekeeping' here is used in a broad sense, encompassing what are sometimes termed 'peace support operations' and humanitarian interventions as well as the more traditional monitoring of peace agreements.



as vectors for the spread of HIV, as appears to have occurred in both Sierra Leone and Cambodia.<sup>30</sup> This second concern was exacerbated by allegations of sexual exploitation and abuse by UN peacekeepers in the DRC and elsewhere.<sup>31</sup>

### **Complicating Matters**

By the early years of this decade therefore a consensus had emerged that conflict led to the spread of HIV, a consensus supported by the identification of a range of risk factors. The latter included high levels of HIV amongst the military, conflict induced migration, changes in sexual behaviour especially increases in violent sexual relations, reductions in health care systems, and new risks emerging in post-conflict situations especially relating to peacekeeping. Within a few years however, further research was beginning to suggest that the links were more complex than first imagined.<sup>32</sup> Some long conflicts demonstrated little change in HIV prevalence, while a number of conflicts saw HIV prevalence reduce. The latter suggested that in some circumstances conflict, far from accelerating the spread of the disease, might ironically act as a braking mechanism. The case of Angola was highlighted as particularly important in this respect.<sup>33</sup> UNAIDS remarked in 2005 that 'largely due to the internal armed conflict, the Angolan HIV prevalence appears considerably lower than in neighbouring countries. This suggests that the restricted mobility as a result of the conflict may have slowed the spread of HIV in the country.'<sup>34</sup> As more empirical evidence emerged, so Alex de Waal began to argue that far from conflict spreading HIV with a number of exceptions, the reverse might actually prove to be the norm despite the risk factors involved.<sup>35</sup> Similarly in a major 2007 study of the available data on HIV, conflict and refugees, the UN's High Commissioner for Refugees, Paul Spiegel, and academic colleagues concluded that 'there is insufficient evidence that

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<sup>30</sup> Bratt, 'Blue condoms', 68; Schneider and Moodie, *The Destabilising Impact*, 8; Chalk, 'Infectious disease', 49; UNAIDS, *On the Front Line* 1st edition, p.6 Table 2.

<sup>31</sup> United Nations, *A Comprehensive Strategy to Eliminate Future Sexual Exploitation and Abuse in UN Peacekeeping Operations* Report A/59/710 (New York: United Nations, 2005), paras 3-10, 44 and 62. See also UNSC Press Release SC/8400, 31 May 2005, available at <http://www.un.org/News/Press/docs/2005/sc8400.htm>. Ironically, the ready availability of condoms to peacekeepers - distributed as a means of protecting them against HIV - was seen by some soldiers as an unofficial endorsement of sexual exploitation.

<sup>32</sup> See for example Paul B. Spiegel, 'HIV/AIDS among conflict-affected and displaced populations: dispelling myths and taking action', *Disasters* 28 (September 2004): 323.

<sup>33</sup> Hence the choice of Angola as one of the four case studies examined below.

<sup>34</sup> UNAIDS, *On the Front Line* 3rd edition (Geneva: UNAIDS/WHO, 2005), 26.

<sup>35</sup> Alex de Waal, 'HIV/AIDS and the military', 8. De Waal's skepticism was reinforced by his doubt over the extent to which uniformed services experienced higher levels of HIV prevalence.

HIV transmission increases in populations affected by conflict. Furthermore, there are insufficient data to conclude that refugees fleeing conflict have a higher prevalence of HIV infection than do their surrounding host communities'.<sup>36</sup>

The empirical evidence was not alone in being questioned. The risk factors which had formed such an important part of the initial consensus also began to look more complex. Studies on prevalence rates in the military conducted through the decade suggested that they were highly case dependent and subject to a number of variables.<sup>37</sup> Moreover both national militaries and UNAIDS have been acting to prevent the spread of HIV through awareness programmes,<sup>38</sup> although the success of such training appears to be case dependent. The picture is also more complicated with regard to conflict induced migration and refugees. In their 2007 study, Spiegel et al argued that out of 12 refugee camps for which high quality data was available across 7 African conflicts, three quarters demonstrated lower prevalence rates than the surrounding hosts.<sup>39</sup> In NE Kenya, refugee camps demonstrated low prevalence rates despite a high incidence of rape in the early 1990s, though it is speculated that this may have been because of low HIV prevalence amongst the rapists at the time.<sup>40</sup> Similarly, continued low HIV prevalence in Bosnia-Herzegovina, despite widespread population displacement and rape in the 1990s, may also be accounted for by low initial prevalence.<sup>41</sup> On the other hand, the low prevalence rates amongst Angolan refugees returning after the conflict has been explained by the effective HIV awareness campaigns conducted in the refugee camps in neighbouring countries.<sup>42</sup> As regards changes in sexual behaviour as a risk factor, although there seems little

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<sup>36</sup> Spiegel and others, 'Prevalence of HIV infection', 2192. Although it should be emphasised that the point is not that there is no link, but that substantial empirical evidence to support such a conjecture is currently lacking while evidence to support the opposite is available.

<sup>37</sup> UNAIDS, *On the Front Line* 3rd edition, p.27; Netherlands Ministry of Foreign Affairs (NMFA), *HIV/AIDS, Security and Democracy*, Seminar Report, Clingendael Institute, 4 May 2005, 5.

<sup>38</sup> On possible initiatives to prevent the spread of HIV/AIDS in militaries, see UNAIDS *Uniformed Services Programming Guide* (Geneva: UNAIDS, 2003). See also Martin Foreman, *Combat AIDS: HIV and the World's Armed Forces* (London: Healthlink Worldwide, 2002), 37-48; *UNAIDS Initiative on HIV/AIDS and Security: Third Quarterly Report* (2002), available at [http://www.who.int/hac/techguidance/pht/UNAIDS\\_initiative\\_HIV\\_security/en/](http://www.who.int/hac/techguidance/pht/UNAIDS_initiative_HIV_security/en/); ICG, *Lessons from Uganda*, 3, 8-9 and 14. The UN's AIDS awareness card is available from [Awareness@unaid.org](mailto:Awareness@unaid.org). For details on the card see UNAIDS *Uniformed Services Programming Guide*, 12.

<sup>39</sup> Spiegel and others, 'Prevalence of HIV infection', 2007. See also Richard Walker, 'UNHCR study challenges assumptions about refugees and HIV spread', *AIDS Portal news*, available at [http://www.aidsportal.org/News\\_Details.aspx?id=5215&nex=51](http://www.aidsportal.org/News_Details.aspx?id=5215&nex=51), accessed 12 May 2008; UNAIDS, 'AIDS and conflict'.

<sup>40</sup> de Waal, 'HIV/AIDS and the military', 8.

<sup>41</sup> UNAIDS, 'AIDS and conflict'.

doubt that rape occurred on a horrendously large scale in Rwanda, Spiegel et al question the reliability of much of the data linking this to HIV infection.<sup>43</sup> Moreover, the impact of conflict on health systems is not straightforward. If there was little or no health care readily available to the majority of people, either because access was limited or because services were simply not present, then conflict is unlikely to have a major impact in this respect.<sup>44</sup> Nor is the data on the links between HIV and peacekeeping as clear cut as it may have initially appeared. With the exception of Sierra Leone there appears to be little or no linkage between UN peacekeeping missions and high prevalence. In Africa a number of states with the long established peacekeeping missions have amongst the lowest HIV prevalence rates (for example, Angola, Eritrea and Somalia).<sup>45</sup>

The link between conflict and the spread of HIV does not now appear to be a straightforward causal relationship – neither the empirical evidence nor a closer examination of the risk factors support this conclusion. This does not however mean that the relationship does not exist. Even critics of the orthodox account accept that conflict may lead to the spread of HIV. As Spiegel et al comment, ‘Displaced populations and those affected by conflict are clearly at risk of HIV transmission. Furthermore, to expect that incidence of HIV infection will be high in survivors of conflict and rape is understandable’.<sup>46</sup> In 2005 UNAIDS admitted that ‘little reliable information is available on levels of HIV infection among uniformed services. Few countries conduct systematic screening and public health surveillance systems are often weak’,<sup>47</sup> while in a major survey of available data on 21 African militaries published in 2008, Oumar Ba and colleagues concluded that ‘HIV/AIDS prevalence rates in most African militaries are significantly elevated compared to their host communities’.<sup>48</sup> Moreover explaining the reduced HIV prevalence in Angola on limited mobility (as UNAIDS did) does not bear comparison with Rwanda where,

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<sup>42</sup> UNAIDS, ‘AIDS and conflict’.

<sup>43</sup> Spiegel and others, ‘Prevalence of HIV infection’, 2191.

<sup>44</sup> Zwi and others, ‘Effect of war’.

<sup>45</sup> Data for this comparison was taken from: UNAIDS’ annual epidemic updates (see above); UN DPKO, *Background Note: 31 December 2005* available at <http://www.un.org/Depts/dpko/bnote.htm#unmil>, last accessed 26 January 2006; US General Accounting Office, *UN Peacekeeping: United Nations faces Challenges in Responding to the Impact of HIV/AIDS on Peacekeeping Operations* Report GAO-02-194 (Washington DC: US General Accounting Office, 2001).

<sup>46</sup> Spiegel and others, ‘Prevalence of HIV infection’, 2193.

<sup>47</sup> UNAIDS, *On the Front Line* 3rd edition, p.11.

<sup>48</sup> Oumar Ba, Christopher O’Regan, Jean Nachega, Curtis Cooper, Aranka Anema, Beth Rachlis and Edward J. Mills, ‘HIV/AIDS in African militaries: an ecological analysis’, *Medicine, Conflict and Survival* 24 (May 2008), 88-100, quotation from abstract.

despite several million refugees as a result of the 1994 genocide and widespread allegations of rape, population wide levels of HIV did not increase. The relationship is therefore increasingly accepted as a more complex one than originally envisaged.<sup>49</sup>

Despite the acceptance of added complexity to the risk factors involved, however, there still appears to be little explanation as to why in some conflicts HIV prevalence rates have not increased. What is required is a more nuanced explanation of the relationship between conflict and the spread of HIV. The following section therefore moves beyond these risk factors to develop a framework which explains this. The framework is not intended to be rigidly deterministic; rather it suggests a number of important factors and their relationship in terms of susceptibility and vulnerability. It suggests that when either susceptibility or vulnerability is low, then the likelihood is that HIV will not be spread as a result of conflict. The subsequent sections use this framework in four case studies of conflict in sub-Saharan Africa where HIV was not spread.

### **Conflict and the spread of HIV: a framework**

Key to the explanation offered here is the recognition that it is not conflict but *specific types of changes which might occur because of conflict* which lead to increased HIV prevalence. If these changes do not occur, or more accurately if they do not occur at a sufficient level of incidence, then HIV prevalence is unlikely to increase significantly as a result of conflict. But even these changes are not sufficient. Rather a number of pre-existing background conditions also need to be in place. Here it is useful to distinguish between susceptibility and vulnerability.<sup>50</sup> A number of background factors can be identified which render a state susceptible to increased HIV prevalence, but these do not in themselves mean such a state will experience increased prevalence in times of conflict; rather a different range of changes introduced by conflict make it vulnerable to increased prevalence. States need to be *both* susceptible *and* vulnerable for conflict to be a significant risk factor in the spread of HIV.

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<sup>49</sup> See for example Ciantia, 'HIV seroprevalence in northern Uganda', 173-4; Mbow and Webb, 'HIV/AIDS affected children', 48; Nguyen and Stovel, *The Social Science of HIV/AIDS*, 12; Mock and others, 'Conflict and HIV', 2-3.

<sup>50</sup> These terms are adapted from the 'Jaipur paradigm' of Barnett and Whiteside, used to explain the relationship between HIV and state instability. Tony Barnett and Alan Whiteside, 'The Jaipur Paradigm: a conceptual framework for understanding social susceptibility and vulnerability to HIV', *South African Medical Journal* 90 (2000), 1098-1101.

In the first part of this framework, five background factors can be identified as contributing to a state's susceptibility. The first of these is the current HIV prevalence rate: if levels are low then it is unlikely that conflict will lead to a significant spread of the disease simply because there are insufficient numbers of HIV positive people to spread the disease. In addition, the stage an epidemic is at may prove important since there are certain times when the disease is more easily spread, not least just after infection when the viral load spikes.<sup>51</sup> To what extent this is true at community level rather than individual however is uncertain. Second, there is considerable epidemiological data linking population density to the spread of infectious diseases, and HIV is no exception here. Thus if a conflict is conducted in a remote, rural area with low population density then susceptibility is unlikely to be high. Once population density increases, either because of where the conflict is being fought or because of migration, then susceptibility increases. Third, since human mobility is key to the spread of HIV, then the transport and communication infrastructure is an important factor in determining susceptibility.<sup>52</sup> Good infrastructure will facilitate the movement of people during conflict – either refugees fleeing the conflict or troops engaged in fighting. The corollary is that poor transport links will allow remote communities, especially those in areas with a low population density, to remain isolated. Fourth, the scale and nature of conflict may prove to be significant. If a conflict is limited in geographic scale and in numbers involved, then it may lack the effective mass to generate the spread of the disease. But if the nature of a conflict is one of identity within states rather than a war of acquisition between states, then this may generate a heightened level of antipathy between communities which renders acts of sexual violence more likely. The duration of a conflict may also prove to be an important factor, allowing time for vulnerabilities to manifest as well as creating a sense of desperation and futility which makes the risks from sexual behaviour less significant. However longer conflicts may also lead to the increased isolation of communities, protecting them from the spread of the disease (as appears to have been the case in Angola and southern Sudan), as well as depression leading to a loss of libido. The final and perhaps weakest factor in terms of susceptibility is poverty. Infectious diseases often attack the poor disproportionately, but there is growing evidence to suggest that this is not the case for HIV in Africa. Rather, England argues that demographic and health surveys of Ethiopia, Kenya and Tanzania suggest higher

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<sup>51</sup> I am grateful to Stefan Elbe for this point.

<sup>52</sup> Mock and others, 'Conflict and HIV', 11.

prevalence amongst middle classes.<sup>53</sup> In its 2008 report on the global epidemic, UNAIDS argued that ‘HIV has no socio-economic boundaries. However... [t]he disproportionate burden of HIV in low-income countries, and the more severe impact of the disease on poor households, often lead to the assumption that HIV is a “disease of poverty”. In fact, the relationship between absolute poverty and the risk of infection is more nuanced, being also highly dependent on context.’<sup>54</sup> However poverty may have an impact on susceptibility in three ways: it may force increasing numbers of women into prostitution for economic survival; there is some evidence from South Africa that poorer women are more vulnerable to rape;<sup>55</sup> and malnutrition has a well established detrimental impact on the immune system.<sup>56</sup>

The second part of this framework, vulnerability, concerns four changes which may occur as a result of conflict. The first of these is dissasortive mixing. One of the striking features of conflict is the potential for mobile groups to mix in new ways. Refugees may seek to flee conflicts by moving from rural areas to urban (or vice versa), from one region of a state to another, or across borders; militaries will encounter new groups of civilians and may be expanded with new recruits (sometimes forcibly and from new areas); new sexual networks may emerge, consensual, casual, commercial, transactional or violent; etc. What is crucial for the spread of HIV is not so much the movement of people but *the degree to which they mix* with new communities. If communities do not mix, then changes in HIV prevalence are less likely. But when communities mix then vulnerability is higher.<sup>57</sup> What is also significant is a differential rate of prevalence between two communities, such that when a community with a low incidence of HIV encounters through conflict one with markedly higher rates, then susceptibility is increased. Second, since the major means by which HIV is spread remains unprotected sex, changes in sexual behaviour as a consequence of conflict represents an important factor. There is a substantial body of literature stretching over centuries, and including the last decade,

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<sup>53</sup> Roger England, ‘The writing is on the wall for UNAIDS’, *British Medical Journal* 336 (May 2008), 102. Though also note that HIV may force individuals, families and communities into poverty.

<sup>54</sup> UNAIDS, *2008 AIDS Epidemic Update*, pp.88-9.

<sup>55</sup> Ostergard and others, ‘The relationship between HIV/AIDS’, 21.

<sup>56</sup> Although evidence of malnutrition increasing the risk of acquiring HIV is limited there is a strong impact on the development of AIDS in people living with HIV. Mock and others, ‘Conflict and HIV’, 9; UNAIDS, ‘HIV, food security and nutrition’, *Policy Brief* May 2008, available at [http://data.unaids.org/pub/Manual/2008/jc1515a\\_policybrief\\_nutrition\\_en.pdf](http://data.unaids.org/pub/Manual/2008/jc1515a_policybrief_nutrition_en.pdf).

<sup>57</sup> See for example Spiegel, ‘HIV/AIDS among conflict-affected and displaced populations’, 323; Verstegen, *HIV/AIDS*, 25; Mock and others, ‘Conflict and HIV’, 4 and 7; UNAIDS, ‘AIDS and conflict’.

which suggests that sexual practices can and do change in conflict. Casual sexual encounters, infidelity, sexual predation and numbers of partners can all increase during conflict for a variety of reasons – stress, changing norms over acceptable sexual behaviour, peer group pressure, hypermasculinity etc. Changes in social perceptions and interactions through conflict can also influence patterns of aggression, not least in respect of sexual violence and rape of women, all of which may increase vulnerability to the spread of HIV.<sup>58</sup> However conflict can also lead to depression and trauma. Empirical evidence exists, particularly in post-conflict settings, of increased levels of depression affecting libido and sexual behaviour with a consequent potential impact on the spread of HIV.<sup>59</sup> A second major cause of HIV infection is unsafe injections of drugs, usually associated with drug abuse. There is considerable evidence that drug abuse may increase in conflict situations (not least alcohol abuse, but also narcotics). There is therefore a *prima facie* case that increased injecting drug abuse might occur, thereby in turn increasing vulnerability to HIV infection. There has been little discussion of this however and empirical evidence is scant, attention instead focusing upon the sexual transmission of HIV. This may however need to change given the increased incidence of conflict in areas which produce narcotics and across established drug routes (especially Afghanistan); fears of increased HIV prevalence in the Russian military, where drug abuse is a recognised problem; and the emergence of injecting drug abuse in sub-Saharan Africa. However the low incidence of injecting drug abuse in sub-Saharan Africa until recently suggests that this may not have been a significant issue during recent conflicts in that region. Finally changes in health support, including education, can affect vulnerability. HIV awareness, availability of diagnostic kits, supply (and use) of condoms as well as the care and treatment of people living with HIV may all suffer as health services are interrupted by conflict or resources diverted within the health services from primary to secondary and tertiary care. But health provision may also be improved if previous levels of supply were inadequate (either through lack of capacity or through unequal availability). How health services and HIV awareness is affected by conflict therefore remains a major variable in assessing vulnerability.

What follows is an initial examination of this framework by surveying four states from sub-Saharan Africa which have recently experienced violent conflicts. The four were chosen because all have suffered demonstrated some of the risk factors identified in

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<sup>58</sup> Ostergard and others, 'The relationship between HIV/AIDS', especially 2 and 5; Ciantia, 'HIV seroprevalence', 172; Mock and others, 'Conflict and HIV', 7.



orthodox accounts, but none saw a significantly heightened HIV epidemic as a consequence of conflict. Why was this, and specifically can this be explained using the framework identified above?

Each case study follows a similar pattern.<sup>60</sup> The first part briefly describes the conflict, its intensity and identifies the traditional risk factors present. The second part discusses susceptibility and the third vulnerability to increases in HIV prevalence levels using the factors identified in the framework above. To provide a common basis for comparison, a number of multi-country datasets were used. These include the Uppsala Conflict Data Program on conflict intensity; UNAIDS and WHO data on the spread of HIV;<sup>61</sup> reports produced by states for the UN General Assembly Special Session on HIV/AIDS (UNGASS); WHO data on epidemiology and country health systems; UNDP data on poverty and development; and data from the World Bank on transport infrastructure. In addition searches on Google Scholar and PubMed using a limited number of key words identified a number of relevant country specific studies.

## **Sierra Leone**

### *The Conflict*<sup>62</sup>

The conflict in Sierra Leone ran from 1991 to 2000. For most of this period it was classified by the Uppsala Conflict Data Program as a 'minor conflict', but in 1998 and 1999 violence escalated to the level of 'war'. Initially the conflict was based in the diamond rich south and east of the country, with the rebel RUF based in Liberia. No part of the country appears to have been wholly immune however, with the conflict spreading to the northern province in 1994 and the capital Freetown being the site for a two week 'killing spree' by the RUF in 1999. Three risk factors can be identified. First, sexual violence and rape was widespread during the conflict, especially but not exclusively by the RUF who also forced young women into becoming 'bush wives'. Second, perhaps half of Sierra Leone's population of over 4M were forced to leave their homes at some time. One report estimated that even in 2001 there were still

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<sup>59</sup> Mock and others, 'Conflict and HIV', 8; Bennett, *Correlation*, 20.

<sup>60</sup> In this respect it is strongly influenced by Alexander George's 'structured, focused' method.

<sup>61</sup> Though note that the UNAIDS methodology has evolved over the years to improve accuracy.

<sup>62</sup> Much of the information on the conflict is taken from the entry on Sierra Leone in the Uppsala Conflict Data Program, <http://www.ucdp.uu.se>, last accessed 15 September 2008. Hereafter UCDP, *Sierra Leone*.

300,000 registered IDPs and between 500,000 and 1 million unregistered IDPs.<sup>63</sup> Third, a large number of foreign troops were based in Sierra Leone, usually as peacekeepers. These included at various times ECOWAS troops (mainly from Nigeria and Guinea), two UN missions, the use of a South African private security firm and a 'humanitarian intervention' by the British military. In 1999 alone, there were some 17,500 UN peacekeepers in Sierra Leone from 30 countries.<sup>64</sup> All of these are traditionally considered to be major risk factors for the spread of HIV in conflict; but although Sierra Leone does have significant levels of HIV, they fall below the regional norm. Crucial in explaining this is Sierra Leone's low susceptibility to conflict driven HIV increases.

### *Susceptibility*

A key element in susceptibility is existing HIV prevalence. Although no large scale assessments of HIV prevalence were conducted until after the conflict (the first being conducted by the US Centers for Disease Control and Prevention in 2002),<sup>65</sup> both the World Bank and UNAIDS estimate that in the early 1990s prevalence rates were low. The first cases of HIV were reported in 1987 in the southern and eastern provinces – the regions where early fighting also occurred.<sup>66</sup> The World Bank estimated that in 1991 when the fighting began prevalence rates were 0.4%, while UNAIDS estimates were even lower. Although UNAIDS figures suggest a gradual increase in prevalence through the 1990s, by the end of the conflict HIV prevalence amongst the key 15-49 age group was still significantly lower than the regional average (in 2003, 1% compared to a regional average of 7%). By 2007 UNAIDS' estimate was a prevalence rate of 1.7%, suggesting a possible acceleration post-conflict but still well below regional average.<sup>67</sup> Although prevalence appears to be higher in urban compared to rural areas (especially the capital Freetown), this is a fairly standard

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<sup>63</sup> *Sierra Leone: Country Report on Declaration Commitment to HIV and AIDS (2006-07)*, unpublished version of report prepared for the UN General Assembly on HIV and AIDS: 42. Hereafter UNGASS, *Sierra Leone*.

<sup>64</sup> UN DPKO, *United Nations Mission in Sierra Leone*, available from <http://www.un.org/Depts/dpko/missions/unamsil/index.html> last accessed 2004.

<sup>65</sup> Reinhard Kaiser, Paul Spiegel, Peter Salama, William Brady, Elizabeth Bell, Kyle Bond and Marie Downer, *HIV/AIDS Seroprevalence and Behavioral Risk Factor Survey in Sierra Leone, April 2002* (Atlanta, GA: Centers for Disease Control and Prevention, 2002): 5. Hereafter CDC, *Sierra Leone*.

<sup>66</sup> Statement by HE Mr Allied Ibrahim Kanu to the 26<sup>th</sup> Special Session of the UN General Assembly, available at <http://www.un.org/ga/aids/statements/docs/sierraE.html>, last accessed 19 September 2008; UNGASS, *Sierra Leone*: 7.

<sup>67</sup> CDC, *Sierra Leone*: 67-8; WHO/UNAIDS, *Epidemiological Fact Sheet on HIV and AIDS: Sierra Leone, July 2008 Update* (Geneva: WHO/UNAIDS, 2008): 5; WHO, *Country Health System Fact Sheet 2006: Sierra Leone* (Geneva: WHO, 2006).

phenomenon, though some small scale studies of commercial sex workers and the military suggest significantly higher prevalence rates in these sub-groups post-conflict.<sup>68</sup> No data exists for these groups prior to the conflict.

Other factors identified as affecting susceptibility are population density, transport infrastructure, the scale of the conflict and levels of poverty. Average population density in 1990 was 57 people per square kilometre, increasing in 1995 to 58 and in 2000 to 63.<sup>69</sup> Although regional variations exist, in rural areas which make up most of the country population density appears to have been consistently low.<sup>70</sup> Transport similarly was poor for the duration of the conflict. In the early 1990s only 11% of roads were paved, reducing to 8% in the late 1990s.<sup>71</sup> Although the figures cited above on IDPs suggest considerable movement of people, it is not clear how far and how quickly they moved. The geographic scale of the conflict was considerable, eventually affecting the whole country. But it was only in 1998 and 1999 that the UCDP changed its classification from 'minor conflict' to 'war'. Although the army of Sierra Leone was initially only 3,000, this was bolstered by ECOWAS, private security contractors and eventually one of the largest UN peacekeeping forces. These numbers are especially significant given Sierra Leone's comparatively small population. As significant is the nature of the conflict, where violence against civilians and human rights abuses were commonplace.<sup>72</sup> Finally Sierra Leone was and remains one of the poorest nations on earth, with over 70% of the population living below the poverty line and over one quarter unable to meet basic food needs.<sup>73</sup> This is reinforced by the UNDP's annual reports on human development, which consistently place Sierra Leone near the bottom of its human poverty index.<sup>74</sup>

Overall Sierra Leone's susceptibility to increased HIV prevalence as a result of conflict appears to have been low. Crucially pre-existing prevalence rates were low, population density was low, transport infrastructure was poor (although conflict-

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<sup>68</sup> UNGASS, *Sierra Leone*: 4 and 6; Mandi Larsen, Sara Casey, Moi-Tenga Sartie, Judith Tommy, Tamba Musa and Martha Saldinger, 'Changes in HIV/AIDS/STI knowledge, attitudes and practices among commercial sex workers and military forces in Port Loko, Sierra Leone', *Disasters* 28:3 (2004): 240-1.

<sup>69</sup> United Nations Population Division, *World Population Prospects: The 2006 Revision Population Database* Sierra Leone country profile, available at <http://esa.un.org/unpp/p2k0data.asp>, last accessed 17 October 2008.

<sup>70</sup> See for example WHO/UNAIDS, *Epidemiological Fact Sheet: Sierra Leone*: 9.

<sup>71</sup> Data from World Bank <http://ddp-ext.worldbank.org/ext/DDPQQ> last accessed 24 October 2008.

<sup>72</sup> See for example UCDP, *Sierra Leone*; Larsen and others, 'Changes': 240.

<sup>73</sup> UNGASS, *Sierra Leone*: 5

induced migration was high), and although the conflict spread widely and despite human rights abuses, for much of its duration the UCDP rated it as 'minor'. The one clear factor suggesting susceptibility was the high level of poverty, but as suggested above this appears to be a comparatively weak factor in determining overall levels of susceptibility.

### *Vulnerability*

One of the key factors in increasing vulnerability during conflict is mixing between different communities, especially between communities with different prevalence rates. Data on this however is difficult to obtain, although a number of inferences can be drawn. Although there was very significant movement because of the conflict, much of this was internal to Sierra Leone limiting the potential to mix with other communities.<sup>75</sup> The major opportunity for disassortive mixing therefore appears to have been with foreign troops, especially peacekeepers. One estimate claims that 32% of peacekeepers came from states with HIV prevalence rates of over 5%, while the Nigerian military (which formed a very significant part of the ECOWAS force) had an estimated HIV prevalence of 10-20%.<sup>76</sup> Peacekeepers were the primary clients for commercial sex workers, which by the end of the conflict had a significantly higher prevalence of HIV than the general population. One report estimated prevalence amongst CSWs in 2005 at 8.5% compared to 1.5% for the general population, while another report suggested that over 70% of CSWs in Freetown were HIV positive.<sup>77</sup> If this abnormally high rate is explained by increased exposure to HIV positive militaries from outside Sierra Leone, then the comparatively low prevalence in the general population implies low disassortive mixing between foreign militaries and the general population. One may therefore tentatively conclude that disassortive mixing was low. Levels of injecting drug abuse also appear to have been low. Again data for the conflict is unavailable, but in the CDC's 2002 survey only 0.4% of respondents between 12 and 49 reported injecting drugs within the previous 12 months, although 50-60% had shared needles.<sup>78</sup> As regards sexual behaviour, rape appears to have been commonplace as a result of the conflict – the UCDP commenting for example that rape was 'rampant when RUF attacked villages and cities, which it did more

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<sup>74</sup> See annual UNDP *Human Development Reports* available from <http://hdr.undp.org>

<sup>75</sup> Respondents to the CDC survey suggested that only 10% of displaced person sought refuge outside Sierra Leone, mostly in Guinea and Liberia. CDC, *Sierra Leone*: 8.

<sup>76</sup> Larsen and others, 'Changes': 242-3.

<sup>77</sup> UNGASS, *Sierra Leone*: 12; Larsen and others, 'Changes': 241.

<sup>78</sup> CDC *Sierra Leone*: 62.

often than attacking regular troops<sup>79</sup>. Moreover the 2005-06 UNGASS country report on Sierra Leone identifies a pattern of high risk sexual behaviour including low condom use, high numbers of sexual partners, high levels of sexual violence and the breakdown of the extended family structure.<sup>80</sup> Despite this there is no evidence of a sharp increase in prevalence rates amongst women which might be expected as result of this, and especially as a result of violent sexual behaviour during the conflict. At a population level there is little difference in prevalence rates between men and women, while crucially in a post war survey women in the 15-24 age group showed the highest prevalence rates, rather than those in older age groups who would presumably been most at risk during the conflict.<sup>81</sup> Finally, Sierra Leone's health system was devastated by the conflict so that by the end of the conflict comparisons with regional norms indicated severe weaknesses.<sup>82</sup> Unsurprisingly given this, knowledge about HIV, including transmission of the disease, was poor in the early years of this decade and condom use low. Post-conflict interventions have however seen signs of improvement especially in terms of both awareness and condom use.<sup>83</sup>

In summary then, although it is difficult to determine the level of disassortive mixing, the indications are that this was low; intravenous drug abuse was also low; although rape, sexual violence and high risk sexual behaviour appears to have been common, this does not seem to have translated into dramatic increases in seroprevalence; and HIV awareness and prevention was low, a result of Sierra Leone's poor health system. Overall therefore vulnerability appears to be mixed with some factors registering strongly but others much less so.

## **Angola**

### *The Conflict*

Angola became independent from Portugal in November 1975 and immediately entered into an internal conflict between rival independence groupings, principally between the Cuban backed MPLA government and South African/US backed UNITA rebels. The conflict lasted until 2002, with only brief periods of ceasefire. For much of the period since 1989 (when the UCDP database begins) the conflict was classified as 'war', the exceptions being 1995 (after the UN brokered peace agreement of

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<sup>79</sup> UCDP, *Sierra Leone*.

<sup>80</sup> UNGASS, *Sierra Leone*: 6, 18 and 45-62.

<sup>81</sup> UNGASS, *Sierra Leone*: especially 13.

<sup>82</sup> WHO, *Country Health System: Sierra Leone*; UNGASS, *Sierra Leone*: 5.

<sup>83</sup> Larsen and others, 'Changes', 239, 246 and 251; CDC, *Sierra Leone*: 8 and 11.

1994) and 2002, the year the conflict ended, when it was classified as 'minor'. The conflict affected most of the country at various times, though the MPLA government held most of the major towns throughout while for long periods UNITA actions were largely in rural areas.<sup>84</sup> In terms of traditional risk factors, the conflict was protracted and widespread with a significant percentage of the population mobilised to fight.<sup>85</sup> Although research conducted after the conflict indicated that Angolan soldiers engaged in risky sexual practices,<sup>86</sup> the prevalence rate of 3.9% amongst military in urban areas in 2003 was identical to that of the general adult population.<sup>87</sup> Reports of widespread sexual violence during the conflict are scarce. Although the UNDP in its 2007/08 *Human Development Report* cited data from IDMC that in 2006 there were still some 62,000 IDPs, suggesting that refugees were a feature of the conflict, they make it clear that these figures have a high level of uncertainty attached to them.<sup>88</sup> Foreign involvement was limited after the withdrawal of Cuban and South African forces in the late 1980s until the involvement of Namibia in December 1999. Communications seems to have been particularly affected by the conflict, with transport internally and externally severely affected. Overall then, despite the length of the conflict and its high level of violence, orthodox factors suggest that the Angola would not be especially at risk. This is supported by the available data on HIV prevalence, although such data is limited especially for the period of the conflict. Some sentinel surveillance data of women reporting to ante-natal clinics (ANC) is available, although sometimes patchily so, while no general population survey is available for the conflict period. The best available estimates are that by the end of the 1980s prevalence rates were extremely low, but that through the 1990s there was a steady increase to just under 2% of the population by the end of the conflict (3.9% of adult population in 2003, compared to a regional average of 7.1%). Since the end of the conflict there has been a levelling off of prevalence rates measured as a percentage of the population, though numbers of people living with HIV have almost doubled this decade.<sup>89</sup>

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<sup>84</sup> Angola country page from Uppsala Conflict Data Program database, available at: <http://www.ucdp.uu.se> last accessed 6 October 2008. Hereafter UCDP, *Angola*.

<sup>85</sup> See IISS Military Balance for period.

<sup>86</sup> Eric G. Bing, Karen G. Cheng, Daniel J. Ortiz, Ricardo E. Ovalle-Bahamon, Francisco Ernesto, Robert E. Weiss and Cherrie B. Boyer, 'Evaluation of a prevention intervention to reduce HIV risk among Angolan soldiers', *AIDS Behaviour* 12 (March 2008): 393.

<sup>87</sup> UNAIDS, *Epidemiological Fact Sheet on HIV and AIDS: Angola – 2008 Update* (Geneva: UNAIDS/WHO, 2008): especially 9.

<sup>88</sup> Data mined from [http://hdrstats.undp.org/buildtables/rc\\_report.cfm](http://hdrstats.undp.org/buildtables/rc_report.cfm)

<sup>89</sup> UNAIDS, *Epidemiological Fact Sheet: Angola - 2008*: 5, 8 and 11; UNAIDS, *Epidemiological Fact Sheet on HIV/AIDS and Sexually Transmitted Infections: Angola – 2004 Update* (Geneva: UNAIDS/WHO/UNICEF, 2004): 2 and 4; UNAIDS, *Fact sheet: Sub-Saharan* 20

### *Susceptibility*

As the Angolan conflict pre-dated the emergence of HIV, pre-existing prevalence rates are zero. Population density is also very low, the median variant in 1975 being 5 people per square kilometre, rising slowly to 11 in 2000 and 13 in 2005.<sup>90</sup> The conflict is widely seen as limiting human mobility rather than prompting large refugee flows,<sup>91</sup> while the percentage of paved roads was virtually zero for the 1980s and 1990s suggesting poor transport infrastructure.<sup>92</sup> And although the conflict lasted the best part of three decades and at various times affected large parts of the whole country, at other times it was largely confined to the extremely lowly populated rural areas, while there are no reports of widespread sexual violence. All of these suggest a very low level of susceptibility to the spread of HIV during conflict. The only factor running against this trend is poverty. Angola is one of the poorest nations on earth. By the end of the war well over half of its population lived below the poverty line and one quarter in extreme poverty.<sup>93</sup>

### *Vulnerability*

Assessing disassortive mixing during the conflict is extremely difficult. There are no indications that the conflict led to increased disassortive mixing, though this may be more a product of the difficulties involved in obtaining evidence. It is also difficult to gauge how behaviour has changed given both a lack of data and the length of the conflict. Although recent data identifies the mean age of sexual debut as 16 and a high rate of multiple sexual partners, it is unclear whether or not the conflict has had any significant impact on this or on levels of sexual violence. Although the military have been identified as engaging in particularly risky behaviour with regard to HIV transmission, prevalence rates are roughly the same as the general population.<sup>94</sup>

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*Africa* (Geneva: UNAIDS/WHO, 2007); WHO, *Country Health System Fact Sheet 2006: Angola* (Geneva: WHO, 2006).

<sup>90</sup> United Nations Population Division, *World Population Prospects: The 2006 Revision Population Database* Angola country profile, available at <http://esa.un.org/unpp/p2k0data.asp>.

<sup>91</sup> For example, Eric G. Bing, Daniel Ortiz, Ricardo E. Ovalle-Bahamon, Karen G. Chen, Fannie H. Huang, Francisco Ernesto and Naihua Duan, 'HIV/AIDS behavioural surveillance among Angolan military men', *AIDS Behaviour*, accessed from PubMed PMID 17641966: 578.

<sup>92</sup> Data from World Bank <http://ddp-ext.worldbank.org/ext/DDPQQ> last accessed 24 October 2008.

<sup>93</sup> Data from UNDP *Human Development Report* various years, available at <http://hdr.undp.org>.

<sup>94</sup> UNAIDS, *Epidemiological Fact Sheet: Angola - 2008*: 15; Bing and others, 'Evaluation of a prevention intervention': 389 and 393; Bing and others, 'HIV/AIDS behavioural surveillance': 580 and 583; UNAIDS, *Epidemiological Fact Sheet: Angola – 2004 and 2008*.



There is also a lack of data on injecting drug abuse in Angola, though the indications are that this is not a factor in increasing vulnerability.<sup>95</sup> Similarly, although there is data on the health service in Angola after the conflict – below regional average numbers in most key health service professions and in life expectancy – there is considerable difficulty in determining the extent to which this deteriorated as a result of the conflict. Interestingly though, although life expectancy is considerably lower than the regional norm (by c.20%) the percentage who die of AIDS related causes is less than half the regional norm. This suggests that the poor health system did not contribute to a significant increase in HIV.<sup>96</sup> Overall therefore it is extremely difficult to gauge how vulnerable Angola was to HIV spreading as a result of conflict, though the indications are that it was not particularly vulnerable.

## **Rwanda**

### *The Conflict*<sup>97</sup>

Although most attention has focused on the 1994 genocide of the Tutsis by rival Hutus, the Rwandan conflict lasted from October 1990 to March 2002 with two main phases (1990-94 and 1997-2002). The first of these phases was mainly internal, though with foreign involvement. The second was fought largely outside Rwanda in the eastern DRC, though its origins lie heavily with the Rwandan refugees who fled there. The Uppsala Conflict Program Database lists 1991-2, 1998 and 2001 as 'war' and the remaining years as 'minor' conflict.<sup>98</sup> In terms of traditional risk factors, Rwanda appears to have been vulnerable to the spread of HIV for three reasons. First, the conflict was ethnic in nature with considerable hate propaganda culminating in the 1994 genocide. Stories of widespread rape during the genocide are commonplace.<sup>99</sup> Second, there was considerable external involvement in the Rwandan conflict, including troops from Zaire, Uganda and Burundi as well as a UN

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<sup>95</sup> For example, Carmen Aceijas, Gerry V. Stimson, Matthew Hickman and Tim Rhodes, 'Global overview of injecting drug use and HIV infection among injecting drug users', *AIDS: Official Journal of the International AIDS Society* 18(17)19 November 2004; Anne Buve, Kizito Bishikwabo-Nsarhaza and Gladys Mutangadura, 'The spread and effect of HIV-1 infection in sub-Saharan Africa', *The Lancet* 359 (2002); 2011; UNAIDS, *Angola: Progress towards universal access and the Declaration Commitment on HIV/AIDS* figures 8 and 10, available at [http://cfs.indicatorregistry.org/country\\_factsheet.aspx?ISO=ANG](http://cfs.indicatorregistry.org/country_factsheet.aspx?ISO=ANG), last accessed 28 October 2008.

<sup>96</sup> UNAIDS, *Epidemiological Fact Sheet: Angola - 2008*:15; UNDP, *Human Development Report 2007 Data* available at [http://hdrstats.undp.org/buildtables/rc\\_report.cfm](http://hdrstats.undp.org/buildtables/rc_report.cfm), last accessed 20 October 2008; WHO, *Country Health System 2006: Angola*.

<sup>97</sup> Much of the information on the conflict is taken from the Uppsala Conflict Data Program's (UCDP) country page on the Rwandan conflict, hereafter UCDP *Rwanda*, available at <http://www.ucdp.uu.se>, last accessed 15 September 2008.

<sup>98</sup> UCDP, *Rwanda*.

peacekeeping force, while the second phase of the conflict took place largely on Congolese territory. Third, refugee flows were considerable, not least in 1994 when first one million fled with the fall of the Hutu-led government, and two million more as a consequence of the genocide.

### *Susceptibility*

Of the factors contributing to susceptibility, data on HIV prevalence in Rwanda began to emerge with sentinel surveillance surveys in the 1980s. With some exceptions, these continued through the 1990s and this decade, supplemented by population based surveys. Crucially, Rwanda suffered an 'explosive' outbreak of HIV in the mid-late 1980s immediately prior to the conflict, similar to that of neighbouring countries.<sup>100</sup> Prevalence rates appear to have been especially high in urban areas, though the outbreak was also widely spread throughout rural areas as well. Of the other factors contributing to susceptibility, Rwanda has one of the highest population densities in the world, albeit with a significant dip in the mid-1990s after the genocide.<sup>101</sup> It is also one of the poorest countries in the world: in 2006, over half the country was living below the poverty line (compared with a regional average of 44%), while the UNDP placed it at 161 on its development index.<sup>102</sup> All of these factors suggest a high degree of susceptibility. The scale and nature of the conflict is perhaps a less clear cut factor, though again on balance suggestive of susceptibility. Through the early 1990s ethnic tensions escalated and violence against civilians was commonplace culminating in the 1994 genocide. Although large areas of the country were involved at various points during the conflict, including the capital Kigali where the highest HIV prevalence rates were recorded, the degree of violence varied. Of the years between 1990 and 2002, the UCDP only cite 4 as crossing the threshold into 'war', and two of these were periods where much of the conflict was fought

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<sup>99</sup> See for example Donovan quotation below

<sup>100</sup> E. Kayirangwa, J. Hanson, L. Munyakazi and A. Kabeja, 'Current trends in Rwanda's HIV/AIDS epidemic', *Sexually Transmitted Infections* 82 supplement 1 (2006): i29, available at [www.stijournal.com](http://www.stijournal.com), last accessed 20 October 2008.

<sup>101</sup> Komisiyo Y'Igihugu Ishinzwe Kurwanya SIDA, *UN General Assembly Special Session on HIV/AIDS: Country Report – Rwanda* hereafter *UNGASS Rwanda* (draft 2008):14; United Nations Population Division, *World Population Prospects: The 2006 Revision Population Database* Rwanda country profile, available at <http://esa.un.org/unpp/p2k0data.asp>, last accessed 17 October 2008.

<sup>102</sup> UNDP, *Human Development Report 2007 Data*, available at [http://hdrstats.undp.org/buildt/tables/rc\\_report.cfm](http://hdrstats.undp.org/buildt/tables/rc_report.cfm), last accessed 3 October 2008. See also UNAIDS, *Epidemiological Fact Sheet on HIV and AIDS: Rwanda – 2008 Update* (Geneva: UNAIDS/WHO, 2008): 4; World Health Organisation *Country Health Fact Sheet 2006: Rwanda* (Geneva: World Health Organisation 2006); *UNGASS Rwanda*: 14.

outside Rwanda.<sup>103</sup> Also less clear cut is transport. Infrastructure was poor throughout the conflict with a very low percentage of roads paved, small numbers of buses and the Ministry of Transport and Communications declared 'defunct' in 1997. This suggests that for much of the conflict mobility was hindered by the poor level of transport.<sup>104</sup> Nevertheless the refugee flows, especially the two major exoduses of 1994, suggests the ability of large numbers of people to move, albeit perhaps in extremis.

Overall it is difficult to avoid the conclusion that Rwanda was highly susceptible to a further increase in HIV prevalence as a result of conflict. Prevalence rates were high at the beginning of conflict, population density was high and so were levels of poverty. The conflict was widespread with high levels of ethnic tensions and extensive reporting of rape, especially during the genocide, while the refugee flows suggest a degree of human mobility. However, during the period of conflict in the 1990s and into the twenty-first century, prevalence rates fell consistently. In 1990 adult HIV prevalence was c.9% with an estimated 250,000 HIV positive adults; in 2001 this had fallen to 190,000 and in 2007 to 150,000 with a prevalence rate of less than 3%.<sup>105</sup> This can only be partially explained by doubts over data on rape, the fluctuating levels of violence over the 12 years and the poor level of transport infrastructure.

### *Vulnerability*

Of the four factors contributing to vulnerability, the most difficult to assess is the level of disassortive mixing as a result of the conflict. The potential for such mixing clearly existed, not least as a result of the two major refugee flows of 1994, the widespread rape of Tutsi women by Hutus during the genocide, and the involvement of external militaries. But there are also reasons to suspect that the actual extent of disassortive mixing may not have been as high as might be thought from this. The refugee flows were along ethnic lines and communities may well have retained a degree of coherence as a consequence; the numbers of foreign militaries were not high and the

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<sup>103</sup> UCDP, *Rwanda*.

<sup>104</sup> Data from the World Bank at <http://ddp-ext.worldbank.org/ext/DDPQQ>; from ??? at <http://afdevinfo.com>; and from the Rwanda National Institute of Statistics at <http://statistics.gov.rw>.

<sup>105</sup> UNAIDS, *Epidemiological Fact Sheet: Rwanda*: 6. See also Treatment and Research AIDS Center, *HIV Sentinel Surveillance among Pregnant Women attending Antenatal Clinics* unpublished paper sponsored by Republic of Rwanda Ministry of Health and US Centers for Disease Control and Prevention, 2002: 11 and 14; and Kayirangwa and others, 'Current trends':i28.

second part of the conflict was fought almost entirely outside Rwanda; and although Tutsi women may have suffered terribly during the genocide, the impact on wider prevalence rates appears to have been limited. At present, there is no evidence of extensive disassortive mixing as a consequence of the conflict.

As regards changes in sexual behaviour, despite a relatively late age of sexual debut and low levels of multiple partnerships, risky sexual behaviour prior to the conflict appears to have been high, as implied by the high national prevalence rate. In particular social restrictions on the use of condoms persisted, as did a low level of knowledge on how HIV was transmitted. HIV prevalence amongst commercial sex workers appears to have been very high – two surveys in Butare in 1983 and 1984 revealed prevalence rates of 75% and 88% respectively – while in 2000 only 26% of CSWs could demonstrate a comprehensive knowledge of how HIV was transmitted.<sup>106</sup> Crucial to any discussion of this however are the events of the genocide. Reports of systematic rape during the genocide are commonplace, as are claims that rape was used as a weapon of war with deliberate attempts to infect Tutsi women with HIV. A typical example of this view is Paula Donovan:

Integral to the plan to annihilate the Tutsi population was the systematic sexual molestation, mutilation, and rape of women and girls...Most survivors describe the genocide as a bloodbath during which rape was inevitable for practically all females... Eyewitnesses recounted later that marauders carrying the virus described their intentions to their victims: they were going to rape and infect them as an ultimate punishment that would guarantee long-suffering and death.<sup>107</sup>

While there is little doubt that the genocide represented one of the most appallingly brutal acts of the twentieth century, the impact on HIV prevalence is less clear cut. Donovan herself admits that it is impossible to calculate how many women who were raped were subsequently killed; while how many of the rapists who stated they were HIV positive actually were is difficult to know – not least because testing was not extensive within Rwanda until the introduction of voluntary counselling and testing

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<sup>106</sup> Kayirangwa and others, 'Current trends': i28-9; Aisha Yousafzi and Karen Edwards, *Double Burden: A Situation Analysis of HIV/AIDS and Young People with Disabilities in Rwanda and Uganda* (London: Save the Children, 2004): 57-8.

<sup>107</sup> Paula Donovan, 'Rape and HIV/AIDS in Rwanda', *The Lancet Supplement* 360 (December 2002): s17.

(VCT) in 1997.<sup>108</sup> Although Donovan claims that the rape of Tutsi women contributed to a subsequent increase in HIV prevalence in Rwanda,<sup>109</sup> UNAIDS data shows not only that the national prevalence rate continued to decline throughout the 1990s, but that HIV prevalence amongst pregnant women in urban areas of Rwanda *declined* in the years after the genocide.<sup>110</sup> Moreover the impact of rape on population wide HIV levels appears to be less significant than some initially believed. Following Spiegel and colleagues' earlier work, in 2008 Aranka Anema and colleagues modelled the impact of rape on population wide levels of HIV in sub-Saharan Africa. Their conclusion was that 'even in the most extreme situations... widespread rape in conflict-affected countries in [sub-Saharan Africa] has not incurred a major direct population-level change in HIV prevalence'.<sup>111</sup> This is not to say that rape did not occur in Rwanda, nor that women were not infected as a consequence. Rather what it suggests is that at a population level, rape as a weapon of war is not a sufficient change in sexual behaviour to significantly increase vulnerability, and that this appears to have been the case in Rwanda.

Of the two final factors in assessing vulnerability, injecting drug abuse appears to be rare in Rwanda although data is limited.<sup>112</sup> A more important issue therefore is the health system and in particular those elements focused on HIV and AIDS. In the mid-1980s the Rwandan Ministry of Health together with the Red Cross initiated a series of developments to combat the spread of HIV, including blood screening and AIDS awareness campaigns. Although the genocide had a devastating effect on these services, the impact appears to have been relatively short lived. During the second phase of the conflict a series of major programmes were begun, including voluntary counselling and testing, prevention of mother to child transmission and access to anti-retroviral therapies. By the end of the conflict Rwanda was already experiencing a 'rapid scale-up of HIV prevention, care, and treatment programmes'.<sup>113</sup>

Overall therefore, vulnerability appears to have been low. There is no evidence of increased disassortive mixing; despite the evidence of rape during the genocide,

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<sup>108</sup> Kayirangwa and others, 'Current trends': i27

<sup>109</sup> Donovan: s18.

<sup>110</sup> UNAIDS, *2007 AIDS Epidemic Update*: 18.

<sup>111</sup> Aranka Anema, Michael R. Joffres, Edward Mills and Paul B. Spiegel, 'Widespread rape does not directly appear to increase the overall HIV prevalence in conflict-affected countries: so now what?', *Emerging Themes in Epidemiology* 5 (2008), available from <http://www.ete-online.com/content/5/1/11> .

<sup>112</sup> UNGASS, *Rwanda*: 13 and 16.

<sup>113</sup> Kayirangwa and others, 'Current trends': i27.

changed sexual practices do not appear to have been a significant factor given the high level of risky behaviour already apparent; injecting drug abuse was not an issue; and the health services, especially those focused on HIV, improved during the second phase of the conflict despite the devastation of the genocide.

### **The Democratic Republic of the Congo (formerly Zaire)**

#### *The Conflict*

Although low level violence was fairly common in Zaire from the early 1960s on, in the 1990s this escalated as the Zairean army and local population began to attack the ethnic Tutsi Banyamuleges in the eastern part of the country. The large number of Hutu refugees from Rwanda after the 1994 genocide added a further dimension to the violence against the Banyamuleges, as well as beginning a series of cross-border raids with Rwanda. The conflict however is usually dated from October 1996 when an organised struggle emerged involving an alliance of Banyamuleges and anti-government groups against the Mobutu government. The rebels advanced quickly on the capital Kinshasa, helped both by local discontent with Mobutu and external aid from Rwanda and Uganda, overthrowing the government in May 1997. In August 1998 however, violence broke out once more as the former allies turned on each other, with Mobutuist and external involvement adding to a complex mix of often fractious groupings. This phase of the conflict ended in 2001, only for violence to re-emerge in 2006 with a splinter grouping from the Banyamuleges. The UCDP describes the four years 1997-2000 as 'war', with the other years 'minor conflict'. It identifies seven foreign governments as providing troops to the conflict as well as UN peacekeepers and a number of rebel groups from other states. The second phase of the conflict also saw the emergence of militia groups consisting of disaffected youths from the eastern part of the country increasingly involved in the violence.<sup>114</sup>

In terms of traditional risk factors, the conflict in the DRC would appear to be vulnerable to an increase in HIV prevalence, not least as a result of the high level of violence for four years, the ethnic dimension to the conflict, allegations of extensive rape especially in the eastern parts of the country, and the involvement of foreign militaries. In addition there was a large influx of refugees from Rwanda in the 1990s

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<sup>114</sup> Democratic Republic of Congo (Zaire) country page from Uppsala Conflict Data Program database, available at: <http://www.ucdp.uu.se> last accessed 6 October 2008. Hereafter UCDP, DRC.



as well as internally displaced people (1.1M in 2006).<sup>115</sup> But the available data<sup>116</sup> suggests that after a steep initial rise in sero-prevalence during the early 1980s, by the mid-late 1980s this had levelled off and has remained fairly constant since, despite the decade long period of conflict. In 2003, just after the second phase of the conflict, prevalence levels amongst 15-49 year olds was at 4.2% (compared to 7.1% for the region), roughly the same as it had been in the late 1980s and early 1990s.<sup>117</sup> Prevalence rates amongst vulnerable groups are predictably higher but again fail to show a significant increase during the conflict. Female sex workers in Kinshasa for example demonstrated sero-prevalence rates of 27% in 1985 rising to 38% in 1989, but dropping to 29% in 1997 and to 22% in 2002.<sup>118</sup> However there are two significant exceptions to this general trend. The first is with pregnant women outside urban areas. In 1993 and again 1997, sero-prevalence for this group was in the order of 4%, but this more than doubled in 1999 to 8.5%, dropping to just under 6% the following year and to just over 4% in 2003.<sup>119</sup> That this corresponds to the peaking of the conflict may be significant, but it fails to translate into a more general population-wide increase in sero-prevalence. Second, Spiegel identifies a significant increase in HIV prevalence in the eastern part of the DRC (between 15% and 24%), where the violence was at its worst.<sup>120</sup> Spiegel's source for this however appears to be a single report from Save the Children based on a part of the region of North Katanga, while other reports suggest little regional variation in the epidemic.<sup>121</sup>

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<sup>115</sup> Congo Democratic Republic National Multisectoral Programme for the Response to HIV/AIDS, *Report on the Implementation of the Declaration of Commitment of the heads of State and of Government for the Response to HIV/AIDS in the DRC* Draft 31 December 2005, hereafter UNGASS, *DRC 2005* (Kinshasa: PNMLS/UNAIDS, 2005): 3

<sup>116</sup> Initial data was available in 1984, but after 1993 this becomes much more sporadic until the early years of this decade.

<sup>117</sup> Congo Democratic Republic National Multisectoral Programme for the Response to HIV/AIDS (PNMLS), *Rapport National de suivi UNGASS* hereafter UNGASS, *DRC 2007* (Kinshasa: PNMLS, 2007): 11; WHO/UNAIDS, *Epidemiological Fact Sheet on HIV and AIDS: Democratic Republic of Congo, 2008 Update* (Geneva: WHO/UNAIDS/UNICEF, 2008): 5; R. Kinoshita-Moleka, JS Smith, J Atibu, A. Tshetu, J. Hemingway-Foday, M. Hobbs, J. Bartz, MA Koch, AW Rimoin and RW Ryder, 'Low prevalence of HIV and other selected sexually transmitted infections in 2004 in pregnant women from Kinshasa, the Democratic Republic of Congo', *Epidemiology and Infection* 136 (2008): 1290-6; Claire Mulanga, Samuel Edidi Bazepo, Jeanne Kasali Mwamba, Christelle Butel, Jean-Willy Tshimpaka, Mulowayi Kashi, Francois Lepira, Michel Carael, Martine Peeters and Eric Delaporte, 'Political and socioeconomic instability: how does it affect HIV? A case study in the Democratic Republic of Congo', *AIDS* 18/5 (March 2004), available at <http://www.aidsonline.com>, last accessed 28 October 2008: 905-910; WHO, *Country Health System fact sheet 2006: DR Congo* (Geneva: WHO, 2006).

<sup>118</sup> WHO/UNAIDS, *Epidemiological Fact Sheet on HIV and AIDS: Democratic Republic of Congo, 2004 Update* (Geneva: WHO/UNAIDS, 2004): 2.

<sup>119</sup> WHO/UNAIDS, *Epidemiological Fact Sheet: DRC 2004*: 4-5.

<sup>120</sup> Spiegel, 'HIV/AIDS among conflict-affected': 325.

<sup>121</sup> Mulanga and others, 'Political and socioeconomic instability'.



### *Susceptibility*

With a generalised HIV epidemic present since the mid-1980s, it would appear that pre-existing sero-prevalence created significant susceptibility to an increase in HIV prevalence. However, levels had been relatively stable for a decade prior to the conflict, and remained so during the conflict. This might suggest that factors outside the conflict had already limited the scale of the epidemic in the DRC, and that the onset of conflict was a less important variable than these other factors; however the fact that sero-prevalence in the DRC is lower than the regional average alternately suggests that higher prevalence levels might have been possible. Population density is relatively low, at 19 per square kilometre in 1995 rising to 22 in 2000. Between 30-40% of these live in urban areas however, leaving the extensive rural areas (where much of the conflict was fought) with a significantly lower population density.<sup>122</sup> Transport infrastructure is similarly poor with less than 2% of roads paved.<sup>123</sup> Although the conflict had a strong ethnic dimension and significant external involvement, both suggesting heightened susceptibility, the focus was frequently limited to the rural east of the country. Interestingly, there appears to be no significant regional differences in prevalence levels, despite this focus.<sup>124</sup> Finally, levels of poverty are high, with the DRC ranked 168<sup>th</sup> on the UNDP's Human Development Index in 2007 and 88<sup>th</sup> on its Human Poverty Index, just above Angola and 10 places below Rwanda.<sup>125</sup>

The DRC's susceptibility to conflict-induced increases in HIV prevalence is difficult to assess. Population density and poor transport infrastructure both suggest low susceptibility, and although poverty levels were high this is the weakest of the factors involved in determining susceptibility. The impact of the scale and nature of the conflict is mixed. On the one hand the ethnic dimension and involvement of external powers would seem to suggest that this would contribute significantly to susceptibility, but these are mitigated by the fact that the conflict was not solely inter-ethnic and that its focus was often limited geographically to the rural east. Existing sero-prevalence levels would also seem to indicate high susceptibility, but the fact

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<sup>122</sup>United Nations Population Division, *World Population Prospects: The 2006 Revision Population Database* DRC country profile, available at <http://esa.un.org/unpp/p2k0data.asp>, last accessed 17 October 2008; UNGASS, *DRC 2005*: 3; WHO/UNAIDS, *Epidemiological Fact Sheet: DRC 2004*: 3.

<sup>123</sup> Data from the World Bank at <http://ddp-ext.worldbank.org/ext/DDPQQ>.

<sup>124</sup> Mulunga and others, 'Political and socioeconomic instability'.

that the epidemic seems to have reached a stable plateau is suggestive of powerful limiting factors in place.

### *Vulnerability*

The potential for disassortive mixing in the DRC during the conflict was clearly high. Not least the large number of states and other groups providing soldiers, and the large number of refugees (from Rwanda as well as IDPs), both suggest the possibility of disassortive mixing. Gauging the extent of such mixing however is difficult and there is little directly available evidence either way. Indirectly the drop in HIV prevalence amongst sex workers may suggest that foreign militaries (and others) did not engage in risky sexual behaviour with this group during the conflict, though the rise in HIV prevalence amongst pregnant women in rural areas may imply some mixing. Neither of these phenomena however lead to firm conclusions.

As regards changes in behaviour, risky sexual practices appear to have been commonplace in the DRC prior to the conflict, as implied by the existence of a generalised HIV epidemic. Significant indicators of this are the relatively low age of sexual debut, low condom use with non-regular partners (even by 2005, only one fifth of young men used condoms with non-regular partners while in 2001 overall condom use was 2.3%), high incidence of multiple sexual partnerships, and the high HIV prevalence rates amongst female sex workers (38% in Kinshasa in 1989).<sup>126</sup> Reports of rape during the conflict in the DRC are commonplace, especially in the eastern part of the country, as well as reports of women being used as sexual slaves by the military.<sup>127</sup> Although Spiegel notes that these reports are anecdotal,<sup>128</sup> it is difficult not to conclude that rape occurred as a result of conflict, especially in the eastern part of

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<sup>125</sup> UNDP, *Human Development Report 2007 Data*, available at

[http://hdrstats.undp.org/buildt/tables/rc\\_report.cfm](http://hdrstats.undp.org/buildt/tables/rc_report.cfm), last accessed 3 October 2008.

<sup>126</sup> WHO/UNAIDS, *Epidemiological Fact Sheet: DRC 2008*: 12 and 15; UNGASS, *DRC 2005*: 14-15; R. Kinoshita-Moleka and others, 'Low prevalence of HIV': 1290-6; Judith M Vandepitte, Faustin Malele, Dieu-Merci Kivuvu, Samuel Edidi, Jeremie Muwonga, Francois Lepira, Said Abdellati, Joelle Kabamba, Catherine van Overloop, Anne Buve, 'HIV and other sexually transmitted infections among female sex workers in Kinshasa, Democratic Republic of Congo, in 2002', *Sexually Transmitted diseases* 34:4 (April 2007), available from <http://www.stdjournal.com>, last accessed 28 October 2008.

<sup>127</sup> For example, Nadine Puechguirbal, 'Women and war in the Democratic Republic of Congo', *Signs: Journal of Women in Culture and Society* 28/4 (Summer 2003): 1271-81; World Food Programme, 'War on women: rape legacy of DRC conflict', available at [http://wfp.org/newsroom/in\\_depth/Africa/CongoDr/031107\\_WarWomen](http://wfp.org/newsroom/in_depth/Africa/CongoDr/031107_WarWomen), last accessed 11 December 2008; CBS News, 'War against women: the use of rape as a weapon in Congo's civil war', 17 August 2008, available at <http://www.cbsnews.com>, last accessed 11 December 2008.

<sup>128</sup> Spiegel, 'HIV/AIDS among conflict-affected': 325.

the DRC. The extent of this however is difficult to gauge, while as Anema and others note, the linkage between rape and an increase in generalised HIV prevalence is not robust.<sup>129</sup> Mulanga and others also note that conflict may have caused behavioural changes which reduced the likely spread of HIV. In particular they note that reduced purchasing power by professionals may have led to a decrease in their use of commercial sex workers, while reduced movement and social life may also have had a limiting effect on risky behaviour.<sup>130</sup> As with other sub-Saharan states, injecting drug abuse appears to have been extremely low and not a significant factor in increasing the DRC's vulnerability.<sup>131</sup> The health system however does appear to have been badly affected by the conflict. Although it is difficult to find data on access to health care prior to the conflict, there seems to be little doubt that the system has suffered and that the density of health care professionals is very low.<sup>132</sup>

In conclusion then, although a case may be made that the DRC was more vulnerable to an increase in HIV prevalence as a result of conflict, the degree is not great and equally the reverse may be argued. The extent of disassortive mixing is unclear; some changes in sexual behaviour may have added to the degree of vulnerability, but this is limited by the risky sexual behaviour commonplace in the country prior to the conflict and changes introduced as a result of conflict which reduced risk; injecting drug abuse appears not to have been an issue; but the health system does appear to have suffered considerably, though again health care was poor prior to the conflict.

## **Conclusion**

The results of the case studies are summarised in Table 1. In all of them, risk factors fail to explain what occurred in terms of HIV prevalence rates. In three of the cases, risk factors were high, but in Rwanda prevalence fell, in the DRC prevalence remained the same while in Sierra Leone it increased albeit remaining significantly lower than the regional norm. In the fourth case study, Angola, conflict preceded the HIV pandemic; although risk factors were low, HIV did emerge and prevalence rates increased, but at levels far lower than those elsewhere in the region. In conclusion

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<sup>129</sup> Anema and others, 'Widespread rape'.

<sup>130</sup> Mulanga and others, 'Political and socioeconomic instability'.

<sup>131</sup> UNAIDS, *Democratic Republic of Congo: Progress towards Universal Access and The Declaration Commitment on HIV/AIDS* available at [http://cfs.indicatorregistry.org/country\\_factsheet.aspx](http://cfs.indicatorregistry.org/country_factsheet.aspx), last accessed 30 October 2008.

<sup>132</sup> WHO/UNAIDS, *Epidemiological Fact Sheet 2004*: 9; R. Kinoshita-Moleka and others, 'Low prevalence of HIV'; WHO, *Country Health System: DRC*.

then, the absence of significant risk factors does not appear to explain satisfactorily why some conflict states do not see the expected increase in HIV. In contrast the framework suggested above does appear to offer greater explanatory power. None of the four cases demonstrate both susceptibility and vulnerability, although some may demonstrate one of these while in the case of the DRC the results for both are mixed. What this appears to suggest is that, despite the fears of a few years ago, conflict does not readily act as a vector for HIV, though the potential for this to occur does still exist under certain circumstances.

This result nevertheless needs to be qualified. First, cases often demonstrated local factors at work in determining HIV prevalence. Assessing the significance of these – for example the fact that prevalence levels in the DRC had plateaued well in advance of conflict – is difficult, but intuitively appear to be significant. Second, interpretations of the available data need to be nuanced and treated with care. Data is also often missing – not least in assessing disassortive mixing, which is accomplished by inference; is patchy; or is of varying reliability. Third, the impact of rape in war on HIV levels appears to be a problematic variable. Recent work suggests, counter-intuitively, that rape in war does not translate into significantly higher HIV prevalence amongst the general population even when sero-prevalence rates are high, an assessment somewhat borne out by the above analysis (especially in Rwanda). But data on rape is notoriously difficult to establish, while the number of women raped who were subsequently killed may also be a major factor in explaining the limited transmission of HIV into the general population. Also it is not clear whether the threat of infection is used by men who do not know whether they are HIV positive or not, simply because of the terror this may induce – as may have been the case in Rwanda. The impact upon women who have been raped in this manner cannot be anything other than traumatic, but may also lead to a belief that HIV has been widely transmitted when in fact it has not. Fourth, other changes in sexual behaviour are also difficult to assess. This is partly because of lack of data during conflict – often because the dangers involved in conflict interrupts surveys. But it is also because a generalised HIV epidemic prior to conflict may be associated with risky sexual behaviour. Gauging the extent of change during conflict when risky sexual behaviour is already prevalent, and whether such changes are meaningful in terms of increasing the risk of HIV transmission is difficult. Fifth, injecting drug abuse does not appear to have been an issue in sub-Saharan Africa, but it may prove to be elsewhere. In particular changing patterns of drug routes during this decade coupled

to conflicts in Iraq and Afghanistan may prove significant factors in the spread of HIV in those areas. There is also growing evidence of injecting drug abuse emerging in sub-Saharan Africa, including Sierra Leone, which may suggest that in the future this may be more of a factor than it appears to have been over the last two decades.<sup>133</sup> And sixth, because those most directly involved in conflict are also those in the age group most at risk from HIV it is possible that transmission rates were higher than the data suggests but a significant proportion of those with HIV were killed before the disease was identified. Data on HIV prevalence – especially population wide surveys - is often collected after a conflict with the result that prevalence rates amongst those killed in conflict – including civilians – remains unknown.

This paper attempted to address the question of why, despite the presence of risk factors, HIV prevalence rates do not always increase in conflict situations. It offered a more nuanced framework to explain this, one based on susceptibility and vulnerability. In so doing it attempted to answer a negative – why something did not happen. Further work is now required to establish whether this framework is equally valid in explaining when HIV prevalence rates do increase.

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<sup>133</sup> I am grateful to Julia Braxton for making this point to me. See Julia Buxton, 'Deconstructing the addiction to the war on drugs', paper presented to the annual BISA Conference, Exeter, December 2008. See also UNAIDS, *2008 AIDS Epidemic Update*, p.43

	<b>Risk factor</b>	<b>Changes in HIV prevalence</b>	<b>Susceptibility</b>	<b>Vulnerability</b>
<b>Sierra Leone</b>	High	Increased, but remained significantly below regional norm	Low	Mixed
<b>Angola</b>	Low	Conflict preceded HIV pandemic; prevalence increased steadily through 1990s but at significantly lower rates than regional norm.	Low	Difficult to assess, but indications suggest low.
<b>Rwanda</b>	High	Fell during period of conflict.	High	Low, despite rape during genocide.
<b>DRC</b>	High	Generalised epidemic which levelled off before conflict at lower than regional norm; no significant change during conflict.		

**Table 1: Summary of Case Studies**

