



Selected Abstracts on HIV and Infant Feeding



from the
XV International AIDS Conference
Bangkok, Thailand

July 11–16, 2004

Prepared for the USAID MTCT Partners Working Group by the Quality Assurance Project, University Research Co., LLC (QAP/URC) and the LINKAGES Project, Academy for Educational Development (AED)



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XV INTERNATIONAL AIDS CONFERENCE
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July 11 - 16, 2004

Editors:

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December 2004

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Acknowledgements

Support for this publication was provided by the United States Agency for International Development (USAID) through Contract No. GPH-C-00-02-00004-00 (QAP/URC) and Cooperative Agreement No. HRN-A-00-97-00007-00 (LINKAGES/AED).

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The editors would like to specifically thank Lani Marquez and Janis Berman, of QAP/URC, and Elisabeth Kvernen, of the LINKAGES Project, for their editorial assistance in putting this document together.

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Recommended Citation:

Koniz-Booher, P and Ross, J (eds). 2004. Selected Abstracts on HIV and Infant Feeding from the XV International AIDS Conference, Bangkok, Thailand, July 11-16, 2004. Bethesda, MD: Published for the U.S. Agency for International Development by the Quality Assurance Project (QAP), University Research Co., LLC (URC).

INTRODUCTION

The XV International AIDS Conference (IAC), held in Bangkok, Thailand, July 11-16, 2004, generated a number of abstracts related to HIV and infant feeding. Approximately eighty-five of these abstracts, developed for both oral presentations and poster sessions, have been selected and organized under several key themes. This compilation was developed at the suggestion of the USAID MTCT Partners Working Group in order to facilitate a review of the emerging research on HIV and infant feeding, encourage dialogue with the authors, and provide evidence, insights and direction for future policy development, programming, and research. Given the subjective nature of the selection of these abstracts and their assignment to one thematic category or another, the editors strongly encourage the reader to visit the IAC website at <http://www.aids2004.org>, where all conference abstracts are available for review.

Themes included in this compilation are the following:

- Postnatal HIV Transmission by Early Feeding Practices
- Breastfeeding and Maternal Health
- ARVs and Postnatal Transmission
- Breastfeeding Practices - Prevalence and Determinants
- Infant Feeding Practices, Options, and Dilemmas (AFASS)
- HIV and Infant Feeding Counseling
- Counseling Tools, Research Tools, and Guides
- Training-Related Assessments and Issues
- Knowledge, Attitudes, and Practices / Skills of Health Workers
- Knowledge, Attitudes, and Practices of Mothers / Communities
- Socio-Cultural Barriers and Facilitators
- Perceptions, Feelings, and Beliefs
- Replacement Feeding / Infant Formula
- Alternatives - Heat Treatment, Chemical Treatment, Wet Nursing
- Issues of Quality of Life, Disclosure, and Community Support
- Other Biomedical Research – Implications for Infant Feeding
- Scaling-Up of Programs / Issues to Consider

An effort has been made to obtain more complete background documentation related to a number of studies (actual presentations or posters) that were presented in Bangkok; to synthesize and present a number of major findings and key issues; and to assemble a contact list for key authors to further facilitate the exchange of ideas, information, and experience. The synthesis below is not intended as a comprehensive analysis of the data or other findings highlighted in the abstracts, but rather an overview. Readers are encouraged to consult the abstracts and to contact the authors and researchers directly involved in this work.

Please circulate this compilation among your colleagues and provide feedback to the editors: Peggy Koniz-Booher, Senior Technical Advisor, Quality Assurance Project, University Research Co., LLC (<pkoniz_booher@urc-chs.com>), and Jay Ross, Policy Adviser, LINKAGES Project, Academy for Educational Development (<jayross@aed.org>).

SYNTHESIS OF MAJOR FINDINGS AND KEY ISSUES

Mode of Feeding and Risk of MTCT

In a landmark study from South Africa first reported in 1999, exclusive breastfeeding (EBF) was associated with lower mother-to-child transmission (MTCT) of HIV relative to mixed feeding.¹ Some hailed this as confirmation of the long-held theory that exclusive breastfeeding was protective. Others saw the study as flawed and in need of confirmation. The public health and AIDS communities appeared divided concerning the policy implications, but both sides called for further evidence. Finally, 5 years later, new evidence regarding the relationship between mode of feeding and risk of transmission has been presented. The ZVITAMBO study in Zimbabwe was designed to test the effect of maternal vitamin A supplementation on MTCT. Supplementation with vitamin A did not influence postnatal transmission but in secondary analysis, a mode-of-feeding effect was observed: 6.9% of exclusively breastfed infants died or were infected compared with 14.1% of those fed breast milk and non-human milk or solid food before 3 months, for a hazard ratio of 2.02 (95% CI: 1.07-3.82)². Although a report from another study, the Ditrane Plus project in Abidjan, Cote d'Ivoire, also suggested increased risk of postnatal transmission with mixed feeding, the numbers involved were too small to reach statistical significance.³ In both studies, predominantly breastfed infants had a transmission risk intermediate between exclusively breastfed and mixed-fed infants.

Does Breastfeeding Affect the Health of HIV-Positive Mothers?

In 2001, secondary analysis of a randomized controlled trial of the effect of breastfeeding on MTCT in Kenya revealed that HIV-positive mothers randomized to breastfeed experienced 3 times greater mortality than mothers in the formula arm of the study.⁴ In line with other studies that failed to confirm these findings^{5,6,7}, new evidence from the Zambia Exclusive Breastfeeding

¹ Coutsooudis A, Pillay K, Kuhn L, et al. Method of feeding and transmission of HIV-1 from mothers to children by 15 months of age: prospective cohort study from Durban, South Africa. *AIDS* 2001;15:379-387.

² **E Piwoz et al. Early introduction of non-human milk and solid foods increases the risk of postnatal HIV-1 transmission in Zimbabwe [MoPpB2008]**

³ **V Leroy et al. Postnatal transmission risk according to feeding modalities in children born to HIV-infected mothers in a PMTCT project in Abidjan, Côte d'Ivoire. Ditrane Plus project ANRS 1201/1202 [MoPpB2007]**

⁴ Nduati R, Richardson BA, John G, Mbori-Ngacha D, Mwatha A, Ndinya-Achola J, et al. Effect of breastfeeding on mortality among HIV-1 infected women: a randomised trial. *Lancet* 2001;357:1651-1655.

⁵ Coutsooudis A, Coovadia H, Pillay K, Kuhn L. Are HIV-infected women who breastfeed at increased risk of mortality? *AIDS* 2001; 15:653-655.

⁶ Newell M-L, Read J, Leroy V, Dabis F. Mortality among HIV-Infected mothers and children's feeding modality: The breastfeeding and HIV international transmission study (BHITS). The 2nd IAS Conference on HIV Pathogenesis and Treatment, 2003 Abstract no. 221. *Antiviral Therapy* 2003; 8(Suppl. 1):S 237

⁷ Sedgh G, Spiegelman D, Larsen U, Msamanga G, Fawzi WW. Breastfeeding and maternal HIV-1 disease progression and mortality *AIDS* 2004, 18:1043-1049.

Study was presented in Bangkok.⁸ Half of the 695 women in the study were randomly assigned to breastfeed exclusively with abrupt cessation at 4 months and the other half to exclusively breastfeed for 6 months with gradual introduction of weaning foods thereafter. At 12 months, mortality rates were virtually identical – 4.6% of the early cessation mothers had died compared with 4.9% of the prolonged breastfeeding group. However, the early cessation group had lower CD4 counts than the prolonged breastfeeding group (336 vs. 427 cells/ml, $p=0.02$), suggesting a possible immunological benefit to the mother from more prolonged breastfeeding.

In another study in South Africa, there were no differences at 6 weeks in height, weight, BMI, fat free mass, fat mass, or percent body fat between infected and uninfected breastfeeding mothers.⁹ Between 8 and 24 weeks, infected mothers lost significantly more weight and ended up with lower body mass indices than uninfected breastfeeding mothers but remained comparable in fat free mass and fat mass with HIV-uninfected breastfeeding mothers in other studies.

ARVs and Postnatal Transmission

A preliminary report from the SIMBA study last year gave hope that ARVs could be used to reduce postnatal transmission through breastfeeding.¹⁰ At this year's meeting, a report on the effective suppression of simian immunodeficiency virus in macaques using tenofovir suggests that similar protection against HIV may be possible in human infants.¹¹ In a pilot study in Belgium, 8 of 9 HIV-positive women on HAART who received ARVs intravenously during labor had undetectable breast milk virus levels 3 and 5 days after delivery.¹² In a Kenyan trial, 30 HIV-positive pregnant women were randomized to receive either perinatal nevirapine (HIVNET 012) or a short course of zidovudine (Thai regimen). Although these regimens are intended primarily to prevent perinatal transmission, breast milk samples collected over 6 weeks postpartum suggested suppression of breast milk HIV RNA by nevirapine compared with zidovudine between 3 and 28 days after delivery (2.2 vs 2.9 \log_{10} units, $p=0.04$). After 28 days, the relative suppression of breast milk RNA by nevirapine appeared to continue but was no longer statistically significant (2.2 vs. 3.0 \log_{10} units, $p=0.1$).¹³

⁸ **L Kuhn et al. No increased risk of maternal mortality attributable to prolonged breastfeeding among HIV-positive women in Lusaka, Zambia [ThPeB7010]**

⁹ **PC Papathakis et al. Body composition changes in HIV-infected South African breastfeeding mothers [ThPeC7290]**

¹⁰ Vyankandondera J, Luchters S, Hassink E, et al. Reducing risk of HIV-1 transmission from mother to infant through breastfeeding using antiretroviral prophylaxis in infants (SIMBA study). Program and abstracts of the 2nd IAS Conference on HIV Pathogenesis and Treatment; July 13-16, 2003; Paris, France. Abstract LB7.

¹¹ **K Van Rompay et al. Oral tenofovir DF protects infant macaques against infection following repeated low-dose oral exposure to virulent simian immunodeficiency virus [LbOrB10]**

¹² **R Colebunders et al. The effect of highly active antiretroviral treatment (HAART) on breast milk: a pilot study in Belgium [ThPeB7047]**

¹³ **MH Chung et al. Suppression of HIV-1 RNA levels in breast milk after randomization to perinatal nevirapine vs. AZT [ThPeB7076]**

Exclusive Breastfeeding – Prevalence and Determinants

Traditional or currently acceptable infant feeding practices often conflict with international recommendations. The recently revised international guidelines on HIV and infant feeding, issued last fall by WHO, UNICEF, UNAIDS, and UNFPA, recommend exclusive breastfeeding for the first 6 months of life for mothers who are HIV-negative or do not know their HIV status (the vast majority of women), and either exclusive replacement feeding or exclusive breastfeeding for HIV-positive mothers. Despite efforts to increase options and improve infant feeding behaviors, especially in resource-poor settings, multiple studies reported in Bangkok found that both exclusive breastfeeding and exclusive replacement feeding are relatively uncommon and difficult to achieve.

A clinical trial in Ethiopia, designed to evaluate the efficacy of ARVs in preventing HIV through breastfeeding, followed breastfeeding and non-breastfeeding seropositive women. Researchers found that less than half (137/293) of infants who were breastfed in the first week of life were exclusively breastfed. Of the 166 infants who had been breastfed at all, 16% were weaned by two weeks, and 66% by 4 months. (Abashawl et al., C12019)¹⁴

The Ditrane Plus project in Cote d'Ivoire designed and implemented nutrition interventions aimed at promoting exclusive breastfeeding and early cessation to prevent postnatal transmission. Despite this intervention, less than half (208/474 or 44%) of the women who expressed a prenatal infant feeding choice intended to breastfeed their newborns. More than half (280 mothers) actually initiated breastfeeding, but only 33% did so exclusively. The median duration of exclusive breastfeeding (n=91) was only 36 days. (Becquet et al., ThPeC7293)¹⁵

In a study in Kenya to determine the correlates of prolonged breastfeeding (defined as beyond 7 months) among HIV-infected women, those who chose to breastfeed were encouraged to exclusively breastfeed and stop rapidly at 6 months. Among the 296 women who were followed for one year, 205 (69%) elected to breastfeed (2 weeks postpartum). The median planned duration of breastfeeding was from 3 to 6 months, but the median observed duration was actually about 12 months. Only 27 percent of the breastfeeding mothers stopped at 6 months or less. (Wairua et al., B12032)¹⁶

Conclusion of abstract authors: A better understanding of the cultural and social practices associated with infant feeding will be necessary to optimize interventions for PMTCT programs.

Fear of Stigma and Other Dilemmas

An anthropological study conducted in Tanzania underscored additional dilemmas related to implementing infant feeding options. Findings suggest that HIV-related stigma and fear of rejection are major factors influencing infant feeding behaviors. Women often breastfeed despite

¹⁴ **Abashawl et al. Breastfeeding (BF) practices of HIV seropositive women in a PMTCT project [C12019]**

¹⁵ **Becquet et al. Uptake and determinants of exclusive breastfeeding with early cessation to prevent HIV-1 transmission through breastmilk. ANRS 1201/1202 Ditrane Plus project, Abidjan, Côte d'Ivoire [ThPeC7293]**

¹⁶ **Wairua et al. Correlates of prolonged breastfeeding among HIV-1 infected women [B12032]**

their knowledge of the risk of HIV transmission. The cost of NOT breastfeeding (shame and rejection by close kin and neighbors) represents a greater burden. (Leshabari, WePeD6401)¹⁷

Conclusion of abstract authors: The risks to both mother and child associated with stigma and related deprivation of social life and well-being should be taken into consideration, as well as the risk of postnatal HIV transmission, when setting policy and counseling women.

Traditional Beliefs, Environmental Factors, and Social Norms

In Namibia, the pilot PMTCT protocol based on the international guidelines promotes exclusive breastfeeding for 4-6 months followed by rapid weaning. Abstinence or the use of condoms for women who are HIV-positive is encouraged during both pregnancy and breastfeeding.

Despite these efforts, traditional beliefs about the necessity of sex during pregnancy and breastfeeding for the good of the baby negate the use of condoms; drought affected women's belief in the sufficiency of their breast milk; generational and gender power dynamics often remove infant feeding decisions from the mother. (Shifiona et al., WePeD6447)¹⁸

Conclusion of abstract authors: PMTCT programs need to be brought into dialogue with the context of where they are being implemented.

Issues of Safety

In South Africa, HIV-positive mothers are provided with free formula for six months as part of the national PMTCT program. One study aimed to describe the preparation of commercial infant formula and the safety of the feeds, measuring bacterial contamination and protein (nutrient) concentration (as an indicator of dilution). Ninety-four mothers at a PMTCT clinic were interviewed (most had 12 years of education and more than 72% had refrigeration), and samples of formula from bottles already prepared were analyzed. A sub-sample of mothers was visited in the home to observe preparation and collect samples. Of the 94 mothers who were followed, mistakes in cleaning bottles were common. Sixty-seven percent of feeds tested at the clinic were contaminated; 81% of feeds tested in homes were also contaminated; 28% of samples collected at the clinic and 47% of home samples were seriously over-diluted. (Bergstrom et al., WePeE6712)¹⁹

Conclusion of abstract authors: Evidence suggests that despite free distribution of formula and relatively high levels of maternal education, issues related to the safety of replacement feeding are surprisingly prevalent.

Common Institutional Challenges

A number of common and recurring institutional challenges specifically related to HIV and infant feeding were highlighted by various Bangkok abstracts, including:

¹⁷ **Leshabari. The dilemmas of implementing infant feeding options among HIV positive mothers: A case study from Kilimanjaro, Tanzania [WePeD6401]**

¹⁸ **Shifiona et al. Obstacles to exclusive breast feeding amongst Ovambo speaking mothers in Oshakati, Namibia [WePeD6447]**

¹⁹ **Bergstrom et al. Bacterial contamination and nutrient concentration of infant milk in South Africa. A sub-study of the national prevention of mother-to-child-transmission cohort study [WePeE6712]**

- Inadequate training for health workers and community volunteers (difficulties in assessing mother's ability to exclusively breastfeed or safely sustain replacement feeding)
- Lack time and staff for VCT and HIV infant feeding counseling / follow-up
- Institutional barriers which inhibit partner participation in PMTCT counseling
- Poor logistics related to the procurement and distribution of ARVs and family planning methods

Cultural and Community Challenges

A number of findings presented in the selected Bangkok abstracts focused on both cultural and community-related infant feeding challenges faces by HIV-positive mothers and their families. Across studies, several issues were emphasized, including:

- Disclosure of HIV status to the partner or other family member(s) as a determining factor for success in following through with infant feeding decisions
- Reluctance of partners to be tested, discuss safe sex, or use condoms, causing additional high levels of stress for mothers
- Dominant / decisive role of mothers-in-law, who negatively influence infant feeding decisions, often insisting, for example, on introducing other foods and liquids to breastfeeding infants as early as three or four weeks of age
- Lack of community support for either exclusive breastfeeding or replacement feeding options (neither being culturally acceptable and both potentially seen as an indicator of HIV-positive status)
- Fear by some mothers of discrimination, rejection, and physical abuse by family and community members, should their HIV status become known
- Lack of clear guidance for breastfeeding mothers who continue to have many questions about the transition between breastfeeding and replacement feeding and/or complementary feeding (what foods should be given, when, and how)

The full abstracts referred to in the footnotes (references in **bold text**) can be accessed directly from the AIDS 2004 website, using the abstract code [in brackets]. Go to:

<http://www.aids2004.org/>

SELECTED ABSTRACTS BY KEY THEMES

Postnatal HIV Transmission by Early Feeding Practices

Abstract number: MoPpB2008

Early introduction of non-human milk and solid foods increases the risk of postnatal HIV-1 transmission in Zimbabwe

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Background: Early mixed feeding (0-3 months) was associated with increased risk of infant HIV transmission in Durban, South Africa. No additional data confirming this observation have been published. We examined the relationship between early breastfeeding (BF) practices and postnatal HIV transmission (PNT) in 2055 HIV-exposed infants who were HIV DNA PCR-negative at 6 weeks.

Methods: Data come from the ZVITAMBO Study, a randomized trial of postpartum vitamin A supplementation (VAS) that also provided education and counseling on infant feeding and HIV. Mothers and infants were enrolled within 96 hours of birth. Detailed feeding and health data, and infant blood for PCR testing were collected at enrollment, 6 wks, and at 3 monthly-intervals. WHO feeding definitions were used or adapted. PNT rates were calculated using Turnbull estimates. Cox proportional hazard regression methods were used in multivariate analyses with PNT or death as the outcome.

Result: 2753 HIV+ mothers had feeding data at enrollment, 6 weeks, and 3 months. 2055 of their infants (74.6%) were PCR-negative at 6 weeks. All mothers initiated BF; 93.2% and 60.8% still BF at 12 and 18 months, respectively. There were 206 infant HIV infections from 6 wks to 18 months (overall PNT rate=12.1%). 68% of PNT occurred after 6 months. VAS did not influence PNT ($p>0.67$).

	Definition	N	PNT (%)	Hazard ratio for death or infection*	95% CI
Exclusive BF (EBF)	Only BM	156	6.9	1.00	
Predominant BF (PBF)	BM & non-milk liquids	490	8.5	1.40	0.71-2.78
Mixed BF (MBF)	BM & non-human milk &/or solid food	1409	14.1	2.02	1.07-3.82

*Adjusted for infant birth weight and maternal CD4, age, and death.

Conclusion: MBF doubled the risk of PNT/death. 2/3 of PNT could have been avoided by stopping BF at 6 months. In settings where HIV+ mothers choose to BF, EBF should be supported and early introduction of non-human milk and solid foods should be strongly discouraged.

MedGenMed. 2004 Jul 11;6(3):MoPpB2008 [eJIAS. 2004 Jul 11;1(1):MoPpB2008]

Abstract number: MoPpB2007

Postnatal transmission risk according to feeding modalities in children born to HIV-infected mothers in a PMTCT project in Abidjan, Côte d'Ivoire. DITRAME PLUS project ANRS 1201/1202

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Objective: To assess the postnatal transmission (PT) risk according to feeding modalities among children born to HIV-infected mothers, in a PMTCT project in Abidjan, Côte d'Ivoire.

Methods: Between March 2001 and March 2003, any HIV-1 infected pregnant woman, age ≥ 18, who accepted pre and post-test counselling, and who received a perinatal PMTCT antiretroviral treatment (zidovudine ± 3TC and nevirapine) was eligible if she gave a live-birth. Two infant feeding interventions were systematically proposed: formula-feeding (FF, free of charge) from birth with a drug inhibiting lactation, or exclusive breastfeeding (EBF) during three months then early cessation of breastfeeding. Paediatric HIV infection was defined as a positive HIV-1 PCR, or if aged >18 months, a positive HIV serology. PT was defined as a child with a negative HIV-1 PCR from a sample obtained at age >30 days who later became infected. Comparison of PT incidence rate (IR) per 100 child-years (%CY) was performed between intent-to-feed groups.

Results: From 03/2001 to 03/2003, 582 live-born children were enrolled. Among the 556 single children fed at least once, 276 (49.6%) received FF from birth, 248 (44.6%) were breastfed from birth for a median duration of 95 days (interquartile range [IQR]: 30-127), and 32 (4.3%) were mixed-fed for a median duration of 28 days (IQR: 2-75). PT occurred in 12 children: one among FF children yielding a IR of 0.6 %CY (95%CI: 0-1.8%), two among children EBF (IR: 8.5 %CY; 95%CI: 0-20.3%), 8 among children predominantly BF (IR: 22.2 %CY; 95%CI: 6.8-37.6%) and one occurred in mixed fed children (IR: 44.6 CY; 95%CI: 0-132.1%).

Conclusion: The few children who were mixed fed had the highest PT risk. FF was acceptable for half of the women leading to a controlled PT risk. Although, it seems that EBF reduced PT, we did not show a significant difference of PT between EBF and PBF children. Further PT analysis will allow studying other PT determinants.

MedGenMed. 2004 Jul 11;6(3):MoPpB2007 [eJIAS. 2004 Jul 11;1(1):MoPpB2007]

Abstract number: B11912

Infant feeding practices and its effect on infants born to HIV seropositive women -Tamil Nadu, India

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Background: HIV sero positive mothers are encouraged to exclusive breast feed for 6 months. The aim of this study is to assess the infant feeding practices among HIV seropositive mothers and to assess the mortality rates between the infants who were breast fed and infants who were on replacement feeds.

Methods: 80 mother and infant pairs were administered questionnaires at the MTCT prevention center follow up clinic at Namakkal. Information on Demographic characteristics, infant feeding practices and current status of infants aged 1 year were recorded and analysed.

Results: The mean age of mothers was 25.6 years and the average family monthly income was Rs 900/month. 27% of infants diagnosed to be HIV positive by HIV DNA PCR. 25% of infants were on mixed feed and 2% of infants were only on replacement feed. 8% of infants on mixed feeds died due to gastroenteritis. 3% of infants on replacement feeds died due to low birth weight. 73% of infants were HIV negative. 37% of HIV negative infants were on mixed feed and 18% of infants were on exclusive breast feeding with an average duration of 1 month.18% of infants were only on replacement feed (buffalo milk, cows milk).

Conclusion: Exclusive breast feeding was uncommon in rural HIV sero positive mothers mixed feeding was common among HIV sero positive and negative infants soon after delivery. There was a lower risk of infection among negative infants who exclusively breast fed. Mortality rates were high in sero positive infants on mixed feed. Therefore repeated counseling on exclusive breast feeding for 6 months need to be emphasized at antenatal clinics to all pregnant women irrespective of HIV status.

MedGenMed. 2004 Jul 11;6(3):B11912 [eJIAS. 2004 Jul 11;1(1):B11912]

Abstract number: ThOrC1417

Breast milk transmission of free and cell-associated HIV in different postpartum periods

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Background: HIV-1 transmission by breastfeeding is associated with high viral and proviral load in milk. Although cell numbers in milk tend to decrease over time, a constant risk of HIV infection has been reported between 6 weeks and 24 months postpartum. Relative transmission rates of free virus and infected cells might vary in different postpartum periods.

Methods: A case-control study nested within a vitamin supplementation trial in Tanzania included 63 HIV-positive mothers whose infants tested PCR-positive only after 6 weeks of age. They were matched to 63 breastfeeding non-transmitting mothers on providing a sample within 1 week of the estimated transmission time for the case. Viral and proviral levels in milk were measured by the Roche Amplicor Monitor 1.5 kit and by real-time PCR, respectively. The C2-C5 *env* region was amplified from HIV RNA and DNA in milk of transmitting mothers and the cloned sequences were phylogenetically compared to those found in infant PBMCs.

Results: After adjustment for vitamin A supplementation, CD4 counts, and disease stage, proviral and free viral levels were similarly associated with HIV transmission by breast milk, OR=2.18 (95% CI 1.15-4.13) and OR=2.45 (95% CI 1.22-4.93). However, transmission occurring before 9 months postpartum was more strongly associated with proviral than free viral

load, OR=6.0 (95% CI 1.34-26.80) vs OR=2.8 (95% CI 1.01-7.77). Although both viral RNA and DNA levels were significant predictors of infant infection after 9 months of age, the association tended to be stronger for HIV RNA concentrations, OR=4.67 (95%CI 1.34-16.24) vs OR=3.25 (95%CI 1.06–9.97). Infants harboring viruses that clustered with milk viral RNA tended to be infected after 9 months postpartum (9/14, 63%). No such trend was observed for variants clustering with milk provirus.

Conclusions: Although infant infection with milk HIV free virus and provirus can occur at any time during breastfeeding, transmission of free virus seems to be facilitated after 9 months postpartum.

MedGenMed. 2004 Jul 11;6(3):ThOrC1417 [eJIAS. 2004 Jul 11;1(1):ThOrC1417]

Abstract number: ThPeB7040

HIV transmission from non-breastfeeding mothers to their infants in Pune, India

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Background: Little is known about current maternal-infant HIV (MCTC) transmission rates in India. We examined vertical HIV transmission from HIV-positive Indian women who chose not to breastfeed their infants.

Methods: Between August 2002 and December 2003, consenting women who chose not to breastfeed their infants were enrolled in a prospective observational study of HIV transmission. All HIV-infected mothers were offered locally available regimens of short course ZDV or nevirapine for prevention of vertical HIV transmission.

Results: Thirty-seven women gave birth to 38 live-born infants. Median maternal age was 22.5 years (range 19-35) with a mean parity of 0.8; 92.5 % were married and 32.5% had no education. Prior to delivery, the median CD4 count was 400 cells/mm³ (range 36-1063) and median plasma viral load (VL) was 12,564 copies/ml (range 560-252,714). Nineteen (51%) of 37 women took NVP only; 4 (11%) took AZT only for varying durations, and 2 (5%) took AZT and NVP. Among 12 women who did not take either AZT or NVP prophylaxis, 9 were in advanced labor or did not meet medical criteria for drug initiation, and 3 were diagnosed with HIV in the post-partum ward. All 37 women chose not to exclusively breast feed their infants. Most infants were mixed fed. During 616 person-years of post-partum follow-up, 4 infants were HIV-PCR positive (10.5% at 14 weeks post partum). The infants were HIV PCR positive at 48 hours(2), 4 weeks (1) and and 14 weeks post-partum (1). Among these 4 HIV PCR+ infants, 1 was delivered by C-section, 2 had NVP and none had AZT; median maternal CD4 count was 141 cells/mm³ and median maternal VL was 200,431 copies/ml. The vertical transmission rate at 14 weeks post-partum for mothers/infants who received any ART was 7.7% (2/26) compared with 16.7% (2/12) for those receiving no ART.

Conclusions: In a cohort of HIV-positive women who chose to not exclusively breastfeed in India, we identified a 10.5% HIV transmission rate.

MedGenMed. 2004 Jul 11;6(3):ThPeB7040 [eJIAS. 2004 Jul 11;1(1):ThPeB7040]

Breastfeeding and Maternal Health

Abstract number: ThPeB7010

No increased risk of maternal mortality attributable to prolonged breastfeeding among HIV-positive women in Lusaka, Zambia

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Background: Concern that breastfeeding may increase mortality of HIV-positive mothers has raised the ethical dilemma that a practice potentially beneficial for the child may be detrimental to the mother.

Methods: As part of a randomized clinical trial conducted in two urban antenatal clinics in Lusaka, Zambia, we tested whether or not mortality and more rapid disease progression among HIV-positive women would be associated with prolonged breastfeeding. 695 HIV-positive women who delivered live born infants were prospectively followed for up to 24 months after delivery. Half of the women were randomly assigned to a counseling program that encouraged abrupt cessation of breastfeeding at 4 months (group A), and the other half to a program that encouraged continued exclusive breastfeeding to 6 months with gradual introduction of weaning foods thereafter (group B). The duration of breastfeeding after 4 months in group B was based on the woman's personal informed choice.

Results: There was no difference in the Kaplan-Meier estimates of mortality between 347 HIV-positive women assigned to group A (mortality at 12 months 4.6% [95% CI: 1.79-7.31]) compared to 348 HIV-positive women assigned to group B (4.9% [95% CI: 1.91-7.86]), $p=0.954$. CD4 counts measured 12 months after delivery were lower among women in group A (early cessation of breastfeeding group, median CD4 count = 336) than among women in group B (prolonged breastfeeding group, median CD4 count = 427), $p=0.02$.

Conclusions: There was no evidence of any increased maternal mortality attributable to long-term breastfeeding in our randomized study comparing short- vs. long-term breastfeeding. Rather, prolonged breastfeeding was associated with higher CD4 counts after delivery suggesting possible immunologic benefits of lactation for maternal health.

MedGenMed. 2004 Jul 11;6(3):ThPeB7010 [eJIAS. 2004 Jul 11;1(1):ThPeB7010]

Abstract number: ThPeC7290

Body composition changes in HIV-infected South African breastfeeding mothers

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Background: The nutritional and immunologic consequences of breastfeeding by HIV-infected women are unknown. These women are particularly vulnerable to nutrient deficiencies from potential dietary inadequacies and likely increased nutrient requirements associated with HIV. The aim of this study was to determine the effect of breastfeeding on the body composition of HIV-infected breastfeeding mothers.

Methods: We measured the height (HT), weight (WT), and body mass index (BMI) of 65 HIV-infected and 41 uninfected breastfeeding mothers in rural South Africa at 8 and 24 weeks post partum, and determined their fat-free mass (FFM), fat mass (FM) and percent body fat (%BF) using bioimpedance spectrometry.

Results: At 8 weeks post partum, HIV-infected and uninfected mothers were not significantly different from one another in HT (159.2 vs 159.7 cm, $p=0.6$), WT (62.7 vs 65 kg, $p=0.3$), BMI (24.7 vs 25.5 kg/m², $p=0.4$), FFM (41.3 vs 43.4 kg, $p=0.2$), FM (21.4 vs 21.6 kg, $p=0.9$) or %BF (33.7 vs 32.5%, $p=0.5$) respectively. Median CD4 in infected mothers was 673 cells/uL, with median HIV viral load of 7000 copies/mL.

Changes between 8 weeks and 24 weeks post partum did not differ significantly between HIV-infected and uninfected mothers in FFM (-0.62 vs +0.19 kg, $p=0.8$), FM (-1.18 vs +0.04 kg, $p=0.3$) and %BF (-1.12 vs +0.03%, $p=0.7$) respectively. In both groups, change in FFM and FM was related to initial FFM and FM. HIV-infected mothers, however, lost significantly more WT (-1.33 vs +0.24 kg in uninfected, $p<0.02$), and had a resultant decrease in BMI (-0.52 vs +0.08 kg/m² in uninfected, $p<0.02$).

Conclusion: HIV-infected breastfeeding mothers lost weight between 8 and 24 weeks post partum, while uninfected mothers gained weight. The loss was primarily FM. In spite of this weight loss, HIV-infected mothers remain comparable in FFM and FM with HIV-uninfected mothers breastfeeding mothers in other studies.

MedGenMed. 2004 Jul 11;6(3):ThPeB7010 [eJIAS. 2004 Jul 11;1(1):ThPeC7290]

Abstract number: ThPeC7307

Child-to-mother transmission of HIV by breastfeeding during the epidemic in Benghazi, Libya

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Background: In the HIV-1 epidemic that occurred in the Benghazi Children Hospital in Libya in 1998-99, at least 402 children and 20 mothers were infected by a monophyletic CRF2-AG strain. The children had clearly acquired the infection through nosocomial transmission. The objective of this study was to determine the transmission modality for the mothers.

Methods: We considered the child-mother pairs involved in the epidemic as concordant if both the mother and child were HIV-positive and as discordant if only the child was HIV-positive. Epidemiological data on the children, with particular focus on the duration of breastfeeding in relation to hospitalization periods, were retrospectively collected by directly interviewing the mothers at our Institution in Rome, where Libyan HIV-infected patients underwent clinical follow-up in 2001.

Results: Of the 104 pairs, 20 were concordant and 84 discordant. In all of the children and in 5 of the 20 infected mothers, an intravenous treatment or a needle-stick injury during the epidemic was documented. Information on breastfeeding was available for 92 pairs. Breastfeeding during or after the child's hospitalisation was reported by 87.5% of the HIV-infected mothers and 30.3% of the HIV-negative mothers (OR 16.13; 95%CI 3.20-152.64). This association remained

significant after excluding from the analysis the 5 mothers who reported a possible at-risk parenteral exposure (OR 23.04; 95%CI 2.87-1018.9). All of the 61 fathers tested for HIV were negative. When repeating the analysis only on the pairs with an HIV-negative father (n=56), so as to exclude the possibility of sexually transmitted infection, the association between the mother's serostatus and breastfeeding during hospitalisation remained significant (OR 12.76; 95%CI 1.38-593).

Conclusions: These results support the hypotheses that HIV can be acquired by breastfeeding an infected child, which could be of particularly great concern in countries where wet-nursing is common.

MedGenMed. 2004 Jul 11;6(3):ThPeC7307 [eJIAS. 2004 Jul 11;1(1):ThPeC7307]

ARVs and Postnatal Transmission

Abstract number: LbOrB10

Oral tenofovir DF protects infant macaques against infection following repeated low-dose oral exposure to virulent simian immunodeficiency virus

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Background: There is a need for effective strategies to prevent mother-to-infant HIV transmission during breast-feeding in developing countries. To mimic the multiple exposures to HIV that occur during prolonged breast-feeding, we have developed an animal model in which infant macaques are bottle-fed repeatedly low doses of virulent simian immunodeficiency virus (SIVmac251). We tested the efficacy of tenofovir disoproxil fumarate (tenofovir DF) in this animal model, using the same pediatric formulation and equivalent regimen as that used to treat human infants.

Methods: Infant macaques were exposed orally to low doses of virulent SIVmac251 during 2 inoculation periods: during the first week of life and for animals that were still uninfected, again at 1 month of age. Each SIV inoculation period consisted of 15 feedings (3 times per day for 5 consecutive days). One group of animals received oral tenofovir DF syrup at a dose (10 mg/kg once daily) estimated to be pharmacokinetically equivalent (based on area-under-the-curve values) to the 8 mg/kg regimen used in pediatric trials, and the 300 mg tenofovir DF tablet given to adults. Tenofovir DF was given once daily starting one day before until one day after each SIV inoculation period.

Results: After the 2 rounds of virus inoculations, 20 of 22 untreated infant macaques were persistently viremic. In contrast, 3 of 6 tenofovir-treated animals were uninfected at 3 months of age (p=0.05; two-sided Fisher's Exact test). We are currently testing in additional animals if a longer post-exposure treatment will further reduce infection rates.

Conclusions: These data suggest that tenofovir DF administration will be effective to protect infants against HIV transmission from breast-milk. Our data provide also support for the ongoing trials in which the use of chronic tenofovir DF administration is investigated to reduce infection rates among high-risk adult groups (commercial sex workers, and men having sex with men).

MedGenMed. 2004 Jul 11;6(3):LbOrB10 [eJIAS. 2004 Jul 11;1(1):LbOrB10]

Abstract number: ThPeB7047

The effect of highly active antiretroviral treatment (HAART) on breast milk: a pilot study in Belgium

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Objective: To measure viral load and drug levels in breast milk of mothers treated with HAART.

Methods: 9 women treated with HAART and 1 woman treated only with zidovudine during delivery were enrolled in the study. All HAART treated women continued HAART at least during 5 days after delivery. Viral load and drug levels were measured in plasma and breast milk of the mother. Children were not breastfed and collecting breast milk samples was stopped 5 days after delivery.

Results: 9 participants were of African, 1 from Asian origin, mean age 29, all of them delivered by caesarean section. They all received zidovudine IV during labour. All except 1 had a plasma viral load of < 50 copies/ml the first day and day 5 after delivery. One patient (the one receiving only zidovudine) had a plasma viral load day 1 of 96 copies/ml plasma and a viral load in colostrum of 261 copies/ml and in breast milk day 3 of 441 copies/ml. Eight of the 9 women treated with HAART had an undetectable viral load in colostrum and breast milk (day 3 or 5). One HAART treated woman with an undetectable plasma viral load at delivery had a viral load in colostrum of 172 copies/ml. Antiretroviral drug levels in plasma, colostrum and breast milk will be presented at the meeting.

Conclusion: in all women treated with HAART during pregnancy and post-natally the viral load was < 400 copies/ml plasma in plasma and breast milk. This pilot study suggests that, in low income countries, through the treatment of women with HAART during breast feeding, the child's infection risks will be very low.

MedGenMed. 2004 Jul 11;6(3):ThPeB7047 [eJIAS. 2004 Jul 11;1(1):ThPeB7047]

Abstract number: ThPeB7076

Suppression of HIV-1 RNA levels in breast milk after randomization to perinatal nevirapine vs. AZT

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Background: Perinatal regimens of nevirapine or AZT are widely used to prevent mother-to-child transmission of HIV-1 in resource-limited settings. This randomized trial was designed to compare the effect of these regimens on breast milk virus during the first 6 weeks postpartum.

Methods: Thirty-nine HIV-1 positive pregnant mothers were randomized to receive perinatal nevirapine (HIVNET 012 regimen) or short-course AZT (CDC-Thai regimen). Nineteen women received nevirapine and 20 women received AZT. After delivery, breast milk samples were collected at home visits from each woman at approximately 14 time points over a 6 week period. Five hundred and twenty-eight breast milk supernatant samples were tested for HIV-1 viral RNA levels using the Gen-Probe HIV-1 viral load assay.

Results: There was a trend for women randomized to nevirapine to have higher log₁₀ HIV-1 RNA viral loads in breast milk during the first 2 days postpartum compared to those randomized to AZT (2.8 vs. 2.1, p=0.1). However, after the neonatal period nevirapine was associated with significantly greater suppression of breast milk HIV-1 RNA. Between 3 and 28 days after delivery, breast milk HIV-1 RNA levels were quantified at ~ 10 time points and averaged. During this period, median breast milk RNA levels among women randomized to nevirapine was significantly lower than that among women taking AZT (2.2 vs. 2.9, p=0.04). After 28 days postpartum, the trend for lower breast milk viral loads in the nevirapine arm persisted (2.2 vs. 3.0, p=0.1).

Conclusions: Perinatal administration of nevirapine is significantly more likely to decrease HIV-1 virus levels in postpartum breast milk when compared to zidovudine. Nevirapine exerts greater effect in breast milk viral suppression 3 days after delivery and is significantly more likely than AZT to suppress breast milk viral load for up to a month following single-dose administration. Sustained breast milk HIV-1 suppression may contribute to the efficacy of nevirapine to decrease mother-to-child transmission of HIV-1.

MedGenMed. 2004 Jul 11;6(3):ThPeB7076 [eJIAS. 2004 Jul 11;1(1):ThPeB7076]

Abstract number: TuPeB4499

A Phase I/II, randomized, placebo controlled study to evaluate chloroquine administration to reduce HIV-1 RNA in breast milk in an HIV-1 infected breastfeeding population: The CHARGE study

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Background: Breastfeeding is accountable for a substantial amount of HIV-1 infections in infants born to HIV-1 infected mothers. HIV-1 viral load in breast milk is associated with mother-to-child transmission of HIV-1. Chloroquine at clinically achievable plasma concentrations leads to the production of post-transcriptionally modified gp120, which renders HIV-1 produced from CQ-treated cells non-infectious. Chloroquine might also inhibit the viral integrase. Chloroquine may thus reduce the infectivity of HIV-1 RNA in breast milk. In addition, it is low in cost and safe to administer.

Methods: In this pilot randomised placebo-controlled trial in Rwanda, 30 HIV-1 infected breastfeeding women were randomised (2:1) to receive either chloroquine 200 mg once daily or placebo from the day of first milk for a duration of 16 weeks. All included women were given single-dose nevirapine 200 mg at the start of labour to reduce peripartum transmission of HIV-1. Regular counselling on exclusive breastfeeding was provided. Primary outcome was the proportion of women with < 50 cps/mL HIV-1 viral load in breast milk after 16 weeks of chloroquine as measured with an HIV-1 RNA PCR.

Results: 40 women were screened and 30 enrolled and randomised to chloroquine (n=20) and placebo (n=10) with at delivery a mean age of 27.7 years, median plasma log₁₀ HIV-1 RNA 3.64 cps/mL, median CD4-count 554 c/mL. The proportion of women with undetectable HIV-1

RNA at baseline in both breasts was 50% and 60% in the CQ and placebo arm respectively. After 8 and 16 weeks of treatment the proportion of women with undetectable HIV-1 RNA load in both breasts was 50% and 40% in the placebo group and 55% and 42.1% in the women using chloroquine respectively. There was no statistically significant difference between the arms at week 8 (fisher's exact test; $p=1.0$) and week 16 (fisher's exact test; $p=1.0$).

Conclusions: In our study there was no evidence for an anti-HIV-1 effect of chloroquine on breast milk HIV-1 RNA load.

MedGenMed. 2004 Jul 11;6(3):TuPeB4499 [eJIAS. 2004 Jul 11;1(1):TuPeB4499]

Abstract number: TuPeC4928

Potential cost-effectiveness of maternal and infant antiretroviral interventions to prevent MTCT during breastfeeding

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Background One third of MTCT occurs during breastfeeding (BF). Several trials are currently evaluating the efficacy of postpartum antiretrovirals to reduce MTCT during BF.

Methods We used Markov modeling to examine the circumstances under which the following interventions - currently of unknown efficacy, but the subject of ongoing trials - would be cost-effective: 1) BF for 6 mo with daily infant nevirapine (NVP) prophylaxis, 2) maternal combination antiretroviral therapy (ART) during pregnancy and for 6 mo of BF; and 3) maternal ART only for women meeting clinical/CD4 criteria. They were compared to: 4) BF for 12 mo; 5) BF for 6 mo; 6) formula feeding for 12 mo. Strategies were evaluated for a hypothetical cohort of 40,000 pregnant women in sub-Saharan Africa, in the context of available VCT in antenatal care. Model estimates were derived from the literature and local sources. Sensitivity analyses were performed on uncertain estimates. The perspective used was that of a government health district.

Results Using base case estimates, BF for 6 mo was the economically preferred strategy: it cost \$806,995 and generated 446,208 quality-adjusted life years (QALYs). Providing daily infant NVP cost an additional \$93,638 and generated 1,183 additional QALYs, but its incremental cost-effectiveness ratio (ICER) of \$79 / QALY exceeded the standard willingness to pay (\$50 / QALY) for resource-poor settings. Maternal ART was potentially very effective, but too costly for most resource-poor settings (ICER: \$87 / QALY). In order for daily infant NVP to be preferred, it must be $\leq 52\%$ effective or cost $\leq \$4.20$ / month. If NVP were donated, it would only have to be minimally effective to be the economically preferred strategy. If ART cost $\leq \$28$ / month, ART to all mothers would become the preferred strategy under our assumption of 82% efficacy.

Conclusions Providing antiretrovirals during breastfeeding represents a promising alternative, should their effectiveness be proven.

MedGenMed. 2004 Jul 11;6(3):TuPeC4928 [eJIAS. 2004 Jul 11;1(1):TuPeC4928]

Abstract number: ThPeB7041

The Kisumu breastfeeding study: A phase II trial of highly active antiretroviral therapy (HAART) to reduce mother-to-child HIV-1 transmission during breastfeeding in resource-poor settings

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Background: Breastfeeding causes 33-50% of all Mother-to-Child Transmission (MTCT) of HIV-1 in sub-Saharan Africa. Because safe and acceptable alternatives to breast feeding are not currently viable for many women in Africa, it is critical to identify ways to maximally reduce MTCT of HIV-1 among breastfeeding women.

Methods: This open-label phase II trial aims to show that using HAART to maximally suppress viral load is safe, effective and possible in resource-poor settings. 480 HIV-infected women in Kisumu, Kenya will receive HAART (ZDV/3TC + NVP) from 34 weeks gestation through 6 months postpartum; neonates will receive single-dose NVP. Transmission rates, adherence, and safety will be monitored. Women are encouraged to breastfeed exclusively and wean rapidly at 6 months. Participants will be followed for 24 months postpartum.

Results : From July - December 2003, 117 HIV-infected women were recruited through an antenatal clinic serving 1200 HIV-1-infected women a year. Of them, 42(36%) did not come for screening or enrollment at 33 weeks gestation. To date, 39 women have begun HAART; 4(10%) have discontinued drug due to neonatal death, stillbirth or initiation of anti-TB drugs. Two (5%) have switched to a second regimen due to rash, including 1 case of Stevens-Johnson Syndrome. There have been no hepatic toxicities. All infants living >24 hours have received single-dose NVP within 72 hours.

Conclusions: Preliminary results suggest HAART is well tolerated by the majority of pregnant or lactating trial participants in this resource-poor setting. Major challenges include: 1) lack of male partner involvement, 2) fear of HIV disclosure, 3) slow enrollment, and 4) a high background neonatal mortality rate (about 6%). With improving access to HAART in Africa, this trial will provide critical information on the safety, tolerance and feasibility of using perinatal and post partum maternal HAART for PMTCT in resource-poor, breastfeeding settings.

MedGenMed. 2004 Jul 11;6(3):ThPeB7041 [eJIAS. 2004 Jul 11;1(1):ThPeB7041]

Abstract number: ThPeB7110

Effectiveness of nevirapine in reducing mother-to-child transmission of HIV in formula-fed infants

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Background: Nevirapine have been shown to prevent mother-to-child transmission of HIV (PMTCT) in breastfeeding women in Africa. There are no data, however, regarding the effectiveness of nevirapine in preventing MTCT in formula-fed infants.

Methods: A consecutive sample of 66 HIV+ women were invited to participate in the PMTCT Program of Nuestra Señora de La Altagracia, Santo Domingo, the Dominican Republic. All of

the HIV (+) pregnant women were to receive a 200 mg nevirapine tablet during labor or 8 hours previous to C-section. Additionally, all children born from these mothers were to be administered a 0.6 ml of nevirapine suspension with a 1 ml tuberculin syringe. The number of infected children was calculated using RNA-HIV-1 (Quantiplex b DNA Analyzer, BAYER-CHIRON). An infant was considered HIV-infected, if blood obtained after six weeks of nevirapine administration tested positive for the virus (RNA-HIV-1).

Results: Nevirapine was administered at onset of labor to 65 (98%) of 66 HIV (+) pregnant women and to 100% of the children. Elective C- sections were performed in 98% of the HIV positive pregnant women, and formula feeding was delivered to all of the HIV (+) mothers. Forty seven percent of the children were male and the median age was 6.5 + 5 months. HIV-1- RNA viral load levels were non-detectable in 92% of the children tested after 6 weeks of age.

Conclusions: These findings suggest that the use of nevirapine, in conjunction with elective C-section, in formula-fed infants is effective in reducing the risk of HIV vertical transmission. Post partum activities should be monitored to avoid the risk of transmission through breastfeeding practices. Support: NIH/Fogarty AIRTP (D43TW00017).

MedGenMed. 2004 Jul 11;6(3):ThPeB7110 [eJIAS. 2004 Jul 11;1(1):ThPeB7110]

Abstract number: TuPeC4950

Modeling the Effectiveness of Nevirapine (NVP), HIV Vaccine and HIV-Specific Monoclonal Antibody (HIV-Ab) on Mother to Child Transmission of HIV from Intrapartum and Breast-Feeding (MTCT) and Cost Effectiveness Analysis of those Interventions

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Background: We develop a model to predict the effects of various interventions including combinations of vaccine, HIV-Ab, and NVP on MTCT of HIV at various ages and the cost effectiveness (CE) of those interventions.

Methods: We use mother to child HIV transmission rates reported from several mother infant intervention studies in Africa to estimate model parameters. These models accommodate different levels of protective immunity (PI) and waning immunity following various vaccine regimens. The models predict the cumulative transmission of HIV at 36 months of age from both intrapartum and breast-feeding (CTR36). The PI of one dose vaccine is modeled to be 50~95% and with a second and third dose it is assumed to be boosted to 75.5~99.5%. NVP, HIV-Ab, and 1st dose of vaccine are assumed to be given at birth. CE analysis compares universal and targeted interventions of NVP only, NVP+Vaccine, and NVP+Vaccine+HIV-Ab.

Results: Our model suggests that when Vaccine (PI=95% at 1st dose, 11% waning over 10 years) is used along with NVP, CTR36 reduces to 1.81~2.11% depending on number of vaccine doses. Addition of HIV-Ab(PI=70%, 50% waning/month) can further reduce CTR36 down to 0.7%. Less effective vaccine (as low as 50% PI 1st dose) used with NVP can still reduce CTR36 to 3.32~6.19%, with slight improvement by adding HIV-Ab. CE analysis suggests that Universal NVP intervention is the most cost effective in prevention of MTCT when the cost of vaccine and the cost of treating HIV infected child are more than \$3.43/dose and \$57/child respectively.

Conclusions: This analysis is restricted to first 3 years of life and does not factor in the benefit of later life. Within this limitation even imperfect vaccine can greatly reduce MTCT especially when combined with NVP. However, to be more cost effective than the universal NVP, the cost of the vaccine should be less than \$3.43/dose regardless of the PI.

MedGenMed. 2004 Jul 11;6(3):TuPeC4950 [eJIAS. 2004 Jul 11;1(1):TuPeC4950]

Abstract number: MoPeB3140

Detection of HIV-1 RNA in breast milk from Subtype C HIV-1 infected women after single dose nevirapine (SD-NVP)

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Background: HIV-1 in breast milk (BM) is a significant risk factor for HIV mother to child transmission, particularly in sub-Saharan Africa where breast-feeding is the norm. Qualitative and quantitative measures of BM shedding may be obtained from lactoserum by nucleic acid amplification techniques. We compared Bayer Versant HIV-1 RNA 3.0 bDNA (bDNA) and ultrasensitive Roche Amplicor HIV-1 Monitor v1.5 (PCR) in 125 breast-milk samples obtained from 45 women with subtype C HIV-1.

Methods: In the HPTN 023 study, 45 women from Zimbabwe and South Africa, received SD-NVP at labor. BM samples were collected at 8, 16, 20 and 24 weeks post-partum and frozen. Split BM aliquots (1 to 5 samples/woman) were analyzed by bDNA and PCR, sample volumes 0.5 to 1ml. The lower level of detection by bDNA was 75-150 copies/ml, and 25-50 copies/ml by PCR.

Results: Among the 125 BM samples, 82/125 (66%) had >25-50 copies/ml by PCR compared to 36/125 (29%) with >75-150 copies /ml by bDNA. In 36 samples with detectable RNA by both methods, median values were 2604 copies/ml by PCR and 401 copies/ml by bDNA (Wilcoxin Signed-Rank, $p < 0.01$) and there was a significant correlation between bDNA and PCR (Spearman, $r=0.87$, $p < 0.01$). In 62/125 (50%) of samples, PCR was greater than bDNA, while only 3/125 (2%) had higher bDNA than PCR values. Among 45 women, one or more BM samples had quantifiable RNA in 37/45 (82%) by PCR vs 20/45 (45%) by bDNA.

Conclusion: Ultrasensitive PCR appears more sensitive than bDNA in limited volume breast-milk samples for the detection of HIV RNA. However, among women with > 175 copies /ml of HIV-1 RNA in BM there was a close correlation between the two assays. Nucleic acid amplification techniques can detect and quantify breast-milk shedding in subtype C HIV-1 infected lactating women.

MedGenMed. 2004 Jul 11;6(3):MoPeB3140 [eJIAS. 2004 Jul 11;1(1):MoPeB3140]

Abstract number: TuPeB4641

Chloroquine concentrations in breast milk after 16 weeks of daily chloroquine intake: The CHARGE study

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Background: Chloroquine (CQ) has been used extensively for treatment and prevention of various diseases including malaria and rheumatoid arthritis. CQ has also been shown to have anti-HIV-1 activity both in vitro and in vivo, with an EC50 of 0.2 µM in primary macrophages. CQ is water-soluble and quickly absorbed, reaching maximum plasma levels 4-8 hours after an individual dose. Equilibrium in plasma is reached after 4 – 6 weeks of daily intake. Data on CQ concentration in breast milk during chronic CQ dosing is however scarce. In this study we provided daily doses of CQ to HIV-1 infected breastfeeding women to evaluate whether sufficient CQ concentrations can be reached to establish an anti-HIV-1 activity in breast milk.

Methods: In this pilot trial in Rwanda, 20 HIV-1 infected breastfeeding Rwandan women received chloroquine 200 mg once daily from the day of first milk for a duration of 16 weeks. We measured CQ concentrations in plasma and milk from both breasts at baseline and week 8 and 16 and subsequently at 1 and 2 weeks after the stop of CQ treatment (week 17 and 18). Samples were analysed using high-performance liquid chromatography (HPLC) with ultra-violet detection.

Results: Women received CQ for a median duration of 112 days (range, 66 – 116 days). Median plasma CQ concentration was 561 ng/mL (range, 244 – 2877) and 403 ng/mL (range 174 – 1414) at week 8 and 16 respectively. Median breast milk CQ concentration at week 8 was 1658 ng/mL (range, 654 – 3618) and 1831 (range, 651 – 4413) in the left and right breast respectively. At week 16 this was 1214 ng/mL (range, 216 – 2843) and 1016 (range, 232 – 2908).

Conclusions: Chloroquine concentration levels were 3-fold higher in breast milk as compared to plasma after 8 and 16 weeks of daily treatment. Participating women had sufficiently high levels of chloroquine in plasma and breast milk to exert some degree of inhibition on HIV-1 replication.

MedGenMed. 2004 Jul 11;6(3):TuPeB4641 [eJIAS. 2004 Jul 11;1(1):TuPeB4641]

Abstract number: ThPeB7057

Mother To child transmission rate of HIV 1 in the national PMTCT program in Cameroon

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Background: A program was introduced in the country in January 2000 .The evaluation of the impact of MTCT prevention components at 15 months target 10 % of the children registered in 3 urban sites by the end of 2003.

Objective: To determine the percentage of paediatric HIV infection after inclusion in the mother to child transmission of HIV program.

Methodology: Prospective follow up of a cohort of infant born of HIV positive women who benefit of antiretroviral therapy.The ARV regimens include either nevirapine (HIVnet 012) or zidovudine (from 36 weeks to 1week post natal). Regular clinical follow up was performed after birth and an evaluation at 15 months by testing the baby.

Results: 111 couples of mother and child were included in the cohort. The average age of pregnancy at delivery is 38, 4 weeks .12,5% are premature. The average birth weight is 3184g after normal delivery in 91,8 % .83,2 % of couple receive nevirapine as antiretroviral drug and 7,5% benefit of a ZDV regimen. Of those under nevirapine the ARV intake was adequate for 92,7%, while less than 50% receive adequate posology of zidovudine . 86,2% of mothers opted for artificial milk. At 15 months post natal, 111 infants were tested for HIV; 9% of them were positive, 87,4% were negative and 2,7% indeterminate. There was a difference between the rate of transmission under nevirapine 8,4% and ZDV regimen 14,3%, $p < 0,001$. HIV testing was positive in 8,8% of infant on artificial feeding and for 14,3% of those on breastfeeding.

Conclusion: In Cameroon, the MTCT rate is low in urban areas where antiretroviral component is associate with high rate of artificial feeding .The simplicity of the regimen scheme of ARV for PMTCT seems to increase compliance and adequate ARV intake in the field.

MedGenMed. 2004 Jul 11;6(3):ThPeB7057 [eJIAS. 2004 Jul 11;1(1):ThPeB7057]

Breastfeeding Practices - Prevalence and Determinants

Abstract number: C12019

Breastfeeding (BF) practices of HIV seropositive women in a PMTCT project

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Background: NIGAT project is a clinical trial in Addis Ababa, Ethiopia, evaluating the efficacy of ARV in preventing HIV transmission through breastfeeding. The project follows both breastfeeding (BF) and non-BF seropositive women.

Method: Women are counseled at the time of enrollment and are offered subsidized infant formula if they choose not to BF. Those who opt to BF are counseled on exclusive breastfeeding and early weaning. Information regarding BF is collected at follow-up visits for 12-months post-delivery. Exclusive BF is defined as giving no other fluid or food to the infant other than breastmilk and liquid medicines or vitamins.

Results: Through Dec '03, 530 HIV seropositive women were enrolled. Almost 30% of women chose not to BF at the time of enrollment. Of the 372 women enrolled in the BF cohort, 337 had live births and 90% were BF at the time of delivery discharge. The % of all infants in the BF cohort who were BF at post-partum visits was:

Type of BF	4 weeks	10 weeks	14 weeks	4 months	6 months
Any	229/298 (77%)	155/269 (57%)	118/244 (48%)	70/212 (33%)	36/174 (21%)
Exclusive (% of those BF)	40%	32%	29%	17%	8%

Less than half (137/293) of infants who were breastfed in the first week of life were exclusively breastfed. Of 166 infants who had been breastfed and had completed 6 months of follow-up by Dec '03, 16% were weaned by two weeks, 25% by 4 weeks, 47% by 10 weeks, 58% by 14 weeks, and 66% by 4 months.

Conclusion: In the absence of sufficient resources for safe alternative feeding options, exclusive breastfeeding is recommended for HIV seropositive women. In spite of counseling women to that effect, we found exclusive breastfeeding was relatively uncommon and weaning occurred both earlier and later than what was recommended. A better understanding of the cultural and social practices associated with infant feeding will be necessary to optimize interventions for PMTCT programs.

MedGenMed. 2004 Jul 11;6(3):C12019 [eJIAS. 2004 Jul 11;1(1):C12019]

Abstract number: ThPeC7293

Uptake and determinants of exclusive breastfeeding with early cessation to prevent HIV-1 transmission through breastmilk. ANRS 1201/1202 Ditrane Plus project, Abidjan, Côte d'Ivoire

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Background: To assess within a PMTCT project in Abidjan, Côte d'Ivoire, the uptake of a nutritional intervention aimed at promoting exclusive breastfeeding (EBF) with early cessation after 3 months of age in order to reduce postnatal transmission of HIV in keeping the benefits of breastfeeding (BF) during this period.

Methods: Between March 2001 and March 2003, any HIV-1 infected pregnant woman, age ≥18, who accepted pre and post-test counselling, and received a perinatal PMTCT antiretroviral intervention (ZDV+NVP+/-3TC) was eligible. Infant feeding interventions were systematically proposed: formula-feeding free of charge from birth, or EBF during 3 months then early cessation of BF with free provision of formula-feeding from time of weaning to 9 months of age. Mother-infant pairs were closely followed during 2 years, with paediatric HIV-diagnosis, nutritional counselling, and detailed collection of feeding practices.

Results: 582 mothers were enrolled. Among the 474 women who expressed a prenatal choice, 44% intended to BF their newborn. Among the 562 singletons fed at least once, the first liquid ingested from birth was formula (27%), breastmilk (36%), water (21%). 280 mothers initiated BF which was predominant (56%), exclusive (33%) or mixed (11%) in the first 48 hours of life. The median duration of EBF (n=91) was 36 days, IQR [9-121]. Among BF mothers (n=248), practice of EBF until the weaning period was obtained in 32 mothers, and was associated with low CD4 count and living in a detached housing. The median age at complete cessation of BF (n=248) was 116 days, IQR [92-205]. Complete cessation of BF before 120 days was associated with low CD4 count and not living with family-in-law.

Conclusion: Acceptability of EBF among BF mothers was low in this population. However, shortening the duration of BF is feasible in this urban context. To fully evaluate this complex intervention, these results will be balanced with infant health after weaning.

MedGenMed. 2004 Jul 11;6(3):ThPeC7293 [eJIAS. 2004 Jul 11;1(1):ThPeC7293]

Abstract number: WePeD6367

Breastfeeding and ART: new social and cultural issues

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Background: With the extension of PMTCT+ programs, an increasing number of women from low income countries may breastfeed their baby while getting ART. This situation raises new questions about acceptability of breastfeeding and ART treatment.

Methods: Perceptions of women applying exclusive breastfeeding and early weaning while getting ART, and perceptions of HIV positive women about the effects of ART on breastfeeding and on mothers' and children's health are studied in a research project on "Social and cultural determinants of mother-to-child transmission of HIV through breastfeeding", held in 5 countries in Asia and Africa, with an anthropological perspective.

Results: First data from Cambodia and Ivory Coast show that some women do consider ART treatment as able to affect lactation and to pass in breastmilk. This perception is embedded in representations about the effects of medicines and food on lactation and breastmilk, which underlie popular preventive prescriptions during lactation. It has already been shown in Senegal that people taking ART think that the efficacy of the treatment is related to its strength, which is modulated by individual compatibility of the patient's body with the medicine. Thus, they consider that adverse side effects are related to the confrontation of the patient's and the medicine's strengths. In the case of breastfeeding, women holding such perceptions might consider that the baby, with limited strength, will be highly vulnerable to toxic effects of ART. Data on the ethnophysiology of lactation and of ART, on perceptions of the potential effect of ART on the baby, and on precautions taken by women to control this effect will be presented.

Conclusions: These data raise an important issue since perceptions of women about ART toxicity might redirect their choice of a feeding option for their baby. Appropriate counselling, adapted from research results, will be discussed.

MedGenMed. 2004 Jul 11;6(3):WePeD6367 [eJIAS. 2004 Jul 11;1(1):WePeD6367]

Abstract number: B12032

Correlates of prolonged breastfeeding among HIV-1 infected women

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Objectives: To determine the correlates of prolonged breast feeding (beyond seven months) among HIV-1 infected women.

Methods: The study was conducted in an outpatient clinic in Kenyatta National Hospital, Kenya between 1999 and 2002. Women were enrolled during pregnancy and sociodemographic information collected. For those who chose to breastfeed, exclusive breastfeeding and rapid withdrawal at six months was encouraged. Infant feeding information was collected at monthly for the first year.

Results: Among 296 women followed for one year postpartum, 205 (69.2 %) elected to breastfeed at two weeks postpartum. The median planned duration of breastfeeding for the first two years of the study (1999-2000) was 3.00 months (Range: 1-18 months) while the median observed duration of breastfeeding was 12.50 months (Range: 1.5-24.5 months). During the latter two years of the study (2001-2002) the median duration of planned duration of breastfeeding was 6.00 months (1-36 months) while the median observed duration of breastfeeding was 11.5 months (1.5 - 24.5). Twenty seven percent of the breast feeders

stopped breastfeeding at 6 months or less, only 12.4% stopped breastfeeding earlier than planned.

Prolonged breastfeeding was associated with lower education (OR 2.7, 95% CI 1.4-5.2), having had a previous infant (OR 2.4, 95% CI 1.2 - 4.9), and unemployment (OR 1.9, 95% CI 0.9-3.6). There was no significant correlation of duration of breastfeeding with marital status, maternal age, disclosure to the spouse, socioeconomic status and maternal CD4.

Conclusion: There was no significant difference in the observed duration of breastfeeding between the first two and the latter two years of the study despite the availability of increased information and WHO recommendations on abrupt cessation of breastfeeding at six months. What is notable is the gap between the actual and planned duration of breastfeeding, which may be influenced by various social factors. Targeting these factors may aid in bridging this gap.

MedGenMed. 2004 Jul 11;6(3):B12032 [eJIAS. 2004 Jul 11;1(1):B12032]

Abstract number: WePeD6447

Obstacles to exclusive breast feeding amongst Ovambo speaking mothers in Oshakati, Namibia

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Issues: Namibia's pilot PMTCT protocol, based on UNAIDS/UNICEF/WHO guidelines, promotes exclusive breast feeding for 4-6 months followed by rapid weaning, and accompanied by abstinence or the use of condoms for women who are HIV positive during both pregnancy and breastfeeding. Within the context of Oshakati however traditional norms encourage two years of breast feeding, with the decision to wean the child being the prerogative of the father, or, in his absence, the maternal grandparents. Traditional norms also conflict with the recommendation of abstinence, while gender dynamics make the women's insistence on condom use near impossible.

Description: This poster, based on seven months of qualitative research, looks at the three variables that most impact on the effects produced by the PMTCT protocol: firstly, the effect of the drought in the region on women's belief in the sufficiency of their breast milk; secondly, the traditional generational and gender power dynamics that remove these decisions from the women's personal ambit; and thirdly, at traditional beliefs about the necessity of sex during both pregnancy and breast feeding for the good of the baby in a context in which men refuse to use condoms.

Lessons learned: PMTCT interventions must be considered within the broader social world its intended beneficiaries inhabit, as the effects on the ground are the complex products of the many ways in which the PMTCT message is offset by the local reality.

Recommendations: PMTCT thus needs to be brought into dialogue with the context of its implementation in an ongoing manner, and this type of research is vital in that process as it allows access to both the production of meaning and the realities that shape it.

MedGenMed. 2004 Jul 11;6(3):WePeD6447 [eJIAS. 2004 Jul 11;1(1):WePeD6447]

Infant Feeding Practices, Options, and Dilemmas (AFASS)

Abstract number: WePeD6401

The dilemmas of implementing infant feeding options among HIV positive mothers: A case study from Kilimanjaro, Tanzania.

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Issues: The aim of the study was to explore views on potential dilemmas around implementing infant feeding options among HIV positive women. The study explored the experiences and concerns of childbearing HIV positive women who opt for exclusive breastfeeding or replacement feeding. It also aims to understand the dynamics of choice of feeding method. The focus was on how HIV positive women cope with suggested options for infant feeding in the African social context and the cultural determinants of such feeding choices.

Description: This study was conducted in the North Eastern part of Tanzania where the HIV prevalence rate among pregnant women attending antenatal clinic is 20%; which is among the highest in the country. Data were collected through participant observation and in-depth interviews with 20 HIV positive women during antenatal, labour and postnatal periods in the zonal hospital and during home visits in the first six months of the baby's life.

Method: Use of Three Case Studies: Three cases presenting women's choice of infant feeding method including exclusive breastfeeding, cows milk feeding and formula feeding are analysed and discussed with emphasis on the context of choice and the situated concerns of each woman.

Lessons Learned: The study suggest that HIV-related stigma and fear of rejection is a major condition when HIV positive mothers decide how to feed their infants. Women often end up breastfeeding despite their knowledge of the risk of HIV transmission through breast milk. The cost of not breastfeeding including being ashamed and rejected by close kin and neighbours seems to be an even greater burden to carry.

Recommendations: The choice and the implementation of infant feeding choice for HIV positive mothers will to a large extent depend on how social cultural perspectives of options suggested are taken into consideration. The risk of being deprived of social life should be considered as well as the risk of HIV transmission in the medical sense.

MedGenMed. 2004 Jul 11;6(3):WePeD6401 [eJIAS. 2004 Jul 11;1(1):WePeD6401]

Abstract number: WePeD6374

Infant Feeding Options Recommended for Mothers with HIV: Are they acceptable, feasible, affordable, sustainable and safe?

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Background: To investigate pregnant women's views on infant feeding options recommended for HIV-infected women. 500 pregnant women participated in the interview survey and 46 pregnant women participated in six focus group discussions. The participants were recruited through antenatal clinics in Moshi urban and rural districts of Kilimanjaro region, Tanzania.

Methods: A structured interview survey complemented with focus group discussions.

Results: Participating women reported that they would change to an alternative infant feeding method if they were found to be HIV-infected and were advised to do so. Cow's milk was regarded as the most feasible infant feeding method for local HIV-infected mothers. Infant feeding formula was regarded as too costly, but if recommended by health workers and distributed free of charge, the majority of the women (82%) were confident that they would then choose this option. The more affluent women were the most confident with respect to being able to practise replacement feeding which involved a monetary cost and in dealing with the social problems of not breastfeeding. In the focus group discussions, women were less optimistic and expressed great concern for the social consequences of not breastfeeding. The safety of exclusive breastfeeding was questioned. Less common infant feeding methods, such as expressed, heat-treated breast milk and wet-nursing, were not regarded as viable options. Several social barriers to replacement feeding were identified in the focus group discussions, including possible lack of support from partner and potential negative reactions from the community.

Conclusion: Future research on infant feeding options should include the broader cultural context and the psychological stress that HIV-infected women face when choosing infant feeding methods.

MedGenMed. 2004 Jul 11;6(3):WePeD6374 [eJIAS. 2004 Jul 11;1(1):WePeD6374]

Abstract number: WePeE6712

Bacterial contamination and nutrient concentration of infant milk in South Africa. A sub-study of the national prevention of mother-to-child-transmission cohort study

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Background: South Africa (SA) provides HIV+ mothers with free formula for six months for prevention of mother-to-child-transmission (PMTCT). Reports describing feasibility and safety of formula feeding in PMTCT-sites vary. Experiences from Khayelitsha, SA were favourable while studies from elsewhere in SA, Botswana and Kenya describe significant difficulties. Aim was to assess how HIV-infected mothers in urban SA prepare commercial infant formula and to assess the safety of the feeds. Objectives were to describe methods of preparation of formula of mothers who received formula as part of the national PMTCT-programme and to measure faecal contamination and protein concentration (indicator of dilution).

Material and Methods: A cross-sectional study in which 94 mothers at a PMTCT-clinic were interviewed and samples of formula from bottles already prepared were analysed. A sub-sample were visited at their homes; samples from milk already prepared and from milk prepared under direct observation were collected.

Results: Most mothers had 12 years of education or more and 72% had refrigerators at home. The majority made mistakes in cleaning bottles. 67% (63/94) of feeds available at the clinic were contaminated; 64% with *Escherichia coli* and 26% with Enterococci. 81% (13/16) of feeds available in homes and 38% (8/21) of feeds prepared under observation were also contaminated. None were infected with *Shigella* and *Salmonella*. 28% (26/94) of samples at clinic were seriously over-diluted, 47% (8/17) of home samples and 14% (3/21) of the observation samples.

Conclusion: Serious levels of contamination and over-dilution were found in milk samples collected from all sites though less in feeds prepared under observation. This suggests that mothers know how to prepare feeds but routinely fail to do so. Gains from improved counselling alone may therefore be limited. The risks in less favoured settings where education and resources may be less satisfactory may be even more serious than those documented here.

MedGenMed. 2004 Jul 11;6(3):WePeE6712 [eJIAS. 2004 Jul 11;1(1):WePeE6712]

Abstract number: MoPeD3938

Infant feeding practices in the context of a PMTCT programme in rural Zimbabwe

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Background: Preventing paediatric HIV infection and training health workers to infant feeding and HIV are national priorities for Zimbabwe. However safe infant feeding practices may be limited by current socio-economical constraints and little accessibility to counselling services. A quantitative and qualitative assessment on infant feeding practices was conducted in the context of the Murambinda Mission Hospital PMTCT programme in Buhera district.

Method: The methodology was two-fold: a community survey of all HIV-infected mothers and a sample of HIV-negative women identified through the PMTCT programme and having delivered between August 15th 2001 and February 15th 2003 (316 women) and focus group discussions of elderly women (five groups of 12-15 women each) living in the district.

Results: We report here on the first phase of the survey conducted between June and August 2003. Among 108 mothers interviewed to date (34.2% response rate), 101 questionnaires were analysed (53 HIV-infected and 48 HIV-negative women). Breastfeeding was ever practiced by 97% of interviewed mothers, with 68.1 and 88.4% of HIV-infected and negative women respectively currently breastfeeding ($p=0.02$). Mixed feeding, evaluated through the 24-hour recall method, was universal (95%) and practiced by 90% of HIV-infected mothers. Other foods/fluids than breastmilk were introduced before four months for 8.5% and 25.6% ($p=0.02$) of HIV-infected and negative mothers respectively, whereas the rates at six months were 48.9 and 28.9 % ($p=0.04$). Only 46.8% of HIV-infected mothers ever discussed infant feeding issues with a health worker and less than 25% knew how to express or heat treat breastmilk and prepare formula.

Conclusion: These preliminary results suggest that an encouraging proportion of HIV-infected mothers are responding positively to infant feeding recommendations for PMTCT. Further improvements of safe infant feeding practices with increased support capacity and supervision at all levels of care within the district are critical.

MedGenMed. 2004 Jul 11;6(3):MoPeD3938 [eJIAS. 2004 Jul 11;1(1):MoPeD3938]

Abstract number: WePeE6837

Infant feeding practice falls short of recommendations in pilot PMTCT sites in Zambia and Kenya

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Background: PMTCT infant feeding guidelines recommend exclusive breastfeeding for mothers who are HIV-negative or do not know their HIV status—the majority of women—and either replacement feeding or exclusive breastfeeding for HIV positive mothers. We present findings from pilot PMTCT sites in Kenya and Zambia on the extent to which PMTCT programs have improved infant feeding practice by mothers, and the consistency of infant feeding practice with recommended guidelines.

Methods: Researchers compared the infant feeding practices, based on a 24-hour recall, of mother and infant pairs before the introduction of PMTCT and among women who received PMTCT services in 2000-2002 at Chipata Clinic in Lusaka, Zambia (n=264 and 374; mothers of 3 month old infants), and district hospitals in Karatina (n=328 and 412; mothers of 6 week old infants) and Homa Bay (n=329 and 313; mothers of 6 week old infants) in Kenya. Midwife/counselors administered questionnaires to HIV-positive and HIV-negative women.

Results: A slightly larger proportion of women who were exposed to PMTCT services reported using replacement feeding (9.8% vs 2.4% in Lusaka; 4.4% vs 0.3% in Karatina; 4.0% vs 1.9% in Homa Bay). There was no significant change from the undesirable practice of mixed feeding to the safer practice of exclusive breastfeeding; 37%, 69% and 70% of women in Lusaka, Karatina and Homa Bay, respectively, continue to practice mixed feeding. Exclusive breastfeeding declined significantly in Karatina (34% vs 27%, p<.05).

Conclusions: Promoting good infant feeding practices is challenging and PMTCT activities at pilot sites have failed to have an impact to date. PMTCT providers should extend infant feeding counseling beyond antenatal care visits, following-up in the postpartum period when women are making decisions about how to feed their infants and grappling with the implementation of their choices.

MedGenMed. 2004 Jul 11;6(3):WePeE6837 [eJIAS. 2004 Jul 11;1(1):WePeE6837]

Abstract number: ThPeB7058

Factors associated with infant feeding choices of HIV positive mothers in urban areas

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Background: The post natal component of the national PTMCT program consist previously of adequate infant feeding counselling. In order to implement a breastmilk donation to HIV positive women, we attempt to evaluate the feasibility of infant feeding choices under recovery cost scheme in urban areas in Cameroon.

Objective: To identify risk factors associated with infant feeding choices among HIV positive mothers

Methodology : Cross sectional study including HIV positive mothers seen at 6 months post-partum .A standardized questionnaire was administered to those of the mothers previously seen at the perinatal period and counselled on infant feeding options. Mothers with medical indication for artificial feeding different of the HIV status were excluded.

Results: 47 mothers were included in the study. The positive serostatus for HIV was discovered before pregnancy for 8,7% of the mothers, for 67,4% during pregnancy and for 23,9% during delivery . 87,2% of the mothers opted for artificial feeding since birth and 8,5 % opted for breastfeeding. The option practice during the first six months were for 10% breastfeeding and 84,8 % artificial feeding, while 4,3% practise mixed feeding. Infant feeding choice and option practised were not associated with the age of mother, the moment of the serodiagnosis, neither with the rank of pregnancy , nor with the economic status . The option chosen and practised were correlated with education level($p=0,02$) and the practice of the feeding option was linked with the marital status. The impact of infant feeding counselling was high and the rational for infant feeding choice linked with the option chosen and practised ($p<0,001$).A great concordance was observed between the option chosen and the one practised ($p<0,001$).

Conclusion : Adequate infant feeding counselling can lead efficiently to post natal prevention of HIV through breastmilk and must be promoted even after delivery.

MedGenMed. 2004 Jul 11;6(3):ThPeB7058 [eJIAS. 2004 Jul 11;1(1):ThPeB7058]

Abstract number: ThPeB7051

Mortality in formula-fed and breast-fed infants born to HIV-infected mothers in a pMTCT program in Kigali (Rwanda): RWA/021 TRAC/NRL project, Lux Development

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Background: To compare mortality among children born to HIV-infected women according to their mode of feeding in a Prevention of Mother-to-Child Transmission of HIV (pMTCT) project in Kigali, Rwanda.

Methods: Between February 1999 and August 2003, pregnant women in a pilot site in Kigali have benefited from HIV testing/counselling and the use of zidovudine (short course) or nevirapine (perinatal). Counselling has been given on the use of formula-feeding (free of charge) or exclusive breast-feeding with early weaning for a 6-month period. The follow-up of mother-infants pairs included HIV diagnosis, counselling on feeding. Data on child survival (death date or last known alive date) and feeding have been retrospectively collected.

Results: Feeding practice and clinical follow-up data were available for 770 children (1999-2003). A total of 580 (75,3%) received formula-feeding, 186 (24,2%) breast-feeding and 4 (0,5%) mixed-feeding. Forty seven children died during the 6-month postpartum period. Among these, 3 out of the 11 with known HIV status (PCR at 1-4 months) were infected. Considering the uninfected children during the 6-month postpartum period, 4 died in each group defined by feeding practice: i.e. the formula-fed ($n=318$, 1,3%) and breast-fed ($n=109$, 3,7%) children ($P=0,265$). Using the whole follow-up period with a median duration of 24,05 months, death

occurred in 82 children (5 HIV+ and 20 HIV -). Among HIV-uninfected children, 8/101 (7,9%) and 12/316 (3,8%) death occurred respectively in the breast-feeding and formula-feeding groups ($P=0,128$: Chi-Square, Kaplan Meier curves and log rank test $P=0,281$).

Conclusion: Formula-feeding does not seem to be associated with a higher rate of mortality than breast-feeding in HIV negative infants born to HIV positive mothers in this cohort where counselling on feeding practice was available. This has to be further confirm in various conditions.

MedGenMed. 2004 Jul 11;6(3):ThPeB7051 [eJIAS. 2004 Jul 11;1(1):ThPeB7051]

Abstract number: ThPeB7210

HIV-associated postpartum infant morbidity and mortality in Pune, India

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Background: Post-partum maternal and infant morbidity and mortality among HIV-positive and HIV-negative women in Pune, India, enrolled in an observational cohort study, was examined.

Methods: Between August 2002 and December 2003, HIV-positive and HIV-negative women were enrolled and followed for up to one year post-partum. HIV-infected mothers were offered antiretroviral prophylaxis for vertical transmission.

Results: Thirty-seven HIV-positive and 115 HIV-negative women-infant pairs were compared. There was no difference between the two groups in terms of age, marital status or parity, but HIV-positive women were somewhat less educated: 17.3% vs. 32.5%; $p=0.07$). All of the HIV-uninfected mothers breast-fed their infants whereas HIV-infected mothers were giving their infants replacement milk (73%) or practising mixed feeding (24%). Only one HIV -positive mother exclusively breastfed her infant. Infants of HIV-positive women were more likely, compared to infant of HIV-negative mothers, to be premature (mean gestational age=36.9 vs 38.3 weeks, $p<0.01$) and have lower birth weight (mean 2375gms; Range 1450-3700 vs. 2590gms; range 1500-4000, $p=0.01$). Follow-up for HIV-infected and -uninfected mother-infant pairs was 616 and 6,338 person-years respectively. Infants of HIV-positive women had more episodes of acute gastroenteritis (5/100 p-yr vs 1/100 p-yr, $p<0.01$), sepsis (6/1000 p-yr vs 0.3/1000 p-yr, $p<0.01$), pneumonia (1/100 p-yr vs 0.03/100 p-yr, $p<0.01$), and anemia (4/100 p-yr vs 0.6/100 p-yr, $p<0.01$). Of 38 livebirths, 4 infant deaths occurred among HIV-positive women (6.5/1000 person-years) compared to 0 deaths among HIV-negative women; 2 of 4 were HIV PCR+ babies. There were no stillbirths among HIV-positive versus 2 among HIV-negative women.

Conclusions: Infants born to HIV-positive women in India and who are mixed fed have very high rates of morbidity and mortality. Acute gastroenteritis and anemia are the most common causes of morbidity among these infants.

MedGenMed. 2004 Jul 11;6(3):ThPeB7210 [eJIAS. 2004 Jul 11;1(1):ThPeB7210]

HIV and Infant Feeding Counseling

Abstract number: MoOrE1068

HIV and Infant feeding counselling: Knowledge, attitude and practice of health workers in Wesley Guild Hospital, Ilesa, Nigeria

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Background: Mother to child transmission (MTCT) is responsible for about 90% of Paediatric HIV infection in Nigeria. Postnatal transmission through breastfeeding is said to be responsible for about a third of MTCT. Prevention of MTCT (PMTCT) through breastfeeding will therefore help reduce the growing number of children infected by the virus. In view of this WHO/UNAIDS reviewed the Infant Feeding Policy, which was adopted by the Nigerian government in 2001. This study was carried out to determine the knowledge, attitude and practice of health workers on appropriate infant feeding in the context of HIV in Wesley Guild Hospital (WGH), Ilesa, Nigeria.

Method: Data collection was by in-depth interview and observation of clinic sessions over a period of four-weeks (May 2003). Respondents included trained midwives, consultants and resident doctors in Paediatrics and Obstetrics.

Results: Only one of the 37 respondents was aware of the existence of a National Policy on HIV and Infant feeding, and none had been trained in HIV and infant feeding counseling. Though most of the health workers were aware of MTCT, majority of the midwives believed all infants of HIV positive mothers would be infected by the virus if breastfed, while all the obstetricians believed that exclusive breastfeeding rather than mixed feeding, was more likely to increase the chances of MTCT. Use of commercial infant formula and wet nursing were the only feeding options most of the health workers were familiar with. In practice, majority of the respondents directed infected mothers to use commercial infant formula regardless of their socioeconomic status.

Conclusion: It is concluded that most of the health workers did not have adequate knowledge to provide appropriate feeding counseling for HIV infected mothers. As part of the efforts of PMTCT in Nigeria, there is need for urgent dissemination of all policies relating to PMTCT and training of relevant health workers in HIV related issues.

MedGenMed. 2004 Jul 11;6(3):MoOrE1068 [eJIAS. 2004 Jul 11;1(1):MoOrE1068]

Abstract number: TuPeD5118

How and whom to counsel on infant feeding practices in times of HIV/AIDS? Women's perspectives from low resource settings in Southern Africa

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Background: This study is designed to explore how mothers make infant feeding decisions and to determine which "voices of counsel" they give particular authority to and why. The research forms part of a greater project that intends to design interventions to optimize PMTCT service delivery. Current policy aims to enable mothers to make an informed choice between either exclusive breast- or formula feeding, avoiding mixed feeding. Mixed feeding is however the norm in the region.

Methods: Qualitative research was conducted in nine sites in Southern Africa (Namibia, Swaziland and South Africa) over a period of 7 months. Specific sites were chosen to include urban, peri-urban and rural settings, and a variety of ethnic groups. A team of eighteen female researchers, matched in the language, ethnic and cultural background of respondents, were trained and mentored by a core-team in data collection, analysis and report writing. Qualitative research methods comprised participant observation, in-depth interviews and focus group discussions. The data was analyzed per site and in its totality, using internal and external analysts.

Results: Infant feeding is a process taking place in a variety of contexts and requiring multiple and complex decisions over a long-term period. The variations and commonalities in mothers' decision making processes across all sites can be captured using an analytical tool which focuses on their *knowledge* and *concerns/interests; relationships with PMTCT facilities*, perceived *obstacles* and experienced *support or lack thereof*.

Conclusions: This paper asserts that PMTCT counselors are often not convincing influences on mothers making infant feeding decisions. Moreover, many of the factors impacting on mothers' decisions are beyond the health system's control. However, involving family and community in infant feeding education may not be the panacea it seems.

MedGenMed. 2004 Jul 11;6(3):TuPeD5118 [eJIAS. 2004 Jul 11;1(1):TuPeD5118]

Abstract number: ThPeB7058

Factors associated with infant feeding choices of HIV positive mothers in urban areas

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Background: The post natal component of the national PTMCT program consist previously of adequate infant feeding counselling. In order to implement a breastmilk donation to HIV positive women, we attempt to evaluate the feasibility of infant feeding choices under recovery cost scheme in urban areas in Cameroon.

Objective: To identify risk factors associated with infant feeding choices among HIV positive mothers

Methodology: Cross sectional study including HIV positive mothers seen at 6 months post-partum .A standardized questionnaire was administered to those of the mothers previously seen at the perinatal period and counselled on infant feeding options. Mothers with medical indication for artificial feeding different of the HIV status were excluded.

Results: 47 mothers were included in the study . The positive serostatus for HIV was discovered before pregnancy for 8,7% of the mothers, for 67,4% during pregnancy and for 23,9% during delivery . 87,2% of the mothers opted for artificial feeding since birth and 8,5 % opted for breastfeeding. The option practice during the first six months were for 10% breastfeeding and 84,8 % artificial feeding, while 4,3% practise mixed feeding. Infant feeding choice and option practised were not associated with the age of mother, the moment of the serodiagnosis, neither with the rank of pregnancy , nor with the economic status . The option chosen and practised were correlated with education level(p=0,02) and the practice of the feeding option was linked with the marital status. The impact of infant feeding counselling was

high and the rational for infant feeding choice linked with the option chosen and practised ($p < 0,001$). A great concordance was observed between the option chosen and the one practised ($P < 0,001$).

Conclusion : Adequate infant feeding counselling can lead efficiently to post natal prevention of HIV through breastmilk and must be promoted even after delivery.

MedGenMed. 2004 Jul 11;6(3):ThPeB7058 [eJIAS. 2004 Jul 11;1(1):ThPeB7058]

Abstract number: WeOrD1256

Taking counsel from women: towards a women-centered PMTCT counseling practice

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Issues: Although it is well known that HIV can be transmitted through breast milk, recent clinical studies have shown that this risk increases through mixed feeding. As such, UNAIDS/UNICEF/WHO recommends either exclusive breast feeding or exclusive formula feeding for a period of 4-6 months. As a result of these findings infant feeding *counseling* within the PMTCT programmes is based on the notions of *informed choice* and *exclusivity*. However, we will be problematising these three concepts - central to global policy guidelines - within the southern African context (Swaziland, South Africa and Namibia) based on qualitative research in nine sites over a seven month period.

Description: Despite the implementation of PMTCT programmes the predominant feeding pattern employed across all nine sites remains mixed. This poster draws on case studies that show the practical situational strategies that women employ with regards to infant feeding practices in contexts of HIV/AIDS, poverty and gender inequality.

Lessons learned: The data shows how the PMTCT *counseling* in the sites under study glosses the quotidian realities within which mothers can only respond to their infants' needs by taking advantage of whatever opportunities arise as they lack the stability needed to implement the long term, fixed and *exclusive* feeding approaches that the counseling prescribes. PMTCT interventions introduce mothers to unrealisable global guidelines which ultimately result in their alienation from the health care setting.

Recommendation: PMTCT counseling should credit mothers with knowing what the obstacles to exclusive feeding are as well as knowing how best to overcome them. Counseling should be participatory rather than didactic and prescriptive as this would reposition mothers as part of the solution rather than as part of the problem.

MedGenMed. 2004 Jul 11;6(3):WeOrD1256 [eJIAS. 2004 Jul 11;1(1):WeOrD1256]

Abstract number: ThPeE8035

Counseling skills of PMCT health care providers in Kenya

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Background: Kenya is in scale up phase of its PMCT program and has undertaken training of PMCT service providers in HIV counseling, breastfeeding, and infant feeding. The quality of

counselling is critical for community acceptance of PMCT services and can determine the success of the program. To determine the quality of the PMCT counseling services provided, we assessed their structuring, engagement and reacting skills during counseling sessions.

Methodology: 105 counseling sessions conducted by trained PMCT counseling staff were observed by a non participatory observer using a standardized rule book. Organized and meaningful focus to a session was used to examine quality of structuring skills while encouragement of client involvement, commitment, and engagement in the counseling process, and promotion of client practices was used to assess the quality of engagement skills. Giving clients feedback about their verbal or nonverbal behavior was used to assess reacting skills. Counseling skills were scored as excellent (>80%), good (60-80%), average (40-60%) or poor (<40%) depending on the proportion of aspects covered.

Results: 83% of PMCT counselling staff were females and 89% were enrolled nurses. Modalities of PMCT counseling identified included group counseling, group counseling followed by individual counseling and one-to-one counseling. 49%, 47% and 5% of the PMCT counseling staff had good, average and poor structuring skills respectively; 78% and 22% had good and poor engagement skills respectively and 59%, 24% and 17% had good, average and poor reacting skills respectively.

Conclusions: The engagement skills of the staff involved in PMCT counseling services is good, however their structuring and reacting skills needs improvement. More studies on counseling skills need to be done to identify training gaps which may need to be addressed in designing a more focused training of PMCT counseling staff.

MedGenMed. 2004 Jul 11;6(3):ThPeE8035 [eJIAS. 2004 Jul 11;1(1):ThPeE8035]

Abstract number: ThPeE7998

Quality of counselling of women in South African PMTCT pilot sites

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Background: South Africa introduced Prevention of Mother-to-Child-Transmission programmes in 18 pilot sites across the country in 2002. The aim of this study was to assess the quality of counselling provided to women in the programme, particularly on infant feeding.

Methods: Structured observations of consultations and exit interviews with women were conducted in 3 different PMTCT pilot sites. The structured observation tool was based on the expected content of counselling sessions found in the South African PMTCT protocol. Exit interviews used structured questionnaires that measured opinion and knowledge of women.

Results: 60 observations/interviews were conducted (34 HIV+, 26 HIV-). 22 counsellors were observed (mean 4 per counsellor). Mean duration of sessions was 18 minutes. The quality of communication skills was very good. 73% of HIV- women were informed of the advantages of exclusive breastfeeding (EBF). Most women were told what the nevirapine was for and when and how to take it. Issues and advantages of disclosure were discussed with only 13 of 34 HIV+ women. Only 2 HIV+ women were asked about essential conditions for safe formula feeding before an infant feeding choice was made. None of the 12 HIV+ women choosing to breastfeed was shown how to position the baby correctly on the breast or asked whether EBF was feasible. 85% of women could not define the term EBF. Only 5 of 15 HIV+ women choosing exclusive

formula feeding were provided with instructions. The site with more training and supervised support performed better. With regard to women's knowledge, there remained substantial confusion regarding the risks of breast-feeding and formula feeding, however a majority understood mixed feeding to be a risk for both HIV transmission and other infections.

Conclusion: The poor quality of counselling in the PMTCT programme will reduce programme effectiveness. There needs to be more attention to the counselling of women, especially on optimal infant feeding.

MedGenMed. 2004 Jul 11;6(3):ThPeE7998 [eJIAS. 2004 Jul 11;1(1):ThPeE7998]

Abstract number: ThOrC1415

Antenatal couple counseling increases uptake of interventions to prevent HIV-1 transmission

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Background: Women who learn that they are HIV-infected often do not implement interventions to prevent vertical HIV-1 transmission. Conducting voluntary HIV counseling and testing (VCT) for pregnant women together with partners may improve maternal access to mother-to-child HIV-1 prevention interventions by facilitating partner notification and increasing their participation in the decision making process.

Methods: Pregnant women presenting to a Nairobi antenatal clinic were offered individual or couple VCT and followed prospectively. At enrollment, women were encouraged to return with their partners within 1 week for VCT. Women and partners were given the choice between post-test counseling as a couple or individually. Nevirapine was provided to HIV-1 infected women and condoms were distributed to all participants.

Results: Among 2104 women accepting testing, 314 (15%) were HIV-1-seropositive and 308 (15%) had partners participate in VCT, of whom 116 (38%) were counseled as a couple. HIV-1-seropositive women whose partners came were 3-fold more likely to return for nevirapine ($p=0.02$) and report administering nevirapine at delivery ($p=0.009$). Nevirapine use was reported by 88% of HIV-infected women who were couple counseled, 67% whose partners came but were not couple counseled, and 45% whose partners did not come for VCT (p for trend=0.006). Among HIV-1-seropositive women, those receiving couple counseling were 5-fold more likely to avoid breastfeeding ($p=0.03$) compared to those receiving individual counseling. Partner notification of HIV-1-positive test results was reported by 138 (64%) women and associated with a 4-fold increased likelihood of condom use ($p=0.004$).

Conclusions: Partner participation in VCT and couple counseling increased uptake of interventions to prevent HIV-1 transmission. These data support antenatal couple counseling as a strategy to reduce perinatal HIV-1 infection risk in developing countries.

MedGenMed. 2004 Jul 11;6(3):ThOrC1415 [eJIAS. 2004 Jul 11;1(1):ThOrC1415]

Abstract number: TuPeC4932

Couple counseling to enhance infant HIV prevention: Cost effectiveness in an antenatal clinic. Nairobi, Kenya

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Background: Pregnant women presenting to a Nairobi antenatal clinic were offered individual or couple VCT and followed prospectively. At enrollment, women were encouraged to return with their partners within 1 week for VCT. Nevirapine was provided to HIV-1 infected. We estimated the difference in cost due to couple counseling, adopting an opt out approach to counseling, and restricting individualized post test counseling to only positive women.

Methods: A spreadsheet-based model was used to compare the costs per 100 infant infections averted of an "opt-out" approach to HIV testing, individualized post-test counseling for HIV positive women only and encouraging couple counseling versus an "opt-in" approach to HIV testing with routine post-test for all women and no partner involvement. We assumed efficacy of nevirapine similar to that observed in HIVNET 012. Costs were calculated based on the average salaries of nurse counselors in Kenya and the time for group information, pre-test counseling, and post-test counseling.

Results: In the study, of 2,833 women enrolled, 311 (11%) received couple pre-test counseling, 2100 (74%) accepted HIV test. Of those tested, 314 (15%) were HIV positive. Restricting individualized post-test counseling to HIV positive women would reduce the program costs by 10%, an "opt-out" approach to HIV testing would reduce costs by 28%, if they did not change uptake of nevirapine. Couple counseling increased uptake of nevirapine by 35% and resulted in a cost saving of 25% per 100 infant infections averted.

Conclusions: In this setting, although there was a low uptake of couple counseling, it was cost-effective. Prevention of mother-to-child transmission of HIV was least costly if the "opt-out" approach was used. In the most resource-limited settings, an "opt-out" approach to counseling with, post-test counseling for positives only and encouraging couple counseling could reduce program costs.

MedGenMed. 2004 Jul 11;6(3):TuPeC4932 [eJIAS. 2004 Jul 11;1(1):TuPeC4932]

Counseling Tools, Research Tools, and Guides

Abstract number: B11040

Helping HIV+ mothers not breastfeeding: a practical guide

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Issues: In Brazil, the PMTCT of HIV program has as a goal the reduction of the transmission risks in uterus/into delivery and to eliminate the transmission risk of breastfeeding. A Practical Guide was developed to help HIV+ mothers and/or caregivers, guiding them to prepare the milk properly, according to baby's age; introduce other foods and incorporate good hygienic habit to avoid infant morbidity/mortality.

Description: The prevalence of HIV among the parturients is 0.6% which means, about 17,000 exposed babies per year. The Ministry of Health (MoH) provides free of charge ARV therapy, cesarian section and infantile formula for the first six months of the child's life. The Practical Guide was based on the guidelines of The Child and Adolescent Statute and The National Politics of Food and Nutrition, which consider the nourishment as a human right. The Guide helps the

HIV+ families in the choice and preparation of food based on healthy alimentary choices and hygienic cares specially if using bottle for feeding.

Lessons Learned: The Guide is an important educational instrument. It collaborates with the establishment and strengthen the HIV+ mother with her baby and also promotes not only the prevention of HIV transmission but also malnutrition and diarrhea.

Recommendations: The right to the life is the first of all natural rights of human beings. In this perspective, the person that demands care should be a priority and, therefore, the option for breastfeeding or not breastfeeding, just one of the elements of care, whose the main objective is to prevent diseases and/or the child premature death. To bring this right for all Brazilian children, the MoH, at the same time that includes in its policy rules to promote, protect and support the breastfeeding, contemplates the contraindication whenever that practice jeopardizes the child's health and life. The World needs to mobilize to adopt such measure in favor of HIV exposed children.

MedGenMed. 2004 Jul 11;6(3):B11040 [eJIAS. 2004 Jul 11;1(1):B11040]

Abstract number: WeOrC1252

Exploring audio computer-assisted self-interviewing (ACASI) for information gathering on infant feeding in the context of HIV

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Background: Understanding infant feeding practices in the context of HIV and factors that put mothers at risk for HIV infection is an important step towards prevention of mother to child transmission of HIV (PMTCT). Face-to-face (FTF) interviewing may not be a suitable way of ascertaining this information because respondents may report what is socially desirable. ACASI is thought to increase privacy, reporting of sensitive issues and to eliminate socially desirable responses. We compared ACASI with FTF interviewing and explored its feasibility, usability, and acceptability in a PMTCT program in Kenya.

Methods: A Graphic User Interface (GUI) was developed using Macromedia Authorware® and questions and instructions recorded in local languages Kikuyu and Kiswahili. Eighty mothers enrolled in the PMTCT program were interviewed with each of the interviewing mode (ACASI and FTF) and responses obtained in FTF interviews and ACASI compared using McNemar's χ^2 for paired proportions.

Results: Mean ages for intended time for breastfeeding were 11 months by ACASI and 19 months by FTF interviewing ($p < 0.001$). Introduction of complementary foods at ≤ 3 months was reported more frequently by respondents in ACASI compared to FTF interviews for 7 of 13 complementary food items commonly utilized in the study area ($p < 0.05$). Seven percent more respondents reported unstable relationships with ACASI ($p = 0.039$). Use of unsuitable utensils for infant feeding was reported by more respondents in ACASI ($p = 0.001$). Regardless of education level, respondents used ACASI similarly and majority (65%) preferred it to FTF interviewing mainly due to enhanced usability and privacy and most (79%) would prefer ACASI for future interviewing.

Conclusion: ACASI seems to improve quality of information by increasing response to sensitive questions, decreasing socially desirable responses, and by preventing null responses and was suitable for collecting data in a low-literacy clinical setting.

MedGenMed. 2004 Jul 11;6(3):WeOrC1252 [eJIAS. 2004 Jul 11;1(1):WeOrC1252]

Training-Related Assessments and Issues

Abstract number: WePeE6710

Model of sustained training for new health interventions in resource constrained settings in KwaZulu-Natal, South Africa

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Issues: Innovative, sustained and contextual training strategies are required for new HIV/AIDS interventions such as pMTCT and the provision of HAART. KZN, (population 8.4 million) the most affected province by HIV/AIDS in RSA, has an ante-natal sero-prevalence of about 36.5%. Vertical programs, earmarked for integration into the district health services, have to be rapidly implemented to provide antiretrovirals, putting tremendous demands on training needs for providers.

Description: A customised training program, informed by a needs analysis of trainers, policy makers and implementers of pMTCT and infant feeding program, was initiated. The training method went beyond filling knowledge gaps, but looked at critical issues related to management, operationalisation as well as service delivery in terms of a quality assurance cycle.

11 HIV/AIDS coordinators (one per district) and 11 pMTCT trainers were identified as key trainers who were responsible for training staff at the 55 pMTCT implementation sites in the province. The training is implemented in 3 cycles. Central, monthly workshops train the 22 trainers. Actively supervised district level training is subsequently run by the district trainers, followed by district and site level training run by the district training team with minimal central input.

Lessons learned: Training for new interventions is critical for the quality and success of new health interventions. Training needs are often underestimated. Widespread, sustained, high quality training is costly, and resource intense.

Recommendations: Comprehensive training strategies for new health programs can be implemented with a few key resource people. Health policy makers should make funds available for additional staff in the early phases of a new health intervention to ensure sustainable, high quality training, leaving funds available for on-going expenses for regular training at a district and site level.

MedGenMed. 2004 Jul 11;6(3):WePeE6710 [eJIAS. 2004 Jul 11;1(1):WePeE6710]

Abstract number: TuPeE5547

Measuring the effectiveness of PMTCT training initiatives

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Background: The introduction of PMTCT, as with any new health service, required training of health workers. This training was for health workers to acquire HIV and infant feeding-specific

knowledge, skills and attitudes. The objective of this study was to review the training model of the National Department of Health (South Africa) to determine its appropriateness for addressing training needs in the context of the rapid scaling up of PMTCT services. The short-term impact of the training was assessed to determine whether it responded to the demands of the PMTCT program in terms of knowledge and confidence in counseling skills.

Methods: This was a descriptive cross sectional study design. Data collection methods consisted of structured interviews with 147 respondents including provincial HIV/AIDS managers, PMTCT co-ordinators, trainers and trainees who attended a 5-day PMTCT and infant feeding training course based on WHO/UNICEF materials.

Results: Amongst trainees the mean score for the knowledge assessment was 49%. 88% over-estimated the risk of HIV transmission through breastfeeding, and 90% were unsure of the health risks associated with formula feeding. 63% of trainees felt comfortable counseling HIV infected women on infant feeding, but only 50% felt comfortable counseling women experiencing breastfeeding difficulties. Amongst trainers, the mean score for the knowledge assessment was 64%, and 90% over-estimated the risk of HIV transmission through breastfeeding. 81% of trainers and 67% of trainees expressed the need for ongoing supervision and mentorship.

Conclusions: Knowledge of trainers was poor and post training knowledge gain of trainees was inadequate, particularly with regard to infant feeding risks. Consideration should be given to the ongoing support and training needs of both trainers and health workers implementing PMTCT to ensure the long-term effectiveness of training efforts.

MedGenMed. 2004 Jul 11;6(3):TuPeE5547 [eJIAS. 2004 Jul 11;1(1):TuPeE5547]

Abstract number: MoPeE4245

Training faith based community educators for prevention of mother to child HIV transmission in Uganda

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Issues: Initial emphasis of PMTCT scale-up in many countries, including Uganda has been in the establishment of facility-based services. However, experience has shown that uptake of PMTCT services is often limited. Community mobilization and education has been recommended, but few operational models exist. The Islamic Medical Association of Uganda developed a model using faith leaders and their communities to select suitable community educators for PMTCT mobilization. Such educators need to be effectively trained to acquire the correct knowledge and skills for promotion of PMTCT including use of supportive religious texts.

Description: 750 community educators were selected through their religious leaders in Kampala. They included both Muslims and Christians. They were trained on PMTCT issues in 5-day workshops of 25 participants each. Pre-test and post-test questionnaires were administered to assess the effect of training. Knowledge that an HIV positive mother can pass HIV infection to her baby during labour and delivery rose from 56% to 72%. Knowledge that 15-40% of HIV positive mothers can pass HIV to their babies if no PMTCT intervention rose from 21% to 61%. Knowledge that one third of HIV positive children acquire HIV through breastfeeding increased from 27% to 67%.

Lessons learned: Community educators for PMTCT can be selected through their faith leaders. A five-day training workshop was found adequate in increasing basic knowledge on PMTCT for community education of the followers of the respective faiths.

Recommendation: Community education for PMTCT is feasible through faith based community educators. These educators need to be empowered with correct basic knowledge and skills. This can be achieved in five day training workshops. This strategy has a potential of reaching many grassroots communities in congregations of various faiths. Further evaluation of the impact of this approach on uptake of PMTCT services is needed.

MedGenMed. 2004 Jul 11;6(3):MoPeE4245 [eJIAS. 2004 Jul 11;1(1):MoPeE4245]

Knowledge, Attitudes, and Practices / Skills of Health Workers

Abstract number: ThPeC7294

Knowledge, attitudes and beliefs of health-care workers regarding alternatives to prolonged and predominant breastfeeding within a PMTCT project. ANRS 1201/1202 Ditrane Plus project, Abidjan, Côte d'Ivoire

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Background: To investigate within a PMTCT project in Abidjan, Côte d'Ivoire, knowledge of health-care workers concerning infant feeding practices, and their attitudes and beliefs regarding the alternatives to prolonged and predominant breastfeeding (BF) proposed within this project.

Methods: The Ditrane Plus project is aimed at the prevention of MTCT of HIV in combining a perinatal antiretroviral intervention with systematic proposition of infant feeding interventions: formula-feeding (FF) free of charge from birth, or exclusive BF during three months then early cessation of BF with free provision of FF from time of weaning to 9 months of age. We performed in November 2003 a survey using a self-administrated questionnaire among health-care workers of this project.

Results: All but three health-care workers (N=57) filled in the questionnaire: 43% knew how many women of the project initiated FF; 96% knew the price of a FF tin; 65% the number of feeds needed daily for a 3-month child; 92% knew that postnatal HIV transmission occurred in the project and 43% knew the number of cases. According to them, choice of the feeding practice of children born to HIV-infected mother should be guided by the socio-economic situation of the mother (n=23), the fact that the partner is informed or not of the mother's serostatus (n=14), and maternal CD4 count (n=9). Complete avoidance of BF and early cessation of BF are perceived as difficult practices (77%). The mothers reported to them these practices induced stigmatisation (68%), child health problems (20%) or malnutrition (30%). Health-care workers believe that women should wean at 3-4 months (77%) to avoid HIV-transmission through breastmilk and since the child is old enough to introduce other foods.

Conclusion: Knowledge and attitudes are consistent within this project. Proposing alternatives to BF induces health-care workers difficulties that should be taken into account when tailoring such complex interventions.

MedGenMed. 2004 Jul 11;6(3):ThPeC7294 [eJIAS. 2004 Jul 11;1(1):ThPeC7294]

Abstract number: ThPeB7111

Strengthening knowledge and skills of health care providers on optimal infant and young child feeding is pivotal to a successful PMTCT programme in Botswana

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Issues: Botswana, with an estimated HIV prevalence of 35.4% among pregnant women is among the most affected countries worldwide. Promotion and sustenance of optimal infant and young child (IYCF) feeding practices is therefore, a key component of the national PMTCT programme. Health care providers need to be knowledgeable about current IYCF recommendations to enable them communicate accurately and consistently.

Description: An initiative to train health care providers on IYCF is being implemented nationwide. The eight-day training curriculum has been adapted from the WHO/UNICEF breastfeeding counseling (1993) and the WHO/UNICEF/UNAIDS HIV and Infant Feeding Counseling course (2000) to suit the Botswana situation. Same questionnaire was administered to 40 infant feeding counsellors in two training sites to assess baseline and post training IYCF knowledge. About 80% were PMTCT counsellors who had received orientation, average two hours, on the draft national HIV and IYCF guidelines during their PMTCT counselling training course.

Lessons learned: The pre-test showed wide knowledge gap on IYCF with an average score of 60% (range 38-84%). Remarkable improvement was recorded in the post-test, average score 80% (range 69%-91%). However, many scored poorly in both tests on key MTCT statistics. For example < half were knowledgeable about the risk of mix feeding and current recommendation on early safe transition from exclusive breastfeeding to formula feeding by an HIV infected woman who chooses to breastfeed.

Recommendations: For successful implementation of MTCT reduction strategies it is essential to train and re-train health care providers on current and emerging issues on IYCF in the HIV context Training same PMTCT counselors is anticipated to enhance integration rather than having vertical programmes.

Acknowledgement: UNICEF has generously provides technical and financial support for the IYCF programme in Botswana.

MedGenMed. 2004 Jul 11;6(3):ThPeB7111 [eJIAS. 2004 Jul 11;1(1):ThPeB7111]

Abstract number: ThPeE7969

HIV & infant feeding knowledge, attitudes and practices of health workers in the Western Cape, South Africa

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Background: While the need for health workers who are well-versed in the risks and benefits associated with infant feeding methods in the context of HIV is clear, studies performed in the Western Cape reveal that health workers have limited knowledge, and lack confidence to counsel HIV-positive mothers, about this topic. Facility-based training for health workers to acquire HIV and infant feeding-specific knowledge, skills and attitudes was conducted amongst

315 participants. This evaluation reviewed the KAP regarding HIV and infant feeding of health workers who participated in the training programme.

Methodology: Individual semi-structured interviews were conducted with 53 health workers using a cross-sectional design. The survey instrument was a blend of projective technique questions, and quantitative knowledge questions.

Results: While participants were positive about the training and reported to have shared the information from the training with others, only two reported having organized and carried out formal trainings for staff, following the training. Health worker knowledge still seems to be low regarding factors increasing the risk of MTCT during breastfeeding with only 8% stating that HIV infection during breastfeeding is a factor and even a lower response of 2% citing a low CD4 count. Although the majority of health workers reported to be confident and capable of providing mothers with accurate information regarding HIV and infant feeding the majority felt that they were not influential with their clients, this was more pronounced with nurses than with lay counselors. Most citing the short time spent with clients, the lack of follow-up and the confusing and conflicting information given by services providers.

Recommendations: Majority of health workers felt over-worked and unable to spend quality time with clients. Support from superiors would create a productive work environment. Future training should not only be knowledge-specific but should also focus on health worker support.

MedGenMed. 2004 Jul 11;6(3):ThPeE7969 [eJIAS. 2004 Jul 11;1(1):ThPeE7969]

Abstract number: TuPeE5444

Primary health care workers knowledge on MTCT of HIV in Bobo-Dioulasso, Burkina Faso

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Introduction: In limited resources countries, primary health care workers are the first actors in PMTCT programs. Before Kesho-Bora project (study on utilization of HAART in reducing mother to child transmission (MTCT) of HIV and for improving maternal health) implementation, primary health care workers knowledge on MTCT are evaluated.

Method: A cross-sectional survey of 62 caregivers was conducted in 6 primary health care services of Bobo-Dioulasso in October 2003. Demographic information, level of knowledge on MTCT were collected through standardized questionnaire. Data analysis was done in Epi-info.

Results: The majority of interviewed health workers knew that the risk of MTCT exist (89%). However less than half knew that this risk is persistent until cessation of breastfeeding (40%). For reducing MTCT, ARVs therapy during pregnancy and best practices of infant feeding were the most reported interventions (respectively 39% and 46%). Around % of the health workers considered that in the absence of any intervention, the risk of MTCT would be over 30% at birth, and superior to 50% at 24 months. Principal midwives and nurses have a better knowledge than the auxiliary midwives and the other support agents ($p \leq 0.01$).

Conclusion: A quite important proportion of caregivers had inadequate knowledge on MTCT, and that could lead to inadequate advices given to women.

MedGenMed. 2004 Jul 11;6(3):TuPeE5444 [eJIAS. 2004 Jul 11;1(1):TuPeE5444]

Abstract number: ThPeB7037

Knowledge, attitudes, and practices among midwives and counselors regarding prevention of mother to child transmission of HIV (PMTCT) -- Botswana, 2003

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Background: Pregnant women in Francistown, Botswana's second largest city, have >40% HIV prevalence and have had PMTCT services available since 1999. Although nearly all women have antenatal care (ANC) and hospital deliveries, uptake of HIV services is relatively low. This could be due to knowledge and attitudes regarding PMTCT among midwives and counselors providing care.

Methods: Face-to face interviews of 82 midwives and counselors (75% of total staff) were conducted in public healthcare facilities.

Results: Nearly all respondents (90%) had formal PMTCT training. The mean score on a 24-item knowledge test was 71% correct. Knowledge of PMTCT drug and infant feeding protocols was high, but there were significant misconceptions: 37% believed that without intervention, all HIV-positive women have positive infants, 32% believed that >30% of women transmit HIV despite AZT and formula feeding, and 15% believed that PMTCT is experimental. Nearly all providers (98%) believed that HIV should be treated more like other diseases, and 84% believed that antenatal HIV tests should be routine. However, one-third of providers were uncomfortable telling women they have HIV and providing advice on next steps after diagnosis. One third wished they did not have to do HIV counseling, and 15% were uncomfortable examining HIV-positive women. Many providers (40%) believed they shouldn't try to convince a woman to have an HIV test, and 11% believed women should not be asked to take medicines that only help their infants.

Conclusions: The success of PMTCT depends on care providers giving correct information and instilling positive attitudes toward HIV testing and interventions. Our data suggest that a substantial number of providers need additional training and support to maximize program uptake.

MedGenMed. 2004 Jul 11;6(3):ThPeB7037 [eJIAS. 2004 Jul 11;1(1):ThPeB7037]

Abstract number: ThPeB7058

Factors associated with infant feeding choices of HIV positive mothers in urban areas

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Background: The post natal component of the national PTMCT program consist previously of adequate infant feeding counselling. In order to implement a breastmilk donation to HIV positive women, we attempt to evaluate the feasibility of infant feeding choices under recovery cost scheme in urban areas in Cameroon.

Objective: To identify risk factors associated with infant feeding choices among HIV positive mothers

Methodology: Cross sectional study including HIV positive mothers seen at 6 months post-partum .A standardized questionnaire was administered to those of the mothers previously seen at the perinatal period and counselled on infant feeding options. Mothers with medical indication for artificial feeding different of the HIV status were excluded.

Results: 47 mothers were included in the study. The positive serostatus for HIV was discovered before pregnancy for 8,7% of the mothers, for 67,4% during pregnancy and for 23,9% during delivery. 87,2% of the mothers opted for artificial feeding since birth and 8,5 % opted for breastfeeding. The option practice during the first six months were for 10% breastfeeding and 84,8 % artificial feeding, while 4,3% practise mixed feeding. Infant feeding choice and option practised were not associated with the age of mother, the moment of the serodiagnosis, neither with the rank of pregnancy, nor with the economic status. The option chosen and practised were correlated with education level ($p=0,02$) and the practice of the feeding option was linked with the marital status. The impact of infant feeding counselling was high and the rational for infant feeding choice linked with the option chosen and practised ($p<0,001$). A great concordance was observed between the option chosen and the one practised ($p<0,001$).

Conclusion: Adequate infant feeding counselling can lead efficiently to post natal prevention of HIV through breastmilk and must be promoted even after delivery.

MedGenMed. 2004 Jul 11;6(3):ThPeB7058 [eJIAS. 2004 Jul 11;1(1):ThPeB7058]

Abstract number: ThPeE8039

PMCT Healthcare Providers Knowledge on Prevention of Mother-To-Child Transmission of HIV

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Background: Appropriate knowledge on PMCT of healthcare providers is critical to success of the scale up of PMCT programs. We assessed knowledge of PMCT among the healthcare workers providing PMCT services in selected health facilities.

Methods: As part of the evaluation of PMCT activities we interviewed healthcare workers providing PMCT services in 9 sites using a self administered questionnaire. Data on knowledge on mother-to-child transmission of HIV, risk factors of MCT, safe delivery practices and infant feeding was analyzed using SPSS version 10.0.

Results: 59% of 151 health workers interviewed were trained on PMCT. 76%, 54% and 90% did not know the correct proportions of children infected at birth with no ARV used, with use of ARVs and at 2 years with breastfeeding without ARVs respectively with trained staff having better knowledge than untrained staff ($p<0.05$). 85%-91% had correct knowledge on the effect of episiotomy, membranes rupture >4 hours and when mother has AIDS on MCT. 83% and 65% would not recommended formula feeds without knowing mothers HIV status and gradual stoppage of breastfeeding if mother is HIV positive respectively but 29% recommend gradual stoppage of breastfeeding for HIV positive women. 83%-93% correctly knew obstetrical practices that reduce MCT of HIV. 82%-97% had correct knowledge on safe delivery practices but 17% would recommend routine suctioning of babies. No differences were noted between trained and untrained staff on infant feeding and safe delivery practices.

Conclusions: Knowledge on MCT at birth is poor but knowledge on risk factors and safe delivery practices is good. There is need to address gaps in knowledge during the scale up phase of PMCT programs in Kenya. The data suggest a spill over effect of PMCT training to non-trained staff.

MedGenMed. 2004 Jul 11;6(3):ThPeE8039 [eJIAS. 2004 Jul 11;1(1):ThPeE8039]

Knowledge, Attitudes, and Practices of Mothers / Communities

Abstract number: TuPeE5443

Knowledge of women consulting in primary health care services on MTCT of HIV in Bobo-Dioulasso, Burkina Faso

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Introduction: A study on utilization of HAART in reducing mother to child transmission (MTCT) of HIV and for improving maternal health is being implemented in Bobo-Dioulasso (Burkina Faso). Women knowledge on MTCT influences their adherence to such programs. Therefore knowledge of women using primary health care services on MTCT was evaluated in the pilot phase of the project.

Method: A cross-sectional investigation was conducted in 6 primary health care services of Bobo-Dioulasso in October 2003. Pregnant women and women consulting healthy infants clinics were interviewed by trained sociologists women. Demographic information, level of knowledge on MTCT, and sources of information were collected through standardized questionnaire. Data analysis was done in Epi-info.

Results: A total of 394 women have been interviewed (mean age= 24.5 years, 60% housewives). 53% declare not to know the existence of MTCT risk. On the other hand, 45% believe that MTCT is systematic during pregnancy in HIV infected women. Only about 3% know that the risk of MTCT was persistent until cessation of breastfeeding. In order to avoid MTCT, administration of antiretroviral therapy during the pregnancy is the best known intervention (14%), followed by best practices of infant feeding (11%). Their main sources of information are the health services (37%) and the medias (36%).

Conclusion: Improvement of women and communities knowledge on MTCT should be a priority for our MTCT prevention program.

MedGenMed. 2004 Jul 11;6(3):TuPeE5443 [eJIAS. 2004 Jul 11;1(1):TuPeE5443]

Abstract number: TuPeC4920

Assessing differences in HIV knowledge and perceptions in rural Malawi among the general community, trained village volunteers, and antenatal clinic participants

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Background: Community education is a critical component of developing successful HIV treatment programs. Evaluating the impact of existing programs is vital to developing further targeted interventions.

Methods: Over the last 18 months, HIV educational programs were developed at a charity hospital in rural Malawi. We compared HIV knowledge between 4 groups: trained volunteer village AIDS counselors (VAC), women who received HIV talks as part of antenatal care (Antenatal), undifferentiated people on the hospital grounds (General), and villagers from outlying areas (Villagers). 1135 people aged 15-75 completed self-administered questionnaires which included 18 questions of HIV knowledge.

Results: The number of questions answered correctly by the VAC, Antenatal, General and Villager groups were 13.9, 13.2, 13.3 and 12.6 respectively. The VAC performed significantly better and the Villager significantly worse than the other groups ($p < 0.05$), but the absolute differences were small. HIV transmission was correctly identified to be via sex (95%), blood (52%), childbirth (41%), and breastfeeding (38%). Only 46% of the Antenatal group identified childbirth and breastfeeding as a modes of transmission. Overall, 23% believed that having an HIV test leads to a quicker death, and 38% believed that medications for other illnesses are ineffective in someone with HIV. Even the VAC group held these beliefs at a rate of 13% and 34% respectively. 48% overall acknowledged themselves to be at risk for HIV.

Conclusions: There is poor knowledge of HIV in rural Malawi, even in groups that received targeted education. Poor knowledge in educators like the VAC volunteers will propagate to those they educate. Therefore, evaluations of educators and education programs are crucial. Programs must increase personal risk perception, as this will motivate learning. Outreach programs are especially needed to educate outlying villagers, who appear to have the least knowledge of HIV.

MedGenMed. 2004 Jul 11;6(3):TuPeC4920 [eJIAS. 2004 Jul 11;1(1):TuPeC4920]

Socio-Cultural Barriers and Facilitators

Abstract number: D12537

HIV and child nutrition : A qualitative study on mothers' narratives on exclusivity in infant feeding practices in Ravensmead and Elsies River, Western Cape, South Africa

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Issues: Infant feeding practices remains one of the most serious challenges facing child care and development, particular in areas with high HIV/AIDS prevalence. Health care providers promote exclusive infant feeding practices but in developing countries mixed feeding commonly occurs.

Description: This poster based on qualitative research examines the issue of mixed feeding within Ravensmead and Elsies River, two colored communities in the Western Cape, post PMTCT counseling. This poster presents the narratives of mothers expressing notions of exclusivity and mixed feeding.

Lessons learned: Infant feeding practices are linked directly to mothers' social, cultural and economic status.

Recommendations: Understanding the social and cultural realities associated with mixed feeding in low socio-economic environments is critical for the development of an effective infant feeding counseling strategy and also for the development of comprehensive PMTCT programmes.

MedGenMed. 2004 Jul 11;6(3):D12537 [eJIAS. 2004 Jul 11;1(1):D12537]

Abstract number: ThPeD7831

Strengthening social relationships for prevention of post-natal HIV transmission to children in rural Tanzania

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Background: Interventions to prevent HIV transmission to children after birth, especially infant feeding, tend to be highly visible. Prevention efforts by parents include deciding to use certain interventions and using them effectively. The role and strengthening of social relationships in such prevention is explored in this research study.

Methods: Exploratory qualitative research was carried out in preparation for HIV prevention programs in Central Tanzania. The design included 20 key informant interviews, 7 interviews with HIV+ mothers and relatives, and 12 focus groups in 3 villages. The role of family members, traditional midwives, church and PLWHAs was especially explored.

Results: There is a large unmet need for HIV and AIDS education, and specifically HIV transmission to children. In rural Tanzania, modified cow's milk is already widely used for orphans, and would be considered desirable for HIV-infected mothers to use. Cow or goat projects would be well-received. People were suspicious of formula milk, because of possible chemical contamination, expired dates and high pricing. Community norms strongly support couple relationships and the desirability of men and women to be tested together. Support within the family may be related to past relations, the state of the economy and the perceived source of the HIV infection. Reducing fear and stigma is seen as crucial to strengthening social support. Senior women, such as traditional midwives are highly trusted and may be consulted on decision-making related to HIV prevention. These people could be trained to conduct education and counseling.

Conclusion: Community groups believe PLWHAs and church leadership can do much to reduce the general fear of AIDS through continuous frequent community education to all groups, together with practical care and counseling.

MedGenMed. 2004 Jul 11;6(3):ThPeD7831 [eJIAS. 2004 Jul 11;1(1):ThPeD7831]

Abstract number: WePeD6377

Cultural factors that influence infant feeding practices in Kericho, Kenya

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Issues: In Sub-saharan Africa, the most important route of infant HIV infections is through mother to child transmission. It accounts for over 95% of childhood HIV infections. With no intervention, 30-40% of HIV positive and breastfeeding mothers pass the virus onto their babies, where 60% of the transmission occurs in the first 6 weeks. Prolonged breastfeeding and mixed infant feeding are associated with increased risks.

Description: We have enrolled 659 HIV positive mothers in our PMTCT program between December 2002 and December 2003. 269(41%) of them opted to breastfeed their babies while only 64(10%) of them opted for replacement feeding. The remaining 326 (49%) had not chosen a feeding option by the time they completed the counseling session. The decisions made by these mothers on their infant feeding practices are, to a large extent, affected by the socio-

cultural norms of the Kenyan society. There is some stigma associated with replacement feeding. The husband, the mother-in-law, and friends insist on knowing why the child is not being breastfed. Once they learn that it is secondary to her HIV-positive status, they discriminate against her. Since HIV/AIDS is associated with promiscuity, they attribute this behavior to the HIV-infected mothers, causing them to feel embarrassed, ashamed, guilty and rejected. Hence, from our experience, the 49% of HIV-infected women who had not chosen a feeding option are likely to mix feed their babies after delivery.

Lessons learned: PMTCT programs should involve the entire society through education and mobilization that extends beyond the pregnant woman. This will encourage community acceptance of those who are HIV-positive and will facilitate the prevention of infant infections through breastfeeding.

Recommendations: PMTCT awareness campaigns for the entire community should be an integral part of any PMTCT program to help reduce the stigma and discrimination associated with not breastfeeding.

MedGenMed. 2004 Jul 11;6(3):WePeD6377 [eJIAS. 2004 Jul 11;1(1):WePeD6377]

Abstract number: ThPeE7948

Anthropological factors affecting HIV positive mothers in their choice of a feeding method, in Phnom Penh, Cambodia

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Background: Guide-lines have been set up to help HIV positive mothers make an "informed choice" about a feeding method for their new-born. As any public health measure, the concept of "informed choice" is a social construct. On the field, recommendations are shaped by the different actors' and institutions' ideas, political will and means at their disposal to enforce them. This research aims at exploring how institutional agency frame women's choices.

Methods: Semi-structured in-depth interviews with forty eight HIV positive mothers; ethnographic procedures.

Results: Results of our research show that so far there is little room for a choice since either method (breast-feeding or milk substitutes) is attached to the institutions' modus operandi. The staff's sense and apportionment of risks is not free and in the context of an emotional issue, conformity with the establishment regulations will ensue. Hence, the axiom that presenting facts such as HIV transmission through breast-feeding or the risks attached to formula feeding can be done in an "objective way" becomes contentious. When looking at all the components included in the mothers' decision-making processes, local organization of the health system play a major role, outstanding the influence of cultural factors. Public or established institutions and person-centered NGOs promote different, sometimes opposite preventive measures.

Conclusions: Questions and recommendations include: a call to policy-makers to review the principles and conditions of informed choice; a discussion about the role of NGOs in the field of PMTCT and ways to better coordinate private initiatives and national policies; the need to train and assess health staff performance about the psychological stress of feeding counseling.

MedGenMed. 2004 Jul 11;6(3):ThPeE7948 [eJIAS. 2004 Jul 11;1(1):ThPeE7948]

Abstract number: WePeD6449

Women themselves define access to PMTCT programmes - a dilemma

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Issues: Swaziland is hard hit by the HIV/AIDS pandemic, and government and civil society have adopted various interventions to combat the spread of the infection. One of these interventions is the PMTCT program, which encourages pregnant women to go for VCT, and then supports HIV-positive women during the peri- and postnatal period.

Description: In a qualitative study, based in Mbabane, Swaziland, 64 respondents were interviewed in an attempt to explore the experiences of mothers, and their social network, in the decision making process associated with feeding an infant. Field notes, participant observation and focus group discussions supplemented the data collection process.

Lessons learned: Although respondents frequently cited breast-feeding as the infant feeding method of choice, most babies were introduced to complementary foods including milk formula as early as three weeks after birth. Few mothers adhered to the international recommendation of exclusive breast-feeding for six months. The poster describes the cultural beliefs and customs that underlie this finding. Although most respondents acknowledged the importance of knowing their HIV status, many described reasons why they had not been tested, failed to collect the results of their HIV-test or refused to disclose an HIV-positive status to their sexual partners. Condom use also poses a challenge to women in a culture where it is perceived to be the man's prerogative to initiate sexual intercourse. Financial and social dependence on the partner or a gainfully employed relative were cited as obstacles to adhering with the PMTCT strategy.

Recommendation: The findings demonstrated the multiple, complex and changing dynamics associated with mothers' decisions of adhering to PMTCT guidelines, and provide essential information to stakeholders involved in implementing interventions to curb HIV pandemic.

MedGenMed. 2004 Jul 11;6(3):WePeD6449 [eJIAS. 2004 Jul 11;1(1):WePeD6449]

Abstract number: WePeD6392

Discourse on formula feeding by HIV positive mothers in Cambodia

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Background: Some policy-makers and NGOs fear that in societies adverse to milk substitutes, using the bottle could lead to stigma. Hence, concern for the individuals commands the promotion of exclusive breast-feeding. Conversely, in societies not opposed to the use of formula, emphasis is put on a global threat, the risk of "spill-over": HIV positive mothers could set a trend undermining "breast is best" policies. This research, conducted in 2003, attempted to evaluate the risks of rejection linked to artificial feeding.

Methods: Semi-structured in-depth interviews with forty-eight HIV positive mothers; ethnographic methods.

Results: In repeated interviews, Cambodians mothers expressed their anxiety at a break of confidentiality through formula feeding, and indicated ways to cope with family's or neighbor's questions. Several types of face-saving methods have been documented, fitting patterns observed in other countries. A local feature is that in opposition to the cultural context in many

African countries, formula feeding is a status symbol in Cambodia. At the same time, most of these mothers maintained that a mother's milk had a better nutritional value, confounding apprehensions that artificial feeding could prevail for complacent reasons.

Conclusions: In Cambodia, HIV positive mothers from poor backgrounds, make use of narrative, silence and denial to ward off suspicions about the reasons behind formula feeding. None of the social risks linked to providing HIV positive mothers with formula, stigma or spill-over, could be foreseen. More research and discussions are necessary to understand how and why using milk substitutes could involve a social risk.

MedGenMed. 2004 Jul 11;6(3):WePeD6392 [eJIAS. 2004 Jul 11;1(1):WePeD6392]

Abstract number: WePeD6451

African traditional healing practices and their influence on infant feeding in the context of HIV/AIDS in Watersmeet, Ladysmith, South Africa

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Issues: This paper explores the influence of traditional beliefs and practices performed in Watersmeet and the implications of these on the lives of vulnerable children in the context of HIV/AIDS. A child in Watersmeet is not viewed as an individual, but viewed as part of the community. Traditional beliefs and practices play a vital role in the upbringing of the child within this community. One of the commonly used practices in Watersmeet is *umfula*; *Umfula* is a mixture of sugar and boiled water. Most mothers in Watersmeet introduce this as a feed during the first few days after the child is born. *Umfula* is not just used for feeding but it is believed to cleanse the digestive system of a newborn child. Another widespread practice is that of *ukuhlwa inyoni*, which is performed by traditional healers by administering enemas on a child. The dilemma here is that health care workers discourage the use of *umfula*, and other practices performed by most mothers because they believe that it is not good for the integrity of the child's digestive system, and as such these conflict with the exclusive feeding policy that they promote.

Description: This qualitative research was conducted among mothers of infants and pregnant women in Watersmeet, a rural area outside Ladysmith in KwaZulu-Natal, South Africa over a seven month period.

Lessons learned: Even though health care providers devalue traditional healing practices, these remain meaningful in the decisions mothers make around child care.

Recommendations: Traditional healers will continue to play a role in child care in areas like Watersmeet. As such I recommend that health care providers rather than ignoring these widespread practices engage in discussion with mothers and traditional healers to create a safe and appropriate space for child care practices.

MedGenMed. 2004 Jul 11;6(3):WePeD6451 [eJIAS. 2004 Jul 11;1(1):WePeD6451]

Perceptions, Feelings, and Beliefs

Abstract number: ThPeB7067

Two-year follow-up in a PMTCT project: The women's point of view. Ditrane Plus project, ANRS 1201/1202, Abidjan, Côte d'Ivoire

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Background: To assess social impact and perception in women after a two year follow up in a PMTCT project in Abidjan, Côte d'Ivoire.

Methods: Consenting women diagnosed with HIV-1 infection and informed of their serostatus were included during the third trimester of pregnancy. PMTCT interventions were systematically proposed: perinatal antiretroviral prophylaxis and infant feeding alternatives to prolonged and predominant breastfeeding (BF): formula feeding (FF) free of charge from birth or exclusive BF during three months then early cessation with free provision of FF until 9 months of age. At the end of follow-up, women were systematically interviewed.

Results: Between May and December 2003, 77 women reached the end of follow-up. Family structure since inclusion in the study had changed in 33 women, of whom 6% explained this change by a reason linked to the project: serostatus disclosure, infant feeding interventions, too frequent visits. Overall, 43% disclosed their serostatus to their partner, and 57% informed him of their participation in the project. In women who chose FF from birth (N=48), 37% reported difficulties to feed their baby since their partner (17%), or their family (83%) disagreed with this practice. Among women who practiced BF with early cessation (N=29), 21% explained the reason of this practice to their partner, 54% reported support of their family while 36% faced opposition. However 55% were ready to "do it again". 12% of women regretted to have accepted HIV screening during pregnancy and 82% would recommend to a pregnant friend HIV screening.

Conclusion: Despite the difficulties reported, most of the women have a positive opinion of their two year participation in the project and would be ready to do it again. Proposing alternatives to BF induces social difficulties for the mothers that should be taken into account in the evaluation of these complex interventions.

MedGenMed. 2004 Jul 11;6(3):ThPeB7067 [eJIAS. 2004 Jul 11;1(1):ThPeB7067]

Abstract number: MoPeD3913

Attitudes and beliefs among pregnant Kenyan women concerning mechanisms and prevention of Mother-To-Child-Transmission (PMTCT) of HIV

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Background: The Kenyan government recommends VCT for pregnant women and their partners. HIV infected women are offered the HIVNET012 nevirapine regimen and breastfeeding is discouraged if safe alternative feeding is available. Otherwise, exclusive

breastfeeding is promoted. These recommendations can only be successfully implemented when fully understood and accepted by the target population and its socio-cultural environment.

Methods: Four focus group discussions (FGDs) were organized to explore attitudes and beliefs among pregnant Kenyan women, concerning mechanisms of MTCT of HIV, alternative infant feeding, access to medical treatment for mother and child, and status disclosure to the male partner. Forty-three women, attending the antenatal clinic of the General Hospital of Mombasa were voluntarily recruited. All FGDs were audiotaped and qualitative analysis was made using the QSR N*5 statistical programme.

Results: In addition to the most common modes of MTCT of HIV (i.e. breastfeeding, intrapartum and in utero), other modes such as rape and used undisposed condoms were reported. To prevent MTCT of HIV, not breastfeeding, surrogate feeding, drugs and caesarean section were suggested. Inevitable transmission was defended as well. Apart from PMTCT, many other possible reasons for not breastfeeding were given. Explored obstacles to hospital-based care included lack of money, family pressure for traditional medicine or prayers, and distrust from in-laws. Almost all participants expected negative outcomes if they told their husbands they had been tested HIV positive.

Conclusions: This study reveals a wide range of opinions and attitudes, which may have been missed by merely quantitative research methods. These insight are believed to be important for implementation of PMTCT programmes since recommendations that start from the target population's point of view are more likely to be accepted and implemented.

MedGenMed. 2004 Jul 11;6(3):MoPeD3913 [eJIAS. 2004 Jul 11;1(1):MoPeD3913]

Abstract number: TuPeD5171

Barriers and Facilitators to Participation in the Prevention of Mother to Child Transmission of HIV Program (PMTCT) in Gaborone, Botswana

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Issues: The existing belief that if money and free antiretroviral drugs were offered to developing countries people would flock to use the services does seem to hold for the Prevention of Mother to Child Transmission of HIV Program (PMTCT) in Botswana. The government offers free counseling, testing, free antiretroviral drugs and free infant formula for babies born to infected mothers and yet the reality of living in an environment full of stigma and discrimination is an impediment to these endeavors.

Description: An explorative qualitative study was conducted in Gaborone, Botswana from July-December 2003. The purpose of the study was to explore factors pregnant women saw as facilitators/encouragers and barriers to participation in the PMTCT program. Twenty (20) pregnant women, ten (10) HIV infected women who are in the program and ten (10) who rejected the program participated in open-ended in-depth interviews.

Lessons learned: Thematic content analysis yielded the following barriers 1. Fear of knowing one's HIV status, 2. Stigma related to free infant formula collection and formula feeding, 3. Lack of partners support, 4. Negative attitudes of health workers, 5. Fear of side effects of AZT, 6. Counseling issues. Factors perceived as facilitators or encouragers included. 1. Good counseling, 2. Availability of free antiretroviral drugs and monitoring services for mother and baby. 3. Fear of caring for an HIV sick baby, 4. Partner support and testing, 5. Positive treatment outcome.

Recommendations: For the PMTCT program to be successful in reducing AIDS related infant mortality in the country, these barriers need to be addressed.

MedGenMed. 2004 Jul 11;6(3):TuPeD5171 [eJIAS. 2004 Jul 11;1(1):TuPeD5171]

Abstract number: B11360

Perceptions and challenges of women who participated in an MTCT clinical trial in Zimbabwe

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Background: Thousands of HIV-related clinical trials are currently running internationally. While these trials are closely monitored to ensure that protocols are followed and patients' rights are maintained, few research efforts have concentrated on investigating the client's perspective and understanding of participation. The aim of this study is to obtain client feedback on all aspects of the trial, from enrollment through to study completion, and use this information to improve the conduct of upcoming trials in Zimbabwe.

Methods: 30 women who participated in an MTCT trial have been approached to participate; data are being collected through in-depth interview. The interview is divided into 3 categories: Perceptions and fears prior to enrollment; Actual study experiences; and Overall opinion and recommendations. The data are being examined for patterns and themes by comparing accounts of participants.

Results: 12 women have been interviewed to date. All clients understood that the study was a "clinical trial," but 4 of them believed that the drug "would work" (i.e., would protect their infants), rather than accepting that it was experimental. All 12 women could recite the objectives of the trial, but 3 admitted that they did not fully understand the objectives at enrollment, but rather later in the trial. All women reported difficulties at study exit: "When the study ended I couldn't get the special treatment I used to get when going to clinics and couldn't afford the formula which I was getting from the project".

Conclusions: Researchers should routinely obtain client feedback, as it is an invaluable tool which can improve the conduct of future trials. Greater effort must be made during the enrollment phase of a study, to ensure that potential clients fully understand the objectives and requirements of the study. Extra care must be taken when an experimental drug is involved, given clients' inclinations to believe that drugs provided by medical staff will "work."

MedGenMed. 2004 Jul 11;6(3):B11360 [eJIAS. 2004 Jul 11;1(1):B11360]

Abstract number: MoPeD3802

Research on the feelings and attitudes of HIV positive mothers in South Africa towards infant feeding and early diagnosis

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Background: This study was done on a population of women attending the Prevention of Mother To Child Transmission of HIV program at Coronation hospital, Johannesburg, South Africa. The purpose of this study was to ascertain women's feelings and attitudes about proposed early (6 weeks) infant HIV testing regimens and evaluation of infant feeding choices. The impact of disclosure and evaluation of depression provided insight on coping mechanisms exhibited by these women. Secondary objectives were to evaluate the women's experiences surrounding the PMTCT intervention.

Method: The study design consisted of in-depth interviews with the women, in a private room. The interview content was semi-structured; i.e. a mix of closed and open-ended questions. Interview data were transcribed and entered into a structured database, with socio-demographic data.

Results: 176 women were interviewed. Data analysis showed that 90% of the women reported that receiving prophylactic medication and counseling were most important since the birth of their babies. 99% reported exclusive formula feeding, irrespective of the infant's status, although 90% indicated that they would prefer breast-feeding if they (the women) were HIV-uninfected. 85% of the participants preferred early testing of their babies. Although all the participants were aware of their HIV status, 60% had not disclosed their status to anyone, which correlated strongly with higher depression scores.

Conclusions: The results indicate that earlier infant testing was preferred, as this reduced the period of uncertainty and anxiety that HIV infected mothers often endure. There was a high rate of exclusive formula feeding reported, consistent with the women's desire to prevent transmission to their babies. Depression scores were higher in the women who had not disclosed their status to anyone, indicating that these women had less support and felt more isolated, than their peers. It also indicated that these women did not cope well with stress. On the whole, the women's experiences of the PMTCT were satisfactory.

MedGenMed. 2004 Jul 11;6(3):MoPeD3802 [eJIAS. 2004 Jul 11;1(1):MoPeD3802]

Abstract number: C10313

The problems and effects of mother to child (MTC) HIV transmission in an extended family system in Ghana

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Issues: Mother to child transmission of HIV accounts for the highest single mode of infection in children in Ghana. The extended family system creates an avenue for interference in decision making by women and almost wipes away their privacy and freedom. It is worse if the economic

status of the woman is not all that sound or the woman depends on family members, particularly among her in-laws.

Description: Most women believe in our local traditions from which it is derived that "a woman is supposedly, placed under the cover and care of the husband". This tradition believes that it is the responsibility of the man to provide all that the woman and her children need. In the pursuit of this some men have added to it, the right to make decisions for their wives and unfortunately in some cases concerning testing, breastfeeding, baby-care, participation in programmes on HIV/AIDS' awareness, education etc. Sometimes these decisions are influenced by in-laws. This has added to the fear associated with HIV and its stigma.

Lessons learned: Women in the low income group and those without any meaningful source of income and therefore depend on their spouses and families are the most vulnerable to the HIV/AIDS' infection. They have not only accepted decisions on their health from their husbands and in-laws but also have almost lost their rights to decide on issues concerning their in-born and newly-born babies.

Recommendation: We need to step-up our Information, Education and Communication (I.E.C.) programmes and involve the communities in whatever programmes members of the community would be involved in and educate them on local, easy to operate small-scale businesses. This would help them to be independent economically and socially and would offer them the freedom to decide the direction of their individual lives.

MedGenMed. 2004 Jul 11;6(3):C10313 [eJIAS. 2004 Jul 11;1(1):C10313]

Replacement Feeding / Infant Formula

Abstract number: na

Improving access to breast milk substitutes for infants of HIV positive mothers in a highly poor indebted country: Cameroon's pilot case study

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Issues: In 2003, a pilot project for access to BMS was implemented in Cameroon through the budget of the Ministry of public health (HIPC funds) within the national PTMCT program (160 PMTCT sites).

Description: After an evaluation of risk factors associated with infant feeding choices and feasibility of infant feeding options, preselection of 10 sites was done in two provinces. Eligibility criteria include: adequate quality of PMTCT services, urban sites, child health unit for follow up, existing pharmacy, availability of at least two counsellors trained on HIV and infant feeding. Procurement and distribution of 18000 tins (450 g) of commercial infant formula (1st age, 2nd age, low birth babies formula) was done. Quality distribution was based on fractional supplies given privately to the beneficiaries, commitment of the targeted sites to the clinical follow-up and respect of national code of marketing of BMS.

Results: During 8,4 months 1208 women were counselled 1098 (90%) opted for formula of whom 998, (90%) received help. 11000 tins were distributed free of charge or at subsidised cost. Quantities ranged from 10 to 40 tins per infant for 6 months according to the socioeconomic status. By this strategy we observed an increasing rate of women attending the child follow up visit , especially the two weeks intervals follow-up move from 45 to 70 % for the first two months. Regular review shows excess stocks of low birth babies formula and results in redistribution. No loss nor deterioration occurred.

Lessons learned: Adequate provision of infant formula under good infant feeding counseling is feasible and can improve follow-up of babies in urban areas in Cameroon.

Recommendations: Political commitment through government driven program and policies can help for access to breastmilk substitutes in PMTCT program in Africa.

MedGenMed. 2004 Jul 11;6(3): [eJIAS. 2004 Jul 11;1(1):]

Abstract number: MoPpB2009

Alternative feeding for HIV exposed child: use of formula in a resource limited setting

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Issues: It is recognized that HIV transmission has consequential medical costs and emotional stress of caring for an HIV infected child. When replacement feeding is feasible, affordable, sustainable and safe avoidance of breastfeeding is recommended with the women having access to information, follow-up, clinical care and support. Studies of morbidity associated with lack of breast-feeding have highlighted the benefits of breast milk .However, breast milk contributes to 1/3 to 1/2 of overall HIV transmission and the additional risk of vertical HIV transmission posed by breast-feeding reduces the efficacy of ARV's used in late preg. and labor for PMTCT.

The most effective way to achieve total PMTCT is to use alternative feeds.

It is however recognized that indiscriminate use of formula in resource poor settings would be catastrophic to infant survival.

Description: We are currently taking care of 146 HIV exposed children in both urban and rural settings in Western Kenya since 2002. Guided by the Academic Model for the Prevention And Treatment of HIV/AIDS(AMPATH), we have in less than 2 years scaled up from seeing a couple of children to hundreds without compromising standards. All the mothers who choose formula are assessed for suitability by experienced nurse-counselors and nutritionists. Access to clean water, fire and skill to prepare the alternative feeds is ensured. Informed choice by the mother is mandatory. The formula is obtained from the post-natal wards after delivery and during weekends when MCH is closed by eligible mothers. Of the 146 infants seen, 80 used formula.

Lessons Learned: With good assessment and training on handling of formula milk, no adverse side-effects are noted on the children on Nan-pelargon. The PMTCT is achieved better in the children on Nan-pelargon than in those on breastfeeding or mixed feeding. Growth is better in those using formula milk.

Recommendations: Replacement feeding is possible in resource poor settings with proper assessment.

MedGenMed. 2004 Jul 11;6(3):MoPpB2009 [eJIAS. 2004 Jul 11;1(1):MoPpB2009]

Alternatives: Heat Treatment, Chemical Treatment, and Wet Nursing

Abstract number: ThPeC7411

Viral, nutritional, and bacterial safety of flash-heated and Pretoria-pasteurized breast milk to prevent mother-to-child transmission of HIV in resource-poor countries

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Background: Heat-treated expressed breast milk (BM) is an infant feeding option advocated by WHO, yet practical methods have not been systematically evaluated. The safety of two simple heating methods, Flash-heating (FH) and Pretoria Pasteurization (PP) is presented here.

Methods: Fresh BM from healthy women volunteers was allocated to unheated controls, FH (50mL BM heated in a 450mL water jacket until water boiled, then BM removed), or PP (450 mL of water brought to a boil, removed from heat, and 50mL BM placed in the water covered for 20 min), simulating field conditions with an aluminum pan as a water jacket, glass peanut butter jar containing the heated milk, and open flame (temp graph shown).

HIV detection: 5 samples were spiked with 1×10^8 copies/mL of HIV-1 subtype C. One mL samples were quantitatively assessed for reverse transcriptase (RT) activity to measure HIV destruction. **Nutrition:** Samples were analyzed for the impact of heat on vitamins (A, B6, B12, C, folate, riboflavin, thiamin) and on proteins (lactoferrin (Lf), lysozyme). **Bacteriology:** Storage safety for 12 h was studied by a) spiking BM with *E. coli* or *S. aureus* and aliquoting to heat then store or store then heat; b) and by measuring the effect of heat on antibacterial properties by heating BM then spiking.

Results: Comparison of RT activity for each sample is shown. FH nor PP significantly decreased vitamin concentrations, although Vitamin A (n=3) decreased >50%. FH trended toward greater vitamin retention than PP. Lf concentration decreased ($p < 0.05$) with heat but the proportion of Lf and lysozyme surviving digestion was similar for FH and PP. FH and PP, either before or after storage, eliminated the spiked bacteria. FH samples inhibited more bacterial growth than PP.

Conclusion: These pilot data suggest FH may be superior to PP in eliminating residual RT activity and in retaining nutritional and antimicrobial properties. These findings support FH as a safe and practical infant feeding option.

MedGenMed. 2004 Jul 11;6(3):ThPeC7411 [eJIAS. 2004 Jul 11;1(1):ThPeC7411]

Abstract number: LbOrB11

Surrogate grandmother lactation to prevent mother-to-child breast milk HIV transmission in coastal Kenya

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Background: The majority of global pediatric AIDS cases are attributed to mother-to-child transmission via birth and breastfeeding processes. Yet breastfeeding remains the primary source of infant nutrition, as formula is neither an affordable nor a safe option. To avoid pediatric

AIDS, novel, cost-efficient technology is needed to feed infants safely. The primary study aim was: 1) determine if HIV (-) grandmother (GM) age women could re-establish a nutritious and adequate milk supply equivalent in essential nutrient bioavailability to mother's milk in coastal Kenya; and 2) assess the community acceptance of surrogate feeding of infants by elder HIV (-) relatives when the birth mother is HIV (+).

Methods: GMs and their postpartum, breastfeeding daughter (DGT) were recruited (N=25 GM; 25 DGT). A manual breast pump was used 4 times a day for 10 minutes over 6 weeks to stimulate re-lactation. GM breast milk and serum samples were collected at the end of 6 weeks. DGTs supplied a one-time donated breast milk sample for bio-equivalence comparison. Aim 2 was addressed by focus group and individual interviews of the villagers, and with chiefs and community leaders.

Results: Data revealed that GM re-lactated milk compared favorably to that from donor DGTs. GM samples contained secretory IgA and proteins of breast milk, leukocytes, fatty acids and other nutritional components at levels similar to DGT's samples. The interview data suggests that GM surrogate feeding was highly acceptable to the informants. The community proposed that grandparents be tested prior to the expected child's birth for HIV and a contract be drawn to promote HIV-free surrogate nursing. The role of the chief and child advocate to oversee this family contract was strongly urged.

Conclusion: This study holds promise to build a culturally-tailored repertoire of feeding technologies that address the burgeoning HIV/AIDS pandemic in Africa and other developing nations by blending traditional and modern knowledge.

MedGenMed. 2004 Jul 11;6(3):LbOrB11 [eJIAS. 2004 Jul 11;1(1):LbOrB11]

Abstract number: ThPeB7112

Microbicidal treatment of HIV-1 infected breast milk as an alternative for prevention of mother-to-child transmission of HIV-1 through breastfeeding

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Background: Reduction of transmission of HIV-1 through breast milk is imperative. Sodium dodecyl sulfate (SDS) is a broad spectrum alkyl sulfate microbicide that inactivates HIV-1 in vitro at low concentrations (Howett et al., 1999). SDS is of little/no toxicity and is inexpensive. We hypothesize that alkyl sulfate microbicides may be used for treatment of expressed HIV-1 infected breast milk and, if needed, could be removed from the milk prior to consumption. We have previously reported that $\geq 0.1\%$ SDS inactivates cell-free HIV-1 in spiked breast milk in vitro and if needed SDS can be efficiently removed from milk. Treatment does not significantly alter milk's nutritional and protective factors (i.e., total protein and lipids, fat and energy content, immunoglobulins).

Methods: Breast milk was spiked with high titer HIV-1 IIIB. Microbicidal treatment was at 37°C for 10 min. Inactivation of cell-free and cell-associated HIV-1 in breast milk was tested with MAGI assays. HIV-1 load of treated milk was assessed by branched DNA technology. Effect of treatment on T cells in milk was studied by FACS.

Results: $\geq 0.01\%$ SDS was virucidal against cell-free and cell-associated HIV-1 added to breast milk within 1 and 7 minutes, respectively. After removal of SDS, HIV-1 infectivity was not

recovered. FACS analysis showed loss of cells when milk was treated with 1% SDS, but were conserved with 0.1% SDS-treatment. $\leq 1\%$ SDS reduced viral load to undetectable levels.

Conclusion: $\geq 0.1\%$ SDS quickly and irreversibly inactivates HIV-1 in breast milk. Treatment with 1% SDS destroys HIV-1 target cells in milk (CD4+ T cells). Alternative microbicides are currently being tested (e.g., red algae -based, milk lipid-based, other alkyl sulfates). Treatment of HIV-1-infected breast milk with alkyl sulfates may be a simple way to prevent/reduce transmission of HIV-1 through breast milk, presumably at a low cost, and with ready availability.

MedGenMed. 2004 Jul 11;6(3):ThPeB7112 [eJIAS. 2004 Jul 11;1(1):ThPeB7112]

Issues of Quality of Life, Disclosure, and Community Support

Abstract number: MoPeD3805

Research on the quality of life of HIV positive mothers in South Africa with regards to infant feeding and early diagnosis

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Background: This study was done on a population of women attending the Prevention of Mother To Child Transmission program at Coronation hospital, Johannesburg, South Africa. The purpose of this study was to ascertain women's feelings and attitudes about proposed early (6 weeks) infant (HIV) testing regimens and evaluation of infant feeding choices. The impact of disclosure and evaluation of depression provided insight on coping mechanisms exhibited by these women. Secondary objectives were to evaluate the women's experiences surrounding the PMTCT intervention.

Method: The study design consisted of in-depth interviews with the women, in a private room. The interview content was semi-structured; i.e. a mix of closed and open-ended questions. Interview data were transcribed and entered into a structured database, with socio-demographic data.

Results: 176 women were interviewed. Data analysis showed that 90% of the women reported that receiving prophylactic medication and counseling were most important since the birth of their babies. 99% reported exclusive formula feeding, irrespective of the infant's status, although 90% indicated that they would prefer breast-feeding if they (the women) were HIV-uninfected. 85% of the participants preferred early testing of their babies. Although all the participants were aware of their HIV status, 60% had not disclosed their status to anyone, which correlated strongly with higher depression scores.

Conclusions: The results indicate that earlier infant testing was preferred, as this reduced the period of uncertainty and anxiety that HIV infected mothers often endure. There was a high rate of exclusive formula feeding reported, consistent with the women's desire to prevent transmission to their babies. Depression scores were higher in the women who had not disclosed their status to anyone, indicating that these women had less support and felt more isolated, than their peers. It also indicated that these women did not cope well with stress. On the whole, the women's experiences of the PMTCT were satisfactory.

MedGenMed. 2004 Jul 11;6(3):MoPeD3805 [eJIAS. 2004 Jul 11;1(1):MoPeD3805]

Abstract number: TuPeD5140

The cost of early infant diagnosis in PMTCT programs in low resource settings

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Background: PMTCT programs in low resource settings recommend regular clinical follow up of all HIV exposed children on co-trimoxazole prophylaxis to age 12 months before establishing their HIV infection status with an HIV ELISA test. This policy, based on the assumption that earlier diagnosis using PCR testing is unaffordable, fails to identify HIV infected children for medical management because of high loss to follow up rates at 12 months of age. The cost to government (provider cost) of diagnosing an infant at 3 versus 12 months of age using PCR versus ELISA testing respectively was assessed.

Methods: A questionnaire was administered by a single investigator to 30 HIV-infected women whose infants were enrolled in an urban PMTCT program in Johannesburg, South Africa at each of the 6-week, 3-, 4-, 7- and 12-month infant visits. The time spent with different categories of staff, medication prescribed and consumables used at each visit was documented. These costs and the capital costs of the program were calculated to establish the average provider cost per patient for each diagnostic option.

Results: The average provider cost per patient, determined from 126 (84%) questionnaires, was R366.95 (range: R219 to R479) and R375.53 (range: R311 to R459) using HIV ELISA and DNA PCR testing respectively. On average, early infant diagnosis would cost government R8.38 (USD1.18) more per patient. Societal costs incurred by patients to attend the PMTCT program are excluded. The lost to follow up rates in this PMTCT program indicate that the number of infants available for earlier HIV testing would be 3-fold higher than at 12 months of age.

Conclusions: A marginal additional investment by government to access an earlier HIV diagnosis for infants could triple the effectiveness of PMTCT programs to identify HIV infected children for medical management and improved quality and quantity of life.

MedGenMed. 2004 Jul 11;6(3):TuPeD5140 [eJIAS. 2004 Jul 11;1(1):TuPeD5140]

Abstract number: ThPeD7671

The Mothers' Programs: Mothers 2 Mothers - continued education and support for PMTCT mothers after delivery

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Issues: Antenatal care is stressful for women recently diagnosed with HIV infection. Postpartum is no less stressful. Mothers must care for themselves and their infant. Decisions made about feeding and family planning must be enacted. Support expected from family, partners and friends might not be present. The health care system, available and focused during pregnancy, seems distant and unfocused. The challenges of economic and emotional deprivation are more acutely felt. Mothers on anti-retroviral therapy (ARV) need adherence support.

Description: Mothers 2 Mothers (M2M) meets the needs of postpartum women living with HIV; providing education, guidance, support and meals. HIV (+) mentor-mothers who have recently

delivered their babies lead M2M support groups, sharing personal experiences with new mothers. Groups meet in primary health centers where mothers and babies receive health care. New mothers on ARV's receive support from fellow mothers, encouraging adherence to treatment. Mothers are taught marketable skills providing opportunities for sustainable income which contribute to dignity and access to food and shelter. The first M2M site was opened in October 2002 in Cape Town. There are now 4 sites in the province, employing 20 women as mentors and coordinators, reaching more than 1000 women each month.

Lessons learned: Mothers who have delivered babies and lived through similar experiences can provide guidance and support to recently delivered mothers. Mothers attending M2M are more likely to adhere to baby feeding regimens, use condoms and continue with family planning. Babies are more likely to attend follow-up appointments. Babies and mothers with medical problems will present early, before conditions become severe. Mothers with support will be more adherent to ARV therapy. M2M programs lead to empowerment of women and destigmatization of HIV. The spillover effect may contribute to more women and men being tested for HIV.

Recommendations: M2M programs offering support to mothers after delivery should be integrated into PMTCT care.

MedGenMed. 2004 Jul 11;6(3):ThPeD7671 [eJIAS. 2004 Jul 11;1(1):ThPeD7671]

Abstract number: WePeE6788

Psychosocial support and disclosure outcomes at one year postpartum in HIV positive women attending a PMTCT program in Soweto, South Africa

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Background: HIV prevalence in pregnant women in Soweto, South Africa is 30%. Our PMTCT programs provide ongoing psychosocial support which addresses issues such as disclosure, infant feeding choices and positive living.

Methods: In 2003, the Soweto PMTCT programme offered HIV counselling to 29,461 pregnant women. Thirty percent of those who accepted testing (8,468 out of 28,067) were HIV-positive. Mothers participated in weekly support groups where disclosure, safer sex practices, family planning and infant feeding were discussed and were referred to family planning clinics located in the same facility. Data were collected from mothers at the infant's 1-yr visit for HIV testing. Mothers were asked standard questions about their experiences with disclosure, uptake of family planning and use of methods to prevent transmission of HIV to sexual partners.

Results: We evaluated a sub-sample of 547 women presenting for follow-up at one year. Of these, 431 (78%) women had disclosed their HIV status to one or more people: 69% disclosed to primary sexual partners, 68% to their mothers, 25% to siblings, 20% to other such as friends or neighbours. Outcomes of disclosure included disbelief (16%), support (74%), violence (2%), desertion (12%) or other such as grief or denial (4%). Reported uptake of family planning (62%), and use of HIV prevention methods such as male condom use (76%) was high.

Conclusions: PMTCT programs offer an opportunity to provide ongoing psychosocial support, counselling and referral for family planning services, as evidenced by our high rates of disclosure and use of prevention methods. This may be a vital entry point for secondary prevention efforts.

MedGenMed. 2004 Jul 11;6(3):WePeE6788 [eJIAS. 2004 Jul 11;1(1):WePeE6788]

Abstract number: D11905

Woman's disclosure of HIV status: a critical component of the PMTCT intervention

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Issues: HIV-infected mothers involved in PMTCT program who disclose their status to their partners are less stressed and can adopt positive living approaches such as dietary adjustments and attention to general health, including compliance with cotrimoxazole prophylaxis for mother and infant. In addition, they are more able to participate fully in non-ARV interventions to reduce MTCT of HIV such as exclusive breast feeding and condom use during pregnancy and lactation.

Description: Chitungwiza is a high density local authority 25km outside Harare, Zimbabwe, with an estimated population of 1.5 million people. The four PMTCT sites in Chitungwiza have been operational since 1998, initially as a pilot project for the MOHCW. During this time, psychosocial support has been provided as a core component of PMTCT service delivery. Community mobilisers present the group talk in the antenatal clinic, and describe the benefits of enrolment into the PMTCT program if mothers test positive. After HIV testing HIV infected mothers are encouraged to join the psychosocial support groups for PMTCT, which meet weekly to share experiences and provide companionship in an environment free of stigma. Data from focus group discussions with both disclosing and non-disclosing HIV-infected mothers were analyzed. Review of attendance register showed that mothers who did not disclose their HIV positive status to partners miss clinic appointments for medical follow up and psychosocial support.

Lessons Learned: The enrolment into the PMTCT program without disclosure still exposes the infant to HIV infection, as mothers find it more difficult to exclusively breast feed and negotiate condom use during pregnancy and lactation.

Recommendation: Disclosure of HIV infection is a difficult issue supporting the need for health education and counseling. Psychosocial support with particular attention to disclosure issues should be considered an integral component of any PMTCT program.

MedGenMed. 2004 Jul 11;6(3):D11905 [eJIAS. 2004 Jul 11;1(1):D11905]

Other Biomedical Research / Implications for Infant Feeding

Abstract number: ThPeB7072

Characterization of productive HIV-1 infection in breast milk of African women from KwaZulu-Natal, South Africa

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Background: Previous studies have reported that infants born to HIV-1 positive mothers ingest up to 25,000 infected cells daily and that viable, living cells are required for virus transmission through breast feeding. At present, little is known about the identity of productively-infected cells

in breast milk, or the factors controlling HIV-1 expression. This knowledge is fundamental to the design of intervention strategies that are safe, affordable and appropriate for the developing world.

Methods: Milk leukocytes of 41 HIV-1-infected treatment-naive mothers from KwaZulu-Natal, South Africa were analyzed using a combined immunophenotyping/in situ hybridization assay. The proportion of cells expressing HIV-1 gag-pol mRNA was evaluated using a panel of phenotypic markers for monocyte-macrophages, and for CD4, CD8 and CD45 lymphocytes. Results were correlated with blood CD4+ counts and duration of breast feeding.

Results: 67% of samples had detectable HIV-1 mRNA. Viral mRNA was detected in CD4+CD45RO+ T-cells, CD14+CD16+ monocytes, and macrophages bearing CD40+ and CD206+ mannose receptors. The proportion of samples with >10% productively infected CD4+CD45RO+, CD206+, CD14+CD16+ and CD40+ cells was 56%, 32%, 29% and 7.1%, respectively. Mothers with CD4+ counts <500 cells/μl were more likely to be HIV-1 mRNA positive. The percentage of samples with >10% productively infected CD4+CD45RO+ lymphocytes was 91.7% among women with CD4+ counts <500 cells/μl compared to 42.9% for women with counts >500 cells/μl. Women with low CD4+ counts (<500 cells) also had increased HIV-1 mRNA expression in CD14+CD16+ (50.0% vs 14.3%) and CD206+ (41.7% vs. 14.3%) cells.

Conclusions: In addition to being principal carriers of productive HIV-1 infection in breast milk, CD4+CD45RO+ and CD14+CD16+ cells are major reservoirs of ongoing viral replication during HAART. There is an urgent need for innovative new drugs that target long-lived CD4+CD45RO memory T-cells and cells of the monocyte-macrophage lineage.

MedGenMed. 2004 Jul 11;6(3):ThPeB7072 [eJIAS. 2004 Jul 11;1(1):ThPeB7072]

Abstract number: ThPeB7056

Human breast milk inhibition of DC-SIGN mediated HIV-1 transfer to CD4+ lymphocytes

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Background: HIV infection of infants via breastfeeding is regarded as a significant mode of virus transmission. We therefore wished to identify what effect human breast milk (hBM) had on HIV-1 replication in vitro. Identifying natural compounds that have the capacity to block HIV-1 infection has significant implications for the development of new HIV therapeutics and microbicides.

Methods: Towards this goal we studied the effects of hBM using both a direct infection assay of CD4+ activated lymphocytes as well as a DC-SIGN mediated co-culture experiment using CD4+ lymphocytes and the THP cell line engineered to express the DC-SIGN molecule (THP-DC). Limiting dilutions of hBM samples were included in both assays and the effect on virus replication monitored.

Results: Although no significant effect was observed in the direct infection assay, although at higher concentrations enhancement to infection could be seen, the hBM demonstrated a strong inhibitory effect on the transfer of both R5 and X4 viruses to activated CD4+ lymphocytes via THP-DC cells. We identify that the inhibitory effect is mediated through blocking of the virus interacting with the DC-SIGN molecule on the cell surface rather than binding to the gp120

envelope protein of the virus. We demonstrate that the inhibitory activity can be alleviated via pre-treatment of the breast milk sample with trypsin and that the activity can be enhanced by heat treatment of the hBM. Size fractionation of the hBM demonstrates that the inhibitory activity can be present in variant molecular weight fractions. We have shown that neither human lactoferrin, α -lactalbumin, lysozyme or β -casein, are responsible for the inhibitory activity. The degree of inhibition has been shown to vary between mothers but not necessarily between breast milk samples from the same mother.

Conclusions: A factor or factors in hBM can successfully disrupt the interaction of HIV-1 with the DC-SIGN molecule and block HIV transfer to activated CD4+ lymphocytes.

MedGenMed. 2004 Jul 11;6(3):ThPeB7056 [eJIAS. 2004 Jul 11;1(1):ThPeB7056]

Abstract number: TuOrB1187

Maternal and infant viral load impact disease progression in HIV-1 infected African infants

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Background: We conducted a prospective observational study in Nairobi among HIV-1 infected pregnant women and their infants to determine association between maternal and infant viral burden, and infant disease progression.

Methods: HIV-1 infected women were enrolled during third trimester and given short course zidovudine for prevention of vertical transmission. Infants identified by HIV-1 DNA PCR to be infected were followed to age 2 years or death. Plasma RNA viral load (VL) was determined during pregnancy for mothers, and at birth, 1 month and thereafter quarterly for infants.

Results: Seventy-nine infants became HIV-1 infected, with 29%, 57% and 14% of infections occurring in-utero, peri-partum and late post-partum respectively. Their mothers were of median age 25 years (range 18-38), median CD4 count 371 (range 6-880), median VL 154,295 copies/ml (range 840-2,203,300), and 81% took zidovudine prophylaxis during pregnancy. Infants were born at median gestation 40 weeks (33-42), median birth weight 3.1 kg (1.9-4.0), 12% were born premature, 53% were male, 84% breastfed, and 49% died during follow-up at a median age of 7.3 months (1.3-24.5). Median peak VL of the infants was 5,622,300 c/ml (range 68,348-270,000,000) and median VL set point was 1,251,450 c/ml (19,220-89,000,000). In unadjusted survival analyses maternal VL >median (HR=2.4, P=.002), birth weight <2.5kg (HR=4.8, P<.001), infant peak VL >median (HR=1.7, P=.02), infant VL at month 3 >median (HR=2.0, P=.009), infant CD4 count <750 cells/ml and CD4 <15% at month 6 (HR=7.4, P<.001 and HR=5.6, P=.005 respectively) were associated with death before age 2 years. In adjusted analyses, maternal VL (HR=2.1, P=.03), infant peak VL (HR=1.9, P=.02) and low birth weight (HR=6.4, P<.001) were independently associated with early death.

Conclusions: High maternal VL, high infant peak VL and low birth weight are predictive of death before age 2 years in this cohort of African HIV-1 infected infants.

MedGenMed. 2004 Jul 11;6(3):TuOrB1187 [eJIAS. 2004 Jul 11;1(1):TuOrB1187]

Scaling-Up of Programs / Issues to Consider

Abstract number: WePeE6688

Evaluation of United Nations-supported pilot projects for the prevention of mother-to-child transmission of HIV: overview of findings

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Issues: Beginning in 1999, the United Nations supported pilot Prevention of Mother to Child Transmission (PMTCT) programs in eleven low-income countries in Africa, Asia and Latin America. The pilots aimed to test the feasibility, impact and sustainability of PMTCT programs in resource-constrained countries and to guide expansion of successful programs.

Description: In 2002, the Population Council and UNICEF conducted an evaluation of the pilot programs utilizing a mix of qualitative and quantitative methodologies, including a review of service statistics and progress reports from the pilot sites; interviews with key informants; rapid assessments of pilot sites and their surrounding communities or site visits in four countries; and a collaborative analysis meeting with PMTCT experts.

Lessons Learned: The evaluation found that maternal-child health settings are able to effectively integrate PMTCT programs. However, these programs do not help as many women as they could; for example, fewer than 25% of HIV positive women seeking antenatal care received antiretroviral (ARV) drugs. Increasing the number of women served remains a critical task. Key findings of the report include: Motivated health workers are the backbone of the successful PMTCT programs and PMTCT providers are seen as offering a good quality service. PMTCT programs have greatly increased education on HIV/AIDS, PMTCT and infant feeding and have contributed to the reduction of stigma in many settings. Program challenges include mobilizing communities, engaging male partners, adopting clear guidance on infant feeding, and strengthening ANC and primary HIV prevention.

Recommendations: PMTCT programs need to embrace innovative approaches such as lay counselors and rapid tests, provide enhanced support to PMTCT providers, and expand partnerships with the community. Government support, partner co-ordination, increased human resources and improving the supply system are essential to scale-up programs.

MedGenMed. 2004 Jul 11;6(3):WePeE6688 [eJIAS. 2004 Jul 11;1(1):WePeE6688]

Abstract number: TuOrE1180

Program recommendations for the prevention of mother-to-child transmission of HIV: A practical guide for managers

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Issues: UNICEF and Population Council have published a practical guide for managers on scaling-up and improving programs for prevention of mother-to-child transmission (PMTCT) of HIV.

Description: The recommendations in the guide are based on successful strategies identified by program managers, an evaluation of pilot programs in eleven countries and an expert meeting held in September 2002. The guide is intended for use by national-level PMTCT teams and can be adapted for district and site managers.

Lessons Learned and Recommendations: The guide provides specific service delivery recommendations for program components introduced by the PMTCT program: 1) HIV counseling and testing are the entry points for PMTCT in antenatal clinics. Programs should start with community mobilization and education to introduce the concept that VCT is a routine part of ANC care. Clinics should routinely offer same day HIV testing to increase acceptance and ensure results are known. Emphasis should be on post-test counseling and providing support. VCT should also be offered during labor when feasible. 2) Short course zidovudine and single-dose nevirapine are currently recommended for ARV prophylaxis. Recommendations are made on how to improve counseling on and monitoring of adherence to ARVs. 3) PMTCT programs should put in place mechanisms for follow up and support infant feeding practices, breast health, good nutrition for all young children and mothers. 4) PMTCT programs should encourage male involvement in decision making and use the opportunity to target young men for HIV prevention awareness. Additionally, the guide addresses how PMTCT programs should employ three approaches—service integration and referral, linkages with other programs, and advocacy—to strengthen primary HIV prevention, antenatal care, family planning and care and support for HIV positive woman, partners and children to address PMTCT goals as well as critical issues for scaling-up programs.

MedGenMed. 2004 Jul 11;6(3):TuOrE1180 [eJIAS. 2004 Jul 11;1(1):TuOrE1180]

Abstract number: B11396

Understanding barriers to pMTCT in Tanzania: findings of a baseline survey

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Background: Tanzania has a population of 34.5 million people and it is estimated that national HIV seroprevalence is about 10%. One of the strategies adopted by the Tanzanian government to fight HIV/AIDS is prevention of mother to child transmission of HIV.

Methods: EngenderHealth conducted a baseline survey prior to implementing a pMTCT project in the Arumeru District in Tanzania. Quantitative data was collected on health infrastructure, staff training needs and service statistics in the MCH, maternity and laboratory units. Focus group discussions were held to understand pMTCT opportunities and barriers, community perceptions on HIV risk, barriers to HIV testing and disclosure, opportunities for partner counseling, breastfeeding practices, and the care and support services available in the community.

Results: The study findings showed that pregnant women on average attend ANC clinics four times during pregnancy. During ANC visits urine tests and blood tests for hemoglobin and syphilis are routinely conducted with universal acceptance among pregnant women. About half of the women who attend ANC services return to deliver at health facilities. Barriers to pMTCT services identified include: many service providers possess inadequate skills in core pMTCT interventions, HIV counseling and testing are not integrated into ANC services, and ARV drugs are not available in the health facilities surveyed.

Community members perceive HIV as a serious disease and that young people are at high risk for infection. Partner communication on issues around risk of HIV infection, testing and

disclosure is very low. Women report that any mother who does not breastfeed her child is discriminated against by the community and faces the threat of domestic violence.

Conclusions: Supply factors may pose the greatest challenge in improving access to quality PMTCT interventions in resource poor countries like Tanzania. In addition, program managers need full understanding of barriers in order to develop locally appropriate and effective strategies.

MedGenMed. 2004 Jul 11;6(3):B11396 [eJIAS. 2004 Jul 11;1(1):B11396]

Abstract number: ThPeE7994

Improving the coverage of a nevirapine-based PMTCT programme in South Africa

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Background: It is three years since the government of South Africa began implementing a PMTCT program. Over this period of time attempts have been made to scale up this program across all provinces. The objective of this study was to evaluate the performance and coverage of the PMTCT program in the nine provinces.

Methods: The study utilised a cross-sectional design. Data was collected at district, provincial and national levels. In each of the nine provinces one pilot site hospital and one feeder clinic were visited. Data collection methods included individual interviews, document review, participant observation and review of routine monthly PMTCT data.

Results: Out of 84406 pregnant women who received antenatal counselling, 46910 (56%) agreed to an HIV test and 39733 (85%) received their test results. 14340 (30%) of the women tested were HIV positive and of these 7853 (55%) were dispensed nevirapine. 7932 (99%) of the infants born to women identified as being HIV positive received their nevirapine dose. 58% (4196/7237) of HIV positive women expressed an intention to practice exclusive formula feeding, and 42% (3041/7237) intended to practice exclusive breastfeeding. The finding in most provinces is that formula feeding intention rates have decreased as the program has been scaled up.

Conclusions: The pilot sites have demonstrated that it is feasible to implement PMTCT in South Africa and remarkable progress has been made in scaling up this program under routine service conditions. However, the national averages for program uptake mask the large differences in performance between provinces. Provinces that performed well achieved this due to the necessary leadership, planning and resource allocation. Attention should focus on the obstacles to program uptake in the weaker provinces in order to achieve national coverage.
MedGenMed. 2004 Jul 11;6(3):ThPeE7994 [eJIAS. 2004 Jul 11;1(1):ThPeE7994]

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