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The Odessa +PMTCT+ Model: A Replicable Reorganization of the Healthcare Delivery System for the Effective Prevention of HIV Transmission to Infants in Resource-limited Settings in Eurasia

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BACKGROUND

HIV infection is growing rapidly in Ukraine; by 2010 it is predicted that 1.44 million people (3% of the total population, 48.4 million in 2001) will be infected with the virus.[1] Currently Ukraine has the highest HIV prevalence rate in the region, estimated at 1% of the adult population.[2] From 1998 to 2002, the number of new HIV cases reported in pregnant Ukrainian women rose from 686 to 2,022.[3] Currently two-thirds of all children born to HIV+ mothers in WHO's European Region are delivered in Ukraine.[4] In 2002, in Ukraine, 1,379 children were born to HIV+ women a 90% increase from the 727 cases reported in 2000.[5]

In Ukraine, the Odessa Oblast (pop. 2.4 million in 2001) and its principal city of Odessa (pop. 1.1 million in 2001) have the highest prevalence rates of HIV (361.3 per 100,000 oblast wide) in the country.[6]

PROJECT DESCRIPTION

In 2000, the Odessa Oblast Hospital (OOH) implemented a program for the prevention of mother-to-child transmission (PMTCT) of HIV based on a comprehensive strategy endorsed by WHO, UNICEF, and UNAIDS.[7] The Odessa PMTCT Project is supported in part by the American International Health Alliance (AIHA) and builds upon more than a decade of programmatic activity funded by USAID that uses partnerships between Ukrainian and American medical professionals to strengthen regional and national health systems and address issues such as infection control, women's health, neonatal resuscitation, and primary care.[8] The Odessa PMTCT Project was also made possible with the help of other local and international organizations such as Médecins Sans Frontières (MSF), who donated critical supplies and several training components.

The Odessa Model integrates three basic components of an effective PMTCT program:

- access to and the use of efficacious antiretroviral (ARV) drugs in accordance with established protocols;
- outreach efforts to identify HIV+ pregnant women and facilitate their access to PMTCT care; and
- comprehensive healthcare delivery services specifically designed for HIV+ women and their newborns.

The Odessa Model is defined as +PMTCT+ because it includes pre- and post-pregnancy follow-up care in addition to successfully integrating the three components described above. The Model's main objectives are to:

- prevent HIV among women of reproductive age and provide family planning to HIV+ women;
- provide specific PMTCT interventions designed to decrease the likelihood of transmission of HIV from mother to child during the prenatal, delivery, and postnatal periods; and
- provide follow-up monitoring, physical care, and social support to the women, their babies, and their families using a primary care approach.

As such, the Odessa +PMTCT+ Model represents a system that can be replicated in other resource-limited settings, particularly in countries such as those of the former Soviet Union that have similar healthcare infrastructures and delivery systems, as well as share a common language.

KEY COMPONENTS OF THE ODESSA MODEL

- **Outreach and Family Planning:** Through the family planning, counseling, STI screening, and educational outreach programs of the Odessa Women's Wellness Center (WWC),[9] located within OOH, the hospital is able to reach HIV+ women and women of reproductive age in general.

- **Services for HIV+ Pregnant Women:** Medically, the Odessa Model follows universally accepted interventions for treating HIV+ pregnant women during the prenatal, delivery, and post-partum periods to decrease the likelihood of MTCT. When necessary, interventions have been adapted to meet the restrictions of a resource-limited setting while maintaining evidence-based integrity. All pregnant women who come to the WWC are given the opportunity to be tested for HIV and given pre- and post-test counseling.

- **Protection of Healthcare Workers:** OOH has implemented universally accepted occupational safety precautions to prevent the transmission of blood-borne infections.

- **Networking:** To facilitate a single institution approach, whereby all HIV+ pregnant women in the region are sent to OOH for care, the hospital has actively worked with other healthcare facilities (such as the Odessa City AIDS Center), social service providers, and local NGOs to establish open lines of communication and effective referral and patient flow systems. This component of the Odessa +PMTCT+ Model is designed to strengthen service delivery, proactively reach women in high-risk groups, and improve the early identification of HIV+ pregnant women to ensure complete case management, continuum of care, and on-going participation in the program.

This single institution approach was supported by the Odessa Oblast Health Administration (OOHA) who issued a special order in May 2002 legislating the referral pattern:

- **On-going Support and Follow-up Services:** The Odessa +PMTCT+ Model provides ongoing social and medical care to HIV+ women and their families. To this end, in June 2003, OOH opened a satellite clinic that offers follow-up medical care and social service referral. For the first time, HIV+ individuals in Ukraine can receive care at a facility located within a conventional, multi-profile hospital rather than at a specially-designated AIDS Center. The creation of the clinic at OOH also helps combat the stigma associated with HIV/AIDS.

- **Training and Developing Health Professionals:** In addition to providing medical care and social service referrals for HIV+ women, OOH staff are committed to training others in the region. To this end and with AIHA support, OOH and its partners
  - in June 2003, opened the South Ukrainian AIDS Education Center (SUAEC), a PMTCT training center located within the OOH Maternity Hospital, to provide practical, skills-based training to healthcare professionals throughout Eastern Europe and Eurasia. SUAEC offers courses in all facets of the Odessa +PMTCT+ Model, including integrated case management; infection control procedures and occupational safety; effective drug therapy; safe delivery practices; prenatal, follow-up, and pediatric care; patient education; and social support services. SUAEC is an affiliated training center of the Regional Knowledge Hub for the Care and Treatment of HIV/AIDS in Eurasia, a project supported by WHO and GTZ;[10]
  - published English- and Russian-language versions of practical guides that address topics related to PMTCT, such as family planning, the prevention and treatment of STIs, infection control practices, counseling, prenatal care, delivery, infant feeding, pediatric care, primary healthcare, and laboratory testing;[11] and
  - developed Russian-language training materials and curricula that are currently used by SUAEC faculty to educate health professionals and policymakers.

EVALUATION METHODOLOGY

An on-going, case-controlled study compares and tracks the effectiveness of +PMTCT+ intervention integrated into maternal/child health and primary care services.

- The **baseline group** consists of 50 pairs of HIV+ women and their (50) babies who received care prior to the establishment by OOH of comprehensive PMTCT activities.
- The **PMTCT group** consists of 244 HIV+ women and their 246 babies who participated in the Odessa PMTCT Pilot Project.

All results, except the MTCT rate, are calculated for the PMTCT group as of March 30, 2004.

RESULTS AND CONCLUSIONS

Preliminary results from 2003 indicate a 75% decrease in the number of HIV-infected babies born to HIV+ women at the Odessa Oblast Hospital.

Other preliminary healthcare delivery improvement results are shown in Table 1. Data indicate:

- a 39% increase in the number of cases where the women's HIV status was known before delivery
- a 25% increase in the number of women whose first prenatal visit occurred before the second trimester of pregnancy
- a 95% increase in the use of ARV prophylaxis when treating HIV+ pregnant women
- a 98% increase in the number of neonates who received ARV prophylaxis

Mothers, babies, and fathers (or sexual partners) were referred to the primary care clinic for follow-up treatment and to local NGOs for support services.

The MTCT rate for the PMTCT group was 6%, compared to 24% for the baseline group (as of December 1, 2003) based on confirmed HIV+ status at 18 months of age. Statistics for the groups were also analyzed for prenatal care, labor/delivery, and post-natal/follow-up care.

Prenatal Care (see Table 2)

Compared with the baseline group:

- 65% of HIV+ pregnant women registered for prenatal care during their first trimester (vs. 40%)

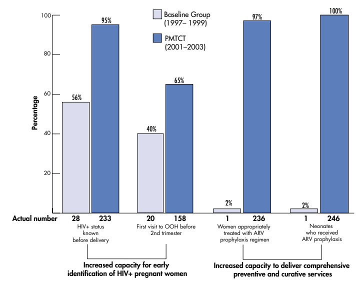
Baseline Group (1997– 1999)
PMTCT (2001–2003)
Percentage
100
80
60
40
20
56%
95%
40%
65%
2%
97%
2%
100%
Actual number
28
233
20
158
1
236
1
246
HIV+ status known before delivery
First visit to OOH before 2nd trimester
Women appropriately treated with ARV prophylaxis regimen
Neonates who received ARV prophylaxis
Increased capacity for early identification of HIV+ pregnant women
Increased capacity to deliver comprehensive preventive and curative services

Table 1. Selected delivery improvement results.

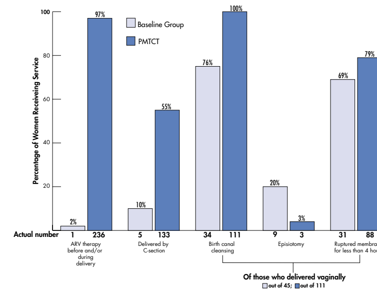
Baseline Group
PMTCT
Percentage of Women Receiveing Service
100
80
60
40
20
2%
97%
10%
55%
76%
100%
20%
3%
69%
79%
Actual number
1
236
5
133
34
111
9
3
31
88
ARV therapy before and/or during delivery
Delivered by C-section
Birth canal cleansing
Episiotomy
Ruptured membrane for less than 4 hours
Of those who delivered vaginally
out of 45; out of 111

Table 3. Labor/delivery.

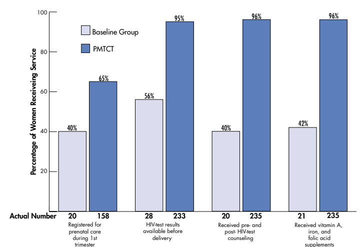
Baseline Group
PMTCT
Percentage of Women Receiveing Service
100
80
60
40
20
40%
65%
56%
95%
40%
96%
42%
96%
Actual Number
20
158
28
233
20
235
21
235
Registered for prenatal care during 1st trimester
HIV-test results available before delivery
Received pre- and post- HIV-test counseling
Received vitamin A, iron, and folic acid supplements

Table 2. Prenatal care.

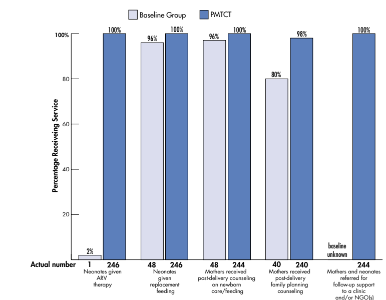
Baseline Group
PMTCT
Percentage Receiveing Service
100%
80
60
40
20
2%
100%
96%
100%
96%
100%
80%
98%
baseline unknown
100%
Actual number
1
246
48
246
48
244
40
240
244
Neonates given ARV therapy
Neonates given replacement feeding
Mothers received post-delivery counseling on newborn care/feeding
Mothers received post-delivery family planning counseling
Mothers and neonates referred for follow-up support to a clinic and/or NGO(s)

Table 4. Post-natal/follow-up care

- 95% had HIV test results available before delivery (vs. 56%)
- 96% had pre- and post-test counseling on HIV (vs. 40%)
- 96% received vitamin A, iron, and folic acid supplements (vs. 42%)

Labor/Delivery (see Table 3)

- 97% of HIV+ pregnant women had antiretroviral therapy (ART) before and/or during delivery (vs. 2%)
- 54% delivered by elective C-section (vs. 10%)
- Of those who delivered vaginally,
  - 100% had birth canal cleansing (vs. 75%)
  - only 3% had an episiotomy (vs. 20%)
  - 79% had duration of ruptured membranes <4 hours (vs. 69%)

Post-natal/Follow-up Care (see Table 4)

- 100% of the infants born to HIV+ women had ART (vs. 2%)
- 100% had replacement feeding (vs. 96%)
- 100% of the women received counseling on newborn care/feeding practices after delivery (vs. 96%)
- 98% received family planning counseling after delivery (vs. 80%)
- 100% of the women and their babies were referred for follow-up support to a clinic and to NGOs for continuing support; data for the baseline group is unknown

Improved policies related to HIV+ pregnancy referrals and health professions training conducted during the 2001-2004 (PMTCT) period include:

- adoption by the OOHA of a new regulation referring all HIV+ pregnant women living in the oblast to OOH for prenatal care and delivery;
- approval by the OOHA of a comprehensive PMTCT training curriculum, including a strong recommendation to health-care workers to receive training;
- training 170 practitioners in occupational health and in preventive approaches, clinical practice guidelines, laboratory techniques, PMTCT, and VCT (conducted in collaboration with PATH) from the Odessa Oblast; and
- training 186 MCH and AIDS systems practitioners from Moldova, Kazakhstan, Russia, and Ukraine in PMTCT, including a "train–the-trainers" course.

EFFECTIVE +PMTCT+ STRATEGIES

Data indicate that the Odessa +PMTCT+ Model is effective in resource-limited settings. The following strategies are recommended for successful implementation:

- Build strong links with a wide range of local NGOs and in-house resources—such as the WWC and satellite clinic—to reach women from high-risk groups and provide them with information on family planning, HIV prevention, the importance of preventing MTCT of HIV, etc. using specially developed educational materials. In turn, patients can be referred to these NGOs and local service providers for assistance with combating substance abuse and finding a job, among other things.
- Build support within the local health authority and medical community to implement new referral protocols, effective resource allocation, and continuing PMTCT education for healthcare workers.
- Establish, when possible, a main care facility at a place that provides easy access to the population(s) it aims to serve. For example, OOH is located in the "Palermo" region of Odessa, a neighborhood known for drug dealing, and the home of many IDUs.
- Establish a satellite clinic to provide follow-up medical care situated in a location convenient for targeted client base(s) and/or local high-risk populations.
- Develop partnerships with international organizations, healthcare institutions, local community organizations, and NGOs to ensure continuous management of care for HIV+ women and their babies.

SUMMARY

Successful PMTCT programs combine efficacious treatment with a cohesive infrastructure that includes comprehensive healthcare delivery services and outreach programs. The Odessa +PMTCT+ Model is one that not only meets these criteria, but is particularly suited for replication in other countries that have a similar healthcare infrastructures and delivery systems, such as those of the former Soviet Union and Eastern bloc. Currently, through the Viramune Donation Program some drug companies are offering pharmaceuticals free-of-charge to eligible countries that can show that they have reliable healthcare delivery and drug distribution systems, as well as patient case-management structures.[12] The Odessa +PMTCT+ Model is one that others in the region can look to when trying to meet these requirements.

Further information about the Odessa +PMTCT+ Model, USAID, AIHA and its partnership programs, and the Odessa partnership can be found at www.aiha.com.

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8. AIHA's Partnership Program has proven highly successful throughout the NIS/CEE region. In particular, the +PMTCT+ pilot project builds upon the success of women's wellness, neonatal resuscitation, infection control, and nursing programs implemented as part of the Odessa/Coney Island partnership (1992-1999) and the Odessa/Boulder community-oriented primary healthcare partnership (1999-present). The MTCT project uses AIHA's partnership methodology, supplemented by expert resources. Boulder Community Hospital and its collaborating institutions in Colorado—including the Health Professions Schools of the University of Colorado and the Denver Health Medical Center—are the lead US partners. These partners, working closely with their counterparts in the Odessa Oblast Health Administration, the Odessa State Medical University, and Odessa Oblast Hospital, are providing training and capacity building related to the model program. In addition, AIHA brings in individual US health professionals and key public health institutions for selected expertise.
9. AIHA's Women's Wellness Centers (WWCs), located in more than 25 communities throughout Eurasia, provide an integrated model of client-centered healthcare delivery. AIHA's innovative WWCs provide a comprehensive range of clinical services—from reproductive health to primary and specialty care—within the setting of an ambulatory care facility, in addition to a wide range of health promotion, disease prevention, and educational programs such as classes addressing topics from intimate partner violence and substance abuse to breast self-exams and coping with cancer. The Odessa WWC was established in 1998 by the AIHA Odessa/Coney Island partnership.
10. For more information on The Knowledge Hub and SUAEC, visit www.aidsknowledgehub.org
11. All currently available versions may be found at www.aiha.com.
12. For example, Boehringer-Ingelheim; see www.boehringer-ingelheim.com/corporate/asp/news/ndetail.asp?ID=694

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