Mortality and health among internally displaced persons in western Kenya following post-election violence, 2008: novel use of demographic surveillance

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Objective To evaluate mortality and morbidity among internally displaced persons (IDPs) who relocated in a demographic surveillance system (DSS) area in western Kenya following post-election violence.

Methods In 2007, 204 000 individuals lived in the DSS area, where field workers visit households every 4 months to record migrations, births and deaths. We collected data on admissions among children < 5 years of age in the district hospital and developed special questionnaires to record information on IDPs. Mortality, migration and hospitalization rates among IDPs and regular DSS residents were compared, and verbal autopsies were performed for deaths.

Findings Between December 2007 and May 2008, 16 428 IDPs migrated into the DSS, and over half of them stayed 6 months or longer. In 2008, IDPs aged 15–49 years died at higher rates than regular residents of the DSS (relative risk, RR: 1.34; 95% confidence interval, CI: 1.004–1.80). A greater percentage of deaths from human immunodeficiency virus (HIV) infection occurred among IDPs aged ≥ 5 years (53%) than among regular DSS residents (25–29%) ($P < 0.001$). Internally displaced children < 5 years of age did not die at higher rates than resident children but were hospitalized at higher rates (RR: 2.95; 95% CI: 2.44–3.58).

Conclusion HIV-infected internally displaced adults in conflict-ridden parts of Africa are at increased risk of HIV-related death. Relief efforts should extend to IDPs who have relocated outside IDP camps, particularly if afflicted with HIV infection or other chronic conditions.

Une traduction en français de ce résumé figure à la fin de l'article. *Al final del artículo se facilita una traducción al español.* الترجمة العربية لهذه الخلاصة في نهاية النص الكامل لهذه المقالة.

Introduction

Following the contentious presidential elections held in Kenya on 27 December 2007, violence and civil unrest erupted throughout the country and lasted for several months. During that time, over 1000 people were killed and 350 000 were displaced from their homes.[1,2] The election pried open long-standing tribal divisions that forced people of certain ethnic groups living in areas dominated by rival ethnic groups to flee. Many of these internally displaced persons (IDPs) went into IDP camps, but even more of them returned to their "ancestral homelands", where their ethnic group constituted the majority. The Luos were one of the ethnic groups most affected by the post-election violence. Many Luos fled from areas in Nairobi, the Rift Valley, and central Kenya, where they lived and worked, to their ancestral homeland in western Kenya along Lake Victoria. There, many relocated in an area with a large, ongoing demographic surveillance system (DSS) that the Kenya Medical Research Institute (KEMRI) and the Centers for Disease Control and Prevention (CDC) have maintained since 2001. The KEMRI/CDC DSS provided a unique platform for measuring the health and demographic consequences of the Kenyan post-election violence on the IDPs resettling outside IDP camps.

Methods

The KEMRI/CDC DSS includes three areas in Nyanza province, in rural western Kenya – Asembo, Gem and Karemo. In 2007, the DSS population included 204 000 people who lived in 384 villages, and 15% of them were < 5 years old. Over 95% of the population is of Luo ethnicity and depends on subsistence farming. The area is very poor; two-thirds of the people live below the poverty line.[3] Malaria transmission is high and perennial, although the area has had high coverage with insecticide-treated bednets since the late 1990s, when a study with bednets was conducted there.[4] In 2007, the area had infant and under-5 mortality rates of 74 and 137 per 1000 live births, respectively. The prevalence of HIV infection in Nyanza province is the highest in Kenya.[5,6] According to a cross-sectional survey in Asembo, in 2003–2004 the prevalence of HIV infection in the DSS was 15.4% among people aged 13 to 34 years.[7]

The surveillance methods employed in the DSS area have been described in detail elsewhere.[8] In brief, trained field workers census all households 3 times per year and record all in-migrations, out-migrations, pregnancies, births and deaths. To be defined as a DSS resident, a person must have resided in the DSS area for at least 4 continuous months or been born to a DSS resident mother. For every death reported, a separate team attempts to conduct a verbal autopsy using a structured questionnaire based on a standardized version suggested for DSS sites around the world.[9–12] Single causes of death are assigned by clinical officers (2 years of medical education after secondary school) who independently evaluate verbal autopsy questionnaires and apply the coding system of the *International classification of diseases, 10th revision* in a standardized way.[13]

As part of the DSS, surveillance for paediatric admissions is undertaken at Siaya District Hospital, located within the DSS. Trained DSS surveillance staff interview caretakers and a clinical officer conducts a standardized physical examination. Trained KEMRI/CDC microscopists perform Giemsa-stained malaria blood smears on all children admitted to hospital.

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(*Submitted: 14 July 2009 – Revised version received: 20 October 2009 – Accepted: 16 December 2009 – Published online: 10 May 2010*)

In this study, IDPs were defined as persons who were forced or obliged to flee or to leave their home or places of habitual residence due to the post-election violence in Kenya, since the elections of 27 December 2007. Because newly-arrived IDPs do not meet DSS residency criteria, we developed new data collection tools for IDPs to be employed during the regular DSS census rounds that are conducted three times a year. In each DSS compound, field workers asked the DSS resident responding for the compound if any IDPs lived there using a DhoLuo translation of the definition given above. IDPs were registered during the first two DSS rounds of 2008 (which comprised the periods from January to April and from May to August). In the second and third DSS rounds of 2008, the vital status and whereabouts of the IDPs previously registered were updated and the dates of out-migration and death were recorded. All reported IDP deaths were further investigated by field workers for verification. By the third round, updated status was available on 93% of the IDPs identified in the first two rounds; the remaining 7% of the IDPs had registration data containing random errors that resulted in their names not appearing in the personal digital assistant used for updating in the third round. For all children admitted to Siaya District Hospital, the interviewer asked the caretaker if the child was an IDP.

All data obtained in the first DSS round of 2008 and in the hospital were entered into scannable forms (Cardiff Teleforms, Vista, United States of America). Multiple data quality checks were performed.[8] Beginning in the second round of 2008, all data collection, including for all IDPs, was transitioned to personal digital assistants.

Deaths reported among IDPs were excluded from mortality rate calculations if on further inspection the individual had died before arriving at or after leaving the DSS, or if the death could not be verified by someone in the compound. Because we wanted to assess mortality during the period of greatest IDP resettlement, we limited mortality rate calculations to the 6 months following the median date of IDP arrival, which was 23 January 2008. As such, all deaths that occurred after 23 July 2008 were excluded. The person-time contribution of each IDP began on the date of arrival in the DSS or on 27 December 2007, the date of the election, for those who had already arrived and could not return home due to the violence ($n = 211$). Person-time contribution ended with date of death or out-migration, the date of the second round update if the third round update was missing ($n = 50$), or 23 July 2008. IDPs without an updated status in either the second or third round were excluded from the calculation of mortality rates. Mortality rates among DSS residents were calculated during a similar period, 1 January to 23 July 2008. Because mortality among DSS residents might also have been affected by post-election violence, DSS mortality rates from 1 January to 23 July 2007 were also used for comparison. Mortality rate ratios with 95% Wald confidence intervals (CIs) between IDPs and DSS residents were calculated using Poisson regression in SAS software, version 9.1 (SAS Institute Inc., Cary, USA).

Because of differences in the age distribution of IDPs and DSS residents, a standardized mortality ratio (SMR) was calculated for overall mortality using the indirect method, with the DSS population used as the standard population.[14] We excluded neonates (≤ 28 days) from the under-5 mortality rate calculations because IDP neonates ($n = 6$) were only registered on arrival to the DSS; new births to IDP mothers were not identified after arrival. Therefore, neonatal deaths would have contributed to mortality rates for DSS residents but not for IDPs. To explore whether the increases in mortality among adult IDPs could be related to their in-migrant status we compared the overall mortality rate among IDPs ≥ 15 years of age with the rate among recent in-migrants who became DSS residents during the same period in 2007. However, in 2007 mortality data was available only for in-migrants who became DSS residents (i.e. who had lived in the area for 4 months); thus, person–time contribution and deaths before the age of 4 months would not have been included.

For analysis of hospitalizations, we included children < 5 years of age from the two DSS divisions, Gem and Karemo, served by Siaya District Hospital. The period of inclusion was from 7 March, when IDP identification in hospital was implemented, to 23 July 2008. The denominator for IDP hospitalization rates was calculated as described above for mortality rates and was limited to internally displaced children < 5 years of age registered in Gem and Karemo. For comparison, hospitalization rates for resident children from Gem and Karemo were used. We stratified comparisons of proportions by age using the Cochran–Mantel–Haenzel test, and we compared medians using the Wilcoxon rank-sum test.

The KEMRI/CDC DSS was approved by the ethical review boards of KEMRI (SSC #647) and CDC (IRB# 3308). All heads of participating compounds gave written informed consent. Data collection on IDPs was approved as an amendment to the protocol.

Results

In the DSS area, 16 428 IDPs were registered. Of 36 518 compounds, 5135 (14%) reported the presence of an IDP, and the median number of IDPs per compound was 5 (interquartile range, IQR: 2–6). From 27 December 2007 to 26 March 2008, when 96.3% of all arrivals occurred (Fig. 1), the rate of IDP in-migration was 289 per 1000 resident person–years, compared with regular DSS in-migration of 138 per 1000 person–years during the first 3 months of 2007 (relative risk, RR: 2.10; 95% CI: 2.03–2.16). Most IDPs came from Rift Valley (37.1%) and Nairobi provinces (31.4%). The median time that IDPs had lived in their last place of residence was 4.0 years (IQR: 2–9). The median age was 18.2 years; 21% of IDPs were < 5 years of age and 10.4% were < 1 year old. IDPs were equally distributed in terms of sex.

By the third DSS round of 2008, completed from September to December, 15 253 (93%) IDPs had their status updated. Of these, 120 (0.79%) had died, 7143 (46.8%) had left the DSS, 7072 (46.4%) still stayed in the compound where they were registered, and 918 (6.0%) had moved into another compound in the DSS. The median time spent in the DSS by those who left was 111 days (IQR: 85–133).

Of the 120 deaths, 96 occurred on or before 23 July 2008. The overall mortality rate among IDPs was 16.4 per 1000 person–years (Table 1). Overall, 0.45 IDP deaths occurred per 10 000 persons per day. As shown in Fig. 2, the median number of days from arrival until death was 96 for internally displaced children < 5 years of age ($n = 37$) compared with 68 for IDPs aged ≥ 5 years ($n = 59$) ($P = 0.011$). The mortality rate was significantly higher among IDPs aged 15–49 years than among 2008 DSS residents of the same age (RR: 1.34; 95%

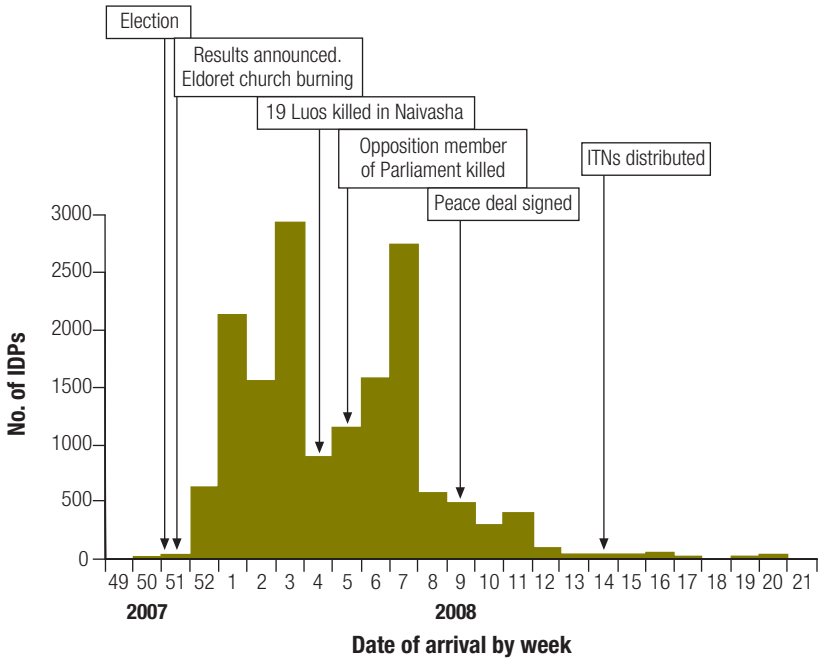
CI: 1.004–1.80, $P = 0.047$), as shown in Table 1. The mortality rate among adult IDPs in 2008 was significantly higher than among DSS adult in-migrants in 2007 (SMR: 1.71; 95% CI: 1.31–2.11).

While post-neonatal mortality rates among internally displaced and DSS children did not differ in 2007, in 2008 the post-neonatal mortality rate was lower among internally displaced children aged 0–4 years (RR: 0.70; 95% CI: 0.50–0.97), as displayed in Table 1. The mortality rate among DSS children < 5 years of age was significantly higher in 2008 than in 2007 (RR: 1.57; 95% CI: 1.42–1.74).

According to the results of verbal autopsies, the leading causes of death among internally displaced children < 5 years of age, excluding neonates, were malaria (31%), HIV infection (20%), tuberculosis (20%) and malnutrition (17%), as shown in Table 2. The causes of death were similar among DSS children, except that tuberculosis was more frequent among IDPs ($P < 0.05$). The leading causes of death among IDPs aged ≥ 5 years were HIV infection (53%), malaria (15%) and tuberculosis (15%). The percentage of deaths due to HIV infection was higher among IDPs than among DSS residents in both 2007 (29%) and 2008 (25%) ($P < 0.001$). The percentage of HIV-related deaths was higher among IDPs in every adult age group, excluding that of 5–14 year olds. Malaria was a more frequent cause of death among IDPs than among DSS residents ≥ 5 years of age in 2008 ($P = 0.041$).

As shown in Table 3, the rate of hospitalization among internally displaced children was almost three times higher than among non-displaced children (RR: 2.95; 95% CI: 2.44–3.58). Danger signs on admission were present in 68% of internally displaced children versus 59% of resident children ($P = 0.04$). There were no significant differences between them in terms of diagnoses, malaria parasitemia or parasite density. The proportion of children who died among those admitted to hospital for any cause was similar for internally displaced and for resident children upon stratifying by age ($P = 0.24$).

Fig. 1. **Date of arrival, by week, of internally displaced persons relocated to the demographic surveillance system area of the Kenya Medical Research Institute and the Centers for Disease Control and Prevention, 2007–2008**



IDP, internally displaced person; ITN, insecticide-treated net.

Discussion

The KEMRI/CDC DSS provided a unique platform for evaluating long-term IDP status outside camps because IDPs could be registered and followed and compared with a contemporaneous population in the same geographical area in terms of prospective population-based mortality and morbidity rates. The influx of IDPs after the Kenyan post-election violence created a sudden population swell in an impoverished area with substantial ongoing health problems.[5,8] While IDP camps, located primarily in the Rift Valley province, received external resources to accommodate the influx of IDPs, fewer resources were available to communities where IDPs were resettling, such as those in western Kenya.[1] Emergency situations where the majority of IDPs do not go to IDP camps are becoming more common in Africa.[15]

The overall mortality rate among IDPs did not reach the 1.0 death per 10 000 persons per day threshold defined for complex emergency situations. It did not represent a doubling of the baseline mortality rate either, although we excluded IDP deaths before arrival in the DSS.[15–17] Luos were targeted in other parts of the country, where atrocities such as mob lynching and burning of safe havens were perpetrated.[1,2,18] Once they reached Nyanza province, where they are in the majority, the risk of direct violence ceased. In Rwanda and Darfur, IDPs had to walk for weeks to IDP camps; however, in post-election Kenya IDPs were transported to their destinations in buses and other vehicles.[15,17,19] After brief stays in transit centres, many IDPs went directly to stay with family and friends. Their rapid transit to a more stable home environment probably led to their enjoying better conditions upon arrival than other IDPs in Africa.[15,17,19–23]

Mortality among adult IDPs was elevated compared with that of resident adults in 2008. While children are usually the most vulnerable group in complex emergencies in Africa, increased non-violence-related mortality among adults has been observed before during crises in more developed countries, such as Kosovo, where people with chronic diseases often go untreated due to lack of access to care.[15,17,19] To our knowledge, there has been no such finding in conflict situations in Africa, where most excess adult mortality is related to violence or acute infections rather than to chronic illnesses.[15,19–22] Rates of HIV infection among IDPs and refugees in Africa can be high, although not necessarily higher than in the communities of origin[24–28]. In our analysis, the majority of adult IDP deaths were ascribed to HIV infection, which accounted for a larger proportion of deaths among IDPs than among DSS residents. However, the high prevalence of HIV infection among IDPs who arrived in the DSS was a pre-existing condition unre-

lated to their IDP status and was probably more closely tied to sociocultural factors. The Luos, who do not traditionally practice male circumcision, have the highest prevalence of HIV infection of all ethnic groups in Kenya.[5,6,29] It is unlikely that IDPs who settled in the DSS area had a higher prevalence of HIV infection than the DSS resident population. From the 2007 Kenya AIDS Indicator Survey, the prevalence of HIV infection among Luo adults aged 15–64 years living inside and outside Nyanza province was similar (20.8% versus 19.2%, respectively). Such prevalence was over threefold higher than among non-Luos living in provinces other than Nyanza.[6] As virtually all Luos were forced to flee from certain areas of the country due to the threat on their lives during post-election violence, there is no reason for thinking that HIV+ IDPs preferentially returned to western Kenya. Such IDPs may have experienced interruptions in their drug supply, however, as occurred in other parts of Kenya during this crisis.[30,31] HIV+ IDPs might have found it more difficult to adhere to medications than DSS residents because they may have left them behind in their rapid exodus and been unable to access HIV-related care in the areas where they settled. Moreover, most health facilities in Nyanza province reported staff and supply shortages during the post-election violence.[30] For HIV+ IDPs already on long-term antiretroviral therapy, the temporary disruption of medications is not likely to have caused a clinically significant decline in the CD4+ lymphocyte count over the ensuing 6-month period. However, HIV+ IDPs who were not on antiretroviral therapy or who had started it recently could have been put at risk of fatal opportunistic infections, such as *Pneumocystis jirovecii* pneumonia, by a disruption in daily cotrimoxazole prophylaxis in particular.[32] We cannot definitely determine the cause of increased mortality among HIV+ IDPs since one limitation of the study was that we did not collect data on whether HIV+ IDPs were on medications or had their supply of medications disrupted. Nonetheless, other studies have shown that HIV+ persons can be treated successfully in conflict settings, although the challenges of maintaining and initiating HIV care in rural, non-camp settings like western Kenya are greater than in urban settings or IDP camps where the population is more confined and accessible.[24,25,27,30,31]

Table 1. **Deaths and mortality rates among persons internally displaced to a demographic surveillance system area in western Kenya (2007–2008) and among regular residents of the area (1 January to 23 July 2007 and 1 January to 23 July 2008)**

Age group (in years)	IDPs				DSS residents		IDP versus DSS 2007 mortality rate		IDP versus DSS 2008 mortality rate	
	No. of deaths	Deaths per 10 000 persons per day	Person–years of observation	Mortality rate[a]	Mortality rate[a] 2007	Mortality rate[a] 2008	RR	95% CI	RR	95% CI
< 5[b]	37	0.81	1248	29.53	24.69	42.40	1.20	0.85–1.69	0.70	0.50–0.97
5–14	3	0.056	1466	2.05	2.28	2.61	0.90	0.28–2.87	0.78	0.25–2.48
15–49	49	0.37	3009	16.29	12.51	12.13	1.30	0.97–1.75	1.34	1.004–1.80
≥ 50	7	1.6	119	58.77	38.13	39.68	1.54	0.73–3.25	1.48	0.70–3.12
All ages	96	0.45	5869	16.36	15.11	18.14	1.08	0.88–1.33	0.90	0.74–1.11
SMR[c]							1.33	1.06–1.60	1.01	0.81–1.22

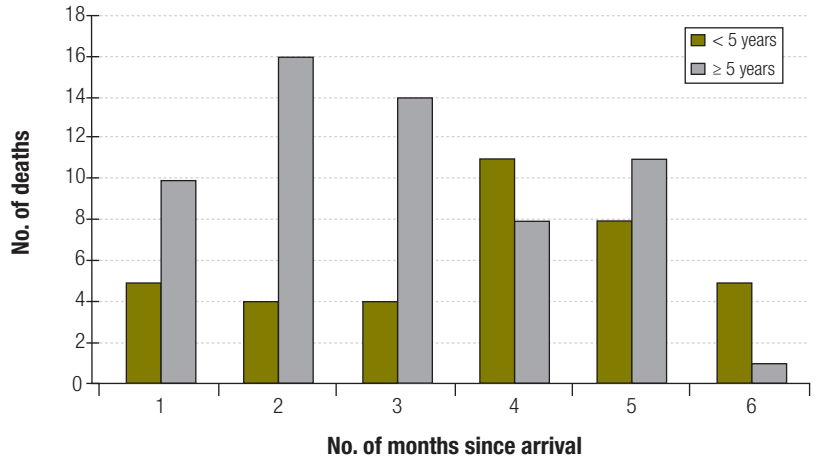
CI, confidence interval; DSS, demographic surveillance system; IDP, internally displaced person; RR, relative risk; SMR, standardized mortality ratio.

[a] Deaths per 1000 person–years of observation.

[b] Excludes both neonatal deaths and the person–time contribution of neonates (children ≤ 28 days old). Age stratum is 29 days to 59 months.

[c] Standardized mortality ratio calculated by the indirect method.

Fig. 2. **Time elapsed from arrival in the demographic surveillance system area until death[a] for internally displaced children <5 years old (*n*=37) versus internally displaced persons ≥5 years old (*n*=59), western Kenya, 2008**



[a] Includes all deaths up to 23 July 2008.

We did not observe elevated mortality among internally displaced children. In fact, in 2008 mortality rates were slightly lower among these children than among resident children. Overall child mortality in the DSS increased from 2007 to 2008, perhaps because children were more vulnerable to disruptions in drug supply and in access to health care and to a worsening of economic conditions owing to the post-election violence. The most likely explanation, however, is that an increase in malaria in 2008 affected children more than adults (KEMRI/CDC unpublished data). Because of concern over immunologic vulnerability to malaria among IDPs coming from non-malarious areas, KEMRI/CDC distributed insecticide-treated bednets to all IDPs in the DSS starting on 15 April 2008. This increased risk of severe malaria was suggested, to a certain degree, by the verbal autopsies in adults, which showed that more malaria deaths occurred among IDP adults than among DSS adults in 2008. Widespread coverage with insecticide-treated bednets may have prevented further excess malaria deaths among IDP adults. Almost all internally displaced children are likely to have slept under ITNs due to distribution by the KEMRI/CDC, whereas this was not the case for DSS resident children. Another possibility is that internally displaced children had better baseline nutritional and health status than resident children because they came from families with more stable employment and better socioeconomic status, as has been noted among migrants from urban to rural areas in other parts of Africa.[33]

Internally displaced children were hospitalized at a higher rate than resident

Table 2. **Causes of death among internally displaced persons and regular residents of a demographic surveillance system area in western Kenya, 1 January to 23 July 2008**

Cause of death	IDPs		DSS residents			
			2007		2008	
	No.	%	No.	%	No.	%
Children <5 years of age[a]	**(*n*=35)**		**(*n*=304)**		**(*n*=615)**	
Anaemia	1	3	26	9	21	3
Gastroenteritis	1	3	23	8	49	8
HIV infection	7	20	35	12	113	18
Malaria	11	31	86	28	183	27
Malnutrition	6	17	55	18	89	15
Meningitis	1	3	15	5	17	3
Pneumonia	1	3	28	9	32	5
Tuberculosis	7	20	13[b]	4	41[b]	7
Other	0	0	23	8	70	11
Persons ≥5 years of age	**(*n*=53)**		**(*n*=888)**		**(*n*=936)**	
Anaemia	0	0	69	8	33	4
Cardiovascular disease	0	0	52	6	51	5
HIV infection	28	53	256[c]	29	235[c]	25
Injury/assault	2	4	24	3	48	5
Malaria	8	15	97	11	69[d]	7
Malnutrition	1	2	7	1	4	0.4
Tuberculosis	8	15	152	17	192	21
Other	6	11	231	26	304	32

DSS, demographic surveillance system; HIV, human immunodeficiency virus; IDP, internally displaced person.

[a] This category excludes neonates (children ≤28 days old).

[b] Percentage of deaths lower than among IDPs ($P<0.01$).

[c] Percentage of deaths lower than among IDPs ($P<0.001$).

[d] Percentage of deaths lower than among IDPs ($P=0.041$).

Table 3. **Characteristics of internally displaced and non-displaced children < 5 years of age hospitalized at Siaya District Hospital, western Kenya, 7 March to 23 July 2008**

Characteristic	IDP (n = 184[a])		Non-IDP (n = 1 100[a])		P[b]
	No.	%	No.	%	
Age (in years)					0.0007[c]
< 1	53	29	389	35	
1	46	25	338	31	
2	37	20	206	19	
3	33	18	107	10	
4	15	8	60	5	
IMCI danger signs[d]					
Any	125	68	650	59	0.04
Respiratory	55	30	356	32	0.74
Dehydration	77	42	473	43	0.88
Median and mean days before admission					
Fever	3	4.3	3	3.5	0.35
Cough	3	4.5	3	4.5	0.61
Diarrhoea	3	3.9	3	4.1	0.39
***Plasmodium*-positive blood smear**					
All children	125	69	686	63	0.30
Aged < 2 years	56	58	418	58	0.99
Aged 2 to 4 years	69	81	268	72	0.10
Parasite density (geometric mean per µl of blood)	31 888		33 190		0.91
Discharge diagnosis					
Malaria	61	39	439	47	0.08
Pneumonia	10	6.4	105	11	0.11
Gastroenteritis	12	7	113	12	0.31
Malnutrition	7	4	59	6	0.53
Deaths among admitted cases	7	3.8	72	6.6	0.24
Hospitalization rate (admissions per person–year)	0.24	–	0.080[e]	–	–

IDP, internally displaced person; IMCI, Integrated Management of Childhood Illness.

[a] Denominators vary slightly for some characteristics due to missing data.

[b] *P*-values are from χ^2 test for difference. Age-stratified analysis using Cochran–Mantel–Haenzel test for comparing proportions, and Wilcoxon rank-sum test for comparing medians.

[c] Represents the *P*-value for the difference in age structure between IDPs and non-IDPs.

[d] IMCI general danger signs include an inability to drink or breastfeed, vomiting everything, lethargy or unconsciousness and convulsions. Respiratory danger signs include chest indrawing or stridor. Signs of dehydration are sunken eyes, crying without tears and non-immediate return of skin to normal after pinching.

[e] Rate ratio for internally displaced versus non-displaced children: 2.95 (95% confidence interval: 2.44–3.58).

children. While they did not die at higher rates after admission, they were admitted with more Integrated Management of Childhood Illness danger signs, which suggests that they presented to hospital later in the course of illness. IDP parents may have been less likely to take their sick children to outpatient clinics because of lack of familiarity with the area and may have waited to take them to hospital when they were sicker and required admission. We did find a significantly lower rate of outpatient visits among internally displaced children than among resident children < 5 years of age (data not shown.) The increase in IDP paediatric admissions could have imposed an excess burden on public hospitals, which are chronically underfunded in rural Kenya.

Our work had limitations. First, IDPs may have been misclassified, since IDP status is usually much more difficult to ascertain outside camps than within camps. We could not verify whether those who claimed to be IDPs were actually IDPs. The expectation of receiving certain benefits may have provided an incentive to report IDP status. Although the definition of an IDP read to each compound clearly stated that an IDP was someone displaced as a result of the post-election violence, it is possible that non-IDP in-migrants, such as people who migrated primarily for economic or social reasons, were reported as IDPs. Over-counting of IDPs could have led to inaccuracies in our overall morbidity and mortality estimates. Second, verbal autopsies may have limited specificity for assigning the cause of death, particularly in places where few people visit health facilities before dying, such as in rural Africa.[10,11] However, the diagnosis of HIV infection or AIDS by verbal autopsy has been found to be relatively accurate.[11,12,34] Moreover, no observer bias in the classification of deaths should have occurred because the clinical officers coding verbal autopsy questionnaires were unaware of a deceased person's IDP status.

Our study provides evidence that IDPs in Africa who live outside IDP camps also need relief services. IDPs can continue to suffer adverse consequences, including increased mortality from HIV infection and other chronic conditions, even after the immediate risk of violence subsides. Unfortunately, this situation still prevails in many regions of Africa where the HIV/AIDS epidemic and the potential for civil strife and conflict threaten one and the same population.[28] ■

Acknowledgements

We would like to acknowledge the acting director of KEMRI for permission to publish this work. We thank the leaders and people of Asembo, Gem and Karemo for their continued participation and support for the work of KEMRI/CDC. Wilfred Ijaa, Peter Ofware and Vincent Orimba of the DSS made special contributions to this analysis. We thank Oliver Morgan and Frank Odhiambo for their suggestions on improving the analysis and Simon Kariuki for overseeing malaria microscopy. We also thank Sufia Dadabhai and Reinhard Kaiser for their assistance with 2007 Kenya AIDS Indicator Survey data. The KEMRI/CDC DSS is a member of the INDEPTH network of DSS sites.

Funding: The project received core funding from the KEMRI/CDC Demographic Surveillance System, which had no direct role in the analysis or writing of the paper.

Competing interests: None declared.

الملخص

وفيات وصحة النازحين الداخليين في غرب كينيا في أعقاب العنف الذي تلا الانتخابات في عام 2008: استخدام مبتكر للترصد الديموغرافي

الغرض تقييم معدلات الوفيات والمراضة بين النازحين الداخليين الذين أعيد توطينهم في مناطق تابعة لنظام الترصد الديموغرافي في غرب كينيا في أعقاب العنف الذي تلا الانتخابات هناك.

الطريقة في عام 2007، عاش 204 ألف فرد في المناطق التابعة لنظام الترصد الديموغرافي، حيث واظب العاملون على زيارة الأسر كل أربعة شهور لتسجيل الهجرة، والـولادات، والوفيات. وجمع الباحثون المعطيات عند دخول الأطفال أقل من عمر خمس سنوات إلى مستشفى المنطقة، وأعد الباحثون استبياناً خاصاً لتسجيل المعلومات عن النازحين الداخليين. وأجريت مقارنة بين معدلات الوفيات، والهجرة، والمعالجة داخل المستشفيات بين النازحين الداخليين والمقيمين إقامة معتادة في المناطق التابعة لنظام الترصد الديموغرافي، وأجري تشريح سردي للوفيات.

الموجودات في الفترة من كانون الأول/ديسمبر 2007 حتى أيار/مايو 2008، نزح 16428 نازحاً داخلياً إلى المناطق التابعة لنظام الترصد الديموغرافي، وظل أكثر من نصفهم في هذه المناطق لمدة تخطت ستة شهور. وفي عام 2008، توفي النازحون الداخليون في الفئة العمرية 15-49 سنة بمعدلات أكبر من المقيمين إقامة معتادة في تلك المناطق (الخطر النسبي: 1.34؛ فاصلة الثقة 95%: 1.004- 1.80). وكانت نسبة الوفيات الناجمة عن العدوى بفيروس الإيدز بين النازحين الداخليين في عمر أكبر من أو يساوي 5 سنوات (53%) وكانت أعلى من تلك النسبة لدى المقيمين إقامة معتادة (والتي بلغت 25-29%) (P<0.001). أما معدلات وفيات الأطفال النازحين في عمر أقل من 5 سنوات فلم تكن أعلى من نفس المعدلات لدى الأطفال المقيمين، ولكن كانت معدلات علاجهم في المستشفيات أعلى مقارنة بهم (الخطر النسبي: 2.95؛ فاصلة الثقة 95%: 2.44 – 3.58).

الاستنتاج يتعرض البالغون من النازحين الداخليين المصابين بفيروس الإيدز في مناطق الصراعات في أفريقيا إلى خطورة أكبر للوفاة المتعلقة بفيروس الإيدز. ويجب توسيع نطاق جهود الإغاثة للمصابين بفيروس الإيدز أو الحالات المزمنة الأخرى.

Résumé

Mise en place élargie d'un programme décentralisé de traitement du VIH dans le KwaZulu-Natal rural, Afrique du Sud : une expansion rapide affecte-elle les résultats des patients?

Objectif Décrire le passage à l'échelle supérieure d'un programme décentralisé de traitement du VIH délivré au travers du système de soins de santé primaires au KwaZulu-Natal rural, Afrique du Sud, et évaluer les tendances des caractéristiques de ligne de base et les résultats sur la population étudiée.

Méthodes Le programme a commencé la distribution d'une thérapie antirétrovirale (TAR) en octobre 2004. Les informations concernant l'ensemble des patients entamant un traitement TAR ont été recueillies dans une base de données informatisée et le suivi de leur état a été actualisé chaque mois. Tous les patients adultes (≥ 16 ans) ayant commencé la TAR entre octobre 2004 et septembre 2008 ont été inclus et stratifiés en groupes de 6 mois. Les caractéristiques cliniques et sociodémographiques ont été comparées entre les groupes. Les taux de rétention sous traitement et de mortalité, ainsi que les nombres de perdus pour le suivi et les résultats virologiques ont été évalués 12 mois après le début de la TAR.

Résultats Au total 5 719 patients ayant initié un traitement TAR ont été inclus (67,9 % de femmes). Le nombre moyen de lymphocytes CD4+ à la ligne de base était de 116 cellules/µL (intervalle interquartile, IQR: 53-173). Une augmentation de la proportion de femmes ayant entamé un traitement TAR alors qu'elles étaient enceintes a été notée, mais aucun changement n'a été observé dans le temps pour les autres caractéristiques à la ligne de base. Le taux global de rétention sous traitement à 12 mois était de 84,0 % (intervalle de confiance à 95 %, IC: 82,6-85,3); 10,9 % sont décédés (IC à 95 %: 9,8-12,0); 3.7 % ont été perdus pour le suivi (IC à 95 %: 3,0-4,4). La mortalité a été plus élevée durant les 3 premiers mois qui ont suivi le début de TAR : 30,1 décès pour 100 personnes-ans (IC à 95 %: 26,3-34,5). À 12 mois, 23,0 % présentaient une charge virale détectable (> 25 copies/ml) (IC à 95 %: 19,5-25,5).

Conclusion Les résultats n'ont pas été affectés par la rapide expansion de ce programme de traitement du VIH décentralisé. Les taux relativement élevés de charge virale détectable mettent en évidence la nécessité de futurs efforts à mettre en place pour améliorer la qualité des services.

Resumen

Ampliación de un programa descentralizado de tratamiento del VIH en zones rurales de KwaZulu-Natal, Sudáfrica: ¿afecta su rápida expansión a los resultados de pacientes?

Objetivos Describir la ampliación de un programa descentralizado de tratamiento del VIH a través del sistema sanitario de atención primaria en zonas rurales de KwaZulu-Natal, Sudáfrica, y evaluar las tendencias de las características iniciales y los resultados de la población en estudio.

Métodos El programa comenzó con la administración de un tratamiento antirretroviral (ARV) en octubre de 2004. La información de todos los pacientes que comenzaron el tratamiento ARV se recopiló en la base de datos del programa y el seguimiento se actualizó mensualmente. Todos los pacientes adultos (≥ 16 años) que iniciaron el tratamiento ARV entre octubre de 2004 y septiembre de 2008 se incluyeron y estratificaron en grupos de seis meses. Se compararon las características clínicas y sociodemográficas intergrupales. A los 12 meses del inicio del tratamiento ARV se evaluó la continuidad asistencial, la pérdida para el seguimiento y los resultados virológicos.

Resultados Se incluyó a un total de 5719 adultos que habían iniciado el tratamiento ARV, de los que el 67,9% eran mujeres. El recuento medio inicial de linfocitos CD4 fue de 116 células/µl (amplitud intercuartil, AIC: 53 - 173). El porcentaje de mujeres que iniciaron el tratamiento ARV durante el embarazo aumentó, si bien no se produjo ningún cambio en otras características iniciales a lo largo del tiempo. La continuidad asistencial general a los 12 meses fue del 84,0% (intervalo de confianza del 95%, CI: 82; 6 - 85,3); el 10,9% falleció (CI del 95%: 9; 8 - 12,0); el

3,7% se perdió para el seguimiento (CI del 95%: 3,0 - 4,4). La mortalidad fue más elevada en los primeros tres meses posteriores al inicio del tratamiento ARV: 30,1 fallecimientos por cada 100 años-personas (CI del 95%: 26,3 - 34,5). El 23,0% tenía una carga viral detectable a los 12 meses (> 25 réplicas/ml) (CI del 95%: 19,5 - 25,5).

Conclusión Los resultados no se vieron afectados por la rápida expansión de este programa descentralizado de tratamiento del VIH. Los índices relativamente altos de la carga vírica detectable ponen en evidencia la necesidad de dedicar un mayor esfuerzo en la mejora de la calidad de los servicios.

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