CHPATER FIVE

LEVELS AND CORRELATES OF INFANTS AND CHILD MORTALITY

Given an Akan, Ga/Dangme, Ewe or Mole-Dagbani household, what is the probability that a male child or female child born today into such household will survive up to the age of one or five? Are the survival chances of male and female children in the household of these ethnic groups the same? These are some of the key questions that this chapter will try to answer. In order to examine the impact of ethnicity, demographic and socio-economic factors on the risk of child mortality the analysis adopted two techniques that will try to answer the three research questions posed in the introductory chapter: first, indirect estimates of sex-specific probability of dying before the age of one and five, and second, sex-specific odds of dying before the age of five across all the ethnic groups.

Indirect Method Results

The results in the tables of this chapter are obtained from Mortpak.[2] Total children ever born and proportion surviving or dead were calculated for each sex across all the four ethnic groups before Mortpak output could be obtained. They give various estimations of mortality probabilities from the North family of Coale and Demeny model life table and Coal-Trussell variants of the Brass indirect method. Both infant and child (under-5) mortality estimates are provided to find if there are any consistent patterns between the two age groups for each of the four ethnic groups. That is, the hypothesis that this section is trying to investigate is, Whether or not there are sex-specific infant and

[2] United Nations Software Package for Mortality Measurements, version 3

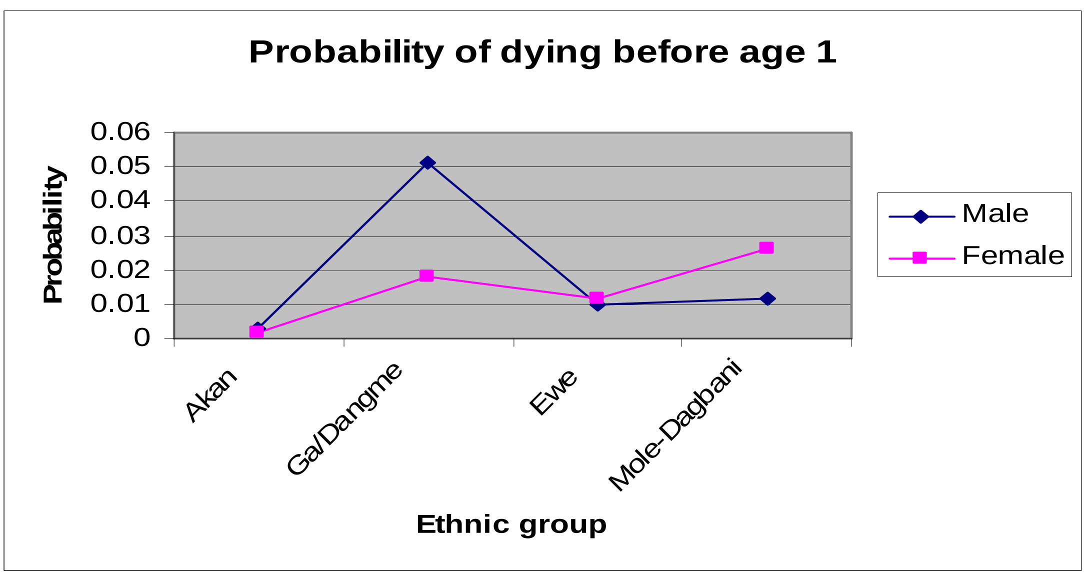
child mortality differentials among the four ethnic groups. The full tables with life expectancy and reference years are given in Appendix C.

Table 5.1 and Figure 4.1 show the sex differential probability of dying as an infant across all the four ethnic groups. Among the Akans and Ewes there seem not to be any significant difference in probability of dying before the age of one for either sex. But probability of dying as an infant is much higher for males and moderately higher for females among the Ga/Dangme and Mole-Dagbani ethnic groups respectively.

<u>Table 5.1: Probability of dying before the age of one</u>

	Akan	Ga-Dangme	Ewe	Mole-Dagbani
Male	0.003	0.051	0.010	0.012
Female	0.002	0.018	0.011	0.026

<u>Figure 4.1: Probability of Dying Before the Age of One</u>

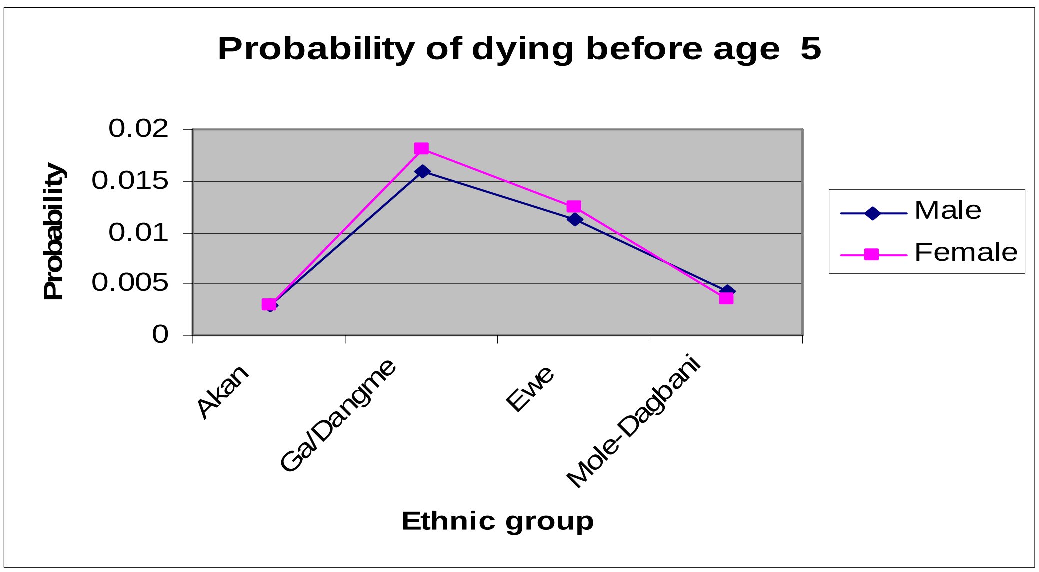


However, with respect to under-5 child mortality, the trend changes for some ethnic groups. In table 5.2 and figure 5.2, it is shown that the differentials among the Akans remain almost the same as that of infants. The Ga-Dangme exhibits opposite trend from that of the infants as the probability of a female child dying before the age of five becomes higher (.018) than the male child (016). Among the Ewes, the female child

Table 5.2 The Probability of Dying Before the age of 5

	Akan	Ga-Dangme	Ewe	Mole-Dagbani
Male	0.003	0.016	0.011	0.004
Female	0.003	0.018	0.012	0.003

Figure 4.2 Probability of Dying Before the Age of 5



(.012) continues to have higher probability than the male child (.011), even though the difference is almost insignificant.

It is interesting to find the same probability levels for both male and female children among the Akans. For a matrilineal society one would expect the female-child to have lower probability of dying before age five. This equality could be attributed to the fact that modern attitude towards matrilineal bias for female child is weak as more and more of modern family would want their children, be it male or female, to inherit them (Aboagye, 1979).

The higher probability of dying before the age of one for female child among the Mole-Dagbani improves as they pass the infancy age in spite of being in an area that is socio-economically less developed; and the over-all probability of dying before the age of five for both sexes is among the lowest of all the four ethnic groups. This could be attributed to long duration of breastfeeding (24 months) and high use of modern health care systems such as immunization (Awumbila, 2003). Overall, these results suggest that girls are disadvantaged in Ghana since the expected survival advantage is generally absent. These indirect estimates measure risk at the aggregate level - they are estimates of population at risk (Iyer & Monteiro, 2004). There may be some confounding factors attributing to the differentials observed at this level.

Correlates of Child Mortality

In this section, the sex-differentials in the risk of dying are further explored at individual level using bivariate and multivariate logistic regression. These are limited to only under-5 mortality since in terms of sex-differentials, infant mortality is mostly a function of maternal health and nutritional status (Caldwell and Caldwell, 1990), and since there is no sex-differential in timing and nature of weaning among these ethnic groups.

Following Choe et tal (1989), Brockerhoff and Hewett (1998) and Gyimah (2002), the analysis will proceed in bivariate logit regression and three models of multivariate logit regression with each model controlling for demographic and socio-economic background of mothers. The main objective here is going further to test the previous hypothesis by investigating how the effect of ethnicity on sex-differential in child mortality is affected by each block of demographic, socio-economic and household environmental covariates.

Mortality Differentials of Under-5 Children

In Table 5.3 the bivariate results of mortality risk ratios for both male and female children under the age of five for the four ethnic groups are compared with the relative risk in the other ethnic groups (the reference category). The reference category is made up of smaller ethnic groups such as Guan, Grussi, Gruma and Hausa.

Table 5.3 Bivariate Odds of Child Mortality

Ethnic group	Male	Female
Akan	0.852**	1.248
Ga-Dangme	0.446***	1.180***
Ewe	0.865*	0.956
Mole-Dagbani	0.829**	1.080***
Reference group	1.000	1.000

** p ≤ .10; **p ≤ .05; *** p ≤ 01*

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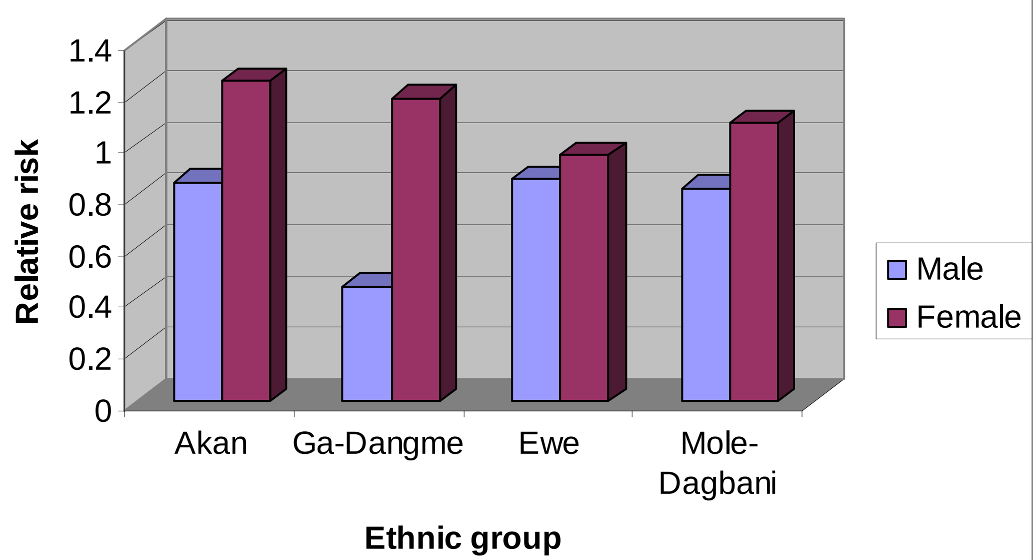
A ratio of 0.852, for example, represents approximately 15% lower chance of dying for an Akan male child compared to children of the ethnic groups in the reference category. And a ratio of 1.248 means a female child has about 25% higher chance of dying.

The risk of dying is lower (between 15% and 55%) for males, and higher for females of all the four ethnic groups compared to the reference group. Figure 4.1, based on Table 5.1, clearly demonstrates that without considering demographic, socio-economic and household environmental factors, the risk of a female child dying before her fifth birthday is higher than that of male child in all the ethnic groups. Among the Ga-Dangme the difference is quite glaring as the female child is twice more likely to die than the male child.

Figure 4.3 Sex-specific child mortality risk: bivariate results



Socio-Economic and Demographic Factors

Besides ethnicity, there are a number of demographic, socio-economic and household environmental factors that are traditionally known to affect child mortality as noted in Chapter Four. Table 5.4 presents the results of simple bivariate logit regression. From the table, children of mothers with shorter birth intervals are significantly at a higher risk of dying than of mothers with longer birth intervals. The odds of dying are higher for female child than male child when birth interval is less than two years.

Table 5.4 Odds of Child mortality by Demographic, socio-economic and household environmental background of mothers: bivariate logit results

	Male	Female
DEMOGRAPHIC		
Respondent age	1.008**	1.012**
Previous birth interval		
less than 2 yrs	1.814***	2.082***
2 or more yrs *ref*		
Birth order		
1 or 2	cc	cc
more than 2 *ref*		
SOCIO-ECONOMIC		
Education		
Resp edu: no/prim	1.186**	1.546***
Resp edu: sec/higher *re*		
Part edu: no/prrim	1.020*	0.996
Part edu: sec/higher *ref.*		
Religion		
Christian	0.684***	1.131*
Muslim/… *ref.*		
Economic status		
Poor	1.106*	1.058
Rich *ref.*		
Marital Status		
Married	1.234	0.504***
Div/wid/sep/ other.. *Ref.*		
Sex of hsehld head		
Male headed house	0.710**	0.767**
Female headed house *ref*		
ENVIRONMENT		
Residence		
Rural	1.259**	1.102*
Urban *ref*		
Well/other	0.884	758*
Pit/bush .	1.314*	2.205**
Flush *ref.*		

Ref = Reference category =1.000

** p ≤ .10; **p ≤ .05; *** p ≤ 01; cc = constant*

Maternal socio-economic backgrounds as education, wealth, religion have been found in many studies to be strongly associated with child mortality differentials. From Table 4.4 the impacts of both maternal and paternal education on the mortality risk of under-5 children show that mortality risk is much higher (about 10 to 60 percent) for children whose parents have only primary or no education. Generally the female-child is at a higher risk of dying before age 5 than a male child when the mother has little or no education.

As stated in Chapter One, some studies have shown that religiosity has some effects on the survival chances (Jaffe et al, 2005; Iyer and Monteiro, 2004). Table 4.4 shows that mothers from Christian background exhibit lower risk of mortality for male child. But for female child the opposite is the case. Girls are more likely to die before age 5 than boys when the mother is a Christian than if she is a Muslim.

Income level of the household is very key in child care in general, but whether it has significant influence on the sex-preferential treatment is yet to be established. As expected, mortality risk is significantly higher (between 5 and 10 percent) for children from poor households than those from the rich homes. For the poor households the female child has a lower risk (5%) of child mortality than the male child.

Generally it is expected that children of single mothers would have higher risk of child mortality due to the fact that they may not have the support of their partners in caring for children. This is significantly true for the female child, but false for the male child as the later suffers higher risk mortality in marital union homes. In fact when other factors are considered in the multivariate analysis, risk of child mortality is significantly lower for children of single mothers (widow, divorced and separated) than of married women. The male child has the higher risk of mortality than the female child in all the ethnic groups (See Appendix D). Inadequate resources in polygamous households could account for these differences.

Expectedly, the risk of child mortality among male-headed households is significantly lower than those headed by females for both male and female children. This is not surprising given the fact that men are better placed economically and educationally to contribute positively to the survival of children. It is only in this background that the relative risks of child mortality are almost the same (0.710 for male and 0.767 for female).

Even though not statistically significant, it is surprising to find that mortality risks are lower (between 12 and 25 percent) for both male and female children whose mothers get water from well or tanks. The type of toilet facility, however, seems to have some important impact on child mortality at this bivariate level of analysis just as it has been found elsewhere to be very significant (Gyimah 2002; Woldemicael, 2000). Female child's mortality risk is almost twice more than that of male child among mothers who do not have flush toilets.

Mortality Differentials of Under-5 Children: Multivariate Results

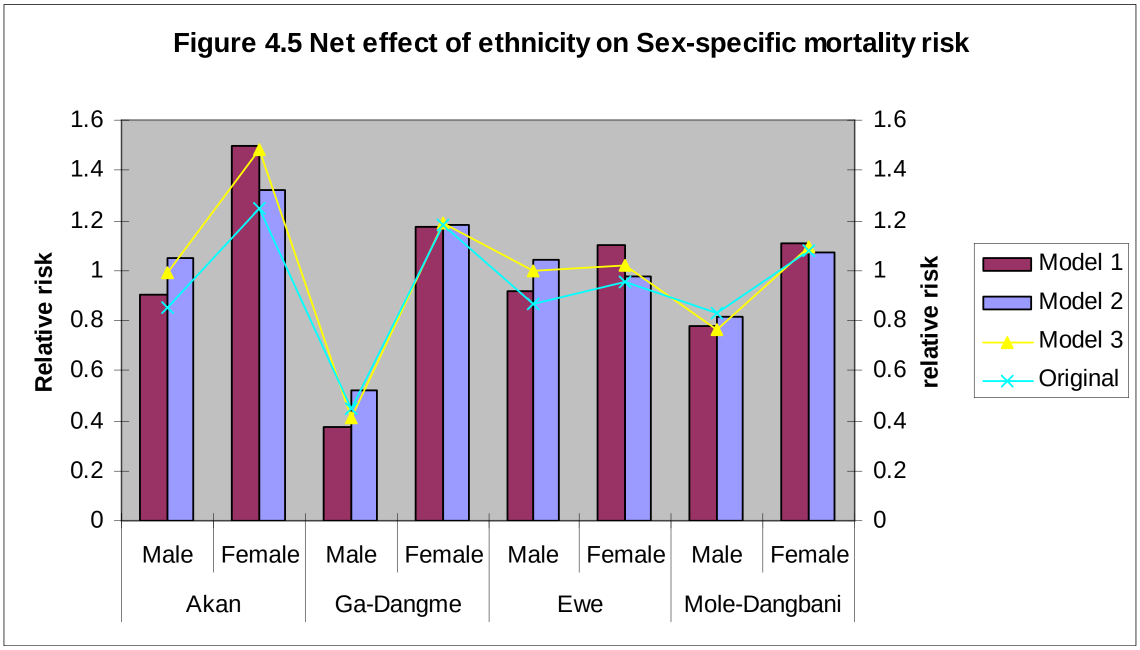
From the bivariate analysis it was discovered that some demographic, socio-economic and household environmental factors have some significant effects on the mortality risk of children of either sex. Against this background, a multivariate logit procedure is applied to determine whether sex-differentials in mortality risks can be explained by these demographic, socio-economic and household environmental backgrounds or by ethnicity alone. This is carried out by controlling for demographic and socio-economic factors in separate blocks of models. Model 1 assesses the net impacts of ethnicity when demographic factors are controlled; Models 2 examines the ethnic net impact when socio-economic factors are controlled; and Model 3 (the full model) assesses the net impact of ethnicity when the influence of all the covariates are controlled. Again the main interest here is to determine whether any observed sex-differential survival advantage or disadvantage of a given ethnic group is modified upon consideration of any of these covariates. Because of suspected multicollinearity, especially between education of the respondents and their partners, a correlation matrix was run. The results did not show any significant multicollinearity among all the variables (see Appendix E). Hence there was no need for elimination of variables that are suspected to be related.

Figure 5.5, based on Table 4.5, shows the net effects of ethnicity on sex-differentials of child mortality risks upon considering the influence of demographic and socio-economic factors in three blocks of models. The *Original* row represents the sex-specific risks of dying when only ethnic group is considered as presented in Table 5.3 (that is, the results of the bivariate analysis).

Table 4.5 Net influence of ethnicity on Sex-specific mortality risk after socio-economic and demographic factors are considered

	Akan		**Ga-Dangme**		**Ewe**		**Mole-Dagbani**	
	Male	Female	Male	Female	Male	Female	Male	Female
Model 1	0.905**	1.496**	0.377**	1.172*	0.915	1.101	0.777	1.106
Model 2	1.049	1.321*	0.522*	1.182	1.045	0.974	0.818*	1.071
Model 3	0.994	1.480*	0.414**	1.187	1.000	1.019	0.761	1.094
Reference	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Original	*0.852***	*1.248*	*0.446****	*1.180****	*0.865**	*0.956*	*0.829***	*1.080****

** p ≤ .10; **p ≤ .05; *** p ≤ .01*



Following the results of Model 1 for each ethnic group in Figure 4.5, it is clear that the effect of ethnicity are still consistent and significant, especially for the Akans and the Ga-Dangme, as female child continues to have higher risk of mortality than the male child in all the ethnic groups. On the other hand, Model 2 reveals quite a significant influence of ethnic impacts on child mortality, especially for the ethnic group in southern Ghana (i.e. Akan, Ewe and Ga-Dangme), with the biggest impacts on mortality risks of Akan children. Even though female child is still having survival disadvantage, the sex differential gap becomes narrower when socio-economic factors are controlled.

The big influence of socio-economic variables on general levels of child mortality among the ethnic groups is only toned down when all the variables (demographic, socio-economic and household environmental conditions) are introduced in the Model 3 analysis. It is amazing to find that the gap between male and female mortality risks becomes wider here than in Model 2 for all the ethnic groups, except in the case of Ewe whose child mortality risks become almost the same (1.000 for male and 1.019, about 2% difference) for male and female children.

Percentage Change in Survivorship

The percentage changes of effect of ethnicity on sex-differential mortality resulting from each set of the covariates are calculated based on the relative change between the odds ratios of ethnicity in the bivariate analysis and the three sets of models in the multivariate analysis. The formula for this assessment is:

$$\left(\frac{EthnicOddsRatioModelK}{EthnicOddsRatioModelB}\right)-1$$

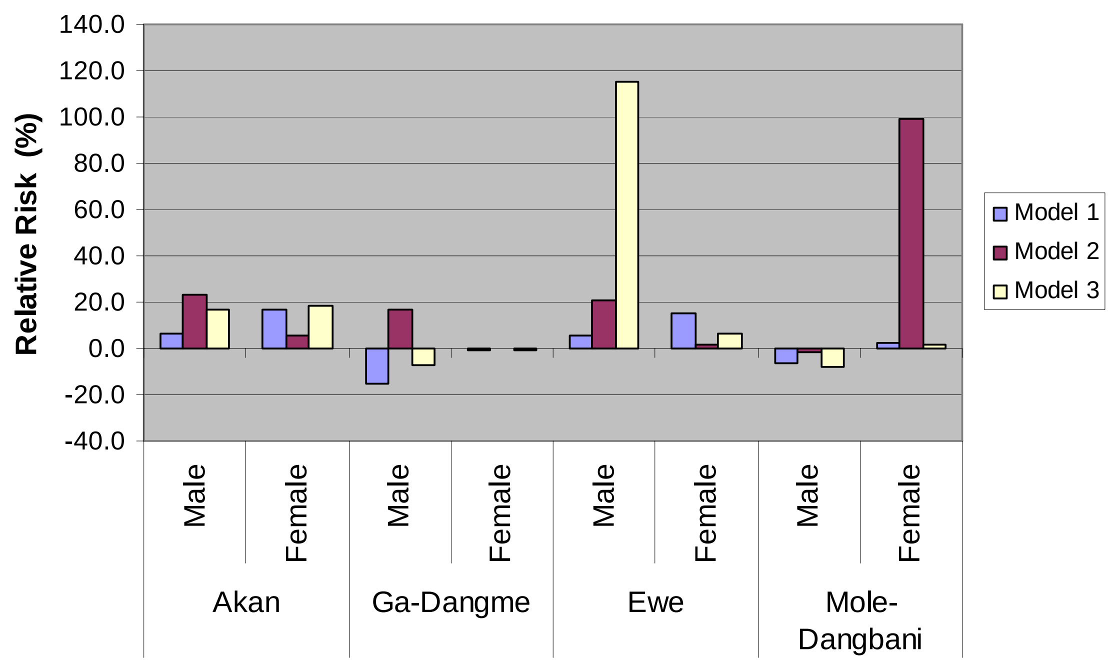
Where the numerator (*ModelK*) is the ethnic odds ratios after considering Models 1, 2 and 3 in the multivariate analysis (see Appendix D for the total results of multivariate models 1, 2 and 3), and the denominator (*ModelB)* is the odd ratios obtained from the bivariate logit regression. For example, Akan male has child mortality odds of 0.905 when only ethnic affiliation is considered in *ModelB* of the above formula (i.e about 10% less than males from other ethnic groups in the reference category). Then after controlling for variance in socio-economic covariates in *ModelK* the odds of child mortality among the Akan males become 1.049. This means socio-economic variations improves the survival status of the Akan male child by 6.2% {(1.049/0.905)- 1}. That is, the risk of dying before the age of five would have been 6.2% higher, relative to the reference groups, in the absence of the variations in the socio-economic backgrounds between Akan mothers and those of the ethnic groups in the reference category.

Table 5.6 and Figure 4.6 show the percentage changes in the effects of ethnicity on the sex-differential child mortality with the introduction of demographic, socio-economic and household environmental variables. The original effect of ethnicity alone is represented by Line Zero.

Table 5.6 Percentage change in child mortality risk between bivariate and multivariate models

	Akan		Ga-Dangme		Ewe		Mole-Dagbani	
	Male	Female	Male	Female	Male	Female	Male	Female
Model 1	6.2	16.5	-15.5	-0.7	5.8	15.2	-6.3	2.4
Model 2	23.1	5.8	17.0	-0.2	20.8	1.9	-1.3	99.2
Model 3	16.7	18.6	-7.1	-0.6	115.6	6.6	-8.2	1.3

Figure 4.6 Percentage change in survivorship



Demographic factors (Model 1) have positive changes showing improvement in child survivorship for both males and females in most of the ethnic groups. Male children of Ga-Dangme and Mole-Dagbani, however, have some negative changes. That is, poor demographic measures such as short birth intervals do worsen the survival chances of male child by 65% and 15% in these two ethnic groups respectively. Female child seems to gain more survival status than male child when demographic measures are controlled.

Consistent with traditional observations variations in socio-economic status are the strongest explanation for survival inequality among the ethnic groups. Survival chances of children improve tremendously by -1 to 99 when socio-economic backgrounds are controlled. This improvement favours the male child more than the female child in all the ethnic groups, except the Mole-Dagbani. In the full model, the survival chances of Mole-Dagbani children hit their worst level. Thus life becomes worse when all factors are taken into consideration, emphasizing how poor their general conditions are. The other three ethnic groups have some improvements in survival status even though not as big as what socio-economic advantages bring to them. With the exception of the Mole-Dagbani, male child makes much better gains in survival status from socio-economic factors than female child in all the ethnic groups.

Use of Preventive and Curative Health Services

Another factor that can account for the female higher risk of child mortality is the use of preventive and curative health services. Studies have shown that there sex differences in the use of curative and health measures (Hill & Upchurch, 1995). DHS data has information on immunization coverage and curative measures for diarrhea, ARI, and malaria of surviving children. The main hypothesis that is tested here is whether or not there are sex differentials in the health care given to the children, and how socio-economic factors affect these differences. In other words, are there sex differentials in the odd of receiving health care?

Two levels of analysis (bivariate and multivariate logit) are used to assess the sex differentials in the use of curative and preventive measures. The multivariate looks at sex-specific odds of getting health care when all the socio-economic, demographic and household environmental factors are taken into consideration. And for each of these levels ethnicity is controlled so that the effects of the main independent variable, sex of child, could be determined.

Table 5.7 combines the results of both the bivariate and multivariate analyses. From both analyses, the odds of male child getting treatment from any of the three diseases is generally higher than that of female in all the ethnic groups. Even though disease prevalence is higher for male child among the Akans as found in Table 5.7 both bivariate and multivariate analyses show how dominantly a male child is more likely to get treatment than his female counterpart. This seemingly preferential treatment for male child goes to explain further why male mortality risk is lower than that of the female child among the ethnic groups such as Akans, Ga-Dangme and Mole-Dagbani.

Table 5.7 Bivariate and multiple logistic odds ratios of preventive and curative health services in Ghana by Ethnicity

	Akan		**Ga-Dangme**		**Ewe**		**Mole-Dagbani**	
	Biva	Multiv	Biva	Multiva	Biva	Multiva	Biva	Multiva
Diarrhea	1.047	1.112	2.833*	0.118	0.618	0.288	0.789	0.620
ARI	1.053	1.345	1.654	1.658	1.544*	1.741	1.375*	1.537
Malaria	1.372**	1.331	1.051	2.585	0.704*	0.517*	1.033	1.153
Immunizations	2.753***	1.096	2.286*	1.35	1.183	1.270	0.886	1.036

Biva=results of bivariate analysis; Multiva = results of multivariate analysis.
** p ≤ .10; **p ≤ .05; *** p ≤ .01; Ref. category = Female =1.000*

Again health care practices throw more light on why at the multivariate level sex differential in risk of child mortality is almost zero among the Ewe children as there is no dominance of one particular sex in health care practices in this ethnic group.