Assess Functionality of IMCI Spatial Facility Infrastructure and Policy Utilization in Trans-Nzioa County, Kenya

Abstract
Implementation of integrated management of childhood illness (IMCI), in a comprehensive and holistic approach, forms bench mark for basic child health in promoting celebration of fifth birth day for children below five years of age. Globally, studies by World health organization (WHO) and United Nations for Children’s fund (UNICEF), show that 90% of Sub Saharan Africa countries as well as Kenya have benefited from IMCI program. The program in Kenya was launched in 1999, is being enhanced in line with MDG 3 of vision 2030, but a lot of benefits have not been harvested by communities at household level. Trans Nzoia District, IMCI program, was initiated a decade ago but still needs substantial support from national IMCI unit to improve basic IMCI spatial infrastructures and policy on essential drug supply and pediatrics equipment at grass root level. The study aimed to determine the level and functionality of IMCI spatial infrastructure and policy utilization in public health facilities in Trans Nzoia District. Cross sectional descriptive study was conducted by mixed data procedure. Sample size of 275 by Fisher’s was used with a proportional purposive design of sampling. In quantitative, data was collected using structured questionnaire and analyzed for central tendency and spatial distribution measurements, while inferential analysis done to provide degree of freedom and measure significant relationship. In qualitative data, Key informants interviews (KII) guides, focused group discussion (FGD) guides, themes and sub themes were discussed into saturation points. The study established that, 89.9% of public facilities in District have insignificant IMCI spatial infrastructure of P values greater than 0.05, as well as majority of health facilities, at level 2 and 3 have compound spatial infrastructure with limited pediatrics’ equipment and drug supply and IMCI policy being underutilized. Push system of essential drug supply was noted on expense for the focused Pull system. Need for department of Child healthcare and Nutrition, Ministry of Public Health and Sanitation in the District to put more measures in improving IMCI program in order to achieve both primary prevention and MDG 3 by 2030.

Key Words
Holistic intervention
Integrated Management of Childhood Illness
IMCI policy
Vertical program

Introduction
The integrated management of childhood illness (IMCI) program addresses on five major causes of morbidity and mortality (Geneva, 1998), among children below five years of age: measles, pneumonia, diarrhea, malaria and malnutrition (Ahmed T, 1999). The program aimed to improve spatial facility infrastructure and enforced IMCI policy and their utilization to enhance quality health care that provide the basic child rights as stipulated in UN Convention on the Rights of the
child articles 3, 6, 7, 19 and 24 (UNCEF, 1989), and Kenya’s laws on Children
acts 2001 section 9 (Kenya, 2004) 
Children living in Africa like Trans nzioa District, have a much higher chance of
dying before the age of five, (Tulloch, 1999); those from poorest families suffer
most, and experiences mortality of 1 in 4 deaths in neonatal period (Lawns J.E,
2004) . Trans-Nzioa District encounters specks of IMCI utilization with current
mortality rate of 76 / 1000 live births for under fives, compared to the national
one 74 /1000 live births (Survey, 2009) . Despite Department of child and nutrition
in Trans-Nzioa District gearing towards planning to develop existing spatial
facility infrastructure and strengthening IMCI policy, it was paramount to
ascertain how these factors were being implemented comprehensive and
holistically (Boulanger, 1999).

Problem Statement
Health records indicate tremendous decline in utilization of IMCI program in
Sub-Saharan Africa and Kenya included (Huicho, 2005). In Trans Nzioa District,
has been ear marked with allocation of huge health expenditure on IMCI program
but there is no major improvement being realized towards the program, thus
against the basic child rights as stipulated in the UN Convention on the Rights of
the child article 3, 6,7,19 and 24 (UNCEF, 1989), and Kenya’s law, child Acts
2001section 9, (Kenya, 2004) Mortality rate in the District is 76/1000 live births
(KSPA, 2010), compared to national 74 /1000 (Survey, 2009). Malaria and
Pneumonia lead in morbidity and mortality rates with 38% consecutively,
Diarrhoea diseases and Malnutrition10% each and Measles 4% per year (Victora
CG, 2000), these decline have negative impact on Primary prevention and
achievement of MDG 3 (Washington, 2004).

Justification
The need for study came out of the concern, emanating from the results of
(Survey, 2009) on persistence gap for child survival in District, despite great
improvement on National quality child health care for under five mortality rates
reduce from 115 to74/ 1000 live births (Survey, 2009). The district is among of
which, IMCI program has been initiated but still need substantial support from
National IMCI unit (Geneva, 1998). Trans Nzioa district has developed core
determinants in spatial health facility infrastructure, IMCI policy strategic
planning, at level 2 and 3 health facilities (KSPA, 2010).

Aim of the Study
Study aims to assess level of IMCI spatial infrastructure and policy utilization in
the district in providing quality child health care for children below five years age,
(Planning, 2003),also intends to provide significant impetus on primary
prevention and to compress single disease management (Vertical programs) into
horizontal IMCI program that has a Highly Impact Interventions for the Child
survival(Planning, 2003).

Research Question
What is level and functionality of IMCI spatial infrastructure and IMCI Policy in
provision of quality Child health care in children below five years of age in Trans
Nzioa district?

Specific Objectives
To assess functionality of IMCI spatial infrastructure in public health facilities in Trans Nzioa district.
To elucidate how IMCI policy influence Child survival in Trans Nzioa district.

**Theoretical Statement**
Though most studies have concentrated to develop plans of improving IMCI programs comprehensively, it is necessary to assess the level of utilization of IMCI spatial infrastructure and its policy actions put in place in order to sustain the program at level 2 and 3 health facilities to enhance accessibility factor besides the affordability policy in the program.

**Conceptual Statement**
From literature review it is clear that sustainable and empowered IMCI programs are determined by quality provision of knowledge and skills,(Hines, 2004,) on IMCI spatial infrastructure, essential pediatrics equipment and drugs, and holistic utilization of child health care policy action,(Hines, 2004,). These factors were used to construct conceptual and operational frame works
Conceptual and Operational Frame works

Figure 2 Showing Summary of IMCI Concepts from literature review.

<table>
<thead>
<tr>
<th>Background</th>
<th>Proximate</th>
<th>Outcome variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spatial health facility - Infrastructure factors:</td>
<td>Knowledge: IMCI education /skills, experience as understood by service providers &amp; community</td>
<td>High level Utilization of IMCI program</td>
</tr>
<tr>
<td>Separate IMCI building and diagnostics equipment</td>
<td>Attitude: Perceived bad or good feelings on IMCI programs.</td>
<td>Significant special infrastructure for under fives (above 60%).</td>
</tr>
<tr>
<td>IMCI emergency and causality unit.</td>
<td>Practices: Community participation in IMCI</td>
<td>facility with separate pediatrics’ equipment</td>
</tr>
<tr>
<td>IMCI Heath information Office</td>
<td>activities that influence service provision of IMCI programs</td>
<td>8 essential oral drugs treatments stores</td>
</tr>
<tr>
<td>Essential drug store.</td>
<td></td>
<td>Vaccines cold rooms and good referral system.</td>
</tr>
</tbody>
</table>

IMCI policy: IMCI coordination
Subsidized therapy
Timely supplies and logistics.
Equitable Pull system on essential drug

Low level Utilization of IMCI program
Below 60%
No IMCI interventions put in place,
Vertical programs still used
Research Method

Study Design
This was a Cross-sectional descriptive study that explored the level and functionality of IMCI spatial infrastructure and policy utilization in public health facilities in Trans Nzoia District. The study adopted mixed methods of data collection procedure. Sample size was determined by Fisher formulae, whereby 275 respondents were surveyed. Quantitative data was collected using a structured questionnaire, while qualitative data were collected using a Focused Group Discussion guide and Key Informants Interviews. Observations were recorded in structured observation checklists during a walk-through survey.

Study Site
The study was conducted in the month of June 2010 in Trans-Nzoia District. Although the total numbers of government health facilities in the district are over 22 only 4 facilities met criteria for inclusion in the study (Facilities where IMCI has been initiated but still need substantial support from the National IMCI unit

Inclusion Criteria
The inclusion criteria were based on service providers who had worked for more than one month in the facility and are dealing with either MCH or IMCI sections.

Exclusion Criteria
Those service providers who were not dealing with MCH or IMCI issues were not involved in this study.

Ethical Consideration/ Confidentiality
This research was approved by the Great lakes of university of Kisumu, Ministry of Science and technology research council. Permission and clearance from relevant offices in MOPHS were sought out before commencing the study. The consents were sought from all respondents before questionnaire could be administered. All the information obtained from respondent was treated with confidentiality. The study was flexible to allow any respondent to withdraw if any case he/she feel uncomfortable to continue with study.

FINDINGS

Demographic Characteristics of Respondents
A total of 275 respondents (service providers) were interviewed in four health facilities. A total of 87% were married. Gender respondent included 50% male and 49% females.

Figure 1 Showing demographic distribution of IMCI service providers in District
IMCI Spatial Health Facility - Infrastructure

Spatial child health facility infrastructure was measured by enquiring on whether the facility had enough IMCI buildings to cover all vertical components of IMCI into one unit of management. The study found out that only 14.5% of facilities are implementing IMCI strategy. While 90% of the facilities are still practicing general pediatrics’ case management in vertical program, table below is an evidence of progressive evaluation on IMCI spatial infrastructure, essential supply and equipments in the district.

Table I: Checklist on functionality of IMCI spatial infrastructures, essential equipment and supply’s stores.
<table>
<thead>
<tr>
<th>trained post IMCI Paramedics</th>
<th>Number trained post IMCI /MCH nurses</th>
<th>Uptake of 8 essential oral therapies.</th>
<th>Source of water supply in the facility</th>
<th>Source of power</th>
<th>Distance from level 4 facility in kilometers.</th>
<th>Number of insecticides treated mosquito nets in store</th>
<th>Number of newborn resuscitation machines</th>
<th>Comprehensive and holistic disease management for the overlapping signs and symptoms</th>
<th>Utilization of single disease management</th>
<th>Follow ups of single disease management</th>
<th>Number of outreach clinic for under fives per month</th>
<th>Facilitators of single disease management/vertical programs</th>
<th>Presence of a</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>13</td>
<td>Very good</td>
<td>CDF bore hole piped</td>
<td>electricity</td>
<td>65</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>PHOs 3 nurses</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>good</td>
<td>CDF bore hole piped</td>
<td>electricity</td>
<td>80</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>PHOs 3 nurse</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>good</td>
<td>CDF bore hole piped</td>
<td>electricity</td>
<td>60</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>PHOs 3 nurses</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Very good</td>
<td>CDF bore hole piped</td>
<td>electricity</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>PHOs 3 nurses</td>
<td>0</td>
</tr>
</tbody>
</table>
separate pediatrics emergency and causality unit.

Source: (KSPA, 2010).

KEY
0 Lack separate IMCI structure
1 Presence of significant IMCI indicator.

Good Essential drug supply and replenish by Push system

Very good Facility has cost-sharing basket (community medical fund) to replenish essential drugs for IMCI.

4.2 Overall Assessment on IMCI Spatial Child Health Facility Infrastructures

Above observation check list showed that 79% of public health facilities in the district have insignificant basic pediatrics medical equipment like new born resuscitation, diagnostic and other child friendly equipment required for quality IMCI program and may contribute to low level 14.4% of IMCI implementation in the district. Push system on essential drugs does not commensurate the high population health in the community.

The facility progressive evaluation results were seconded by respondents who were asked whether IMCI spatial health facility - infrastructure have been incorporated into facility management, out of 275 respondents who participated in the survey majority, 77%, agreed that quality IMCI is not being practiced.

Caption I:  Gap on IMCI Spatial Child Health Infrastructures in Tansnziao District.

“Most facilities in the district are not implementing comprehensive IMCI and holistic Child approach in managing of under five - disease due to many shortcomings beyond the facility and National IMCI unit control , thus we just implement the vertical programs in isolation instead of being done in single management. Even the 11 days basic training to service provider is expensive that the GOK cannot afford for a continuous process.”(KII interviewed Bondeni, Tulwet and Kaplamai facilities 23rd, 24th June 2010)

Table II:  List of Intended IMCI Equipment and Supply’s Stores at level 2 and level 3.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Infant scale , balance type</td>
</tr>
<tr>
<td>2</td>
<td>Clinical thermometer</td>
</tr>
<tr>
<td>3</td>
<td>Electrical hot plate 3KW</td>
</tr>
<tr>
<td>4</td>
<td>Gas cooker , portable, burner</td>
</tr>
<tr>
<td>5</td>
<td>Blood pressure machines and stethoscope</td>
</tr>
<tr>
<td>6</td>
<td>Scale weighing bathroom</td>
</tr>
<tr>
<td>7</td>
<td>Paediatric BP scuff</td>
</tr>
<tr>
<td>8</td>
<td>Resuscitator set ,infant</td>
</tr>
<tr>
<td>9</td>
<td>Ambu bags and mask – new born ,young ,older child and adult sizes</td>
</tr>
<tr>
<td>10</td>
<td>Oxygen source e.g oxygen cylinder and set bor oxgen concetrator</td>
</tr>
<tr>
<td>11</td>
<td>ENT Diagnostic set</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>12</td>
<td>Laryngoscope</td>
</tr>
<tr>
<td>13</td>
<td>Ultrasonic nebulizer</td>
</tr>
<tr>
<td>14</td>
<td>Spacer for delivery rapid acting bronchodilator through inhalation</td>
</tr>
<tr>
<td>15</td>
<td>Laryngealtubes assorted – pediatric and adult</td>
</tr>
<tr>
<td>16</td>
<td>Timers</td>
</tr>
<tr>
<td>17</td>
<td>Iv giving set</td>
</tr>
<tr>
<td>18</td>
<td>Soluset for newborns</td>
</tr>
<tr>
<td>19</td>
<td>Iv canulas butter fly gauge.23,25,.branula gauge 24,22</td>
</tr>
<tr>
<td>20</td>
<td>Needles 23, gauge disposal</td>
</tr>
<tr>
<td>21</td>
<td>Syringe ,disposal 2cc, 5cc, 10cc</td>
</tr>
<tr>
<td>22</td>
<td>NG tubes (pediatric)</td>
</tr>
<tr>
<td>23</td>
<td>Rectal tubes</td>
</tr>
<tr>
<td>24</td>
<td>Cotton wool</td>
</tr>
<tr>
<td>25</td>
<td>Surgical spirit</td>
</tr>
</tbody>
</table>

Source: (National IMCI implementation guideline at Districts level, 2001-04).

### Table III: First line IMCI Drugs Checklist.

<table>
<thead>
<tr>
<th>Prevention</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast feeding</td>
<td>Oral rehydration therapy</td>
</tr>
<tr>
<td>Insecticide treated material</td>
<td>Antibiotics for pneumonia</td>
</tr>
<tr>
<td>Complementary feeding</td>
<td>Antibiotics for sepsis</td>
</tr>
<tr>
<td>Hib vaccine</td>
<td>Antibiotics for dysentery</td>
</tr>
<tr>
<td>Zinc</td>
<td>Newborn resuscitation</td>
</tr>
<tr>
<td>Newborn temperature management</td>
<td>Antimarial</td>
</tr>
<tr>
<td>Antenatal steroids</td>
<td>Zinc</td>
</tr>
<tr>
<td>Tetanus toxoids</td>
<td>Vitamin A</td>
</tr>
<tr>
<td>Neverapine and replacement feeding</td>
<td></td>
</tr>
<tr>
<td>Antibiotic for premature rupture for membrane</td>
<td></td>
</tr>
<tr>
<td>Clean delivery</td>
<td></td>
</tr>
<tr>
<td>Measles vaccine</td>
<td></td>
</tr>
<tr>
<td>Antimalarial intermittent</td>
<td></td>
</tr>
<tr>
<td>Vitamin A</td>
<td></td>
</tr>
</tbody>
</table>

Caption II. Uptake of 13 Essential IMCI Oral Drugs in District

Assessing whether 13 essential IMCI oral treatments was being implemented in the district, 27 out of 43 clinical health workers interviewed 77% (21) accepted to have all 13 essential oral treatments supplied by Push system of essential drugs and not Pull system that advocates for equity. The service package of IMCI is replenished on regular basis by KEMSA-MMOS on the Push system and not Pull system which the facility ordered for. First line drugs included oral septrin (antibiotic) oral coertem (anti-malaria), albendazol (syrup anti-worms), vitamin A drops and while second line drugs are amoxil syrup or gentamicin and xrestapen injections (antibiotic) coeartem injection or iv quinine (antimalaria), paracetamol injection. (KII interview in Tulwet and Suwerwa facilitie ,o, 23rd and 24th June 2010)

On the focused antenatal clinic visit, Retrospective records showed more than 80% failure rate due to ignorance or pregnant mothers being busy on the farms. Only to attend the last trimester. “Huwa wanasema bora wapate kadi ya kuzaliwa na ya kiliniki ya mtoto for immunization” Others believed that regular visits to the facility during the pregnancy are signs of cowardness in the community. “She is not a really respectable women” “Immunization defaulters occurs when babies reach 9 months. Remedy on defaulter is done by carrying out the outreach clinics at least once per month. “Community ignores measles vaccine due to their own herd immunity from the households” (KII and FGD discussants - 23th and Tulwet, Kaplamai and Suwerwa 24th June 2010).

Utilization of IMCI policy in health facilities
This objective sought to understand the respondents’ characteristics on how IMCI policies are affecting implementation of IMCI program (Table IV)

Table IV: Influence of IMCI Policy to foster IMCI Program.

<table>
<thead>
<tr>
<th>Facility</th>
<th>Free medical Service for under -5</th>
<th>Supply for Treated mosquito nets</th>
<th>System of drug supply</th>
<th>df</th>
<th>X2</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bondeni (n=81)</td>
<td>Yes ………63 No 18</td>
<td>65 16</td>
<td>Push 71 Pull 20</td>
<td>2</td>
<td>25.3</td>
<td>0.001</td>
</tr>
<tr>
<td>Tulwet (n=81)</td>
<td>Yes 70 No 21</td>
<td>74 7</td>
<td>Push 70 Pull 21</td>
<td>2</td>
<td>19.6</td>
<td>0.001</td>
</tr>
<tr>
<td>Kaplamai (n=51)</td>
<td>Yes 55 No 45</td>
<td>50 5</td>
<td>Push 41 Pull 10</td>
<td>2</td>
<td>21.6</td>
<td>0.004</td>
</tr>
<tr>
<td>Suwerwa (n=84)</td>
<td>Yes 60 No 24</td>
<td>70 14</td>
<td>Push 74 Pull 10</td>
<td>2</td>
<td>18.9</td>
<td>0.002</td>
</tr>
</tbody>
</table>
From observation check list above, we noted that policy on free medical services for children below five years is insignificant (P value =1.13) in the general district healthcare for under fives.

**Overall Assessment on IMCI Program in District**

Table VI above revealed that most facilities provide subsidized and free inpatient medical services in IMCI program. Further analysis on IMCI policy shows that main system of essential drugs supply is Push system rather than Pull system that advocated by UNCEF, for equity and participatory in logistics supply of essential drugs. However the policy has a significant relationship towards the enhancement of the fifth year birth day celebration.

**Caption III: Insufficient Drug Supply from KEMSA**

“Most facilities are not constantly getting enough drugs supply from GOK supply KEMSA, thus a facility without Cost sharing developing Fund (CSDF), prescribes drugs to guardians to buy in nearest pharmacy in the market” (KII interview Suwerwa -24th June 2010)

**Discussion**

**IMCI Spatial Health Facilities - Infrastructure**

This study established that greater part of public health facilities, have not integrated comprehensive and holistic of evidence based high impact intervention to develop existing building suit IMCI basic buildings Medical equipments and drug supply which is inconsistence with the Second National Health Sector Strategic Plan II 2005 -2010, (MOH, 2005b) and IMCI survey draft report (MOH, 2006b). Similar study by (Peterson 2004) exposed out that many sick children are not properly assessed and treated by service providers therefore, parents are poorly advised on second opinion or referrals, study noted that recurrent essential drug and equipment supply shortage is mainly associated by Push system of drug supply as revealed by (Picazzo, 2004), as a mode of essentil supply from Kenya medical supply’s agent (KEMSA). Large number of out pediatrics patients, leave limited number of service providers at a level of few opportunities to practice Comprehensive IMCI clinical procedures thus rely on history, sign and symptoms to determine the course of disease management using available resources which concurred by a study by (Picazzo, 2004).

**Policies Affecting Facilities to Implement IMCI program**

The study discovered that most of IMCI policy poses insignificant utilization for IMCI program. For example, Free medical treatment and cost sharing funds are not always reliable and efficient to allow health facility to manage diseases in large numbers of the under fives attending the facility (Simoes EA, 2003).

“The welcome of Community pharmacy and Cost sharing Funds created cartels of misusing facility funds and drugs by most of managers because their conflict of interest”

This observation was consistent with (Victoria, 2000) , that aimed to scale up IMCI implementation at both national and local levels by use of Pull and participatory approach in supply of essential drugs and equipment, free therapy and cost sharing funds for children below 5 years of age (Armstrong Schellenberg JR, 2004).
**Conclusion**

Study discovered that majority of facilities have insignificant IMCI Facility-infrastructure, essential drugs and equipment supply to implement comprehensive and holistic quality IMCI program. It also noted inadequate grassroots support in implementing IMCI policies across the District.

**Recommendation**

GOK to partner with other Private Provision Partners, to innovate and improve existing infrastructure in facilities, into IMCI mode spatial infrastructures that compliments with comprehensive and holistic approaches for child healthcare, as well as advocating IMCI policy at community level, through synergistic participation at household level.

**Acknowledgement**

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Victoria, C.G., Bryce, J. . (2000) Reducing deaths from diarrhea through oral rehydration therapy, Bulletin of the world health organization,


Figure 3: Showing location of Trans Nzioa District (Green) in Kenya.  
(Source: Survey map of Kenya, 2007)