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LITERATURE REVIEW ON PROGRAM STRATEGIES AND MODELS OF CONTINUITY OF HIV/MATERNAL, NEWBORN, AND CHILD HEALTH CARE FOR HIV-POSITIVE MOTHERS AND THEIR HIV-POSITIVE/-EXPOSED CHILDREN

AIDSTAR-One
AIDS SUPPORT AND TECHNICAL ASSISTANCE RESOURCES

FEBRUARY 2012

This publication was produced by the AIDS Support and Technical Assistance Resources (AIDSTAR-One) Project, Sector I, Task Order I, USAID Contract # GHH-I-00-07-00059-00, funded January 31, 2008.

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AIDS Support and Technical Assistance Resources, Sector I, Task Order 1 (AIDSTAR-One) is funded by the U.S. Agency for International Development under contract no. GHH-I-00-07-00059-00, funded January 31, 2008. AIDSTAR-One is implemented by John Snow, Inc., in collaboration with Broad Reach Healthcare, Encompass, LLC, International Center for Research on Women, MAP International, Mothers 2 Mothers, Social and Scientific Systems, Inc., University of Alabama at Birmingham, the White Ribbon Alliance for Safe Motherhood, and World Education. The project provides technical assistance services to the Office of HIV/AIDS and USG country teams in knowledge management, technical leadership, program sustainability, strategic planning, and program implementation support.

Recommended Citation

Sherr, Lorraine. 2012. *Literature Review on Program Strategies and Models of Continuity of HIV/Maternal, Newborn, and Child Health Care for HIV-Positive Mothers and Their HIV-Positive/-Exposed Children*. Arlington, VA: USAID's AIDS Support and Technical Assistance Resources, AIDSTAR-One, Task Order 1.

Acknowledgments

Thanks to the following research assistants: Natasha Croome, Katherine Parra-Castaneda, Ilana Sichel, and Dr. Claudine Clucas. Thanks also to Gretchen Bachman, Senior Technical Advisor, U.S. President's Emergency Plan for AIDS Relief Orphans and Vulnerable Children Technical Working Group Co-chair, Office of HIV/AIDS, U.S. Agency for International Development (USAID); and Ben Isquith, HIV/AIDS Program Advisor, Orphans and Vulnerable Children, Office of HIV/AIDS, USAID.

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ACRONYMS

| | |
|--------|---|
| ART | antiretroviral therapy |
| HAART | highly active antiretroviral therapy |
| MNCH | maternal, newborn, and child health |
| PEPFAR | U.S. President's Emergency Plan for AIDS Relief |
| PMTCT | prevention of mother-to-child transmission |
| PMTCT+ | PMTCT enhanced by integration with maternal treatment |
| STI | sexually transmitted infection |

EXECUTIVE SUMMARY

This literature review assesses the existing evidence base on integrated models for HIV-positive women and their HIV-positive/-exposed infants.¹ It focuses on health and social services necessary to provide comprehensive care for HIV-positive mothers and their HIV-positive/-exposed children over time. The review is organized around two sections:

1. A summary of previous systematic reviews on integrated care
2. The results of a literature review on integrated service provision.

The literature shows that different models of integration have been introduced, and it is very challenging to tease out which components of these models contribute to specific outcomes. Previous systematic reviews indicate that most integration research has not been designed in a rigorous manner. In particular, few of the existing studies look specifically at child outcomes. Most focus exclusively on maternal and/or adult service outcomes, which are then presumed to have implications for children—invariably related to vertical transmission and antiretroviral coverage, uptake, and adherence. In addition, many of these reviews confine themselves to service integration, with scant reference to or inclusion of community integration or social services.

This comprehensive literature search generated 112 studies for screening, 22 of which were eligible for abstraction. Seven are studies with strong empirical data from some form of controlled trial; another 15 describe integrated programs for which the evidence is weaker but still worth monitoring.

As with previous systematic reviews, this literature review focuses mainly on research on the prevention of mother-to-child transmission of HIV and treatment services. There appear to be few to no detailed studies on the integration of social services. This may be a result of the paucity of data on such services, the limited provision of such services, or the relative lack of evaluation studies covering such services that do exist.

Overall, the data show a mixed and rather complex picture. It is clear that integration is a broad and ill-defined concept, and the scarcity of high-quality studies limits the confidence with which any form of service provision can be recommended. More investigation and research are needed to determine the different modalities of integration, which approaches work, and in which contexts they work.

¹ The review was commissioned for the U.S. President's Emergency Plan for AIDS Relief Regional Consultation: Meeting the HIV, Maternal, Newborn, and Child Health, and Social Support Needs of Mothers and Their Young Children held in Addis Ababa, Ethiopia in 2011. The meeting presented a unique opportunity for U.S. Government staff and key partners from around Africa to share promising practices and approaches to promote south-to-south learning on the targeted integration of health and social support services for pregnant women, infants, and their mothers, and for preschool-aged children and their mothers.

INTRODUCTION

This publication was commissioned for the U.S. President’s Emergency Plan for AIDS Relief Regional Consultation: Meeting the HIV, Maternal, Newborn, and Child Health (MNCH), and Social Support Needs of Mothers and Their Young Children held in Addis Ababa, Ethiopia in 2011. The meeting presented a unique opportunity for U.S. Government staff and key partners from around Africa to share promising practices and approaches to promote south-to-south learning on the targeted integration of health and social support services for pregnant women, infants, and their mothers, and for preschool-aged children and their mothers. The focus was on programs that “go beyond” providing vertical services that address a single need toward combination services that meet the continuum of health and social service needs of clients, through both facility and community interventions (see Appendix 1 for the meeting agenda).

This review summarizes previous systematic reviews on integrated care and presents the results of a literature review on program strategies and models of continuity of HIV/MNCH care for HIV-positive mothers and their HIV-positive/-exposed children.

There have been many calls for HIV/MNCH service integration (Mwalali and Ngui 2009), for both services that link the health and social sectors and services that involve the community in service provision (Rosato et al. 2008). However, despite much discussion, there is limited evidence on the benefits of integration, or even a universal understanding of what it means to “integrate.”

Different organizations define integration differently. For example, consider the following definitions and considerations of integration from various organizations and papers, in which integration refers to:

Joining together different kinds of services or operational programs in order to maximize outcomes, e.g., by organizing referrals from one service to another or offering one-stop comprehensive and integrated services; in the context of HIV, integrated programs may include sexual and reproductive health, primary care, maternal and child health, as well as integration of HIV testing and counseling with the diagnosis, prophylaxis, and treatment of tuberculosis. (Joint UN Programme on HIV/AIDS 2011)

The organization, coordination, and management of multiple activities and resources to ensure the delivery of more efficient and coherent services in relation to cost, output, impact, and use (acceptability). (U.S. President’s Emergency Plan for AIDS Relief 2011)

The organization and management of health services so that people get the care they need, when they need it, in ways that are user friendly, achieve the desired results, and provide value for money. (World Health Organization 2008)

A variety of managerial or operational changes to health systems to bring together inputs, delivery, management, and organization of particular service functions. Integration aims to improve the service in relation to efficiency and quality, thereby maximizing use of resources and opportunities. (Briggs and Garner 2006)

While in some cases integration of various services is seen as advantageous and has been documented, the overall lack of integration has been noted as a barrier to effective delivery (Bhutta

et al. 2008), and descriptions from interventions in various countries reveal compartmentalized care and low levels of integration. Researchers have further noted that many services are fragmented, perhaps accounting for poor follow-up and suboptimal care, especially where stigma is associated with specific services (Greeff and Phetlhu 2007).

There may be many advantages to integrated health care provision, especially for maternal and child health (Leeper and Reddi 2010). Strategies that harmonize and integrate services, such as integration of HIV testing, can reduce funding competition and enhance efforts to strengthen infrastructure (Bolu et al. 2007). In many cases, the integration of services may very well be a necessity for maintaining the health of the HIV-positive mother and her HIV-positive/-exposed child. At the same time, it is not clear that integration is always beneficial or appropriate; some research suggests that integration has led to the dilution of expertise and thus a decline in the quality of care, reduced knowledge, and poorer attendance, with unclear longer-term ramifications (Dudley and Garner 2011).

A number of systematic reviews examine elements of integrated care generally and in relation to HIV specifically. Most recently, a review on integration from the U.S. Agency for International Development has helped to inform this discussion (Kennedy et al. 2011). The following section reviews previous systematic reviews in more detail.

PREVIOUS SYSTEMATIC REVIEWS

Some of the systematic reviews examining elements of integrated care generally and in relation to HIV specifically are reviewed below. Note that some of these reviews include the same studies in their assessments.

- *Strategies for Integrating Primary Health Services in Middle- and Low-Income Countries at the Point of Delivery* (Briggs and Garner 2006): This systematic review reports on five studies of different forms of integration. The objective of this review is to assess the effects of strategies to integrate primary health care services on producing a more coherent product and improving health care delivery and health status. Briggs and Garner examine the impact of adding an extra component to family planning services and compare both integrated services to specialized services and enhanced care packages to routine care. They describe four outcomes: health care delivery, service coherence, health care status for patients, and other outcomes. From these studies, they find that integration has a positive effect on referrals, while attendance and costs are similar. They find no differences in overall use (which was low), and knowledge is higher in the vertical (specialized) conditions. Health care delivery shows an advantage for the integrated provision. Two of the studies show improvement in child factors, with more comprehensive examination and better child outcomes in the integrated arms. The authors conclude that the results are mixed and the methodologies may affect intensity and type of provision, concluding that the evidence on integration is inconclusive.
- *Integrating Prevention of Mother-to-Child HIV Transmission (PMTCT) Programmes with Other Health Services for Preventing HIV Infection and Improving HIV Outcomes in Developing Countries* (Tudor Car et al. 2011): This review examines the effects of PMTCT integration on coverage and uptake. The authors were able to identify only a single study (Megazzini et al. 2010)² out of 28,654 potentially relevant references that met their inclusion criteria. This study reports on a cluster randomized controlled trial in Zambia with six clinics providing routine care and six providing integrated models. The findings show a 10 percent increase in antiretroviral therapy (ART) coverage in the integrated models. However, it may not be an ideal intervention because it fell short of targets as well as universal roll-out of treatment according to guidelines for both mother and baby (only 52 percent received the maternal and infant treatment). The authors caution that basing policy on a single study is problematic, and that, despite the fact that the gains are statistically significant, the absolute levels of treatment coverage are far from optimum.
- *The Impact of Prevention of Mother to Child Transmission (PMTCT) Programmes on Maternal Health Care in Resource-poor Settings: Looking Beyond the PMTCT Programme—A Systematic Review* (Both and van Roosmalen 2010): This review examines the impact of PMTCT programs on maternal health care and describes three different levels of verticality of provision: fully vertical, semi-vertical/-integrated, and fully integrated (horizontal). The authors screened 1,627 reports and generated

² Also included in this systematic review.

21 reports. They examined outcomes in terms of antenatal care, emergency obstetric care, treatment of sexually transmitted infections (STIs), postpartum care, family planning, skilled birth attendance, and anemia treatment. All of these outcomes cluster around maternal health rather than child health. A key finding is that 7 of 15 relevant studies report negative effects of PMTCT programs on antenatal care, including longer labor, extended waiting time, disruption of services, fear of stigma, and avoidance of antenatal care. However, 4 of 15 studies describe positive effects, such as improved confidentiality, communication, obstetric practices, medical supplies, and health promotion, as well as improved emergency obstetric care. Five of six publications looking at STI treatment find no effects. The two studies that examine postpartum care find no effect, and seven out of eight that examine family planning describe no effect, with the eighth reporting a positive effect. The authors conclude that PMTCT services have both positive and negative effects on maternal health care services, exacerbated by the semi-integrated nature of provision. Despite the scant evidence, the authors call for more full integration.

- *Strategies for Integrating Primary Health Services in Low- and Middle-Income Countries at the Point of Delivery* (Dudley and Garner 2011): This review assesses the effects of strategies to integrate primary health care services on health care delivery and health status in resource-poor countries (low and middle income), based on nine studies. This review differentiates the types of services integrated and shows that integration of HIV prevention and control at facility and community levels is a factor in efficacy. Four examine integration as opposed to single specialized services. The integration of STI services with family planning and maternal and child health appears to decrease utilization, knowledge, and satisfaction, and has little impact on health outcomes for mother or child. However, the integration of HIV prevention has some effect on STI treatment and incidence and HIV incidence. No effect on knowledge or risk is found. The authors conclude that add-on services have shown the most effective results in the short term. Complex integration has shown few if any effects on service or health outcomes, and the authors caution against policy advice in the absence of clear evidence that integration may not necessarily improve health outcomes.
- *Integration of Maternal, Neonatal and Child Health and Nutrition, Family Planning and HIV: Current Evidence and Practice from a Systematic Cochrane Review* (Kennedy et al. 2011): This review analyzes 19 published studies,³ evaluating the effectiveness of integrating HIV services with MNCH nutrition/family planning services. Overall, integration of the services is found to be effective; however, the methodological rigor of the studies is found to be poor, and significant evidence gaps remain.⁴ The studies cover seven forms of service examining four types of integration. The seven services are family planning, antenatal care, and post-abortion, childbirth, postnatal, child, and nutrition services. The integration issues covered are HIV counseling and testing; HIV prevention, care, and treatment; and psychosocial/other services.

The most common outcome measured is the uptake and use of contraception, which consistently improves in integrated services. Increases in ART initiation are shown in two studies, and an increase in HIV testing uptake is shown in four out of five studies. The three studies that examine changes in health outcomes, focusing on pregnancy and recovery from malnutrition, find positive improvements. Five out of seven studies show an improvement on

³ Three studies reviewed were the same as in this systematic review: Chabikuli et al. 2009, Killam et al. 2010, and Potter et al. 2008.

⁴ Note that this study scores methodology on a nine-point scale, awarding a point for meeting each of nine methodological criteria. However, it is unclear whether the criteria are equal (e.g., meeting 75 percent on follow-up may not be equal to a randomized controlled trial). Thus, it is statistically questionable, but is an indicator of rigor with a low average of 2.7 out of 9 with no randomized trials.

the quality of services. One study shows mixed effects, and the only negative outcome is that workload increased for staff in one clinic when the services were integrated.

Fourteen additional unpublished reports find that integrated services increased the number of HIV-exposed children receiving follow-up and care, and found a decrease in the time for ART initiation in pregnant women, a doubling of the number of women initiated to ART, an increase in use of services among postpartum women and their infants, improvements in quality of care, and improvements in awareness of HIV risks, HIV testing history, and HIV testing referrals.

Factors that promote effective integration, within the studies and reports, include staff personality and experience, stakeholder interest, substantial training and investment, transferable skills, simple and inexpensive integration, integrated electronic patient notes across services, male partner involvement, client avoidance of inconvenient or highly crowded ART clinics, and community involvement. Inhibiting factors for effective integration are limited financial resources, perception of HIV-positive women that staff are not supportive of their pregnancies, confidentiality fears of the clients, male partner permission for women to attend services, low level of HIV risk among family planning clients, high staff turnover, staff unwillingness to engage in discussions about sexuality with clients, extra responsibility seen as additional work, late presentation of care, and additional waiting times and costs for contraceptives.

METHODOLOGY

SYSTEMATIC REVIEW

The previous reviews reveal a mixed picture, highlighting severe impediments as a result of the paucity of studies. Building on these earlier efforts, this broad and updated systematic review aims to provide an overview of existing evidence, describe studies on integration with various forms of integration, and explore outcomes generally with a specific focus on child outcomes.

SEARCH STRATEGY

The authors sought studies describing the results of integration of services in the arena of HIV and PMTCT, specifically in relation to MNCH, through computerized searches of two major electronic databases: MEDLINE and PsycINFO (including the Cochrane database). These two sources were used because, given the restricted timeline for this search, they provide the widest coverage.

KEY TERMS

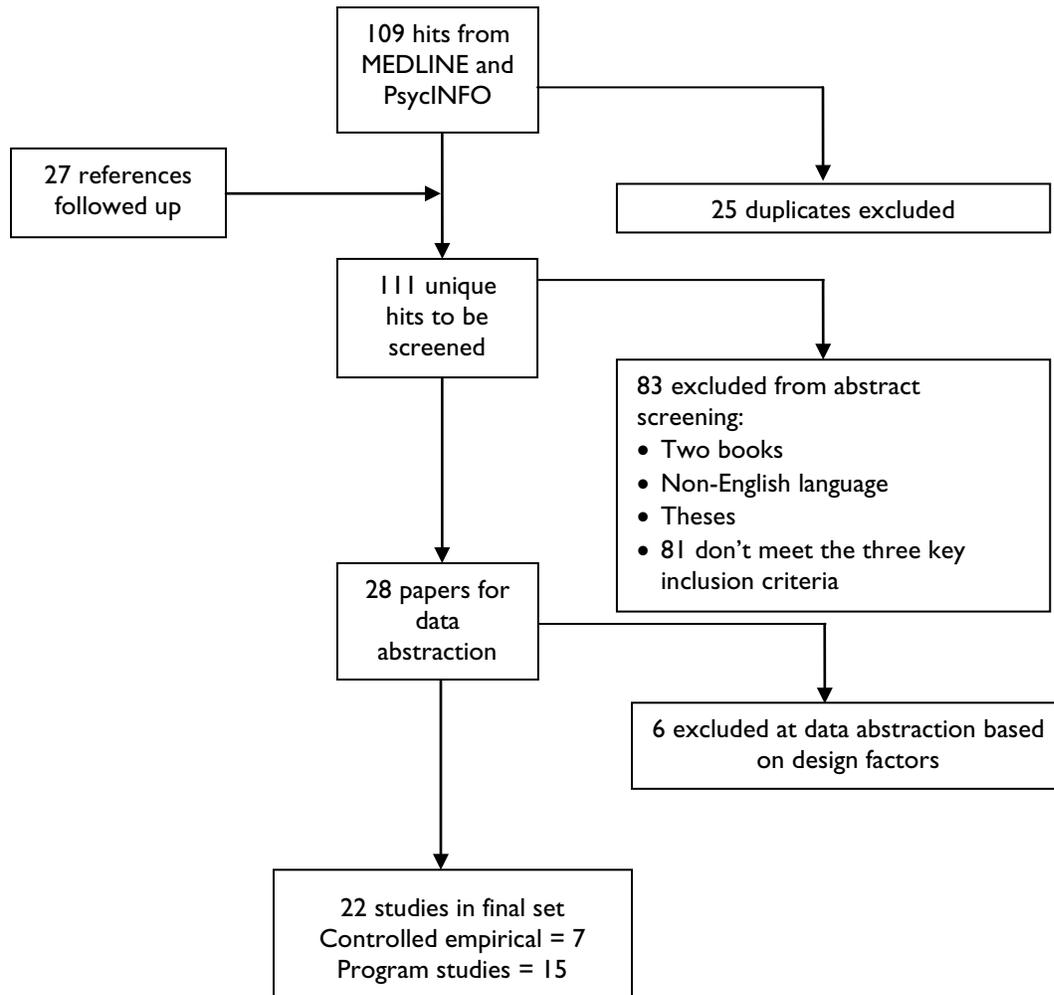
Key terms for the search included HIV, PMTCT, and any references to integrated services with the *integrat** search term. A variety of other search terms were used to seek out relevant studies, and references were followed up and added into the screening cluster from studies that were directly in the search area and from the systematic reviews outlined previously. Other terms used to seek out integrated services included “retention in care,” “continuity of care,” “service models,” and “maternal health,” or “neonatal health,” or “child health.” Table 1 shows hits generated by the three key terms for the two databases. The three terms were then combined to generate overlap papers.

Table 1. Hits generated by key terms

| Term | Hits in MEDLINE | Hits in PsycINFO |
|------------------|------------------------|-------------------------|
| <i>HIV</i> | 225,787 | 28,460 |
| <i>PMTCT</i> | 395 | 89 |
| <i>Integrat*</i> | 225,158 | 126,271 |

Figure 1 sets out the search strategy and final selection of included studies for this report.

Figure 1. Search strategy for inclusion in paper



STUDY INCLUSION CRITERIA

The authors included studies if they have adequate design, provide quantitative data, include some form of integration, and report on a direct or indirect child and mother outcome. Indirect child outcomes were considered, including maternal factors that could influence child infection.

Tudor Car et al. (2011) addressed the question of study design, including such factors as randomized controlled trials, cluster-randomized controlled trials, controlled clinical trials, controlled before and after studies, and interrupted time series studies comparing integrated PMTCT interventions to non-integrated or partially integrated care for pregnant women, mothers, and infants. These criteria were used to inform the selection and adequacy criteria in this review. Two tiers of inclusion capture a wider literature on integration to inform policy. All quantitative studies with child outcomes that do not benefit from the rigor of randomized controlled trials, controlled clinical trials, controlled before and after studies, or interrupted time series studies, but that did collect systematic data or provide descriptions appear within the second tier.

DATA ABSTRACTION

The research team created a data abstraction sheet. Three researchers carried out data abstraction, with confirmation of selection and abstraction by a fourth researcher to ensure validity and agreement. Data abstracted from each study include publication details (author, title, status, year), location of study, study design, duration and completeness of follow-up, participant information, interventions examined, a coding of partial or full integration, details of comparisons performed, and details of child outcomes, maternal outcomes, and other outcomes. Finally, notes on findings rank quality of evidence to feed into the tiered system (strong versus weak, based on design factors).

RESULTS

The various searches generated 112 studies for screening. After exclusions, 22 studies were eligible for abstraction. These include seven studies with empirical data from some form of controlled trial (“Group 1” studies) and a further 15 studies (“Group 2” studies) that describe integrated programs and are deemed worthy of inclusion for monitoring purposes, although below the standard of inclusion according to design methodology quality criteria. The 22 studies are summarized in Table 2.

GROUP 1 STUDIES

Among the seven Group 1 studies are a number of effects in relation to integration, while for other variables there are no differences. The majority of studies concentrate on adult outcomes, with only two giving clear infant/child outcomes. There is also a gap on effects on older children. As noted in the other systematic reviews, the number of studies with solid and reliable designs are few, and thus the database and evidence base are somewhat limited—although some studies are under way that may provide more evidence in due course (Rotheram-Borus et al. 2011).

In brief, Megazzini et al. (2010) in Zambia show that an integrated approach results in increased nevirapine coverage in five of six clinics and increased adherence. In Sub-Saharan Africa, Palombi et al. (2007) note a high retention rate and the likelihood that nutrition provision enhances such retention. They note reduced malnutrition and gastrointestinal problems, which are probably attributable to water filter provision rather than the integration of services. In South Africa, Futterman et al. (2010) examines integration of trained community providers rather than health care integration and finds higher rates of clinic visits, better social support access, and reduced depression scores. There are no differences in PMTCT-related actions or HIV transmission risk behaviors. Key outcomes such as antiretroviral use, infant testing, and HIV avoidance feeding were high in both groups. In Nigeria, Chabikuli et al. (2009) note significant improvements in family planning attendance and contraceptive uptake. This is the only study to report on male involvement and to find improvement associated with integration. Killam et al. (2010) in Zambia find that integration is associated with a doubling of ART uptake. In Kenya, van’t Hoog et al. (2005) compare before and after integration and records increased counseling, increased HIV test acceptance, increased identification of HIV for the mother, and increased uptake of nevirapine over time. However, design limitations in such a study need to be considered because roll-out of treatment co-occurs. Simba et al. (2008) in Tanzania examine the effects of integration on workload and indicates that PMTCT could be scaled up and integrated within reproductive and child health services using existing staff.

GROUP 2 STUDIES

The authors also reviewed 15 Group 2 studies, which provide a much more descriptive level of information. These are summarized subsequently, but results should be treated with caution and as generally indicative rather than definitive given the methodological limitations.

In brief, Braun et al. (2011) in Malawi show inadequate integration and point to the need for high-quality integration if it is to be effective. Nyandiko et al. (2010) in Kenya point out that adults are prioritized for care if the child is well or asymptomatic, which could lead to neglect of the sick child. This study also notes the very high loss to follow-up, whichever service is provided. Ginsburg et al. (2007) provide a review of 18 low-income countries providing in-depth guidance on how to enhance effective integration with such improvements as training of a key obstetrician, emphasizing that infrastructure needs are paramount in integration strategies. This study points out that even when infants return (for immunization in this instance), they are often not identified as HIV-exposed, with the concomitant loss to follow-up of HIV-exposed babies, even in integrated provision. Mazia et al. (2009) in Swaziland describe how a comprehensive care package incorporating health and counseling services is associated with an increase in cotrimoxazole uptake and enhancement of postnatal visits. Welty et al. (2005) in Cameroon reiterate the high level of need and confirm the importance of male attendance in antenatal clinic visits and male involvement in helping the mother with decision making. A number of other topics are covered in the descriptive studies, including the importance of hospital integration, the provider experience, and the different models of integration into different health settings (such as immunization clinics, drug and alcohol clinics, and maternal and child health clinics). Potter et al. (2008) report that integration supports STI screening in Zambia. However, also in Zambia, Chi et al. (2007) caution that there is high attrition along the cascade of visits and that many women eligible for treatment do not receive it due to the high dropout rate.

Table 2. Summary of Findings

| Study | Geographical Region | Integration Description | Effects | | Other Conclusions |
|---|---------------------|--|--|---|---------------------------------|
| | | | Child | Mother | |
| Group 1 Studies (Controlled Empirical Studies) | | | | | |
| 1. Chabikuli et al. 2009 | Nigeria | PMTCT, family planning, HIV clinic. Pre-and post-retrospective review. | | Significant improvements in family planning attendance and uptake of contraceptives attributed to integration. Improved male participation. | |
| 2. Futterman et al. 2010 | South Africa | PMTCT plus cognitive behavioral intervention (eight sessions) plus mentor mother (HIV-positive, recently delivered, coping positively, trained). Comparison group gets routine care. | Higher rate of clinic visits for intervention. | No statistically significant differences between groups in PMTCT-related actions or other transmission risk behaviors. Antiretroviral use, testing the baby, and exclusive infant feeding are high in both groups. Well-being improved. Better informed on HIV, social support access, healthy living, and self-care. | |
| 3. Killam et al. 2010 | Zambia | Stepped wedge design comparing antiretroviral therapy (ART) referral and antenatal care integrated service for ART provision to HIV-positive mothers. | | 1,566 patients eligible for ART. More enrolled while pregnant and within 60 days of HIV diagnosis in intervention cohort (376/846, 44.4%) vs. control (181/ 716, 25.3%), adjusted odds ratio 2.06, 95% confidence interval (1.27–3.34); and more initiated ART while pregnant in intervention (278/846, 32.9%) vs. control (103/716, 14.4%), adjusted odds ratio 2.01, 95% confidence interval (1.37–2.95). | Integration doubled ART uptake. |
| 4. Megazzini et al. 2010 | Zambia | Prevention of mother-to-child transmission (PMTCT) plus HIV testing, treatment, and adherence. Cluster randomized controlled trial of 12 labor wards. | | Increased nevirapine coverage in five of six clinics. Adherence increased nevirapine coverage. | |

| Study | Geographical Region | Integration Description | Effects | | Other Conclusions |
|---------------------------|----------------------------|--|---|--|--|
| | | | Child | Mother | |
| 5. Palombi et al. 2007 | Sub-Saharan Africa (DREAM) | DREAM package. ⁵ Comparing DREAM plus water filters and formula with DREAM plus highly active antiretroviral therapy (HAART) plus breastfeeding option. | Reduced gastrointestinal problems with water filters, lower rates of anemia and malnutrition. | 80% retention. Nutrition provision enhances retention. | Gathering support for combination services. |
| 6. Simba et al. 2008 | Tanzania | Study of impact of integration of PMTCT with reproductive and child health on workload in cross-sectional study of over 50 facilities. | | | Services for PMTCT can be scaled up and integrated into reproductive and child health services using existing staff. |
| 7. van't Hoog et al. 2005 | Kenya (Kisumu) | Two time periods of evaluation, before integration and after integration. N = 8,231 (4,012 pre- and 4,089 post-introduction service). | Nevirapine uptake was higher in the second period: 70% compared with 57% in the first period ($p < 0.001$). | Significantly increased pre-test counseling, acceptance of test, pick-up of HIV-positive patients. | |

⁵ DREAM package = education and social support; voluntary counseling and testing; highly active antiretroviral therapy since late February 2002; treatment of opportunistic infections, sexually transmitted infections, and malaria; nutritional evaluation and supplementation; laboratory diagnostic support, including measures of viral load and CD4 cell subsets; mother-and-child HIV prevention and care; home care; information technology and data management; and operational research.

| Study | Geographical Region | Integration Description | Effects | Other Conclusions |
|--|----------------------------|--|---|--|
| Group 2 Studies (Descriptive Studies of Services) | | | | |
| 1. Braun et al. 2011 | Malawi | PMTCT, early infant diagnosis, and pediatric ART services. | Only 29% of HIV-positive children enrolled in services. High mortality. | Inadequate integration. |
| 2. Cervantes et al. 2003 | United States | Women who use drugs/Hispanic, three-phase multicomponent program. | | Drug use, alcohol, risk behavior, and mental health benefits. |
| 3. Chi et al. 2007 | Zambia | Descriptive study of 680 pregnant women examining simple integration of antenatal and ART services. | | High attrition along the cascade of visits. One-third of women failed to follow up, of whom 43% eligible for treatment. |
| 4. Chinkonde et al. 2010 | Malawi | PMTCT plus voluntary counseling and testing with some pediatric referral for HIV-positive children. Qualitative interviews with providers. | | Weak evidence. |
| 5. de Koning et al. 2005 | Kenya | Descriptive account of providers' views of integration of HIV-related care in the maternal and child health setting. | | Low quality. |
| 6. Evjen-Olsen, Olsen, and Kvåle 2009 | Tanzania | Program integration description looking at integrated service provision. | | Asserts that hospital-based program with a vision of integrated health care may contribute to the lower figures on mortality found in the area (no data could be found). |

| Study | Geographical Region | Integration Description | Effects | | Other Conclusions |
|-------------------------|-----------------------------------|--|---|---|---|
| 7. Ginsburg et al. 2007 | 18 low-income countries (review). | PMTCT services are integrated into maternal and child health services, but adult and pediatric care and treatment programs often function independently, without coordination or linkages. | Infants return for immunizations but are not identified as HIV-exposed unless mother brings for antenatal care or is specifically asked. Loss to follow-up of HIV-exposed babies is common. | Significant loss to follow-up. | Training of a key obstetrician in care and treatment, including staging and HAART, is instrumental in integrating care into maternal and child health services. Training of other physicians means more treatment is provided. Increased infrastructure to provide comprehensive HIV care to improve postnatal follow-up of both HIV-infected mothers and their infants facilitated the linking of mother to child and integration. |
| 8. Mazia et al. 2009 | Swaziland | Seven sites, quasi-experimental pre- and post-test. Aspects of antenatal care, labor and delivery, family planning, PMTCT, and HIV care and treatment are included as well as postnatal care and women's health. | Significant increase in the proportion of HIV-positive mothers and their exposed infants who had started cotrimoxazole prophylaxis as recommended. | 20-fold increase in postnatal visits within three days. Significant increase in observed breastfeeding before discharge (from 28% to 80%). Infant feeding advice 35% to 63%. Increase in HIV testing for postpartum mothers and their partners. | |
| 9. Nyandiko et al. 2010 | Kenya | PMTCT, ART treatment, and feeding counseling. Mother/child visits not combined. | Benefits of treatment. High loss to follow-up, <50% infant testing. | | Inadequate integration. Child visits prioritized over adult visits for immunization. Adult health care prioritized if child asymptomatic—neglect of child needs if not ill. |
| 10. Otieno et al. 2010 | Kenya | Descriptive account of benefits of integrating HIV into maternal and child health clinic. | | | Removes stigma and enhances attendance. |

| Study | Geographical Region | Integration Description | Effects | | Other Conclusions |
|-----------------------------|---|--|--|---|--|
| 11. Potter et al. 2008 | Zambia | Pre- and post-retrospective account of integration of sexually transmitted infection screening in PMTCT provision (syphilis screening). There were 5,801 first visits to 22 antenatal clinics from 1997 to 2004 in Lusaka. | | | Integration of PMTCT and sexually transmitted infection services improved rapid plasma reagin (RPR) test screening. |
| 12. Rollins et al. 2007 | South Africa | Integration of HIV into immunization clinics. | Over 7% of 6-week-old infants attending immunization and 20% born to mothers with HIV are infected with HIV. | | Integration of HIV into immunization clinics enhances pick-up of positive infants and therefore early treatment provision. |
| 13. Rutenberg and Baek 2005 | 10 countries in Africa, Asia, and Latin America | Qualitative interviews. | | | Weak evidence. |
| 14. Torpey et al. 2010 | Zambia | 38 sites—baseline and follow-up data 2005 to 2008. PMTCT expanded into existing maternal and child health structures. | | Increased inflow into the cascade, enhanced uptake of testing, collection of results, and utilization of interventions. | |
| 15. Welty et al. 2005 | Cameroon | Pre- and post-study. PMTCT, nevirapine, and counseling. | | High-level need. | Male involvement suggested. |

DISCUSSION

The data reviewed here show a mixed and rather complex picture. Integration is clearly a broad and ill-defined concept. Integration is not always beneficial or appropriate (Dudley and Garner 2011), and there are arguments for and against integration in the general literature. The paucity of studies of high quality, specifically controlling for integration and gathering child outcomes, limits the confidence with which any form of integration can be recommended.

In the literature reviewed, different models of integration are introduced, and it is challenging to tease out which individual component contributes to specific outcomes. A variety of different models are in use: where HIV services are integrated with pregnancy care, where STI or voluntary counseling and testing services are integrated with PMTCT, or where PMTCT is enhanced by integration with maternal treatment (PMTCT+), with maternal and child health, or with child and reproductive health or specific provisions such as immunization. The benefits are seen in terms of uptake and reach, yet the studies clearly show that uptake and reach are not optimal, and there is no evidence that integration fully addresses all service issues. In some cases, integration may dilute expertise, stretch staff, and result overall in a diminished standard of care. One study in South Africa shows that despite high coverage of PMTCT interventions, there was low follow-up of both mothers and their babies, with poor integration of PMTCT into routine care, confounded by unclear roles and inadequate record keeping, which further limit integration and access (Horwood et al. 2010).

The situation remains complicated. Specialization occurs when there is a need for high concentration of expertise, and this probably accounts for the evolution of vertical programs, such as those that focus on HIV. Integration may dilute such expertise, and the cost-benefit balance of specialization and integration must be clearly weighed. This is particularly true in resource-constrained environments where there may be a limit on both personnel and facilities.

While this review aims at covering a range of health and social services necessary to provide comprehensive care for HIV-positive and -exposed mothers and children, the reality is that the existing literature relies on a heavy focus on PMTCT and treatment. The search did not provide detailed studies on the wide range of alternative provision and services that could fall under the integration umbrella, such as social services and social welfare provision. This may be as a result of the paucity of data on such services, the infrequent provision of such services, or the relative lack of evaluation studies covering such services when they do exist.

No single study provides comprehensive long-term outcome data looking at children from conception to school age. Of the studies identified, most concentrate on adult outcomes, with few integrating a comprehensive array of child outcomes. Those that are represented include a narrow viewpoint that concentrates on treatment uptake, feeding variables, immunization, infant health conditions, and infant HIV status. Study outcomes rarely include consumer views or appraisal, so there is little input from parents (Levy 2009). Within this review, no representations of child perspectives are operationalized, included, or reported.

The literature also suggests that males/fathers are rarely included or studied. Male involvement has shown to be important in helping women with decision making. For example, males attending HIV

services have shown themselves to be more approachable for family planning services; thus, by integrating HIV and family planning services, males can become more involved in family planning (Mahy et al. 2010), which is especially important with new data emerging on the importance of family planning counseling.

There are also cases where the integration of various services and provisions is seen as advantageous. The studies suggest integration has the potential of extending the reach of HIV counseling and testing and thereby identifying those eligible for treatment and care. There are also some consistent benefits of integration listed in the studies that relate to such variables as reduced stigma, which is a huge barrier to care. For example, HIV testing may be perceived as stigmatizing, and thus integration of HIV testing with a routine test offered in a variety of services may obviate or reduce the stigma. Integration may offer the opportunity to enhance quality of care by incorporating psychological and social welfare provision into more holistic systems.

The literature also reveals documented cases of integration that have had positive outcomes. For example, integration of nutrition has been shown to aid HIV treatment programs (Scarcella et al. 2011). Integration of HIV testing in pregnancy into routine prenatal care has been seen to increase uptake, reduce stigma, and normalize HIV testing for all pregnant women (Conaty et al. 2005; Hudson and Sherr 1997; Postma et al. 1999; Sherr et al. 2006; Tookey et al. 1998). The PMTCT+ programs (Colton 2005) serve as examples of integrated approaches that aim care at both the mother for her own health, as well as prevention of infection to the baby (World Health Organization 2003). Integration of HIV services into a wide range of specialties has also been shown to increase identification of co-infections, enhancement of follow-up and attendance, and overall improved physical and mental health outcomes. For example, a recent study examining the efficacy of integrating PMTCT services with tuberculosis (Gounder et al. 2011) reports high tuberculosis identification with a straightforward integrated program.

The literature does note that results seem to differ according to which service is being integrated. There also seems to be a difference between the integration of biomedical services into different biomedical areas (such as introducing HIV testing into a range of services) and the integration of biomedical services into non-biomedical areas. For example, studies seem to indicate that offering HIV testing and counseling at multiple venues enhances reach, the ability to identify HIV infection in the first place, and the opportunity to treat and prevent onward transmission. However, the integration of services such as psychosocial support appears to be qualitatively different as a form of provision. In early studies, the lack of acknowledgment or provision on psychosocial dimensions may have contributed to low engagement, poor adherence, and low emotional support. Integration with psychosocial services can be seen as an important area for service expansion and may enhance the quality of provision and thus the engagement.

It may be that the infrastructure for integration is as important as the infrastructure for vertical provision, and the quality of the provision is a key determinant. In resource- and personnel-constrained environments, integration may be considered more as a solution for cost-efficacy demands rather than specific outcome-driven demands. Integration may also be regarded as a strategy that is vulnerable to waste or duplication, but addressing those concerns may come at the price of specialization.

CONCLUSION

Overall, the literature on integration is sparse and inadequate. There are some advantages to integration, but there are also disadvantages, as well as some variables that show no effect. Contexts differ enormously, and variables such as health care personnel availability, skill levels, and provision facilities factor into efficacy.

There are perhaps many missed opportunities. For example, a number of studies looking at the impact of PMTCT programs on maternal health care conclude that PMTCT programs “miss the opportunity” to enhance maternal health because they are too vertical and lack integration. For children, the current Joint UN Programme on HIV/AIDS target aiming for virtual elimination of vertical transmission is achievable, but only if changes in the delivery mechanism are made. A simple biomedical approach will not be effective in reaching this target (Gounder et al. 2011). The World Health Organization has suggested that one possibility would be to explore a more integrated service approach. A recent modeling exercise exploring a series of scenarios finds that to address virtual elimination of new child infections, wider coverage, efficacious regimes, safer infant feeding, and comprehensive integrated approaches are needed, including family planning and wider conceptual thinking and service delivery (Mahy et al. 2010). There has also been a solid call for integration and family approaches to HIV that would benefit children (Joint Learning Initiative on Children and HIV/AIDS 2009), and the challenge now is to gather well-validated models that explore enhancement of PMTCT services to good effect, especially in terms of parental and infant outcomes.

In conclusion, debates about specialization versus integration continue in many situations and environments (Frenk 2009). More investigation and research are needed to determine the different modalities of integration, which approaches work, and in which contexts they work.

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APPENDIX I: AGENDA

PEPFAR REGIONAL CONSULTATION: MEETING THE HIV, MNCH, AND SOCIAL SUPPORT NEEDS OF MOTHERS AND THEIR YOUNG CHILDREN

NOVEMBER 8-10, 2011, ADDIS ABABA, ETHIOPIA

MEETING OBJECTIVES

- Create a common understanding of the service needs for a continuum of HIV, MNCH, and social support services from pregnancy through primary school for mothers living with HIV and their children.
- Provide a forum for country programs to share promising practices that address challenges in designing, implementing, monitoring, and evaluating integrated services for these target populations.
- Identify 1-2 potential next steps for country programs to improve the quality of existing integrated services; these next steps may include proposals for implementation, further evaluation, south-to-south/cross-learning technical assistance, or other next steps not yet identified.
- Explore methods of routine monitoring of integration and methods for evaluating these efforts.

DAY BEFORE THE MEETING STARTS

5:00-7:00 pm **Early Meeting Registration**
Sign in early and pick up your name badge and meeting materials to review.

DAY I

7:30-8:25 am **Meeting Registration**
Pick up your name badge, meeting materials, and goodies at the registration table.

8:30-8:50 am **Welcome and Comments**
Welcome: Caroline Ryan (OGAC)
Master of Ceremonies: Andrew Fullem (AIDSTAR-One)
Brief Comments: Mary Catherine Phee (DCM, U.S. Embassy)
Opening Comments: Neghist Tesfaye, State Minister of Health

8:50-9:05 am **Meeting Overview**
Master of Ceremonies: Andrew Fullem (AIDSTAR-One)

9:05-10:05 am **U.S. Government Perspective: A Continuum of Response**

(30 minutes presentations, 30 minutes Q&A)

Moderator: Jeanne Rideout (USAID/Ethiopia)

Presenters: Caroline Ryan (OGAC) and Milly Kayongo (USAID)

Introductory remarks by OGAC/PEPFAR-HQ staff as to why this issue is important and how PEPFAR is conceptualizing the issue followed by Q&A.

10:05-10:35 am

Morning Break

10:35-11:45 am

An Integrated Care Pathway for Mothers and Their Young Children

(40 minutes presentations, 30 minutes Q&A)

Moderator: Carmela Green-Abate (PEPFAR/GHI Coordinator, Ethiopia)

Presenters: Hiwot Mama and Gretchen Bachman (USAID)

Hiwot Mama, a client of one program in Ethiopia, will give a brief overview (approximately 10 minutes) illustrating the client experience, highlighting why integrated services help support clients along a pathway to better health. This will be followed by a presentation of the pathway, which highlights the clinical and social services that may be needed from pregnancy through the beginning of primary school for mothers living with HIV and their young children.

11:45 am-12:45 pm

WHO Guidelines Revisions: Capitalizing on Opportunity

(30 minutes presentations, 30 minutes Q&A)

Moderator: Dr. Abubakar (CDC/Ethiopia)

Presenter: Nigel Rollins (Scientist, Department of Maternal, Newborn, Child and Adolescent Health, WHO and Professor in Maternal and Child Health at the University of KwaZulu-Natal, South Africa [Honorary])

A presentation on implementing WHO guidelines within diverse health systems and available resources. The presentation will consider how integrated service delivery approaches and targeted linkages might leverage improvements in health outcomes beyond HIV, and how these might be achieved. Examples from national, facility, and community will be shared.

12:45-1:45 pm

Lunch

1:45-2:45 pm

Services for Pregnant Women through Labor and Delivery

(30 minutes presentations, 30 minutes Q&A)

Moderator: Andrew Abutu (CDC)

The first presentation will be from a technical working group member and present the bundle of HIV, MNCH, and social services needed for this population. Additional presentations will highlight specific programs.

Presentations Technical Content Overview: Milly Kayongo (USAID)

1. Mentor Mothers: The m2m Approach. Presenter: Dorothy Chikampa (Zambia)

2. Male Involvement in PMTCT Using a Quality Improvement Approach.
Presenter: Gebremedhin Derebe (Ethiopia)
3. Integration of ART in Primary Health Units Targeting Pregnant Women.
Presenter: Thembie Masuku (Swaziland)

2:45-4:00 pm

Small Group Work

Participants will break up into small groups. Participants will sign up for groups prior to arrival, at registration, or during the morning. Country teams are strongly encouraged to make sure they have representation in each group. Group work categories outlined below with 2-3 common questions under each heading to be provided to guide group work:

- Group A: Human resources for health, including training, supervision, task shifting, and program administration and management. Moderators: Ben Isquith (USAID) and Milly Kayongo (USAID)
- Group B: Monitoring and evaluation. Moderators: Rachel Blacher (CDC) and Sisay Alemayehu (CDC/Ethiopia)
- Group C: Linking clients to health and social services and rapidly identifying people who drop out of services. Moderators: Andrew Abutu (CDC) and Marcy Levy (AIDSTAR-One)
- Group D: Policy. Moderators: Ugo Amanyeibe (USAID) and Andrew Fullem (AIDSTAR-One)
- Group E: Country ownership and sustainability through capacity development: institutionalization, comprehensive planning, systems strengthening. Moderators: Marta Levitt-Dayal (USAID) and Gretchen Bachman (USAID)

4:00-4:30 pm

Tea Break and Gallery Walk

Opportunity to get coffee/ tea and snacks and walk through the results of the small group work.

4:30-5:30 pm

Country Team Work

This is an opportunity for the country teams to come together and share information gathered during the day regarding services for pregnant women living with HIV. Based on country context and the information presented during the day, teams will identify action items that can be undertaken to improve access to and utilization of services along an integrated pathway. Teams will be provided with tools to identify actions that can be implemented in the next six months, six months to a year, and a year to two years. Country teams will identify major activities, stakeholders that need to be involved, and any technical assistance needs that have to be addressed in order to achieve results. Teams will build on this work each day and make a presentation to the entire team at the end of day three.

DAY 2

8:30-8:45 am

Preparing for Today

Master of Ceremonies: Andrew Fullem (AIDSTAR-One)

Review highlights from the previous day and review the agenda for the day.

8:45-9:30 am

Meeting the Full Needs of Mothers and Their Young Children Through Clinic and Community Interventions

(25 minutes presentations, 20 minutes Q&A)

Moderator: Gretchen Bachman (USAID)

Presenter: Linda Richter (Human Sciences Research Council)

Linda Richter will talk about the importance of meeting the full needs (social and medical) of mothers and their young children through both clinic and community interventions.

9:30-11:30 am

HIV Health and Social Care: Integration Models

Moderator: Marta Levitt-Dayal (USAID)

Presentations and Q&A: Based on surveys with U.S. Government teams, there are specific areas of interest regarding integrating social services for pregnant mothers, new mothers, and their children. These include integration of services for orphans and vulnerable children into facility programs, and the integration of nutrition into facility and community programs that target mothers living with HIV and their young children.

Presentations:

1. Infant Feeding Buddies: A Promising Practice on Supporting Mothers for Optimal Infant and Young Child Feeding. Presenter: Nobanzi Dana (South Africa)
2. The Mother Support Program. Presenter: Daniel Kinde (Ethiopia)
3. Integrated Nigeria Orphans and Vulnerable Children Presentations. Presenter: Philomena Irene (Nigeria)
4. Pediatric Outreach HIV Counseling and Testing to Improve Pediatric ART Enrollment. Presenter: Solomon Tessama (Ethiopia)
5. Using the Champion Community Approach to Improve Early Infant Diagnosis in the Democratic Republic of the Congo. Presenter: Mitterand Katabuka (DRC)

11:30 am-12:30 pm

Open Spaces

A time for spontaneous networking, meeting with your colleagues over topics of common interest. There will be some pre-reserved topic tables, and many open ones. Please don't miss this chance for productive discussion!

12:30-1:30 pm

Lunch

1:30-2:30 pm

Services for Mothers and Children (0-24 months)

Moderator: Pam Ching (CDC)

The first presentation will be from a Technical Working Group member and present the bundle of HIV, MNCH, and social services needed for this population. Additional presentations will highlight specific programs.

Presentations Technical Content Overview: Andrew Abutu (CDC)

Group 1 (Moderator: Pam Ching)

1. Provision of ART in Integrated MNCH and a Model Approach to Following Mother Infant Pairs. Presenter: Kebby Musokotwane (Zambia)
2. Integrating Family Planning within HIV/AIDS Prevention and Care Services. Presenter: Mengistu Asnake (Ethiopia)

Group 2 (Moderator: Andrew Abutu)

3. Targeting Inadequate Postnatal Infant and Young Child Nutrition, Follow-up, and Referral of PMTCT Mothers and Their Exposed Children. Presenter: Ochi Ibe (Namibia)
4. Back-up Support of Integrated PMTCT/MNCH Service at Health Post Level. Presenter: Alemayehu Ayalew (Ethiopia)

2:30-3:45 pm

Small Group Work

Participants will break up into small groups. Participants will sign up for groups prior to arrival, at registration, or during the morning. Country teams are strongly encouraged to make sure they have representation in each group. Group work categories outlined below with 2-3 common questions under each heading to be provided to guide group work:

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- Group B: Monitoring and evaluation. Moderators: Rachel Blacher (CDC) and Sisay Alemayehu (CDC/Ethiopia)
- Group C: Linking clients to health and social services and rapidly identifying people who drop out of services. Moderators: Andrew Abutu (CDC) and Marcy Levy (AIDSTAR-One)
- Group D: Policy. Moderators: Ugo Amanyeive (USAID) and Andrew Fullem (AIDSTAR-One)
- Group E: Country ownership and sustainability through capacity development: institutionalization, comprehensive planning, systems strengthening. Moderators: Marta Levitt-Dayal (USAID) and Gretchen Bachman (USAID)

3:45-4:15 pm

Afternoon Coffee and Tea Break/Gallery Walk

Opportunity to get coffee/tea and snacks and walk through the results of the small group work.

4:15-5:15 pm

Country Team Work

As on Day 1, this is an opportunity for the country teams to come together to share information gathered during the day regarding services for mothers living with HIV and their HIV-exposed and/or HIV-positive children, ages 0-24 months. Based on country context and the information presented during the day, teams will identify action items that can be undertaken to improve access to and utilization of services along an integrated pathway. Teams will be provided with tools to identify actions that can be implemented in the next six months, six months to a year, and a year to two years. Country teams will identify major activities, stakeholders that need to be involved, and any technical assistance needs that have to be addressed in order to achieve results. Teams will build on this work each day and make a presentation to the entire team at the end of day three.

6:30-8:30 pm

Evening Reception

DAY 3

8:30-8:45 am

Welcome to Last Day

Master of Ceremonies: Andrew Fullem (AIDSTAR-One)

Review highlights from the previous day and review the agenda for the day.

8:45-9:45 am

Services for Mothers and Children (25 Months to Start of Primary School)

Moderator: Ryan Phelps (USAID)

The first presentation will be from a Technical Working Group member and present the bundle of HIV, MNCH, and social services needed for this population. Additional presentations will highlight specific programs.

Presentations Technical Content Overview: Anita Sampson (USAID/South Africa)

Group 1 (Moderator: Ryan Phelps)

1. KidzAlive: Psychosocial Care for HIV Infected/Affected Children and their Caregivers. Presenter: Nicole Potgieter (South Africa)
2. Family Centered Care. Presenter: Yori Matumona (DRC)

Group 2 (Moderator: Anita Sampson)

3. Combining Health Education and Economic Strengthening for Integrated Orphans and Vulnerable Children Support. Presenter: Silke Felton (Namibia)
4. Expansion of Routine Provider-Initiated Testing and Counseling in Pediatric Care Programs. Presenter: Yoseph Gutema (Ethiopia)

9:45-11:00 am

Small Group Work

Participants will break up into small groups. Participants will sign up for groups prior to arrival, at registration, or during the morning. Country teams are strongly encouraged to

make sure they have representation in each group. Group work categories outlined below with 2-3 common questions under each heading to be provided to guide group work:

- Group A: Human resources for health including training, supervision, task shifting, and program administration and management. Moderators: Ben Isquith (USAID) and Milly Kayongo (USAID)
- Group B: Monitoring and evaluation. Moderators: Rachel Blacher (CDC) and Sisay Alemayehu (CDC/Ethiopia)
- Group C: Linking clients to health and social services and rapidly identifying people who drop out of services. Moderators: Andrew Abutu (CDC) and Marcy Levy (AIDSTAR-One)
- Group D: Policy. Moderators: Ugo Amanyiwe (USAID) and Andrew Fullem (AIDSTAR-One)
- Group E: Country ownership and sustainability through capacity development: institutionalization, comprehensive planning, systems strengthening. Moderators: Marta Levitt-Dayal (USAID) and Gretchen Bachman (USAID)

11: 00-11:30 am

Morning Break

Opportunity to get coffee/tea and snacks and walk through the results of the small group work.

11:30 am-1:00 pm

Monitoring and Evaluation in the Context of Integrated HIV, MNCH, and Social Service Programs

Moderator: Rachel Blacher (CDC)

This session will include a recap of the monitoring and evaluation small group session, two country presentations that are addressing monitoring and evaluation issues, and a group discussion about what is needed to evaluate service integration efforts for these populations in order to add to the evidence base.

1. Overview presentation: Rachel Blacher (CDC)
2. Recap of monitoring and evaluation small group work (TBD)
3. Community Monitoring and Evaluation to Track PMTCT and Mother Infant Pairs through Community Health Workers. Presenter: Hamomba Leoda (Zambia)

1:00-2:00 pm

Lunch

2:00-3:00 pm

Country Action Plans: Bringing it all Together and Next Steps

This is an opportunity for the country teams to come together at the end of the day and share information gathered during the day regarding services for mothers living with HIV and their HIV-exposed and/or HIV-positive children ages 25 months to the start of primary school. Based on country context and the information presented during the day, teams will identify action items that can be undertaken to improve access to and utilization of services along an integrated pathway. Teams will be provided tools to identify actions that can be implemented in the next six months, six months to a year, and a year to two years.

Country teams will identify major activities, stakeholders that need to be involved, and any technical assistance needs that have to be addressed in order to achieve results. During this time teams will review the country team work done on the previous days to identify opportunities to ensure seamless access to services over these time periods.

3:00-4:30 pm

Country Presentations and Closing Plenary Session

Moderators: Caroline Ryan (OGAC) and Emily Chambers (OGAC)

Brief presentations from each of the participating countries based upon their country level small group work. Present on the missed opportunities and gaps identified and possible program solutions to address them, with a focus on the services that will ensure that clients are served through a continuum of response.

For more information, please visit aidstar-one.com.

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