BREASTFEEDING AND INFANT AND CHILD MORTALITY: THE CASE OF SELECTED AREAS IN DODOMA, TANZANIA

BY

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A B S T R A C T

This research is intended to study the levels and covariates of breastfeeding and establish the effects of breastfeeding on infant and child mortality.

The objectives are to ascertain the relationship between some socio-economic factors, maternal factors and breastfeeding, assess the extent and degree of the effects of breastfeeding on infant and child mortality and recommend measures to be undertaken in lowering infant and child mortality in Tanzania.

The data were taken from the household interviews. The target population for this study was women in childbearing ages (15-49 years) with at least two live births. In total, 1000 households were covered. 500 households in Dodoma Urban and another 500 households in Dodoma Rural. Univariate, bivariate and multivariate analysis of the data were employed.

It was found that many women breastfeed for more than two years. However, breastfeeding is not the main determinant of the underfive mortality in the studied areas. Education, residence, maternal age, parity and birth interval are found to be strongly correlated with both breastfeeding and underfive mortality.

2.4 THE VARIABLES

The variables used in this study are presented in Table 1 together with their description and categories.

Table 1

Variables and their measurement used in the analysis

VARIABLE	NO	ABBREVIATION	MEASUREMENT
Mortality	1	MOR	Proportion of children dead: (a) under 1 year (b) 1 to under 5 years
Breastfeeding	2	DBF	Number of months breast fed in the last closed birth interval (LCBI)
Level of education of mother	3	EDU	Years completed formal schooling*
Occupation of Mother	4	OCC	Ranking of occupations based on status and skill. 1 = Agricultural work 2 = Others ** 3 = Officework
Maternal age	5	MBP	Age of mother at birth of penultimate child in years (15-49).
Current age of mother	6	AGE	Completed single years
Parity	7	CEB	Number of children ever born alive.
Place of residence	8	RES	Dichotomized 1 = rural, 2=urban
Income / year (in Tanzania shs.)	9	INC	Amount in Tsh. nine categories. ***
Birth interval	10	BI	The number of months the women spent in the LCBI

total population of 1,237,819 about 5.2 per cent of Mainland's population, hence the average density is 30 people per sq. km.

In 1967, the density ranged from over 100 people per sq.km in urban areas to 1 person per sq. km in rural areas (Thomas, 1967), and in 1978, Dodoma district recorded the highest density of 26.3 whilst Kondoa district had the lowest at 20.8.

3.2 PREPARATION FOR DATA COLLECTION

This is the most crucial part, because a meticulously prepared instrument normally brings very good data. The data to be collected were determined by the hypotheses that were to be put to test.

3.2.1 The Research Instrument

The research instrument used was the questionnaire. The questionnaire had both closed and open-ended questions. The closed type questions were constructed in such a way that responses were recorded by using numbers. This was to facilitate easy punching of the data into the computer.

The language used in the interview was Kiswahili, hence the questionnaire was prepared in Kiswahili. Later it was translated to an English version. The English and

3.6.3 Sensitive and Ambiguous Questions

Some questions especially those concerned with fertility, for example, resumption of intercourse after birth, type of contraceptive(s) one uses etc, were rather sensitive, hence the researcher had to take an ultracare in eliciting a required response.

3.7 EVALUATION OF DATA

The reliability of data, especially in developing countries, is often doubtful as each data generating system suffers from one or another defect. This retrospective study carried in Dodoma is no exception. It is imperative therefore that before any analysis can be carried out, the validity and accuracy of the data be ascertained.

Most data suffer from errors emanating from collection, compilation, coding and publishing. Data errors due to over-estimation, under-estimation or misreporting and under-reporting of different events are rampant. For example, under-reporting of ages is a common problem to most females, and males often report extreme ages. Age zero is not considered in several societies, so that children below age one can be omitted in different demographic studies. Other ommissions are caused by memory lapse and by death.

In other situations, people prefer ages ending in multiples of 5's or 10's and next to this is even numbers of 2,4,6,8 etc. It is undisputed that these can cause errors in the estimated rates in one way or another (Shyrock and Siegel, 1976) such as in the estimation of proportion of children dead. Whipples' index and Myers' index have been used to check on digit preference and age-heaping respectively.

Whipples' index was employed to check for heaping on multiples of five, that is, terminal digits '0' and '5' combined. The Whipples' index for Dodoma survey women aged 15-49, was found to be 159 (see Appendix c). Since Whipples' index ranges from 100 which shows that there is no digit preference to 500 indicating that all ages were reported with the same terminal digit, then the results of the Whipples' index calculated shows that there was little digit preference.

On the other hand, Myers' index calculated for Dodoma Survey data was found to be 14.81 (Table 2) which also show very little age heaping on single digit. The theoretical range of the index is 0, representing absolutely no heaping, and 90 which would result if all ages were reported at single digit.

Table 2:

Myers' Blended Index for Terminal Digits Preference For Dodoma Urban and Rural Districts.

Terminal Digit	Percent Distribution	Deviation from 10[a]
0	16.07	6.07
1	7.96	2.04
2	10.24	0.24
3	6.54	3.46
4	5.83	4.17
5	15.78	5.78
6	8.53	1.47
7	8.93	1.07
8	12.71	2.71
9	7.39	2.61
Total		29.62
Summary Index of Age Preference (½ Total)		14.81

Source: Computed from Dodoma Survey (1991).

note: [a] signs disregarded.

Nevertheless, problems of age heaping and age preference have been minimized by grouping ages. With

these few errors on age-data, it was antincipated that data on children everborn (CEB), estimation of duration of breastfeeding, birth interval between the penultimate child and the index child, would suffer from similar problems. In CEB data, the following reporting errors are very common.

(i) misreporting of age of women

Under-reporting of ages may cause over-estimation of the mean CEB while over-reporting of ages may cause under-estimation of the mean CEB. However, if women are to report their ages randomly, compensatory effects would result, and hence the data would be plausible.

(ii) memory error in CEB reporting

It is common feature for older women to omit some of their offspring when stating the children they ever had. This problem is more pronounced when the children are dead or happen to be living somewhere else. This problem is mainly due to memory lapse, especially if the children died when the women were still at young ages.

(iii) Zero error

Zero error occurs when women with no parity are classified in a "not-stated" category of women. This misclassification would lead to fewer number of women

in particular age-groups and consequently leading to an over-estimation of the mean CEB of the concerned age-groups.

In this study, the zero error does not arise, because women with no parity were not considered in the first place. Women who are of concern here are those with at least two livebirths. Thus we are left with two problems as far as CEB is concerned. These are errors due to misreporting of age of women and memory error in the reporting of children everborn (CEB).

It has been observed that the mean CEB increases with an increase in ages of women (See table 4). This observation is true even at older ages when recall lapse is usually expected to be optimum. From these results, one can conclude that memory error in reporting CEB data in Dodoma survey was minimal. This was possible because the respondents were not only asked to give number of children they ever had, but other questions were constructed to countercheck the validity of the response on number of children ever-born (see Appendix a).

In the case of duration of breastfeeding, the data collected was for the surviving penultimate child (i.e. how long did the penultimate child breastfeed up to weaning period). The choice of the most recent two children was an attempt to reduce the likelihood of recall bias which is

prominent when women are asked about the duration of breastfeeding for their older children, and also to remove the problem of reverse causality which occurs when the penultimate child dies causing the cessation or non-initiation of breastfeeding leading to shorter durations of breastfeeding.

Nevertheless, the data on breastfeeding show some heaping on durations of multiples of 6 and 12 months, with peaks at 12, 18, 24, 30 and 36 months. This is due to the fact that usually people tend to refer time events in terms of years, that is 1½ year, 1 year, ½year and so on, and then translate into months. However, reporting erroneous durations of breastfeeding in preferred months are not always responsible for the observed pattern, it might partly be due to cultural norms in relation to breastfeeding practices. In Dodoma region, especially in rural areas, there are cultural norms for continued breastfeeding until at least 24 months according to Gogo tradition before the child is weaned.

Bearing in mind the errors of misreporting of ages and memory lapse arising by asking a direct question, data for birth interval (BI) between the last two livebirths, and the maternal age at penultimate child (MBP) were computed by using other related variables. The computation of data for these two variables necessitated the researcher to

choose women of at least parity two in the age-bracket (15-49). As such data for BI and MBP have minimum errors.

Data for other variables such as education, place of residence and type of occupation do not suffer very much from the problems discussed above. However, data on income were very difficult to obtain without misreporting problems. Although it was possible to estimate the household income basing on salaries, in reality however, this would not portray the true income of the household. Since salary may not necessarily be the only source of income, a variable of extra income was constructed to try to capture the extra income for the respondents. These two added together could at least present a true picture of the total income of an individual.

For those not employed and are agriculturalists, the researcher would ask how much in terms of harvest one possess then convert into monetary terms by using rural cooperative societies prices for various crops. Furthermore misreporting error was minimized by categorizing income into groups.

Drawing from the above discussion, it is imperative therefore to subject survey data to elaborate and rigorous analysis so as to reach a plausible explanation of various phenomena.

CHAPTER FOUR

THE FINDINGS: STATISTICAL ANALYSIS

4.1 INTRODUCTION

In this chapter, a combination of univariate, bivariate and multivariate analyses are employed. The univariate analysis is presented in tabular form showing the effect of each variable on the infant and child mortality.

The correlation matrix is then constructed to explain the relationships between the variables not explained in the univariate analysis. The multivariate analysis applied is the multiple regression analysis which is used in order to determine the strength of effect of independent variables on the dependent variable in a multivariate perspective.

4.2 THE CHARACTERISTICS OF THE STUDY POPULATION

The total number of women of parity two and above aged 15-49 years were 704 which is 55 percent of the total number of women covered in the survey. This is the study population. Breastfeeding is a common phenomenon in the society studied. The mean duration of breastfeeding in the last closed birth interval is estimated to be 21 months, and it is further revealed that 83 percent of the total

women studied breastfeed their children for a year and above.

Table 3.

Characteristics of the Study Population

All women with parity two and above	54.9% (704)
Mean duration of breastfeeding in the last closed birth interval (LCBI)	21.04
The mean children everborn per woman.....	4.67
Women who breastfed for more than a year in the last closed birth interval	82.8% (583)
Illiterate women.....	20.2% (142)
Women employed in modern sector	19.9% (140)
Rural residents	48.3% (340)

Source: Dodoma Survey (1991) (N = 704)

Note: Figures in parentheses are number of cases.

A total of 140 women are employed in the modern sector representing 20 per cent of the study population, while the remaining 80 per cent are in the informal sector. Many women in the study population are literate (80%) having education of varying levels, that is from lower

primary (standard 1-4) to tertiary level. Illiterate women are the minority (20%).

As regards to place of residence, women residing in rural areas are slightly fewer in number compared to those who live in urban areas. Rural women constitute 48.3 per cent, whereas those residing in urban area constitute more than half of the study population (52%).

The mean children everborn per woman in the study population is 4.6; with rural women having more children than urban women. The mean children everborn for the women understudy shows an increasing trend with age. Under normal circumstances, this is anticipated trend because as the woman becomes older she bears more children. Table 4 gives the mean number of children ever born per woman by age of the mother.

Table 4

Children ever born per woman by age of the mother and mean CEB

Age-group	Cases	CEB	Mean CEB
15-19	10	25	2.5
20-24	97	251	2.59
25-29	172	542	3.15
30-34	152	671	4.08
35-39	132	732	5.54
40-44	79	559	7.05
45-49	62	510	8.22
Total	704	3288	4.67

Source: Dodoma Survey (1991) (N = 704)

4.3 DIFFERENTIALS IN DURATION OF BREASTFEEDING BY MATERNAL CHARACTERISTICS

Table 5 gives the mean duration of breastfeeding by maternal characteristics. Seven variables have been considered. These are parity, education, occupation, income, place of residence, maternal age at birth of penultimate child and birth interval.

Table 5

Mean duration of breastfeeding by maternal characteristics

Parity:	1-2	20.09	(149)
	3-4	19.49	(230)
	5+	22.87	(272)
Mothers' education:			
	no education	24.58	(167)
	primary 1-4	23.45	(60)
	primary 5-7	19.83	(320)
	Secondary and above	17.12	(82)
Place of residence:			
	rural	23.34	(303)
	urban	19.05	(348)

(Table 5) continued

Type of occupation:		
Agricultural work	23.07	(309)
Others	18.56	(139)
Office work	19.59	(202)
Family income/year (Tshs):		
10,000 - 29,999	22.87	(287)
30,000 - 69,999	20.59	(195)
70,000 - 149,999	18.54	(123)
150,000 +	17.50	(32)
Maternal age: <18 yrs	19.8	(74)
18 - 30 yrs	20.6	(422)
30+ yrs	22.8	(146)
Birth Interval in LCBI (yrs):		
<1	10.3	(3)
1 - 2	15.7	(98)
2+	22.1	(541)

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Source: Dodoma Survey (1991) (N = 651)

Note: - The grand total for different characteristics is not the same because of the missing cases.

- The number of cases are given in parentheses.

duration of breastfeeding of 4.3 months, results which concur with other empirical studies (see Ferry and Smith, 1983).

Urbanization is associated with lower prevalence of breastfeeding because of the life-styles in modern towns and cities that are somehow incompatible with breastfeeding. The decline in breastfeeding reflects a subconscious attempt to move from the traditional to modern culture and the shift to bottle feeding may be a feature of modernization and acquisition of western material culture. In urban population, women of young ages, less parities, higher education and income are dorminant, and these factors are known to have a negative influence on breastfeeding.

4.4. DIFFERENTIALS IN INFANT AND CHILD MORTALITY

Table 6 gives the proportion of children dead under five years old out of those born alive by subgroups of their mothers. Nine demographic and socio-economic characteristics of mothers in selected areas in Dodoma are presented. These characteristics are current age, parity, education, rural-urban residence, occupation, income, breastfeeding duration, maternal age at birth of penultimate child and the birth interval between the last two births.

Table 6:

Proportion Children Dead Under Five Years
By Subgroups of Women

Age:	15-24	0.192	(70)
	25-39	0.168	(322)
	40-49	0.225	(118)
Parity:	1-2	0.144	(90)
	3-4	0.164	(175)
	5+	0.214	(245)
Education:	no education	0.270	(165)
	primary 1-4	0.187	(50)
	primary 5-7	0.138	(250)
	secondary and above	0.123	(45)
Place of residence:	rural	0.248	(284)
	urban	0.104	(226)
Occupation:	Agricultural work	0.576	(249)
	Others	0.094	(79)
	Office work	0.103	(132)
Family income / year (Tshs.)			
	10,000 - 29,999	0.611	(227)
	30,000 - 69,999	0.131	(135)
	70,000 - 149,999	0.090	(81)
	150,000+	0.063	(18)
Breastfeeding duration (yrs):			
	< 1	0.164	(48)
	1 - 2	0.151	(304)
	2 +	0.220	(126)

Table 6 (continued)

Maternal age:		
	< 18	0.224 (57)
	18 -30	0.148 (290)
	30+	0.178 (121)
Birth interval in LCBI (yrs):		
	< 1	0.347 (2)
	1 - 2	0.153 (70)
	2+	0.167 (396)

Source: Dodoma Survey (1991) (N = 510)

Note: - The grand total for different characteristics is not the same because of the missing cases.

- The number of cases are given in parentheses.

4.4.1 Demographic characteristics

High risks of death for children born to mothers in both extreme maternal ages have been reported (Hobcraft et. al., 1984). The roles of biological and environmental factors leading to this phenomenon have been advanced. It is suggested that immature maternal reproductive development could adversely affect the outcome of pregnancy to very young mothers (Ahmad et. al., 1991). In young mothers, it is further argued, pregnancy taxes their bodies, increasing nutrient demand which may not necessarily be met, and consequently leading to birth of babies with low weight which are prone to risks of death

of other people such as the older siblings who may not be able to offer the right child care. This may lead to higher risks of death for the said children.

4.5 CORRELATION ANALYSIS

We have endeavoured to establish the relationships between the variables discussed by looking at the pattern in the tabular analysis. The degree of this relationship may be examined by utilizing the simple correlation approach, where the correlation coefficient measures the degree of closeness of the linear relationship between two variables.

In this section, simple correlation of the variables is presented. the correlation matrix given in Table 7 summarizes the correlation coefficients for ten explanatory variables. These variables are infant and child mortality, breastfeeding duration, maternal age, birth interval, parity, current age, residence, education, occupation and income.

Table 7: The correlation matrix

	MOR	DBF	MBP	BI	CEB	AGE	RES	EDU	OCC	INC
MOR	1.0000									
DBF	.1321*	1.0000								
MBP	-.0034	.1285*	1.0000							
BI	.0395	.3033**	-.0185	1.0000						
CEB	.1673**	.2429**	.6904**	.1338*	1.0000					
AGE	.1265*	.2042**	.8211**	.2227**	.7155**	1.0000				
RES	.3125**	-.2873**	.0950	-.0100	.2203**	.0681	1.0000			
EDU	-.2890**	-.3005**	-.2464**	-.0895	-.4160**	-.3240	-.4845**	1.0000		
OCC	-.0703	-.1026	-.0990	-.0759	.0719	-.1443*	.2510**	-.3437**	1.0000	
INC	-.2585	-.2462**	.0116	-.0302	-.1471**	-.0136	-.5848**	.4343**	-.2932**	1.0000

(N = 570)

Source: Dodoma Survey (1991)

Note: * 1 - tailed significance 0.01

** 1 - tailed significance 0.001

From table 7, it can be noted that variables education and income are negatively correlated with infant and child mortality. This correlation is significant at 0.01 level. The implication of this correlation is that the higher the level of education and income, the lower the infant and child mortality. Likewise, the two variables are negatively correlated with duration of breastfeeding and the coefficient is significant at 0.01 level. This suggests that at higher levels of education and income, mothers tend to breastfeed for shorter durations and vice versa.

The occupation of the mother is found to have weak negative correlation coefficients with both infant and child mortality and duration of breastfeeding. However, from the direction of the coefficients, it is clear that the higher the status of the occupation of the mother, the lower the mortality of the underfives and the shorter the duration of breastfeeding.

There is a strong positive correlation between the variable parity with mortality of infants and young children. The correlation coefficient is significant at 0.001 level, showing that the higher the number of children everborn the higher the number of children dead. Parity is also strongly correlated with duration of breastfeeding. The coefficient is positive and significant at 0.001 level. It is thus deduced that women of low parities breastfeed for short durations and vice versa.

Table 7 further depicts that place of residence is positively correlated with underfive mortality and significant at 0.001 level. This observation is in favour of rural residents, implying that there is higher mortality risk among children born to rural mothers. On the other hand, residence and duration of breastfeeding are found to be negatively correlated. The coefficient of correlation has a high magnitude and significant at 0.001 level. The sign of the coefficient favours the urban residents, suggesting that urbanites breastfeed their offspring for

shorter durations than their rural counterparts.

Age of the mother is found to be positively correlated with both mortality for the underfives and duration of breastfeeding. The coefficient of correlation between age and underfive mortality is significant at 0.01 level whereas that between age and breastfeeding is significant at 0.001 level. At higher ages, mothers tend to experience more deaths of their children and breastfeed longer.

Although duration of breastfeeding has a statistically significant correlation with underfive mortality, the coefficient is of less magnitude and has an unexpected sign. This observation could be attributed to the fact that since the variable - mortality included infants and young children then the effects of breastfeeding on mortality are masked by the presence of older children, suggesting that the effects of breastfeeding are more prominent in very young ages.

As expected, birth interval is positively correlated with breastfeeding, the coefficient being of high magnitude and significant at 0.001 level. The inference here is that the shorter the birth interval the shorter the duration of breastfeeding.

Conclusively, it can be observed that whereas the variables - residence, education, age, parity and birth

interval have strong positive relationship with duration of breastfeeding, statistically significant at 0.001 level, maternal age is correlated positively with breastfeeding but significant at 0.01 level. On the other hand, variables occupation, birth interval and maternal age have weaker linear relationship with the underfive mortality.

4.6 REGRESSION ANALYSIS

4.6.1 The Model and Assumptions

The models suggested below are estimated by the Ordinary Least Square (OLS) technique of regression analysis because of its advantages of simplicity and convenience in the process of estimation and interpretation.

The OLS method is only useful if the assumptions of the classical linear regression model are fulfilled. The following is a list of the assumptions followed.

1. all independent variables are not significantly related to each other.

2. the dependent variable does not affect the independent variables implying that causation runs on one side only,

3. the error term is normally distributed with zero mean

i.e. $E(\epsilon_i) = 0$,

and a constant variance i.e, $E(\epsilon_i^2) = \sigma^2$.

The model for determination of effects of breastfeeding on infant and child mortality are represented by a linear multiple regression equation:

$Yt = a + bx_1 + cx_2 + dx_3 + \text{----------} + jX_q + Ut$

where,

Yt = dependent variable

a,b,c,d ---- j = unknown parameters to be estimated.

X_1, X_2, X_3--------X_q = a set of regressors, and

Ut = random error term.

The variables to be included in the regressions are occupation, residence, current age, education, income, parity, duration of breastfeeding, maternal age, birth interval and proportion of children dead. The models are presented as follows;

1. MOR = f(AGE,RES,EDU,OCC,INC,CEB,MBP,BI,DBF,E).
2. DBF = f(AGE,RES,EDU,OCC,INC,CEB,MBP,BI,E).

(for description of the abbreviations see section 2.5, Table 1).

E = Error term

(E is assumed to satisfy all the classical assumptions of a linear regression model, viz., randomness, zero mean, constant variance and normal distribution of the disturbance).

f = a functional operator.

The assumed specific relationship are as follows:

1. $MOR = b_0 + b_{16}AGE + b_{18} RES + b_{13}EDU + b_{14} OC + b_{19}INC + b_{17}CEB + b_{12}DBF + b_{15}MBP + b_{110}BI + E.$

2. $DBF = b_0 + b_{16} AGE + b_{18}RES + b_{13}EDU + b_{14}OCC + b_{19}INC + b_{17}CEB + b_{25}MPB + b_{210}BI + E$

4.6.2. Multiple regression results

In examining the statistical results, the task is to see whether the equations give good fit given by R^2 (the coefficient of determination) statistic, and then try to see if the explanatory variables included in the models are significant or not.

Table 8 gives the standardized regression coefficients for the determinants of breastfeeding. Out of the eight explanatory variables included in the regression equation, only education, place of residence and birth interval are found to have a statistically significant effect on duration of breastfeeding. Variables - maternal age, occupation, parity and age have weak effect on duration of breastfeeding. R^2 for all eight variables is 21.3 per cent (see tables 8).

The variable-duration of breastfeeding - was added to the eight variables mentioned in Table 8 to see its effects on infant and child mortality. Multiple regression for

both infant mortality and child mortality were carried out. Five models were formed by dropping one variable among those with high correlation ($r \geq 0.5$). The five different models are compared to demonstrate shifts in estimated effects of certain variables when a particular variable is controlled.

Table 9 gives the standardized regression coefficients for the determinants of infant mortality. The variable - duration of breastfeeding is found to have a weak effect on infant and child mortality. However, the effect of breast-feeding is in the expected direction which was not the case in bivariate analysis.

When residence variable is controlled, the explanatory power of the explanatory variables in the equation is reduced from 8.8 per cent to 6.8 per cent (Model 2), while the magnitude of the coefficients of variables-education, income and parity increase though not significant.

Model 3 which is formed by controlling maternal age offers some interesting results. The coefficient of determination (R^2) is reduced from 8.8 per cent to 5.7 per cent, and only variable residence is significant at 0.01 level. Whereas the dropping of the variable-parity in Model 4 does not bring any profound change in the R^2, in Model 5 where the variable - age was dropped, R^2 was reduced by 1.1 per cent with variables - occupation, education and

parity becoming significant at 0.05 level.

From the above observations, variables - residence, maternal age, and current age have been found to have strong effect on infant mortality than breastfeeding.

Table 10 presents the standardized regression coefficients for the determinants of child mortality. In all five models, the variable duration of breastfeeding doesn't seem to be significant, but the magnitude of the coefficients are much smaller than was the case in Table 9. This shows that the effects of breastfeeding are much stronger in infants than in children above year one.

Education is found to be significant in all models, whereas when age is controlled (Model 5), education and parity - which were significant at 0.05 level in determining infant mortality, now become significant at 0.01 level. Maternal age has a strong effect on child mortality as well, because by dropping it in Model 3, the explanatory power of the remaining variables is reduced by 51 per cent - that is from 18.5 to 13.4 per cent.

It is now concluded that education, parity, residence, maternal age at birth of penultimate child and current age of the mother have a very strong effect on child mortality.

Table 8:

Standardized regression coefficients for the determinants of breastfeeding - by entire method

Independent variable	Coefficients
Birth interval	0.2777**
Residence	-0.1614**
Maternal age	0.0147
Occupation	-0.0156
Education	-0.1121*
Income	-0.0752
Parity	0.0836
Current age	0.0220
R-Square	21.3%

Source: Dodoma Survey (1991)

Note: - ** Significant at 0.01 level

- * Significanty at 0.05 level

- R^2 = 21.3 per cent

Table 9

Standardized regression coefficients for the determinants of infant mortality

Independent Variable	Coefficients				
	Model 1	Model 2	Model 3	Model 4	Model 5
Birth interval	-0.0519	-0.0564	0.0181	-0.0488	-0.0017
Residence	-0.2037**	-	-0.1873**	-0.2051**	-0.1955
Maternal age	-0.3469**	-0.3291**	-	-0.3176**	0.1705**
Occupation	0.0984	0.0193	0.1071	0.0902	0.1305*
Breastfeeding	-0.0502	-0.0304	-0.0520	-0.0465	-0.0485
Education	-0.0884	-0.1134	-0.1146	-0.0997	-0.1228
Income	-0.0387	-0.1021	-0.0583	-0.0406	-0.0401
Parity	0.0869	0.0906	0.0118	-	0.1456
Current age	0.2720**	0.2591**	0.0177	0.3051**	-
R-Square	8.8%	6.8%	5.7%	8.5%	7.1%

Source: Dodoma Survey (1991)

Note: - ** Significant at 0.01 level

- * Significant at 0.05 level

- See text for the explanation of the Models.

Table 10

Standardized regression coefficients for the determinants of child mortality

Independent Variable	Coefficients				
	Model 1	Model 2	Model 3	Model 4	Model 5
Birth interval	-0.0777	-0.0821	0.0116	-0.0709	-0.0158
Residence	-0.2123**		-0.2149**	-0.2382**	-0.2251**
Maternal age	-0.4415**	-0.4178**	-	-0.3825**	-0.2239**
Occupation	-0.0585	-0.0359	0.0667	0.0400	0.0946
Breastfeeding	-0.0021	0.0201	-0.0051	0.0042	-0.0071
Education	-0.1171*	-0.1406*	-0.1448*	-0.1333*	-0.1536**
Income	-0.0689	-0.1427**	-0.0941	-0.0729	-0.0710
Parity	0.1704*	0.1699*	0.0708	-	0.2371**
Current age	0.3231**	0.3158**	0.0094	0.3938**	-
R-Square	18.5%	15.7%	13.4%	17.3%	15.9%

Source: Dodoma Survey (1991)

Note : ** Significant at 0.01 level

* Significant at 0.05 level

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

This research is intended to study the levels and the covariates of breastfeeding and establish the effects of breastfeeding on infant and child mortality. The objectives are to ascertain the relationship between some socio-economic factors, maternal factors and breastfeeding, assess the extent and degree of the effects of breastfeeding on infant and child mortality and recommend measures to be undertaken in lowering infant and child mortality in Tanzania.

This chapter provides the conclusion of the findings and recommendations for policy and research in the auspices of the aforementioned objectives.

5.2 CONCLUSION

It has been established in this study that many women (82.8%) breastfeed for more than a year, the mean duration of breastfeeding being 21 months. However, the study reveals that breastfeeding is not the main determinant of the underfive mortality in the studied areas.

On the other hand, education, residence, maternal age, parity and birth interval are the variables found to be

strongly correlated with both breastfeeding and underfive mortality. The variables mentioned are found to have a strong effect on mortality of the underfives than breastfeeding. The findings of this research show that breastfeeding for long duration is beneficial to young children especially infants, nevertheless, its positive effects are elevated in a multivariate perspective.

It has been found that in countries where the situation generally is more favourable to child survival - as signalled by a low level of infant mortality, it is somehow impossible to find any improvement of survival chances associated with breastfeeding even through the first three months of life. Only in very few cases among those countries with generally less favourable conditions is any improvement seen in subsequent survival chances associated with breastfeeding continuation for as long as 12 months (Millman and Cooksey, 1987).

Apparently, factors that increase mortality risks not only increase the importance of breastfeeding for children's survival, but also increase the age up to which its benefits continue to be important. In retrospect, this observation suggests that any policy intervention designed to promote breastfeeding should concern itself primarily with how children of the most deprived subgroups are fed, and should stress continuation of breastfeeding to higher ages for those same subgroups.