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Address all correspondence to: The Ethiopian Journal of Health Development, Tikur Anbessa Hospital, P.O. Box 32812, Addis Ababa, Ethiopia. Telephone: +251 1 513628, or +251 1 157701, FAX: +251 1517701.

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You CH, lee KY, Chey RY, Menguy R. Electrog-astrographic study of patients with unexplained nausea, bloating and vomiting. *Gastroenterology* 1980 Aug; 79(2):311-4.

As an option, if a journal carries continuous pagination throughout a volume, the month and issue number may be omitted. You CH, lee KY, Chey RY, Menguy R. Electrog-astrographic study of patients with unexplained nausea, bloating and vomiting. *Gastroenterology* 1980;79:311- 4.

(2) Organization as author

The Royal Marsden Hospital Bone-Marrow Transplantation Team. Failure of syngeneic bone-marrow graft without preconditioning in post-hepatitis marrow aplasia. *Lancet* 1977;2:742-4.

(3) No author given Coffee drinking and cancer of the pancreas [editorial]. *BMJ* 1981;283:628.

(4) Article in a foreign language Massone L, Borghi S, Pestarino A, Piccini R, Gambini C. Localizations palmaires purpuriques de la dermatite herpiforme. *Ann Dermatol Venereol* 1987; 114:1S45- 7.

(5) Volume with supplement

Magni F, Rossoni G, Berti F. BN-52021 protects guinea- pig from heart anaphylaxis. *Pharmacol Res Commun* 1988;20 Suppl 5:75-8.

(6) Issue with supplement

Gardos G, Cole JO, Haskell D, Marby D, Paine SS, Moore P, The natural history of tardive dyskinesia, *J Clin Psychopharmacol* 1988;8(4 Suppl):31 S-37S.

(7) Volume with part Hanly C. Metaphysics and innateness: a psychoanalytic perspective. *Int J Psychoanal* 1988;69(Pt 3):389-99.

(8) Issue with part Edwards L, Mcyskens F, Levine N, Effect of oral isotretinoin on dysplastic nevi, *J Am Acad Dermatol* 1989; 20(2 Pt 1):257-60.

(9) Issue with no volume Baumeister M. Origins and control of stereotyped movements. *Monogr Am Assoc Ment Defic* 1978;(3):353-84.

(10) No issue or volume

Danoek K. Skiing in and through the history of medicine. *Nord Medicinhist Arsb* 1982:86-100.

(11) Pagination in Roman numerals

Ronne V. Ansvarsfull. Blodtransfusion till fel patient. *Vardfacket* 1989;13:xxvi-xxvii.

(12) Type of article indicated as needed

Sprago PM, Manners JM. DDAVP and open heart surgery [letter] *Anaesthesia* 1989;44:363-4.

Fuhrman SA, Joiner KA. Binding of the third component of complement C3 by *Toxoplasma gondii* [abstract]. *Clin Res* 1987;35:475A.

(13) Article containing retraction

Shishido A. Retraction notice: Effect of platinum compounds on murine lymphocyte mitogenesis (Retraction of Alsabti EA, Ghalib ON, Salem MP In: *Jpn J Med Sci Bioi* 1979;32:53-65). *Jpn J Med Sci Bioi* 1980;33:235-7.

(14) Article retracted

Aisabti EA, Ghalib ON, Salem MH. Effect of platinum compounds on murine lymphocyte mitogenesis [Retracted by Shishido A. In: *Jpn Med Sci Bioi* 1980;33:235-7). *Jpn J Med Sci Bioi* 1979;32:53-65.

(15) Article containing comment

Piccoli A, Bossani A. Early steroid therapy in 19A neuropathy: still an open question [comment]. *Nephron* 1989;51 :289-91. Comment on: *Nephron* 1988;48:12-7.

(16) Article commented on Kobayashi V, Fujii K, Hiki V, Tateno S, Kurokawa A, Kamiyama M. Steroid therapy in 19A nephropathy: a retrospective study in heavy proteinuric cases [see comments]. *Nephron* 1988;48:12-7 Comment in: *Nephron* 1989;51:289-91.

(17) Article with published erratum

Schofield A. The CAGE Questionnaire and psychological health [published erratum appears in *Br J Addict* 1989;84:7;01]. *Br J Addict* 1988;83; 761-4. Books and Other Monographs

(18) Personal authors Colson IH, Armour WI. Sports injuries and their treatment. 2nd rev. ed. London: S. Paul, 1986.

(19) Editor(s), compiler as author

Diener HC, Wilkinson M, editors. Drug-induced headache. New York: Springer Verlag, 1988.

(20) Organization as author and publisher

Virginia law Foundation. The medical and legal implications of AIDS. Charlottesville: The Foundation, 1987.

(21) Chapters in book

Weinstein L. Swartz MN. Pathologic properties of invading microorganisms. In: Sodeman WA Jr, Sodeman WA, editors. Pathologic physiology: mechanisms of disease. Philadelphia: Saunders, 1974:457-72.

(22) Conference proceedings

Vivian VI. editor. Child abuse and neglect: a medical community response Proceedings of the First AMA National Conference on Child Abuse and Neglect; 1984 Mar 30-31; Chicago. Chicago: American Medical Association, 1985.

(23) Conference paper

Harley NH. Comparing radon daughter dosimetric and risk models. In: Gammage RB. Kaye SV, editors. Indoor air and human health. Proceedings of the Seventh life Sciences Symposium; 1984 Oct 29-31; Knoxville (TN). Chelsea (MU; Lewis, 1985:69-78.

(24) Scientific and technical report

Akutsu T. Total heart replacement device. Bethesda (MD): National Institutes on Health, National Heart and Lung Institute; 1974 Apr. Report No.: NIH-NHLI-69-2185-4.

(25) Dissertation

Youssef NM. School adjustment of children with congenital heart disease [dissertation]. Pittsburgh(PA): Univ. of Pittsburgh, 1988.

(26) Patent

Harred IF, Knight AR, McIntyre IS. inventors. Dow Chemical Company, assignee, Epoxidation process, US

pat net 3, 654,317. 1972 Apr 4. Other Published Material

27 Newspaper article

Rensberger B, Specter B. CFCs may be destroyed by natural process. The Washington Post 1989 Aug 7; Sect. 1 :2(col.5).

(28) Audiovisual

AIDS epidemic:the physician's role [videorecording]. Cleveland (OH): Academy of Medicine of Cleveland, 1987.

(29) Computer file

Repal system [computer program]. Ms-DOs version. Edwardsville(Ks): Medi Sun, 1988.

(30) Legal material

Toxic Substances Control Act: Hearing on s. 776 Before the subcommittee on the Environment of the Senate Comm. on Commerce. 94th Cong. 1 st sess. 343 (1975).

(31) Map

Scotland [Topographic map]. Washington: National Geographic Society (US), 1981.

(32) Book of the Bible

Ruth 3:1-18 The Holy Bible. Authorized King James version. New York: Oxford Univ. Press, 1972.

(33) Dictionary and similar references

Ectasis Dorland's illustrated medical dictionary. 27th ed. Philadelphia: Saunders, 1988:527.

(34) Classical material

The Winter's Tale act 5. Scene 1, lines 13-66. The complete works of William Shakespeare. London: Rex, 1973. Unpublished material

(35) In press

Lillywhite HB. Donald JA. Puhnonany blood flow regulation in an aquatic snake, Science. In press.

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Original article

Schistosoma mansoni infection in Jiga town, Gojam Administrative Region

Fekade Shewakena¹, Helmut Kloos¹, Fekadu Abebe², and Hailu Birrie²

Summary: The impact of socioeconomic status and water use patterns on *Schistosoma mansoni* infection was studied in Jiga town in Gojam Administrative Region: Questionnaire interviews and parasitological surveys were made in a 10% randomly selected household sample covering 106 households with 505 individuals. The household surveys showed that use of stream water continued after installation of the piped water system in 1983, due to the high cost of piped water and frequent breakdown of the pump. Simple and multiple regression and correlation analyses of the relationship between *S.mansoni* infection and socioeconomic, water use and environmental variables at the individual and household levels revealed that intensity of infection was not related to the amount of water used in the home ($r=-0.33$, $p<0.05$) and income ($r= -0.37$, $p<0.05$). Infection rate was positively correlated with level of education ($r = 0.34$), students being the most affected ($r = 0.30$). Mapping of mean egg counts and water sources used failed to reveal any travel distance effect on infection. The potential use of geographic mapping of individual and household infection and behavioral data in tropical disease research is discussed. [Ethiop. J. HealthDev.1995;9(1):1-6]

Introduction

Understanding of social, economic and human behavioral factors in relation to water use has repeatedly been emphasized as a prerequisite for the implementation of schistosomiasis control programs (1-3). Although more than 200 communities in Ethiopia have been found to be endemic for *Schistosoma mansoni*(4), few epidemiological studies have been carried out to evaluate socioeconomic and behavioral factors (5-7).

This study examines the role of socioeconomic and water use variables in schistosomiasis occurrence in Jiga town in Gojam Administrative Region. Results of *S.mansoni* transmission dynamics, human water contact, community participation and intersectoral collaboration in the local pilot schistosomiasis control project have been presented elsewhere (8-11).

Jiga is a typical Ethiopian road side town with about 5,000 inhabitants located on the road from Addis Ababa to Gondar at 1,850 meters altitude. Detailed description of the study community has been given elsewhere (8, 11). - Jiga was chosen for the pilot schistosomiasis control project by the Institute of Pathobiology because of a) the high prevalence of schistosomiasis, b) the suitable population size and relative stability of the population, with little emigration and immigration, c) the presence of well defined water contact sites at

From the ¹ Department of Geography, and ²
Institute of Pathobiology, Addis Ababa
University, P.O.Box 1176, Addis Ababa.

the local stream and reservoir, d) the fact that Jiga is a typical highland community with a representative social organization, political structure and stream transmission pattern, and e) the completion of the town's first water supply system in November 1983 (11) .

The control project, developed by the Institute of Pathobiology in collaboration with various local, regional and national institutions, was implemented with community participation between 1985 and 1986 following baseline sociological, demographic and epidemiological studies in 1983 and 1984 (8, 11) .The water supply system was installed by the Ethiopian Water Supply and Sewerage Authority (WSSA) as part of the National Community Water Development Program, with labour input from Jiga community.

Methods

Census and mapping: All households were enumerated and mapped and a census was carried out in 1984. The town was mapped at an approximate scale with the aid of a compass and the use of a project car measuring distances along roads and between households and the various stream water sites.

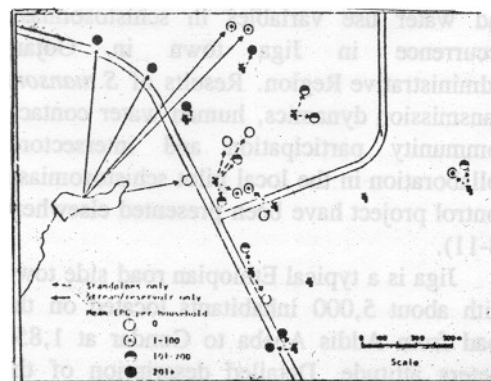


Figure 1: Mean EPG of households using public standpipes and stream/reservoir only.

Socioeconomic and water use survey : The survey carried out in 1986 covered 106 households with 505 individuals. The households were selected by systematic random sampling and every tenth house was visited for questionnaire interviews. Questions about the etiology, prevention and symptomology of schistosomiasis mansoni, socioeconomic status, demographic and environmental situations of households were directed to male household heads. Five local high school students and graduates trained by one of the investigators (FS) carried out all household interviews.

Parasitological study: The residents of the 106 selected households were subjected to parasitological examination in 1986. Stool was processed for microscopic examination using the Kato thick smear technique and two slides were prepared from a single stool specimen. Geometric means was used to estimate intensity of infection (expressed as eggs per gram of stool, EPG) for the individual and household level.

Analysis of data: Simple and multiple regression and correlation analyses were employed. For binary data on some socioeconomic variables, each observation was coded either "0" or "1" by the regression model as described by Johnston (12). Knowledge scores were calculated to examine the knowledge of household heads relating to schistosomiasis etiology and symptomatology vis-a-vis *S.mansoni* infection. Scores of "0" were given to those who did not know about "bilharzia" (the local term for schistosomiasis), "1" for those who claimed to know but failed to describe etiological and symptomological facts accurately, "2" for those who provided partial correct answers and "3" for those who provided all answers. The logs of prevalence of infection per household (+ 1) was added to include households and individuals free of *S.mansoni* infection in the analysis. The F test was employed to test for statistical significance of the relationships between variables.

Results

Prevalence and intensity: *Schistosoma mansoni* infection was identified in 80 (75%) of the households, but the overall prevalence in the sample population was 37.7%. Mean intensity of infection per household (Geometric mean egg count/gm of stool per household) ranged from 0 to 525 (Fig. I). The age and sex specific distribution of infection showed bimodal peaks for both males and females, with prevalence peaks in the 10-14 and 33-39 age groups.

Water use: Most households used more than one water source for cooking, drinking and washing utensils. Only 5(4.7%) and 17(16.0%) of the households reported using exclusively stream water and public taps, respectively. The latter, however, admitted that they used stream water whenever the standpipes broke down several times a year for several days. The remaining 84(79.2%) used piped water intermittently, even when it was available. Of the 106 households studied, 73(68.9%) claimed to use stream water for washing clothes while the remaining 33(31.1 %) said that they used only public and private taps for this purpose.

Reasons for the choice of water source varied considerably. Of the 73 households that used stream water for laundering 38(52.1 %) named high price of piped water, and 33(54.2%) stated that they could wash clothes more cleanly at the stream as their most important reason. The remaining two households named nearness of the stream to their homes as the decisive factor. This difference in water use were not, however, associated with mean intensity of infection at the household level. This was in spite of the fact that the number of water contact with the local stream had significantly decreased, especially for fetching water and washing clothes, between 1983 and 1987 (the end of the water contact study at the stream (10). The inadequacy of safe water in 1986 is also indicated by the fact that nearly 50% of all households continued to use rain water collected from roofs of their houses. The

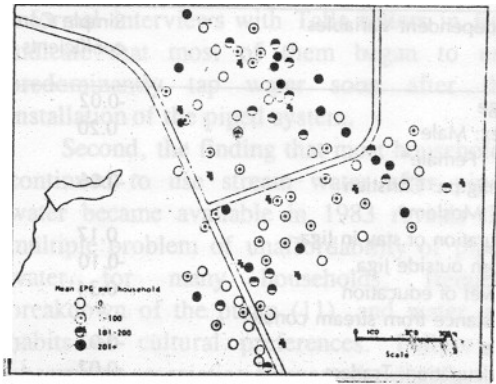


Figure 2: Mean EPG of households using more than one source of water .

amount of water consumed by households at home was found to vary between one and six madgas (an earthen container about the size of a bucket) per day. The negative correlation ($r=0.33$) between prevalence of *S.mansoni* infection and the amount of water consumed per household, regardless of source, suggests that increasing consumption of water at home can contribute to reducing infection levels. Knowledge and education: Variation in the knowledge about schistosomiasis among household heads failed to significantly predict *S.mansoni* prevalence in households ($r=-0.12$). Both prevalence and intensity of infection were as positively correlated with level of formal education ($r=0.34$ and 0.29 , respectively; $p<0.05$). The correlation results remained positive ($r=0.18$ and 0.25) even when only individuals above 14 years of age were included in the analysis.

Socioeconomic level: Income of the study households was reportedly low. Fifty percent of the households surveyed had monthly incomes of less than 50 birr (US \$10), and 71 % earned less than 100 birr .The low income and poverty of the population is also indicated by the harsh living conditions and

Table 1: simple and multiple correlation coefficients between differences in egg-counts and socio-economic, demographic and environmental variables among 505 individuals

Independent variables	Simple correlation coefficients	Multiple r	Multiple r ²
Age	-0.02	0.92	0.00
Sex: Male	0.20	0.12	0.01
Female*			
Religion: Christian	-0.06	0.14	0.2
Moslem*			
Duration of stay in Jiga	-.17	0.27	0.07
born outside Jiga	-0.10	0.27	0.07
Level of education	0.34+	0.41	0.17
Distance from stream contact site	-0.03	0.41	0.17
Occupation: Traders	-0.02	0.37	0.14
Government employees	-0.04	0.44	0.19
Craftsmen	-0.07	0.44	0.19
Talla sellers	0.08	0.44	0.19
Housewives	-0.05	0.44	0.19
Students	0.30+	0.47	0.22
Daily labourers and enemployed	0.06	0.47	0.22
Family size	0.07	0.47	0.22

Multiple r = 0.47+

+ Significant at 0.05

Multiple r² = 0.22

Standard error of estimate = 0.71

* Not included in the multiple regression analysis and low educational status

low educational achievement. Eighty eight of the 106 (83%) surveyed households had only one or two rooms with dirt floors and mud walls, 76(72%) had pit latrines, many of them of the makeshift type and out of use. Only four households could afford to have private standpipes installed, 18% of the individuals above seven years were illiterate and 20% had attended only the government literacy campaign.

Given the small income difference among households, the absence of positive correlation ($r=-0.37$, $p < 0.05$) between prevalence of infection and monthly income suggests that with growing income, infection may decrease considerably. Occupational prevalence of infection was the highest (55.6%) in craftsmen (mainly weavers), followed by students (49.7%), daily labourers and unemployed (45.8%) and housewives (34.4%). The lowest infection rate was observed among Talla sellers (22.2%) and government employees (23.5%).

Except for students, very low correlation coefficients were observed among occupational groups. There was statistically significant association between students aged 6-18 years and egg counts

which could be due to intensity of water contact activity and/or lack of immunity (Table 1).
Regression and Correlation Analysis:

Coefficients obtained from the various regression and correlation analyses between prevalence of *S.mansoni* infection and independent variables are presented in tables 1 and 2. These results indicate that the contribution of each variable to infection, both at the household and individual level was small but variable. Nevertheless, the overall multiple correlation coefficients ($r=0.58$ and 0.47 , at the household and individual levels, respectively) were statistically significant ($p < 0.05$). The partial correlation coefficients were very low for all variables, showing that the strength of each variable in explaining infection was dependent largely on its association with the other variables.

Discussion

Most socioeconomic and water use variables were weakly associated with *S.mansoni* infection and in this study, apparently due to a combination of the narrow range of socioeconomic level among households, the

usual problem of obtaining reliable information on income in rural Ethiopia (5) and the likelihood of preexisting infection prior to the introduction of piped water in 1983. Nevertheless, the results of this study have several implications for schistosomiasis epidemiology and control. First, the inverse relationship between household income and infection corroborates with findings elsewhere in Ethiopia (13, 14). Traders and government employees, the two most affluent groups, had some of the lowest infection rates among adults in Jiga. But talla sellers a high risk group of females in rural villages in Gondar Region and in Tensae Berhan in Arsi (13, 14), were found to have the lowest rates of infection among occupational groups in Jiga.

Informal interviews with Talla sellers in Jiga indicate that most of them began to use predominantly tap water soon after the installation of the piped system. Second, the finding that most households continued to use stream water after piped water became available in 1983 reveals the multiple problem of unaffordability of piped water for many households, frequent breakdown of the pump (11), and water use habits or cultural preferences. Failure to observe an association between the distribution of *S.mansoni* infection and water use pattern in 1986, three years after installation of the piped system, appears to be due to a combination of continued exposure at the stream.

Third, the correlation between prevalence and intensity of infection and education appears

Table 2: Simple multiple and partial correlation coefficients between differences in egg counts and socio-economic, demographic and environmental variable among 106 households in Jiga

Independent variables	F value	Simple r	Multiple r	Multiple r^2	Partial correl. Coefficients
Age: Below 5 years	17.14	0.38+	0.38	0.14	0.06
5-19	0.02	0.11	0.38	0.14	0.01
20+	3.89	0.32	0.42	0.18	-0.01
Sex: Males	0.01	0.25	0.42	0.18	-0.01
Females	0.02	0.25	0.42	0.18	-0.01
Household income	7.66	-0.37+	0.48	0.24	-0.16
Daily household water use (no. of madga)	4.47	-0.33+	0.52	0.27	-0.14

Latrine use (months)	2.34	-0.25	0.54	0.29	-0.15
Distance from stream contact site	1.0	0.01	0.54	0.29	-0.14
Religion: Christian	3.52	0.09	0.57	0.32	-0.05
Moslem	0.05	0.07	0.57	0.32	0.01
Knowledge of schistosomiasis	0.32	-0.12	0.57	0.32	0.05
Occupation of head of household					
Traders	0.07	0.16	0.57	0.32	0.09
Government	0.07	-0.18	0.57	0.33	0.06
Craftsmen	1.56	0.19	0.58	0.34	0.11
Talla sellers	0.09	0.14	0.58	0.34	0.05
Daily labourers and unemployed	0.65	0.02	0.58	0.34	0.09
Others	0.17	-0.02	0.58	0.34	-0.04

Multiple r - 0.58+

+ Significant at 0.05

Multiple r²

Standard error of estimate = 0.1

be influenced by location of Jiga Elementary school which is adjacent to the stream resulting in frequent contact during school hours. However, it is not known if the general health consciousness of older students associated with school teaching resulted in higher water contact, a situation described by Polderman in Lake Tana area (13).

Fourth, absence of a significant correlation between egg counts and knowledge about "bilharzia" among household heads further indicates the difficulties encountered by the community health education program in Jiga, described by Abebe et al (11). It is generally recognized that health education has traditionally been neglected and remains one of the least effective control measures in schistosomiasis control. Only in few countries, particularly Egypt, could effective health education programs be developed at the national level (15, 16).

The mapping of epidemiological parameters such as water use and infection constitutes an important but neglected research tool in schistosomiasis and other infectious diseases. Several spatial studies have been able to identify both high risk groups and schistosomiasis transmission sites in Egypt and Kenya (17, 18). If carried out longitudinally, they may contribute to monitoring changes in transmission, relevant human behaviour and socioeconomic indicators and thus assist in the evaluation of control programs.

References

1. Lima e Costa MFF, Magalheaes RS, Rocha CMF, Antunes N. Katz. Water-contact pattern and socioeconomic variables in the epidemiology of schistosomiasis mansoni in an endemic area in Brazil. Bull Wid Hlth Org. 1987;65:57-66.
2. Farooq M, Mallah MB. The behavioral pattern of social and religious water-contact activities in the Egypt-49 bilharziasis project area. Bul Wid Hlth Org. 1966;35:587-595.

3. Oelton PRA. Sociological approach to the control of *Schistosoma mansoni* in St. Lucia. Bull Wld Health Org. 1976;54:587-595.
4. Kloos H., Lo CT, Birrie H, Ayele T, Tedla S, Tsegay F. Schistosomiasis in Ethiopia. Soc Sci med 1988;26:803-827.
5. Kloos H. Schistosomiasis and irrigation in the Awash valley of Ethiopia. Ph.D Dissertation, Dept. of Geography, University of California, Davis, 1977.
6. Kloos H, Lemma Ac The epidemiology of *Schistosoma mansoni* infection in Tensae Berhan: Human water contact patterns. Ethiop Med J. 1980;18:91-98.
7. Poldennan AM. Intestinal schistosomiasis north and west of Lake Tana, Ethiopia. Trop Geogr Med 1974;26:170-177.
8. Abebe F, Ayele T, Birre H. Epidemiology of schistosomiasis in Jiga. IPB (Institute of Pathobiology) Rept. 1986;2: 14-28.
9. Birrie H., Ayele T, Abebe F. Transmission of schistosomiasis in Ethiopia: Malacological aspects. Unpublished report, Institute of Pathobiology , 1988.
10. Kloos H., F. Abebe, Ayele T, Birrie H, Shewakena F. The control of schistosomiasis in Jiga town, Ethiopia. II. The impact of piped water supply and environmental control measures on human water contact patterns. Riv. di Parassitol. 1991;8(52):55- 60.
11. Abebe F, Kloos H, Ayele T, Birrie H. The control of schistosomiasis in Jiga town, Ethiopia. I Community participation and intersectoral collaboration. Riv. di Parssitol. 1991;8(52):143-153.
12. Johnston R.J. Multivariate Statistical Analysis in Geography. London and New York: Longman, 1980.
13. Poldennan A.M. The Transmission of Intestinal Schistosomiasis in Begemder Province, Ethiopia. Doctoral dissertation, Universiteit Leiden, 1975.
14. Lemma A., G. Desole A.M. Poldennan, Mazengia B, Redda A, Kloos H. The epidemiology of *Schistosoma mansoni* infection in Tensae Berhan, Ethiopia: Prevalence of schistosomiasis. Ethiop Med J.1987;17:63-74.
15. Kloos H. Human Behaviour, health education and schistosomiasis control. Unpublished, 1993.
16. Loza S.F. Health education, mass media and schistosomiasis operations research results. Paper presented at the SRP 993 International Conference on Schistosomiasis. Ministry of Health, Cairo, February 1993;14-18.
17. Kloos H., Higashl GL, Cattani JA, Schinski VD, Mansour NS, Murrell KD. Water contact behaviour and schistosomiasis in an Upper Egyptian village. Soc Sci Med. 1983;17:545-562.
18. Kloos H. Spatial patterns of schistosomiasis in infection, water contact behaviour and transmission: Three case studies. Paper presented at the SRP 1993 International Conference on Schistosomiasis. Ministry of Health, Cairo, February 1993; 14-18.

Original article

Survey of condom use among college students

Kidane Gebre Kidan, and Bereket Azeze¹

Abstract: In June 1993, a condom use survey was done on 391 volunteer students in the Gondar College of Medical Sciences (GCMS). Of the 228 who were sexually active, 47.9% had used condoms at least 'once in the last six months preceding the survey. During the study period, condom use was reported by 84.9%, and 33.3% of the respondents who said they had contacted commercial sex workers were found positive with at least one of the Conventional sexually transmitted diseases. However, among 175 who claimed not to have sexual contact with commercial sex workers, only 64 (36.5%) used condom. Besides, the association of condom use with demographic factors and high risk sexual behaviours was analyzed. Age, sex and history of contact with commercial sex workers were shown to have statistically significant association. Eighty six students (54.5%) in the 20-24 age group and 18 students (27.7%) in the 15-19 age group used condoms. The proportion of male students using condom (46.5%) was higher than that of female students (1.3%). It is suggested that condoms should easily be made available to students and sex education be part of health education sessions. [Ethiop. J. Health Dev. 1995;9(1):7-11]

Introduction

The World Health Organization estimates that as of mid-1993 , over 13 million young people and adults have been infected with HIV since the start of the pandemic (1).Alarming projections to the year 2000 anticipate that between 38 million and 110 million adults and more than 10 million children will be infected (2). The World Health Organization projects that 90 % of all new HIV infections will occur in developing countries by the year 2000 (1). To date, over 2 million HIV infected adults have developed AIDS, and most of them have died (1).

The prevalence of HIV in some African countries is now 20-30% among sexually active adults (3). In high prevalence countries of Africa such as Uganda, as many as one out of every three adults is infected. Out of the 13 million HIV infected people in the world, a million have occurred in sub-Saharan Africa (1), with approximately 80% of the risk being attributed to heterosexual transmission (4). In Ethiopia, a total of 11,927 AIDS cases were reported from January 1986 to March 1994 (5). The challenge facing national and international communities is to act speedily and effectively to block further spread of the pandemic and to minimize its impact. This pandemic warrants global mobilization and a study on sexual behaviour and the prevention of sexual risk-taking behaviours.

So far, efforts to slow down the spread of HIV by changing sexual behaviour have been limited to messages directed not at everybody but only at particular risk or core groups such as drug users and commercial sex workers. Surveys in East and Central Africa have shown high levels of knowledge about AIDS, but this knowledge has had little impact on behaviour (6). For example, in Ghana, even though knowledge about the disease (its mode of , transmission and prevention) is reasonably high, especially in the urban areas, more than 80% in some studies, this

knowledge "is not translated into practice as people still continue to be involved in high-risk behaviours such as unprotected multiple-partnersexual contact (7).

¹From the Department of Gynaecology and Obstetrics, Gondar College of Medical Sciences.
P.O.Box 196, Gondar, Ethiopia

Table 1: High risk sexual behaviour and condom use among college students of Gondar College of Medical Sciences, 1993.

Sexually active in the past six months		Condom Use	
No.	%	No.	%
Sex partner			
1 140	61.4	60	44.4
\$ 1 88	38.6	49	55.6
Sexual contact with CSW*			
Yes 53	23.2	45	84.9
No 175	76.8	64	36.5
Reported history of STD**			
Yes 12	5.3	4	33.3
No 216	94.7	105	48.6

* CSW = Commercial Sex Workers

** STD = Sexually Transmitted Disease

One of the behavioral changes or new practices suggested to stop further spread of HIV infection is condom use even if it does not completely eliminate the risk of transmission (8). The promotion of condom use during sexual intercourse has always been a problem, both for family planning reasons and for prevention of HIV infection. In a study done on knowledge levels and feelings of some people about condoms in Addis Ababa,

Ethiopia, in 1991, only 11% reported using condoms once or more than once in the past (9). In another study done in 1993 in the If village of Gorgora, Gondar Region, among 1 pupils in the local high school, 60% reported using condoms during sexual intercourse in the past (unpublished data, Department of Community Health, Gondar College of Medical Sciences).

In this survey, taking the students of the Gondar College of Medical Sciences as a study group, we examined possible factors that might pose as barriers against using condoms during high-risk sexual intercourse. A previous study in the same area showed 'that the knowledge that the students of Gondar College of Medical

Sciences had about AIDS was adequate and comparable with that of other college and high school students (10).

Methods

This study was conducted in June 1993 at the Gondar College of Medical Sciences. Out of a student population of 427, 391 volunteered to take part in the survey. A self administered questionnaire that had been pre-tested and prepared in English was distributed. The volunteers were briefed on how to fill the questionnaire with the utmost precision and honesty. To gain maximum co-operation, the questionnaires were designed in such a way that the identity of the participants would be kept confidential. The questionnaire was distributed among students by the investigators right before lectures simultaneously in their respective classrooms. Students sat separately and the filled questionnaire was collected on the spot.

The questionnaires included questions on age, sex, department, year and marital status, risk in sexual behaviours (number of partners, history of sexually transmitted disease, and sexual contact with commercial sex workers), frequency of condom use during the past six months, and knowledge of condom distribution and purchase locations in their area of residence.

From the data compiled, condom use in relation to cases of contacts with high risk groups, and demographic variables were tested (4 using x2 tests. EPI-INFO Version 5 (CDC, Atlanta GA) software program was used to process data.

Results

The mean age of the 391 volunteer students was 20 years (S.D. + 3). Of these participant 105 (26.8%) were sanitary, 122 (31.2%) nursing, and 164 (41.2%) medical students. The majority (81%) were male and of the total, 98.2% were not married.

Of the 228 who were sexually active, 140 (61.4%) had one partner and 88 (38.6%) had more than one partner. Besides, of the sexually active students, 53% had contacts with commercial sex workers and 12% had contracted sexually transmitted diseases in the six months preceding the study (Table 1).

Table 2: Condom use by students of the Gondar College of Medical Scinces by age and sex, 1993.

Sexually active		Condom use at least once in the past six months	
Age			
15-19	65	18	27.7
20-24	158	86	54.4
25-29	3	3	100
30-24	2	2	100
Sex			
Male	192	106	55.2

Female	36	3	8.3
Total	228	109	47.8

Of the 53 who had had contact with commercial sex workers and the 12 who had history of sexually transmitted diseases, 45 (84.9%) and 4 (33.3%), had used condoms, respectively.

One hundred and nine of the 228 students (47.8 %) had used condoms at least once in the past six months (Table 2). A higher condom use by male participants 106 (46.5%) than female participants 3 (1.3 %) was observed.

Condom use was also analyzed in relation to the duration of stay in the College. Accordingly, a higher condom use was observed by the final year sanitary and nursing students, 22 (78.6%) and 14-(66.7%), respectively. However, this was not observed in the final year medical students, 11 (52.4%) (Table 3).

When questioned, the reasons given by 79 sexually active students for the low, and in some cases no use of condoms as protection against sexually transmitted diseases including AIDS included, unavailability 35 (44.3%), partner trust 34 (43%), shortage of condoms 6 (8%), and partner's disagreement 4 (5.1%). Also, the majority of the students {278/391 or 71.1% } did not know of condom distribution and purchase locations in their areas of residence.

Discussion

The HIV virus is spreading beyond the high-risk groups (11). The students of Gondar College of Medical Sciences are likely to be labelled as low risk groups as they are believed to have good knowledge about the disease and methods of preventing it. Moreover, the nursing and medical students have access to case studies of victims in their clinical practices. The sexual behavioral difference of this group, when compared with the data collected from Gorgora high school students, is strikingly low. This supports the conclusions reached by studies done in East and Central Africa that little sexual behavioral changes are registered despite high levels of knowledge about AIDS and the HIV virus (6). Many of the female participants stated that they rarely negotiate with their male partners, and this was reflected by the low condom use when compared to their male counterparts. This is a common phenomenon since women in many countries are victims of repressive culture and male domination (13-15).

Table 3: Condom use by category and level of education among of Gondar College of Medical Sciences students, 1993.

Education program	Sexually active	Condom use	
		No	%
1st yr San.	2	10	45.5
2nd yr San.	28	22	78.6
1st yr Nurs.	38	8	21.1

2nd yr Nurs.	25	7	28
3rd yr Nurs.	21	14	66.7
2nd yr Med.	18	8	44.4
3rd yr Med.	27	17	63
4th yr Med.	28	12	42.9
5th yr Med.	21	11	52.4
Total	228	109	47.8

San = Sanitary Nurs = Nursing Med = Medicine

* No 1st year medical students at GCMS

A higher condom use was observed as the years of training increased among the nursing and sanitary students in the survey, and this can be attributed to the better awareness acquired. However, our observations among the medical students showed no significant rise in its use, still supporting the conclusions reached that, despite high level of knowledge about AIDS and HIV virus, little changes in sexual behaviour are observed.

In this study, even if the overall use of condoms is low, the number of condom users who have had contact with commercial sex workers is high (84.5%). This percentage is also high when compared with the data collected from randomly selected males between 15 and 49 years of age in the town of Jimma, whose mean year of education was 7.1, where it was found out that use was 24.4% (12). Since the poor bargaining position of the CSW in developing countries leaves them in a state of conditioned helplessness to reject unprotected sex (13), this comparatively high percentage of condom use while in contact with commercial sex workers may show the origin of the idea of protected sex by a study group.

People have different reasons for not using condoms. The reasons vary from loss of pleasure or desire for skin contact to misconceptions about condoms (16). In our survey, the possible factors tested as barriers against condom use were unavailability of condoms, shortage, and the partners' disagreement on the matter.

The promiscuous sexual behaviour and overall low condom use rate of this study group is disturbing since it involves one of the productive age groups of the country's population as they are responsible to promoting health in the future. The negative effects on the economy that such behaviour entails can easily be predicted. It is estimated that the indirect costs, costs which arise from the loss of members of a society due to AIDS, is between 65 and 75 percent of the total costs, i.e., indirect cost plus direct cost (actual expenses incurred in dealing with the disease). And 90 percent of the indirect cost will be accounted for by premature death (17). In order to alleviate problems such as low condom use due to unavailability as stated, it is suggested that condoms should be made easily available to every student, i.e., distribution should not be only in family planning clinics but also through

dormitory proctors, class representatives and in the students' tea-rooms. Group discussions on the subject of safe sex should be included with health education sessions.

It was tried to use proctors and peer group leaders as media for condom distribution after this survey was made, and most of the students took the condoms. But since a second survey has not yet been made, the actual use cannot be commented upon. Studies of the same nature need to be conducted in the other 9 medical colleges in Ethiopia.

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Reference

1. World Health Organization, Global Programmes on AIDS (GPA). The HIV/AIDS pandemic: 1983 overview. WHO/GPA/CNP/EV A/93.1.
2. Ehraadt AA. Trends in sexual behaviour and the HIV pandemic. *Am J Pub Hlth* 1992;82:1459-61.
3. Berkley, SF. HIV in Africa: What is the future? *Ann Intern Med* 1992; 116:339-41.
4. Priscilla RU. Africa- Women and AIDS; Negotiating behavioral change. *Soc Sci Med* 1992; 34:63-73.
5. Ministry of Health, National AIDS Control Programme. Monthly Morbidity and Mortality Report, March 31, 1994.
6. Allen S, Serufilira A, Bogaerts J, Pierre PV, Nsenoumuremyi F, Lindan S, et al. Confidential HIV testing and condom promotion in Africa. *JAMA* 1992; 2(5):5.
7. Amofah GK. AIDS in Ghana: profile, strategies and challenges. *AIDS Analysis in Africa* 1992; 2(5):5.
8. Goedert II. What is safe sex? Suggested standard linked to male at improperlf W"-Ot«ted sexual intercourse. *Lancet* 1987; 18575-6.
9. Eshete H. Knowledge and feelings of some people about condoms/ in Addis Ababa, Ethiopia. *Ethiop I Health Dev* 1991; 5:81-82.
10. Teka T. College students' attitudes and knowledge of AIDS. *Ethiop Med I* 1993; 31:233-7.
11. Temmerman M, Ali FM, Ndinya-Anchola, I, Noses S, Plummer FA, Piot P. Rapid increase of both HIV -1 infection and syphilis among pregnant women in Nairobi, Kenya. *AIDS* 1992; 6:1181-5.
12. Larson C, Mekonnen A, Aboud F, Shiferaw T. Risk behaviours "for HIV infection: Their occurrence and determinants in Jimma Town, South-Western Ethiopia. *EMI* 1991; 29:127-36.
13. Worth D. Sexual decision making and AIDS; why condom promotion among vulnerable women is likely to fail. *Studies in Family Planning* 1989; 20(suppl 1):297-307.
14. Wofsy C. Women and the acquired immunodeficiency syndrome. *West I M* 1988; 149:687-90.

15. Bradbeer C. Human immunodeficiency virus and its relationship to women.\ Int I STD AIDS 1990; 1:233-38.
16. Earle D. Social marketing: making condoms available to communities. Family Health International May 1994; 1:27-30.
17. Alim W. The Socio-economic effect of AIDS in Africa. Presented to the International Conference on AIDS in Africa, Yaounde, Cameroon, 8-11 December 1992;1-9.

Original article

Forms and/contents of oxalate and calcium in some vegetables in Ethiopia

Kasaye Jiru and Kelbessa Urga¹

Abstract: Contents and forms of oxalate and calcium in some vegetables of Ethiopia were determined. On the average, the total oxalate content of spinach, swiss-chard and beet root were 9794, 7554 and 222 mg/100g on dry weight basis, respectively. The other vegetables studied however, contained low level of oxalate. Two fractions of oxalate were isolated- a fraction soluble in boiling water and an associated (nsoluble residue which was predominantly in the form of calcium oxalate. The water-soluble oxalates of vegetables studied account for over 50% of the total oxalate. Most of the calcium in the vegetables was in the form of calcium oxalate which is unlikely to be available to the body. Since the intake of vegetables cannot be discouraged, it is worthwhile to improve the nutritional value of these vegetables by reducing the water-soluble oxalates as it accounts for over 50% of the total oxalate content. [Ethiop. J. Health Dev. 1995;9(1):13-18]

Introduction

The majority of the population in Ethiopia, obtain their nutritional requirements from plant foods such as cereals, legumes and vegetables. The intake of foods of animal origin such as milk products, meat, eggs and fish is small (1).

Vegetables, particularly green leafy vegetables, are inexpensive and rich sources of several nutrients such as calcium, iron, carotene, ascorbic acid and in some cases group vitamins (2, 3). Protein concentrates from leaves (novel foods) are good sources of protein and are included in balanced diets especially for vulnerable segments of the population. Cultivation of green leafy vegetables in kitchen gardens was also encouraged in order to richly supplement the diets of pregnant and lactating mothers and children (4, 5). Fruits and vegetables are also crucial in efforts to prevent micronutrient deficiencies (6). However, the main constraint to their nutritional exploitation is the presence of some antinutritional and toxic factors such as nitrate and oxalate (7, 8, 9).

Oxalic acid is a dicarboxylic acid, and its salts are considered to be antinutrients as well as toxins. They can render some mineral nutrients unavailable by binding them to form insoluble salts which are not absorbed by the intestine. In addition, ingestion of large amounts of oxalic acid can be toxic (3, 10). The main interest in oxalate has been its complex formation with calcium to form water insoluble calcium oxalate within both plants and animals, which presumably precludes the utilization of calcium by the body. However, water-soluble oxalates and free oxalate can also combine with calcium from other foods in the intestinal tract and further reduce calcium availability (2, 10).

Fruits, green leafy vegetables, and tubers traditionally cultivated in Ethiopia have been reviewed by Zemede et al (11). In most areas of Ethiopia, the cultivation and intake of green leafy

vegetables is low except during rainy seasons when many types of edible leaves and roots, wild and cultivated are consumed. The low intake of green leafy vegetables in most areas of Ethiopia has resulted in increased prevalence of vitamin A deficiency (12). The limited consumption of green leafy vegetables may be due to lack of appreciation of their nutritional value, avoidance because of beliefs and taboos, non-availability in markets and high price. In ensete (*Ensete ventricosum*) cropping areas, kale is consumed along with ensete foods thus making part of the daily diet. Kale which contains more protein than ensete, is also one of the main sources of protein in these areas (13).

¹From the Ethiopian Nutrition Institute,
P.O.Box 5654, Addis Ababa, Ethiopia

Vegetables are believed to be consumed mainly in some larger towns where one can find a variety of them at vegetable stands and shops all year round. Even in these towns, vegetables are consumed mainly during periods of fasting (14).

Several studies on oxalate content of various foods have been carried out elsewhere (8, 9, 15). However, the oxalate content of the vegetables cultivated in Ethiopia is not known. The present study was, therefore, undertaken with the objective of identifying the forms and to determine the content of oxalate in some vegetables collected from markets in Addis Ababa. The content of minerals such as calcium, phosphorus, and iron in the vegetables was also studied.

Methods

Sample collection Vegetable samples for the study include potato (*Solanum tuberosum*), beet root (*Beta vulgaris*), sweet potato (*Ipomoea batatas*), carrot (*Daucus carota*), cabbage (*Brassica oleracea capitata*), kale (*Brassica carinata*), lettuce (*Lactuca sativa*), swiss-chard (*Beta vulgaris cicla*) and spinach (*Spinacia oleracea*). The selection of the vegetables for the study was merely based on their availability throughout the study period. The vegetable samples were collected from fourteen sites in Addis Ababa of which nine were open markets and five from State shops. These sites are reputed for the sale of vegetables throughout the year. Every effort was made to obtain freshly harvested samples which were then placed in polyethylene bags to minimize contamination and stored from 1 to 15 days in a cool room maintained at 4 °C before analysis.

Sample preparation. All the vegetable samples were thoroughly washed and rinsed in deionized water to remove all soil, drained and shredded using an Osterizer (Oster, USA). Samples of freshly shredded materials were dried at 60 °C in an air circulation oven to constant weight. The dried samples were ground to pass through Imm mesh screen using a Cyclotec sample mill (Cyclotec, Tecator-AB, Sweden) and were used in all analyses.

Analytical methods. The moisture content of the fresh vegetable samples was calculated from the loss in weight during drying at 100 °C for 12 hrs in a drying oven (16). Calcium and iron contents were estimated by the method described by the AOAC (16). Total phosphorus was determined according to the method of Fiske and Subbarow (17). The oxalates in vegetable samples were separated into two fractions using the following

procedure: Two grams of finely ground plant material was extracted with 100 ml of boiling deionized water for 30 min, filtered and adjusted to 200 ml. The hot water extract residue was further extracted with 150 ml of boiling 1M HCl for 30 min, adjusted to 200 ml, and filtered. The oxalate concentration in the two fractions was determined as outlined in AOAC (16) with potassium permanganate titration. The content of calcium oxalate and free calcium (mg/100g dry weight) was calculated according to Bradbury and Holloway (18). All the analyses were carried out in triplicate and the results calculated and expressed on dry weight basis.

Results

The dry matter content of vegetables is presented in Table I. The dry matter content was high in sweet potato and potato indicating the lowest moisture content in these vegetables. The dry matter content was, however, quite low in lettuce and swiss-chard, 6.4% and 8.3%, respectively. Consequently, root vegetables contain the highest dry matter compared to green leafy vegetables. Forms of oxalates in the vegetable samples studied are shown in Table I. The total oxalate (water-soluble and insoluble fraction) contents of spinach, swiss-chard and beet root were the highest, 9794, 7554 and 222 mg/100g, respectively whereas contents of total oxalate in sweet-potato, potato, kale, lettuce and cabbage were low, the values being 59, 77, 79, 81 and 142 mg/100 g, respectively. The contents of water-soluble oxalates in lettuce and kale were equal (60 and 61 mg/100 g, respectively). However, the contents of water-soluble oxalates in spinach, swiss-chard and beet root were 7796, 4684 and 216 mg/100 g, respectively. Both potato and sweet-potato samples contain equal amounts of water-soluble oxalates (38 mg/100 g). Values for water-soluble oxalates were also similar for carrot and cabbage.

Higher percentage of water-soluble oxalates to total oxalate was observed in spinach, kale and lettuce which amounted to 80, 76, 76, respectively (Table I). The lowest percentage concentration of water-soluble oxalates to total oxalate was noted in sweet-potato (50%). For other vegetables this ratio, ranges from 52 to 64%.

The insoluble form of oxalate expressed as calcium oxalate was shown in Table 1. Spinach and swiss-chard contain as high as 4182 and 2907 mg/100 mg calcium oxalate, respectively. Sweet-potato and lettuce contained the least amount of insoluble oxalate (32 and 36 mg/100 g, respectively). Table 2 shows the content of calcium, iron and phosphorus in the vegetable samples. The iron content of the vegetable samples ranges from 0.5 to 7.2 mg/100 g, the highest value being obtained in spinach. With respect to phosphorus content higher values were recorded in lettuce, swiss-chard and spinach (76, 68 and 67 mg/100 g, respectively). Potato, carrot, and beet root contained the least amount of phosphorus. As indicated in Table 2 the calcium content of the vegetable samples varied from 26 to 489 mg/100 g. Spinach and swiss-chard were found to possess higher levels of calcium (489 and 417 mg/100 g). Lower concentrations of calcium were observed in potato, sweet-potato and carrot (26, 29 and 37 mg/100 g, respectively).

The ratio of calcium to total oxalate was less than 0.5 for the study samples except for kale, lettuce and sweet-potato. The lowest ratio of calcium to total oxalate was observed particularly for spinach and swiss-chard. The ratio of calcium to phosphorus was much higher in spinach (6.0), swiss-chard (4.5) and kale (3.9). Lower values were recorded for the rest of the vegetables (Table 2).

Discussion

In the vegetable samples studied, water- soluble and insoluble forms of oxalates were estimated although the ratio of water-soluble to total oxalate varied. Hodgkinson (10) similarly reported that both soluble and insoluble oxalates (calcium oxalate) may be present, but the ratio may vary considerably in different foods. The total oxalate content of : sweet-potato, potato, carrot, lettuce, cabbage and kale was in agreement with values for fruits, tubers and vegetables reported elsewhere (17, 18) .Considerable variations in the oxalate content of plants can occur depending on the season, species, variety and soil nutrients (15,19,20,21). The influence lthese factors however, was not considered In, the present study. The oxalate content in spinach and swiss-chard was much higher compared with other vegetables studied. Poneros-Schneier and Erdman (22) indicated that spinach was rich in

Table 1: Mean values for dry matter, total oxalate, water-soluble oxalate in vegetables (mg/100 g dry weight)*

Vegetables	Dry matter, fresh weight	% of total oxalate	Soluble oxalate	Insoluble oxalate	Ratio of calcium oxalate	soluble oxalate/ Total oxalate, %
Beet root	11.2" 2.1	221.6" 6.3	216.2" 3.4	216.2" 3.4	0.25" 0.01	55
Cabbage	8.7" 1.3	141.6" 7.2	73.1" 7.2	98.9" 2.9	0.36" 0.02	52
Carro	9.8" 1.0	114.5" 4.4	71.4" 4.4	63.4" 1.5	0.32" 0.01	62
Kale	12.9+ 3.5	79.3+ 4.7	60.1+ 3.5	27.8+ 1.5	2.80+ 0.1	76
Lettuce	6.4+ 4.6	80.5+ 6.3	61.3+ 3.2	35.5+ 1.8	1.20+ 0.1	76
Potato	24.3+ 3.1	77.0+ 4.0	38.2+ 1.6	46.1+ 1.7	0.34+ 0.05	50
Sweet Potato	28.5+ 1.7	59.0+ 6.3	38.0+ 1.3	31.7+ 3.7	0.49+ 0.02	64
Spinach	11.4+ 4.3	9793.7+ 16.3	7796.1+ 18.1	2906.5+ 11.2	0.05+ 0.01	80
Swiss Chard	8.3+ 1.7	7554.0+ 20.1	4684.1+ 15.9	4181.6+ 12.8	0.06+ 0.01	62

Table 2: Mean values for minerals in vegetables (mg/100 g dry weight)*

Vegetables	Total calcium	Free calcium	Phosphorus	Calcium/Phosphorus	Iron
Beet root	83.0 $\pm$ 2.2	15.3 $\pm$ 0.9	34.9 $\pm$ 9.3	2.4 $\pm$ 0.2	1.4 $\pm$ 0.9
Cabbage	50.8 $\pm$ 3.9	19.9 $\pm$ 1.2	41.7 $\pm$ 14.3	1.3 $\pm$ 0.5	1.0 $\pm$ 0.4
Carrot	36.7 $\pm$ 2.4	7.8 $\pm$ 0.9	34.8 $\pm$ 8.8	1.0 $\pm$ 0.3	1.3 $\pm$ 0.4
Kale	221.8 $\pm$ 4.8	213.1 $\pm$ 2.8	52.2 $\pm$ 9.1	3.9 $\pm$ 1.3	3.4 $\pm$ 0.5
Lettuce	98.5 $\pm$ 1.9	84.5 $\pm$ 3.1	75.9 $\pm$ 15.3	1.3 $\pm$ 0.3	3.6 $\pm$ 0.2
Potato	26.1 $\pm$ 1.0	11.7 $\pm$ 1.1	25.5 $\pm$ 7.7	1.1 $\pm$ 0.1	5.7 $\pm$ 0.8
Sweet potato	29.3 $\pm$ 1.2	19.3 $\pm$ 0.7	51.8 $\pm$ 3.4	0.6 $\pm$ 0.2	0.5 $\pm$ 0.2
Spinach	488.7 $\pm$ 3.6	Nil	66.5 $\pm$ 15.5	6.0 $\pm$ 1.3	7.2 $\pm$ 2.8
Swiss Chard	416.9 $\pm$ 6.6	Nil	68.4 $\pm$ 13.8	4.5 $\pm$ 1.8	5.4 $\pm$ 0.7

a-Mean values of three analyses $\pm$ S.D., n = 14

oxalate, which was thought to inhibit calcium absorption by forming insoluble calcium oxalate salts in the small intestine. Vityakon and Standal (20) also reported high levels of oxalate in spinach.

During the analysis of oxalates, the extraction with boiling water dissolved water- soluble oxalates (sodium-, potassium- and ammonium-oxalate) .Spinach and ,swiss-chard followed by beet root contained higher levels

of water-soluble oxalates. The water-soluble oxalates are comparatively more toxic as they form insoluble salts with calcium and magnesium rendering these trace metals unavailable from other sources of food in the

digestive tract (2). Kansal and pahwa (23) also reported that spinach contained a very high amount of oxalates (11 g/100 g), 74.3% of which were in water-soluble form. Although the distribution of oxalate in our

study samples varies, the study demonstrated , that green leafy vegetables contain higher oxalate content than other types of vegetables.

Vegetables are also good source of iron. Spinach contained high amount of iron compared to other leafy vegetables studied. Iron in vegetables however, forms stable but soluble complexes with oxalate which might be available for absorption. Van Campen and Welch (24) indicated that the high oxalate of spinach did not result in poor availability of iron at least to rats which means that spinach could be a good iron source.

The vegetables studied appear to be rich sources of calcium but not so nutritionally owing to high content of oxalates. For instance, while spinach contains high level of calcium, it is shown to be unavailable for absorption due to the formation of the insoluble calcium oxalate and this has been demonstrated in human studies (25). Kelsay (26) also reported that spinach is rich in oxalic acid, which inhibit calcium absorption by

forming insoluble calcium oxalate salt in the small intestine. Weaver (27) also suggested that the presence of spinach in a meal could reduce the availability of calcium from other food stuffs consumed during the same meal. Although spinach and swiss-chard contain higher level of calcium, the amount of free calcium available for utilization in the body was virtually zero. The ratio of calcium to oxalate less than 2.0 with the exception of kale indicates that all the calcium contained in these vegetables is bound to oxalic acid thus making it unavailable for absorption. Ackermann and Gepauer (28) suggested that the calcium/oxalate ratio in a diet just below the critical value of 2.0 indicates a likely excess in the intake of oxalates. In the present study, the calcium/oxalate ratio lies on the safe side of the toxic level in kale. This ratio was unfavourable in the other vegetables studied.

Kelsay (29) demonstrated that the calcium from oxalate containing vegetables has been shown to have lower biological value than calcium from vegetables not containing oxalic acid. The phosphorus content of the vegetables studied was found to be within the recommended limits for optimum utilization (30).

The relatively low concentration of total calcium compared with insoluble calcium oxalate suggest that most of the vegetables , tissue calcium was unavailable for absorption by the body. This insoluble oxalate cannot inactivate further calcium whereas the soluble forms can combine with calcium from other foods and reduce its availability .

A substantial variation was observed in the total oxalate content and its fractions in the vegetable samples. However, it may be possible to improve the nutritional value of these vegetables by reducing the soluble oxalate as it accounts for over 50% of the total oxalate present.

Acknowledgement

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References

1. Bekele A, Wolde-Gebriel Z, Kloos H. Food, diet and nutrition. In: Zein Ahmed Zein and Kloos, H(eds), The ecology of health and disease in Ethiopia. Westview Press, Oxford, 1988:85-102.
2. Pingle U, Ramassastri BV. Absorption of calcium from a leafy vegetable rich in oxalate. Br. I. Nutr. 1978;39:119-125.
3. Oke OL. Toxic chemicals in Nigerian foodstuffs. Ind. I. Nutr. Oietet. 1970;7:119-129.
4. Pirie NU. The production and use of leaf protein. Proc. Nutr. Soc. 1969;28:85-90.
5. SinghU, SaxenaNC. Effect of maturity on the oxalate and cation contents of six leafy vegetables. Ind. I. Nutr. Oietet. 1972;9:269-276.
6. Simmersbach F. Presenting micronutrient deficiencies: food abundance and diversity are fundamental. Food Nutr. Agric. 1993;7:8-17.
7. Gupta K, Wagle OS. Nutritional and antinutritional factors of green leafy vegetables. I. Agric. Food Chem. 1988;36:472-474.
8. Singh PP, Sharma NC, Sur BK. Value of green leaves as sources of available calcium. Ind. I. Med. Res. 1969;57:204-209.

9. Singh PP, Sharma OC and Saxena SN Nutritional value of foods in relation to the oxalic acid content. *Am. I. Clin. Nutr.* 1962;25:1147-1152.
10. Hodgkinson A. Oxalic acid in biology and medicine. London, Academic Press, 1977.
11. Asfaw Z, Nigatu A and Asefa M. Survey of the indigenous food plants of Ethiopia and food preparations from the indigenous food crops. Addis Ababa University , Addis Ababa, 1992.
12. Wolde-Gabriel Z, Oemeke T, West CE. Xerophthalmia in Ethiopia: a nationwide ophthalmological, biochemical and anthropometric survey. *Eur. J. Clin. Nutr.* 1991;45:469-478.
13. Selinus R, Gobeze A, Vahlquist D. Dietary studies in Ethiopia. 111. *Acta Sac. Med. Upsaliensis.* 1971;t:XXVI:158-178.
14. Knutson KE, Selinus R. Fasting in Ethiopia. *Am. J. Clin. Nutr.* 1970;23:956-959.
15. Kasidas GP, Rose GA. Oxalate content of some common foods; determination by an enzymatic method. *J. Hum. Nutr.* 1980;34:255-266.
16. AOAC. Association of Official Analytical Chemists, Washington DC.
17. Fiske CW, Subbarow Y. The colorimetric determination of phosphorus. *J. Biol. Chem.* 1925;66:375-400.
18. Dradbury JH, Holloway WD. Chemistry of Tropical Root Crops: Significance for nutrition and agriculture. Australian Centre for International Agricultural Research, Canberra, 1988;46-47.
19. Fasset DW. Oxalates. In: *Toxicants Occurring Naturally in Foods*. National Academy of Sciences, Washington DC. 1973;342-362.
20. Vityakon P, Standal DR. Oxalate in vegetable Amaranth. Forms, contents and their possible implication for human health. *J. Sci. Food Agric.* 1989;48:469-474.
21. Singh PP, Saxena NC. Variation in oxalate
22. Poneros-Schneider AG and Erdman JW. IR Bioavailability of calcium from sesame seeds, almond powder, white bread, spinach and nonfat dry milk in rats. *J. Food Sci.* 1989;54: 150-153.
23. Kansal VK and Pahwa A. Utilization of magnesium from leafy vegetables and cereals :effect of incorporating skim milk powder in the diets. *Ind. J. Nutr. Dietet.* 1979;16:453-459. ,
24. Van Campen DR and Welch RM. Availability to rats of iron from spinach:effect of oxalic acid. *J. Nutr.* 1980;110:1618-121.
25. Heaney RP, Weaver CM and Decker D. Calcium absorbability from spinach. *Am. I. Clin. Nutr.* 1988;47:707-711.
26. Kelsay IL, and Pratter ES. Mineral balance of human subjects consuming spinach in a low-fibre diet and in a diet containing fruits and vegetables. *Am. I. Clin. Nutr.* 1983;38:12-19.
27. Weaver CM, Martin BR, Ebner IS and Krueger CA. Oxalic acid decreases calcium absorption in rats. *J. Nutr.* 1987;117:1903- 1905.
28. Ackermann H and Gebauer H. The toxicity of oxalate containing vegetables and feed plants. *Nahrung.* 1957;1:278-283.
29. Kelsay IL. Effect of oxalic acid on calcium bioavailability. In: Kies, C(ed.), *Nutritional Bioavailability of Calcium*. Washington DC, American Chemical Society , 1985: 105-113.
30. National Research Council (USA). Recommended Dietary Allowances. A report of the Food and Nutrition Board. Publ. No. 1964, Washington DC, National Academy of Sciences, 1968. .

Original article

A sociological and serological study of attenders of family planning clinics in Addis Ababa

M Elizabeth Duncanl, Gerard Tibaus, Andree Pelzer, Letebirhan,Mehari, Peter L Perine, John Peutherer, Hugh Young, Yasmin Jamil, Sohrab Darougar, Inga Lind, Karin Reimann, Peter Piot, Erwin Roggen

Abstract: A study of 542 women attending family planning clinics (FPC) and 1568 women attending obstetric and gynaecologic clinics in Addis Ababa showed utilisation of FPC was highest in those with a family income of 100-500 EB per month (36%), in women who were: Tigrawi (33%) or Amara (31 %), aged 20-34 years (30%), age 16 or older at first marriage/coitus (28%), parity of 2... 2 children (35%), > 5 lifetime husbands/sexual partners (39%), or were bargirls (73%) or prostitutes (43%). FPC attendance was lowest among the nulliparous (2.3%), women from rural areas (10%), the Guragie (10%) and Oromo women (19%), Moslem women 14(%), those of subsistence income (< 10EB per month) (14%). The seroprevalence rates indicative of exposure to STD pathogens were high as was the prevalence of essentially asymptomatic pelvic inflammatory disease (PID). Only 4% of FPC at tenders had no serological evidence of STD: 64% had 3 or more different STD. Specific present or active STD infection prevalence for syphilis (VDRL) 28%, Neisseria gonorrhoea 31 %, genital chlamydia 46% and HSV-2 21% was higher in FPC at tenders than among women attending other clinics. Clinical evidence of PID was also more common in the FPC at tenders (54%), 37% having evidence of salpingitis. Thus FPCs provide a useful setting for screening women particularly at risk. Because of lack of symptoms, these women are unlikely to attend either an STDs clinic or a hospital for routine check up, and as such are not treated and represent a population from which STDs can spread into the population. Measures to screen, treat and educate FPC at tenders, their partners and their clients, are recommended in an attempt to Control STDs and ultimately HIV in the community. [Ethiop. J. Health Dev. 1995;9(1):19-30]

Introduction

Ethiopian women have practised traditional methods of contraception for protection against pregnancy. However, family planning is not generally discussed among women, not even among the young and educated. Many men refuse to allow their wives to use contraceptives either because they wish to have more children, or have misconceptions about birth control. They refuse using condoms for fear of spoiling their sexual enjoyment. The Family Guidance Association of Ethiopia (FGAE) provides clinical and educational services to the community as well as training services in family planning for various categories of health workers. Family planning clinics (FPC) have been provided by hospitals and Maternal and Child Health Clinics (MCHC) run by community nurse/midwives, initially under medical supervision and with regular consultant referral clinics.

The MCHCs are within easy reach of the in community they serve and play a key role in women's health by providing primary health care, antenatal, intrapartum and postnatal care, family planning advice and child welfare/vaccination as well as treatment for minor ailments within the same compound. Moreover, because of the overcrowding at busy hospitals, many women prefer to attend the MCHCs for gynaecological advice where they can be seen more quickly. A further bonus for women unaccustomed to gynaecological examination is that they are seen by a female health attendant. MCHC, community nurse/midwives with training in family planning became expert at diagnosing common gynaecological problems and treating pelvic inflammatory disease (PID), the most common consequence of sexually transmitted diseases (STDs).

¹From Department of Medical Microbiology ,
University of Edinburgh, Ahlaine, Cardrona,
Peebles, EH45 9HX, UK

According to a literature review from 1976- 1992 (2-8) there are no reports of STDs prevalence rates among FPC attenders in Ethiopia and very few in the rest of Africa. These few publications report knowledge of the fertile period (6), degree of sexual activity among adolescents (6, 7), knowledge of contraception (6, 7), AIDS and spread of HIV (8). Despite an increasing volume of literature regarding sexual activity among adolescents (9- 14), knowledge and use of contraception (13- 18), AIDS and spread of HIV (9-12,14-17,19- 21), there is serious ignorance about STDs in general (22) and amongst men in particular (23). At the same time there is a dearth of information coming from Africa on prevalence of STDs, the socioeconomic aspects of their transmission, and of their sequelae. Most reports are from old surveys of STD clinic attenders which are not representative of the population, or screening of antenatal clinic attenders (1 Wilson Carswell, personal communication). Cervical cancer (CC), STDs and pelvic sepsis have been major causes of morbidity and mortality among Ethiopian women (24,25).

The aim of this study was (i) to determine the prevalence of selected STDs, PID and CC in women attending FPC and (ii) to draw a socioeconomic profile of FPC attenders in order that services could be targeted more effectively. The data on the women studied are taken from a larger investigation of sociodemographic factors associated with STDs, PID and CC in Addis Ababa. The study was carried out with the permission of the Ministry of Health.

Methods

Two thousand one hundred eleven women were included in this cross-sectional study without pre-selection: 542 were at tenders at regular FPCs; 1121 were attending gynaecological outpatient departments (GOPD), 342 and 106 attended antenatal (ANC) and postnatal (PNC) clinics, respectively. The selection of two teaching hospitals in Addis Ababa, (the Black Lion and St. Paul's Hospitals) and Lidetta, a MCHC for this study was because (i) it was anticipated that the patients seen would be representative of the hospital population of Addis Ababa; (ii) the staff of the obstetric and gynaecologic units are accustomed to collaborating in research projects; (iii) one of the investigators (Dr . Duncan) was a consultant at those centres and thus the investigation could be carried out without disruption of ongoing clinical work and teaching; (iv) by using the teaching hospitals and the Lidetta MCHC, medical students could be exposed to research

methodology and concepts during their training. For women attending the FPC, ANC and PNC inclusion criteria were (i) they were the first to be registered that day, thus possibly being kept longer at the MCHC than otherwise would have been the case. For women attending the GOPD of the two hospitals their

selection criteria were that they were first-visit attenders (i) who would not be likely to have received antibiotics recently and (ii) who as first attenders would be more representative of the GOPD clientele, than those returning for repeated investigation and treatment. Verbal informed consent was obtained from all participating women who were informed that a blood sample would be taken from them and a free-of-charge test for syphilis would be carried out and treatment given. No woman refused consent for either the questionnaire, the blood taking or the clinical examination. The VDRL results were taken back to the clinics within 48- 72 hours where standard penicillin (PAM) treatment was prescribed for syphilis if indicated and if other appropriate antibiotic treatment had not already been given. Other gynaecological conditions were also handled similarly.

The number of women in the study was determined by the results of preliminary studies regarding (i) the prevalence of N. gonorrhoea, trichomoniasis and the clinical evidence of PID in 100 GOPD attenders; (ii) the prevalence of N. gonorrhoea in 200 parturient women; (iii) the aetiology and treatment of 134 women with pelvic and puerperal sepsis, and pelvic abscess; all these studies had been carried out in St Paul's Hospital. A minimum of 200 patients was considered to be a suitable number to allow for meaningful statistical analysis of the results.

The breakdown of the study group into approximately 50% symptomatic GOPD attenders and 50% asymptomatic attenders divided into half each of FPC and obstetric patients was selected for the same reason. The collection of data, cytology slides and sera, and the VDRL test was made during an eight month period in 1975 and 1976 while ethnic and socioeconomic factors could be assessed independently of population migration that occurred during the revolution. Analysis was done abroad but the data and specimens could not, however, be despatched from the country until 1977 and 1978. Further serologic testing using micro-methods in five European laboratories was carried out from 1983-1990 as appropriate tests and funding became available. Personal details were obtained by means of a questionnaire completed, in private, initially by two senior Ethiopian nurse midwives

Table 1: Socio-economic factors of women using family planning clinics in Addis Ababa

n FPC/n of women studied*		(%)	P-value
Ethnic group			
Amahara	373/1223	31	
Oromo	61/317	19	
Guragie	32/318	10	
Tigrai	58/176	33	
Other**	18/72	25	<0.001
Religion			
Orthodox	494/1856	27	
Moslem	29/208	14	<0.001
Origin			
Urban	494/1718	29	
Rural	36/352	10	<0.001
Manthly income Ethiopian Birr (EB)***			
1-10	51/367	14	
10-50	213/667	32	
50-100	60/118	32	
100-500	114/317	36	
>500	25/79	32	<0.001
Age			
<20	31/181	17	
20-34	428/1421	30	
35-49	79/443	18	
>50	0/53		<0.001
Parity			
0	9/392	2	
1	67/392	17	
2	106/353	30	
3-5	238/636	37	
6-10	114/304	38	
>10	8/25	32	<0.001

Table 1 continued

Age at first marriage			
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<13	106/462	23	
13-15	211/839	25	
16-18	143/507	28	
>18	53/199	27	0.09
Number of husbands/sexual partners			
1	242/910	27	
2-5	143/720	20	
>5	119/304	39	
Unknown	32/146	22	<0.001
Marital status/profession			
Single	4/20	20	
Married	286/1244	23	
Divorced	89/345	26	
Widowed	11/46	24	
Maid	37/160	23	
Talla Seller	35/132	27	
Prostitute	45/105	43	
Bargirl	30/41	73	<0.001

*n = number because the data were not recorded for some variables, the number analysed does not add up to the total number of women in the study.

**Fifty percent (36/72) WERE Moslem

*** Many of the women did not know that their husbands income was, they only handled the A housekeeping money@ .

Cochran-Mantel-Haenszel no-zero correlation

(Sisters) who worked with Dr. Duncan throughout the study, and then by an Ethiopian female assistant with secretarial training who was trained in the art of questionnaire completion by Dr. Duncan and the Ethiopian Sisters who also checked the findings prior to the clinical examination. The language used was Amharic with, for those women who did not speak Amharic, either interpretation from other languages, or the questionnaire was completed by a senior clinic or hospital nurse (usually a sister) who spoke Orominga or Tigringa as a first language. Data included were: present age, ethnic group, religion, residence, family monthly income, marital status/profession (single, married, widow, divorcee, housemaid, talla seller, prostitute, bargirl), number of lifetime husbands/sexual partners, number of years married, duration of sexual life (years), total number of pregnancies, parity (number of viable children born), age at menarche, age at first marriage, age at first coitus, and relation of first coitus to the menarche, self-history of STDs (syphilis or gonorrhoea) and whether treated or not, use of contraceptives and type, and present complaint or reason for attending the hospital/clinic.

Clinical data were obtained by Dr. DunCall, who also made the cytological smears and collected the blood samples, assisted by Dr. Wilson. The procedure for collection of clinical data was standardised and recorded on specially prepared sheets. Gynaecological examination: Full

abdominal and gynaecological examination was carried out using a good light source (daylight or angle poise lamp). Particular attention was paid to the state of the cervix and for evidence of upper and lower genital tract infection involving the urethra (U), salpinges (S) and Bartholin glands (B) which were inspected (U,B) and palpated (U,S,B) (26).

Cervical cytology: A cervical cytological smear preparation was made. The slides were sent to Liege, were stained using the Papanicolaou stain and examined by light microscopy by Dr Pelzer for evidence of

Table 2: **Symptoms of women attending family planning and other womens= clinics in Addis Ababa**

Symptom	Attenders at FPC	Attenders at other clinics
Total number of women seen	542	1569
pain		
Abdominal pain	18	297
Pelvic pain	11	265
Backache	2	84
Dysmenorrhoea	2	32
Other gynaecologic Pain	0	15
Menstrual problem/abnormal bleeding		
Amenorrhoea	3	219
continuous bleeding	5	130
Irregular menses	5	97
Menorrhagia	9	76
A Abortion@	2	23
Other	0	71
Vaginal discharge		
Excessive discharge	16	209
Urinary		
Dysuria	2	76
Frequency	1	8
Other	0	35

n = number

FPC = Family Planning Clinic

cancer cells, excessive numbers of polymorphonuclear (PMN) cells (evidence of cervical infection), and for presence of trichomonas and monilial hyphae (evidence of heavy vaginal infection involving the cervix). Serological tests: Ten ml of whole blood was obtained by the clinic doctor from each woman using disposable needles and vacutainer tubes prelabelled with name and study number. The serum was prepared the same day and stored at -20°C. Serological tests for syphilis were carried out on all sera using VDRL. The sera were then frozen and stored at -20°C. Sera were transported frozen to the United Kingdom and kept at -20°C until further testing could be carried out: in Edinburgh for syphilis using TPHA (27) and hepatitis B virus (HBV) (28); in London for herpes simplex virusL (HSV2) (29) and Chlamydia trachomatis D-K (CTD-K) and Lymphogranuloma venereum 1-3 (LGV) (30); in Copenhagen for N.gonorrhoea (gonococcal antibody test (GAT) (31); and in Antwerp for Haemophilus ducreyi (32,33). Statistical analysis was made using the Chi-square and Cochran-Mantel-Haenszel General Association Statistic (34).

Results

There were 2111 women enrolled for the study of whom 542(25.7%) attended FPC clinics:

Utilisation of FPC and contraceptives was highest among women who were Tigrawi (33%), Amara (31%), Ethiopian Orthodox (27%), urban dwellers (29%), had a family income of 100-500 EB per month (36%), were aged 20-34 years (30%), had two or more children (35%), were age 16 or older at first marriage (28%), had more than five lifetime husbands/sexual partners (39%), and were by profession (bargirls 73%, prostitutes 43%) (Table 1). Regarding the last factor, it should be noted that the categories of last marital status/profession were mutually exclusive: eg. a divorcee who became a prostitute was recorded as the latter.

FPC utilisation was lowest among women who were nulliparous (2.3%), came from rural areas (10%), were Guragie (10%) or Oromo (19%), or Moslem (14%) and those of subsistence income (< 10 EB per month) (14%).

Most common complaints among clinic attenders were abdominal or pelvic pain, menstrual disorder, vaginal discharge and urinary symptoms. Women attending FPC had few symptoms compared with those attending other clinics such as GOPD, ANC, PNC (Table 2).

The prevalence rates for serological evidence of exposure to all six STDs were higher in that FPA group compared with women attending other clinics, but only statistically significantly increased for gonorrhoea, and high titre genital chlamydiae (Table 3). Only 4% of FPC attenders had no serological evidence of STD (Table 4) and 64% had serologic evidence for three or more different STDs. Clinical evidence of PID, past

or present, was more common among the FPC attenders chiefly because they had more salpingitis. In contrast, cervical cancer, dysplasia, cervical infection and trichomoniasis (the latter two being diagnosed cytologically) -were- all significantly less common among FPC attenders. Only eight women (1.5%) attending FPC were found to be pregnant on clinical examination: whether these women were pregnant as a consequence of failed contraception/forgetting to take the combined pill, or came in hopes of having an IUCD inserted (as an abortifacient), we could speculate.

More FPC attenders required treatment for salpingitis and urethritis than non-FPC attenders. Cervical ectropion (erosion) was more common among FPC attenders {Table 5}.

Discussion

The analysis of social and economic factors associated with acceptance of family planning and contraception is complex.

The higher utilisation of FPC among Tigrawi and Amara women was associated with higher income and, possibly, with education. Family monthly income may be an unreliable measure, but should be included in any further study of FPC attenders. The impression was that there were more Tigrai women amongst the professional group (nurses, teachers, secretaries) who also were in the higher income group and, by virtue of their job, better educated, and thus better motivated to achieve a smaller family size. Thus the reason for the association of FPC utilisation with income may have been ethnic and economic rather than religious. Indeed, there was a twofold difference of FPC attendance between the Orthodox and Moslem women.

But from cross variable analysis {details not shown} there were proportionately more Orthodox Christian women than Moslems in the higher income bracket {100-500 EB per month}. Furthermore, significantly fewer attenders at FPC belonged to the poorest (< 10 EB per month) group. The economic aspect is enigmatic as the service was entirely free at MCHC clinics and at one of the teaching hospitals. There must be other reasons such as education, tradition, or possibly better survival of children, which promotes family planning acceptance among upper income women.

Table 3: **Prevalence of sexually transmitted diseases among women attending family planning and other clinics in Addis Ababa.**

Diagnosis		Number tested	Number Positive	%	OR	95% CI (P-value)
Syphilis	FPC	475	180	39	1.19	0.96-1.48
(TPHA	Other	1362	470	35		(NS)
(VDRL)	FPC	496	137	28	1.08	0.86-1.35
	Other	1459	382	26		(NS)
Gonorrhoea	FPC	481	312	66	1.53	1.24-1.91
	Other	1370	770	56		(<0.001)
*GAT titre \$ 1/320	FPC	481	147	31	1.83	1.44-2.31
	Other	1370	266	19		(<0.001)
C. trachomatis (D.K. & LGV1-3)	FPC	481	307	64	1.14	0.92-1.41
	Other	1365	830	61		(NS)
*Titre\$ 1/64	FPC	481	220	46	1.26	1.02-1.55
	Other	1365	547	40		(0.03)
Hepatitis B virus	FPC	486	192	40	1.08	0.88-1.34
	Other	1373	517	38		(NS)
HSV-2	FPC	481	196	41	1.15	0.93-1.42
	Other	1365	512	38		(NS)
*HVS-2 titre\$ 1/128	FPC	481	101	21	0.04	0.81-1.35
	Other	1365	277	20		(NS)
H. ducreyi	FPC	476	97	20	1.09	0.84-1.41
	Other	1355	258	19		(NS)
Cervical cytological diagnosis infection	FPC	514	178	35	0.08	0.65-0.99
	Other	1442	575	40		(<0.04)**

Table 3 continued

Diagnosis		Number tested	Number Positive	%	OR	95% CI (P-value)
Trichomoniasis	FPC	514	48	9	0.42	0.31-0.58
	Other	1442	284	20		(<0.001)**
PID(Bus)	FPC	535	290	54	1.22	1.00-1.49
	Other	1557	765	49		(0.04)
Bartholinitis	FPC	535	41	8	0.85	0.59-1.22
	Other	1557	139	9		(NS)
Urethritis	FPC	535	189	35	1.12	0.91-1.38
	Other	1557	510	33		(NS)
Salpingitis	FPC	535	196	37	1.38	1.13-1.70
	Other	1557	459	29		(0.003)
Pregnant	FPC	542	8	1.5	0.03	(<0.001)**
Cervical cancer (all diagnoses)	FPC	542	2	0.4	0.18	0.05-0.66
	Other	1569	31	2		(0.001)**
Cervical cytological diagnosis cancer	FPC	513	2	0.4	0.25	0.06-1.07
	Other	1433	22	1.5		(0.04)**
Dysplasia	FPC	513	1	0.2	0.31	0.03-2.45
	Other	1433	9	0.6		(NS)

n = number

OR = Odds ration

FPC = Family planning clinic attenders

NS = non significant

Other = Women attending other clinics(gynaecological or obstetric) TPHA = Treponema pallidum haemagglutination assay

GAT = Gonococcal antibody test

HSV-2 = Herpes simplex virus 2

* = High titre indicates present or active infection

** = Negative statistical correlation with family planning attenders compared with the attenders at other clinics

The greatest demand for FPC services was from women with more than 5 lifetime husbands or sexual partners, the majority of whom were employed as commercial sex workers. For social reasons the demand for FPC services was lower for women having 2-5 lifetime sexual partners/husbands but not involved in prostitution. Possibly of significance is the observation from analysis of the infertility data that the complaint of infertility was highest in those with two or three lifetime sexual partners or husbands.

In this study, the main differences among a prostitute, bargirl or talla seller were age, age at first marriage and duration of marriage. As reported by the women, 95% of each group had a monthly family income of <50 EB. The classification of women involved in prostitution into these three groups was based on how the women initially described themselves. On detailed cross variable analysis it was found that the three classifications did in fact fall into separate groups. Bargirls

were the youngest, had been married for the shonest time (presumably employed to serve as waitresses in bars for the physical needs of their customers) and were paid a monthly wage irrespective of their work load. The professional prostitutes (setinga adari) were self-employed and put a red coloured light in the window's of their houses. The youngest often stand (to solicit) in front of their doorways or in the streets, while the older women sit at home and wait for their clients. Talla sellers worked from home, many sitting outside their houses selling tall a to passers-by. These women, frequently widows or divorcees, are among the oldest and poorest involved in prostitution. Not all talla sellers were involved in prostitution; 5% of those we studied reported having become talla sellers without explicitly stating that they were separated from their husbands. Professional prostitutes and tall a sellers were first married very young. In general, prostitutes and bargirls maintained their jobs and livelihood, by virtue of not becoming pregnant. Both groups had higher income than talla sellers who, on the other hand, were frequently widowed or divorced, and would not lose their jobs should they become pregnant.

Detailed analysis shows increased usage of FPC according to age at first marriage. Attendance was lowest (20%) amongst those married before the age of 10 years, and highest (38%) among those married after the age of 25 years. Age at first marriage/coitus 0.0001) associated with age at first coitus: those with sexual debut at age 13-18 had the largest number of children. Those married youngest also had the lowest family income (whether as cause or effect cannot be determined by our data), and age at first marriage/coitus increased with higher family income and, as stated above, possibly with education.

The effect of these factors on FP acceptance is thus related to the following: (i) very young age at first coitus leads to increased risk of STD especially gonorrhoea and genital chlamydial infection (35,36) with resultant PID and infertility; such infertile women would not require FP advice/contraception, but would attend FPC for infertility advice; (ii) age of sexual debut at 13-18 is associated with higher parity and could prompt a demand for FP advice; (iii) older age at first marriage is associated with higher income, better education, decrease in infant and perinatal mortality, and hence, lower parity, and is likely to lead to more FP acceptance, as has been shown elsewhere (37).

Women attending the FPC had remarkably few symptoms/complaints compared with other clinic at tenders, although they had more clinical evidence of past/present PID, and more active infection requiring immediate treatment. They also had more serological evidence of exposure to STDs, and higher titres which were indicative of active/present infection. Less than 3% complained of vaginal discharge although 9% had T. vaginalis in their cervical cytology smear which would

Table 4: Seroprevalnce of STDs among Family planning clinic attenders and other women attending obstetric and gynaecologic clinics in Addis Ababa

Prevalence	FPC attenders		Other clinic attenders	
	No	%	No	%
Negative	23	(4)	101	(6.5)

Positive (All STD)				
1 STD	62	(12)	200	(13)
2 STDs	107	(20)	314	920)
3 STDs	113	(21)	316	(20)
4 STDs	104	(19)	289	18.5)
5 STDs	67	(12)	125	(8)
6 STDs	6	(12)	224	(14)
Total	542		1567	

reflect a very severe infection involving cervix. .

The increased STDs and subsequent PW may be explained by oral contraception or the) use of IUCD. Some of the combined pills (oral contraceptives) cause cervical ectropion, as was observed in our study, with the transformation zone and the endocervical epithelium being exposed to bacterial and viral agents. Oral contraceptives are per se a factor increasing transmission/acquisition of STD. Detailed analysis of pm prevalence and type of contraceptive showed 4% increase in pm in women using the contraceptive pill, and 12% increase in pm in those using an IUCD, the latter despite our deliberate policy not to insert the IUCD in women with clinical evidence of old/earlier pm, and women engaged in prostitution. Studies elsewhere have shown that women are quick to blame ill health or symptoms of STDs and pm on a contraceptive. Thus certain effective methods of contraception have fallen into disrepute and even led to the failure of FP programmes (3).

The tables show an apparent discrepancy in the number of serological tests for specific STDs. The first 100 women had their VDRL test carried out in St Paul's Hospital. The laboratory was unwilling to continue the routine free testing of the study patients (especially as some women would normally have been able to pay for the test), nor to store -he sera. Thus from patient study number 101 onwards the VDRL testing and storage of sera was done by NAMRU-5. For consistency, the VDRL results of the first 100 patients were discounted, although the patient's socioeconomic, clinical and cytological data were used in the analysis of serum. Thus the earlier tests VDRL were carried out on 1955 sera, and the latest (for antibody to H.ducreyi) on 1831 sera.

The seroprevalence rates for exposure to STD pathogen among Ethiopian FPC at tenders is high. In particular there were 31% with GAT titres $\geq 1/3209$, 45% with antibody to present active or recent gonococcal, genital chlamydial or herpetic infections, respectively. These prevalence rates are higher than the few published, available data from FPC elsewhere in Africa: gonorrhoea 3% in Zaire (2) and 5% in Ibadan (38) Nigeria, 10% in South Africa (3), and 17.5% in Kenya (39); genital chlamydiae 16%, culture positive in South Africa (5), and 35% seropositive in Nigeria (40); or syphilis (TPHA) 18% in Nigeria (2). Swaziland had 15% trichomoniasis among FPC attenders (4). We could not find published records of FPC prevalence rates for either genital herpes or chancroid in

Africa. It could be argued that the data from this study are rather old and hence irrelevant to Ethiopia in the mid 1990s. This study however is useful as a seroepidemiological baseline and should prompt another study as a matter of urgency particularly as there are indications that teenage sexual activity, previously virtually unknown, and STD prevalence are both on the increase (14).

Significance of marital status/profession: A contributing factor to the high STD prevalence rate among FPC attenders reported in this study may have been the proportion of 1 women in prostitution attending the FPC (20%) which is two times higher than the number of women in prostitution attending the other clinics (11%). Detailed analysis of the association of the classical STDs (syphilis and gonorrhoea) with marital status/profession has shown the lowest prevalence to be among those still with their first husband/sexual partner. Women who were married to their, second or subsequent husbands, widows, divorcees or maids formed an intermediate group between those with a stable first marriage and those involved in prostitution. Among the commercial sex workers, prevalence rates for classical STDs increased from being lowest among talla sellers to highest among bargirls (4-2). However detailed analysis of these three groups (i) women with

stable first marriage, (ii) women in prostitution, and (iii) all other women (single, widowed, divorced, maids, married to second or subsequent husband) showed that there was no difference in the proportion of group (i)

women attending FPC or other clinics, and there were rather fewer (45%) compared with 55% of the group (ii) women attending FPC. Hence, it is unlikely that this group was responsible for the increase in STDs amongst FPC attenders. We have combined marital status and profession, as according to the information the women gave us, the two were mutually exclusive. "I was divorced, now I am a prostitute", "I was married now I am a bargirl!", "My husband died now I am a talla Seller". To exclude those who are now in prostitution from the analysis would be to exclude 14% of the women.

As most gonococcal and genital chlamydial infections in women are silent (26,36) women with these infections form a reservoir of infection, infecting and being infected by promiscuous men who transfer the infection to others (43,44), whether the transfer be from women in prostitution to the wife or vice versa. Thus as women across the social and marital spectrum attend FPC, a new responsibility for family planning services is the detection, treatment and prevention of reproductive tract infections (44), although as Hopcraft et al observed, "In family planning

Table 5: Gynaecological conditions requiring immediate treatment in family planning and other women's clinics in Addis Ababa

Table 5: Gynaecological conditions requiring immediate treatment in family planning and other women's clinics in Addis Ababa

Condition	Attenders at FPC			Attenders at other clinics		
		Total			Total	%
Number of women seen Pelvic inflammatory disease		542			1569	
PID/Parametritis	20			106		

*Pelvic Abscess	0			10		
*Peritonitis	0			8		
Total		20	4%		124	8%
Salpingitis	141			222		
Acute/chronic	0			17		
*Pyosalpinx		141	26%		239	15%
Total						
Urinary tract infection						
Upper A UTI@	1			12		
Urethritis	101			26		
Total		102	19%		38	2%
Cervicitis	12	12	12%	32	32	2%
Noted but not treated cervical ectropion (Cervical erosion)	32	32	6%	32	32	2%

n = number

FPC = family planning clinic

* required emergency admission

programmes in most developing countries the question of diagnosing and treating STDs appears to be almost completely ignored, probably because of fear of calling attention to a possible association between contraception and promiscuity, and partly because of implications for extension of staff training and clinic services" (39). Indeed at the time of this study, the MCHC's were designed to run at low cost and thus only did basic investigations. Bacteriological and cervical cytology examinations were done in referral hospitals, and then were only available to the very few who could afford to pay for these tests.

However as we have shown elsewhere there is increased Pill among those who have been infected by *N. gonorrhoeae* or genital chlamydiae (26,36). The diagnosis of Pill by detecting palpably thickened Bartholin glands, urethra or salpinges (26) can be made easily by trained community nurse/midwives. Subsequent treatment with a two week course of tetracyclines should clear both infections as well as treating co-existent syphilis. FPCs, especially those in MCHCs which have a good rapport with the surrounding community, are then in a strong position to carry out discrete tracing and treatment of contacts of infected women. Ideally interim microbiological surveys of FPC at tenders at clinics in different locations would monitor the STDs prevalence and the effectiveness of intervention strategy. These tests are expensive and can only be carried out in specialised centres. The advent of serological tests by micromethods while not always diagnostic, none-the-less are a valuable sero-epidemiological tool, and used along with clinical and sociological data in the more readily available statistical programs are valuable in detecting populations at risk.

In conclusion, a high seroprevalence of STDs and Pill among FPC at tenders is reported. The FPC provides a useful setting for screening and treating women particularly at risk, who for lack of symptoms, will not attend either an STD clinic nor a hospital for routine investigation. These untreated women represent a population from which STDs are introduced in the community. We

recommend that FPCs should adequately screen, treat and educate FPC attenders, their partners, and their clients, in an attempt to control STDs in the community. It is imperative to treat the male sexual partner(s) concurrently to avoid reinfections. This is particularly important because of the risk of HIV spreading rapidly through the community (46), which can be anticipated as it has been observed that gonorrhoea, a marker of sexual activity (47), is highly prevalent among the FPC attenders studied. Moreover, STDs, especially those causing genital ulceration, facilitate the transmission of HIV. Further surveys should be implemented to monitor STDs prevalence and the effectiveness of intervention programs.

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References

1. Madebo T. A six month prospective study on different aspects of abortion. *Ethio. Med. J.* 1993;31:165-172.
2. Nsofor BI, Bello CSS and Ekwempu CC. Sexually transmitted disease among women attending a family planning clinic in Zaria, Nigeria. *J Gynecol Obstet*, 1989;28:365-367.
3. Hall SM and Whitcomb MA. Screening for gonorrhoea in family planning acceptors in a developing country. *Publ Hlth Lond*, 1978;92:121- 124.
4. Meheus A, Friedman F, Van Dyck E, and Guyver T. Genital infections in prenatal and family planning attendants in Swaziland. *E Afr Med J*. 1980;47:212-217.
5. Ballard RC, Fehler HG and Piot P. Chlamydial infections of the eye and genital tract in developing countries, in *Chlamydial infections* (eds D Oriel, G Ridgway, I Schachter, D Taylor-Robinson and M Word), 1986 pp 479-486.
6. Rosenbert MI, Schulz KF and Burton N. Sexually transmitted diseases in sub-Saharan Africa. A priority list based on Family Health International's Meeting. *Lancet*, 1986;ii:152-153.
7. Boohene E, Tsodzai I, Hardee-Cleaveland K, Weir S and Ianowitz B. Fertility and contraceptive use among young adults in Harare, Zimbabwe. *Studies in Family Planning*, 1991;22:264-71.
8. Govender V, Bhana R, Pillay A, Panchia R, Padayachee GN and de Beer M. Perceptions and knowledge about AIDS among family planning clinic attenders in Johannesburg. *S Afr Med J*, 1992;81:71-74.
9. Abdool Karim Q, Abdool Karim SS and Nkomokazi I. Sexual behaviour and knowledge of AIDS among urban black mothers. *S Afr Med J* 1991;80:340-343.

10. Odujinrin OM and Akinkuade FO. Adolescents AIDS knowledge, attitude and beliefs about preventive practices in Nigeria. *European J Epidemiol*, 1991;7:127-133.
11. Friedlan RH, Iankelowitz Sk, De Beer M, de Klerk C, Khoury V, Csizmadia T, Padayachee GN and Levy S. Perceptions and knowledge about the acquired immunodeficiency syndrome among students in university residences. *S Afr Med J*, 1991;79:149-154.
12. Mafany NM, Mati IK and Nasah BT . Knowledge of and attitudes towards sexually transmitted diseases among secondary school students in Fako District Cameroon. *E Afr Med J*, 1990;67:706-711.
13. Nichols D, Woods ET, Gates DS and Sherman I. Sexual behavior, contraceptive practice, and reproductive health among Liberian adolescents. *Studies in Family Planning*, 1987;18:169-176.
14. Mathews C, Kuhn L, Metcalf CA, Ioubert G and Cameron NA, Knowledge, attitudes and beliefs about AIDS in township school students in Cape Town. *S Afr Med J*, 1990;78:511-516.
15. Wilkins HA, Alonso P, BaldehS, Cham MK, Corrah T, Hughes A, Iaiteh KO, Oelman B and Pickering H. Knowledge of AIDS, use of condoms and results of counselling subjects with asymptomatic infection in The Gambia. *AIDS Care*1989;1:247-256.
16. Bertrand IT, Makani B, Hassig Se, Niwembo KL, Djunghu B, Muanda M and Chirhamolekwa C. AIDS-related knowledge, sexual behavior, and condom use among men and women in Kinshasa, Zaire. *Am J Publ Hlth*, 1991;81:53-58.
17. Wilson D, Sibanda B, Mboyi L, Msimanga S and Dube G. A pilot study for an HIV prevention programme among commercial sex workers in Bulawayo, Zimbabwe. *Soc Sci Med*, 1990;31:609- 618.
18. Mbizvo MT and Adamchak DI. Condom use and acceptance: a survey of male Zimbabweans. *Centr Afr J Med*, 1989;35:519-523.
19. Foster SI and Furley KE. 1988 public awareness survey on AIDS and condoms in Uganda. *AIDS*,1989;3:147-154.
20. Neequaye AR, Neequaye IE and Biggar RJ . Factors that could influence the spread of AIDS in Ghana, West Africa: knowledge of AIDS, sexual behavior, Prostitution, and traditional medical practices. *J Acquired Immune Deficiency Syndromes*,1991;4:914-919.
21. Adamchak DI, Mbizvo MT and Tawanda M. Male knowledge of and attitudes and practices towards AIDS in Zimbabwe. *AIDS*, 1990;4:245- 250.
22. Herbst MC. AIDS: a right to be informed. *Med Law*,1991;10:83-93.
23. WassefHH, FoxE, AbbatteEA, Toledo IF and Rodier G. Knowledge of sexually transmitted diseases and attitudes towards them in population at risk in Djibouti. *Bull Wid Hlth Org*, 1989;67:549-553.
24. Perine PL, Duncan ME, Krause DW, Awoke S and Zaidi AA Pelvic inflammatory disease and puerperal sepsis in Ethiopia. I Etiology. *Am J Obstet Gynecol*, 1980;138:1059-63.
25. Duncan ME. Perine PL, Krause DW, Awoke S and Zaidi AA Pelvic inflammatory disease and puerperal sepsis in Ethiopia. n Treatment. *Am J Obstet Gynecol*, 1980;138:1059-63.
26. Duncan ME, Reirmann K, Tibaux G, Pelzer A, Mehari L and Lind I. Seroepidemiological study of gonorrhoea in Ethiopian women. 1. Prevalence and clinical significance. *Genitourin Med*, 1991 ;67 :485-92.
27. Young H, Henrichsen C and Robertson DHH. *Treponema pallidum* haemagglutination test as a 3 screening procedure for the diagnosis of syphilis. *Br A J Vener Dis*, 1974;50:341-46.

28. Peutherer IF, Mackay P, Ross R, Stahl S and E Murray K. Use of hepatitis B antigen produced in 4 *Escherichia coli* in an assay for anti-HBc. *Med lab j Sci*, 1981;38:355-58.
29. Forsey T and Darougar S. Indirect Micro- fluorescence test for detecting type-specific antibodies to herpes simplex virus. *J Clin Pathol*, 1980;33: 171-76.
30. Treharne ID, Darougar S and Iones BR. Modification of the micro-immuno fluorescence test to provide a routine sero diagnostic test for chlamydial infection. *J Clin Pathol*, 1977;30:510-7.
31. Reimann K, Odum L, Larsell SO and Lind I. Indirect Haemagglutination test using gonococcal pilus antigen: how useful to diagnose gonorrhoea? *Genitourin Med*, 1987;63:250-55.
32. Museyi K, Van Dyck E, Vervoort T, Taylor D, Hoge C and Piot P. Use of an enzyme immunoassay to detect serum IgG antibodies to *Haemophilus ducreyi*. *J Infect Dis*, 1988;157(5):1039-1043.
33. Roggell E., Hoofd G., Van Dyck E., Piot P. Enzyme immunoassays (BIAS) for the detection of anti-H *ducreyi* serum IgA, IgM antibodies. *Sex Transm Dis*, 1994;21:36-42.
34. Mantel N. Chi-square test with one degree of freedom: extensions of the Mantel Haenszel procedure. *J Am stat Assoc*, 1963;58:690-700.
35. Duncan ME., Reimann K, Tibaux G, Pelzer A, Mehari L and Lind I. Seroepidemiological study of gonorrhoea in Ethiopian women. 2. Socio-economic picture. *Genitourin Med*, 1991;67:493-7.
36. Duncan ME, Iamil Y, Tibaux G, Pelzer A, Mehari L and Darougar S. Seroepidemiological and sociological studies of genital chlamydial infection in Ethiopia women. *Genitourin Med*, 1992;68:221- 227.
37. Morley D., Lovel H. *My name is to-day*. MacMillan, London, 1986;46-57.
38. Onifade A and Osoba AO. Venereal disease among Nigerian women attending intra-uterine contraceptive device clinics. *J trop Med Hyg*, 1972;75:213-216.
39. Hopcraft M, Verhagen AR, Ngigi S and Haga ACA. Genital infections in developing countries: experience in a family planning clinic. *Bull Wld Hlth Org*, 1973;48:581-586.
40. Darougar S, Forsey T, Osoba AO, Dines RJ, Adelusi B and Coker Go. Chlamydial genital infection in Ibadan, Nigeria. *Br J Venereal Dis*, 1982;58:366-9.
41. Feleke Wand K'loos H. Sexually transmitted diseases. In *The Ecology of Health and Disease in Ethiopia*. (eds H K'loos and Zein Ahmed Zein), Chapter 1993;Chapter 22. pp 296-306. Westview Press, Boulder, San Francisco. Oxford.
42. Duncan ME, Roggen E, Tibaux G, Pelzer A, Mehari L and Piot P. Seroepidemiological studies of *Haemophilus ducreyi* infection in Ethiopian women. *Sex Transm Dis*. 1994;21(5): 280-288.
43. Verhagen AR and Gemert W. Social and epidemiological determinants of gonorrhoea in an East african country. *Br J Vener Dis*. 1972;48:277- 286.
44. Willcox RR. Importance of "feedback" in gonorrhoea control. *Br J Vener Dis*. 1965;41 :287-91.
45. Meheus A. Women's health: importance of reproductive tract infections, pelvic inflammatory disease and cervical cancer, in (eds A Germain et al). 1992;61-91. Plenum Press. New York.
46. Khodakevich L and Zewidie D. AIDS. in *The Ecology of Health and Disease in Ethiopia*. (eds H Kloos and Zein Ahmed Zein), 1993;Chapter 22, pp 319-337. Westview press. Boulder, san Francisco. Oxford.
47. Clay JC, Manuel ARG and Veeravahu M. Is gonorrhoea a good index of changed heterosexual behavior? *Genitourin Med*, 1988;64:135.

Original article

Prevalence and significance of sexually transmitted diseases among Ethiopian women attending antenatal clinics in Addis Ababa

M Elizabeth Duncan¹, Gerard Tibaus, Andree Pelzer, Letebirhan Mehari, John Peutherer , Hugh Young, Yasmin Jamil, Sohrab Darougar, Inga Lind, Karin Reimann, Peter Piot, Erwin Roggen, Peter L Perine

Abstract: To determine the prevalence of sexually transmitted diseases (STDs) and the risk for (i) the mother regarding pregnancy wastage and puerperal sepsis and (ii) the child with regard to congenital and neonatal infection, 342 routine antenatal clinic (ANC) at tenders were investigated. The prevalence of antibodies showing exposure to specific STD pathogens in pregnant women attending ANC was: syphilis (TPHA) 27%, (VDR:) 28%, gonorrhoea 43%, genital chlamydiae 54%, HBV 37%, HSV-2 35 %, H ducreyi 10%. High titre seropositivity suggestive of active infection was: gonorrhoea 10%, genital chlamydiae 31 %, HSV2 19%; with HBV SAg 5% -all of which are likely to be transmitted to the foetus in utero or during delivery. Only 10% of ANC at tenders had no serological evidence of any STD: 72% had serological evidence for two or more STDs. Among conditions requiring treatment vaginitis was the most important, 20% having a severe trichomonal infection. Despite the frequency of this condition it was noted that few women (4%) complained of vaginal discharge. Thus women attending the ANC revealed a high prevalence of STD. Consequently the foetus and neonate are put at risk because of intrauterine or intrapartum transmission of infection. The high prevalence among ANC at tenders also reflects the relative prevalence of STDs in the community. Measures such as screening at ANC and information and education regarding prevention are required to reduce STDs in pregnant women and their sexual partners. Prophylaxis for the neonate can be considered until this goal is achieved. [Ethiop. J. Health Dev. 1995;9(1):31-40]

Introduction

With the decline of endocarditis and pyelonephritis in pregnant women, the problems of serious infections in obstetric practice have shifted from the pregnant Of parturient woman to her unborn or infant child (1). The foetus and the premature newborn, physiologically disadvantaged by immaturity, are prey to endogenous micro-organisms harboured in the birth canal. The likely etiological causes of congenital infection are grouped together in the unlovely word STORCH (syphilis, toxoplasmosis, other [viruses] , rubella, cytomegalovirus and herpes viruses) each of which may cause clinical manifestations in the newborn (1) .Gonococcal ophthalmia, once a scourge in industrialised countries, is still extremely important in developing countries with highly prevalent STDs (2). Maternal Chlamydia trachomatis infections cause premature rupture of the membranes and low birth weight as well as neonatal ophthalmia and pneumonia (3). Maternal syphilis has long been recognised as a health hazard for the child, while more recently hepatitis B (4,5) and HSV2 have been shown to be vertically transmitted, the latter being passed from mother to child from infected genital lesions during vaginal delivery (1).

Ethiopia is a country where STDs are highly prevalent (6). The prevalence of STDs among ANC at tenders has not been quantified but for two notable exceptions. Screening for syphilis at a mother and child health clinic showed that 15%-17.6% (7,8) of the mothers were sero-positive. The prevalence of Neisseria

¹the Department of Medical Microbiology, University of Edinburgh, Ahlaine, Cardrona, Peebles, EH45 9HK, UK.

gonorrhoeae was 9% in 200 isolates from asymptomatic parturient women (9). N. I gonorrhoeae were also isolated from 28% of 11 women with puerperal sepsis (9).

Routine antenatal screening for STDs has been, and still is for many African countries, only by serological tests for syphilis, usually using the Venereal Diseases Reference Laboratory (VDRL) or Rapid Plasma Reagin (RPR) tests. Gonorrhoea has been identified by the presence of intracellular gram negative diplococci in Gram-stained smears of endocervical or vaginal discharge. Only recently have serological tests using micro- techniques become available for an increasing number of STDs.

To quantify the problem in terms of prevalence of STDs and the related risk for the mother developing puerperal sepsis, and of the child with regard to congenital and neonatal infection, the pregnant women attending ANC were investigated. The data are part of a larger investigation of socioeconomic factors associated with the prevalence and transmission of STDs and cervical cancer among 2111 Ethiopian women conducted in 1975.

Permission to carry out the study and to send patient data, sera and cytological slide preparations to Europe for processing was given by the Ministry of Health of Ethiopia.

Methods

A total of 2111 Ethiopian women attending clinics in two teaching hospitals and an MCH clinic in Addis Ababa were enrolled in this

Table 1: **Distribution of pregnant women by clinic**

Clinic	No. seen	No. pregnant*
Antenatal	342	342
Postnatal	106	0
Family planning	542	8
Gynaecological	1121	184
Total	2111	534

*no refers only to the women attending the ANC

cross-sectional study (Table 1), after giving informed verbal consent. Pregnant women attending the ANC regularly were entered in the study on the basis of first come first to register for the clinic without other criteria for pre-selection. None of those invited to take part refused to do so.

Details regarding the study number and patient criteria, collection of data, serum storage and timing of testing are recorded elsewhere (10). The collection of data, cytology slides and sera, and the VDRL test were made during an eight month period in 1975 and 1976 while ethnic and socioeconomic factors could be assessed independently of, population migration as occurred during the revolution. In brief:

Patient socio-economic data was collected by means of questionnaire completed, in private, by an Ethiopian female assistant, in Amharic with translation into other languages if required.

Clinical data including the cytological smears and blood samples, were obtained by two physicians. Particular attention was paid to the state of the cervix and for evidence of upper and lower genital tract infection, 11 involving the urethra (U), salpinges (S) and Bartholin glands (B) which were inspected (U,B) and palpated (U,S,B) (11).

Cervical cytological data for cancer cells, excessive numbers of polymorphonuclear (PMN) cells (evidence of cervical infection), and for presence of trichomonas and monilia hyphae (evidence of heavy vaginal infection involving the cervix) were obtained from 11g Papanicolaou stained smears examined in Liege by a physician.

Serological tests for syphilis were carried out in Addis Ababa using VDRL; in Edinburgh for syphilis using TPHA (12) and hepatitis B virus (HBV) (13); in London for herpes simplex virus (HSV2) (14) and Chlamydia trachomatis D-K (CTD-K) and Lymphogranuloma venereum 1-3 (LGV) (15); in Copenhagen for N. gonorrhoeae (gonococcal antibody test (GAT) (16); and in Antwerp for Haemophilus ducreyi (17,18).

Statistical methods: Data were stored and computed in Liege by G. Tibaux. Statistical analysis was made using the Chi-square and Cochran-Mantel-Haenszel General Association Statistic (19).

Results

Sociodemographic data of women attending ANC are shown in Table 2. The prevalence of antibodies showing exposure to specific STD pathogens in pregnant women attending ANC is shown in Table 3 (syphilis (TPHA) 27%, (VDRL) 28%; gonorrhoea (GAT) 43% ; genital chlamydiae 54%; HBV 37%; HSV-2 35%; H ducreyi 10%). Of particular interest is the prevalence of high titre seropositivity suggestive of active infection: gonorrhoea 10%, genital chlamydiae 31 %, HSV-2 19%; also HBV SAg 5% and HBeAg 4% .All these infections are likely to be transmitted to the foetus in utero or during delivery .

Palpable thickening of urethra, salpinges and Bartholin glands with/without tenderness was regarded as evidence of present/past genital infection (II). Assessment of Fallopian tubes by palpation was only possible up to 14-16 weeks gestation. Clinical evidence of PID was 23% overall, chiefly due to urethritis, although five women with a normal pregnancy had acute salpingitis, and II (3%) had oophoritis (Table 3).

Cervical cytology revealed no cervical cancer among ANC at tenders, but 36% had grossly infected slides indicative of cervicitis, 20% had T. vaginalis in the smear indicating presence of a severe vaginal infection.

Table 2: Socio-demographic status of aNC attenders

	No	(%)
Ethnic group		
Amhara	188	(56)
Oromo	41	(12)
Guragie	69	(20)
Tigre	28	(8)
Othe*	14	(4)
Total	340	
Religion		
Ethiopian Orthodox	301	(89)
Moslem	36	(11)
Origin		
Urban	312	(92)
Rural	28	(8)
Age		
<20	49	(15)
20-24	106	(31)
25-29	95	(28)
30-34	57	(17)
35-39	22	(7)
40-49	7	(2)
>50	0	
Parity		
0	90	(26)
1	64	(19)
2	56	(16)
3-5	84	(25)
6-10	48	(13)

>10	2	(1)
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* 50% (36/72) were Moslem

NB. of women attending ANC, only 27 (8%) had used any form of contraception: 25 pill, 2 IUCD

Only 10% of ANC at tenders had no serological evidence for any STD: 72% had serological evidence of two or more STDs. (Table 4).

The chief complaints among ANC at tenders were due to the discomfort of late pregnancy, in three cases to onset of labour in the former group and to abortion in the second group (Table 5). The majority of ANC attenders were seen in the third trimestre of pregnancy, Among conditions requiring treatment (Table 6) vaginitis was the most important, chiefly due to trichomonal or monilial infection, Despite the frequency of this condition it was noted that few ANC attenders (4%) complained of vaginal discharge,

Discussion

Epidemiological surveys in selected population groups yield useful data on STDs prevalence in the community in which antenatal patients are considered as a 'normal risk' group (20) of healthy women of reproductive age group. Hence the high exposure to STDs detected among ANC attenders must be of concern, as they reflect the relative prevalence of STDs in the community. The higher seroprevalence of STDs in pregnant women attending GOPD may reflect the socioeconomic profile of these women. Of particular concern to obstetricians and neonatologists is the risk to the mother of puerperal sepsis (2,21), and vertical transmission to the foetus in utero or during parturition.

Prevalence rates for syphilis among African pregnant women are high (22,31). The high prevalence of reactive serological tests for syphilis in this study indicates not only that the prevalence in the community is high, but also that antenatal screening and treatment for this disease is essential. Syphilitic infection in the mother may result in abortion, intrauterine death, intrauterine growth retardation (IUGR) and congenital syphilis. With highly endemic maternal syphilis, congenital syphilis causes foetal and perinatal death in up to 40% of the infants affected. Rates for congenital syphilis are 850/100,000 live births in Lusaka and 3,200/100.000 in Addis Ababa (32,8) treatment of syphilis in pregnancy is normally based on positive specific serology. If, however, facilities are not available to confirm or disprove the positive non-specific test (VDRL) treatment is normally given without confirming the diagnosis. In areas of high prevalence, particularly where there is past history of abortion or unexplained perinatal death (including macerated foetuses), it is suggested that routine penicillin prophylaxis is not only justifiable (33) but that Imass treatment with a single dose regimen of penicillin of all clinic attenders would be cost effective, leaving clinic staff free to investigate the high risk groups (22). Without simultaneous treatment of infected sexual partners, reinfection would be likely and high prevalence (25%) of congenital syphilis may still be found (30).

In Ethiopia, 21 % of children of seropositive mothers developed signs of syphilis, while the stillbirth and abortion rate of infected women was almost double that of the normal clinic population (7) .A contemporaneous study to this one found that syphilis was the fourth most common cause of perinatal death and accounted for 10% of the 70 perinatal deaths per 1000 births and almost 5% of all postneonatal deaths (34).

Table 3: Sexually transmitted diseases and gynaecological conditions in ANC attenders

Diagnosis	No teste	No Positive	(%)
Syphilis (TPHA)	307	83	27
Syphilis (VDRL)	314	84	27
N. gonorrhoeae (GAT)	308	131	43
*Titre $\geq 1/320$	308	32	10
C. trachomatis			
(D-K & LGV 1-3)	306	164	54
*Titre $\geq 1/64$	306	96	31
Hepatitis B virus	309	113	37
HBV Sag positive	309	16	5
HSV 2	306	108	35
*Titre $\geq 1/128$	306	59	19
H. ducreyi	306	32	10
#Seronegative	342	33	10
Cervical cytology			
infection	298	107	36
Trichomoniasis	298	60	20
PID (BUS)	339	79	23
Bartholinitis	339	11	3
Urethritis	339	73	22
**Salpingitis	339	5	1

No. = number Treponema pallidum haemagglutination assay
GAT = gonococcal antibody test HSV 2 = Herpes simplex virus 2
PID = pelvic inflammatory diseases B = Bartholinitis
U = Urethritis S = Salpingitis
High titre indicates present or active infection
#Seronegative = Women with no serological evidence for any of the
STDs shown above
** Salpingitis could only be assessed on those with pregnancy <14-16
weeks.

In Zambia congenital syphilis/syphilitic infection is implicated in 20-30% of the total perinatal mortality which is 50 per 1000 births (35). Additionally 19% of miscarriages in Zambia are attributed to syphilis (36), while there is a 28-fold increased risk for stillbirths among women with RPR seroreactivity at titre $> 1/23$ (24). Almost 9% of the infants under three months of age admitted to hospital and 7.5 % of neonates admitted to intensive care units had congenital syphilis (28).

The 43% GA T seropositivity in normal risk Ethiopian women indicates a high level of gonococcal infection in the community. The 10% seropositivity at titre $\geq 1/320$ indicative of active infection is comparable to 9% culture positivity found in parturient women (9,11), and to the prevalence reported from many sub-Saharan countries (35,37-40).

Gonococcal infection in the mother, usually asymptomatic, is found in the endocervix, urethra and Bartholin glands. Acute gonococcal salpingitis may occur in the first trimester and simulate the signs and symptoms of ectopic pregnancy. The significance of a high level of infection in parturient women is the subsequent development of puerperal sepsis. *N.gonorrhoeae* is an important primary pathogen isolated from 18-34% of women with

Table 4: Seroprevalence of STDs among Antenatal Clinic attenders in Addis Ababa

Seroprevalence	ANC attenders	
	No	(%)
Negative (All STD)	33	(10)
Positive		
1 STD	60	(18)
2 STDs	74	(22)
3 STDs	73	(21)
4 STDs	49	(14)
5 STDs	18	(5)
6 STDs	35	(10)
Total	342	

Untreated antenatal maternal gonorrhoea is also important because of risk of contamination of the neonate during its passage down the birth canal. Gonococcal ophthalmia is an emergency condition requiring immediate treatment because of risk of corneal ulceration. Silver nitrate drops into each eye at birth is effective but may cause chemical conjunctivitis. Alternatives are 10% sulphacetamide drops, penicillin, chloramphenicol or tetracyclines eye ointment, the latter also being effective against ocular but not pharyngeal *C.trachomatis* infection. In some developing countries, eye prophylaxis reduced the incidence of neonatal ophthalmia by 83% and 93% when using silver nitrate and tetracycline ointment, respectively (42).

Chlamydial serovars A-C, D-K and LGV are all sexually transmissible. The prevalence of antibody to genital chlamydiae (54%) in this study was very high: 31% had IgG titres $\geq 1/64$ or IgM titres $\geq 1/8$ indicating present/active infection (43). The role of genital chlamydial pathogens in the aetiology of pelvic infections is well established in industrialised countries, but a similar situation in developing countries has only recently been appreciated (44). For lack of reference, prevalence rates for *C.trachomatis* culture positive infections in pregnant African women (39,45-48) are similar to those for *N.gonorrhoeae*. The prevalence rates of 27- 71% diagnosed by serology without giving high titre seropositivity (49,50,25), or Chlamidiazyme tests (29) cannot

be compared with the culture rates. Although the role of *C.trachomatis* as a pathogen in puerperal sepsis has not yet been established, suggestive evidence for this is that *C.trachomatis* has been isolated from 6- 7% of healthy postnatal African women (40,38) but 8-20% with puerperal sepsis (51,41,40). *C.trachomatis* does however cause post-abortion sepsis (52). *C.trachomatis* has replaced *N.gonorrhoeae* as the most important single etiological agent of neonatal infections, worldwide, causing up to 32% to all cases (2). The transmission rate from an infected mother to her newborn is 30- 45% for *N.gonorrhoea* and 30% for *C.trachomatis* (37,2).

Inclusion conjunctivitis, typically, develops within the second week of life; naso-pharyngitis, otitis media or afebrile pneumonia may occur 2-3 months after birth, associated with cough and marked tachypnoea. *C.trachomatis* has recently been reported to be the most common cause of ophthalmia neonatorum in The Gambia (33%), compared with *N.gonorrhoeae* (25%) (53). Prevention of infection of the newborn is based on the identification and treatment of the mother during pregnancy. Where the diagnostic methods/ facilities are lacking, empirical treatment is indicated for pregnant women whose male sexual partners have non- gonococcal urethritis (NGU). The mother should be treated with erythromycin 500mg, twice daily for ten days: tetracyclines, the standard treatment for chlamydial infections in men, should be avoided if possible during pregnancy because of possible adverse effects on the foetus .

Table 5: **Symptoms of ANC attenders**

Symptom	Attendees at ANC	
	No	(%)
Number of women seen	342	
Pain/discomfort		
Abdominal	32	
Pelvic	46	
Backache	11	
Other gynae. Pain	2	
Total	91	
Abnormal bleeding		
Amenorrhoea**	3	
Continuous bleeding	4	
Total	7	
Vaginal discharge	15	
Urinary symptoms		
Dysuria	9	

δ Frequency	0	
Total	9	

* Percentage of total symptoms may be misleading,

as some patients had more than one.

** These women did not realise that they were pregnant.

δ Unusually there were no complaints of frequency.

Maternal herpes infection during pregnancy has been associated with spontaneous abortion, congenital malformations of the central nervous system (CNS) and prematurity, while neonatal infections caused by HSV2 transmitted during the second stage of labour affect predominantly the skin and CNS. In industrialised countries, if the virus is known to be present in the genital tract at or near term, elective Caesarean, section is recommended (1). Apart from this study the only record of the prevalence of HSV2 in pregnant women in Africa is 53% in the Gambia (54). Congenital infection is rare in some developing countries because HSV 1 and HSV2 infections are almost universal in childhood, and women are immune to the viruses by the time they become pregnant.

Hepatitis B is endemic in Ethiopia, with regional variations (55). The prevalence among ANC attenders (HBV 37% (all markers), 5% HBsAg and 4% HBeAg) is at the lower end of the population ranges reported for both Ethiopia (56) and elsewhere (24,25,45,57). Where risk of vertical transmission is most important, vaccination of babies born to HBsAg positive mothers should be adequate.

However, where horizontal transmission may present an equally significant risk, ideally, all babies should receive active vaccination at birth. The cost of such a programme makes it a practical proposition only for a very few who are rich. (58). In Ethiopia, where hepatitis is the most important non-obstetric cause of maternal mortality (59), there were 93 cases with 31 maternal deaths (3.9/1000 deliveries) in 1973-74 (60): the mortality rate in 1973 rose to 43% during the third trimester while the known foetal wastage was 60% for those delivering in hospitals (58).

The risk to the mother of *H. ducreyi* infection is of developing genital ulcerative disease which would predispose to infection with HIV. In turn HIV could be transmitted to the foetus in utero. Apart from this, other possible risks to the neonate from maternal med. infection are at present unknown, and require further investigation.

Trichomoniasis, although common among Ethiopian pregnant women, the prevalence being in the middle of the reported range from other African countries (14-49%) (41,45,53,61,62), caused little symptomatic vaginitis. However as trichomonas can also be found in the urethra and Skene's glands, the symptoms may be confused with those of bacterial urinary tract infection. Probably the most important effect of the infection is the alteration of the vaginal pH, thus interfering with defence mechanisms in the vagina (33). The 2 g stat dose of metronidazole administered in the ANC (63) has revolutionised the treatment of what can be a troublesome and distressing condition.

This study has shown that women attending ANC in Addis Ababa in 1975/76 had a high prevalence of STDs. STDs can affect the mother, as well as putting the foetus and neonate at risk because of intrauterine or intrapartum transmission of infection. The high prevalence among

ANC at tenders also reflects the relative prevalence of STDs in the community. It has taken the emergence of HIV/AIDS, a fatal STD, to highlight the problems of STDs across Africa and the need to understand the epidemiology of these conditions, and to control transmission

Table 6: **Obstetric diagnosis and conditions requiring immediate treatment in women attending ANC**

Condition	Number
Number of women seen	342
In labour	3
with medical, gynaecological or Obstetric complication	27
UTI (upper)	5
Urethritis	15
Vaginitis	71
Cervicitis (acute)	3
Salpingitis	
Acute/chronic	4
Bartholin	
Cyst/abscess/infection	3
Abortion	1

by all means that are socially and culturally acceptable. Because of the mothers' concern for a healthy baby, screening and treating pregnant women and their husbands/sexual partners is recommended as a first step prevention of STDs among ANC attenders and must be a high priority for health care providers and administrators. Awareness of SAD as a problem, and understanding of the mode of transmission is essential. Education for STD prevention requires sensitivity as well as cultural attitudes and beliefs,," some African languages STDs are translated as women's diseases. Withholding details of the diagnosis in the mother or child until the male partner/father has been tested, to inform him of his (positive) result before his wife is given her result has been found to be an effective way of dealing with this misconception. Ultimately the best

prevention is fidelity in stable closed heterosexual relationships (64) with barrier methods for those involved in prostitution for economic survival. Such methods will result in the control of SAD, HIV/AIDS in particular.

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References

1. Hurley R. Serious infections in the newborn in *Infections in Obstetrics and Gynaecology, Clinics in Obstetrics and Gynaecology* (ed D Charles), W.B. Saunders Company Ltd, London, Philadelphia, Toronto. 1983;65-91.
2. Laga M, Plummer FA, Nzanze H, Namaara W, Brunham RC, Ndinya-Achola JO, Maitha G, Ronald AR, D'Costa LJ, Bhullar VB, Mati JK, Fransen L, Cheang M and Piot P. Epidemiology of ophthalmia neonatorum in Kenya. *Lancet* ii, 1986;1145- 1149.
3. Harrison HR. Chlamydial infection in neonates and children, in *Chlamydia' infections* (eds D Oriel, G Ridgway, J Schachter, D Taylor-Robinson and M Ward), Cambridge University Press, Cambridge, London, New York, New Rochelle, Melbourne, Sydney. 1986;283-292.
4. Okada K, Kamiyama I, Inomata M, Imai M, Miyakawa Y and Mayumi M. e antigen and anti-e in the serum of asymptomatic carrier mothers as indicators of positive and negative transmission of hepatitis B virus to their infants. *New Engl J Med* 1976;294:746- 749.
5. Beasley RP and Stevens CE. Vertical transmission of HBV and interruption with globulin, in *Viral hepatitis* (eds GN Vyas, SN Cohen and R Schmid), Franklin Institute Press, Philadelphia. 1974;333-345.
6. Duncan ME, Tibaux G, Pelzer A, Reimann K, Peutherer JF, Simmonds P, Young H, Jamil Y, Darougar S. First coitus before menarche and risk of sexually transmitted disease. *lancet* 1990;335:338-40.
7. Larsson Y and Larsson U. Congenital syphilis in Ethiopia. *Ethiop Med J* 1970;8:163-172.
8. Perine PL. Congenital syphilis in Ethiopia. *Ethiop Med J Zambia* 1983;17:12-14.
9. Perine PL, Duncan ME, Krause DW, Awoke S and Zaidi AA. Pelvic inflammatory disease and puerperal sepsis in Ethiopia. Etiology. *Am J Obstet gynecol* 1980; 138: 1059-63.
10. Duncan ME, Tibaux G, Pelzer A, Mehari I, Perine PL, Peutherer JF, Young H, Jamil Y, Darougar S, Lind I, Reimann K, Piot P and Roggen E. A sociological and serological study of attenders at family planning clinics in Addis Ababa. {submitted to the *Ethiop J Hlth Dev*}
11. Duncan ME, Reimann K, Tibaux G, Pelzer A, Mehari I and Lind I. Seroepidemiological study of gonorrhoea in Ethiopian women. 1. Prevalence and clinical significance. *Genitourin Med*, 1991;67:485- 92.
12. Young H, Henrichsen C and Robertson DHH. Treponema pallidum haemagglutination test as a screening procedure for the diagnosis of syphilis. *Br J Vener Dis*, 1974;50:341-46.
13. Peutherer J F, Mackay P , Ross R, Stah I S and Murray K. Use of hepatitis B antigen produced in *Escherichia coli* in an assay for anti-HBc. *Med lab Sci* 1981 ;38:355-58.
14. Forsey T and Darougar S. Indirect micro. fluorescence test for detecting type-specific antibodies to herpes simplex virus. *J Clin Pathol*, 1980;33: 171-76.
15. Treharne JD, Darougar S and Jones BR. Modification of the micro-immuno fluorescence test to provide a routine sero diagnostic test for chlamydial infection. *J Clin Pathol*, 1977;30:510-7.
16. Reimann K, Odum I, Larsen SO and Lind I. Indirect haemagglutination test using gonococcal pilus antigen: how useful to diagnose gonorrhoea? *Genitourin Med*, 1987;63:250-55.

17. Museyi K, Van Dyck E, Vervoort T , Taylor D, Hoge C and Piot P. Use of an enzyme immunoassay to detect serum IgG antibodies to *Haemophilus ducreyi* J Infect Dis,1988;157(5): 1039-1043.
18. Roggen E., Hoofd G., Van Dyck E., Piot P. Enzyme immunoassays (EIAS) for the detection of anti-H ducreyi serum 19A, IgG and IgM antibodies. Sex Transm Dis, 1994;21:36-42.
19. Mantel N. Chi-square tests with one degree of freedom: extensions of the Mantel Haenzel procedure. J Am Stat Assoc, 1963;58:690-700.
20. Meheus A and de Schryver A. Sexually transmitted diseases in the third world, in Recent advances in sexually transmitted diseases and AIDS (eds JRW harris and SM Forster), 1991;201-217.
21. Duncan ME, Perine Pl, Krause DW, Awoke S and Zaidi AA. Pelvic inflammatory disease and puerperal sepsis in Ethiopia II: Treatment. Am J obstet Gynecol, 1980; 138: 1059-63.
22. Guinness IF, Sibandze S, McGrath E and Cornelis Al. Influence of antenatal screening on perinatal mortality caused by syphilis in Swaziland. Genitourin Med 1988;64:294-297.
23. Meheus A, Friedman F, Van Dyck E, and Guyver T. Genital infections in prenatal and family planning attendants in Swaziland. East AfrMedJ,1980;57:212-217.
24. Watts TE, larsen S and Brown ST. A case-control study of stillbirths at a teaching hospital in Zambia, 1979-80: serological investigations for selected infectious agents. Bull Wid Hlth Org 1984;62:803-808.
25. Klugman KP, Patel J, Sischy A and McIntyre JA. Serological markers of sexually transmitted diseases associated with HIV-1 infection in pregnant black women. s Afr Med J 1991 ; 80:243-244.
26. Cooper-Poole B. Prevalence of syphilis in Mbeya, Tanzania -the validity of the VDRL as a screening test. East Afr Med 1986;63:646-650.
27. Watson PA. The use of screening tests for sexually transmitted diseases in a third world community -a feasibility study in Malawi. European J sex Transm Dis 1985;2:63-65.
28. Mabey DCW. Syphilis in sub-saharan Africa. AfrJ sex Transm Dis 1986;2:61-64.
29. Ndumbe PM, Watonsi E, Nyambi P , Mbaya P and Yanga D. Sexually transmitted infections in selected high risk populations in Cameroon. Genitourin Med 1992;68:193- 194. [Letter]
30. Mefane C and Toung-Mve M. Syphilis chez la femme enceinte, Libreville (Gabon). Bull Sac Pathol Exot 1987;80:162-170.
31. LilijestrandJ, Bergstrom S, Nieuwenhuis F and Hederstedt B. Syphilis in pregnant women in mozambique Genitourin Med 1985;61 :355-358.
32. Hira sK, Bhat CJ, Ratnam AV, Chintu C and Mulenga RC. Congenital syphilis in Lusaka -II. Incidence at birth and potential risk among hospital del iveries. East Afr Med J 1982;59:306-310.
33. Ross sM. Sexually transmitted diseases in pregnancy, in Obstetric problems in the developing world, Clinics in Obstetrics and Gynaecology (ed RH philpott), W.B. saunders Company Ltd, London, Philadelphia, Toronto. 1982;565-592. .
34. Naeye RL, Tafari N, Marboe CC and Judge DM. Causes of perinatal mortality in an African city. Bull Wid Hlth Org 1977;55:63-65.
35. Hira sK. Sexually transmitted disease -a menace to mothers and children. Wid Hlth Forum 1986;67:243-247.
36. Ratnam AV, Din sN, Hira sK, Bhat GJ, Wacha DsO, Rukmini A and mulenga RC. Syphilis in pregnant women in Zambia. Br J Venereal Dis 1982;58:355-358.

37. Galega FP, Heymann DI and Nasah BT . Gonococcal ophthalmia neonatorum: the case for prophylaxis in tropical Africa. *Bull World Health Org* 1984;62:95-98.
38. Welgemoed NC, Mahaffey A and Van den Ende J. Prevalence of *Neisseria gonorrhoeae* infection in patients attending an antenatal clinic. *S Afr Med* 1986;69:32-34.
39. Braddick MR, Ndinya-Achola JO, Mirza , NB, Plummer FA, Irungu GT, Sindi SKA and , Piot P. Towards developing a diagnostic algorithm for *Chlamydia trachomatis* and *Neisseria gonorrhoeae* cervicitis in " pregnancy. *Genitourin Med* 1990;66:62-65.
40. Temmerman M, Laga M, Ndinya-Achola JO, Paraskevas M, Brunham RC, Plummer FA, and Piot P. Microbial aetiology and diagnostic criteria of postpartum endometritis in Nairobi, Kenya *Genitourin Med* 1988;64:172-175.
41. Mason PR, Katzenstein DA, Chimbira THK and Mtimavalye L. Vaginal flora of , women admitted to hospital with signs of li. sepsis following normal delivery, Caesarean section or abortion. *Centr Afr J Med* 1989;35:344-351)
42. Laga M, Plummer FA, Piot P, Datta P, Namaara Wand Ndinya-Achola JO. Prophylaxis of gonococcal and chlamydial ophthalmia neonatorum. *New Engl Med J* 1988;318:653-657.
43. Duncan ME, Jam i I Y, Tibaux G, Pelzer A, Mehari L and Darougar s. seroepidemiological and socioeconomic studies of genital chlamydial infection in Ethiopian women. *Genitourin Med* 1992;68:221-227.
44. Ballard RC, Fehler HG and Piot P. Chlamydial infections of the eye and genital tract in developing countries, in *Chlamydial infections* (eds D Oriel, G Ridgway, J schachter, D Taylor-Robinson and M Ward), Cambridge University Press, Cambridge, London, New York, New Rochelle, Melbourne, Sydney. 1986;479-486.
45. O'Farrell N, Hoosewn AA, Kharsany ABM and Van den Ende J. Sexually transmitted pathogens in pregnant women in a rural South African community .*Genitourin Med*. 1989;65:276-280.
46. Walker U and Hafler W. Prevalence of *Chlamydia trachomatis* in pregnant women and infertility cases in Abeokuta, Nigeria. *Trop Med Parasit* 1989;40:77-78.
47. Beaujean G and Wi Ilems I. prevalence of *Chlamydia trachomatis* infection in pregnant women in Zaire. *Genitourin Med* 1990;66: 124-125 [letter]
48. Leclerc A, Frost E, Collet M. Goeman j, Bedjabaga L. Urogenital *Chlamydia trachomatis* in Gabon: an unrecognised epidemic. *Genitourin Med* 1988;64:308-11.
49. Kadi Z. Bouguermouh A, Djenoui T , Allouache A, Dali S, Hadji n. Chlamydial genital infection in Algiers: a sero- epidemiological survey. *Trans Roy Soc Trop Med Hyg* 1990;84:863-5.
50. Mabey DCW, OgbaseJassie G, Robertson jN, Heckels jE and Ward ME. Tubal infertility in the Gambia: chlamydial and gonococcal serology in women with tubal occlusion compared with pregnant controls. *Bull World Health Org* 1985;63:1107-1113.
51. Bentsi CKlufio CA, Perine PL, Bell TA, Cles LD, Koester CM and Wang S-P. Genital infections with *Chlamydia trachoma tis* and *Neisseria gonorrhoeae* in Ghanaian Women. *Genitourin Med* 1985;61 :48-50.
52. Outhie j, Hobson D, Tait IA, Pratt BC, Rees E and Lee N. The outcome of termination pregnancy in relation to pre-operative social;clinical and microbiological features, in *Chlamydial infections* (eds D

- Oriel, G Ridgway, J Schachter, D Taylor- Robinson and M Word), Cambridge University Press, Cambridge, London, New York, New Rochelle, Melbourne, Sydney. 1986;197-200.
53. Mabey D, Hanlon P, Hanlon L, Marsh V and Forsey T. Chlamydial and gonococcal ophthalmia neonatorum in The Gambia. *Annals of Tropical paediatrics* 1986;7:177:180.
 54. Mabey DCW, Lloyd-Evans NE, Conteh S and Forsey T. Sexually transmitted diseases among randomly selected attenders at an antenatal clinic in The Gambia. *Br J Venereal Dis* 1984;60:331-336.
 55. Tsega E, Mengesha B, Hansson BG, Lindberg J and Nordenfelt E. Hepatitis A, B and delta Infection in Ethiopia: a serologic survey with demographic data. *Am J Epidemiol* 1986;123:344-351.
 56. Tsega E, Viral Hepatitis, in *The Ecology of Health and Disease in Ethiopia* (eds H Kloos and Zein Ahmed Zein), Westview Press, Boulder, San Francisco, Oxford. 1993;213-222.
 57. Jama H, Grillner L, Biberfeld G, Osman S, Isse A, Abdirahman M and Bygdemen S. Sexually transmitted viral infections in various population groups in Mogadishu, Somalia. *Genitourin Med* 1987;63:329-332.
 58. Duncan ME. Tropical infections in pregnancy, in *Recent Advances in Obstetrics and Gynaecology* (ed J Bonnar), Churchill Livingstone, Edinburgh, London, Melbourne and New York. 1987;33-63.
 59. Kwast BE, Kidane-Mariam W, Saed EM and Fowkes FGR. Epidemiology of maternal mortality in Addis Ababa: a community-based study. *Ethiop Med J* 1985;23:7-16.
 60. Clinifit Report 1973 and 1974. Clinical Report of the St Paul's Hospital Maternity Department, Addis Ababa, Ethiopia. Prepared by the Medical Faculty Obstetrical Department for 1973 and 1974.
 61. Osoba AO and Onifade A. Venereal diseases among pregnant women in Nigeria. *West Afr Med J* 1973;22:23-25.
 62. Nasah BT, Nguematcha R, Eyong M and Godwin S. Gonorrhea, trichomonas and candida among gravid and nongravid women in Cameroon *Int J Gyn Obstet* 1980;18:48- 52.
 63. Ross SM. Vaginal and oral nitrimidazine in the treatment of vaginal trichomoiiasis. *Br J Venereal Dis* 1973;49:310-313.
 64. WHO. Message for World AIDS day, 1st December 1991. Cited by Dixon P. 1993. In *Tear Times*, Spring Issue 60:18-21.

Original article

Unmet need and the demand for family planning in Addis Ababa

Tekabe Ayalew, Amare Dejene and Yared Mekonnen¹.

Abstract: A study was conducted in 1993 to estimate the unmet need for family planning service in Addis Ababa. The city was categorized for the purpose of the study, based on population density. Five kebeles were selected from each category and one hundred households from each kebele and a total of seven hundred fifty women were included. Among the interviewed, the total unmet need was 49% (368), of which 43.7% (328) want to limit and 5.3% (40) want to space. The prevalence of contraceptive use (met need) was 21.6% (162), indicating a great deal of potential users and the need for appropriate method to reach them. It was found that age, knowledge about contraception and level of education of respondents were the most important factors affecting unmet need and there was no significant interactive effect. [Ethiop. J. Health Dev. 1995;9(1): 41-45]

Introduction

A favourable balance between population growth and socio-economic development is a necessary part of the strategy for development. There is an explosive urban growth in almost all parts of the developing countries and the population of cities in these countries is growing at 3.6% per year compared to 0.8% in developed countries (1). As a result, there is more demand for social services (including health and education services) which are limited in number. Family Planning is, in addition to being a right of an individual, a demographic necessity which will help to maintain a permanent decline in fertility, thereby minimizing its contribution to socio-economic problems (1). But this decline in fertility will only be reached by widespread voluntary uses of modern family planning (FP) methods.

Extending FP services has, therefore, become a priority target of the development program, both as an end in itself and to promote other development goals (1). Addis Ababa is now facing the strongest migratory pressure, in addition to its natural population growth. According to the reports of the Central Statistics Authority (CSA), the population of the city is estimated to be 2.4 million at present, while according to the 1984 census, it was 1.4 million (2). This shows that the population of the city has increased by 71.4% within 8 years. Obviously, this has contributed a lot to the increase in the level of unemployment and the pressure on education and health services.

It is plausible that governments should establish FP goals on the basis of the demand for the service and that they should impose demographic goals on FP providers (3). However, in developing countries, there is lack of reliable measurement of the demand for FP to enable FP agencies to scale their service based on the demand for FP. Using the estimate of women FP

users in the reproductive age group will over-estimate the scale of the service, for it includes those women who are currently using, and do not need, the service (4).

Currently, the contraceptive prevalence for the country is estimated to be 4.8% and 32.8% for Addis Ababa, for currently married women, with a total fertility rate of 6.4 and 2.6, respectively (5). Although the degree of unmet need in Addis Ababa is not well quantified, it is probably similar to other reports from the capital cities of developing countries, where the unmet need varies from 40% in Togo (6) to 60% in Kenya (7). It is estimated that the creation and successful implementation of national population policies can help nations to

¹From the National Research Institute of Health, P.O.Box 1242, Addis Ababa, Ethiopia

achieve their development goals and improve the quality of life of their citizens (8). In view of this fact, given the more immediate local concerns like provision of public services and rehabilitation of the post-war economy and social system, the promulgation of the national population policy of Ethiopia and its ongoing implementation will have a positive impact in promoting the supply and use of FP services. This study was conducted from April 1993 to November 1993 to estimate the unmet need for family planning services among ever married women in Addis Ababa.

Methods

The study measured unmet need for FP based on the respondents' statement (while they are not currently using contraception) that they want no more children (limiting) and want to delay the next (whether the first or not) pregnancy for two or more years (spacing). That is, measuring the proportion of women who are not using contraception but wish to control their fertility -limiting or spacing their birth.

The demand for FP is the sum of contraceptive prevalence (met need) and unmet need for FP (those who want to limit or space their birth but are not using contraception) (9). The region of Addis Ababa served as the sampling frame for the study. There were a total of 179, 169 married women in the city with an average of 631 married women per kebele (there are 284 kebeles) (2). And the sampling frame was all married women in the city according to the 1984 census. There is a clear difference in population density between the densely populated inner part and the relatively sparsely populated periphery. The population per kebele and the area of each kebele was considered in categorizing the kebeles as densely and sparsely populated.

Five kebeles were selected from each category and seven hundred fifty ever married women were selected from the kebeles.

Households from each kebele were selected randomly and in case of more than one ever married woman in a household, the one who owns the house or is registered at the kebele was taken.

All selected kebeles were initially approached by the investigators and discussion was made

Table 1: **Percentage of ever married women with unmet and met need for FP by age, Addis Ababa, 1993**

Age group	Unmet need for FP		Total (n=368)
	Want to limit (n=328)	Want to space (n=40)	
20-24	7.0	27.9**	34.9
25-29	18.9	16.7	35.6
30-34	31.4	4.3	35.7
35-39	46.1	3.5	49.6
40-44	62.3	0	62.3
45-49	70.8**	1.2	72.0**
Overall	43.7	5.3	49.0
	met need for FP		total (n=157)
	Limiting (n=122)	Spacing (n=35)	
20-24	13.9	7.0	20.9
25-29	18.9	15.6**	34.5**
30-34	21.3	6.7	28.0
35-39	14.3	1.7	16.0
40-44	13.8	2.2	16.0
45-49	14.1	0	14.1
Overall	16.7	4.9	21.6

**p < 0.001

with the concerned authorities on how to implement the project. Enumeration was carried out by female high school graduates who were trained for one day for this purpose. The enumerators were selected from each

kebele under study, and were assigned to their respective kebeles to collect data. A standard pre-coded questionnaire for family planning studies (10), which contains information of importance to the study, was pretested, modified and administered.

Data processing and analysis were done using Dbase III Plus (Ashtone- Tate Corp. 1990), SPSS/PC (SPSS Inc, Chicago, 1987) and GLIM (Royal Statistical Society, 1986) programs.

Results

A model was fitted, using SPSS/PC's loglinear modelling (considering all seemingly important variables which include parity, number of live children, religion and ethnic group), and it was found that age, knowledge about contraception and education of respondents were (in order of importance) the most important variables affecting unmet need for FP .

Among the interviewed, the total unmet need was 49.0%, of which 43.7% want to limit and 5.3% want to space their birth. Almost half of the women are with unmet need, while the proportion of women who are currently using any type of contraception are 21.6% .This means that, if the unmet need was to be satisfied, the prevalence would rise to 70.6% - the total demand for FP .

Table 2: **Percentage of women with unmet need for FP by knowledge about contraception, Addis Ababa, 1993.**

Knowledge unmet need for FP			
	Want to limit (n=328)	Want to space (n=40)	Total (n=368)
Yes	30.7	5.2*	35.9
No	78.5**	2.5	81.0**

* P<0.005, ** P<0.001

The total unmet need for FP increases as the age of women increases (Table I). Unmet need for limiting increases as age increases while unmet need for spacing decreases. This depicts that the major component of unmet need is that for limiting. The trend of total unmet need is determined by that of unmet need for limiting. Likewise, demand for limiting takes the greatest share in the distribution of the total demand for FP The prevalence of contraceptive use is high among those women aged 25-34 years, while it is low among those women at the two ends of the age spectrum.

This is an important indication for policy makers that, though the prevalence is higher for limiters, still a great effort has to be made to reach the demand of those who want to limit their birth.

Those women who are ignorant about contraception have a higher unmet need than those who know about it (Table 2). Women who do not know about contraception have a higher unmet need for limiting than those who know. But in the case of unmet need for spacing, those women who know about contraception have a higher unmet need than those who do not know.

As indicated in Table 3, those women with higher level of education have a lower unmet need for FP than those with lower level of education. This is also true in the case of unmet need for limiting, while for spacing, it is those women with a higher level of education who have a higher unmet need than those with a lower level (Table 3). The prevalence of contraceptive use is high among those with a higher level of education than the others. Most of the women who use contraception use it for limiting rather than spacing. In the case of total demand for FP , those women with a low level of education have the highest total demand for FP. Women with a low level of education have more unmet need than those with a high level of education. The marital status of women has an important implication for policy makers in that those who are in union with their husbands have a lower unmet need for limiting

Table 3: **Percentage of ever married women with unmet need for FP by education, Addis Ababa 1993.**

Level of education	Unmet need for FP		
	Want to limit (n=328)	want to space (n=40)	Total (n=368)
Illiterate	67.9** (76.1**)	0.9 (2.7)	68.8** (78.8**)
Elementary	55.9 (67.2)	5.0 (7.6)	60.9 (74.8)
High school+	19.6 (46.6)	5.4* (16.1*)	25.0 (62.5)

Note: Percentages in parenthesis indicate total demand for family planning service.

than those who are not in union; and those in union have a higher unmet need for spacing than those women who are not in union (Table 4).

This implies that there is a need for FP service to reach, in addition to the conventional target group, women who are not in union with their husbands. Since unmet need is defined as the proportion of women who are not currently using contraception but want to limit or space their birth, it is important to look into the reasons why these women are not using contraception.

The reasons for not currently using contraception are: want children (30.6%), difficult to obtain (17.3%), health concern (13.6%), religious reason (3.6%), opposed to FP (2.8%), husband opposed (1.4%), and costs too much (0.4%).

The first group (who want children) are excluded from the analysis while considering unmet need. Most of the women who want to control their fertility do not currently use contraceptives because they could not obtain any; some think it causes health related problems. Furthermore, there are others who do not use contraception for religious reasons, their husbands' opposition or their own opposition to FP .

Discussion

The unmet need for FP in Addis Ababa (49%) approximates that of developing countries like Kenya (60%) (7) /and Togo (40.1%) (6). This shows that there are a great number of potential users of contraception. An appropriate method has to be designed to reach them.

Age is an important variable in determining the unmet need and thereby the demand for FP. The younger women need spacing births rather than limiting, while the older women prefer to limit. This is also true for Sudan (11). This indicates that the FP service has to take into account these needs and to use a method to suit the need of the target group - temporary contraception for the younger age and a permanent one for the older age-group.

Family planning programs have a major impact on child survival. The chance of survival of a child is much higher if couples are able to space births, to limit the number of children and avoid pregnancies too early or too late in the life of the other .

There is an obvious gap between knowledge and use of contraceptives. Not all who know about contraception practice it. This is due to many reasons, including limited access to the service and fear of side effects. Those who are not using contraception because of lack of access to it might practice it if the service was made accessible, but still there are those women who are not using contraception and will not use it even if the service was made accessible. Definitely, these groups need a more effective communication, including consultation and advice rather than making the service accessible. However, those who have knowledge about contraception are more likely to seek the service and they have the highest unmet need.

Education was found to be one of the key factors in changing patterns of contraceptive

Table 4: **Percentage of ever married women with unmet need for FP by union status, Addis Ababa, 1993.**

Current union	Unmet need for FP		
	Want to limit (n=328)	Want to space (n=40)	Total (n=368)
in union	45.0	6.1*	51.1
Divorced	64.0	2.7	67.6
Separated	72.1	1.2	73.3
Other	76.7**	0	76.7**

use. This is in line with previous studies conducted by CSA (5). Educated women are more likely to know about what service is available and are more likely to seek and use the service. That is why women with a higher level of education have a much higher level of contraceptive use.

Girls in general, and particularly those from families living at subsistence level, are unlikely to get the opportunity to attend school partly because of male preference and partly because of the fact that children, especially girls, are needed as unpaid child labour. This necessitates the importance of FP education, apart from formal education, that can be organized by FP agencies. Further investigation, in relation to women's choice of contraception method, is required to know why the majority want to limit their children than to space their birth.

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References

1. Sadik N. Choice or chance. Populi, 1991; 18(2):4-231.

2. Central Statistics Authority , Ethiopia. Analytical Report at National Level, Addis Ababa, 1991.
3. Expert group meeting on family planning, health and wellbeing, Bangalore, India, Oct.20-30. JOICFP News, Washington D.C., 1992; No.222.
4. Dwiyanu A. The demand for family planning in Indonesia 1976 to 1987: A supply- demand analysis. Demographic and Health Survey World Conference Proceedings, 1990; 3:2135-55.
5. Central Statistics Authority , Populations Analysis and Studies Center, Ethiopia. The 1990 National Family Planning and fertility survey report, Addis Ababa, 1993.
6. International Programs of the Population Reference Bureau (PRB). Unmet need for family planning, Africa Demographic and Health Surveys Chart Book, U.S.A., 1992: 14- 16.
7. DHS. Kenya Demographic and Health Surveys: Summary Report, Maryland, 1989.
8. Inter-American parliamentary group on population and development. Population Policy in Latin America and the Caribbean, U.S.A., 1993.
9. Institute for Resource Development Inc. Unmet need and demand for family planning. Comparative Studies No.5, Maryland, 1990.
10. IRD/Macro International Inc. Model 'B' Questionnaire, Maryland, 1990.
11. LIRD/Macro International Inc. 1991. Sudan: Demographic and Health Survey 1989/1990, U.S.A., 1991; 73-75.

Review article

Mental health in Ethiopia EPHA Expert Group report

Atalay Alem¹, Menilik Destal and Mesfin Araya¹.

Introduction

The American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV) conceptualizes the term 'Mental Disorder' as "a clinically significant behavioral or psychological syndrome or pattern that occurs in a person that is associated with present distress (painful symptom) or disability (impairment in one or more important areas of functioning) or with a significantly increased risk of suffering death, pain, disability or an important loss of freedom. ...this syndrome or pattern must not be an expectable response to a particular event" (1). The 10th edition of the International Classification of Diseases (ICD- 10), similarly uses the term to imply "the existence of a clinically recognizable set of symptoms or behaviour associated in most cases with distress and with interference with personal functions..." (2).

Such a definition is said to have influenced the decision to include certain conditions as mental disorders (1). This decision or classification has helped and will help to study the various aspects of conditions and thereby to devise preventive, therapeutic and rehabilitative techniques.

In this way, the developed countries have shown significant progress in the identification of priority areas and management of mental health problems (mental disorders) pertaining to their situations .

In Ethiopia, various prevailing conditions (eg. culture, civil war , natural adverse conditions, policies, etc.) have been hampering such progress. Although world-wide and few local studies have indicated the presence of mental disorders to the same extent as in developed countries, the unique characteristics of the many disorders in Ethiopia, their similarities with and discrepancies from disorders in the developed countries with respect to personal, geo-social and other epidemiological and clinical variables are not known. Because of this, and possibly other reasons, the establishment of organized and situationally tailored mental health services could not materialize in the country .

Nevertheless, great effort towards improvement is being made lately by Professional Ethiopians in the field. The effort of the professionals is being appreciated by the Ministry of Health of Ethiopia, World Health Organization and other professionals in the field who are doing their best to boost their educational and material capacities in their management tasks.

The Government of Ethiopia has Commissioned the Ministry of Health to work out a plan of action for the development of the country's mental health system. The action plan is reportedly submitted for approval. Also, for the first time in the country's history , a mental health legislation was recently formulated by an inter-sectoral committee and this is also awaiting

approval. This legislation will be one step ahead in facilitating mental health development and in protecting the rights (medical and social) of the mentally ill.

Given the above situations, we believe that the Ethiopian Public Health Association's (EPHA's) plan of including mental health for the short term workshop is very timely. Accordingly, this paper has the following objectives:

¹From the Amanuel Psychiatric Hospital and the Department of Psychiatry , Faculty of Medicine, P.O.Box 1176, Addis Ababa.

- 1.. To give an update of available information on the extent of mental health problems in Ethiopia as compared to the rest of the world.
2. To review the evolution of mental health services in the country .
3. To attempt to indicate policy options, plans and interventions pertaining ,to mental health problems in the Ethiopian context.

The global situation

Worldwide studies have shown the prevalence of mental health problems and their disabling effect at individual and national levels to be quite significant. This has led to the recognition, by member states of WHO, of mental health care as one of the priorities and to its inclusion in the program of primary health care. As a result, the past few decades have shown great changes in the pattern of mental health services.

In many countries, psychiatry and psychiatric services have transformed from isolation and rejection to integration and active involvement in general medical care.

The trend in the developed nations for the past three decades has been de-institutionalization -shifting the treatment of the mentally ill from the confinements of lunatic asylums to general hospitals and clinics and to community care. Such moves were said to be results of three main motivating forces:

- a) Those persons, mostly professionals, who were imbued with the ideology that community care would be far better for the mentally ill.
- b) Those in the government, who thought community care would be far cheaper .
- c) An array of civil right advocates who wanted to give the mentally ill their 'right and freedom' (3).

Following de-institutionalization, various organizational patterns of mental health services have been innovated in the community .Day hospitals, half-way homes, day-care centres, addiction treatment units, domiciliary care, etc. , can be cited as examples. Each one of these. has its specialities and caters for a particular group of clientele, thus allowing coverage of the overall spectrum of clinical conditions (4).

Many developing countries, have also taken measures to provide mental health care within the framework of primary health care. Some have managed to give the service at all levels of the health care system from the community health service to the highest referral hospitals. Results of such moves were found to be rewarding. The Number of people attending psychiatric out-patient services at district levels rose significantly. At the same time, the number of people requiring attention at central specialized centres was reduced. Results have also shown better response of patients to treatment and public satisfaction at having the service in their own community (5).

Mental health problems in Ethiopia

Traditional Notions Regarding Types of Mental Health Problems: Though not systematically categorized as in modern psychiatric nomenclature, there have, for centuries, been recognized syndromes of mental illnesses in traditional Ethiopian societies. Such syndromes are given different names in different ethnic languages.

Even though no consistent criteria are present, some of the terminologies connote the relative degree of severity of the individual's mental derangement and, accordingly, the degree to which individual patients are given/denied responsibilities. For example, in the Amharic language, "cherqun yetale" denotes a severely mentally ill person unfit for any responsibility. The Oromo word "maraattu" also denotes the same. "Wofeffe" or "nik" implies that a person is not too reliable because he/she has inconsistent behaviour due to episodic explosiveness or other unusual changes in his/her inter-personal communication. "Abbsho" is a term that describes an individual who had taken some psycho-active drug (herb) at some earlier period in his/her life, and who later develops psychotic-like behaviour whenever taking some alcoholic drink.

Prevalence of mental disorders in Ethiopia: Until recently, studies on the prevalence of psychiatric conditions in the country have been scarce. The few earlier studies were done mostly by foreigners. Most of these earlier studies were done using clinical samples from attenders of out-patient clinics. Two studies, one by Giel and van Luijk (6) and the other

Table 1: **Prevalence rates of mental disorders in Ethiopia (7)**

Source	Year	Sample	Measures ^a	Prevalence
Adult:				
Giel and van Luijk ¹⁰	1968	n=384	interview	8.6%
		Bonga Kessel	symptoms;	
Giel and Workneh ¹¹	1969	n=370	interview	9.1%
		South-west rural	kessel	
Kortmann ⁵	1985	n=40	SRQ	12.0%
		Addis Ababa	interview	
Teferi et al. ⁶	1988	n=2000	SRP	17.2%
		Hadiya-Kembata rural		
Samuel ²	1989	n=860	SRQ	12.3%
		Jimma, mothers		
Children:				
Giel and van Luijk ²⁸	1967	n=373	Teachers=	11.3%
		Bonda attending school	report	
		4-20 years		
Giel et al. ²³	1968	n=381	interview	5.2%
		Rural town	SW	
		0-20 years		
Samuel ²	1989	n=860	RQC	24.8%
		3-12 years	Behaviour	23.2%
		Jimma	problems	

^aThe Kessel classification includes explicitly psychiatric symptoms, unexplained physical symptoms, eg, psychosomatic, abnormal psychological reaction to all symptoms, and personality disorders. SRQ=24-item Self-Reporting Questionnaire of the WHO. RQC = 20-item Self-Reporting Questionnaire for Children of WHO. Behavioural problems = 54-items tapping externalizing and internalizing behaviour problems taken from Achenbach = s questionnaire.

by Kortmann (8) reported on community surveys. The methods used by these researchers and their findings are listed in the Table 1.

The late 80's and the 90's have shown changes in psychiatric research in the country . More Ethiopians have been involved in studying mental health problems locally. Also, these latter researches are done using standard instruments sponsored by the World Health Organization (WHO) [SRQ], and the WHO and the US Alcohol, Drug Abuse and Mental Health Administration (ADAMHA) [CIDI] to assess psychiatric conditions in different cultures (9, 10)

and which are supposed to be consistent in picking out cases despite cultural variations amongst nations. The other differences between the earlier and later studies is that the later use community samples.

In spite of using different methods, the results of the various studies showed closer figures of prevalence rates. Moreover, these results were also similar to findings in other parts of Africa and developing countries elsewhere. [The works of T.V.M. Joup 1986 (10), M Dadphale 1983 (11), Harding et al. 1980 (9) can be cited as examples]. From what has been reported in studies done in the country and from worldwide statistics, we can conservatively estimate that 12% of Ethiopians suffer from mental disorders. That is, out of a population of 50 million, six million currently have some sort of psychiatric disturbance. Of these, one million or 2% of the total population are suffering from the severest form of mental illness or psychosis whereas five million or 10% are suffering from milder disorders or neurotic conditions (7).

Probably, the figures could be higher for Ethiopia if studies covered wider areas and larger samples. This assumption emanates from the recognition of the unique extent of stressful situations in which the peoples of the country have been going through for the past few decades in particular .

The other aspect of prevalence studies in Ethiopia is the lack of information on. the extent of specific conditions. .Although the ICD and DSM have come up with codes for many clinical conditions under their classification system of mental disorders, only one of the researches done in the country (12) attempted to measure the prevalence of specific psychiatric illnesses. This lack is mainly due to :

a) the self-limiting coding system used in psychiatric out patient departments and in discharge summaries of in-patients. The coding system for mental illnesses allows the recording of only five classes of disorders without coding for specific psychiatric conditions. The five codes are:

1. 067 -psychosis
2. 068 -Neurosis
3. 069 -Mental retardation
4. 073 -Epilepsy
5. 078 4 -All other diseases of the nervous system

b) the lack (until recently) of standardized instruments for detecting specific psychiatric disorders in the community.

All the same, since the recent past, attempt has been going on at the different psychiatric centres to establish a pattern of recording specific diagnoses in addition to the existing five codes both at out-patient and in-patient records. Data thus collected at Amanuel Hospital show the following diagnosis pattern at out-patient and in-patient levels during a twenty-month period.

It must be clear that the population on which the hospital data are collected are not representative of the country's population for quite a few reasons. First, not many people in the country know about the existence of the medical alternative for helping the mentally ill. Second, some of those who are aware of the existence of the medical alternative refuse to accept it in principle and go

elsewhere to seek help. Thirdly, the medical alternative is in acute shortage in the country. Centres are available only in Addis Ababa, and other provincial cities and there are many problems which prevent a lot of patients from coming or being brought to these centres. Therefore, it is only a minority of the mentally disordered that get attention from health workers, particularly from mental health professionals. Fourthly, many mentally ill people do not come to the hospital until their illness reaches extreme severity and manifests itself in aggression, destruction or disruption of peace in some way. The fifth reason is shortage of drugs. The budget allocated for drugs in the hospital is very small and there is, in general, very frequent absence of essential psychotropic drugs in the country. People drop the idea of coming to the hospital when the news about the absence of drugs spreads.

Determinants of mental health

Traditional Concepts: There is probably more concordance in the notions of different ethnic and religious groups regarding the etiology of mental illnesses than regarding physical illnesses. In any ethnic or religious group, supernatural powers are given the attribute of controlling the well-being of the individual's mind. When a person goes mental awry, the cause is most of the time ascribed to the will of some supernatural force.

The will of such supernatural force(s) is said to be negatively directed towards an individual for various reasons. Some of such reasons are: a) when a person sins either by commission or omission; b) when a person contemplates of doing the forbidden; or c) where, a supernatural force acts against a person for his/her enmity towards a favoured one. People are also said to fall mentally ill if their minds are dwelt in (possessed) by spirit(s) of evil supernatural force(s). There are many assumptions as to why and when a person may be possessed by evil spirit(s). For example, when a person walks alone in the woods; when having sex in the open; when falling asleep in the meadow; when walking along the river-side around noon-time; when walking in a grave yard,... when entering a long-closed room without blessing self, etc.

In both the Christian and Moslem populations of the country, it is widely believed that there are certain individuals who have the capacity to make a person mentally ill by their magical power. Such individuals are supposed to be endowed with either good or evil spirit(s). They are feared and respected by the masses and often, offerings are given to them so that they may drive one's enemy mad or that they may protect one from going mad. The mechanisms they are said to use are often incantation, sorcery, enchantment, and certain rituals. "Debtera", "Kalicha", "Tenquai" and "Tila Wogi" are names of such powerful individuals.

Buda (evil eye) is another phenomenon widely believed to cause mental illness in people. When someone with the evil eye looks at a person, he/she may make that person mentally ill. The victim becomes restless, aggressive, destructive and shouts incoherently. The onset is very acute. The diagnosis is reached at later when the healer forces the victim (during exorcism) to talk about who made him ill. People could also be targeted by "evil eyes" when eating in front of others. Most victims of buda (evil eye) are children, adolescents and women, especially handsome ones.

Danqara/Metet: This is a unique phenomenon which is still practised by adversaries against each other. "Denqara" is an item on which the incantation of a magician ("debtara" or "tanquai ") is said to have been effected. When such an item is put on the roof, door, at the gate or in the compound of a person's home or across the path of that person, the person will be expected to develop some mental illness or some other misfortune will befall that person. The items often used for such purpose are the bodies of a dead mouse, or chicken or cat. Food and grain are also sometimes used.

Poisoning through food and drink is also widely believed to be cause of mental as well as physical illnesses or death. In certain areas in the country, it is the custom for hosts to first taste the food or drinks which they offer their guest(s) to reassure the latter about the safety (poison free) of the offered food or drink. If this is not done, the guest may refuse to accept or may insist {politely} that the host should taste the food/drink. During exorcism at holy water or church healing rituals, one can hear the mentally ill talk, whilst in a trance state, about having been made ill by being poisoned via food or drink. It is well known that some physical, psychological {personal}, familial, social and other environmental factors contribute either to the occurrence or perpetuation or both, of certain mental disorders. Some of such factors like malnutrition, chronic illnesses, separation, migration, natural disasters, unstable social situations, overpopulation, etc., have been very common in Ethiopia. But only one study has so far reported the association between some stressors and psychiatric symptoms {13}. In that study, it was found that divorced, separated and widowed people displayed a higher frequency of psychiatric morbidity. The study also found positive correlation between chronic illnesses like hypertension, diabetes, epilepsy and chronic liver disease and higher prevalence of psychiatric disorders. Mention was made earlier of the unique stressful situation in which peoples of this country have been through for the past few decades in particular. War, dramatic environmental {natural} changes and associated famine and political torture have been shaking the stability of the mental state of citizens. Such stressors are classified amongst the highest in causing mental disorders in individuals. They produce severe stress response in everybody and require excess and prolonged coping efforts {14}. Often times, such coping may fail in many individuals due to too much stress. As a result, a segment of the surviving population exposed to the above kind of adverse conditions develop psychiatric disorders. A common psychiatric disorder that is a sequel to such stressors is post traumatic stress disorder.

Post traumatic stress disorder (PTSD) is a condition which has been included in the psychiatric classification of disorders since DSM-111, 1980 {American Psychiatric Association}. The major symptoms of this disorder include: a) feeling numb to the world with a lack of interest in former activities, and a sense of estrangement from others, b) reliving the trauma repeatedly in memories and in dreams, and c) anxiety, which may manifest itself in problems of sleep, concentration and alertness. The disorder may develop immediately after or as late as months after the disaster.

One need not experience the unusual stressor for oneself to develop PTSD; simply witnessing others experiencing the stress can also produce the disorder in the witness. In other words, it is not only individuals who go the war front or who are tortured and maimed, or who lose significant figures during such disasters that develop PTSD. Taking into consideration the large areas of the country where civil war at various scales had been going on for decades, the millions

of people, military and civil, involved, the extent to which political torture and killings have been practised at every corner in urban and rural settlements, etc. , we can expect a huge but unnoticed number of Ethiopians to currently suffer from PTSD .

A 1988 study revealed that 15% of the male and 9% of the female American veterans who served in Vietnam from 1964 to 1965 still suffered from PTSD 15 years after returning home (15). The author of the paper stressed on the importance of recognition of PTSD as treatment may prevent the long term psychosocial impairment (alcoholism, divorce, suicide, violence and difficulty in holding a job). It was also noted that as sufferers may complain of somatic anxiety symptoms, health workers unfamiliar with the presentations of PTSD may expose cases to unnecessary expenses for investigations and treatments. Among other significant etiological factors associated with mental illness and which have been common phenomena in the country , famine, poverty, migration, displacement (resettlement) and parental loss, etc. , are the common ones. The impacts of these major events on the mental health of individuals in the country have not been studied.

The other ominous feature of our societies which has not been given enough attention is the spread of the use of the psychostimulant substance "chat" (*Catha edulis*), alias khat. Some botanical and epidemiological studies were done on chat over the past 3 decades. The studies mentioned that chat use was spreading and that it caused health and economic problems(16, 17, 18). Even though sporadic case reports from abroad associated chat with psychosis (19,20,21), and records from Amanuel Hospital mention chat induced psychoses, studies so far done on chat lacked systematic and controlled analysis of its impact on the mental, physical and social well-being of individuals.

Alcohol in its various forms has been widely in use in the non-moslem parts of the country . The use of cannabis (hashish) has also recently been reported to be spreading. These two substances (alcohol and hashish) do cause different kinds of mental disorders on the users. Nevertheless, there is no estimate, in our country , of these on the mental state of individuals.

Mental health services in Ethiopia

Currently, both the traditional and modern methods of treatment are used by people for their mental problems. The traditional healing methods are used more by most people. From the point of view of the majority of the population, there are reasons for the more use of traditional healings. Some of these reasons are: a) the deeply ingrained religious and inherited beliefs that all mental illnesses are of spiritual origin, and like their causations, their preventions and cure are achieved via traditional healers whose methods of treatment have a spiritual theme; b) traditional healers are more accessible; c) the fees charge by traditional healers and the cost of prescribed items are usually cheaper than that of the modern services; d) the orders of traditional healers are symbolic (of some meaning) and attractive to the masses. For example, a person said to be possessed by an evil spirit would more easily accept wearing an amulet in which are inscribed powerful exorcising figures than those bitter, unattractive tablets from hospitals; e) traditional healers identify with the population in their ways of living better than modern health workers, and the people feel more at ease and at home with the former.

Often, similar methods are used by the traditional healers to treat both physical and mental illnesses. The major traditional procedures will be mentioned here:

a) Wearing amulets: Writings or inscriptions on goat skin or a piece of paper strip. The skin or paper strip is then folded into a tiny bundle which is then sewn in a piece of animal skin or clothing which in turn is worn by the patient. There are different formulae used by Christian and Muslim healers for use for different disorders. Some healers also give herbs, pieces of hyena skin, lip palpebrae or skin.

b) Holy Water: This is mainly used by coptic followers but followers of other religions also use it. Bathing in or drinking holy water at intervals or for days at a go when prescribed by the priest is believed to prevent as well as cure mental illnesses. Also, sprinkling of such water on the walls and floor of one's home is said to be a sacramental against daring evil spirits.

c) Herbal prescriptions: Concoctions of various herbs are given to patients either to chew or drink, or the herb may be prescribed to be sewn in a piece of clothing and then be worn around the neck.

d) Performing rituals: Some rituals have traditionally been or are being performed by some sectors of the population as a sacrifice for appeasing spirits. eg. Slaying a cock of particular texture (as prescribed by the healer), moving the carcass round oneself a particular number of times, and then throwing it towards a particular (prescribed) direction. Another example is chewing the leaves or roots of a medicinal plant which is blessed by a healer and then spitting the chewed material over the patient.

e) Exorcism by prayer: It is widely used among both the Moslem and Christian population to beseech God for His mercy upon the mentally ill.

f) Exorcism by fumigation: This is mainly used by the healers to release the possession of evil eye or "buda". The healer burns the stem or root of some specific plant and the patient is fumed. After some time, the patient shouts and kicks and thrashes. The healer then asks who he/she (the possessing spirit) is, and later orders the evil spirit to leave. The spirit is then offered (through the patient) something to eat or drink. The offering is often a residue of the local beer, "tella", or some ash or some sort of waste material. After the patient consumes the offered material (which the spirit, not the patient is believed to have consumed), the spirit is said to have left the patient because the patient then either calms down or tells that the buda has released him/her.

Modern (western type) mental health services

a) Psychiatric Centres: Until 1987, psychiatric services were provided by Amanuel Hospital, the only mental hospital in the country, and by the clinic of the university at the Department of Psychiatry located at St. Paul's Hospital. At present, services are provided at 30 centres throughout the country. Six of these centres are in Addis Ababa; the rest are in 24 hospitals in the regions (Table 2).

Table 2: **Regions with psychiatric Centres**

Rgion	Number of centres	Psychiatric beds	Staff
1	1	-	Psychiatricnurse
3	5	-	Psychiatricnurse
4	11	-	Psychiatricnurse
5	2	-	Psychiatricnurse
6	4	-	Psychiatricnurse
12	1	-	Psychiatricnurse
14	6	380	Psychiatrist
			GPs
			Psychiatricnurse
			Psychologist**
			Social worker**
			Health assistant

** found only in amanuel hospital

The six centres in Addis Ababa are the Amanuel Hospital, the University Department Clinic at St. Paulos, the psychiatric units at the two army hospital, and the clinics at the A.A. University and the Prison Administration. Amanuel hospital has 350 psychiatric beds while the Army Hospital hAs 30 psychiatric beds.

Amanuel Hospital: Located in Addis Ababa, it is the first psychiatric centre in the country . The building of the hospital was constructed by the Italians for general purpose when the country was occupied for five years by Fascist Italy during 1935-1940. Since the defeat of the Italians, the building has been functioning as a mental hospital.

The hospital was under the Ministry of Interior and the Red Cross Society until the establishment of the Ministry of Health in 1948. Under the Ministry of Health, it was first incorporated with Menelik II Hospital, but after sometime, it started to operate as an independent mental hospital (22). For many years, it served as an asylum for confining the mentally ill. Until about nine years ago, it had more patients than the number of beds, with two to three people sharing one bed. Staff assigned by the Ministry of Health to work in the hospital were not selected by criteria for the special handling of the mentally ill.

Instead, transfer or assignment to Amanuel Hospital used to imply falling into disfavour with the Ministry .In some cases, the staff were transferred to work at the hospital when they themselves fell mentally ill (23). Even today, the facilities of the hospital are very poor. Many of the beds are occupied by long-stay (chronic) patients who have no other place to go to. There are no specialized wards. Children and adult patients stay in the same ward. Patients with different degrees of severity of illnesses are kept together .

Moreover, offender patients admitted by court order or by police request, no matter how dangerous (aggressive) they might be, stay in the same ward with other patients. Armed soldiers (guards for offenders) from the prison administration also stay in the same ward with patients.

There are no dining rooms where the inpatients could eat or be fed properly. They eat sitting either on their beds or on the floor of their ward. The outpatient area is over-crowded with no shelter for waiting people. A multi-purpose hall is being built at present with aid from Oxfam.

Mental Health Workers: Before the late 60's, psychiatric services were given by foreign professionals working at Amanuel Hospital and at the University Department Clinic in St. Paulos' Hospital. Until 1987, there were only two Ethiopian psychiatrists in the country, one in the university department and one in the army. In 1990, the number of indigenous psychiatrists increased to six. That was the year when Amanuel Hospital was staffed with Ethiopian specialist psychiatrist for the first time. Before then, the hospital used to be run by foreign specialists. At present, there are 12 psychiatrists in the country, all Ethiopians. Of these, eight work at Amanuel hospital, two senior psychiatrists work at the out-patient clinic of the university department in a general hospital in Addis Ababa, one works at the Armed Forces Hospital and one psychiatrist practices in private.

There are a total of 120 psychiatric nurses in the country giving services in the different centres mentioned above. In most centres, they work in pairs. There are three psychology and two sociology graduates working as clinical psychologists and psychiatric social workers, respectively, in Amanuel Hospital. These professionals didn't have any formal clinical training in mental health. Their work depends entirely on experience they gained while working in the hospital.

In addition, there are fourteen general doctors currently attached to Amanuel Hospital and the Psychiatry Department of the University. The psychiatric-to-population ratio for Ethiopia is at present 0.02 per 100,000.

According to an unpublished survey done two years ago, the mean psychiatrist-to-population ratio for four African Countries (Ethiopia, Tanzania; Zambia, Nigeria) was one per 1.14 million. The range was one per 900,000 for Nigeria to 1 per 6 million for Ethiopia (). If we compare these figures with those of other countries reported many years back, we find ours to be extremely backward. To cite an example, twenty years ago, the psychiatrist-to-population ratio for Latin America was 1.52 per 100,000 and for South-East Asia, it was 1 per 100,000 (4).

Services Available: The main service is out-patient service, which is provided at all psychiatric centres. About 100-150 patients are seen everyday in the outpatient clinics of Amanuel Hospital, out of which 50-60 are new patients. In order to be able to see a doctor, patients or relatives have to queue in the hospital yard starting from as early as 5:30- 6:00am. But those patients who are extremely difficult to manage are seen at the emergency OPD any time of the day (24).

In-patient service is given mainly at Amanuel Hospital for civilians and at the Armed Forces Hospital for the army. Psychiatric nurses working at regional hospitals sometimes admit cases in their respective hospitals for management, but in most instances, they refer admission requiring cases to Amanuel. This is because there are no psychiatric beds in the general hospitals in the country. At Amanuel Hospital, there is always a long list of severely ill patients waiting for days to be admitted. Many beds are occupied by chronic cases who could have been rehabilitated elsewhere, but there is no such place or home to send them to. Patients come from all parts of the country and this also lengthens the waiting period. If bed is not available, patients who need admission will go back with only one injection of an antipsychotic drug as oral medication is often not possible to administer. Patients who are brought from distant places of the country with no relatives in Addis), are likely to stay in sheltered bus stops, etc., until bed is available, as they are not accepted by hotels because of their disturbed state of mind.

There is a rudimentary occupational therapy unit in Amanuel Hospital run by unqualified attendants and serves mainly as pastime for in-patients. The psychologists help the doctors in counselling and simple psychotherapy. The two social workers' task is to assess patients' social status, locate relatives of patients, facilitate transport for discharged ones and verify documents of non-paying patients. Amanuel Hospital is also active in certifying people regarding their mental state. Sanity evaluation for certification is done by a board consisting of the psychiatrists, the psychologists and the social workers. The board is thus active in providing professional opinion to courts all over the country on the mental state of offenders who are referred to the hospital by courts for sanity evaluation. There is no forensic psychiatrist in the hospital or in the country. Another situation where board certification is often required is when employers request the hospital to assess the sanity or level of functioning of their employees. This request is made by employers for purposes of pension or change of job or location.

A drug and alcohol treatment unit was recently started within the existing unit at the University Department Clinic in St. Paul Hospital. There are no other sub-speciality services. Child and adolescent units, forensic units, day care centres, rehabilitative services, occupational and other therapeutic services are conspicuously lacking. The main reason for absence of these services is lack of trained staff in the various specialities, although material shortage is also a significant factor. Health education in mental health is given daily at Amanuel Hospital. Some of the other centres also give mental health education to out-patient attenders.

Training in Mental Health: The Department of Psychiatry in the Medical Faculty and the staff of Amanuel Hospital have been giving practice and theoretical training to under-graduate doctors. Similar training is also given to under-graduate nurses by psychiatric nurse-tutors and doctors at Amanuel Hospital. Under-graduate doctors are given the psychiatric training during their final year in the medical school. The nurses get theoretical education in their first year, and practical 11 exposure in their final (3rd) year of training. There is post-graduate training in the country for graduate doctors. All the psychiatrists in the country had their post

graduate training abroad with the help of the World Health Organization and developed countries. Five of the psychiatrists were trained in the United Kingdom and the others, one each, in the USA, Netherlands, Kenya, former GDR, Cuba, Bulgaria and Yugoslavia. The starting of the Psychiatric Nurse Training in 1987 was a breakthrough in the development of mental health services in the country. All the 120 psychiatric nurses in the country were trained here since then. The training is given by the Psychiatry Department of the University and Amanuel Hospital, jointly. The Ministry of Health oversees the training. The World Health Organization helps materially and covers the financial expenses. The training consists of three months' intensive theoretical and practical education at Amanuel and St Paul hospitals, followed by nine months' independent practice (internship) at the respective hospitals where the trainee nurses came from. There is, however, regular supervision of the nurses every three months during this nine-month period. The nurses graduate after one year of total training. They are then assigned to the hospitals they came from to render psychiatric services. Supervision of psychiatric nurses by psychiatrists continues on a yearly basis.

Regional Variations

No comparative study has yet been done regarding the extent of mental health problems in the country. All the etiologically associated factors mentioned earlier in this review affect all regions more or less equally. However, there are three factors that were or have been more prevalent in certain regions than in others. These are: war, draught/famine and the consumption and cultivation of the psycho-active substance chat/khat (*Catha edulis*).

War and Draught: Though the trauma due to the prolonged civil war and the few international wars has somehow affected every region and citizen, some regions obviously shouldered the brunt of suffering for decades. The Northern, Northwestern and Eastern regions are examples.

War causes mental disturbance in individuals because of several events that occur during or after it (25). Among such adverse events are: disquiet, lack of freedom and basic necessities, loss, and displacement.

Disquiet: War causes disturbance of the mind of people in combat zones by upsetting the routine calm which people were used to. Noise of shooting, the view of damage, witnessing killings and sight of wounded persons, sight of fatal weapons, threats and undue demands from armed soldiers, etc. all have a disquietening effect on the minds of people.

Loss of various kinds is one of the disastrous effects of war. Survivors in areas where the civil and inter-national wars had taken place had lost several things. Some lost body parts, others lost relatives or close friends, still others lost properties. Many lost a combination of these.

Those who lost their body parts have lost the capacity to function as optimally as they would like to. In addition to the disability, the lack or inadequacy of social support causes superimposed hopelessness.

Loss of loved ones by death is irreversible. When one's significant figure departs via death, the impact could be so intense that some people may find it difficult to cope with, even when the

death is long expected. When such loss occurs violently and combined with other losses and adverse events, as it had been happening to lots of people in the war regions, the stress can become disastrous on the mental well-being of survivors. Loss of property is another nasty experience that people in civil war areas had been through. Life-long efforts which were made in accumulating one's possessions became valueless in a matter of minutes or hours because of crazy destruction. Aspiration for a better life was shattered for the countless people who are left devoid of their hard earned properties. The despair of such people is compounded by the inability to revitalize their means of living after the war(s).

Losses during war are different from loss at ordinary times because among other reasons, the losses are caused suddenly and are violent. Besides, they are executed intentionally to incite suffering and humiliation in the victims. Moreover, people in war zones lack social support as damage and loss are pervasive in the region and nobody is able to help someone else.

Lack of freedom and basics: As a result of threat to their lives, people in war areas are often limited to their homes or dug-out shelters. They become unable to move freely and secure basic necessities like food, water and other essentials. This condition leads to malnutrition and poor hygiene of family members, which in turn can lead to the development of all sorts of physical illnesses. The complex effects of deprivation and illness, especially over a prolonged period, as had been the case in some war regions of our country, could have higher contribution to psychological problems of citizens.

The populations of most draught affected regions also suffered from the direct effect of war. Conversely, the regions where war has been going on for years suffered from draught more than other regions. Some regions were affected mainly by draught. Survivors of draught/famine also suffered from loss and lack of basics, the loss being mainly through death due to starvation.

Young survivors of drought/famine and war suffer the most in such regions. Besides what has already been explained regarding effects of loss and deprivation, young (child) survivors have additional problems since they are most of the time orphaned. Orphans suffer from lack of appropriate parenting. That is, they will be deprived of a parent's loving care and guidance in preparation for their future adult life. They grow short of supervision and correction if and when they deviate from the norm in their behaviour. As adult survivors are occupied with their own problems, unfortunate orphans are left to the mercy of fate. Malnutrition affects young children of war drought affected regions more than it does adults. This is because babies in such areas will be of low birth weight due to poor ante-natal maternal feeding; and children in countries like ours are already at a disadvantage because of the traditional discrimination which allows only the left overs to children. When the effect of draught and war are added to it, the impact becomes quite immense. The young children thus affected fail to grow both physically and emotionally. They become predisposed to mental illnesses this way.

Displacement: Where there is war and famine, displacement or migration is inevitable. The migration could be by people's own will in a way of dealing with the problem or by force from authorities. The migration can be to a safer place either within the country or abroad.

As one leaves the area where one had established one's life, one will be overwhelmed with the grief of separation. All that was familiar is left behind. Moreover one's mind becomes preoccupied with the anxiety-laden ideas or worries about what might await one in the new area. "Will one be accepted by people there? Will the culture and ways of life be agreeable to one's values? If not, how to cope with them? Will one find shelter, food and other basics? Will the weather be bearable? ...On arriving at the new place, the migrants will encounter problems in some or all of the conditions mentioned above. Some migrants develop coping mechanisms while others fail to do so. Instead, they react with maladaptive behaviours like aggressive over-indulgence, withdrawal, etc. Such behaviours could be unacceptable to the locals of the new place and there may be negative response from these local residents. This negative response further worsens the stress on the migrants .

Only few of the major adverse situations that people in regions struck by war and draught faced have been described here. It is a proven fact that such events are significant causes of psychological morbidity in people. Some people may suffer from milder emotional problems with excess coping mechanisms while others, failing to cope, may develop incapacitating mental disorders like PTSD already mentioned.

We can therefore conclude that there can be a higher chance of developing psychiatric disorders in such regions than in other regions

Drugs: It was briefly mentioned earlier that the use of chat or khat is spreading. Reports of causal relationship between chat chewing and mental illness was also mentioned. There were international conferences on chat and its effects on consumers. During those conferences, chat was condemned as a cause of physical, mental and social problems(25,27). At some point, efforts were made locally through mass media to increase public awareness about the damaging effects of chat chewing.

It is despite all these facts that chat use is spreading across the country .However, those regions where the plant is cultivated are more involved than others in its consumption. These regions are the Eastern, Southern and Central regions of the country .

In some of these regions, chat is replacing other cash crops because of its higher market values and because of the less laborious cultivation(13).

The reasons people give for chewing chat are diverse. Some, especially farmers, say that they chew to combat fatigue in their tedious daily task. Others chew chat for its appetite suppressing effect. This is not to get slimmer but to suppress the pangs of hunger as they cannot afford to buy enough food. Some chew to stay awake and alert when they read/study, drive or stay on guard posts. Others say it has medicinal value like in hypertension (whereas studies reported the effect to be the contrary) (28) .Many people chew for socializing and to get the benefit of its mood elevating effect. Some sectors chew chat as part of a religious ritual.

The export to other countries is also said to be on the rise with an increasing revenue. Chat trade is legal in the country and many people lead luxurious lives on money from its sale. As cocaine is a major source of income in some regions of Latin America, so is chat becoming for the

growers and businessmen in the regions where it is cultivated. Be it due to the significance of the above advantages to people, or due to the inadequate health education regarding dangers of chat chewing, or other reasons, chat use and abuse is spreading in an alarming speed.

Strategies for developing mental health care systems in Ethiopia

The famous international conference in Alma Ata defined essential health care as relevant, accessible, affordable and acceptable by the communities and involving their full participation (29). Any serious embarkment in establishing a health care system needs to adhere to this definition if the system is to be practical and if it is going to benefit the population.

Besides, a health care system needs to address itself not only to curative aspects but also to preventive, promotive and rehabilitative measures. Only then can peoples' health qualify to the WHO definition, "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" .

With the above points in mind, it is necessary to first list the common problems encountered in the development of mental health services. These are:

1. Negative attitude: As mentioned in the earlier part of this review, many people still ascribe mental illnesses to the individual's wrong-doings and assume that such illnesses are incurable or if curable, can only be cured through spiritual healers. By extension, this attitude is shared by some policy makers and professionals, including health workers.
2. Inaccessibility of service centres (scarcity).
3. Limited knowledge of the spectrum of mental disorders: It is only when people become too aggressive, destructive or disinhibited that they are supposed to have mental illness. Other milder forms of disorders are not considered as illnesses.
4. Centralization: Mental health services are not given in most clinics or hospitals.
5. Shortage of human resources.
6. Limited scope of management skills: The main treatment modality in the country regarding mental illnesses is confinement and drug administration. Other important preventive, curative and rehabilitative services are lacking.
7. Lack of proper planning, monitoring and evaluation: There is no department in the Ministry of Health or in the regional health bureaux that looks after the development of mental health services in the country .
8. Lack of basic statistics on the prevalence of major mental health problems.
9. Shortage of essential drugs .
10. Lack of national mental health policy. Aims of the strategies for mental health development should be:
 - a) Early recognition of mental illnesses.
 - b) Determination of priorities.
 - c) Treatment of the mentally ill as close to their homes as possible.
 - d) Decentralization and integration of mentalhealth services with general health services.
 - e) Involve the community in the preventive, therapeutic and rehabilitative programs. To achieve these aims, we need to do the following:

1. Decentralization of mental health services : Psychiatric services should be provided at every hospital, health centre, clinic and health post.

Advantages of decentralization are:

- a) People need not travel long distances to reach Amanuel Hospital or the few psychiatric centres elsewhere.
- b) Health workers in other fields will be more able to identify and treat or refer mentally ill people. This advantage is of paramount importance since 20-30% of attenders of any general out-patient clinic do so because of psychological problems.
- c) The more familiar health workers and other people become with mental health problems and the services, the less isolated and stigmatized will the mentally ill be.
- d) Reduction of the excess work load at the central referral hospital.

2. Establishment of a tiered mental health service system: The degree of involvement and the range of responsibilities of health workers at the various levels of the health care system (central referral hospital, regional hospital, rural hospital, health centres, clinic, community health post) should be defined regarding mental health services. There has to be a channel for two-way referrals between higher and lower level health workers.

3. Human resources development: The curricula, for undergraduate doctors, nurses and health assistants should be revised and reconstructed in such a way to enable the future health workers to identify and treat particular mental health problems. Such basic mental health training should also be given to community health agents. In addition, efforts have to be made to give basic mental health training to trainee teachers and agricultural field workers. Teachers and agricultural field workers have direct contact with the masses and they can easily identify and refer patients to health workers. Also they can be involved in mental health education. We need to train more psychiatrists, clinical psychologists and psychiatric social workers and occupational therapists.

4. Infrastructural development: Based on priorities, centres for treatment, rehabilitation and preventive programs need to be developed in every region. This requires collaborative work amongst governmental (central and regional) and non- governmental organizations, and the local communities. Involvement of the communities is indispensable as it will only be then that infrastructures acquire relevance to the expectations and demands of the society.

5. Research: Statistical information is of very high value for proper use of resources. What priority conditions to set, how, when, where and by whom to render services requires careful analysis of local and national situations.

The development of research activities can be facilitated if a mental health research unit with inter disciplinary involvement is established at the highest level of the mental health care system. The functions of such a unit will be to:

- a) Identify and conduct research on pressing national and regional mental health problems.
- b) Develop and institute mechanisms to ensure the utilization of results of studies on mental health by national and regional policy makers, planners and health professionals.

c) Provide consultative services to interested government (central and regional), international agencies and professional groups in the area of mental health.

d) Provide in-service training on mental health research to interested professionals employed in government institutions and international agencies.

e) Provide technical support to psychiatric residents and other graduate students who choose to conduct mental health studies as part of the requirements of their training (eg. MSc, thesis work). If and when such a research unit becomes functional, it will be a major driving force in the development of relevant research work in mental health.

6. Supply essential drugs: Drugs for the treatment of mental illnesses have always been in shortage. Many patients are under-treated due to absence or shortage of appropriate drugs. There should be a policy for a continuous supply of at least one representative drug from the different essential groups of psychotropics.

7. Establish liaison with influential traditional healers: There is some evidence that some mild mental problems could be relieved through traditional healing procedures (30). Mental health workers should respect, work with and know more about the healing skills of such traditional healers. This way, we can identify more problems which can be resolved by the traditional way and appropriate referral can thus be made. The traditional healers (because of their influence on the community) can also then play important roles in promoting modern mental health, and in infrastructure development.

8. Mental health promotion: Involve the community in mental health education using the mass media, or through organizations in the society; eg. youth, women's, farmers, organizations, using community leaders, religious leaders, etc. Involve the community in resource mobilization for infrastructural development.

9. National health policy: The Ethiopian government has included mental health as one area of concern in its national health policy. However, such policy should include specific plans for mental health service development. There should be commitment to a time limited goal for the practicability of specific services. (Eg. , "in the next five years, all hospitals in the country will be staffed with psychiatric nurses.")

10. Establishment of a mental health unit within the Ministry of Health and within the regional health bureaux: The task of this unit will be planning, monitoring and evaluating mental health services nationally or regionally.

It establishes policies and lays down general guidelines. The WHO recommended the establishment of such a unit long ago. The presence of such a unit in the Ministry of Health is also one of the criteria for membership to the African Mental Health Action Group. But Ethiopia has not yet fulfilled this requirement. "Given the close dependence of mental health promotion on socio-economic conditions, there is a need for an institutional mechanism for coordinating mental health with national (or regional) development policies. ..To draw broad policy lines on mental health related issues, discussions and decision-makings take place at high government

levels. However, this decision making requires an appropriate technical mechanism to furnish it with well researched, well formulated and relevant policy options, and to translate the decisions into implementable plans." (31)

Therefore, it is essential that a mental health unit be established in the MOH and in each regional health bureau. The unit within the Ministry of Health should preferably be represented by a psychiatrist.

Role of EPHA in mental health care development in Ethiopia Because of the comprehensive scope of the public health department in the health care system, we believe that EPHA can play a significant role in improving the mental health services in the country. The main areas where EPHA involvement could help most are:

- a) Training of mental health workers in the epidemiology of relevant 'subjects, in research methodology and in the management of health care systems.
- b) Research: The EPHA has members who are experts in research work. EPHA can thus play a big role in collaborating with mental health professionals and institutions in formulating and conducting research and in analysing results.
- c) Planning and evaluating: -EPHA can contribute much in devising evaluation instruments and in working out plans of action regarding mental health services.
- d) Mental health promotion: The country's health care system can benefit from EPHA's advocacy of mental health services development. EPHA has contacts with significant governmental and non-governmental organizations within and outside the country. Within the country, EPHA can help by its contributions in priority setting, policy developments and resources allocation for a better mental health service system. One such activity is initiating contacts with other agencies relevant to the betterment of mental health services. It can also contribute by organizing seminars and workshops on mental health.

The EPHA can also help mental health institutions here by soliciting help from, "road, by identifying centres that can award scholarships in mental health, and by engaging in other similar activities which may be relevant to the development of better mental health services in the country.

References

1. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, 4th ed., Washington D.C.
2. WHO Classification of Mental and Behavioral Disorders: Clinical Description and Diagnostic guidelines, Geneva, 1992;5.
3. Lamb HR. Lessons learned from de-institutionalization in the US. British Journal of Psychiatry, 1993; 162:587-.
4. Neki J.S. The spectrum of mental disorders and the responsibility of the mental health service. Mental Health Sciences in Developing Countries, Basher et al. (eds.) Papers presented at a WHO Seminar in Addis Ababa, 1973; 18-22.
5. WHO Technical Report Series, Geneva, 1984; 698:5-7.
6. Giel and Van Luijk. Psychiatric morbidity in a small Ethiopian town. The British Journal of Psychiatry, 1969; 115:149-162.

7. Mesfin A. and Aboud F. Mental illness in Ethiopia, in Kloos H. and Zien A.Z. (eds.) *The Ecology of Health and Disease in Ethiopia*, 1993;493-506.
8. Kortmann F. Problems in practicing Psychiatry in Ethiopia. *Ethiopian Medical Journal*, 1988; 26:77-83.
9. Harding T. et al. Mental disorders in health: a study of their frequency and diagnosis in 4 developing countries. *Psychological Medicine*, 1980; 10:231-241.
10. Joup TVM. et al. A baseline study on mental disorders in Guinea Bissau. *British Journal of Psychiatry*, 1986; 148:27-32.
11. Dhdphale M. et al. The frequency of psychiatric disorders among patients attending semi-urban and rural general outpatient clinics in Kenya, *British Journal of Psychiatry* , 1983 ; 142:379-383.
12. Eskinder R, Dereje K and Atalay A. Prevalence Estimation of Mental Disorders by Use of the Composite International Diagnostic Interview (CIDI) in an Urban District in Ethiopia. (Accepted for Publication), 1993.
13. Solomon T. Determinants of mental illness in rural Ethiopian adult- population. MPH thesis. Addis Ababa University, 1989.
14. Atkinson L. et al. *Introduction to Psychology*. 10th ed., Harcourt Brace Joranorich Publishers. Orlando, Florida.
15. *Psychological Med. (Editorial) Chronic Post Traumatic Stress Disorder: Implications of recent epidemiological and neuro psychological studies*. 1989; 821-824.
16. Almeshal A. et al. Cath edulis (Khat): Use, abuse and current status of scientific knowledge. *FITOTERAPIA*. 1985; LVI(3).
17. Kalix P. The pharmacology of khat. *General Pharmacology*. 1984; 15(3):179-187.
18. Kalix P. Khat: a plant with Amphetamine effects. *Journal of Substance Abuse Treatment*. 1988; 5:163-169.
19. Giannini A.J. And Castellani A. Amanic- like psychosis due to Khat (*Catha edulis* Forsk). *Journal of Toxicology and Clinical Toxicology* .1983; 19:455-459.
20. Gough SP and Cookson IB. Khat induced schizophreniform psychosis in U.K.. *The Lancet*. Feb. 25 1984;p.455.
21. McLaren P. Khat psychosis. *British Journal of Psychiatry*. 1987; 150:172.
22. Menelik D. Impact of War on Mental Health (unpublished essay).
23. Fikre W. et al. The Amanuel Hospital: An Evaluative Survey. 1973 (Unpublished) .
24. Atalay A. Suggestions for Improvement of Mental Health Care in Ethiopia. Essay submitted to the University of Manchester, Department of Psychiatry , 1989 (unpublished).
25. Mitike T. Improvements of Patients. Care Pre and Post Psychiatric Nurse Training. Thesis. Addis Ababa Ethiopia.
26. International Symposium of Khat. Dec.13. 1984. Department of Chemistry .Addis Ababa University .Ethiopia.
27. Shahandeh B. et al. (eds.) *The Health and Socio economic Aspects of Khat Use*. Proceedings. Antananarivo, Madagascar, Jan.17-22,1983.
28. Kalix P. Pharmacological aspects of the chewing of khat leaves. *Pharmacological Review*. 1985; 37(2):149-163.
29. WHO, Alma Ata, Primary Health Care. Report of the International Conference on Primary Health Care, 1978.
30. Atalay A. et al. Traditional Perception and Treatment of Mental Disorders in Central Ethiopia, 1994 (To be published).

31. Hollander D. (Lecture Notes: Department of Psychiatry University of Manchester, U.K. 1992.
32. Amare G and Krikorian AD. Chat Coffee's rival from Harar, Ethiopia in botany cultivation and use. *Economic Botany*, 1973 27:353-377.
33. University of Manchester, Department Psychiatry .Unpublished report on relevant of the U.K. training scheme (Psychiatry) overseas medical graduates 1993.

National HIV/AIDS update

AIDS/SAD Control Program
Ministry of Health, Addis Ababa.

1. Introduction

This report is published by the National AIDS Control Programme on a monthly basis. The major objectives of the publication are to:

-Notify the current status of AIDS epidemic in the country, and provide information for decision making and future planning . -Provide feedback to health institutions and collaborating agencies in the country. From January 1986 to 30, November 1994, a total of 15.565 AIDS cases have been reported by 55 hospitals in the country .

2. Criteria used to diagnose AIDS patients in Ethiopia.

The World Health Organization (WHO) provisional case definition with positive serology test for HIV antibodies is the criteria used to diagnose AIDS. According to the case definition, a patient has to manifest at least two major and one minor signs and show an HIV positive serology.

3. Summary of the report for the month of November 1994.

In November 1994 alone, a total of 304 AIDS cases were reported by 12 hospitals.

Table 1: **Distribution of reported AIDS Cases by hospital, for the month of November 1994.**

Hospital	Cases
Arbaminch	31
attat	19
Bushulo	9
Debre tabor	15
Gandhi	13
Gimbi	43
Hiwot fana	47
Jimma	74
Metehara	11
Wonji	7
Yekatit 12	12
Tiraglame	32
Total	304

Table 2: **Distribution of AIDS Cases by Year of Report as of 30, November 1994.**

Year	Sex			Sex Ratio (M:F)	Percent of Total
	Male	Female	Total		
86	1	1	2	1:1	0.01%
87	12	5	17	2.4:1	0.11%
88	67	18	85	3.7:1	0.55%
89	128	62	190	2.1:1	1.22%
90	292	156	448	1.9:1	2.88%
91	585	300	885	1.9:1	5.69%
92	1094	1272	3256	1.6:1	20.92%
93	3198	1937	5124	1.6:1	32.92%
94	3310	2247	5558	1.5:1	35.71%
Total	9566	5998	15565	1.6:1	100.0%

The proportion of female patients being reported has increased since 1992.

Table 3: **Age and Sex Distribution of reported AIDS Cases, as**

of 30, November 1994.

Age group	Sex			Percent
	Male	Female	Total	
0-4	126	115	241	1.55%
5-14	17	20	37	0.24%
15-19	193	657	850	5.46%
20-29	3567	3199	6767	43.48%
30-39	3511	1389	4900	31.48%
40-49	1551	448	1999	12.84%
50-59	484	146	630	4.05%
60+	117	24	141	0.91%
Total	9566	5998	15565	100.00%
(Percent)	(61.46%)	(38.54%)		

Average age for females = 27 years, and for males = 32.5 years, and for both = 30.0 years

Table 4: **Distribution of Reported AIDS Cases by Marital Status as of 30, November 1994.**

Marital Status	Male	Female	Total	percent
Single	4528	2319	6847	44.3%
Married	3763	1813	5576	35.94%
Divorced	475	1125	1600	10.31%
Widowed	83	383	466	3.00%
Paediatric cases (Age<15 y)	128	115	243	1.57%
Unspecified	562	221	783	5.13%
Total	9566	5998	15564	100.00%

Table 5: Reported AIDS Cases by Occupation as of 30, November 1994.

Occupation type	Male	Females	Both	Percent
Army	1739	41	1780	11.44%
Bar worker*	95	176	271	1.74%
Daily labourer	470	151	621	3.99%
Driver	1055	7	1062	6.82%
Farmer	298	18	316	2.03%
govt employee	1696	450	2146	13.79%
House Wife	0	1228	1228	7.90%
Mechanic	269	4	273	1.75%
Merchant	1079	242	1321	8.49%
Other	692	417	1109	7.12%
Prisoner	53	0	53	0.34%
Servant	15	372	387	2.49%
Sex worker	0	871	871	5.60%
Student	264	392	656	4.21%
Tella Seller	12	197	209	1.34%
Unemployed (<15y)	136	128	264	1.70%
Unemployed (adult)	366	455	821	5.27%
Unspecified	1327	849	2176	13.97%
Total	9566	5998	15565	100.00%

* Bar Worker include bar owners and those who are not at high risk as sex workers

Table 6: Average number of AIDS cases per month and number of reporting hospitals by year, as of 30 November 1994

Year	Average no. of cases per month	Reporting hospitals		Total
		Addis Ababa	Region	
Before 1988	0 to 1	7	0	7
1988	7	13	2	15
1989	16	15	4	19
1990	37	17	14	31
1991	74	17	22	39
1992	269	17	29	46
1993	427	18	30	48
1994	505	18	37	55
Total		18	37	55

Table 7: AIDS Cases by Risk factors, as of 30, November 1994.

Risk Factors:	Male	Female	Total	Percent
History of Multi-Partner Sexual Contact (MPSC)	8440	5128	13569	87.17%
History of Blood Transfusion	75	50	125	0.80%
Maternal HIV or Breast Feeding	125	116	241	1.55%
History of illegal injection	73	66	139	0.89%
IV drug abuse	4	2	6	0.04%
Unspecified	849	636	1485	9.54%

Table 8: **Distribution of AIDS cases by hospital and by year for Regional hospitals, as 30 November 1994.**

Reporting Hospital	Year of Report									Total	Percent
	86	87	88	89	90	91	92	93	94		
Air force	0	0	0	0	0	0	0	18	0	18	0.24%
Alamata	0	0	0	0	0	0	0	0	13	13	0.17%
Ambo	0	0	0	0	0	3	14	42	16	75	0.99%
Arbaminch	0	0	0	0	7	24	41	86	77	235	3.11%
Asebe teferi	0	0	0	0	0	12	6	30	39	87	1.15%
Assab	0	0	2	0	0	0	0	0	0	2	0.03%
Assela	0	0	0	0	1	26	6	0	38	71	0.94%
Attat	0	0	0	0	0	14	59	176	162	411	5.43%
Borena	0	0	0	0	1	0	0	0	0	1	0.01%
Bushulo	0	0	0	0	0	0	20	93	160	273	3.61%
Central prison	0	0	0	0	0	0	0	0	10	10	0.13%
Debre berhan	0	0	0	0	0	0	8	12	71	91	1.20%
Debre markos	0	0	0	0	0	0	46	32	0	78	1.03%
Debre Tabor	0	0	0	0	0	11	70	0	80	161	2.13
Dessie	0	0	0	0	0	19	86	94	460	659	8.71%
Dil chora	0	0	0	0	13	31	72	335	28	479	6.33%
Die dawa	0	0	0	0	0	0	0	0	88	88	1.16%
Felege hiwot	0	0	0	8	1	18	575	162	0	764	10.10%
Gimbi	0	0	0	0	7	0	0	74	242	323	4.27%
Goba	0	0	0	0	0	5	0	45	0	50	0.66%
Gondar College	0	0	0	0	32	82	214	144	307	779	10.30%
Heroes Center	0	0	0	0	1	3	0	1	1	6	0.08%
Hiwot fana	0	0	0	0	14	59	93	150	153	469	6.20%

Reporting Hospital	Year of Report									Total	Percent
	86	87	88	89	90	91	92	93	94		
Hossana	0	0	0	0	14	0	34	0	56	90	1.19%
Jimma	0	0	1	1	0	12	0	121	74	209	2.76%
Maichew	0	0	0	0	0	0	0	0	9	9	0.12%
Mekelle	0	0	0	0	0	0	0	0	20	20	0.26%
Metehara	0	0	0	0	0	0	1	0	32	33	0.44%
Mizan	0	0	0	0	0	1	5	0	8	14	0.19%

Nazareth	0	0	0	1	0	14	180	132	218	545	7.20%
Nekemt	0	0	0	0	0	0	0	81	262	343	4.53%
Pawie	0	0	0	0	0	0	59	60	0	119	1.57%
Quiha	0	0	0	0	0	0	0	0	6	6	0.08%
Shashemene	0	0	0	0	0	9	17	10	0	36	0.48%
Woldia	0	0	0	0	0	0	31	112	81	224	2.96%
Wonji	0	0	0	0	3	13	42	70	54	182	2.41%
Yigalem	0	0	0	0	0	0	0	0	23	23	0.30%
Yirgalem	0	0	0	0	10	21	136	255	148	570	7.53%
Total	0	0	3	10	90	277	1815	2335	2936	7566	100.00%

Table 9: **Distribution of AIDS Cases by Hospital and by Year for Addis Ababa Hospitals, as of 30, Nov. 1994**

Reporting Hospital	Year of Report									Total	Percent
	86	87	88	89	90	91	92	93	94		
ALERT	0	1	32	37	61	0	339	224	72	766	9.6%
Amanuel	0	0	0	0	0	1	6	5	0	12	0.15%
Armed forces	0	4	3	22	59	64	36	30	13	231	2.89%
Balcha	0	0	3	0	0	0	0	0	0	3	0.04%
Entrel command	0	0	2	0	0	0	11	33	28	74	0.93%
Central prison	0	0	0	0	0	0	0	19	39	58	0.73%
Ethio-Swedish	0	0	5	0	0	3	3	0	7	18	0.23%
Gandhi	0	0	0	1	0	0	0	0	37	38	0.48%
Kolfie. tbc	0	0	0	0	5	0	0	49	221	275	3.44%
Menelik II	0	0	0	13	7	0	0	378	325	933	11.66%
St. Paulos	0	0	4	0	1	23	23	294	272	612	7.65%
St. Petros	0	1	1	4	84	39	39	235	115	555	6.94%
Police	0	2	1	10	5	36	36	52	38	173	2.16%
Ras desta	0	1	0	30	44	106	106	362	381	1057	13.21%
Tatek	0	0	0	0	6	22	22	2	3	33	0.41%
Tikur Anbessa	0	3	25	47	43	148	148	634	764	1812	22.65%
Yekatit 12	2	5	3	13	22	16	16	199	179	690	8.63%
Zewditu	0	0	3	3	21	50	50	273	191	659	8.24%
Total	2	17	82	180	358	508	508	2789	2622	7999	100.00%

Table 10. **Clinical Signs and Symptoms of reported AIDS Cases.**

Clinical Manifestations	Males	Females	Total	Percent	
MAJOR SYMPTOMS					
Weight loss >10% of body weight (Failure to thrive)	8365		5291	13657	87.74%
Prolonged Fever for >1month	8001		5098	13100	84.16%
Chronic Diarrhoea for >1 month	5768		3620	9389	60.32%
MINOR SYMPTOMS					
Generalized Lymphadenopathy	2356		1286	3642	23.40%
Persitent Cough for >1 month	6583		3955	10539	67.71%
Skin rashes	125		73	198	1.27%
Tuberculosis(pulmonary and/or Disseminated)	1377		811	2188	14.06%
Recurrent herpes zoster	1367		755	2122	13.63%
Generalized pruritic dermatitis	1590		1094	2685	17.25%
Oropharyngeal candidiasis	1931		1230	3161	20.31%
Pneumonia (including PCP)	404		228	632	4.06%
Chronic herpes simplex	98		84	182	1.17%
CNS derangement	133		56	189	1.21%
Night sweats& Generalized	114		66	180	1.16%
Body Weakness					
Loss of appetite	21		9	30	0.19%
.Kaposi= s Sarcoma	32		8	40	0.26%

News

SOMA- Net: the Social Science and Medicine Africa Network is a Network of scientists, Institutions and Agencies working in health and social sciences in Africa. SOMA-Net is dedicated to the promotion and advocacy for the application of trans-disciplinary approaches in solving health problems in Africa. Founded in September 1990, the Network is guided by the recognition that in addition to biological and structural factors. Social and Behavioral Components of society are also important determinants of health, disease and illness. SOMA-Net's primary goal therefore, is to enhance closer collaboration between social and biomedical scientists whose combined effort provides potential strength for broadening the basis for the understanding, identification and solutions to health problems in Africa.

To this date, around 27 African Countries have established their local networking. Cognizant of this, a local steering committee to prepare the ground for near future establishment of a national network has been established. The committee is filling up a directory of interested individuals and has already begun to communicate with the Nairobi head office of SOMA-Net.

This notice is intended to help as many scientists as possible to get in touch with the steering committee and be available for contact when the general assembly is to be called in the near future. Be a member and make all benefit as a member.

For more information please contact:

Dr. Aklilu Kidanu, Institute of Developmental Research (IDR), Addis Ababa University ,
P.O.Box 1176, Tel. 251-1-12-32-30, Fax 251-55-13-33

Notice board

Training Opportunities

Local The Department of Community Health in the Faculty of Medicine of Addis Ababa University wants interested individuals to be aware of the Master of Public Health Degree Program which will welcome a new class of students in September 1995.

The program includes basic postgraduate Courses in Management, Epidemiology, Biostatistics, Maternal and Child Health, .Health Education, Environmental Health and Nutrition. Another vital part of the curriculum is the Community Health Residency in a Woreda Health Department or its equivalent.

The candidate's individual interests and career plans can be pursued in an area of concentration and thesis research. The applied research project is carried out during the second year, usually in the location of the Community Health Residency.

The program continues for 22 months from September 1995 until July 1997. Application forms are available at the Registrar's Office in the Sidist Kilo Campus of the University. All documents must be submitted to the Registrar's Office between March and May 1995. Equally important is obtaining letters of support from institutions which plan to utilize the new knowledge and skills acquired by the trainee. Most candidates are sponsored by the Ministry of Health. The Department encourages other institutions to do likewise.

Prospective candidates must have at least a baccalaureate degree, previous training in a health or related professions, and at least two years' experience in health or related services. Other academic requirements are as specified in the application form of the School of Graduate Studies of the University. If you have inquiries please forward them to Dr.Derege Kebede, Head, Dept. of Community Health, Faculty of Medicine, P.O.Box 1176, Addis Ababa. Fax: 251-1-51-77-01

International

International Research Fellowship Award

-The applicants must be in the first ten years of their career.

-They must have experience in research and must have a few publications.

-They must identify a sponsor in the u.s. in their field of research.

The fellowship is granted for two years, it covers round trip travel, a stipend and an institutional allowance for the awardee's research expense.

The application forms are available in the Department of Internal Medicine. Prospective applicants may contact Dr. Milkias Shamebo as soon as possible. Applications should reach the Department before June 1995 and October 1995.

These will be scrutinised by the Nominating committee and forwarded to the Fogarty International center for reviewing. Management training for health and family planning professionals

1. Program Management: Managing for Quality For Family Planning Managers Bangkok, Thailand, 12 June -30 June 1995

2. Managing Successful Training Programs, Dakar, .Senegal 23 October-17 November, 1995

3. Executive Courses in Health Financing and Sustainability Boston, U.S.A , 12 June -30 June 1995, June -28 June 1996

4. Planning and Directing Management, Information System, Boston, U.S.A, 10 June -28 July 1995, 8 July -26 July 1996. For more Information Contact: Management Training, Management Sciences for Health, 165 Allandale Road, Boston, Massachusetts 02130- 3400, USA.

Meetings

May 28/5 -2/6 9th International Congress of the World Association for Emergency and Disaster Medicine -Jerusalem, Israel -Contact: Gil Travel One Penn Center at Suburban station 1617 JFK Blvd.,Suite 946 Philadelphia, PA 19103, USA. Tel: (800)223-3855, Fax: (215)568-0696

June 6/6 -16/6 14th World conference on Family Medicine: Meeting New Challenges Hong Kong -Contact: Dr. John Chung, Hong Kong College of General Practitioners 8/F Duke of Windsor 15 Hennessy Road, Hong Kong. Tel: (852)528.6618, Fax: (852)866.0616

July 2/1 -7/7 15th Congress of the International Society for Cardiovascular Research, Prague, Czech Republic-Contact: Prof.D.j.Hearse Cardiovascular Research Rayne, Institute St. Thomas Hospital London SE1 7EH England, Tel:(44 71)928.92.92 Fax:(4471)928.06.58