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CHARACTERISTICS OF HOUSEHOLDS EXPERIENCING UNDER- FIVE DEATHS: A CASE OF TROPICAL INSTITUTE OF COMMUNITY HEALTH AND DEVELOPMENT (TICH) PARTNERSHIP DISTRICTS

Oindo CO[1*], Otieno CF[1], Okeyo NO[1], Olayo RN[1], Muga RO[1] and CO Kaseje[1]

Clement Oindo

Corresponding author email: clemooindo@yahoo.com

[1]Great Lakes University of Kisumu, P.O. Box 2224-40100, Kisumu, Kenya.

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ABSTRACT

Although there has been global decline in Infant and Child Mortality rates, sub-Sahara African countries still bear the greatest burden in the world. Many of these deaths occur as a result of preventable diseases such as pneumonia, malaria, measles and malnutrition. This has been witnessed in the six partnership districts of the study. With the introduction of a dialogue model, the study aimed at investigating the characteristics associated with the affected households. The overall result in the six partnership districts is a reversal of the recent child mortality trends in Kenya. The study aimed to determine the child mortality rates in six partnership districts and their distribution by socio-economic characteristics and health seeking behaviour. Mortality and population data were derived from a complete household census of 27 sub-locations within the partnership districts (Nyando 7, Kisumu 2, Bondo 7, Suba 7, Siaya 2 and Rachuonyo 2 sub-locations). Child mortality and its relationship to specific variables relating to background and proximate factors were considered.
Between 2006 and 2007, proportions of households with child deaths declined in all the districts with Rachuonyo and Suba district sub-locations having the greatest decline from 38% to 12% and 15% to 0.1%, respectively. Proportions of health facility deliveries decreased in households that experienced under-five deaths in all the other 5 districts except Nyando sub- locations with an increase of (18%). Measles vaccination coverage was lower among households with child deaths.

Use of Insecticide Treated Nets (ITNs) was lower among households with child deaths in Kisumu and Bondo unlike in Rachuonyo where a large proportion of the households experiencing child deaths were using ITNs.

Child mortality declined by type of housing and level of education. Households living in mud houses and had mothers with primary education experienced the highest proportions of child mortality while households living in permanent houses with mothers having secondary education and above, the lowest. Education of mothers remains a significant determinant of child mortality along with health facility delivery. No difference in child mortality was realized between mothers having primary education and those that had none. Better health seeking behavior should, therefore, be encouraged to help stem the high child mortality rates.

Keywords: Child mortality, distribution, partnership, districts

INTRODUCTION

Infant and child mortality rates in many parts of the world have been decreasing in recent decades, but still remain among the highest in the world in sub- Saharan Africa. Seven in every 10 of the deaths are due to diarrhea, pneumonia, measles, malaria and malnutrition and often a combination of these conditions, which are also the reason for seeking care for at least three out of four sick children who are brought to a health facility [1]. Every year, some 9.7 million children mostly in developing countries die before their fifth birthday [2].

Child mortality is closely linked to poverty. Income poverty and child mortality are highest in Africa, but childhood under-nutrition is by far the highest in South Asia, while the share of people with insufficient calories (undernourishment) is highest in the Caribbean. [3]

Improvements in public health services are key; these include safe water and better sanitation. Education, especially for girls and mothers, will also save children's lives. Advantages of better sanitation facilities are severely limited when mothers are not educated. As little as 1-6 years of formal education results in considerable reduction in child mortality risk, even among mothers using poor water and toilet facilities. The combination of some education and adequate facilities appears to substantially reduce the risk of death [4].

Rapid declines in under-five mortality have been seen in Latin America and the Caribbean, Central and Eastern Europe and the Commonwealth of Independent States (CEE/CIS), East Asia and the Pacific. However, there remain many countries with high levels of child mortality, particularly in sub-Saharan Africa and South Asia. An analysis of background characteristics in 63 developing countries finds that child mortality is considerably higher among children living in rural areas and in the poorest households [5].

After Independence in the early 1960s, child mortality in Kenya fell rapidly. Until around 1980, the under-five mortality rate (U5MR), fell at an annual rate of about 4 percent. This rate of decline slowed in the early 1980s, to about 2 per cent per annum. Recent data from the 1998 Kenya Demographic and Health Survey (KDHS) showed that, far from declining, the U5MR increased by as much as 25 percent from the late 1980s to the mid 1990s [6]. Comparison of mortality rates recorded in 2003 KDHS with the earlier KDHS surveys shows an increase in both infant and under-five mortality rates from 1989 to 2003. For example, the infant mortality rate increased by 30 percent from 60 deaths per 1,000 live births in 1989 to 78 per 1000 in 2003. Similarly, under-five-mortality rate increased by 30 percent between the same period [7]. The trend depicts continued deterioration in the quality of life amongst the Kenyan population over the last 20 years. This adverse trend coincided with a number of other adverse trends: stagnation in growth of *per capita* income, declining levels of immunization, falling school enrolment, and the emergence of an HIV/AIDS epidemic. [7]

Many studies have included household socio-economic characteristics, most often sanitation facilities, sources of drinking water, and sometimes income. The influence of socio-economic factors on child mortality is often considered within the Mosley-Chen framework, with socio-economic determinants affecting child health through maternal factors, environmental contamination, nutritional inputs, and injury. However, socio-economic measures have often proved to be surprisingly weak in explaining child mortality [8].

Basic healthcare TICH dialogue sessions give mothers life-saving knowledge about how to attend to their health needs and those of their children. The dialogue sessions also promote good community health by training people on basic hygiene, sanitation and nutrition.

This study looks at the characteristics of households experiencing under-five mortality, given the fact that the sites involved have been subjected to a combined intervention package offered at the partnership sites to improve child health thereby reducing the child mortality rates in these sites. The objective of this study was to determine the characteristics of households experiencing under-five mortality in theses sites.

METHODS

Data collection procedures

A complete household census was done in some of the sub-locations in six districts in Nyanza province. These are sub-locations in which partnership activities are conducted. The provincial administration and other stakeholders in these sub-locations invited TICH to conduct partnership activities in the said sub- locations. The enumerators were Community Health Workers (CHWs) with reading and writing capacity, who were trained and have been carrying out household registration twice a year from the inception of the program in 2006. Refresher courses are offered at the beginning of each data collection period. The data are collected in one week with each CHW concentrating on his/her village first and can offer assistance to others afterwards. A 10% sample of households are selected and revisited by the TICH technical team to validate data collected by the CHWs. All households reporting deaths are also visited for validation and verbal autopsy.

Data analysis

Data were entered into Statistical Package of Social Sciences SPSS worksheet and analysis done using the SPSS version 11 software. Frequencies and cross tabulations were performed to determine the dominant characteristics of the data which are used to describe the population.

Data limitation

Caution should be taken in interpreting the mortality information presented in this paper because it uses information from the household registers of partnership sites and not the whole districts to construct the rates. The data mainly contained nominal variables and were limited in the tests that could be conducted.

RESULTS

Proportion of under-five deaths

The results of this evaluation indicate a significant reduction level of child mortality in the partnership districts during the 2006–2007 period compared to child mortality level during an earlier period before the partnership programme. This reduction as shown in table 1 cannot be fully accorded to the TICH partnership programme since there are other interested partners working in the same areas.

Table one gives a summary of the number of households experiencing under-five deaths in the districts of partnership. As is seen, drastic reductions in under-five mortality have been experienced in Suba, Nyando and Rachuonyo partnership sites, while the least reduction in under-five mortality was witnessed in Bondo partnership sites.

Education of mothers

The households with females aged 15-49 years had fewer deaths compared to households without. All reported deaths in Suba occurred in households with mothers of primary level of education, with no reported deaths in Kisumu and Suba in households with post primary Education. Of all the under-five deaths experienced in Nyando, Suba and Siaya none occurred in the household where mothers did not attend school. From table 2, it is seen that more deaths occurred in households where the mothers had attained at least primary education. However in Bondo partnership sites, there was little difference between mothers who had attained at least primary education and the mothers who did not go to school at all.

Health facility delivery

All the U5 who died in Suba and Siaya in 2007 were not delivered at the facility. In Kisumu 66.7% of the U5s who died were delivered at the health facility. Table 3 gives a summary of the under-five deaths by health facility delivery in 2006 and 2007. Mothers in the rural area still prefer delivering elsewhere rather than at the health facility. Apart from Kisumu district partnerships in which most deliveries (66.7%) occurred at the health facilities in 2006, the other districts partnership sites had more deliveries occurring elsewhere in the same year. Kisumu, Nyando, Suba, and Bondo districts partnership sites witnessed a reduction in the proportion of births carried out in the health facilities between 2006 and 2007, while Nyando district partnerships witnessed an increase in the births conducted at the health facility between 2006 and 2007. In Siaya district partnership sites, all the registered deliveries did not occur at the health facility in both 2006 and 2007.

Immunization

Penta valent 1 vaccine uptake increased in all districts between 2006 and 2007 as indicated in table 4. The proportion of households in the sites with reduced deaths after penta valent 1 vaccination continued to increase. Penta valent 3 and measles uptake also increased, though not as much as penta valent 1. There was generally an erratic trend in the uptake of penta valent among the districts. While penta valent 1

uptake was relatively high in all district partnership sites in both years, the uptake of penta valent 3 reduced marginally in all the districts partnership sites in both years. The proportion of households not experiencing death after the uptake of these vaccines also increased except for households in Kisumu and Bondo for penta valent 3 and measles vaccine. Table 4 gives a summary of the households not experiencing death after uptake of the vaccines.

ITN use

Use of ITN was noted to be quite widespread in the partnership sites with most districts reporting more than 65% use. Households experiencing no deaths had a higher proportion of ITN use than households experiencing deaths. Kisumu and Rachuonyo had the least proportions of under-five deaths in households using ITNs. Kisumu had 67.3 % and 44.6 % in 2006 and 2007, respectively while Rachuonyo had 73.1% and 56.6% in 2006 and 2007, respectively. There was a reduction in ITN use in Kisumu, Bondo and Siaya in both years.

Housing type

The housing types were categorized as semi-permanent (either roofing or walling materials is not locally available or made), permanent (both roofing and walling materials are not locally available or made) and all temporary (both roofing and walling materials are locally available or made).

Housing type influences morbidity of the child living in a household. Most acute respiratory illnesses occur due to poor ventilation of the house. The household data collected in the partnership districts sites revealed that households living in semi permanent structures experienced more deaths than households living in all temporary structures which consist mainly of grass thatched and mud walled structures and permanent structures. However in Siaya and Kisumu, more households living in temporary structures were experiencing death with Siaya posting higher proportions of 69.3% and 86% in 2006 and 2007 respectively while Kisumu having 46.3% and 70.8% in 2006 and 2007, respectively.

DISCUSSION

To reduce child mortality, programmes that address the main causes of infant and child mortality should be reinforced with particular emphasis on control and management of post- neonatal mortality diseases like diarrhea, and malaria. There is need to improve access and quality of maternal and child-care services and to put in place an effective referral system [9].

Mother's education

A number of researchers using data from African countries have established that educational attainment of the parents is inversely related to infant and child mortality [10]. The inverse associations have been attributed to many causes including breakdown of unfavorable traditional child raising practices, increased public hygienic practices and use of modern medical facilities, better nutrition knowledge

and feeding practices and increased income plus redistribution of family resources in favor of children [10].

The results from all the districts of study on educational level of mothers seem to be consistent with those of other studies on child mortality where it was found that death rates were higher among the households where mothers are uneducated or with primary education than with secondary education and above. It was found that 100 per cent of all households that reported U5 deaths in Suba had mothers with primary education and no death was reported in Kisumu and Suba in households with post primary education.

Women with secondary education in the poorer households of South Nyanza (majority of households living bellow poverty line) reported a lower mortality compared to the rate of the uneducated women in a better off Nyeri District. [10].The results also reveal that child mortality is highest in house holds where the mother has attained only primary education. This may mean that most girls in the districts partnership sites do not get to go to secondary schools or that primary education only does not help in averting under-five mortality in the partnership sites.
Mother's education turned out to be one of the main determinants of the child mortality. Mothers should at least attain primary education. The higher the educational level of the mother, the less the risk of juvenile death for her child. However, insignificant differences in child mortality are noted for mothers with secondary and tertiary education [11].

Immunization
There is a large variation in vaccination coverage by province. In Central Province, for example, 79% of children are fully vaccinated and only 2% have received no vaccination at all. While in Nyanza province, only 38% of the children are fully immunized with 18% receiving no vaccination at all. In comparison with the results obtained at the partnership sites, households without deaths of children below the age of five had higher measles coverage. However, this trend kept fluctuating between districts as shown in table 1.

Health facility delivery
Neonatal mortality is mainly experienced by children who are not born in health facilities with the help of a skilled attendant. Therefore, delivery of children at health facilities would go along way in providing the children a good chance of survival in their early days. From the data, it is clear that more deaths were experienced in households where children are born elsewhere rather than the hospital.

Use of ITNs
Greg Fegan and colleagues, from the Kenya Medical Research Institute, provide important mortality data from a large national programme on insecticide-treated bed nets in Kenya. They reported an impressive 44% reduction in the risk of dying in children who used the bed nets [12]. Large proportions of households use ITNs and have experienced fewer deaths than households that do not use ITNs in the areas of

partnership. The fewer deaths can be in part attributed to the wide use of ITNs thereby preventing malaria which is known to claim children's lives.

CONCLUSION

Kenya needs a unified approach to healthcare delivery, rather than fragmented programs, to be able to overcome under-five mortality rates. This statement proves to be true in the areas of partnership where these data were collected. The results of this evaluation indicate that facility delivery, availability of a clinic card, type of housing and insecticide treated bed net use if adopted as stand alone intervention will not arrest U5 mortality. Under-five mortality is complex and requires multiple integrated interventions.

The most urgent priority is to ensure access to, and improve the quality of education for girls and women and to remove obstacles that hamper their active participation [13]. As has been seen from the data, most under-five deaths occur where mothers have attained primary education only. This would mean that the government of Kenya subsidized Public secondary education introduced in 2008 would go a long way in averting under-five child mortality and should therefore be strongly supported especially for girls.

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Table 1: Households experiencing under- five mortality in the partnership sites.

	2006	2007
Nyando	38	4
Kisumu	88	14
Rachuonyo	424	249
Suba	284	3
Bondo	143	116
Siaya	114	21

Table 2: Mortality of Under- fives by mothers' Educational level.

	2006			2007		
	None	Primary	Secondary and above	None	Primary	Secondary and above
Nyando	9.1	78.8	12.1	0	33.3	66.7
Kisumu	4	82	14	19	81	0
Rachuonyo	12.5	73.1	14.4	4.3	76.1	19.6
Suba	11.1	63.5	25.4	0	100	0
Bondo	42.7	50.5	6.8	26	66	8
Siaya	6.7	73.3	20	0	75	25

Table 3: Under-five Mortality by Health Facility Delivery.

	2006		2007	
	Facility Delivery	**Delivery Elsewhere**	**Facility Delivery**	**Delivery Elsewhere**
Nyando	25.0	75.0	42.9	57.1
Kisumu	66.7	32.3	7.1	92.9
Rachuonyo	45.9	54.1	11.3	88.7
Suba	26.9	73.1	0.0	100
Bondo	41.9	58.1	8.4	91.6
Siaya	0.0	100	0.0	100

Table 4: Households not experiencing deaths after vaccination.

	Penta valent 1		**Penta valent 3**		**Measles**	
	2006	2007	2006	2007	2006	2007
Suba	81.1	85.4	76.1	80.3	77.8	84.1
Bondo	77.8	80.8	64.4	63.5	86.1	85.2
Nyando	82.4	89.3	61.2	71.3	92.9	92.2
Rachuonyo	77.1	80.8	73.2	76.5	73.3	75.4
Kisumu	77.6	81.8	65.5	65.2	48.2	87.6
Siaya	83.2	86.0	47.5	57	89.5	NA

Note: NA implies that all the children in households that experienced deaths were not old enough to be vaccinated against measles.

Table 5: Proportion of households experiencing under- five mortality by ITN use.

	2006	**2007**
Bondo	81.4	57.8
Nyando	100	100
Kisumu	80	35.7
Siaya	50	0

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