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Working Paper

Ethiopia: effects of civil war on nutrition, mortality, and vaccination coverage using CE-DAT database from 2000 – 2008

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Complex Emergency Database

Ethiopia: effects of civil war on nutrition, mortality, and vaccination coverage using CE-DAT database from 2000 – 2008

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List of Abbreviations

AAU	Addis Ababa University
AFD	Alliance for Freedom and Democracy
CE-DAT	Complex Emergencies Data Base
CMR	Crude Mortality Rate
CRED	Center for Research on the Epidemiology of Disasters
CSA	Central Statistical Agency
CUD	Coalition for Unity and Democracy
EDHS	Ethiopia Demographic and Health Survey
EEBC	Eritrea-Ethiopia Boundary Commission
EPPF	Ethiopian People's Patriotic Front
EPRDF	Ethiopian People's Revolutionary Democratic Front
FDRE	Federal Democratic Republic of Ethiopia
GAM	Global Acute Malnutrition
GDP	Gross Domestic Product
GNI	Gross National Income
GPLM/F	*Gambella* Peoples Liberation Movement/Force
HSDP	Health Sector Development Program
IDP	Internally Displaced People
MCV	Measles vaccination coverage
MDGs	Millennium Development Goals
MoFED	Ministry of Finance and Economic Development
MoH	Ministry of Health
NEBE	National Election Board of Ethiopia
NGOs	Non-Governmental Organizations
OLF	Oromo Liberation Front
ONLF	Ogaden National Liberation Front
SNNPR	Southern Nations Nationalities People's Region
SSA	Sub-Saharan Africa
TGE	Transitional Government of Ethiopia
TPLF	Tigray People's Liberation Front
TSZ	Temporary Security Zone
U5MR	Under five Mortality Rate
UIC	Union of Islamic Courts
UNHCR	United Nations Higher Commission for Refugees
UNICEF	United National International Children's Fund
UNMEE	UN Mission in Ethiopia and Eritrea
WDI	World Development Indicators
WFP	World Food Program
WHO	World Health Organization
WMS	Welfare Monitoring Survey

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1. Introduction

Ethiopian economy is primarily based on agriculture accounting for about half of the gross domestic product (GDP), 90% of exports, and employs 75% of the population. The agricultural sector is dependent on erratic rainfall and technologically backward farming system both of which result in low production and productivity. With a per capita Gross National Income (GNI) of US$ 280 (WDI, 2009), Ethiopia is grouped among low income[2] countries.

Infant mortality rate is 80 and under five mortality is 132 deaths per 1000 live births in 2005 (EDHS, 2005). With a total population of 80.7 million in 2008, life expectancy at birth is 55 years (WDI, 2009). Due to inadequate access to safe water, poor sanitation and medical facilities, people especially in rural areas are vulnerable to and suffer from vaccine-preventable diseases such as measles. As part of the Millennium Development goals (MDGs), the country aims at a two-third reduction in infant and child mortality by 2015 to be achieved through upgrading the proportion of births attended by skilled health personnel, increasing immunization against vaccine preventable diseases, and upgrading the status of women through education and enhancing their participation in the labor force (EDHS, 2005).

Among the various challenges that Ethiopia faces to improve the welfare of its population and achieve the MDGs are civil war and conflict. In addition to socio-political unrest, conflicts lead to economic destruction and welfare loss. Poverty, hunger, malnutrition, and food insecurity are some of the major socio-economic consequences of conflict. War and conflict destroy resources, impede production, hamper market relationships, reduce income, and lead to food insecurity and malnutrition. These in turn lead to widespread deprivation that create citizens with little hope for a better future making a vicious circle of political, social, economical, and environmental problems.

This study attempts to shed light on the effect of civil war and conflict on nutrition, mortality, and vaccination coverage in four regions of Ethiopia. The study is based on CE-DAT database covering the period from 2000-2008. Section two and three set the political and development scene of

[2] The World Bank uses Atlas method. Countries with GNI per capita of US$ 975 or less are categorized as low income countries (World Bank, 2009).

Ethiopia. Section four zooms into conflict affected areas and demographics in Ethiopia with a focus on nutrition, mortality and vaccination coverage. Conclusions are made in section five.

2. Political Context in Ethiopia – an overview

Ethiopia faced a series of Civil war and internal armed conflicts for many years. The guerrilla fight to overthrow the military government of *Mengistu Hailemariam* started in 1974. The fight continued internally for years and in 1989, the Tigrayan People's Liberation Front (TPLF) joined forces with various ethnically based opposition groups creating the Ethiopian People's Revolutionary Democratic Front (EPRDF) to overthrow the *Mengistu* regime (IISS, 2009). EPRDF captured Addis Ababa in May 1991 and Transitional Government of Ethiopia (TGE) resumed power in the same year (figure 1). Among the major parties of the TGE were TPLF, Oromo Liberation Front (OLF), and Ogaden National Liberation Front (ONLF). Soon after, arguments among the major parties of TGE started to drive differences. Political parties such as OLF and ONLF argued that ethnically based secession was the only answer to Ethiopia's ethnic strife. Following the withdrawal of OLF and ONLF candidates from regional elections and wave of conflicts between OLF and ONLF against TPLF; both OLF and ONLF withdrew from TGE in 1993. In the same year Eritrea got independence by referendum.

In 1995, Ethiopia's first multi-party election for House of Representatives was carried out and Government of Federal Democratic Republic of Ethiopia installed with TPLF, led by *Meles Zenawi*, as the dominant party. *Meles Zenawi* continued to rule the country as a prime minister while internal armed conflicts between the Government army and the OLF and ONLF continued at a low intensity level (IISS, 2009).

From 1998-2000, economic and political tensions between Ethiopia and Eritrea led to destructive war that resulted in the loss of numerous lives and economic destructions. Armed conflict began in 1998 due to a dispute over three territories: *Badme*, *Zalembessa*, and *Burie*. The war resulted in more than 50,000 fatalities and 10,000 internally displaced individuals (IISS, 2009). In addition, Eritreans and Ethiopian citizens of Eritrean origin were deported to Eritrea. The United Nations sanctioned full arms embargo on Ethiopia and Eritrea in 2000 and by the end of the year, the United Nations Mission in Ethiopia and Eritrea (UNMEE) was established as a peacekeeping force in the border area Temporary Security Zone (TSZ). In 2002, the Eritrea-Ethiopia Boundary Commission

(EEBC) ruled on the delimitation of the border, awarding the contested town of *Badme* to Eritrea. Even though Prime Minister *Meles* announced that Ethiopia is prepared to accept the 2002 Boundary Commission's ruling, both countries have armed forces around the border areas in 2008.

The year 2001 registered two major events in Ethiopia. In March, internal conflict within the dominant party of the ruling coalition, TPLF, resulted in the split of 12 members of its Central Committee. Main areas of objection lie over issues concerning corruption and political ideology (Tadesse and Young, 2003). In September 2001, when Prime Minister *Meles* was re-appointed as Chair of the ruling coalition, EPRDF, he formed a new cabinet.

Another major event in 2001 was protest of Addis Ababa University (AAU) students against restrictions on academic freedom including the right to organize a student union, publish a student newspaper, and removal of armed uniformed police from the university campus. The protest was joined by high school, college, and university students all over the country in solidarity. The protest led[3] to killings and imprisonment of students and human right activists (Amnesty, 2002; Human Rights Watch, 2001), while many students from AAU fled to Kenya and Djibouti. Consequently, all students except graduating class were suspended for one academic year. A year later, while the government responded to student protests by replacing AAU police by private security guards, other barriers to freedom of association and publication were not removed.

The 2005 national election, which succeeded in attracting about 90% of the registered voters to the polls, led to conflicts especially between the EPRDF and the opposition Coalition for Unity and Democracy (CUD) over election results. Protests led to death and arrest of students and civilians[4]. The National Election Board of Ethiopia (NEBE) released the final results on September 5, 2005, in which EPRDF retained control of government with 59% of the vote. After 2005, internal conflicts among different opposition parties and the government army continued. OLF continued internal struggle for freedom of Oromo people; ONLF for Somali people, and *Gambella* Peoples Liberation Movement/Force (GPLM/F) for the *Gambella* people. A rebel group based in the north named

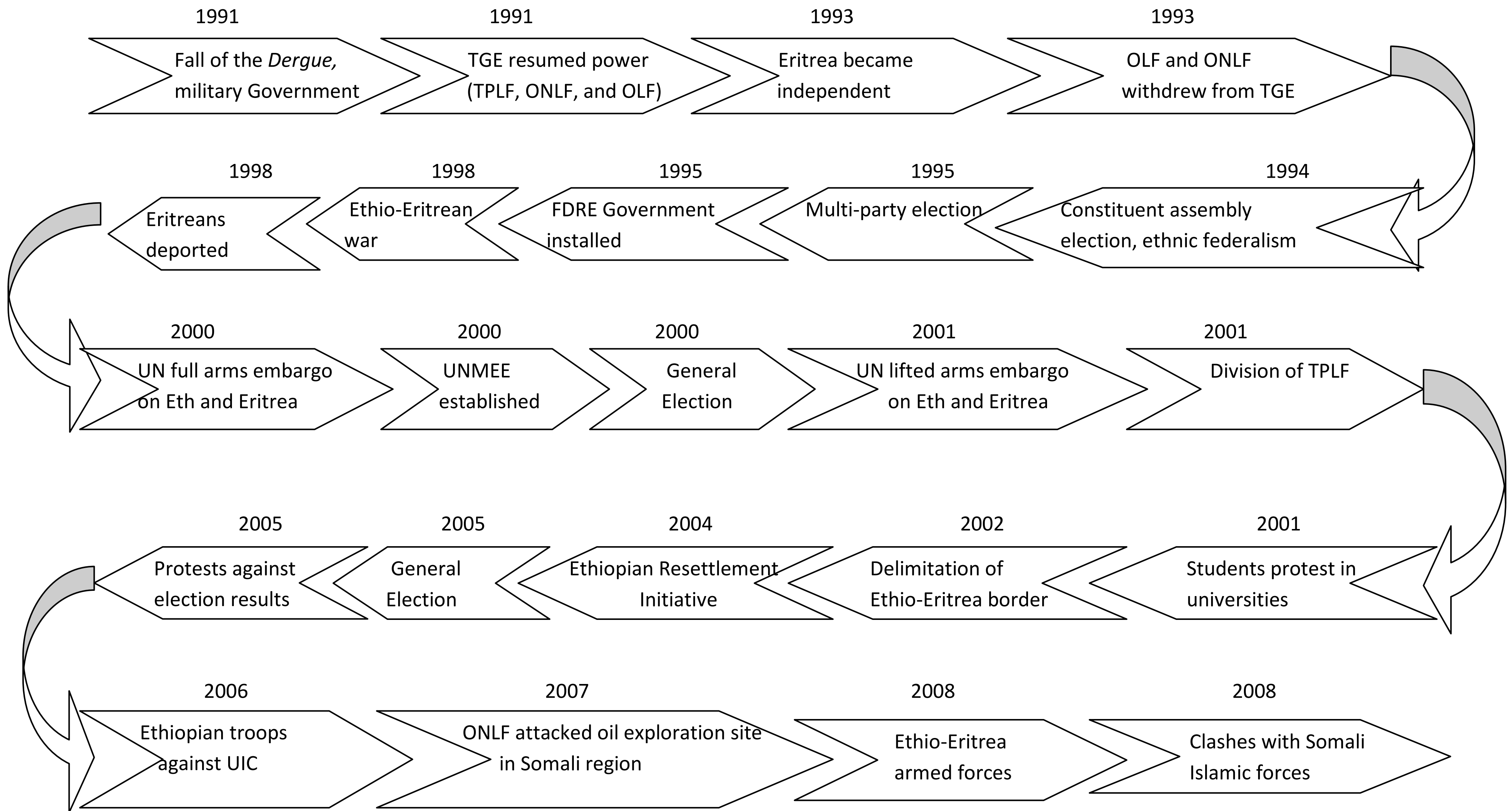
[3] According to reports of Amnesty (2002), around 3000 people, including students, opposition party members, human right activists and news paper vendors were arrested. Police reported that 31 people were killed during raids at the AAU while hospital sources put the number of dead at least at 41 and 45 people were hospitalized (Human Rights Watch, 2001).

[4] Ethiopian government reported 61 civilians and 7 policemen were killed during the protest while the Independent Commission of Inquiry report stated that 193 protestors were killed (New America Media, 2006)

Ethiopian People's Patriotic Front (EPPF) joined with ONLF, OLF and others to form a coalition called Alliance for Freedom and Democracy (AFD).

In 2006, Ethiopian government sent out troops to Somalia in support of the Transitional Federal Government of Somalia against the Union of Islamic Courts (UIC). There is also a claim by the Ethiopian government that ONLF is linked to the UIC which resulted in blockade of the Somali region in 2007, effectively cutting the region off from all domestic and international trade (IISS, 2009). In addition, attacks of ONLF on a Chinese-based oil exploration site in Somali region were reported in 2007.

Figure 1. Major political and conflict events in Ethiopia (1991 – 2008)



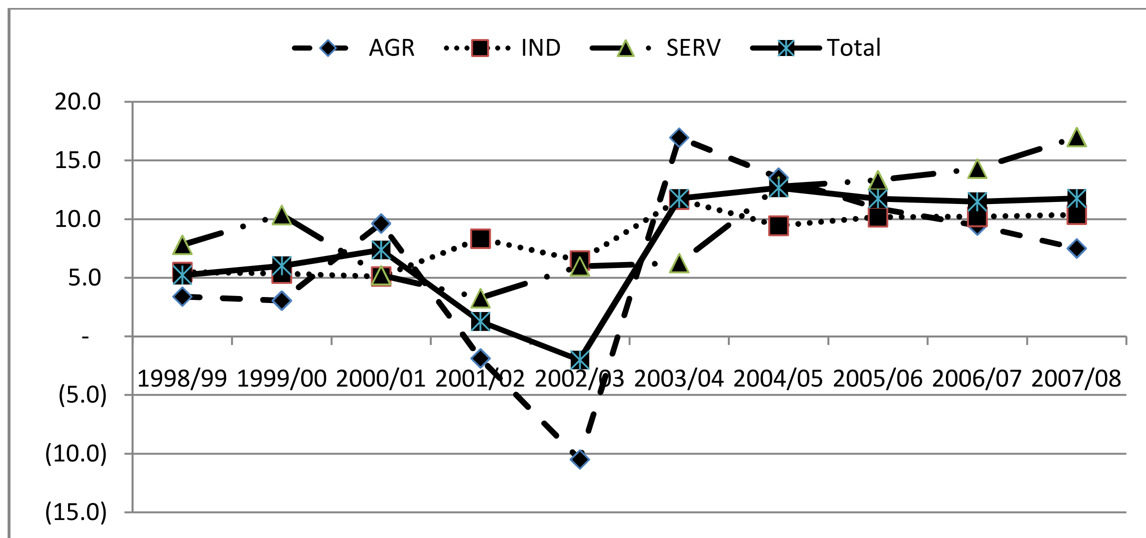
Source: Authors compilation from various sources

3. Development Context in Ethiopia – an overview

Agriculture, being the dominant economic activity in Ethiopia contributes 44.6% to GDP followed by services, 43.4% and industry 13.1% (MoFED, 2009). Looking at the trend in the past 10 years, the decline in the share of agriculture in GDP from 51.2% in 1998/99 to 44.6% in 2007/08 is compensated by an increase in the share of the service sector from 37.2% to 43.4% during the same period. The industrial sector's contribution to GDP merely increased from 12.4% to 13.1% in the past decade.

In Ethiopia, GDP growth largely follows the growth pattern of agriculture (figure 2). As the agricultural sector is dependent on rainfall which makes its growth highly volatile, it makes the GDP growth unstable. Especially, in the year 2002/03 when agricultural growth declined by 10.5%, the total GDP growth declined by 2%. The agricultural crisis in 2002/03 in Ethiopia was due to a combination of many factors among which lack of recovery from past droughts, subsequent environmental degradation, high farmer indebtedness, and deterioration in coffee prices were the major ones (Brown, 2008).

Figure 2. Volatility in GDP growth by sector (1998/99 – 2007/08)



Source: MoFED (2009)

According to MoFED (2009) estimates, the poverty head count index[5] has declined from 0.45 in 1995/96 to 0.38 in 2004/05. Even if poverty index is higher in rural than urban areas, the declining trend in national poverty index is mainly due to decline in rural poverty than urban in the past decade. Rural poverty head count index decreased from 0.47 in 1995/96 to 0.39 in 2004/2005 while urban poverty

[5] The poverty head count index shows the percentage of population living below $1 a day (MoFED, 2002).

index showed a modest increase from 0.33 to 0.35 in the same period. This is mainly because rural people spend (use their produce) more on food than non-food items while the reverse is true for urban people. This is in line with the increasing trend in calorie intake of rural people. However, it should be noted that a basket with high calorie does not necessarily mean high nutrient and vitamin content in terms of quality (MoFED, 2002).

In addition to poverty measures, health indicators give a better look into welfare status of a country. The latest Welfare Monitoring Survey[6] in Ethiopia (2004/05) indicates that 47% of children are stunted, 8.3% are wasted, and 37.1% are underweight. In all cases rural figures are higher than urban ones. The survey found that only 35.9% of the total population has access to safe drinking water. WDI (2009) reported a higher figure of 42% of the total population having access to improved water sources in 2006. This figure, however, is still lower than the Sub-Saharan Africa (SSA) average of 58.38% in the same year.

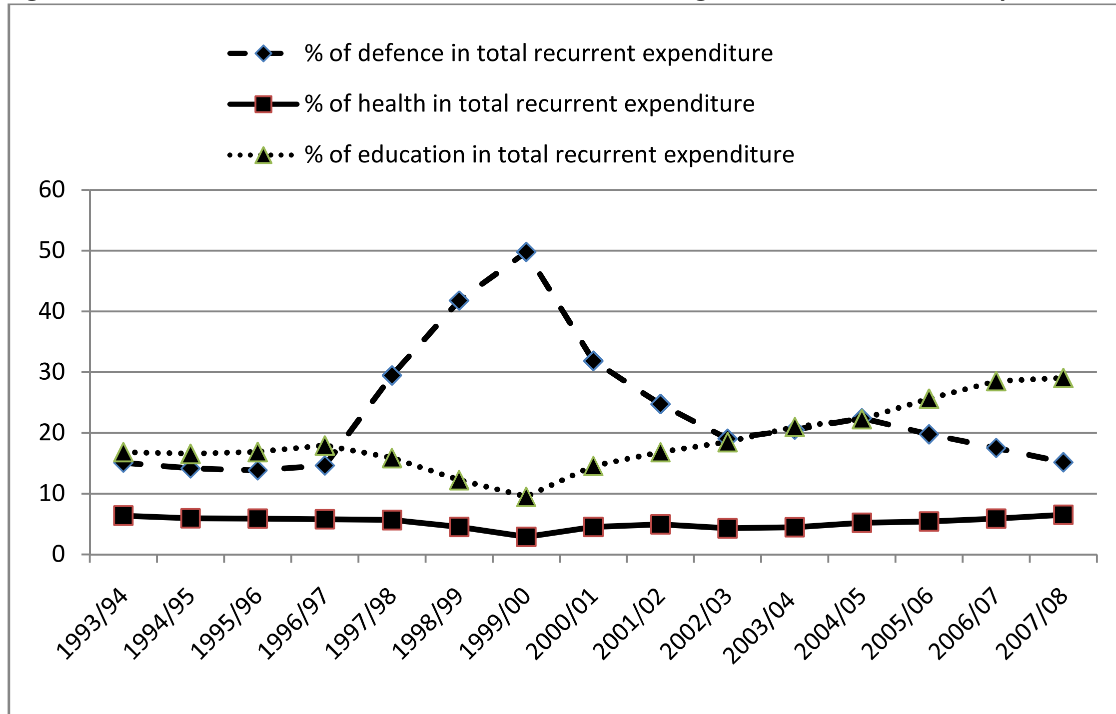
The Ethiopian Demographic and Health Survey (EDHS, 2005) recorded an infant mortality rate of 80 per 1,000 live births with higher rates in rural than urban areas. At the national level Under 5 mortality rate is 132 per 1,000 live births, 135 for rural and 98 for urban areas. According to WDI (2009) both infant and under 5 mortality rates of Ethiopia fall below the rate for SSA in 2007. However, Ethiopia is not doing well in terms of measles vaccination coverage compared to SSA. In 2007, even if WDI (2009) reported that immunization against measles in Ethiopia is 65% which is higher than the 56.8% reported by WMS (2004/2005), the figure is below the SSA average of 72.88%. In fact, the SSA average itself is below the required immunization coverage by one year of age of 90% of UNICEF and 80% of WHO.

Infectious and communicable diseases account for about 60-80% of the health problems in the country (MoH, 2009). The 2004 WMS found Malaria (23.72%) and diarrhea (13.54%) as the two major self-reported health problems. Accordingly, the government has put an emphasis on communicable diseases under the Health Sector Development Program (HSDP III) with a clear focus on poverty-related health conditions and problems that affect mothers and children (HSDP, 2005). However, even if the government has shifted focus on important problems of health, the budget allocated to health sector has not increased in the past years. In fact the share of health in total Government recurrent expenditure has remained the same while that of education increased over the years (figure 3). It is notable that during

[6] The Welfare Monitoring Survey is conducted by Central Statistical Agency (CSA) of Ethiopia using representative household sample size in all regions of the country.

the Ethio-Eritrean war defense share escalated while health and education both declined showing the effect of war on basic services.

Figure 3. Share of health, defense and education in total government recurrent expenditure



Source: National Bank of Ethiopia (2009)

4. Effects of civil war on nutrition, mortality, and vaccination coverage: CE-DAT data

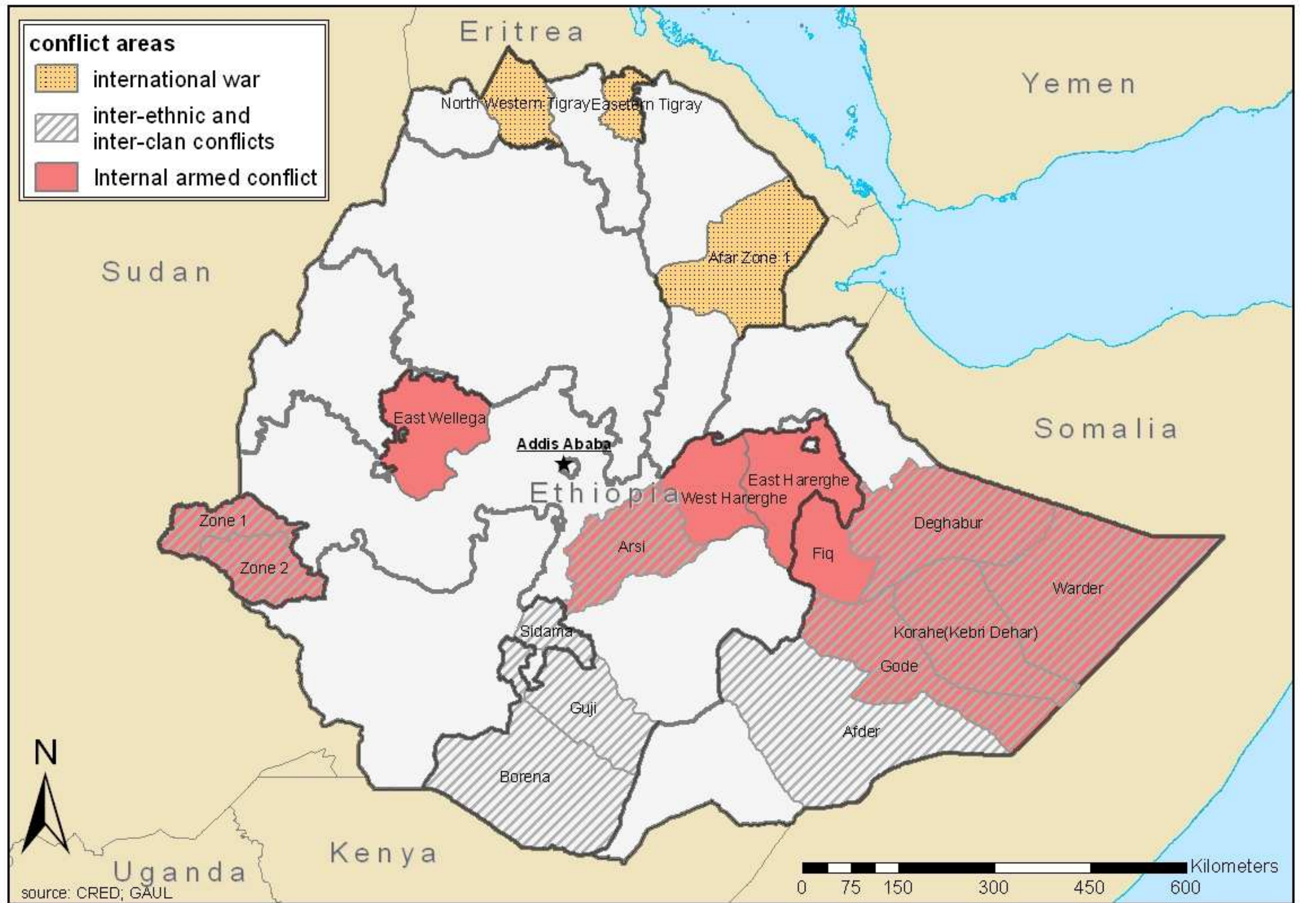
4.1 Conflict-affected areas in Ethiopia

This paper attempts to look at three types of conflicts in Ethiopia: international war, internal armed conflict, and inter-ethnic and inter-clan conflicts for the period of 1991-2008. In Ethiopia, the Ethio-Eritrean war is registered as international conflict in the period of study. As shown in figure 4, the districts where the major conflict territories are found, *Badme*, *Zalembessa*, and *Burie*, are shown as conflict affected areas on the map.

Internal armed conflicts are conflicts between opposition parties such as ONLF, OLF, and GPLM/F against the Government army. These have been occurring in Somali region between ONLF and Government army; in *Oromia* region between OLF and Government army; and in *Gambella* region between GPLM/F and Government army. Districts affected by internal armed conflict in the Somali region are *Deghabur, Fiq, Gode, Korahe* and *Warder* (IDMC, 2009). In the *Oromia* region, internal armed conflict between OLF and government army is not easily traceable. For the purpose of this study, the districts highly affected by

frequent armed conflicts are taken. These include, but are not limited to, East *Harereghe*, West *Harerghe*, *Arsi*, and East *Wellega*. In the *Gambella* region, both *Zone* 1 and *Zone* 2 are taken as districts affected by internal armed conflict.

Figure 4. Conflict areas in Ethiopia at province level



Even though inter-ethnic and inter-clan conflicts arise at different times and different places, this study considers conflicts that occur repetitively and are still unresolved over the years. Inter-ethnic and inter-clan disputes arise often based on resource ownership such as land and water or boundary demarcation. In the Somali region, the *Habar yonis* and *Idagaale* groups fight over a water reservoir and land. These and other conflicts are reported in *Afder, Deghabur, Gode, Korahe*, and *Warder* Districts. It is notable that districts such as *Deghabur, Gode, Korahe*, and *Warder* face both internal armed conflict and inter-ethnic and inter-clan disputes. In *Oromia* region the *Gabras*, *Gujis*, and *Borana* communities fight over regional territory in *Borana*, *Guji and Arsi* districts. In *Gambella* region the *Anuak* and *Nuer* ethnic groups have

conflicts over the official language of the region and resources making both districts, *Zone* 1 and *Zone* 2 areas affected by conflict.

4.2 Conflict affected population demographics of Ethiopia

Reporting the exact number of conflict affected population is challenging especially in developing countries, where access to conflict areas is restricted and statistical data base is limited. Conflict results in displacement of people from their home to another location, Internally Displaced People (IDP), and/or become refugees in another country.

A. Refugees in Ethiopia

Ethiopia hosts refugees coming from Eritrea, Somalia, Sudan, and Kenya. According to the UNHCR (2008) report, there were 83,480 refugees in Ethiopia in 2008 (table 1). More than half of the refugees coming from Somalia, Sudan and Kenya are females and people below the age of 18 years.

Table 1. Refugees in Ethiopia by origin

Origin	Total	% of female	% under 18 years
Somalia	33,600	52	62
Sudan	25,900	53	60
Eritrea	21,000	32	31
Kenya	2,600	53	58
Various	380	45	39

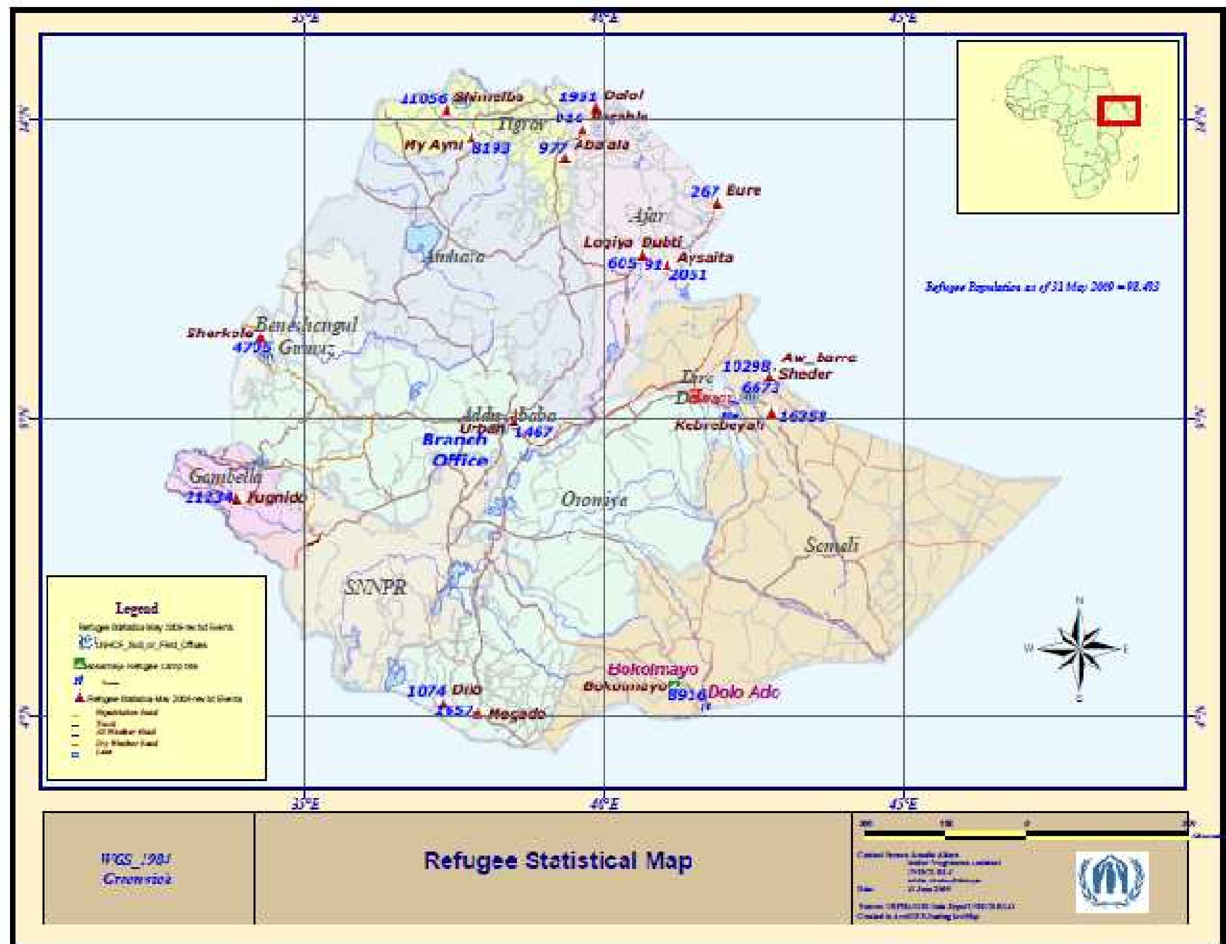
Source: UNHCR (2008)

According to UNHCR (2009) report, the number of refugees in Ethiopia has increased to 98,483 as of May, 2009. The UNHCR report shows the distribution of refugee camps in Ethiopia with number of refugees as shown in figure 5. *Fugnido* camp in *Gambella* region has the highest number of refugees in 2009, 21,234 from Sudan followed by *Kebrebeyah* camp in Somali region hosting 16,358 refugees from Somalia. *Aw-barre* camp in the same region hosts another 10,298 Somalians. *Shimelba* camp in *Tigray* region hosted a significant number of Eritreans, 11,056 by end of May, 2009.

B. Refugees out of Ethiopia

Ethiopian refugees are found in neighboring countries Kenya and Sudan and in countries categorized as main countries for Ethiopian refugees such as United States, Germany, Canada, South Africa and Yemen. The latest data accessible on the number of Ethiopian refugees and asylum applicants is for 2005 (UNHCR, 2005). In 2005, there were 59,449 Ethiopian refugees and asylum seekers in different countries. The majority were in Kenya, followed by Sudan and United States. In June 2009, UNHCR reported that the number of refugees originating from Ethiopia increased to 63,862 (UNHCR, 2009).

Figure 5. Number and distribution of refugees in Ethiopia



Source: UNHCR Statistical Map (2009)

C. Internally displaced people in Ethiopia

In Ethiopia, internal displacement have occurred due to international conflict between Ethiopia and Eritrea and internal conflict between different ethnic groups over access to political power, scarce resources, and administrative boundaries (IDMC, 2009). The Ethio-Eritrian war caused a displacement of 350,000 people from areas along the common border of *Tigray* and *Afar* regions by the end of 2000 (Dessalegn, 2004). Internal conflict-induced displacements have been mainly occurring in *Somali*, *Oromia*, and *Gambella* regions. In these regions, internal conflicts take two forms. On the one hand, conflicts between opposition parties (ONLF, OLF, and GPLM/F) and Government army cause displacement of people in areas where the conflict occurs. On the other hand, inter-ethnic and inter-clan conflicts over scarce resources, administrative boundaries, and others cause displacement of people.

The International Displacement Monitoring Center (IDMC) reported that in 2008 the number of internally displaced people in Ethiopia ranged between 200,000 – 300,000. In 2009, the UN and other international organizations estimated that over 300,000 people remain displaced by conflict or violence in Ethiopia (IDMC, 2009). For instance, inter-clan conflict between the *Nuer* and *Anuak* in *Gambella* region displaced 13,000 people (IDMc, 2009); ethnic clashes between Somali and Oromo ethnic groups over resource in an administrative boundary displaced 150,000 people (Somali and Oromia officials in IDMC, 2009).

4.3 CE-DAT data: review of database for Ethiopia

The Complex Emergency[7] Database (CE-DAT) is an international initiative that monitors and evaluates the health status of populations affected by complex emergencies. CE-DAT was created in 2003 under the Center for Research on the Epidemiology of Disasters (CRED). CE-DAT is a database of nutrition, mortality and vaccination coverage - the most commonly used public health indicators of the severity of a humanitarian crisis.

The CE-DAT database for Ethiopia is collected by various Non Governmental Organizations (NGOs), including but not limited to Concern, GOAL, Save the Children US, Save the Children UK, MSF-B, MSF-H, OXFAM, UNHCR, WFP, and World Vision from 2000-2009. The surveys in CE-DAT data base cover all regions of Ethiopia though data for some regions is available for only one year (example, *Tigray* region). For *Somali*, *SNNPR*, *Oromia* and *Amhara* regions data on nutrition, mortality and vaccination coverage are available throughout 2000-2008. However, surveys in *Benishangul Gumuz*, *Gambella* and *Afar* regions are scarcely done in the period of consideration. Hence, the analysis on the health indicators will be limited to these four regions in relation to conflict areas and the period 2000-2008. The database has many surveys carried out in Somali region. This is probably because of the high need for intervention in the region, many pre and post-intervention assessment studies are done as compared to other regions. All surveys in Amhara and SNNPR region are carried out among residents while a few surveys are available among refugees and internally displaced populations (IDPs) in Somali and Oromia region.

[7] Complex emergency refers to all crisis characterized by extreme vulnerability that display a combination of the following features: a) government is unwilling or incapable to effectively respond, resulting in a need for external assistance; b) political oppression or armed conflict; c) displacement; and d) increased mortality (CE-DAT Complex Emergency Data base, 2009).

4.4. CE-DAT Survey Results

4.4.1. Nutrition

As of December 15, 2009, CE-DAT has received 208 validated[8] surveys with Global Acute Malnutrition (GAM)[9] representing residents, IDPs, IDP-residents, and refugees in all regions of Ethiopia. In the years from 2000-2007, Somali region has the highest GAM ranging from a maximum of 43.18% in 2001 to 12.96% in 2004 (table 2). Compared to the other three regions, Somali region, with six of its nine regions affected by conflict, has a critical nutrition situation with a GAM value[10] greater than 15% throughout 2000-2008 except in 2004 and 2008. In contrast, a GAM of above 15% was registered only once in SNNPR region in 2000 and never in all other regions.

Comparing GAM values among refugees, IDPs and residents, the only survey available for refugees in Somali region, in *Kebribeyah* camp reported a value of 9.1%. This value is quite low compared to GAM values of residents in previous years. This seems to indicate that refugees are actually better-off in nutrition as they get humanitarian assistance in camps than those outside camps. However, meaningful comparison could not be made because of lack of surveys on residents in Somali region in the same year. IDP and IDP residents are found to have higher GAM value as compared to residents in Somali region in all the years that survey is available. In Oromia region, survey on refugees and residents in 2007 in conflict affected areas showed that GAM is higher among refugees than residents. The GAM for residents in East *Hararghe* and West *Hararghe* is reported at 6.9% and 8.6% while it is 13.5% for refugees in *Borana* district.

Table 2. Average GAM (%) among children 6-59 months for four regions of Ethiopia based on CE-DAT database (2000-2008)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Amhara	10.80 (1)	10.60 (3)	14.13 (4)	9.78 (6)	NA	14.30 (3)	11.30 (2)	11.35 (4)	12.83 (3)
Oromia	10.80 (5)	9.53 (3)	6.80 (1)	10.31 (7)	6.00 (3)	6.83 (3)	7.76 (7)	9.67 (3)	10.87 (3)
SNNPR	19.30 (6)	2.80 (1)	10.30 (4)	11.41 (8)	7.80 (1)	7.56 (7)	3.70 (2)	3.48 (5)	12.38 (8)
Somali	35.64 (18)	43.18 (5)	27.50 (2)	19.32 (13)	12.96 (12)	18.79 (7)	20.41 (11)	15.70 (2)	9.10 (1)

Source: Complex Emergency Database (CE-DAT), CRED Brussels (2009)
Numbers in brackets are number of surveys on which average GAM is calculated.

[8] The surveys received by CRED are classified as validated and pending. For this study, only the validated surveys are used.
[9] Global Acute Malnutrition (GAM) is an index measuring weight-for-height, reflecting recent weight loss or gain; which is the best indicator of wasting. GAM calculated using z-scores (defined as weight-for-height index less than -2 standard deviations from the median weight of the reference distribution for children of the same height and/or having oedema) were used for the analysis.
[10] A GAM Z-score <5% is acceptable; 5-10% is poor; 10-15% is serious (emergency); and ≥15% is critical (WHO standard)

Looking at the number of surveys by GAM severity, Somali region has 81.7% of surveys reporting a value >15% and 16.9% reported a serious nutrition situation (table 3). In Amhara region, 76.92% of total surveys reported a serious nutrition situation while none reported critical situation in both Amhara and Oromia regions. In Oromia region, majority surveys reported poor situation. In SNNPR, surveys reported critical situation, 14.29% and the majority 47.62% reported serious situation.

Table 3. Summary of number of surveys by GAM severity for four regions of Ethiopia, based on CE-DAT database (2000-2008)

	Acceptable (<5%)	Poor (5-9.9%)	Serious (10-14.9%)	Critical (>15%)
Amhara	0 (0 %)	6 (23.08%)	20 (76.92%)	0 (0%)
Oromia	0 (0%)	20 (57.14)	15 (42.86%)	0 (0%)
SNNPR	8 (19.05%)	8 (19.05)	20 (47.62%)	6 (14.29%)
Somali	0 (0%)	1 (1.41)	12 (16.9%)	58 (81.69%)

Source: Complex Emergency Database (CE-DAT), CRED Brussels (2009)
Numbers in brackets are percentage of total surveys.

The high number of NGO surveys carried out in Somali region implies that the GAM values reported seem to reflect, on average, the reality at the ground level. This can be verified by comparing average GAM results of CE-DAT database with official figures of EDHS in 2000 and 2005 (table 4). It is notable that the GAM values are comparable for all the four regions except Somali region. The difference in absolute values of GAM between EDHS and CE-DAT surveys of Somali region could perhaps be due to differences in sample areas. However, both sources confirm that GAM in Somali region surpasses the 15% critical nutrition situation.

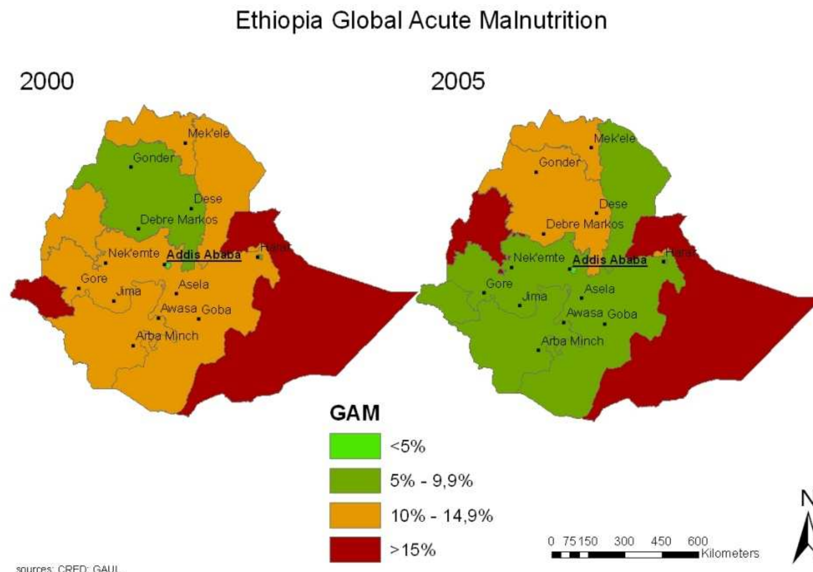
Table 4. Comparison of EDHS and CEDAT data - GAM (%)

	2000		2005	
	CE-DAT	EDHS	CE-DAT	EDHS
Amhara	10.8	9.5	14.3	14.2
Oromia	10.8	10.4	6.83	9.6
SNNP	19.3	11.8	7.56	6.5
Somali	35.64	15.8	18.79	23.7

Source: EDHS (2000 & 2005) and CE-DAT (2009)

Figure 6 compares GAM severity among regions of Ethiopia using official EDHS statistics in 2000 and 2005. The figure shows that Somali region has a GAM surpassing the critical acute nutrition situation in both 2000 and 2005. According to the EDHS, Somali and *Gambella* regions recorded a GAM greater than 15% in 2000. In 2005, while the GAM for *Gambella* region dropped to 6.8%, GAM in Somali region increased to 23.7% in 2005 from 15.8% in 2000, worsening the critical situation in the region. In 2005, *Benishangul-Gumuz* joined the GAM level of critical situation compared to its 2000 figure.

Figure 6. Global Acute Malnutrition in Ethiopia (EDHS, 2000 and 2005)



In general, in any survey considered; whether official survey or CE-DAT surveys, Somali region is found to have a critical acute malnutrition situation. A close look at the CE-DAT data base on the areas where critical acute malnutrition is recorded in the region, areas of inter-ethnic and inter-clan conflicts and internal armed conflicts such as *Fiq*, *Gode*, *Afder*, *Warder*, *Deghabur* and *Korahe* are found to have a high GAM compared to areas of relative stability such as *Shinele*. For instance, the average GAM for 8 surveys covering 4 areas in *Shinele* district gives an average of 11.15% while 5 surveys covering 5 areas in *Fiq* district gives an average of 32.38%. Even though it is difficult to attribute the high GAM value in *Fiq* only to internal armed conflict, it could be a possible contributor for the high GAM in the area. Conflict disrupts trade, transport, and social services and above all it hampers humanitarian access. For instance, it is a recent phenomenon that MSF-Swiss withdrew from providing medical care to vulnerable people in *Fiq* district due to repeated administrative hurdles and intimidation (IRIN, 2009).

4.4.2. Mortality

As of December, 2009, CE-DAT has 156 validated surveys on Crude Mortality Rate (CMR) and 153 validated surveys on Under 5 mortality rate representing residents, IDPs, IDP-residents, and refugees.

A. Crude Mortality Rate

The average CMR for Somali region is found to be above the WHO emergency threshold of 1 death per 10,000 people/day in the years 2000, 2003, and 2006 (table 5). The highest average CMR of 4.86 is reported by 6 surveys in 2000 in *Gode*, one of the conflict affected areas, on residents, IDPs and IDP residents. The only survey available for CMR of refugees in Somali region is done in *Kebribeyah* in 2008

reporting a CMR of 0.37. This is comparable with a CMR of 0.54 among refugees in 2007 in *Borana* district of Oromia region.

Table 5. Average CMR (per 10,000 per day) for four regions of Ethiopia, based on CE-DAT database (2000-2008)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Amhara	0.50 (1)	0.58 (3)	0.78 (4)	0.55 (5)	NA (0)	0.28 (3)	0.40 (2)	0.27 (4)	0.25 (2)
Oromia	0.53 (4)	0.93 (3)	0.48 (1)	0.52 (6)	0.79 (3)	0.25 (3)	0.23 (7)	0.30 (3)	0.29 (3)
SNNPR	1.33 (3)	0.30 (1)	0.53 (4)	0.68 (7)	0.39 (1)	0.22 (7)	0.21 (3)	0.15 (5)	0.41 (8)
Somali	4.86 (6)	0.11 (2)	0.15 (1)	1.19 (5)	0.41 (12)	0.83 (3)	1.04 (10)	0.41 (2)	0.37 (1)

Source: Complex Emergency Database (CE-DAT), CRED Brussels (2009)
Numbers in brackets are number of surveys on which average GAM is calculated.

From the surveys on CMR, both Amhara and Oromia regions have CMR at acceptable level by WHO threshold, while SNNPR has 92% of surveys at acceptable and 7.69% of surveys at alert situation (table 6). In Somali region, half of the surveys reported acceptable situation, and the other half recorded alert (35.71%) and crisis (14.29%) situations.

Table 6. Summary of number of surveys by CMR severity for four regions of Ethiopia, based on CE-DAT database (2000-2008)

	Acceptable (≤1)	Alert (1-2)	Crisis (≥2)
Amhara	24 (100%)	0 (0 %)	0 (0%)
Oromia	33 (100%)	0 (0%)	0 (0%)
SNNPR	36 (92%)	3 (7.69%)	0 (0%)
Somali	21 (50%)	15 (35.71%)	6 (14.29%)

Source: Complex Emergency Database (CE-DAT), CRED Brussels (2009)
Figures in brackets are percentage of total surveys.

B. Under Five Mortality Rate (U5MR)

The average U5MR of all surveys in Amhara region falls under the WHO threshold of 2 deaths per 10,000 people/day. Oromia region has recorded U5MR above 2 in the years 2001 and 2004 while it is in 2000 and 2002 that U5MR was above 2 for SNNPR region (table 7). For Somali region, the average U5MR is above the WHO threshold in the years 2000-2006, with the exception of 2001 and 2004. The highest average U5MR of 4.34 is reported in Somali region in 2005 with two surveys carried among IDPs in *Jijiga* district and one survey among residents in *Degehabur* district, one of the conflict affected areas in the region.

Table 7. Average U5MR (per 10,000 per day) for four regions of Ethiopia, based on CE-DAT database (2000-2008)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Amhara	0.84 (1)	1.23 (3)	1.77 (4)	1.08 (5)	NA	0.58 (3)	0.14 (2)	0.57 (4)	0.34 (2)
Oromia	0.80 (4)	2.10 (3)	1.70 (1)	1.17 (6)	2.24 (3)	0.52 (3)	0.46 (7)	0.89 (3)	0.83 (3)
SNNPR	2.27 (3)	0.80 (1)	2.55 (4)	1.87 (7)	0.81 (1)	0.60 (7)	0.49 (3)	0.31 (5)	1.29 (8)
Somali	3.56 (3)	0.26 (2)	2.80 (2)	4.24 (5)	1.62 (12)	4.34 (3)	3.58 (10)	0.93 (2)	0.94 (1)

Source: Complex Emergency Database (CE-DAT), CRED Brussels (2009)
Numbers in brackets are number of surveys on which average GAM is calculated.

Comparison of U5MR among refugees and residents shows that refugees are better off as they get better assistance by humanitarian workers in camps. For instance, a survey on refugees in *Kebribeyah* reported a relatively lower U5MR of 0.94. In addition, Amhara region has all surveys reporting acceptable level by WHO threshold, while Oromia and SNNPR regions have 81% and 82% of surveys at acceptable level, respectively (table 8). In Somali region, only 42% of the surveys reported acceptable situation, while 37% reported alert and 20% crisis situations.

Table 8. Number of surveys by U5MR severity for four regions of Ethiopia, based on CE-DAT database (2000-2008)

	Acceptable (≤2)	Alert (2-4)	Crisis (≥4)
Amhara	24 (100%)	0 (0%)	0 (0%)
Oromia	27 (81%)	6 (18 %)	0 (0%)
SNNPR	32 (82%)	7 (17%)	0 (0%)
Somali	17 (42%)	15 (37%)	8 (20%)

Source: Complex Emergency Database (CE-DAT), CRED Brussels (2009)
Numbers in brackets are percentage of total surveys.

4.4.3. Measles Vaccination Coverage

As of December 15, 2009, CE-DAT has received 144 validated surveys with data on measles vaccination coverage (MCV) among children (9-59 months) representing residents, IDPs, IDP-residents, and refugees in all regions of Ethiopia. Unlike the other health indicators, 3 surveys in *Somali* region reported measles vaccination coverage meeting UNICEF requirement of 90% in 2002 and 2008 (table 9). A closer look at the surveys in the region for these two periods shows that the surveys were done on IDPs in *Jijiga* district in *Hartisheik* camp and on refugees in *Kebribeyah* camp. Hence, the high figures of vaccination coverage in Somali region should be taken with care as they do not represent residents. The survey results for Oromia and SNNPR show that vaccination coverage is below the WHO requirements for most of the study years.

Table 9. Average MCV coverage (%) for four regions of Ethiopia, based on CE-DAT database (2000-2008)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Amhara	82.90 (1)	62.60 (3)	86.00 (1)	81.20 (6)	NA	78.33 (3)	88.40 (2)	58.80 (2)	80.95 (2)
Oromia	51.55 (2)	6.80 (1)	70.00 (1)	46.53 (3)	82.80 (3)	60.10 (3)	39.63 (3)	53.20 (3)	50.37 (3)
SNNPR	39.53 (3)	15.90 (1)	45.30 (4)	64.66 (7)	73.20 (1)	62.57 (6)	16.90 (2)	67.68 (4)	76.31 (8)
Somali	38.25 (4)	88.20 (1)	94.50 (2)	13.11 (13)	62.58 (12)	31.21 (7)	13.95 (4)	NA	98.60 (1)

Source: Complex Emergency Database (CE-DAT), CRED Brussels (2009)
Numbers in brackets are number of surveys on which average GAM is calculated.

The majority of surveys in Oromia and SNNPR show vaccination coverage below 80%, while 60% of surveys in Amhara report above 80% coverage meeting the WHO requirement. However, none of the surveys in Amhara, Oromia and SNNPR regions show that vaccination coverage meets the UNICEF requirement (table 10).

Table 10. Number of surveys by MCV coverage requirements of UNICEF and WHO for four regions of Ethiopia, based on CE-DAT database (2000-2008)

	UNICEF (≥90% coverage)	WHO (≥80% coverage)	<80% coverage
Amhara	0 (0%)	12 (60%)	8 (40%)
Oromia	0 (0%)	3 (13.64%)	19 (86.36%)
SNNPR	0 (0%)	0 (0%)	36 (100%)
Somali	3 (6.82%)	4 (9.09%)	40 (90.91%)

Source: Complex Emergency Database (CE-DAT), CRED Brussels (2009)
Numbers in brackets are percentage of total surveys.

Vaccination coverage among refugees and residents shows an interesting comparison. In 2007, a survey on refugees in *Borana* district of Oromia region reported 65.9% coverage while the average for 2 surveys among residents in the same region is 46.85%. This indicates that vaccination coverage among refugees is far better than residents in Oromia region. It was not possible to make similar comparison for Somali region due to lack of survey on residents in 2008. However, a survey on refugees in the same year in *Kebribeyah* found vaccination coverage of 98.6% which attests to the fact that refugees have better vaccination coverage in both regions.

5. Conclusion

Ethiopian has gone through various forms of conflicts which affect the healthy growth of the country both economically and socially. This study attempted to take stock of nutrition, mortality and vaccination coverage in conflict affected areas using CE-DAT database. The study found that Somali region with six of its 9 districted affected by war has registered critical nutrition situation and crisis mortality situations. In terms of vaccination coverage, the region seems to be doing well in aggregate terms. However, disaggregating the type of households considered in the surveys showed that vaccination coverage among residents fall far below the WHO immunization requirement while refugees have a high coverage. Meaningful comparison of health status among refugees, IDPs and residents was not possible due to lack of surveys. However, it is vital to distinguish different categories of households as humanitarian and development interventions need to target these household groups differently. Given that conflict and civil war impede such interventions, it is important to consider the contribution of such factors while developing health programs in war-affected regions of Ethiopia.

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