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Ente Ecclesiastico Civilmente Riconosciuto con D.P.R. n. 596/72
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Relevance of early HIV testing in severe malnourished children

ABSTRACT

Introduction: Rainbow Project is a large scale “model of care” for orphans and vulnerable children, run by the Association of Pope John the 23rd in Zambia. A HIV targeted voluntary screening was conducted in 14 Rainbow Nutritional Centers in Ndola District (Zambia) for the children under-five years old.

Rationale: Failure to thrive is one of the early sign of HIV infection. Late diagnosis of HIV infection leads malnourished children towards high mortality.

Objective: to introduce early screening for HIV infection in nutritional centers to reduce mortality of children.

Methodology: From 1st March to 13th May 2008, health talks were given to the guardians, focusing on HIV/AIDS. Testing was started in the centers for children above 18 months while referring children below 18 month for HIV/PCR to the local clinics. HIV exposed children from 6 weeks of age to 1 year were referred for prophylaxis to the nearest ART clinic. In the same testing day all children were screened for MUAC (Mid Upper Arm Circumference) and presence of oedema to detect severe malnutrition. The severely malnourished children were enrolled in the Rainbow Nutrition Clinic in which RUTF (Ready To Use therapeutic Food) was given.

Findings: 801 children and adults were tested. 12,5 % of children were found severely malnourished. 9% of children above 18 months were newly diagnosed as HIV positive. The overall number of HIV positive children in Rainbow centers is 15%.

Conclusions: Rainbow Project strongly recommends that all children referred to nutritional centers are offered HIV test, even if the period of study is too short to provide data on mortality.

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Introduction

The Association of Pope John the 23rd, a Catholic community scattered in 5 continents and present also in Zambia, Kenya and Tanzania, is in the fore-front to protect the child's right to a family.

The Pope John 23rd is an International Lay Association of Pontifical Right with legal status. It was founded by Fr' Oreste Benzi, a Catholic priest, in Italy in the early '60 and counts now more than 1850 members from different countries.

Sharing life directly with the poor, marginalised and oppressed is the charisma and the guideline for all interventions of the Association Pope John 23rd.

The Association's non violent political action springs out from this shared life and is carried out wherever the Association is present around the world. The Association tries to be "voice of the voiceless" and to remove the causes of injustice and oppression.

The Rainbow Project, run by the Association Pope John 23rd, is a large-scale "model of care" meaning to help a large number of orphans and vulnerable children keeping them within the extended family. It operates in the Copperbelt, especially in and around Ndola.

The aims of Rainbow Project are:

- To reach and help a large number of children.
- To keep them in a related or non-related family by supporting these families psychologically and materially.
- To make the nation aware of this humanitarian emergency.

Rainbow Project works in partnership with different organization, in order to act together in all the field of action.

Rainbow Project operates through:

Executive group: The networking system is linking organisations, local authorities and the families caring for orphans and vulnerable children. All participating organisations meet on a regularly basis in the Rainbow executive group.

Helping and listening centre: in each compound where Rainbow is operating there is a helping and listening Centre where Rainbow operators organize the intervention in that particular area.

Street Children Service: the service strives, through the programmes of Outreach, drop in Centre and a transit home, to retrieve street children from the street and reintegrate them back to their families and communities of origin.

Microcredit scheme: Rainbow has elaborated the scheme "Twin- Track approach", trying to find a balance between short term need to assist the families, and the long term need to try to help these families in becoming self supportive.

Education support: Rainbow is proposing different ways for the educational support:

1) Payment of school fees and uniforms where it's possible
2) Primary and secondary schools approached to exempt orphans from payment of school fees
3) Supporting of community schools in areas where it has been proven impossible to send the children to existing primary schools

Nutrition support

In the Ndola Health District there are 14 Traditional Nutritional Centres (TNC) that cater for about 450 children coming from local communities.

The children, usually under five year of age, are referred by the local clinics and once a week the activities that are carried out are as follows:

1) Children are weighted and weight recorded, comparing the weight from the last week
2) Cooking demonstration for mothers and guardians on the preparation of local food suitable for the recovery of undernourished children.
3) Health talks on socio-sanitary subjects such as hygiene, HIV/AIDS, child diseases, etc. The awareness and knowledge given to families who care for undernourished children in terms of health and hygiene remain as a personal and local community heritage which translates into a better capacity to look after and cure children. Health talks are carried out by the operators or by people from the local clinics (CHW or lay counsellors).
4) Distribution of a meal to the children after cooking demonstration. Eating together is the way for the Rainbow personnel to ensure eating capacity of the children
5) Distribution of food supplement to be used at home for the following week. The food distributed will be just a supplement that is suppose to help the correct nutrition schedule of the child.
6) Home visitation for those children not gaining weight regularly. This allows our volunteers to make sure also that the supplement is not share in the family and assess the general conditions of the families involved.

Usually the children should be held in the nutrition centre for 3 months.

In some cases the families of the children are put on a waiting list for Rainbow's Micro Credit program, in an attempt to make the family self-sustaining and self supporting.

Rationale for addressing the problem

The Zambia Demographic Health Survey (ZDHS) monitoring data indicates that malnutrition is worsening; with 2001/2202 levels of underweight reaching 28% , chronic malnutrition 47% (42% in 1996) and acute malnutrition 5%.

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Severe malnutrition is associated with high morbidity and mortality. Malnutrition prevalence varies from district to district.

Widespread poverty and high HIV/AIDS rate is worsening the situation. [i]

The estimated number of children with HIV in Zambia is 95,000. 11,602 are at the moment receiving ART.[ii]

Recent studies find that the median age at which children with HIV begin antiretroviral treatment is between five and nine years old. Most infants with HIV around the world are not treated because access to HIV diagnosis remains limited.

Despite the encouraging increase in the number of children on antiretroviral treatment, the youngest cohort of children exposed to the virus – those under age one – are not getting diagnosed and are missing out on treatment. As a result, large numbers of very young children are dying every year because of AIDS. (From Children and AIDS – Third Stocktaking Report 2008).

Malnutrition is a very severe problem in Ndola, especially among the poorest layers of the society. It affects principally children and in most of the cases it is worsened, by the HIV infection.

We have discovered that most of the time the children that were not gaining weight in the expected 3 months time in the TNC were ultimately found with HIV-AIDS infection. Sometimes these children even if referred to the local clinic in case of sickness, died after infections, such as diarrhoea, pneumonia or malaria because they were discovered HIV + already on stage 3 of 4 of the WHO paediatric classification of HIV/AIDS.

The onset of AIDS in children is known to be much earlier than in an adult. A significant proportion of HIV-infected children will develop AIDS and die within the first 2 years of life.

In babies, there is a very rapid increase in HIV viral levels in the first weeks of life in perinatal acquired HIV infection. These levels remain very high for the first1-2 years of life. They gradually decline over the next few years, reaching a “steady state” by the age of about 5-6 years.

It is estimated that 75% of all HIV – infected children will die before their fifth birthday without ART.[iii]

Poor growth is common in HIV-infected children and has a significant adverse effect on survival independent of the degree of immune deficiency. Intrauterine growth may be compromised in children born to HIV-infected women.

Traditional risk factors such as insufficient food intake and diarrhoea contribute to poor growth in children with HIV. However, in children not receiving ARVs, energy supplementation alone improves weight gain but does not reverse deficits in height.

Other factors associated with impaired ponderal and linear growths include level of HIV replication and use of ARVs for suppressing viruses and improving immune status.

Results of studies also suggest that prevention, early detection and treatment of diarrhoeal illnesses may be effective targets for enhancing childhood growth and survival in children with HIV.

Gastrointestinal infections, a common cause of childhood malnutrition and growth retardation, also contribute significantly to poor growth in HIV-infected children. Children infected with HIV appear to be especially vulnerable to diarrhoeal diseases.

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Some children who otherwise are without HIV-related illnesses or reduced CD4+ counts may benefit from nutritional rehabilitation; ARVs can be deferred for these children.
The mechanism by which HIV replication impedes growth has not been established.
Several studies observed that the level of HIV replication is closely associated with both the rate of growth and the quantity of lean tissue stores. Dietary intake also varies inversely with level of virus, suggesting that viral replication directly or indirectly suppresses appetite.
Several studies performed before potent ARVs were available showed that increasing the nutritional intake in children with HIV-associated growth failure with supplemental enteral and tube feedings improves weight but does not affect linear growth or lean body mass (i.e., arm muscle mass).
A number of causal factors suggest that the genesis of growth disturbances in HIV-infected children is multifactorial. Poor growth is often attributable to recognizable illnesses and secondary conditions that accompany HIV infection. Secondary causes of growth faltering or failure, many of which are potentially preventable, reversible or modifiable, are involved. These include dietary insufficiency, diarrhoeal illnesses, and anemia. Poor growth is also encountered in HIV-infected children with no discernible secondary illnesses (i.e., much of the variance in growth appears to be independent of HIV infection and suppression of viral replication with ARVs is an importance means of enhancing growth).
The negative effects of HIV infection on postnatal growth have been consistently observed and well documented in studies performed in both industrialized and developing countries.
Sub-Saharan African children with HIV also have growth retardation early in life.
Abnormalities in growth and metabolism are common in children infected with HIV. Poor growth was among the first manifestations of HIV infection to be recognized in children and had a significant effect on short-term survival. More recently alterations in body fat distribution and lipid, glucose and bone metabolism were described that may place HIV-infected children at increased risk for future morbidities.
Poor growth is both a manifestation of HIV as well as an independent risk factor for death.
From all these evidences coming from the scientific literature regarding the problem of HIV and children and from our own experience at grass root level we understood that the earlier the status of the child is known the better it is, monitoring in this way his/ her level of CD4 and viral load and on the other side preventing and promptly curing the diarrhoeal diseases and any degree of malnutrition. The child, if the status is known, will have access to ART before his/her nutritional status might be so deteriorated that the life of the child is at risk .

Objective

A proposal to carry out a targeted screening for HIV/AIDS within the malnourished children of the Rainbow Centres was forwarded to the local DHMT and to the management of Ndola Children's Hospital to know the HIV status of the children in the centres, monitoring their level of CD4 and offering them antiretroviral therapy and appropriate nutrition support before conditions were too severe, in order to reduce overall mortality.

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One of the secondary aims of the programme was to create a link between the families of the children found positive and the local Health System, indicating to the guardians the nearest children's ART clinic, referring the children to the local clinics for Cotrimoxazole prophylaxis and for HIV/PCR.
During the same campaign all the children were screened for severe malnutrition using the MUAC and the presence of oedema in order select the children subsequently enrolled in the RUTF programme to assure them, especially to those found HIV+, the proper nutrition support.

Methodology

The programme was divided in two phases: the sensitization period and the testing day.
After assessing the suitability for every Nutrition Centre in terms of logistics and receiving permission from DHMT, in collaboration with Hope Humana – New Start (a local NGO performing VCT) and the local clinics, the project volunteers started, during the month of march, a sensitization period that lasted, for every centre, not less then 4 weeks.
During this period of sensitization the guardians/parents received health talks that focused on HIV/AIDS according to the following list:

1) What is HIV/AIDS
2) Why is important to undergo VCT and also to test your child
3) Mother to child transmission of HIV- Breastfeeding and HIV
4) Confidentiality for the test (before, during and after)
5) How to protect your child from infections: diarrhoeal diseases, malaria, tb
6) Health of the child in general

These topics were discussed among the beneficiaries of the programme with the help of qualified personnel from the Rainbow Programme and/or the Local Clinic. (CHW, lay counsellors)
The purpose of the sensitization month was to give the opportunity to the participants to gain knowledge, share ideas and decide about the test in an informed way.
In the month of April the VCT programme was conducted in 14 nutritional centres in the Ndola District, also distributing Multivitamin Syrup and Folic Acid according to the needs of the children.
Hope Humana- New Start provided group counselling, testing of the children above 18 months with post testing counselling to the guardians. Possibility of testing was offered also to the guardians.
For the children below 18 months a referral system was put in place in order to send those children to the nearest available clinic that was able to perform HIV/PCR.
The link with the local clinics was of paramount importance in order not to confuse guardians on who was dispensing medical support.
Cotrimozaxole syrup was donated by the Project to the local clinics according to the number of children screened and in need of it. The choice not to give out the treatment from the medical personnel of the Project was in line with the will no to disrupt the in place relationship between the guardians and the local health system.

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All the data regarding general information of the children were recorded on a file by the medical personnel of the Rainbow Project that were the only people to have access to the above mentioned file. The status of the child was recorded as well.

At the end of the testing day the guardians were free to share with the personnell the result of the test.

All the children underwent the screening to detect those with severe acute malnutrition using the MUAC and the presence of oedema as tools.

The exercise was carried out to understand better the pattern of malnutrition in our centres and most of all to detect the children with higher risk of mortality to be included in the Rainbow CTC Nutrition Programme.

Mid-upper-arm circumference is an indicator of acute malnutrition that reflects mortality risk; MUAC < 110mm or bilateral pitting oedema are in the admission criteria for the OTP (Outpatient Therapeutic Programme) that implies the use of Ready to Use Therapeutic Food (RUTF).

At the end of the activities every centre provided food for all the participants and beneficiaries of the screening.

Findings

801 children and adults were tested.

The overall total of children present in the centres, in the screening days, were 381 out of 470 that are enrolled in the nutrition programme.

Average attendance was 81% (lowest 45% - highest 100%).

The attendance rate in most cases has been over 70%.

338 bottles of Multivitamin and 77 courses of Folic Acid were distributed.

Out of the 381 children present, 351 were screened with MUAC and oedema.

The children below 6 months were not included as MUAC protocol provides.

Of 44 eligible children to enter the new RUTF programme 41 had a Red MUAC (< 11 cm) and 3 were find with different degrees of oedema.

The overall percentage of children eligible for RUTF programme was 12,5 % .

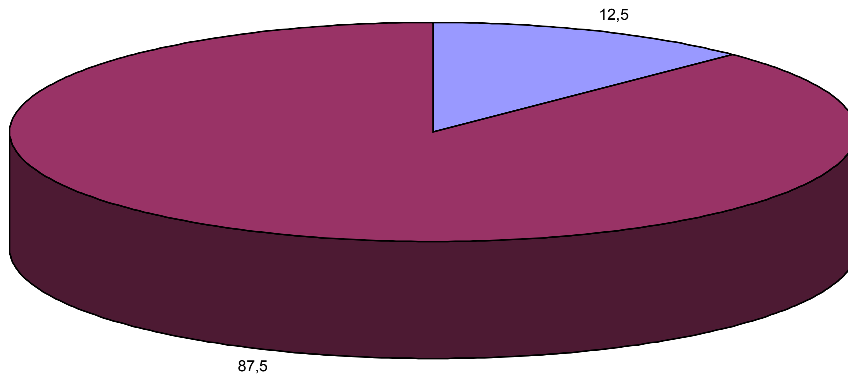

Fig 1: Percentage of children Eligible for RUTF programme

The figure below shows for every centre the percentage of children found eligible for CTC programme.

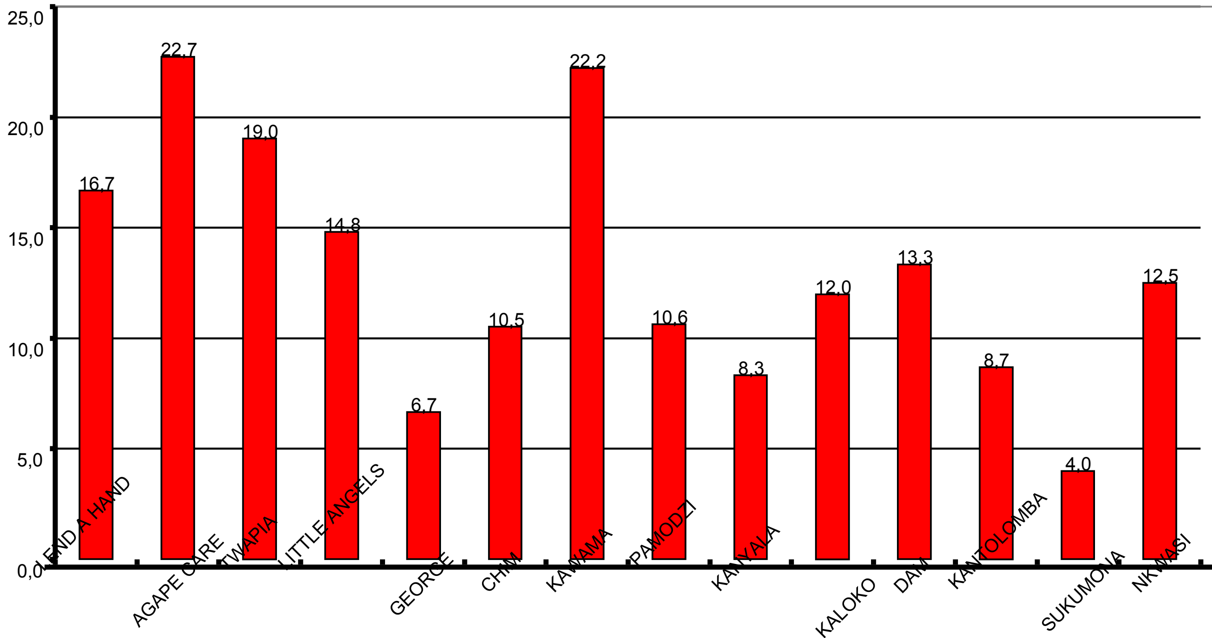

Fig 2: Percentage of children eligible for RUTF programme per centre

The children from six weeks of age to one year HIV exposed not already on phrophylaxis were referred for it to the nearest ART clinic. The table below shows the number of children referred and the number of bottles of syrup donated.

Clinic	n° of Septrim bottles donated	Referred for prophylaxis
Twapia	5	5
Lubuto	14	8
Chifubu	18	17
Total	37	30

Table 1: number of children referred and the number of bottles of syrup donated.

The children undergoing VCT were 148 out of 381 (39% of the total).
95 were tested with rapid test and 53 referred per HIV/PCR.
Most of the guardians knew already the status of the child, being themselves aware of their own status.
It was very rare to have a guardian refusing to know the status of the child.

Many of the mothers that were found negative did not test the child. If they were still breastfeeding they have been advised to retest in three months.

On the 95 tested with the rapid test (above 18 months) 9 were found positive as a new diagnosis (9%). The overall percentage of positivity among the children present was of 12 % being the children positive (whether already on treatment or new diagnosis) 49 in total out of the 381 children present. If from the total number of children are detracted the children that were sent for PCR and of which the results is not yet known, the percentage raises to 15%.

About 62 % of the guardians went for the test.

The rate of HIV positive guardians was 33% including the guardians /mothers that disclose the results without doing the test regardless the status being positive or negative.

Just few (ten mothers) refuse to go for VCT not being aware of their status.

The figure below shows the number of children tested in the centres compared with the children found positive during the screening and the overall number of positive children for every centre.

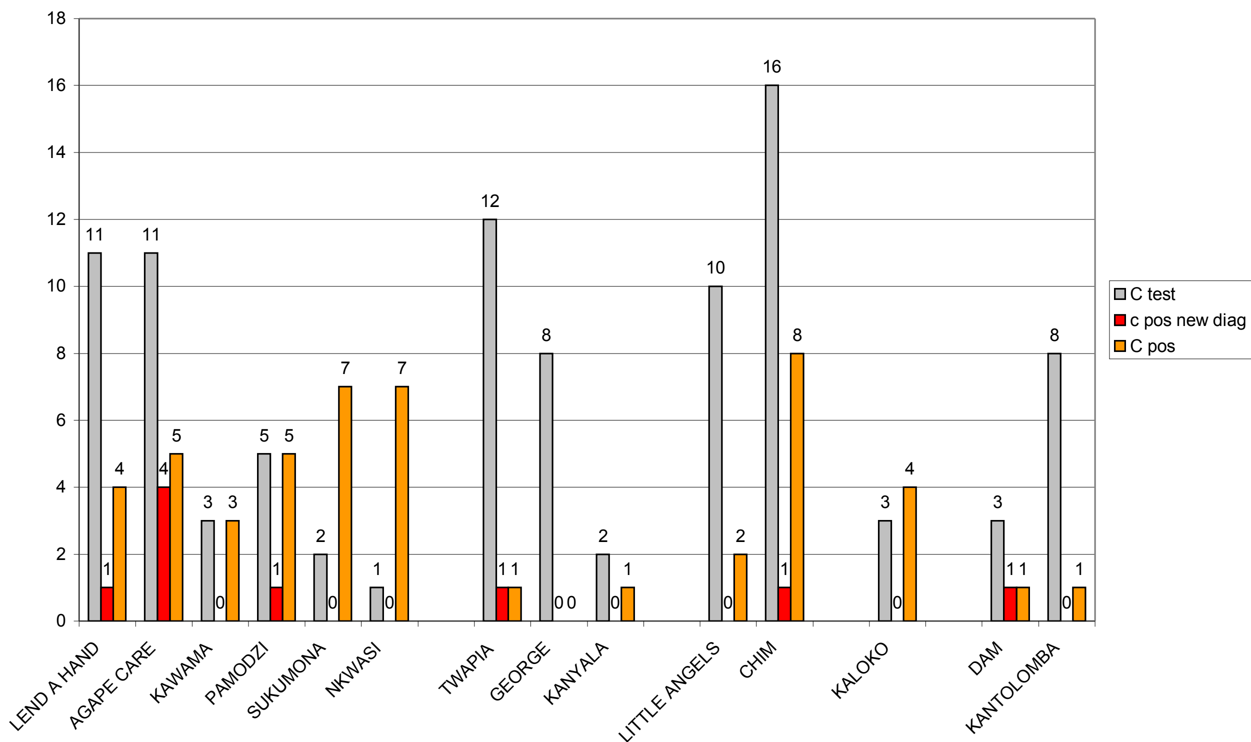

Fig 3: Comparison between the number of children tested, the one found positive and the overall number of positive children in every centre

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Discussion

The overall attendance rate has been very high, probably due to the well conducted sensitization process that has been carried out with the help of the local clinics.

Cotrimoxazole prophylaxis was donated from the Rainbow Project to the referral local clinics according to the number of children referred. Overall number of children referred for prophylaxis was 30.

Every clinic accepted the donation but the Nurses in charge said that Cotrimoxazole is usually available for the children who are in need of it. The major problem is that mothers are not always aware of the need of prophylaxis for their children if they are HIV exposed. Some HIV positive mothers apparently didn’t know about it; this can be still due to stigma.

The high number of children from positive mothers already tested is a good indicator of the work that the local clinics are doing to sensitize the HIV positive mothers on children’s testing.

Most of the mothers that know already their status and were already on ARVs underwent the test to avoid indirect disclose of their status to the others.

The percentage of children found positive is high but, this can be due to strict relationship between malnutrition and HIV infection.

Although many mothers were already aware of the status of their children a consistent number (95) undertook the test.

The provision of Multivitamin Syrup to the children of the nutritional centres was very well accepted by the operators and by the mothers/guardians of the children in the centres. To everyone was underlined the fact that Multivitamin was just a supportive treatment and that if the child was sick he/she should have gone to the nearest clinic to receive proper medical attention.

Nevertheless the personnel from the project strongly believed that in such a contest, with children status going from underweight to severe malnutrition, the supplementation with Multivitamin has been a very helpful procedure.

Multivitamin syrup was not delivered to:

1) Children less then 6 months with normal growth chart
2) Children very sick that were referred to the local clinic or to the hospital

Folic Acid was distributed on a clinical judgment of the presence of anaemia and in the cases of severe malnutrition.

Regarding the MUAC and oedema screening the exercise has given a better understanding of the situation of the children in the traditional nutritional centres. 44 children were detected in need of further treatment with RUTF.

Going through the under five card of the children there was confirmation that some of the children were kept longer in the programme because of food insecurity in their own households.

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Implications and conclusions

Often, HIV test result is not shared within the family members, especially from wife to husband because of stigma and fear of being refused and neglected. The children are the first victims of stigma inside the families, since their being HIV+ is an indirect disclosure of the mother's status.

Women and children pay the consequences of stigma since in some cases they have to take ARVs hiding from the father/husband and failing to reach adequate compliance to the therapy.

Stigma is high in the community but also within the families and for this reason one of the major issue to look into is the involvement of men in the fight against HIV. This is one of the main constraints leading children to suffer and die.

The massive screening carried out was an affective way to fight stigma, and this was documented by the high number of people (more then 800) totally tested besides all the children and the guardians from the nutrition programme.

Speaking freely about HIV/AIDS and using the premises of the project usually used for other activities has given to the process of testing an atmosphere of normality. Many people felt free to come and test because of the friendly environment that they usually find in the Rainbow Helping and Listening Centres.

The impression was also that stigma was fought through education. The month of sensitization was important to build that confidence among the guardians that allowed them to live freely the moment of the test. During the month of sensitization the parents were suggested to come together on the testing day.

The Rainbow Project strongly recommended the DHMT to offer VCT to every malnourished child attending the local clinics in Ndola District.

The infected children are not easily rescued from severe malnutrition, so it is very important to make the HIV diagnosis before children reach severe stage of malnourishment.

The Project advocated the presence in the local clinics of nutrition support for the HIV+ children since they are most in danger of dying from malnutrition, especially advocacy was carried out on the presence of RUTF and HEPS in every clinic to assure fast and long lasting recovery to the malnourished children.

Knowing the HIV status of a child is also important for the general health of the child especially in the first 5 years of his/her life since prevention and early cure of some condition can reduce mortality and morbidity.

The results that came out from the screening are going to help all partners involved to care better for the children in the nutrition programme and has helped many people in gaining knowledge and, consequently, fighting stigma ultimately increasing the survival rate of the HIV positive children.

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Abbreviations

CHW: Community Health Workers

CTC: Community-based Therapeutic Care

DHMT: District Health Management Team

HEPS: High Energy Protein Supplement

MUAC: Mid Upper Arm Circumference

NGO: non governmental organization

PCR: Polymerase Chain Reaction

RUTF: Ready to Use Therapeutic Food

TNC: Traditional Nutritional Centres

VCT: Voluntary Counselling and Testing

[i] Guidelines for the Management of Acute Malnutrition 2008

[ii] UNAIDS 2008 and MOH 2007

[iii] Growth failure in HIV-infected children - Consultation on Nutrition and HIV/AIDS in Africa: Evidence, lessons and recommendations for action / Durban, South Africa 10−13 April 2005 - Stephen M. Arpadi