Compiled Homework # 1

ART: a key issue in solving HIV/AIDS puzzle in Zambia……..Jelena

Zambia: Access to ARVs……Nelly

HIV/AIDS Preventative Measures in Zambia…….....Pragnya

Issues in Developing HIV/AIDS Diagnostic Tools in the Resource-Scarce Setting of Zambia……Jeff

Generic Anti-retroviral Therapy in Zambia……Alexis

Gender and Cultural Issues in HIV/AIDS Populations in Zambia…….Victoria

Challenges in the Healthcare Infrastructure in Zambia…….……Jina

PART I: ART: a key issue in solving HIV/AIDS puzzle in Zambia

The devastating effects of HIV/AIDS on human health and economy particularly in the developing world have urged World Health Organization (WHO) and US Agency for International Development (USAID) to launch a global initiative to prevent further spread of HIV/AIDS and to provide necessary treatment for millions infected. On World AIDS Day 2003, WHO and USAID released a concrete plan, named '3 by 5' initiative, to extend life-preserving anti-retroviral treatment (ART) to 3 million people living with HIV/AIDS in low- and middle-income countries by 2005. The '3 by 5' initiative is regarded as a step towards achieving a goal to make the overall access of HIV/AIDS prevention and treatment accessible for all who need them as a human right.

Why is ART so important? The introduction of highly active ART (HAART) in 1996 (where available) was accompanied by a dramatic decrease in the morbidity and mortality related to HIV infection. The goals of ART are to improve quality of life, to suppress HIV viral load, to preserve therapeutic option, and to restore immune function (indicated by CD4 cell count). Another major impact of ART has also been the decline in the three major opportunistic infections Pneumocystis pneumonia, Mycobacterium avium bacteremia, and disseminated cytomegalovirus infections.[1] Currently, the major classes of antiretroviral drugs are nucleoside reverse transcriptase inhibitors (NRTIs), nonnucleoside reverse transcriptase inhibitors (NNRTIs), and protease inhibitors (PIs). Both classes of reverse transcriptase inhibitors prevent viral genes incorporation into the DNA of T helper cells (CD4+ cells), and the protease inhibitors prevent viral replication. US FDA approved 20 antiviral drugs for use so far (please refer to Appendix I for a list of drugs), and a large number of potential regimens can be created in affluent countries, reducing the risk of developing ART resistance. Unfortunately, ART doesn't come without the side effects. These may include gastrointestinal problems, high rate of hepatotoxicity, lactic acidosis, neuropathy, pancreatitis and other side effects. However, the benefits of ART largely outweigh these side effects. Other concerns associated with ART include its expense, development of drug resistance, drug interactions, and last but not least, difficulties in adhering to complicating treatment regimes.

Of the 6 million people in the developing world in need of ART, only 8 percent have access, so the WHO/USAID ideal is still a distant goal. Sub-Saharan Africa is worst affected by HIV/AIDS, with Zambia as one of the leading countries.[2] As part of the "3 by 5 initiative", Zambian President Mwanawasa announced that he planned to provide ART access to 100,000 people in need by the end of 2005. However, in September 2005 during his lecture at Harvard University, President explained to the audience that only 15,000 of Zambian people have access to this important treatment.

According to WHO statistics, 140, 000 Zambians are in need of ART, meaning that the current coverage is only 11 percent.[3]

The main antiretroviral drug regimen in Zambia is stavudine, lamivudine, and nevirapine in accordance with WHO recommendation, with a fixed-dose combination widely used. The regimen comprising zidovudine, lamivudine and nevirapine is also a recognized first-line regimen but less commonly used.[3] These regimens are effective, however, it is important to note that they are not part of the US Department of Health and Human Services (DHHS) preferred regimens for initial treatment. The DHHS preferred initial treatment regimes are more expensive and were selected on the basis of demonstrated potency in clinical trials, relatively low frequency of serious adverse reactions, substantial clinical experience, and a requirement for dosing no more than twice daily.[4]

Constitution of WHO declares that 'The highest attainable standard of health is one of the fundamental rights of every human being, without distinction of race, religion, political belief, economic or social condition.' However, Zambia is an example of a country where poorest are least

able to protect themselves from HIV/AIDS. Cost to the patient is listed as the main barrier of access to ART. The majority of Zambians live under the poverty line and on less than a dollar per day. Therefore paying the costs of ART, estimated to be $8 per day, represent an impossible task. The major step forward for Lusaka district is that in 2004 four Lusaka clinics, Chelstone, Kalingalinga, Matero and Kanyama, have started to provide ART free of charge.[5] However, the coverage of people in need of ART is still low.

Another important barrier to ART access is shortage of health workers. One study estimates that providing HAART to all Zambians in need would require twice the number of laboratory technicians and doctors currently available in the public health system. This study suggests that the success of HAART program in Zambia over the medium term could depend more on its human resource capacity, then on its budget capacity, and points out that training should be an urgent priority.[6]

Gender inequality, inadequate information about the drugs and how to manage a life on a treatment, language difficulties and illiteracy are also listed as major obstacles to ART success in Zambia. These problems are recognized in many studies which call for specific resource allocation in order to target traditionally excluded groups (women, poor, street children, etc.)

References

1. Barttlet, JD. Initial antiretroviral therapy for HIV infection. In: UpToDate, Rose, BD (Ed), UpToDate, Waltham, MA, 2005.

2. WHO, 'Coverage and need for antiretroviral treatment' Retrieved from http://www.who.int/hiv/facts/cov0605/en/index.html

3. WHO. Zambia; Summary country profile for HIV/AIDS treatment scale-up. Retrieved from http://who.int/3by5/en/cp_zmb.pdf.

4. Panel on Clinical Practices for Treatment of HIV Infection convened by the Department of Health and Human Services. Guidelines for the use of antiretroviral agents in HIV-1-infected adults and adolescents; 2004. In: UpToDate, Rose, BD (Ed), UpToDate, Waltham, MA, 2005.

5. Jones, PS. Who is getting or will get anti-retroviral treatment in Zambia? Equity, access and fairness in the governance of 'scaling-up' HIV/AIDS medication. The Norwegian Center for Human Rights, 2004. Retrieved from http://www.humanrights.uio.no/forskning/publ/publikasjonsliste.html

6. The Costs of Anti-Retroviral Treatment in Zambia', Partners for Health Reform Plus, October, 2003.

Appendix I: Classification of Antiretroviral Drugs

Classification of Antiretroviral Drugs

Drug (abbreviations)	Brand name
Nucleoside and nucleotide reverse transcriptase inhibitors (NRTIs)	
Abacavir (ABC)	Ziagen®
Didanosine (ddI)	Videx®, Videx® EC
Emtricitabine (FTC)	Emtriva®
Lamivudine (3TC)	Epivir®
Stavudine (d4T)	Zerit®
Zalcitabine (ddC)	Hivid®
Zidovudine (ZDV, AZT)	Retrovir®
Tenofovir (TDF)	Viread®*
Non-nucleoside reverse transcriptase inhibitors (NNRTIs)	
Delavirdine (DLV)	Rescriptor®
Efavirenz (EFV)	Sustiva®
Nevirapine (NVP)	Viramune®
Protease inhibitors (PIs)	
Amprenavir (APV)	Agenerase®
Atazanavir (ATV)	Reyataz®
Fosamprenavir (FPV)	Lexiva®
Indinavir (IDV)	Crixivir®
Lopinavir ritonavir (LPV/r)	Kaletra™
Nelfinavir (NFV)	Viracept®
Ritonavir (RTV)	Norvir®
Saquinavir (SQV)	Fortovase®, Invirase®
Tipranavir (TPV)	
Fusion inhibitor	
Enfuvirtide (T-20)	Fuzeon®
Fixed dose combinations	
Zidovudine+Lamivudine	Combivir®
Zidovudine+Lamivudine+Abacavir	Trizivir®
Lamivudine+Abacavir	Epzicom®
Emtricitabine+Tenofovir	Truvada®

* Nucleotide reverse transcriptase inhibitor

PART II: Zambia: Access to ARVs

Zambia is one of the countries in Africa most affected by the HIV/AIDS pandemic. At the end of 2003 about 920,000 adults and children were living with HIV and AIDS. 470,000 of these were women aged between 15 and 49. Young women are particularly vulnerable, with 11 per cent of women in the 15-24 age group infected, compared to three per cent of men in the same age group. According to UNAIDS, an estimated sixteen per cent of the adult population in the country is living with HIV. Prevalence is about twice as high in urban areas as in rural areas.

In 2004, in response to the escalating epidemic, the government of Zambia created a plan to roll out a national HIV/AIDS programs. One of the key elements of the program became access to ARVs and the government took actions to improve the availability of ARVs in the country. Thus in September 2004, in line with WTO/TRIPS regulations, the government declared HIV/AIDS a national emergency in a bid to start manufacturing generic AIDS drugs. The declaration, which extends from August 2004 to July 2009, allowed for the government to issue licenses to local firms to begin to manufacture generic AIDS drugs. Consequently, the government awarded a locally based pharmaceutical company, Pharco Limited, a license to manufacture a generic antiretroviral drug combination.

In June 2005 the Zambian government declared its commitment to provide antiretroviral drugs (ARVs) for all people in Zambia who need treatment. The program plans to provide free ARVs in public health institutions. 200,000 people require ARVs and the immediate target is to put 100,000 people on antiretroviral drugs by the end of 2005. There are currently more than 12,000 people receiving ARVs through the public health care sector and up until recently most of these patients were receiving treatment at a heavily subsidized price of US $8 per month.

Before the implementation of the new initiative of the government, the Central Board of Health (CBOH) provided treatment at more than fifty clinics and healthcare centers. In addition, treatment was also available in a large number of private clinics accessible to those who could afford to pay for services. Furthermore, free care has been historically provided in some rural areas by civil society organizations such as Medecins Sans Frontieres (MSF).

Treatment roll-out in Zambia is supported by the Global Fund to Fight AIDS, Tuberculosis and Malaria, which has recently approved a US$ 253 million grant. The World Bank granted Zambia US$ 42 million under the second Multi-Country HIV/AIDS Program for Africa. Zambia is also a beneficiary under the US Presidential Emergency Plan for AIDS Relief (PEPFAR), of the Bell and Melinda Gates Foundation. In addition, Zambia has been granted debt cancellation. Therefore, the government has determined that abolishing the cost of ARVs in public health facilities is a moral obligation with great public health benefits.

However, there has been some controversy surrounding treatment and access to drugs issues in Zambia. Despite the many treatment centers across the country, there are concerns that the drugs are not reaching the poorest and most marginalized sections of the population, especially in rural areas.

Adult (15-49) HIV prevalence rate	16.5% (range: 13.5%-20.0%)
Adults (15-49) living with HIV	830 000 (range: 680 000-1 000 000)
Adults and children (0-49) living with HIV	920 000 (range: 730 000-1 100 000)
Women (15-49) living with HIV	470 000 (range: 380 000-570 000)
AIDS deaths (adults and children) in 2003	89 000 (range: 63 000-130 000)

Source: UNAIDS, Zambia, end of 2003

References

Government of the Republic of Zambia, Ministry of Health, Free Antiretroviral Therapy (ART), Operational Guidelines for Health Facilities in Zambia, Lusaka, August 1, 2005, http://www.sahims.net/doclibrary/Sahims_Documents/Zambia_ARVs_aug05.pdf

Global AIDS Program, Lessons for today and tomorrow: An analysis of HIV/AIDS reporting in Southern Africa, Panos Southern Africa, 2004, http://www.panosaids.org

Reuters, Zambia declares AIDS emergency to produce ARVs, 3 September, 2004, http://www.accessmed-msf.org/prod/publications.asp?scntid=12112004174478&contenttype=PARA&

IRIN PlusNews. "Community benefits from free ARVs." 13 September 2005. http://www.plusnews.org/AIDSreport.asp?ReportID=5234&SelectRegion=Southern_Africa&SelectCountry=ZAMBIA. Accessed 7 March 2006.

World Health Organization, 3 by 5 Initiative: Zambia, July 2004, www.who.int/3by5/en/Zambia.pdf

PART III: HIV/AIDS Preventative Measures in Zambia

Zambia has been compounded by one of the world's most devastating HIV and AIDS epidemics. The statistics[i] alone are appalling:

- one in every six adults is living with HIV
- 89,000 people died of AIDS in 2003
- life expectancy at birth has fallen below 40 years
- 630,000 children are AIDS orphans.

The purpose of this report is to very briefly introduce the reader to some of the preventive methods being used within Zambia to combat HIV. In addition, organizations involved, success stories and challenges in using prevention will be discussed.

The primary sources for this report are listed at the end of the document.

PREVENTIVE METHODS:

Education: Almost half (46.5%[ii]) of Zambia's population is under the age of 14 and reachable through education. Therefore, the Zambian Ministry of Education is using schools to spread the word on HIV. In order to penetrate the population, they are translating these materials into some 30 of the more widely spoken local languages[i].

HIV education is not just a matter for the young. Still 11% of men and 19% of women do not know that HIV can be avoided. Nearly a quarter of adults think that mosquitoes can transmit HIV; one in five think they can be infected by witchcraft; and 12% believe that sharing a meal with an infected person puts them at risk. The level of understanding is lower in rural areas than in towns, and women are less knowledgeable than men. More innovative and aggressive campaigns are necessary than just school programs.

Truck drivers, sex workers, urbanites, ruralites, etc. are regularly bombarded with messages from Billboards, TV, radio advertisements, and street-side drama groups.
Many of the most effective strategies have been promoted by the Copperbelt Health Education Project (CHEP), a group funded mainly by the Norwegian Agency for Development Cooperation (NORAD). They use Peer-centered education, like Anti-AIDS clubs, drama, role play and games to reach schools, sex workers, street children and soldiers. In addition, PSI (Population Services International) has joined forces with the Pharmaceutical Society of Zambia to form the Zambia Social Marketing Project (ZSMP) to socially market preventative education and methods. For

example, their HEART television campaigns in 2000 were seen by some 71% of urban and 37% of rural youth. Other organizations like the Red Cross, USAID, WorldVision, CARE international, etc work regularly to prevent HIV/AIDS through education programs.

Male Condoms: Condoms are regularly marketed by the ZSMP, and their brand of "Maximum" condom is supposed to be the best-selling brand in Zambia. In addition, education campaigns such as HEART have increased condom use, particularly in urban areas. PSI noted an increase in condom sales from 4.7 million in 1993 to 10.6 million in 2002.

It is necessary to note that condoms have been a constant source of controversy in the country - usually between the right-wing Government, Christian Groups and International Aid Organizations. In 2001, for example, condom ads were banned from the air for a time.

Female Condoms: In 1997, ZSMP launched "Care," the first female condom in the market. In addition ZSMP tries to hold clinics for women to show how the condom is used and is able to prevent HIV. Little is known about how much the female condom is actually used, since the larger issue is female disempowerment. Sexual abuse is common and women hardly ever have a say in their sexual activity.

Mother-to-Child Prevention: Mother-to-Child transmission is largely funded by the United States' PEPFAR initiative and cooperation of the Zambian government. The Prevention of Mother-to-Child Transmission (PMTCT) initiative was launched in 1999 and in 2004 had grown to 74 health facilities in four provinces. These facilities offer antiretroviral drugs (primarily Nevirapine) to expectant mothers reducing the risk of transmission by around 50%. However, fewer than 6% of all pregnant women were tested for HIV in 2003. The bigger issue, is therefore HIV testing.

HIV Testing: Of course this is one of the most important aspects of prevention. Awareness can be the first step in prevention of HIV transmission. Zambia is slowly introducing mandatory testing of its military personnel. In addition, some companies (like the mining company Konkola) require all their employees to undergo mandatory testing.

The Government is aware of this issue and is setting up (along with a lot of international and local NGOs) confidential voluntary testing clinics for citizens to get tested.

SUCCESSES

Outside of condom sales, there is good evidence of a significant fall in HIV prevalence in certain communities. Among women aged 15-19 years surveyed in Lusaka, the proportion living with the virus almost halved from 28.4% in 1993 to 14.8% in 1998. Over the same period, there appears to have been a general decline in prevalence among young women in urban areas, and to a lesser extent among teenage women in rural areas. The greatest reductions were found among well-educated women, while prevalence among the least educated remained stable or increased. It is thought that the falling prevalence levels indicate a drop in the number of new infections, possibly as a result of behavioural change. This is an encouraging sign that efforts to educate young people about avoiding HIV have had some success.

CHALLENGES

There are a great many challenges in Zambia's response to curbing the HIV/AIDS epidemic, particularly in prevention.

- The WHO has had repeated reports about Zambia's lacking lab facilities and human resources. It is really hard to curb an epidemic when people can't find out their HIV status.

- Condoms are a source of great debate between the more right wing government that strongly believes in abstinence, versus the aid organizations who see it as one of the few preventative measures feasible.

- Social attitudes to rape, sexual practices and general female disempowerment need to be addressed in order to curb this epidemic. Prevention methods such as condoms are ineffective when women have little say in their sexual activity. In addition, infected women not only pass it on to partners, but their own children as well.

CONCLUSION:

In conclusion, Zambia and the international community at large are taking several preventative measures in order to stop the brutal grasp of AIDS on the population. However, many challenges need to be addressed in order for these to be more successful. Testing facilities, trained health workers, female empowerment and a more cooperative government are just some of the issues that need to be addressed. In the end, it will take a great amount of cooperation between all factions of society and the world to curb the transmission of HIV in Zambia in the rest of Africa.

References:

http://www.avert.org/aids-zambia.htm
http://www.psi.org/where_we_work/zambia.html
http://www.ifrc.org/WHAT/health/archi/society/infozam.htm#zamsrcbran

Part IV: Issues in Developing HIV/AIDS Diagnostic Tools in the Resource-Scarce Setting of Zambia

With the prevalence of HIV/AIDS in Zambia increasing at a harrowing rate, the development of more cost-efficient, effective medicines is undeniably important. Yet paralleling the need for such development is an urgent need for cheaper and more reliable diagnostic methods. Analyzing factors such as viral load and CD4 count are crucial in delivering effective treatments to those suffering from HIV/AIDS. However, the scarcity of laboratory resources, as well as funds, in Zambia complicates the use of Western diagnostic techniques in the impoverished country.

This paper presents a very superficial overview of factors that must be considered when looking at the role of diagnostics in solving the HIV/AIDS problem of Zambia.

Background

Typically, methods used to diagnose and manage HIV/AIDS detect three types of markers in blood samples: viral RNA, p24 antigen, and antibodies to HIV antigens.[1]

Within the first 2 weeks of infection, both viral RNA and p24 antigen levels increase significantly. With regard to viral RNA, this increase results in viraemia, and assays that detect viral loads are useful in observing the onset of viraemia soon after infection. Eventually, the body's

[1] Constantine NT, Zink H. "HIV testing technologies after two decades of evolution." *Indian J Med Res,* 2005 Apr; 121(4):519-38.

immune system responds to the increased presence of virus, resulting in a decrease in viral load. Yet as the immune system weakens with the progression of the disease, the body is unable to maintain its attack against the virus; thus, viral load begins to increase exponentially again, which usually accompanies the transition into AIDS.

Additionally, the p24 antigen increase parallels that of viral load. Due to less sensitive detection methods, however, the rise in p24 antigen levels is unable to be detected until approximately 1 month after infection.

Lastly, three to four weeks after infection, antibodies to the HIV antigens can be detected in the blood. While this time period may vary amongst people, it is rare that these antibodies go undetected for more than two months after infection.

Current Developments and Necessary Considerations

Most of the diagnostic techniques currently being used and further developed are those that detect absolute CD4 counts or viral loads.[2] A plethora of manufacturers have produced relatively cheap diagnostic kits, which are listed in a document recently prepared by the World Health Organization.[3]

Such developments have allowed for the testing of not only absolute CD4 cell counts, but also CD4 percentage counts. These percentage counts are important in the diagnosis of HIV in children, as absolute CD4 counts can vary dramatically in the early years of life. Further developments in the diagnosis of HIV could include detection p24 antigen levels, which would be remarkably beneficial in infant diagnoses.

More recent developments have included a microchip CD4 counter that requires a minute volume of blood and provides an accurate and quick measurement of both absolute and relative CD4 counts.[4] The application of new technology, such as microchip production, to the field of diagnostics is crucial to coming up with more cost-efficient and reliable techniques.

Conclusion

While much work has been done in trying to deliver more efficient diagnostic methods to African countries like Zambia, there is still a lot of room for further development. In the process of evaluating and producing new methods, the factor of sustainability must be kept in mind, as well as the immense value of a point-of-care diagnostic method.

Part V: Generic Anti-retroviral Therapy in Zambia

On September 2, 2004, the Zambian government declared HIV/AIDS a national health emergency to allow for the generic manufacturing of anti-retroviral drugs in Zambia. This use of compulsory licensing allows local manufacturers to produce generic versions of internationally patented ARVs from September 2004 through July 2009, with complete impunity from intellectual property laws. The only stipulation to the production process is that none of the ARVs produced in Zambia can be exported.

---

[2] "Transfer of HIV Monitoring Technologies Into Resource-Poor Settings: Moving the Field Forward." Report of a Forum for Collaborative HIV Research Workshop. February 26, 2006; Washington, D.C.

[3] "Sources and prices of selected medicines and diagnostics for people living with HIV/AIDS." UNICEF, UNAIDS, WHO, MSF. June 2005

[4] Rodriguez WR, et al. "A Microchip CD4 Counting Method for HIV Monitoring in Resource-Poor Settings. *PLoS Med*, 2(7). July 2005.

In a country where the average lifespan at birth has dropped precipitously from a projected 60 years to a dire 37, in large part due to HV/AIDS, the situation can be considered no less than an emergency. An estimated 16.5% of adults (15-49) are HIV positive and approximately 89,000 Zambians die each year from AIDS. Currently there are an estimated 800,000 AIDS orphans in Zambia[5] and 470,000 women of childbearing age are now HIV positive, leaving the potential increase for future HIV-positive births or yet-unborn orphans to be massive[6]. Of the one million people currently infected with HIV, 140,000 are judged to be in need of ARVs[7]. These numbers necessitate the immediate and widespread availability of HIV drugs. However, at current international patent prices, ARVs cost Zambians between $400 and $800 per month. In a country where 73% of the population lives on less than $350 per year, this cost is out of reach for all but a select few.

In 2003, in conjunction with the WHO/UNAIDS 3x5 Initiative, the President of Zambia stated that 100,000 people would be on treatment by the end of 2005. Declaring a national emergency and allowing production of ARVs within Zambia could certainly help meeting this goal more likely, given current conditions and resource constraints. By the end of 2004 there were between 18,000 and 22,000 Zambians on treatment (though some of these were funding their treatment privately)[8]. Initially, worried about sustainability, the government subsidized ARV treatment programs but required that recipients pay $8 per month to ensure adherence and reduce abuse. However, after the Global Fund pledged an additional $254 million over five years (in addition to the existing $92 million grant), to be used primarily for treatment scale-up, this fee was abolished in February 2005 and clients are now responsible only for transportation and testing costs to obtain ARVs. Additionally, PEPFAR has chosen Zambia as one of its 15 "focus countries" and has allocated $84.7 million for fiscal year 2005. Of this budget, 23% is earmarked for ARV purchase and distribution. These are all hopeful signs in how Zambia is moving towards its goal of universally free and available ARVs.

The generic production of ARVs is allowed under the current rules associated with the Trade-Related aspects of Intellectual Property Rights (TRIPS) agreement, signed by all members of the WTO (147 countries) in 1995. The TRIPS agreement established an international set of rules governing patents and copyrights and made it illegal for any member country to produce any product that is under patent in another country. However, at the WTO Doha Conference held in Qatar in November 2001, members agreed that an individual country could take measures to protect the health of its citizens, even if those measures infringed upon the overarching TRIPS agreement[9]. The Doha Declaration allows for compulsory licensing, whereby a country can issue a government license to someone other than the patent owner to replicate patented or copyrighted goods or processes. This licensing is allowed in instances where a government deems that the patent holder is abusing their rights as owners, for reasons that include selling a product at a cost that is too high for buyers when there are no affordable alternatives.

Pharco Limited was the first company to apply for a government license to produce generic ARVs in Zambia. They were expected to start production early in 2005 after conducting clinical trials on their generic version. Production capacity was estimated at 150,000 treatments per year[10]. As of this

---

[5] Reuters, "Zambia Declares AIDS Emergency to Produce ARVs", 3 September 2004. Accessed at http://www.accessmed-msf.org/prod/publications.asp?scntid=12112004174478&contenttype=PARA& on September 20, 2005.
[6] UNAIDS Zambia webiste: http://www.unaids.org/en/Regions_Countries/Countries/zambia.asp. Accessed 7 March 2006.
[7] WHO website http://www.who.int/3by5/en/cp_zmb.pdf, Accessed on September 20, 2005.
[8] From "HIV & AIDS in Zambia: Prevention and Care" on AVERT.org website http://www.avert.org/zambia-aids-prevention-care.htm, Accessed on September 21, 2005.

[9] From "TRIPS, AIDS, and Generic Drugs" on AVERT.org website: <http://www.avert.org/generic.htm> , Accessed on September 18, 2005.
[10] UN Integrated Regional Information Network**, "**ZAMBIA: Local AIDS drug production expected," November 3, 2004. Accessed on <http://www.aegis.com/news/irin/2004/IR041111.html> on September 21, 2005.

writing, a more current estimate of generic production in Zambia was unavailable. This is most likely because no drug produced in Zambia appears on the latest edition of the WHO Prequalified Drug List - the list of drugs deemed acceptable for purchase by UN agencies. Prequalified status is granted to specific manufacturer's drugs after an application process and subsequent proof of independent bioequivalence and quality assurance tests to ensure safety and quality in manufacturing processes and products[11]. As of January 2005, Global Fund recipients may only purchase generic drugs that have passed the WHO Prequalification process, so at this point local production of ARVs may be either unauthorized or unprofitable, given that most of the ARVs available in Zambia are provided for with Global Funds. Additionally, the availability of generic drugs from existing production facilities in South Africa and India, as well as existing procurement networks within the health care and NGO structures in Zambia, may limit the current need for domestic manufacturing of generic drugs.

Part VI: Gender and Cultural Issues in HIV/AIDS Populations in Zambia

Sexual behavior by both men and women are highly shaped by dynamic cultural and social norms and beliefs. In many regional and local situations, women tend to have less power than men to negotiate safer sex and are more easily blamed as the cause of infection. Fn the other hand, persistent sociocultural, and often very local beliefs perpetuate riskier, extramarital sexual behavior about men. This paper briefly examines these sexual beliefs and practices, and discusses possible areas for prevention or intervention.

Women in Zambia and presumably in other resource-poor countries are more easily infected with HIV because they often lack the power to negotiate safe sex with men (Gibson 2003:48). Sexual negotiation is deeply embedded in local sociocultural and economic structures between genders. In matrilineal ethnic groups, Kinuma (2005:87) suggests that women with more power are less likely to have spouses with extramarital partners. This suggests that greater understanding and research in empowering women, both economically and socioculturally, through changing beliefs, norms, and practices can help reduce infection.

Women are also more easily blamed and stigmatized than men (Gibson 2003:49) in part by public health announcements and in part by the stigma of prostitution. More research into male mobility and male sexual behavior may help to shift blame and bureaucratic policies that perpetuate blame and stigmatization of women. Furthermore, women are more likely to carry the burden of HIV/AIDS-infected family members (Gibson 2003:50), further perpetuating inequalities in access to educational, economic, and treatment opportunities. An important task, then, is to better understand the costs of persistently false beliefs about female sexuality and how these beliefs tend to justify the status quo of gender inequalities.

Sociocultural notions of male sexuality, fertility and parenthood affect male sexual behavior in Zambia (Ndubani 2003:294), regardless of household status and occupation (Kimuna 2005:87). Such notions may factor into male engagement in early sexual activities and sexual conduct with multiple partners later in life (Ndubani 2003:294; Kimuna 2005:87). Furthermore, actual condom use among males is still relatively low. Although it is widely understood that condoms can reduce the risk of infection, the association of condoms with unfaithfulness and promiscuity as well as a threat to male potency and reduction in pleasure may be more compelling. These notions and practices may be largely perpetuated by peer and intergenerational information and cultural norms (Ndubani 2003:295; Kimuna 2005:87). Research is needed to explore current efforts that not simply alter

[11] *WHO Access to HIV/AIDS Drugs and Diagnostics of Acceptable Quality,* 25th Edition, August 11, 2005, http://mednet3.who.int/prequal/ Accessed on September 21, 2005.

practices (eg, "practice safe sex with condoms"), but rather address the costs and harms of sociocultural beliefs and norms of masculinity and sexuality.

The intersection of education, economics, and culture seem a primary focal point in addressing the larger issue of prevention and gender. Ndubani (2003) has shown that education is a strong determinant for behavioral change among both men and women and that behavior of both genders are changing in response to the AIDS epidemic. Furthermore, more research is needed that explores the economic gender inequalities that perpetuate differences in sexual negotiation.

References

Garbus Lisa. "HIV/AIDS Zambia." UC San Francisco Country AIDS Policy Analysis Project. March 2003.

International HIV/AIDS Alliance. "Voices from Zambian Communities-Experiences of HIV/AIDS-related treatment in urban and rural settings: a report of community consultations on HIV/AIDS-related treatment in urban and rural Zambia, 2002–2003, with a practical guide on consulting individuals and community groups about HIV/AIDS-related treatment"

Kimuna, Sitawa and Yanyi K. Djamba. "Wealth and Extramarital Sex Among Men in Zambia." International Family Planning Perspective, 2005, 31(2):83-89.

Ndubani, Phillimon and Virginia Bond, Rita Liljeström and Bengt Höjer. "Understanding young men's sexual health and prospects for sexual behavior change in rural Zambia." *Scand J Public Health, 2003; 31: 291–296.*

Part VII: Challenges in the Healthcare Infrastructure in Zambia

Home-based care (HBC) is rarely practiced in the U.S., but it has found great success in developing countries. In Zambia, the HBC infrastructure is affordable and does not rely on hospital locations, which are already overcrowded, to treat patients. Furthermore, healthcare becomes accessible to rural inhabitants who are often miles away from the nearest hospital.

In treating HIV/AIDS patients in Zambia, Nsutebu et al. and the World Health Organization both emphasize the critical role that family members play in the care of a HIV/AIDS patient. Trained community volunteers act as counselor, nurse, and medical advisor to patients and also family caregivers. Outside the immediate family, Nsutebu describes how the the local community can affect the quality of the healthcare programs. For example, the Family Health Trust HBC (FHT HBC) forms community groups of caregivers who provide services such as basic nursing for free.

Between FHT HBC and the Ndola Catholic Diocese HBC Programme (Ndola HBC), which are the two HBC organizations studied by Nsutebu, it seems that Ndola HBC has been more successful. This partly could be attributed to the incentives that volunteers receive in the Ndola HBC system. Volunteers receive food supplements at half-cost and have greater responsibilities to the program.

Several challenges face the HBC system in the future. Foremost is the issue of scale-up. Currently, the FHT only covers 7% of all chronically ill patients in its target area. If the program expands, greater human labor must be expended to match the increased workload. Larger HBC systems will have to deal more often on controlling quality of care, maintaining efficiency, and recruiting more community volunteers. More medical professionals—not just trained volunteers—would be necessary in order to stay up-to-date with new medicines and recommend different drug regimens.

With scale-up, funding becomes another primary concern. As of now, both FHT and Ndola function on foreign donor funds. However, foreigners cannot support the project forever; the Zambian government must fully supervise and fund its own national healthcare plan for HIV/AIDS. Government involvement will be vital for HBC to become a national infrastructure, instead of existing in pocket areas where NGOs are established. Public health facilities that are already built could serve as effective centers for home-based care.

Availability of laboratory resources is another question mark. With more patients on treatment, will there be enough technical resources for clinical monitoring? Will community volunteers also be trained to run the diagnostic equipment? Will it be affordable?

The home-based healthcare model in Zambia has been praised for its effectiveness. Although I appreciate the innovative approach in a low-resource setting, coverage is nowhere near sufficient. Serious scale-up of ARV treatment will require more human personnel, government involvement, funds, and laboratory resources.

---

[i] *Introduction to AIDS in Zambia*, HIV & AIDS in Zambia – The Epidemic and its Impact, http://www.avert.org/aids-zambia.htm, 2003

[ii] *Zambia*, CIA Fact File, http://www.cia.gov/cia/publications/factbook/geos/za.html, 2005

EC.S11 Engineering Capacity in Community-Based Healthcare
Fall 2005