

N3062.53 and N23.73, respectively. Treatment using the traditional method was computed to be 4.98 times more expensive than when using the IMCI guidelines. The most costly drug category was antibiotics, accounting for 56.2% of the total costs, with ampiclox the single most expensive drug prescribed by the health workers. Antibiotics (cotrimoxazole) accounted for only 19.0% of the total cost using the IMCI guidelines.

A further look at the antibiotic prescription pattern revealed of the 115 patients who received antibiotic prescription, 34/115 (29.6%) received a combination of two antibiotics with metronidazole and cotrimoxazole as the most common antibiotics combination [28/34 (82.4%)]. Metronidazole was the second antibiotic given to the other six patients who received a combination of two antibiotics.

Although diarrhoea was the third most common presenting complaint, none of the patients was prescribed oral rehydration solution (ORS) salt. Using the IMCI guidelines, 164 packets of the ORS salts would have been prescribed (accounting for 26.8% of total drug cost).

## Discussion

The results of this study have shown that the use of IMCI guidelines in the management of common childhood illnesses would lead to a reduction in the cost of drug treatment by first level health workers. The estimated total cost of drugs was N15279.39 (average of N118.44/child) compared with a total drug cost of N3062.53 (average of N23.73/child) had the IMCI guidelines been used. In a similar study from Kenya, the estimated cost of the drugs needed to treat children using the IMCI guidelines was found to be less than the cost of drugs actually prescribed by the health workers<sup>3</sup>. Operational research has documented large potential savings related to drug cost with the introduction of IMCI guidelines<sup>4</sup>.

The practice of polypharmacy by the health workers is most likely responsible for the high cost of drugs in this study. An average of 4.5 drugs/child was prescribed by the health workers, with 24.8% of these children having between 6–8 drugs prescribed per child. This is much more than the number of drugs prescribed per child using the IMCI guidelines. Also, apart from the tendency of prescribing an antibiotic to virtually all sick children, the practice of antibiotic combination, as well as the use of expensive antibiotics, could have contributed to the high cost of drug treatment by the health workers. The IMCI guidelines recommend inexpensive drugs of proven efficacy and also reduce inappropriate drug prescription by health workers.

The tendency to use several classifications per child when following the IMCI guidelines did not seem to lead to an increased cost. In this study, 26/129 (20.2%) patients had between 4–6 classifications per child. This may probably be due to the recommendation of the same first-line antibiotic (cotrimoxazole) for several classifications by the IMCI guidelines (pneumonia, dysentery and acute ear infection).

While this study has provided useful information on drug costs when applying IMCI guidelines, there are limitations. The projected cost savings related to drugs when using IMCI guidelines were based on the assumption that inappropriate drugs would not be prescribed by health workers once they are introduced to and started using the IMCI guidelines. This is important because, in practice, health workers are unlikely to stop prescribing inappropriate drugs. To reduce the frequency of inappropriate drug prescription, at first level health facilities, policies can be formulated that will restrict the use of

non-essential and expensive drugs at health facilities. An additional measure would be to put in place a mechanism of regular and meticulous supervision of first level health facilities by qualified and experienced health personnel to achieve the expected cost effectiveness and rationality of drug prescription envisaged by the IMCI guidelines.

In conclusion, therefore, it is recommended that this study be repeated in a variety of settings to determine the effect of IMCI guidelines on actual treatment costs after the guidelines have been implemented.

## Acknowledgement

This paper was presented in part at the 32nd Annual General and Scientific Conference of the Paediatrics Association of Nigeria, Calabar, 23–27 January 2001.

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# Motives, sexual behaviour, and risk factors associated with HIV in individuals seeking voluntary counselling and testing in a rural district of Malawi

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TROPICAL DOCTOR, 2003, 33, 88–91

**SUMMARY** A study was conducted among individuals seeking voluntary HIV counselling and testing (VCT) in order to (a) describe their motives and source(s) of information, (b) describe their sexual behaviour; and (c)

identify risk factors associated with HIV infection. Of 723 individuals who sought VCT, the most common reason (50%) was recent knowledge of HIV/AIDS and a desire to know their HIV status. The majority (77%) underwent VCT after being encouraged by others who knew their status. Ninety five per cent reported sexual encounters, with 337 (49%) engaging in unprotected sex. HIV prevalence was 31% and an HIV-positive status was associated with being female, being over 25 years of age and/or being a farmer.

There is a demand for VCT, and the service provides an opportunity for intensive education about HIV/AIDS prevention on a one-to-one basis. It could also be an entry point to prevention and care for those who are infected.

## Introduction

Malawi, a small country in central-southern Africa, is currently experiencing a severe epidemic of HIV infection. The National HIV prevalence rate has been steadily increasing over the past 15 years and in 1999 there were 760 000 adults aged 15 to 49 years infected with HIV<sup>1</sup>. The adult prevalence rate is estimated at 16%<sup>1</sup> and HIV/AIDS is also the leading cause of death in this most productive age group.

HIV voluntary counselling and testing (VCT) has been shown to be a cost-effective way of reducing HIV transmission in Africa<sup>2,3</sup>. The widespread availability of VCT coupled with post-test support services has had a major effect in stabilizing HIV prevalence in Uganda<sup>4,5</sup>. The sooner HIV-infection status is known the more important the benefits for prevention and care. People who discover they are HIV-negative can take more energetic measures to remain uninfected – i.e. persuading their partner to go for HIV-testing or using condoms. People in a stable relationship who test positive for HIV can take steps to protect their partner from becoming infected, and mothers can avoid mother-to-child transmission of the virus. Access to preventive therapy and life prolonging medication such as cotrimoxazole prophylaxis and antiretroviral therapy could be an added incentive for testing. The family may also be better prepared having time to make arrangements for the financial security of the survivors. Finally, people living with HIV can bring first-hand experience to affirmative action and help neighbours, institutions and policy-makers face up to the reality of the epidemic and break the vicious cycle of fear, stigma and denial.

Since early 1999, as part of an integrated HIV control strategy, a VCT centre was set up in the district hospital of Thyolo, a rural region in southern Malawi. The centre offers VCT services free of charge to all who wish to know their HIV status. A better understanding of the reasons why individuals seek VCT, their source(s) of information, as well as knowledge of their sexual behaviour and HIV-status, would be useful when considering expanding existing VCT services and related HIV preventive strategies within the general population.

This study was carried out among individuals seeking VCT in order to (a) describe their motives and source(s) of information, (b) describe their sexual behaviour and (c) identify risk factors associated with HIV infection.

## Material and methods

### Study setting, voluntary counselling and HIV testing

The study was conducted between March 2000 and April 2001 in Thyolo district, a rural region in southern Malawi.

The district has one VCT centre which is located in the main district hospital. All consecutive individuals who wished to know their HIV status of their free will and who presented at the centre were involved in the study. Individuals underwent pre-test counselling which involves: giving basic information about HIV and AIDS and its prevention; explaining the reasons for recommending the HIV test and the patient's right to refuse the test. If consent is given, blood is withdrawn and the person is requested to return for post-test counselling. If the blood test is negative for HIV, the patient is given information on how to avoid acquiring HIV and AIDS (primary preventive counselling). On the other hand, if the test is positive, the individual receives information on how to prevent re-infection, on preventing transmission to partner(s) and on the use of condoms (secondary preventive counselling). Those who test HIV positive have the possibility of being offered cotrimoxazole prophylaxis and being referred to a home-based care service which provides continuing counselling, social support and management of basic opportunistic infections.

All blood samples were screened for HIV-1 and HIV-2 using a combination of the Capillus (Cambridge Diagnostics Ltd, Galway, Ireland) and HIV-Spot (Genelabs Diagnostics, Singapore) test. Any discordant sample was retested, and if it remained discordant was sent for ELISA testing at the referral hospital in Blantyre.

### Study population and data collection

Interviewer-administered questionnaires, which had been pre-tested, were used to gather information on basic socio-demographic data, sexual behaviour including condom use, and the reasons for seeking VCT. All individuals were interviewed after obtaining informed consent. Interviews were conducted in the local language in a counselling unit by trained and experienced HIV counsellors and the same team was used throughout the course of the study. Counselling unit registers were used for gathering information on the counselling process and HIV status. Privacy during the interview process and confidentiality of the data was ensured.

### Statistical methods

Analysis was done using the Epi Info software (Centre for Disease Control and Prevention, Atlanta, USA), and the LOGISTIC software<sup>6</sup>. HIV-positive serostatus was designated as the dependent variable for identifying potential risk associations. The measures of risk were determined by crude odds ratio (OR) and adjusted odds ratios (adjusted OR). Odds ratios were adjusted using multivariate logistic regression, and all related *P*-values are based on the likelihood ratio statistic. The level of significance was set at *P* = 0.05 or less and 95% confidence intervals (CI) were used throughout.

## Results

### Characteristics of the study population

There were 735 individuals who were registered for VCT during the study period. Of these, 12 individuals were excluded from the study; four did not want to participate in the interview and eight questionnaires were incomplete. Of the 723 who completed their data 445 were men and 278 (39%) women with a mean age of 26 and 29 years, respectively. The mean educational level was 6 years in

**Table 1** Reasons for seeking voluntary counselling and testing (VCT) services (n=723)

Variable	Males (%)	Females (%)	Total (%)
Reasons for seeking VCT			
Recent knowledge about HIV/AIDS and wish to know status	237 (53)	124 (45)	361 (50)
Suspicion that partner had unprotected sex outside a relationship	47 (11)	35 (13)	82 (11)
Preparing for marriage	30 (7)	24 (9)	54 (8)
Preparation to have children	9 (2)	9 (3)	18 (3)
Having had unprotected sex outside a steady relationship	27 (6)	10 (4)	37 (5)
HIV test performed confirmation of results wanted	33 (7)	3 (1)	36 (5)
Repeated illness and suspicion of having AIDS	58 (13)	70 (25)	128 (18)
Infertility	4 (1)	3 (1)	7 (1)
Total	445	278	723

school. There were 306 individuals who were married while 417 (58%) were either unmarried, divorced or widowed. The most common occupations were farming [320 (44%)], students [216 (30%)], unskilled workers [121 (17%)], and business [38 (5%)]. The majority (90%) resided in villages with 76% earning less than US\$4 per week. All individuals underwent pre-test counselling, and 723 accepted HIV testing returning for their results and underwent post-test counselling: 223 (31%) who were HIV positive. The mean period between pre- and post-test counselling was 1 day.

#### Reasons for seeking VCT and source of information (Table 1)

The most common reasons for seeking VCT included: recent knowledge about HIV/AIDS and the wish to know their HIV status [361 (50%)]; repeated illness and suspicion of AIDS [128 (18%)] and suspicion that the partner had practised unprotected sex outside the current relationship [82 (11%)]. Of those who underwent VCT; 557 (77%) did so after being encouraged by others who had undergone VCT; 60 (8.3%) after listening to messages on the radio; 58 (8%) after having attended a drama session on VCT; 44 (6%) after being encouraged by home-based care volunteers, and 4 (0.6%) after having seen a billboard on VCT.

#### Sexual behaviour and risk factors associated with HIV infection

Of all individuals who underwent VCT, 689 (95%) reported having sexual encounters. Of these, 49 (7%) used condoms always, 303 (44%) intermittently and 337 (49%) did not use condoms. The reasons for no condom use included: having sex with a regular partner (37%); having no prior knowledge about the usefulness of condoms (34%); condoms not being available (21%); reduction of pleasure (5%); partner refusal (2%); and religious reasons (1%).

The median age in which individuals had their first sexual encounter was 16 years (range 10–28 years) with a mean of five lifetime-partners prior to undergoing VCT. Of the 116 (34%) individuals who had never heard of condoms, 93% resided in villages.

Significant risk factors associated with an HIV-positive status included being female, being over 25 years of age and being a farmer by profession (Table 2).

## Discussion

This study shows that recent knowledge about HIV/AIDS and the subsequent wish to know one's HIV status is the most important reason for undergoing VCT in a rural district in Malawi. Over 90% of those seeking VCT reported having had sexual encounters, about half engaging in unprotected sex. About one-third of all VCT clients were HIV-positive. An HIV-positive status was associated with being female, being over 25 years of age and being a farmer by profession.

The great majority (77%) of all individuals in our setting, sought VCT after being encouraged by others who knew their status. VCT clients therefore serve as a media for effective advocacy of the service within the rural population of study. The finding also affirms the role of individuals who know their HIV status in breaking the vicious cycle of fear, stigma and denial associated with the disease. In a rural district in Malawi, it is likely that individuals reside principally in villages and had a limited number of years of school education. Despite intervention efforts, including social marketing and condom promotion that have been underway for a number of years, about one-third of all individuals who engaged in unprotected sex in this study had no idea of the usefulness of condoms. For one in every five persons, condoms were not accessible when they were needed. In Malawi, information, education and communication (IEC) strategies on safe sex behaviour and social marketing of condoms have often concentrated on urban areas and

**Table 2** Risk factors associated with HIV infection in individuals seeking voluntary counselling and testing (n=723)

Variables	HIV+ (%)	Odds ratio (OR)	*Adjusted OR (0.95, CI)	P-value
Gender				
Men	91/445 (20)	1	1	
Women	132/278 (48)	3.5	2.0 (1.3–3.0)	0.001
Age				
< 25 years	71/415 (17)	1	1	
> 25 years	152/308 (49)	4.7	3.0 (1.9–4.6)	<0.001
Marital status				
Married	88/417 (21)	1	1	
Single/divorced/widowed	135/306 (44)	3.0	1.2 (0.8–1.8)	0.35
Residence				
Semi-urban towns	24/100 (24)	1	1	
Villages	199/623 (32)	1.5	0.7 (0.4–1.2)	0.25
Education				
> 8 years	36/252 (14)	1	1	
< 8 years	187/471 (40)	4.0	1.4 (0.9–2.3)	0.14
Occupation				
Non-farmers	69/403 (17)	1	1	
Farmers	154/320 (48)	4.5	2.4 (1.5–3.7)	<0.001
Income				
< US\$4/week	166/548 (30)	1	1	
> US\$4/week	57/175 (33)	1.1	1.1 (0.7–1.7)	0.57
Age of first sexual encounter				
< 16 years	109/359 (30)	1	1	
> 16 years	114/364 (31)	1.1	1.0 (0.7–1.4)	0.79
No. of lifetime partners				
< 5 partners	160/538 (30)	1	1	
> 5 partners	63/185 (34)	1.2	1.3 (0.9–2.0)	0.18
Condom use				
Yes	104/386 (27)	1	1	
No	119/337 (35)	1.5	0.9 (0.6–1.3)	0.62

\*Adjusted for gender, age, marital status, residence, education, occupation, income, age of first sexual encounter, number of lifetime partners and condom use.

have used the written media (boards, posters, etc.). This strategy is not adapted for the less literate and remote rural populations. There is now an urgent need for socio-culturally adapted, intensive and sustained educational campaigns that can bridge knowledge gaps and promote access to safer sex among rural populations. A combined strategy of using the mass-media along with intensive education on a one-to-one-basis through VCT might be the most effective approach in our setting. Such a strategy has been shown to be effective in reducing risk behaviour and promoting safer sex in Uganda<sup>7</sup>. The particular groups who were found to be at high risk of being HIV positive in our study could be targeted by such a strategy.

Our experience with VCT in Thyolo is encouraging for a number of reasons. First it has been possible to integrate VCT services within the framework of a rural district health service. Second, it has allowed the opportunity to introduce HIV preventive counselling and the eventual possibility of offering cotrimoxazole prophylaxis for those who are found to be HIV positive<sup>8</sup>. VCT for individuals who wish to know their HIV status of their free will is being provided alongside systematic VCT (and cotrimoxazole prophylaxis) offered to all tuberculosis patients<sup>9</sup> and blood donors<sup>10</sup>. Third, good links have been established between the hospital counselling service and community care groups including an association of people living with HIV and AIDS. This has made it possible to refer ill or destitute HIV infected individuals to the community for continuing social support, home based care, management of basic opportunistic infections and nutritional supplementation. Such a network offering a package of care and support is likely to increase the acceptability of the service and would be useful when considering the possible introduction of anti-retroviral therapy into the system.

One of the main limitations of the current VCT testing strategy in Thyolo has been its reliance on laboratory based tests. This has created an immense work burden on the district laboratory and has limited the expansion of the service to peripheral areas. The fact that there is only one VCT centre in the district is also very likely to limit access from remote and distant areas. The district has now started to use rapid whole-blood tests which offer the important advantage of being technically simple to perform. This now allows the possibility of gradual expansion of VCT services to peripheral health centres and stand-alone VCT sites with the aim of increasing access to the service for all.

Our study shows that there is a demand for VCT services for a wide range of reasons. Offering VCT provides an opportunity for one-to-one intensive education on HIV/AIDS prevention and can also serve as an entry point to prevention and care interventions for those who are infected. What is now needed is the political will, as well as the resources to make VCT available to the vast numbers of people in Malawi with little or no access.

### Acknowledgments

This study received ethical approval from the National Health Sciences Research Council of Malawi. This study was financed by MSF-Luxembourg which supports integrated counselling services in Thyolo. We are particularly grateful to Mr R Chitsekho for his contributions in data collection and to all the clients of the VCT centre who participated in the study.

### Note

R Zachariah, M-P Spielmann and C Chingi designed and supervised the study and coordinated the collection and analysis of data. A D Harries and L Buhendwa also assisted in the design of the study protocol and interpretation of the data. All authors participated in writing the paper and A D Harries edited the final version.

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## Need for paediatric surgery care in an urban area of The Gambia

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TROPICAL DOCTOR, 2003, **33**, 91–94

**SUMMARY** The report evaluates the need for paediatric surgical care in an urban area of sub-Saharan Africa. Seven