DEMAND FOR CHILD HEALTH CARE SERVICES: THE CASE OF SUBA EAST DIVISION, MIGORI DISTRICT, KENYA.

BY

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DECLARATION

This research project is my original work and has not been presented for a degree in any other university.

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DEDICATION

To my parents William and Patricia.

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Acronyms

AIDS - Acquired Immune Deficiency Syndrome

AMREF - African Medical Research Foundation

BCG - Bacilles Calmette Guerin

DTP - Diphtheria - Tetanus - Pertussis

EPI - Expanded Program on Immunization.

HIV - Human Immunodeficiency Virus

KDHS - Kenya Demographic and Health Survey

KEPI - Kenya Expanded Programme on Immunization.

KNH - Kenyatta National Hospital

MCH - Maternal and Child Health

NGO - Non Governmental Organization

NHSSP - National Health Sector Strategic Plan

OPV - Oral Polio Vaccine

ORT - Oral Rehydration Therapy

UCI - Universal Child Immunization

UNICEF - United Nation's Children's Fund

WHO - World Health Organization

Definitions

- Poverty - Denial of opportunities and choices most basic to human development.
- Mortality rate - The number of deaths per 1000 of a population.
- Infant mortality rate - The number of children per 1000 live births who die between birth and the first birthday.
- Child mortality rate - The number of children who die per 1000 children surviving to the first birthday.
- Under-five mortality rate - The number of children per 1000 live births who die between birth and the fifth birthday.
- Child - A person under the age of 5 years.
- Immunization - Preventing serious attacks of communicable diseases in individuals by producing them in a mild form, usually by vaccination.
- Morbidity - Any departure from a state of wellbeing expressed in terms of people who are ill and /or as episodes of illness.
- Life expectancy - the number of years an individual is expected to live if current mortality trends continue.
- Mother - this is the female guardian of the child.

Abstract

The major objective of the study was to identify which factors affect demand for child health care services and their importance in Migori district. The high child mortality rate, morbidity rate and low life expectancy levels are a contrast to the increase in the number of personnel in the district. The study therefore set out to highlight some of the factors that contribute to these poor health indices. To achieve the objectives of the study, cross sectional primary data were collected using a questionnaire from a sample of 123 respondents. Both the descriptive and regression results were given. For the multinomial econometric analysis of the data, only 106 respondents were used due to some incomplete data. Due to the discrete nature of the demand for child health care, a multinomial logit model was adopted to capture the overall demand and the demand for the particular health providers.

The results showed that waiting time, number of siblings, household size, father's level of education, household's level of income and mother's employment were the significant variables. Number of siblings and household's level of income were found to be negatively related to the demand for child health care services. Waiting time, household size, father's levels of education and mother's employment are positively related to the demand for child health care services.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

World Health Organization (WHO) defines health as a state of complete physical, mental and social well being and not merely the absence of disease or infirmity. Pediatric or child health care is the appropriate medical and preventive care given to the child for its survival, growth and development. Child health care entails preventive (immunization, nutrition, water and sanitation) and curative services which are the appropriate medical treatment of common diseases and injuries at a health facility (Monekosso, 1994).

Health status is measured by indices such as mortality, morbidity, nutrition and life expectancy levels. Improvements in nutrition, sanitation and drinking water supply would lead to a reduction in mortality and morbidity rates in children and hence an increase in life expectancy. Nutrition status of young children is a sensitive indicator of health status and nourishment levels of a population. It gives the current health status of the child in terms of immediate (acute) factors such as inadequate food intake. Immunization of children is one of the preventive measures of early childhood mortality. The recommended vaccination schedule for children is presented in Appendix I. It is in this spirit that the Early Childhood Development Programme aims at integrating health and nutrition with emphasis on the prevention and promotion to optimize health and

nutrition standards of the children (United Nations Children's Fund UNICEF, 2001).

Health care itself is not a 'good' rather, the demand for health care is derived from a demand for health care improvements or health maintenance. In contributing to consumer's utility, health improvements and maintenance have value in use therefore health itself cannot be traded or exchanged in the market (Donaldson and Gerard, 1993). Health care is valued to the extent that it improves health. It is only be demanded as input into the production of health, and the level of demand for health services would be determined by the extent to which they satisfied the individuals' underlying preference for health. The demand for medical care is not only constrained by a choice of how much, but, also of what kind (William, 1999). The demand for health is a derived demand from the value placed on being fit and well to lead fulfilling lives. The relationship between health and health care is that any demand for health care is derived from the demand for health as long as the health care system can promote that health (Mooney, 1986).

1.2 Government of Kenya's Policy Towards Health Care Services

In an effort to improve the health status of Kenyans, the government of Kenya since independence has committed itself to the expansion of health facilities and other resources. Health facilities include hospitals, health centers, clinics and dispensaries. This commitment is evidenced by the increase in the number of health facilities from 1547 in 1979 to 4355 in 2000(Republic of Kenya,

1980 and 2001) and by the increase in the number of enrolled nurses per 100,000 population from 72.71 in 1994 to 94.40 in 1999 (Republic of Kenya, 2000). In addition, the government created a conducive environment for the private sector, Non -Governmental Organizations (NGO'S) and church mission to participate in the provision of health services. Currently, the Ministry of Health is engaged in delivery of basic health packages. According to the National Health Sector Strategic Plan (NHSSP), the basic packages of health services consist of malaria prevention and treatment, Integrated Management of Childhood Illnesses (IMCI), Expanded Programme on Immunization (EPI), reproductive health, Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome/Tuberculosis (HIV/AIDS/TB) prevention and management and the control and prevention of major environmental health related communicable diseases such as cholera and typhoid. (Republic of Kenya, 1999). These packages will ensure that women and children are catered for especially those living under extremely difficult conditions.

The Ministry of Health through Kenya Expanded Programme on Immunization (KEPI) has vowed to continue expanding and intensifying its activities in order to decrease the incidence and prevalence of the vaccine-preventable diseases namely: tuberculosis, measles, poliomyelitis, whooping cough, tetanus and diphtheria (Republic of Kenya, 1994). The government of Kenya / UNICEF's strategies as stipulated in the 1994 - 1998 programme for child survival and development are to achieve a universal child immunization (UCI)

with a full immunization target of 75 percent of all children under five years of age and to control diarrheal diseases among infants and children and promote the use of Oral Rehydration Therapy (ORT) to convert at least 80 percent of those at risk. The Bamako initiative strategy, which aims at strengthening community-based actions for improving the survival and quality of life of women and children, is in action in Kenya.

1.3 Child Health Status in Kenya

Despite the increase in the health delivery infrastructure in Kenya, health status indicators are not impressive. For instance, one in every nine Kenyan child does not live to the fifth birthday. This shows a slight decline from the KDHS 1993 by one percent. The infant mortality rate stands at 74 deaths per 1000 births. The under-five mortality rate which is 23 per cent higher in rural areas (109 per 1000 births) than in urban areas (88 per 1000 births). The number of children with stunted growth increased from 33 percent in 1998 to 35 percent in 2000, underweight children also increased from 22 percent to 23 percent during the same period and the infant and child mortality increased by 20 percent between 1989 and 2000 (Republic of Kenya, Kenya Demographic and Health Survey (KDHS), 1998, Republic of Kenya, 2002). The Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS) pandemic has also badly hit Kenya with an estimated 700 people dying of AIDS everyday. It is also estimated that approximately 2.2 million Kenyans are HIV positive leading to a high number of orphans (Republic of Kenya, 2001, Republic of Kenya, 2002).

1.4 Child Health Status in Migori District

In any society, health status indices reflect the state of health in that society. The health status indices for Nyanza Province are generally the poorest in Kenya. The under-five mortality is exceptionally high in Nyanza Province where 199 per 1000 children die before the fifth birthday. The former South Nyanza District, from which Migori District was curved, has the highest under-five mortality rates with 0.244 in 1989 (see Appendix III). In terms of immunization, Nyanza Province ranks last with only 47 percent of children aged 12 - 23 months fully vaccinated (see Appendix II). The immunization coverage in Migori was only at 68 per cent (Republic of Kenya, 1997) in 1995. This was still below the Kenya government's target of 75 percent and above. However, according to Republic of Kenya's fifth child nutrition survey, (1996), Migori District had recorded 75 percent in childhood vaccination. This was again below other districts, which recorded over 80 percent. Migori District, with 21 percent of severely wasted children had the highest percentage in Nyanza Province. The percentage of acutely undernourished children was 48 percent compared to the provincial average of 36 percent and the national average was 21 percent (Republic of Kenya, 1994). Despite all these, the number of heath facilities increased from 33 in 1993 to 48 in 1996(Republic of Kenya, 1997).

1.5 Statement of the problem

The demand for child health care services is derived from the need for good health of the children. Low health status for the children in Migori District as evidenced by very high mortality, acutely undernourished and serverly wasted children, suggests either limited demand or low supply or other intervening factors in child health care services in the district. While some of the factors that influence demand for health services are known, the relative importance of each of the factors varies from region to region. In this connection, the relative importance and the magnitude of the determinants of demand for child health care services in Migori District are not known.

1.6 Objectives of the study

The general objective of the study was to find out why the health status indices in Migori District are poor despite the increase in the number of health facilities in the district. The specific objectives were:

i) To identify which factors affect demand for child health care services in Migori District.

ii) To identify the relative importance/significance of each identified factors.

iii) To make recommendations based on the two objectives on the ways of improving child health care services in the district.

1.7 Significance of the Study

The determinants of demand identified will help in the explanation of the variation in use of child health care services in Migori District. Health policy-makers and N.G.O'S could use the results to deliberate on ways of improving health status in the district. The study has also added to the current knowledge on health care in general and child health care in particular.

1.8 Scope of the Study

The study only covers the health providers within Migori District. Interviews took place with the female guardian of the child. The study covers children below 5 years who had visited a health provider within the last six months prior to the survey.

CHAPTER TWO

LITERATURE REVIEW

Presented in this section is the literature review. It is divided into two sections, general literature and literature specific to Kenya.

2.1 General Literature

According to Lee (1979) elasticity of demand, might be expected to depend on such factors as the availability of substitutes within and without the National Health Services, and the 'price' to be paid in relation to household income. In the work, the writer suggests that community valuation for health services can be elicited in two ways:

i) Observed behaviour: observe the number of visits that take place at each of a range of prices or the variation in prices faced by consumers being necessary to build up a demand schedule.

ii) Stated behaviour: acquire information about actual valuations by asking the respondents to state how he would trade off various commodities and services against his income or time. A study on demand for medical services can either be a longitudinal (time series) or cross -sectional study. The prices of medical care can either be money prices or time prices. The time prices are measured by the opportunity cost of the patient's time, travelling time and waiting time, which are used as proxies in demand studies.

In view of Sorkin (1975), it is explained that consumers are more ignorant and uncertain in their role as consumers of health services than as purchasers of

most other commodities. They cannot assess the quality and character of health services they consume and are generally unaware of health care alternatives available for treating a given illness. Furthermore medical care is characterized by low degree of substitutability and is not wanted until it becomes a preferable alternative to the pain and other consequences of illness. This implies that the price elasticity of demand for medical care would tend to be low. The effect of income cannot be predicted a priori and preference is given to the use of permanent income (average of current income and future income).

In their book Donaldson and Gerard (1993), assume the existence of a fully informed consumer. The implication is that the consumer has perfect knowledge of the relationship between health care and its contribution to health improvements or maintenance of health. He/she therefore has the ability to judge the value in exchange of health care as well as the value in use of health. Charges help to reduce frivolous demand but it is not also easy to separate frivolous demand from necessary demand. Low-income groups have been shown to be most disadvantaged by corresponding reduction in the consumption of necessary care that accompanies the introduction or raising of charges. There is asymmetry of information between patients and doctors regarding the technological relationship between health care and its effects on health. In such a situation, the patient seeks advice on what services to demand from the very person who is supplying these services; the doctor. Thus, the doctor is placed in the unusual position of being both a demander and a supplier of a service for which they bear

little, if any, financial burden. Such a situation will lead to over-utilization of services since the doctor could ask for more visits and/or prescribe more drugs for financial gains.

According to Jack (1999), the health care choices open to consumers are whether to seek medical care or not and what kind of facility to visit and how often. The fact that there are a large number of zero expenditures, the positive observations are highly skewed towards zero and that medical care is not a homogenous commodity means that regressing expenditures on prices and other variables directly may not provide useful information. Such a study uses multilevel analysis in which an attempt is made to separate types of consumption choices. The choices include the decision to use care, the choice of the type of care to use and the intensity of care use, given the type chosen. This incorporates both discrete and continuous choice econometric modeling techniques, because the choices of whether to consume care and what kind of service to consume are discrete choices, while the decision of how much to consume (of the chosen type) is continuous choice.

To estimate the relationship between delivery characteristics, mothers' characteristics and delivery choice, Schwartz et al (1988), used the mixed multi-nominal logit technique. Two types of independent variables were used: (i) conditional variables for example, price of delivery (ii) unconditional variables for example, mothers' age, which does not change as a result of the choice. The implicit assumption of the estimation was given as the "Independence of

Irrelevant Alternatives" (IIA). This means that the model cannot be appropriately applied when there are different degrees of substitutability or complementarity among the various choices. In such a case, it would imply that each of the six delivery choices (relatives, traditional, public home, private home, public away, private away) is independent and has different characteristics. It also implies that as the value of a variable pertaining to a particular delivery method changes and mothers adjust their choices in response, the proportionate distribution of their movement from that particular delivery type and the five alternatives will be identical to the initial distribution of choices over the five alternatives. The effect of this assumption is to lessen the simulated effects of changes on some specific variable values, which may change the policy implications of the findings. In the estimation, the log of the odds of any particular choice being made (choice 1 for example) was given as:

$$\left[\frac{\mathrm{Prob}(Y_i = j)}{\mathrm{Prob}(Y_i = 1)}\right] = \gamma\left(X_{ij} - X_{i1}\right) + \beta_j Z_{ij} \qquad (2.1.1)$$

(j=2,.....N). Where,

γ are the coefficients associated with the choice-varying (conditional) independent variables.

β_j are coefficients varying by choice of delivery type. In determining the probability of woman i choosing delivery type 1, the β_j's reflect the influence of the woman's personal circumstances (the Z variable) on her choice of any particular j delivery system.

X_{ij} is a vector of values for a set of independent variables (e.g. set of price) that vary by choice (j=1,2…N) and by woman (i=1,2…M).

Z_i is a vector of independent variables that vary only by woman.

Another study by Gertler and Van Der Gaag (1990) developed a model for the estimation of demand for health care services in Rural Cote d'Ivore and Peru. The objective of the study was to find the impact of user fees on the utilization of medical care. The demand for provider j was given as:

$$\pi_0 = \frac{\exp(V_o)}{\exp(V_o) + \left[\sum_{j=1}^{J} \exp(V_j/\sigma)\right]^{\sigma}} \qquad 2.1.2$$

And self-care demand was given as:

$$\pi_i = (1-\pi_o)\frac{\exp(V_i/\sigma)}{\left[\sum_{j=1}^{J} \exp(V_j/\sigma)\right]^{\sigma}} \qquad 2.1.3$$

Where, $V_j = \beta_{0j} + \beta_{1J}X + \alpha_1(Y-P_j - wT_j) + \alpha_2(Y - P_j - wT_j)^2$ and

X = Vector of demographic variables.

Y = The level of income.

T_j = Time spent obtaining care from provider j.

W = Opportunity cost of time.

P_j = direct payment to the provider.

β's and α's are the coefficient of the demographic and economic variables respectively.

The study found that in Cote d' Ivore, the model was consistent with utility maximization since σ =0.34 for adults and 0.41 for children. The results for children showed that demand falls with age from zero to three years old. Mother's education does not influence the choice of the provider and there is no difference by gender. Further, the severity of illness and the number of children increase the demand for medical care and children's utilization of medical care is more sensitive to time than adult utilization. The results implied that the opportunity cost of time is a bigger barrier to health care for poorer individuals than it is for richer individuals. Thus, the results underscored that poor people are not just money poor but are also time poor. In the Peruvian case, the model was also consistent with utility maximization since σ = 0.98 for adults and 0.44 for children. The findings for the children were that the probability of seeking medical care falls with age until three years and then flattens off. Mother's education also increases the demand for medical care and the utilization does not differ by gender. The overall results for both Cote d'Ivore and Peru were found to be consistent with economic theory. The results showed that price is an important determinant of the decision to use medical care. The conclusion drawn was that uniform user fees can generate substantial revenues but are very likely to reduce the utilization of medical care by the poor as they are regressive and act as barriers to medical care.

In a study by Gerdtham and Johannesson (1995), a model for new estimates of the demand for health was developed. The aim of the study was to estimate the demand-for-health equation using Swedish micro data, and measuring health capital by a categorical measure of overall health status that is bad, fair and good health. The individual maximizes utility subject to private goods, leisure time and health, which are separable in time. The study adopted Grossman's model. The demand function was specified as:

$$H_t = H_t (p, P, Y, W, A, E, Q, H_o)$$

Where, p, P and Q were vector prices of private goods, vector of medical care prices in time t and Q is the rate of time preferences respectively. p, P and Q were however not included in the estimations since they do not vary between individuals. Y is the non-wage income, W are the wage rates, A are the variables affecting the rate of depreciation of health and E are the education levels all in periods 1, 2... T and H_o is the initial inherited stock of health capital at time zero (use a dummy 0 if parents or siblings have had health problems). The dependent variable H_t is the stock of health measured by a categorical health measure, where individuals rated their own current health status on a three-point scale: (0 = bad health), (1 = fair health) and (2 = good health). The results obtained for the full sample was that income affected demand negatively, age was found to decrease the demand for health, marital status negatively affected demand while education positively affected health. Overall, the demand for health was found to be lower

for males than females. This type of categorical measure is more appropriate since it captures all individuals (sick or not).

Ii (1996) developed a mixed demand model for an urban area in Bolivia under the assumptions that sick individuals face a choice among self - treatment and several professional treatments. The independent variables were grouped into two: Attributes of the choice for the individual (X_i) and the characteristics of the individual (Z_i). The former vary with choice and individual while the latter are the same for all choices and varies only across individuals. Choice attributes included consulting fee, waiting - time at the health facility and travel time to the health facility. Individual characteristics variables included age, sex, per capita consumption, the number of sick days in the previous month, level of education, language spoken, working status, number of adults aged 16 years or older and number of children aged 15 years or younger in the household. A dummy variable to indicate if an individual is from a family with a member employed at a company which registers social security to establish its effect on demand for health care. Choice 0 was let to be self - care alternative and 1, 2, 3 and 4 was let to be the various provider alternatives. The demand for self care alternative was given as:

$$prob[Y_i = 0] = \frac{1}{1 + \sum_{j=0}^{J} \exp(\alpha' X_{ij} + \beta'_j Z_i)} \qquad 2.1.4$$

And the demand for provider is given by:

$$\Pr ob[Y_i = j] = \frac{\exp(\alpha' X_{ij} + \beta'_j Z_i)}{1 + \sum_{j=0}^{J} \exp(\alpha' X_{ij} + \beta'_j Z_i)} \qquad 2.1.5$$

The log likelihood for the problem was given as:

$$\ln L_i = \sum_{j=0}^{J} D_{ij} \ln prob[Y_i = j] \qquad 2.1.6$$

Where D_{ij} is a dichotomous variable that takes on the value 1 if individual i chooses j that is if

$Y_i = j$. The money prices used was the sum of consulting fees, cost of medicines, and travelling costs. The opportunity cost of time was taken to be the sum of round trip travel time and waiting time. User fee, working in the informal sector, consulting fee, waiting time and travel time coefficients were all found to be negative. Mothers' education coefficient had a negative sign as expected. There was also an indication of gender bias with male infants being more likely to be treated professionally and children from female - headed households were less likely to seek formal care. The study data were of good quality since they were obtained specifically for the study. The study was based on an urban area, while the present study was based on a rural area.

To show the effect of patient initiated contacts, Puing - Junoy, et al (1998) studied health care provider choice in the case of patient - initiated contacts: An extended version of discrete choice of model demand in Spain. The main aim of the study was to analyze the effects of individual and provider specific factors on

the individual choice. The variables included individual characteristics, health related characteristics (smoking habits, physical exercise), levels of education, perceived health status, chronic disorders and access cost. Income was also included and since it was not observable, status was used as a categorical variable and used employment status and level of studies as a proxy. The major finding was that the indirect access cost (travel and waiting time) plays an important role in the health care provider choice when monetary prices are zero. The study also found that, health status plays an important role on individual decision in terms of seeking formal care and the type of provider chosen. Health related characteristics (smoker, little exercise) reduce probability of seeking formal care while poor health status, having chronic disorders and no formal schooling are positively related to the probability of seeking formal care.

Another study by Glick et al (2000) in Madagascar to examine the utilization of and the demand for education and health services used both the descriptive and behavioural analysis was carried out. However of importance to the present study is investigation of health services. The objective was to determine the impact of household characteristics and health care facility factors on the decision to take a child to public or private hospital or not at all. The study used a nested logit model given as:

$$probability_j = \frac{\exp\left(\frac{V_i}{\sigma}\right)\left[\sum_{k=2}^{k} \exp\left(\frac{V_k}{\sigma}\right)\right]^{(\sigma-1)}}{\exp(V_i) + \left[\sum_{k=2}^{k} \exp\left(\frac{V_k}{\sigma}\right)\right]^{\sigma}} \qquad 2.1.7$$

to estimate the determinants of health care facility choice. Where,

V=V (X, Q, Y, P) and X is a vector of individual characteristics, Q is a vector of provider characteristics, Y is the household income and P is the cost of medication. This allows for grouping of related choices together and correlation of the error terms for related choices. This also accounts for the fact that not all individuals have access to both types of facilities. The specifications included individual and household factors, household per capita expenditures, provider cost and characteristics that were estimated using a nested logit model. Both the direct and indirect costs were estimated but for children below 15 years old, only direct costs were used and the coefficient captured in part the effect of opportunity costs incurred by the household in seeking treatment for the child. Price variable was interacted with dummy variables for household per capita expenditure quartile because the poor are more sensitive to changes in prices and the interaction allows prices to differ across income groups.

The households were found to be moderately sensitive to the cost of care with the higher costs causing lower demand for child health care. Schooling of head of household had a positive effect on seeking care relative to no care while availability of free vaccines increases the demand for hospital care but not for basic care facilities. Distance had a negative significant impact on the decision to seek basic care while duration of illness did not affect the choice of care. There was also no gender bias in the decision to seek basic care. Simulation results were also carried out to test the impact of user fees increase for public health care

providers and the expansion of private health care sector and they indicated that raising the cost of treatment at public facilities reduces the utilization of health care services. The conclusions drawn were that households were moderately sensitive to the cost of care, the poor are less likely to seek care when sick and that quality of health care provider in the rural was poor.

In Bangladesh, Levin et al (2001) carried out an empirical study of the demand for child curative care in two rural thanas of Bangladesh. The study focussed on the effect of income, women's employment and the prices of obtaining child health care using a nested multinomial logit specification. Utility function was maximized subject to both a production function of health and the joint wealth constraints to yield a reduced-form demand equation as:

$$M^* = M^*(C, t_r, m, W_h, W_w, Z_h, Z_w, A_h, A_w)$$

Where C, t_r and m are the price of consumer goods, cost of travel time and price of medical services respectively. W_h, W_w; Z_h, Z_w; and A_h, A_w are the non-wage income, demographic characteristics and community characteristics of husband and wife respectively. M^* is

1) The use of service provider versus self-care during an illness episode in the past two months. 2) The choice of 4 providers: public trained paramedic trained physician, untrained village practitioner (mixture of allopathic and traditional treatment) and traditional trained and untrained practitioners.

Two types of models were estimated in the multivariate analysis; when both parents were present and when the father was absent. The study found that

expenditure on child's illness was higher when the father was absent, mother had more years of education, few mothers were members of credit and household had more assets. Wealth decreased the likelihood that the child had an illness and affected the likelihood that curative childcare was sought. Travel time negatively affected the use of a provider. The multivariate results showed that if child had more siblings, there was an increased likelihood that the child had been ill since there was more competition for limited resources. The older the child and the mother, the more likely that the child had been ill and care was more likely to be sought if the mother was a member of a credit union. As distance increased, the likelihood of seeking care decreased. Finally longer distances to providers lessen the likelihood that child curative care will be sought from there.

2.2 Literature Specific to Kenya

In Kenya, Ndele (1988) specified a model for the demand for health services in Nairobi. The study investigated stability of health care demand for curative services across a set of traditional and modern facilities in Nairobi. The demands for general out patient and antenatal care were estimated using OLS while the demands for maternity, immunization and family planning services were estimated using MLE technique. The logit model was specified as:

$$P_j = \frac{1}{1+e^{-ZBj}} \qquad 2.2.1$$

Where, Z is the vector of explanatory variables, B_j are the parameters to be estimated and p_j is the probability of choosing alternative j over alternative k. One

of the assumptions was that demand for health services enters a utility function directly, and that health care is a derived demand from a more fundamental demand for good health. The other assumption was that an individual i spends his time and money on services like medical checkup, immunization, consulting a physician, consumption of nutritious food and doing physical exercises to produce good health. Therefore, a health production function for individual i is a function of: health services, time input into the production process, other nonmedical commodities and a set of other exogenous variables like environmental conditions and socioeconomic attributes of an individual that affects status. The study was in agreement with Grossman (1972) that an individual inherits his stock of health, which begins to depreciate after a certain age, and that investing in health capital can increase the stock. The estimation results for the different services were discussed separately. The findings were that economic variables (income, time, and cost of treatment and drugs) have little effect on demand for outpatient services in government and city commission facilities though income was a very important determinant of health care demand in private facilities. Distance was found to reduce demand for immunization services in Nairobi suggesting that accessibility is crucial for increased utilization of immunization services. Another finding was that the probability of a mother attending immunization facility increased with the time spent waiting for immunization. However, the work variable did not specify whether it was self-employment, wage earner or salary earner.

Mwabu et al (1993) conducted an empirical analysis of the relationship medical care quality and medical care demand using detailed household and facility data sets from a rural district of Meru in Kenya. In the analysis, it was assumed that many providers characterize health care system. Thus in the event of an illness, a patient was assumed to choose the health care alternative that yielded the maximum expected utility. By solving a maximized indirect utility function, one gets health care consumption bundles, rather than health status improvements or health outcomes. Another assumption was that the direct utility function was separable in medical care goods and other consumption bundles and that consumption of non - health commodities is constant for different levels of medical services. Apart from other prices, the indirect utility function is dependent on medical care prices and not on prices of improvements in health status. This indirect utility function permits an investigation of direct demand effects of prices and income and is given as $V_{ij} = V_{ij}(X_i, Z_i, Y_i, r_{ij}, a_{ij})$.

This shows the maximum utility that individual i can achieve, conditional on seeking treatment for an illness, controlling for income Y_i, health care prices r_{ij}, prices of other goods a_{ij}, personal attributes X_i and facility specific characteristics Z_j. However, a_{ij} was normalized to zero so as to ease econometric work. In estimating the behavioural patterns, it was assumed that each household member faces four health care provision alternatives, that is, government clinic, mission, private and residual self - treatment alternative.

Both the descriptive and maximum likelihood statistics were presented. Income was found to exert a strong positive effect on the probability of seeking medical care from a mission or private provider, relative to self - treatment. From the perspective of the households distance was the most important of price factors since it's directly related to the magnitude of the out-of- pocket costs and time costs for travelling to a facility to obtain medical care. The elasticity of medical care demand with respect to own user charges was smallest for government facilities while income elasticity was strongest for non- - government facilities. Growth of income was found to shift demand from informal health care to modern sector, with much of this demand ending up in private and mission clinics. There was no significant difference found in the demand for healthcare by gender, though signs on the coefficient indicated that women may be more disadvantaged by distance and user fees than men.

Ngugi (1999) carried out a research on health seeking behaviour during reforms in Kenya, a case of Mwea division, Kirinyaga district. The assumption was that individuals derive satisfaction (util) from utilization of a commodity. Util level is influenced by both commodity and consumer characteristic. Although utility is not measurable, individual consumers have the ability to rank their preferences. The study analyzed preferences across households and within the households. The health care alternatives comprise public, private, mission, off counter and traditional health services. Both secondary and primary data were used. There were two samples the 'patient sample' who were seeking health care

from the facilities at the time of the interview and the 'core sample' who consisted of those who have done so in the last six months to give both descriptive and regression analysis. The independent variables used were age, time spent and costs using the 'patient sample' while frequency, acre-owned and other facility for the 'core sample'. The dependent variable was (Y = 1) when public facility is used and (Y = 0) otherwise.

The study found that cost sharing resulted in a decrease in the use of public facilities in Kenya. The demand for services across alternative sources reflected complementarity in consumption and in the case of an illness, individuals behaved as if they were indifferent in choice of facilities as long as services required were available. Children had several players when they fell sick and their sicknesses were reported in mild conditions. The choice of a facility was based on perceived satisfactory services and the distance from the facility. Consumers were found to prefer services that were comparable to the utility derived from the fee charged and were also ready to pay lower fee, wait long, and receive satisfactory services.

2.3 Overview of the Literature

Most of the literature reviewed revealed that the data used were secondary data from demographic and health surveys and living standard measurement studies and estimated demand for health care in general. The studies adopted a nested multinomial logit model to capture the choices of the type of care from different providers. Maximum likelihood estimation and descriptive analysis dominated the estimation methods applied since most problems involved the choice of the type of care. The present study will use primary data collected using a questionnaire. The multinomial logit model is used in the present study and both the descriptive and regression analysis results are presented.

CHAPTER THREE

THEORETICAL FRAMEWORK AND METHODOLOGY

3.1 Theoretical Framework

Health care is both a consumption good and an investment good. As consumption good, health care improves welfare, while as an investment good, health care enhances the quality of human capital by improving productivity and increasing the number of days available for productive activities. Health care service is hence demanded only as input into the production of health. The level of demand for the health service is determined by the extent to which they satisfy the household's underlying preference for health. Preferences for health are then independent of health status and health care demand changes as the onset of illness altered the way in which medical care services could improve health. An individual makes a choice about whether to seek care for a particular illness episode as well as what service provider to use. Since he/she has limited resources of money and time, he/she has to weigh the choice of treating an illness episode and choosing a particular type of health care against the purchase of other commodities.

The household or parents are assumed to derive utility from the human capital (health) of their children and from consumption of all other goods and services, they therefore have preferences for health. The healthcare service alternatives available to the household are public, private, mission, traditional healer, chemist/pharmacist or self - care/shop in the event of an illness. The utility

depends on health and on consumption of goods other than medical care. The benefit from consuming medical care is an expected improvement in health and the cost of medical care is reduced consumption of other goods. Taking a child to a health facility improves the child's human capital, but lowers the household's consumption of other goods and services since there are costs associated with healthcare.

The household chooses the health provider alternative, which brings the maximum utility. The utility function is represented as:

$$U = U(H, C) \qquad (3.1)$$

The household's utility maximization problem can be stated as:

$$\text{Max } U(H, C)$$

$$\text{S.T. } P^*H + PC = Y$$

Where H is the improvement in the child's human capital from another visit to the health provider, C is the level of household consumption possible after taking the child to this health facility alternative, P* is the provider cost and P is the price of other consumption goods. A Lagrangian function is formed to solve the utility maximization problem. It's first order conditions are solved to give marshalian demand function:

$$H = H(P^*, P, Y) \qquad (3.2)$$

$$C = C(P^*, P, Y) \qquad (3.3)$$

Hence H is the demand for improvement in the child's health. The study postulates a relationship between improvement in the child's health (H) and the

determinants. P* depends on the provider attributes (X_i) while P depends on the consumer attributes (Z_{ij}). The demand for improvement in the child's healthcare (H) is determined by the individual and household attributes (X_i) and provider attributes (Z_{ij}). Where,

X_i are the explanatory individual and household variables; i= 1, 2, …, n where, X_1 is the mother's age (MAG), X_2 is the mother's level of education (ME), X_3 is the father's level of education(FE), X_4 is the mother's employment (MEMP), X_5 is the father's employment (FEMP), X_6 is the age of the child (AC), X_7 is the number of siblings (NS), X_8 is the household size (HS), X_9 is the level of monthly income (Y) and X_{10} is the gender of the child (GC).

Z_j are the explanatory health provider variables; j = 1, 2,…,n where, Z_1 is the provider cost (P*) = direct cost + indirect cost. Where, direct cost = consultation fee + cost of drugs + round trip transportation cost. Indirect cost, which consists of travel and waiting time is the value of the foregone income, Z_2 is the distance to the provider (DP), Z_3 is the availability of drugs (AD) and Z_4 is the availability of medical personnel (AP). The equation is given as:

H = f (MAG, ME, FE, MEMP, FEMP, AC, NS, HS, Y, GC, AP, AD, DP, P*)

3.2 Methodology

3.2.1 The Econometric Model

The econometric model will involve the estimation of a logit model as explained and derived in appendix IV as used by Shem, 2002. A number of specific dichotomous and multiple-choice models, which, pertain to the choices

the individual will make of the health provider alternative will be specified for estimation. These are:

1) A binary logistic regression model involving the choice of visiting a provider or not given as,

$$Logit(H_n)=\alpha_0+\alpha_{n1}W_m+...+\alpha_{nm}W_m+\varepsilon_i \quad (3.4)$$

Where, W = W (X_i, Z_j) so the functional form is given as:

$$H_n=f(X_i,Z_j)$$

Where, W_m refers to the specific explanatory variables, α_n refers to the specific outcomes of the dependent variable, $H_n = 1$ if provider is visited and $H_n = 0$ if provider is not visited and, X_i are the explanatory individual and household variables; i= 1, 2… 10 and Z_j are the explanatory health provider variables; j = 1, 2… 4 as explained earlier. α are the parameters to be estimated showing the probability that H_n will be chosen or not. The function estimates the probability that a health provider is visited or not.

2) A multinomial logit regression model involving the choice of health provider alternative to visit is given as:

$$Logit(H_n)=\alpha_0+\alpha_{n1}W_m+...+\alpha_{nm}W_m+\varepsilon_i \quad (3.5)$$

W is as above and the functional form is given as: $H_n=f(X_i,Z_j)$.

i = 1, 2, …, 10 and j = 1, 2, …, 4 as defined above where, subscript n and m are as

explained before, $H_n = 0$ if self care is chosen, 1 if traditional healer, 2 if public facility, 3 if mission facility, 4 if private clinic and 5 if chemist /pharmacist. This function estimates the probability that a health provider is chosen. Only the provider alternatives in Migori District were chosen.

A logit model is based on the cumulative logistic probability function. Logit H_n is the logarithm of the odds ratio, and is linear in X_i and Z_j. It is the dependent variable and is the logarithm of the odds that a particular choice were made. The coefficients thus obtained measure the change in the log of the odds of choosing a provider as a result of a unit change in the individual, household (X_i) and provider attributes (Z_j). As the probability goes from 0 to 1, the logit H_n goes from $-\infty$ to $+\infty$. This implies that although probability is bounded within (0,1) H_n is not. H_n is linear in X_i and Z_j, however the probabilities are not linear in X_i and Z_j.

3.2.2 Description and Measurement of Variables

Health care (H): This is the dependent variable. It is a measure of demand for child healthcare services and was measured by the probability that 1) Provider or no Provider visit is chosen. 2) A health provider alternative is chosen when a need arises.

Gender of the child (GC): is given by the use of a dummy variable GC that took the value of 1 if male and 0 otherwise.

Mother's level of education (MF): This is the highest level of formal education attained by the mother. Four levels of formal categories are recognized: No

education, primary education, secondary education and university education. Three dummies are introduced: $ME_2 = 1$ if primary education, zero otherwise; $ME_3 = 1$ if secondary education, zero otherwise; $ME_4 = 1$ if university education, zero otherwise.

Father's level of education: This is the highest level of formal education attained by the father. Four levels of formal categories are recognized: No education, primary education, secondary education and university education. Three dummies are introduced: $FE_2 = 1$ if primary education, zero otherwise; $FE_3 = 1$ if secondary education, zero otherwise; $FE_4 = 1$ if university education, zero otherwise.

Mother's age (MAG): This is the chronological age of the mother. It is given in years.

Mother's employment (MEMP): This is the activity that preoccupies most of the time of the mother. A dummy variable of MEMP = 1 if the mother is not employed/housewife and 0 otherwise is introduced.

Father's employment (FEMP): This is the activity that preoccupies most of the time of the father. It is given by a dummy variable of FEMP = 1 if the father is in formal employment and 0 otherwise.

Age of the child (AC): is given in months.

Number of siblings (NS): This is the number of sisters and brothers of the child.

Household size (HS): This is the number of people who live in the household.

Household level of Income (Y): This is monthly total income of the household, monthly household expenditure is used as a proxy and given in Kenya shillings.

Provider cost (p*): Is given by the direct costs + indirect costs, where, direct costs = consultation fee + round trip transportation cost + cost of drugs and indirect or opportunity costs are given by the monetary value of the foregone income during the round trip travel time and waiting time. Time = Round trip travel time (Tt) + Waiting time (Wt). Time is measured in the minutes.

Distance To the provider (DP): This is the perceived distance from the residence to the health provider and was given in Kilometres.

Availability of Drugs (AD): This is the perceived availability of drugs by the respondent, which is a proxy for availability of treatment. A dummy AD =1 if drugs are available and 0 otherwise is introduced.

Availability of Personnel (AP): This is the perceived availability of personnel by the respondent, which is also a proxy for availability of treatment. A dummy AP =1 if personnel are available and 0 otherwise is introduced.

3.2.3 Data Analysis and Results

The data were analyzed using econometric software (EViews) presenting both the descriptive and regression results. Included in the descriptive analysis are the measures of central tendency, dispersion and correlation coefficient. The measures of central tendency included:

i) Mean which is the arithmetic average of the observations.

ii) Median which is the middlemost observation.

iii) Mode which is the most occurring observation.

The measures of dispersion, which measures the spread of observations, included:

i) Range which is the difference between the largest and the smallest observation.

ii) Percentiles.

Correlation Coefficient to find the relationship between the variables.

3.2.4 Sampling Procedure and Data Collection

Both primary and secondary data were collected. For primary data, the population of interest was the mother/female guardians of children aged 5 years and below who had visited the health provider in the past 6 months preceding the survey. Suba East division is divided into 6 locations and 14 sub - locations. A cluster sampling procedure was used to select 2 locations, one within the town and the other in the rural. The sub-locations were purposively selected to fall in areas that were densely populated. Finally, the respondents who met the criteria were selected and interviewed skipping 3 homes after every successful interview. An interview schedule (see Appendix V) was administered to collect data on the variables identified in section 3.2.2. Both the personal interview and observation technique were used. A sample size of 123 respondents was interviewed.

Table 3.1: Respondents figures from each Location

Location	No. of Respondents	Visited provider		No visit
		Curative	Preventive	
Suna - Central	82	55	15	12
Kakrao	41	25	11	5
Total	123	80	26	17

Source: Survey Data (May 2002)

Table 3.1 shows that out of the 82 mothers interviewed in Suna-central location, only 12 had not chosen provider visit for their children while in Kakrao location 5 out of the 41 had chosen provider visit.

3.2.5 The Area of Study

The study was conducted in Migori District. The district is in Nyanza Province of Kenya. It borders Kuria and Transmara districts and Republic of Tanzania to the South, Homa - bay District to the North, Kisii and Transmara Districts to the East and Suba District and Lake Victoria to the West. Sugarcane farming and fishing dominate the economic activity in the area. Most of the heads of households are informally employed leading to poor living conditions. However, Suba - East division being the district headquarters, is a cosmopolitan town with most of the inhabitants either government employees or settlers.

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

4.1 Descriptive Statistics

This presents the characteristics of the sample.

Age of the child (AC)

Table 4.1: Age of the child in months

Age	No. of children	Percentage	C.f.*	P c.f.**
0 - 20	71	58	71	58
21 - 40	37	30	108	88
41 - 60	15	12	123	100
Total	123	100		
Mean Age - 20.6 Months Maximum Age - 60 months Minimum Age - 0.75 months				

Source: Survey Data (May 2002)

From table 4.1, majority (58 percent) of the children were between 0 and 20 months, while only 12 percent were between 41 - 60 months. This coincides with the age when children are taken for vaccinations.

Note: * represents Cumulative Frequency and ** represents Percentage Cumulative Frequency.

Mother's Age (MAG)

Table 4.2: Mother's Age in Years

Age	No. of mothers	Percentage	C.f.	P c.f.
Below 20	14	11	14	11
20 - 24	44	36	58	47
25 - 29	36	29	94	76
30 - 34	19	15	113	91
35 - 39	8	7	121	98
Above 40	2	2	123	100
Total	123	100		
Mean Age - 25.67 Years Maximum Age - 54 Years Mode Age - 20 Years				

Source: Survey Data (May 2002)

From table 4.3, 76 percent of the mothers are about an age of below 29 years old. It is also evident from the survey that there is early motherhood since most mothers had an age of below 29 years. The other two who were between 51 and 60 were not biological mothers, but grandmothers who had been left with the responsibility of taking care of the children due to the death of the children's parents. The implication is that there is extended care and burden falling to the older generation.

Gender of the child (GC)

Table 4.3: Gender of the child.

Gender	Number of children	Percentage
Males	67	54
Females	56	46
Total	123	100

Source: Survey Data (May 2002)

Out of the 123 mothers interviewed, 54% had male children while 46% had female children. This shows that the probability of coming across a male child who had visited a provider within the last 6 preceding the survey was higher than a female child.

Number of Siblings (NS)

Table 4.4: Number of Siblings

No. of siblings	No. of Mothers	Percentage	C .f.	P c. f.
0 - 2	92	75	92	75
3 - 5	29	24	121	99
6 - 8	2	1	123	100
Mean No of siblings - 1.66 Maximum No of siblings - 7 Mode No of siblings - 1				

Source: Survey Data (May 2002)

From table 4.4, on the average, 75 percent of the mothers had 2 siblings. This shows that the mothers have fewer children or that their other children had died. The high child and infant mortality rates in the district can explain this.

Household Size (HS)

Table 4.5: Household Size

Size	Number of people	Percentage	C .f.	P c. f.
0 -2	0	0	0	0
3 - 5	73	60	73	60
6 - 8	41	33	114	93
Above 9	9	7	123	100
Total	123	100		

Maximum HS - 10 Mean HS - 5.34 Mode HS - 3 Median HS - 3 Minimum HS - 3 Range - 7

Source: Survey Data (May 2002)

Table 4.5 shows that 60 percent of the households are between 3 - 5. No household had less than 2 siblings. The general mean of 5 people per household is higher than the average number of siblings (see table 4.4). The impression is that most mothers stay with children other than their own children.

Father's Education (FE)

Table 4.6: Father's Education

Level	No Education	Primary	Secondary	University	Total
Number	2	34	66	4	106
Percentage	2	32	62	4	100

Source: Survey Data (May 2002)

From table 4.6, it shows that only 2 percent of the fathers did not attend any school, another 4 percent had attained the highest level of education (university). The majority, 62 percent had attained secondary level of education while, 32 percent had attained primary level of education.

Mother's Education (ME)

Table 4.7: Mother's Education

Level	No Education	Primary	Secondary	University	Total
Number	2	81	39	1	123
Percentage	1.63	65.85	31.71	0.81	100

Source: Survey Data (May 2002)

Table 4.7 shows that only one mother had attained university level of education while two had no education. On the other hand the majority (65.85 percent) had attained primary level while 31.71 percent had attained secondary level of education. This shows that most women are either not taken to school or most educated women prefer staying in town so were not found in the village.

Mother's Employment (MEMP)

Table 4.8: Mother's Employment

Employment Status	Number of mothers	Percentage
Not employed	83	67
Employed	40	33
Total	123	100

Source: Survey Data (May 2002)

Table 4.8 shows that 67 percent of the mothers are not employed while only 33 percent had some form of employment. Most of those employed run small - scale businesses in their homes. This conforms to table 4.7, which shows that 66 percent of the mothers had attained only primary level of education which may not be good enough to attain formal employment.

Father's Employment

Table 4.9: Father's Employment (FEMP)

Employment Status	Number of fathers	Percentage
Formal employment	31	29
Not formal employment	75	71
Total	106	100

Source: Survey Data (May 2002)

Table 4.9 shows that 71 percent of the fathers were formally employed while 29 percent were in informal employment. Due to high level of unemployment in Kenya, most people resort to informal employment to earn a

living. This is made easy because no formal training is required for the informal jobs, most of them are learnt on the job.

Marital Status (MS)

Out of the 123 respondents, 106 (86 percent) of them were married while only 17 (14 percent) of them were not married. All the mothers who were not married took their child to the provider.

Perceived availability of personnel (AP)

Table 4.10: Perceived availability of personnel

Availability	Number of respondents	Percentage
Available	95	90
Not Available	11	10
Total	106	100

Source: Survey Data (May 2002)

Table 4.10 shows that 90 percent of the respondents who visited the health providers perceived that the personnel were available at the facility visited. Only 10 percent perceived that the personnel were not available yet they still visited the providers.

Distance to the provider (DP)

The study revealed that most of the respondents were within a distance of 2 kilometres from the providers. The furthest distance was 60 kilometres.

Perceived availability of drugs (AD)

Table 4.11: Perceived availability of drugs

Availability	Number of respondents	Percentage
Available	67	63
Not Available	39	37
Total	106	100

Source: Survey Data (May 2002)

From table 4.11 63 percent of the respondents who visited the facilities perceived that drugs were available while 37 percent perceived otherwise yet they still attended the health facilities. Mothers may visit the health facilities even if it's perceived not to have drugs. So long as the personnel are available, they may attend the facilities for diagnosis and prescription then buy the drugs from elsewhere. Further, most cases were for curative that required diagnosis from the providers. Drugs could be bought from other sources.

Travel Time (TT)

The study results show that though on the average travel time was 40 minutes some mothers travel for 180 minutes. This shows that mothers are willing to travel for a long time to attend the health facilities.

Waiting Time (WT)

The mean waiting time was found to be 51 minutes. The maximum waiting time was 300 minutes. Most mothers waited for 60 minutes.

Household's level of Income (Y)

Table 4.12: Household Level of Income

Income (Ksh)	Number of respondents	Percentage	C.f.	P c. f
Below 1000	2	1.62	2	1.62
1000 - 1999	13	10.57	15	12.19
2000 - 2999	17	13.82	32	26.01
3000 - 3999	40	32.52	72	58.53
4000 - 4999	16	13.01	88	71.54
5000 - 5999	9	7.32	97	78.86
6000 - 6999	6	4.88	103	83.74
7000 - 7999	5	4.07	108	87.81
8000 - 8999	3	2.44	111	90.25
9000 - 9999	0	0	111	90.25
10 000 - 10 999	4	3.25	115	93.5
11 000 - 11 999	2	1.62	117	95.12
Above 12 000	6	4.88	123	100
Total	123	100		
Mean Y - 5475.13		Median Y - 3499.5		Mode Y - 3499.5
Maximum Y - 45, 000		Minimum Y - 499.5		

Source: Survey Data (May 2002)

Table 4.13 shows that 59 percent of the households had an income of between 3000 - 3999 Ksh. per month with a maximum of 45,000 Ksh. and a minimum of 499.5 Ksh. This shows that there is a very big variation between the highest income household and the lowest income household.

Table 4.13: Reason for choice of the provider

Provider/Reason	Best	Nearest	Cheapest	Total
Public	10	10	42	62
Private	10	7	4	21
Mission	18	5	0	23
Total	38	22	46	106

Source: Survey Data (May 2002)

Table 4.12 shows that 42 of the mothers who visited the public provider did so because it was the cheapest while only 10 of them did so because it was the best and the nearest. A total of 62, 21 and 23 visited the public, private and mission provider respectively. Overall, 46 of the respondents who visited a provider did so because it was the cheapest. This shows that in the district, most mothers due to lack of finances choose providers who offer cheap services.

4.2 Regression Results

This sub - section presents the estimation results using a logit model of the individual and household attributes and the provider attributes that are important in explaining the choice of whether to visit a provider when a need arises. This

was to establish the direction and significance of their effects on the choice. Four models were estimated:

- A dichotomous logit model of $H_n = 1$ if any health provider is visited during a need and $H_n = 0$ if any provider is not visited during a need and the functional form was:

$$Logit(H_n)=\alpha_0 +\alpha_{n1}W_m+...+\alpha_{nm}W_m +\varepsilon \quad (4.1)$$

- A dichotomous logit model of $H_n = 1$ if a public provider is visited and $H_n = 0$ if otherwise.

$$Logit(H_{pub})=\alpha_0 +\alpha_{n1}W_m+...+\alpha_{nm}W_m +\varepsilon \quad (4.2)$$

- A dichotomous logit model of $H_n = 1$ if a private provider is visited and $H_n = 0$ if otherwise.

$$Logit(H_{pri})=\alpha_0 +\alpha_{n1}W_m+...+\alpha_{nm}W_m +\varepsilon \quad (4.3)$$

- A dichotomous logit model of $H_n = 1$ if a mission provider is visited and $H_n = 0$ if otherwise.

$$Logit(H_{mis})=\alpha_0 +\alpha_{n1}W_m+...+\alpha_{nm}W_m +\varepsilon \quad (4.4)$$

The functional relationship of the model was given as $H = f(W_m) = f(X_i, Z_j)$ where X_i are the individual and household attributes and Z_j are the provider attributes. Thus,

H = f (AC, GC, MAG, WT, NS, HS, FE, Y, MEMP, FEMP, AD, AP).

Being a dichotomous function, the regressions concern is not the value of the coefficients but its sign and significance. Several models were estimated and the four presented below were interpreted since they gave consistent results.

Demand for overall child health care services in Migori District

Dependant variable: Visit to any provider = 1

Non visit to any provider = 0

N =total observations = 106.

McFadden R - squared = 0.764

Logit (H) = -14.57024893 - 0.1762694937AC - 4.94419776GC

(-1.668431)* (-1.395593) (- 1.322688)

+ 0.2764724421MAG + 0.4999500165WT - 1.489222505NS + 1.92546708HS

(1.296564) (1.899422)* (- 1.659373)* (1.932242)*

+8.058113592FE - 0.0002422764498Y + 3.709214357MEMP

(1.733793)* (- 1.829729)* (1.808800)*

+3.449425687FEMP - 6.142976771AD + 4.189384013AP

(1.406967) (- 1.372826) (1.593654)

Demand for public child health care services in Migori District

Dependant variable: Visit to a public provider = 1

Visit to alternative provider = 0

N = Total number of observations = 88

McFadden R - squared = 0.432

Logit (H pub) = 6.843721087 + 0.01692068989AC + 0.09311856268GC

(2.236910)** (0.716949) (0.161653)

- 0.1471509816MAG + 0.009891960607WT + 0.06746512059NS

(- 1.819522)* (1.138453) (0.183609)

+ 0.1570445314HS + 0.8070943418FE3 - 0.0003864947214Y

(0.792626) (1.000507) (- 1.930365)*

- 1.805686292MEMP - 0.439111827FEMP + 0.4254806959AP

(- 1.951306)* (- 0.480376) (0.433284)

-3.426418012AD

(-3.889058)***

Note: * ** *** represents significance at 10, 5, and 1 percent level of significance respectively.

The values in parentheses are the z-statistics.

Demand for private child health care services in Migori District

Dependant variable: Visit to a private provider = 1

Visit to alternative provider = 0

N = Total number of observations = 88

McFadden R - squared = 0.312

Logit (H pri) = -4.988476164 + 0.007226253292AC + 0.2656440354GC +

(- 1.673585)* (0.328232) (0.379007)

0.1076184536MAG - 0.01023798367*WT - 0.0723842741NS - 0.2154979163HS

(1.387275) (- 1.140797) (- 0.214910) (- 0.971052)

+0.09994820584FE + 0.0002143094106Y + 0.8445137528MEMP

(0.115239) (1.843764)* (0.973040)

-0.07495677359FEMP + 2.604049523AD - 1.615200441AP

(- 0.096968) (2.321951)** (- 1.573986)

Demand for mission child health care services in Migori District

Dependant variable: Visit to a mission provider = 1

Visit to alternative provider = 0

N = Total number of observations = 88

McFadden R - squared = 0.171

Logit (H mis) = -6.622919807 - 0.02115370206AC - 0.1567646995GC +

(- 2.082477)** (- 0.986152) (- 0.244921)

0.08227547809MAG + 0.00192794635WT - 0.2010527328NS

(0.953597) (0.276482) (- 0.654892)

+ 0.1235506144HS - 0.4478967379FE - 2.534243369e-05Y +

(0.01745) (- 0.582382) (-0.442093)

0.6945273693MEMP +0.8546092836FEMP +2.392013707AD+ 1.167037862AP

(0.876732) (1.158625) (2.494313)** (0.913156)

Note: ** represents significance at 5 percent level of significance.

The values in parentheses are the z-statistics.

Table 4.14: Correlation Matrix

	AC	GC	MAG	WT	NS	HS	FE3	Y	MEMP	FEMP	AD	AP
AC	1.000	-0.016										
GC	-0.016	1.000										
MAG	0.395	0.151	1.000									
WT	-0.126	0.051	-0.153	1.000								
NS	0.126	0.257	0.579	-0.092	1.000							
HS	0.058	0.171	0.360	-0.195	0.670	1.000						
FE3	0.113	0.107	0.093	-0.221	0.125	0.185	1.000					
Y	0.179	-0.119	0.106	-0.094	0.037	0.144	0.265	1.000				
MEMP	-0.149	-0.038	-0.014	0.070	-0.000	0.059	-0.067	-0.204	1.000			
FEMP	0.172	0.121	0.093	-0.156	0.079	0.091	0.417	0.293	-0.134	1.000		
AD	-0.070	-0.147	-0.057	-0.494	0.064	0.086	0.114	0.071	-0.017	-0.069	1.000	
AP	-0.180	-0.012	-0.187	0.139	-0.162	-0.147	0.052	0.012	-0.083	0.202	0.083	1.000

4.3 Interpretation of the regression results

Introduction

Based on the results of the logistic model, the major concern is the goodness of fit, the sign and the level of significance not the numerical value of the coefficients. From the sample a total of 106 valid cases were included in the analysis. The other 17 cases had some missing values hence prompted their exclusion. The McFadden R - squared of 76% shows that the model explains 76 percent of the variation in the dependent variable. Experience from past empirical research has shown that a McFadden R - squared of above 20% indicates a strong relationship between the independent and dependent variables. (Shem, 2002 pp.133).

Household Size (HS)

Household size was found to be the most significant factor in determining the demand for child healthcare services as shown by the highest z - statistic. It has positive sign to imply that as the size of the household increases, the likelihood of taking the child to the provider also increases. This was as expected since the large household size could comprise adults who would also participate in taking the child to the provider. The explanation is that most of the diseases are hygiene and income based. Therefore, as the household size increases, sharing of resources intensifies, as people become poorer, hence they will attend hospital more often.

Waiting Time (WT)

Waiting time is a significant factor in determining the demand for child healthcare services. It however had a positive sign against the expectations. This means that an increase in waiting time would lead to an increase in the likelihood taking a child to the provider. The possible implication is that mothers were comfortable waiting for a longer time to see a doctor as this was perceived to mean that the longer the doctor takes with a patient, the superior the services. So a mother waiting for long also expects to take long with the doctor.

Mother's Employment (MEMP)

Whether a mother is a housewife or not also significantly determines the choice of whether to take a child to the provider or not. This means that there is a significant difference in attendance between mothers who are employed and those not employed. With unemployment, mothers are more likely to take their children to hospital. A housewife spends most of the time with the child and is able to take the child to the provider. She can also detect any change in the child. Further, employment separates a mother from the children and reduces attention. Since employed mothers spend less time with the child she is unlikely to detect a problem. The negative and significant sign in the demand for public child healthcare services suggests that employed mothers do not attend the public facilities. This can be explained by the fact that these mothers have higher income and hence prefer more personalized treatment.

Household's Level of Income (Y)

This was also found to be significant, though having an unexpected negative sign in the general child healthcare demand. This means that an increase in the household income reduces the likelihood of taking the child to the provider. However, when the demand functions for the various providers are estimated, it has the expected positive sign for the private providers. This conforms to Mwabu, (1993) and could be explained by the fact that when household's income increases, they are placed in higher social classes that require more personal attention. So they would be seeing private doctors or high-cost private hospitals. Apparently, in Migori, most hospitals are basically low-cost even if private with less personal attention. The implication is that as income tends to go down, more attendance is experienced at the low-cost medical facilities. It also shows that the low-income households are the ones whose children fall sick more often and hence require such visits.

Father's Level of Education (FE)

Since there were only four and two entries in the no education and university education, the categories were reduced to only two: primary education and post-primary education for regression analysis. One dummy of 1 if post-primary education and 0 otherwise was introduced. There was a significant difference in the attendance between the fathers with post-primary and primary level of education. This shows that the likelihood of attendance increases with an increase

in the level of education. An educated father knows that a child has to be taken to the provider when a need arises.

Availability of Personnel (AP)

The availability of personnel was insignificant. This means that there was no difference in attendance between those who perceived that personnel were available or not. The relationship was found to be positive to imply that an increase in the perceived availability of personnel would lead to an increase in the likelihood of taking a child to the provider. The interest of the mothers when they visit the health providers is to get the prescription and diagnosis.

Number of Siblings (NS)

Is insignificant therefore not an important variable. An increase in the number of siblings that a child has decreases the likelihood of taking the child to the provider as expected. Competition for attention increases with an increase in the number of siblings. This is true especially when the children sleep in one room and there is an outbreak, they all get infected.

Gender of the Child (GC)

There is no gender discrimination when a child needs to visit a health provider therefore insignificant. This finding conforms to Gertler and Van Der Gaag (1990), Glick (2000) and Mwabu (1993) but is in disagreement with Li (1996).

Age of the Child (AC)

Age of the child is negative and insignificant. This means that an increase in the age of the child decreases the likelihood of taking the child to the provider when a need arises. This shows that as a child grows old, apart from reduced vulnerability and having received almost all the required vaccinations, it is likely that the mother has another child. This conforms to Levin (2001), and Gertler and Van Der Gaag (1990).

Mother's Age (MAG)

An increase in the age of the mother increases the chances of provider visit. This positive and insignificant relationship can be explained by the fact that older mothers are experienced and independent making decisions pertaining to the child's health. This factor is significant in the demand for public child healthcare services and has a negative relationship to show that an increase in the age of the mother reduces the likelihood of visiting a public provider. This finding is similar to Levin (2001).

Father's Employment (FEMP)

The positive and insignificant relationship suggests that the difference between the decision of a father in formal and in informal employment may not play a role.

Perceived Availability of Drugs (AD)

Availability of drugs was a insignificant factor. This implies that the difference between the perceived availability of drugs and otherwise on the decision to visit a provider was not important and had a negative sign. This variable was however the most significant in all the demand for the three providers with positive for both private and mission providers and negative for public provider. This further explains that the users of private and mission providers would prefer all the services under one roof.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND POLICY RECOMMENDATIONS

This section provides the summary of the results and highlights the possible policy recommendations.

5.1 Summary

The study shows that the demand for public child healthcare services is high. The large number of mothers who attended the public facility shows this. The significant determinants of the demand are waiting time, number of siblings, household size, father's level of education, household level of income and mother's employment status. However, the most significant determinant in the demand for public, private and mission child healthcare services is the availability of drugs. It has a positive relationship in both the demand for private and mission providers while it has a negative sign in the demand for public providers. This shows that even in the absence of drugs at the public facilities, mothers would still visit these facilities because they are cheaper. However, the high cost private and mission facilities users would rather prefer all the services under one roof.

Waiting time, household size, father's level of education and mother's employment are significant and positively related to the general demand for child health care services. On the other hand, number of siblings and household's level of income are significant and negatively related to the general demand for child healthcare services. Gender of the child, age of the child and perceived

availability of drugs were insignificant and negatively related to the general demand for child healthcare services.

In the demand for public child healthcare services, mother's age, household's level of income, mother's employment and perceived availability of drugs were negative and significant determinants. The only significant determinant in the demand for mission child healthcare services is the perceived availability of drugs. In the demand for private child healthcare services, household level of income and perceived availability of drugs were the significant determinants. Household level of income had a positive sign.

5.2 Conclusion

There is evidence of high attendance at the public facilities in Migori District because it is cheap. An increase in the level of income drives mothers away from the public health providers to the private health providers. There is limited use of the traditional healers as providers of health services in the district with only one mother having taken the child to this provider. The conclusion is that there is preference for modern child healthcare services in the district.

5.3 Policy Recommendations

From the research findings, child healthcare services are divided into two: the curative and the preventive. A lot of emphasis is given by the government on the preventive measures as evidenced from the health information system at the facility with so much information on immunization coverage. Further, the study revealed that both the private and mission facilities play a very important role in

the provision of child healthcare in the district. This is shown by the 41 percent of the population who are served by these sectors. The following policy recommendations are thus made:

1) To save the mothers from the agony of waiting, the government should provide more trained personnel at the public facilities. Since the findings indicate that mothers are willing to wait so long as proper attention is given to the child by the medic.

2) There should be more efforts to explain the importance of fewer children through family planning and improvement in the standards of education. Since the findings show that as the number of siblings increases, it is likely that someone goes to hospital. Qualitative data show that mother's level of education is generally low with the majority having attained only primary education.

3) More low-cost facilities should be put in the income disadvantaged areas so that they are properly utilized. Poverty eradication measures will also reduce pressure on low-cost facilities since the level of income tends to go down, there is more attendance in the low- cost medical facilities.

4) Measures should be taken to improve the general level of education which would enable parents to secure jobs hence reduce poverty because father's employment and level of education is also positively related to the demand for child healthcare services. Descriptive data also show that mother's level of education is generally low.

5) There should be some sort of balance between work and childcares such that employed mothers have a chance of taking care of their children too. This balance can be undertaken by giving working mothers more payoff in the day so that the mothers work for less hours when their children are below school going age. Mother's employment is important to the extent that it boosts the family income. However, continued absence of the mother can affect the health of the child.

6) More medical personnel should be trained and posted to the district. Along with these, the diagnosis facilities should also be provided. This is because the findings show that the absence of drugs in a health facility is not a reason enough to close down the facility because the doctors can offer diagnosis and prescription services. The findings indicated that mothers would visit the facilities even when they perceived that drugs were not available. This shows that their main interest was diagnosis and prescription.

7) Early marriages should be discouraged since mature mothers are more likely to take care of their children. Qualitative data show evidence of early marriages with the youngest mothers being 17 years old.

8) To save the lives of the children, there should be regular mobile clinics in the villages. These should be properly publicized so that they are made aware prior to the visits. Passing of information through the mass media has done so well with the recent immunization campaigns. Bringing the

services to the door step has also done well since even the uninformed mothers get to know of it when the services are delivered at the neighbours'. Involving the mass media in the campaigns will ensure that the coverage increases.

5.4 Limitations of the Study/ Areas for Further Research

1) The study only covered mothers whose children had had a need of visiting a provider in the past six months prior to the survey. The others whose children had not had a need could also be having vital information to the study.

2) The study captured demand by the number who visited the facilities or not. Another study can be carried out and demand captured by the number of visits to the facilities.

3) The study used primary data obtained from the respondent's point of view. A similar study could be carried out but from the health sector's point of view.

4) A similar study should be carried out in other districts with similar health status index problems to find out if the findings are consistent.

APPENDICES

Appendix I

World Health Organization Immunization Recommendations

Age	Vaccine
Birth	BCG, (OPV - 0)
6 weeks	BPT - 1, OPV - 2
10 weeks	DPT - 2, OPV - 2
14 weeks	DPT - 3, OPV - 3
9 months	Measles

Source: State of the World's Vaccines and immunization WHO 1996 page 29.

Appendix II

Full Vaccination Coverage by Province 1993 / 1998

Province/Year	1993	1998
Central	92.6	84.8
Nairobi	86.7	72.7
Eastern	85.0	74.9
Coast	81.1	71.9
Riftvalley	75.9	69.3
Nyanza	69.7	46.5
Western	69.5	56.2

Source: Kenya Demographic and Health Surveys.

NB: Full Vaccination, Received BCG, Measles and three doses of DPT and Polio (excluding 0). No information was available for North Eastern Province.

Appendix III

Proportion of Children Dead by Province 1969, 1979, 1989

Province/year	1969	1979	1989
Kenya	0.207	0.172	0.134
Nairobi	0.128	0.115	0.092
Central	0.146	0.104	0.069
Coast	0.231	0.218	0.166
Eastern	0.183	0.146	0.098
North Eastern	0.185	0.161	0.146
Rift Valley	0.155	0.145	0.111
Western	0.233	0.203	0.173
Nyanza	0.286	0.237	0.205
Kisii	0.186	0.147	0.121
Kisumu	0.305	0.268	0.233
Siaya	0.320	0.275	0.243
South Nyanza	0.333	0.279	0.244

Source: Republic of Kenya: Population Census: Analytical Report on Mortality.

Appendix IV

Econometric Model specification

On the basis of utility maximization, the multinomial logit model of choice of medication or no medication is developed. For each possible choice, an individual chooses the health provider, which offers him the highest utility. The utility of an individual i depends on the attributes of the provider Z_{ij} and the attributes of the individual and household X_i. The individual i is faced with a problem of making a discrete choice amongst j alternatives expressed as,

$$U_{ij} = U_{ij}(X_I, Z_{ij}) + \varepsilon_{ij} \quad (A1)$$

Where,

U_{ij} is the utility expected by individual i by using provider j, for this case, j consist of use of, traditional healers, private clinics, missions or public clinics.

X_i is a vector of attributes of an individual and the household.

Z_{ij} are the attributes of provider j that individual i chooses.

ε_{ij} is the error term capturing the vector of unknown parameters.

If provider j is preferred to m, then,

$$(X_i, Z_{ij}) + \varepsilon_{ij} \succ U_{im}(X_i, Z_{im}) + \varepsilon_{im} \quad (A2)$$

Assuming that the utility function U_{ij} in inequality is linear equation (2) yields

$$W_{1i} + \ldots + \alpha_k W_{ki} + \varepsilon_{ij} \quad (A3)$$

Where $W_{1i}, \ldots, W_{k\,i}$ are the transformations of the provider and individual and household

attributes and ε_{ij} are considered to be normally distributed. Equation (3) can be written in compact form as,

$$U_{ij} = W_{ij}\alpha + \varepsilon_{ij} \qquad (A4)$$

The probability that individual i prefers provider j to m is given as the utility of the preferred provider weighted by the total utility of the two providers as shown in equation (5).

$$P_{ij} = \frac{e^{Wij\,\alpha}}{e^{Wij\,\alpha} + e^{Wim\,\alpha}} \qquad (A5)$$

This represents the probability of provider j when only two providers are considered that is j and m. In the case of multiple providers, the probability that individual i prefers provider j amongst K alternative providers is given as,

$$P_{ij} = \frac{e^{W_{ij}\,\alpha}}{\sum_{k=1}^{K} e^{W_{im}\,\alpha}} \qquad (A6)$$

Where k = 1, 2, 3,…, j, …,K.

Specification of the Estimating Model

The specific form of the logistic regression model to be used is given as,

$$P(H_j) = \frac{e^{\alpha_0 + \alpha_1 W_1 + \ldots + \ldots \alpha_m W_m}}{1 + e^{\alpha_0 + \alpha_1 W_1 + \ldots + \ldots \alpha_m W_m}} \qquad (A7)$$

Where P (H_j) is the probability that health provider j will be chosen.

However, the odds that health provider j will be chosen over health provider m is given as,

$$P(H_j)/P(H_m) = P(H_j)/P[1-P(H_j)] = e^{\alpha_0+\alpha_1 W_1+\ldots+\alpha_m W_{mm}} \qquad (A8)$$

where $P(H_m) = P[1 - P(H_m)]$ *and the outcome* var*iable is dichotomous*

Now, if we take the natural logarithm of both sides of equation (8) as,

$$\ln\{P(H_j)/P[1-P(H_j)]\} = \alpha_0+\alpha_1 W_1+\ldots+\alpha_m W_m \qquad (A9)$$

Where,

$\ln\{P(H_j)/P[1-P(H_j)]$

is the log of the odds ratio that health provider j is chosen rather than m and is called the logit, which can then be written as,

$$Logit(H) = \alpha_0+\alpha_1 W_1+\ldots+\alpha_m W_m+\varepsilon \qquad (A10)$$

For outcome variables with more than R categories however, requires the estimation of R-1 equations, one for each category relative to the reference category, to describe the relationship between the outcome variable and the explanatory variables but the reference category, the estimation equation can be written as,

$$Logit(H_n) = \alpha_0+\alpha_m W_m+\ldots+\alpha_{nm} W_m+\varepsilon \qquad (A11)$$

n = 1, 2, …, R-1

Where, subscript m refers to the specific explanatory variables W and subscript n refers to the specific outcomes of the dependent variable and α_0, α_{n1},..., α_{nm} are the parameter estimates. The estimating model involving the choice of health provider alternative can, therefore be specified as,

$$H_n = \alpha_0 + \alpha_i W_i + \varepsilon_i$$

In linear form it is written as,

$$H_n = \alpha_i W_i + \varepsilon_i \; ; where \; \alpha_i W_i + \varepsilon_i > 0$$

Where, H_n is the discrete dependent variable represented by the health provider alternative.

W_i is the vector of provider and individual and household explanatory variables.

α is the parameter to be estimated showing the probability that the health provider alternative H_n will be chosen or not.

ε is the disturbance term.

The model states that the probability of health provider alternative H_n being chosen is dependent on a number of factors represented by W_i. The functional form is given as,

$$H_n = f(X_i, Z_j)$$

Where, X_i and Z_j are explanatory individual and household variables and explanatory health provider variables respectively. The function estimates the probability that H_n will be chosen or not given these explanatory variables.

Appendix V

Interview Schedule.

The main objective of this study is to analyze the determinants of demand and utilization of child healthcare services in Kenya for a Kenyatta University Research paper. The information given will be treated confidentially and only be used for the purpose of this study. Only the mother of the child will be interviewed.

Respondent Number..... Name (optional)..... Area .....

A) Do you have a child between the ages of 0 and 5 years old? Yes☐ No ☐

(If yes continue, If No terminate)

B) Have any of them had a need to visit to a health provider in the past 6 months?

Yes☐ No ☐ (If yes, continue, if no terminate)

C) Did you take the child to the provider? Yes ☐ No☐

D) What was the problem? Sickness ☐ Clinic ☐

Individual and Household Attributes

Please provide the following information about you and your household.

1) Individual and household characteristics (Interviewer ask for each attribute)

AC	GC	MA	NS	HS	MS

Key: AC= Age of the Child. GC= Gender of the Child. MA= Mother's Age. NS= Number of Siblings. HS= Household Size. MS = Marital Status of the mother.

2) Education and Employment Status

ME	FE	MEMP	FEMP	MP	FP

Key: ME=Mother's Education. FE=Father's Education. Both given by the highest level of formal education attained. MEMP=Mother's Employment, given by housewife or not. FEMP=Father's Employment given by formal employment or not. MP=Mothers Profession. FP=Father's Profession.

Provider attributes

1) Please provide the following information regarding the facility visited during the illness.

Facility	RTTC	CF	CD	AP	AD	DP	TT	WT	NV
Mission									
Private									
Public									
Chem./phar									
Selfcare/shop									
T Healer									

Key: **RTTC**=Round Trip Travel Cost. **CF**=Consultation Fee. **CD**=Cost of Drugs **AP**=Availability of personnel given by available or not. **AD**=Availability

of Drugs given by available or not. **DP**=Distance to the provider. **TT**=Travelling Time. **WT**=Waiting Time. **NV** = Number of Visits. **CHEM/PHARM** =Chemist or Pharmacist. **T Healer** = Traditional healer.

2) When your child falls sick, which are the four most important healthcare providers that you would consult in order of preference.

a) b) c) d)

3) Tell me in order of visits the providers visited when the child was sick.

a) b) c) d)

4) Interviewer (If there is a difference between (1) and (2) give reasons as to why it was so, if no go to question 5).

i) I did not have money☐ ii) It was the nearest☐ iii) It was the best☐

5) Why did you choose this provider alternative? Cheapest ☐ Nearest ☐ Best ☐

6) Under which bracket does your average monthly expenditure fall in Kenya shillings? (Tick where applicable and quote the figure for above and below).

Below 1,000	6,000 - 6,999	12,000 - 12,999
1,000 - 1,999	7,000 - 7,999	13,000 - 13,999
2,000 - 2,999	8,000 - 8,999	14,000 - 14,999
3,000 - 3,999	9,000 - 9,999	Above 15,000
4,000 - 4,999	10,000 - 10,999	
5,000 - 5,999	11,000 - 11,999	

7) What was the amount of income from the following farm activities?

Farm produce (crops or animals)	Quantity per season	Average price.

General Information

1) Are the following facilities available at the provider alternative visited?

(Tick only for Yes)

Toilet ☐ Clean water ☐ Functional laboratory ☐

2) Did you like or not the following at the facility?

(Tick against what was liked only.)

a) Opening time☐ b) Closing time☐ c) Equipment used ☐

d) Facility cleanliness ☐ e) Reception by the personnel ☐

f) Medication given to your child ☐

3) Do you visit the same facility for immunization every time? Yes ☐ No ☐

(If yes go to 5, if no continue)

4) Why do you normally change the facilities?

a) No vaccine☐ b) Cheaper elsewhere☐ c)Looking for qualified staff ☐

5) Please give any general information about the child health care services in your area.

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Thank you

Appendix VI

Summary of Raw Data

	H	AC	GC	MA	NS	HS	MS	ME2	ME3	ME4	FE2	FE3	FE4	MEMP	FEMP	AP	AD	DP	TT	WT	Y	Provider	Reason
1	0	12	0	21	2	5	1	1	0	0	1	0	0	0	1	1	1	1	30	2	1499.5	self	cheapest
2	1	27	1	21	1	4	1	0	1	0	0	1	0	1	1	1	0	3	60	150	6499.5	public	best
3	0	55	0	34	4	8	1	1	0	0	0	1	0	0	0	1	1	0.3	6	2	20000	chemist	best
4	0	28	1	30	3	7	1	0	1	0	0	1	0	0	0	0	0	0.15	10	2	10499.5	chemist	best
5	1	7	1	18	0	3	1	1	0	0	1	0	0	0	0	1	1	1	30	60	1499.5	public	cheapest
6	1	41	0	30	0	3	1	0	1	0	1	0	0	0	0	1	0	1	25	30	3499.5	public	cheapest
7	1	14	1	18	1	6	1	1	0	0	0	1	0	1	0	1	0	1	30	60	2499.5	public	nearest
8	0	24	1	20	0	3	1	1	0	0	0	1	0	1	0	0	1	0.05	5	15	2499.5	chemist	cheapest
9	0	60	0	32	4	7	1	1	0	0	0	1	0	1	0	0	1	1	20	5	3499.5	chemist	cheapest
10	1	15	0	24	0	4	1	0	1	0	1	0	0	1	0	1	0	2	45	90	5499.5	public	cheapest
11	1	11	0	25	2	5	1	1	0	0	1	0	0	0	0	1	0	2	60	300	4499.5	public	nearest
12	1	6	0	25	3	6	1	1	0	0	0	0	0	1	0	1	1	60	30	60	3499.5	mission	best
13	1	6	1	20	1	5	1	0	1	0	0	1	0	1	1	1	1	2	60	60	4499.5	private	nearest
14	0	24	0	20	1	4	1	1	0	0	1	0	0	0	0	1	1	2	60	2	1499.5	chemist	cheapest
15	1	12	1	22	1	4	1	1	0	0	1	0	0	1	0	1	0	2	60	60	1499.5	public	best
16	1	48	1	26	1	3	0	1	0	0	***	***	***	1	***	1	1	2	60	180	2499.5	public	nearest
17	1	12	0	27	0	4	1	0	1	0	0	1	0	1	1	1	1	1	60	30	6499.5	mission	nearest
18	1	36	0	38	3	4	1	1	0	0	0	1	0	1	0	1	0	2	30	30	1499.5	public	cheapest
19	1	5	0	18	0	3	1	1	0	0	1	0	0	1	0	1	0	2	60	120	1499.5	public	nearest
20	1	18	1	23	2	3	0	1	0	0	****	****	*****	0	***	1	0	1.5	60	90	2499.5	public	cheapest
21	1	36	1	25	4	7	1	0	1	0	0	1	0	0	1	1	0	2	10	120	7499.5	public	cheapest
22	1	20	1	24	1	3	1	0	1	0	0	1	0	0	1	1	0	2	80	30	7499.5	public	cheapest
23	1	18	0	18	0	7	1	1	0	0	0	1	0	1	0	0	1	0.5	10	20	3499.5	mission	nearest
24	0	6	1	25	1	4	1	1	0	0	0	1	0	0	0	1	1	2	40	5	3499.5	self	cheapest
25	1	14	0	25	1	5	1	1	0	0	0	1	0	1	0	1	1	2	60	16	30000	private	best
26	1	8	0	32	4	8	1	1	0	0	0	1	0	1	0	1	1	0.05	10	2	11499.5	mission	nearest

27	1	24	0	28	4	10	1	1	0	0	0	1	0		1		0	1	1	1	30	20	3499.5	mission	nearest
28	1	60	1	30	1	7	1	0	1	0	0	1	0		0		1	1	0	2	60	30	10499.5	public	best
29	1	8	0	26	2	8	1	0	1	0	0	1	0		1		0	1	1	1	20	15	4499.5	mission	best
30	1	18	1	27	3	6	1	1	0	0	0	1	0		1		1	1	0	2	40	30	7499.5	public	cheapest
31	1	8	0	18	0	3	1	1	0	0	1	0	0		1		0	1	0	3	30	120	2499.5	public	cheapest
32	1	24	1	28	1	8	1	1	0	0	0	1	0		1		0	1	1	1.5	20	60	3499.5	mission	best
33	1	2	0	20	1	3	0	1	0	0	***	****	****		1	**		1	1	2	30	120	3499.5	public	cheapest
34	1	2	1	24	3	7	1	1	0	0	1	0	0		1		0	1	1	2	2	30	4499.5	mission	best
35	0	2	0	22	1	4	1	1	0	0	1	0	0		1		0	1	1	1	5	1	4499.5	self	nearest
36	1	36	0	30	2	5	1	1	0	0	0	1	0		1		0	0	1	2	20	1	3499.5	private	nearest
37	1	18	1	38	3	5	1	1	0	0	1	0	0		1		0	0	0	1	120	210	6499.5	public	nearest
38	1	8	1	38	7	10	1	1	0	0	1	0	0		1		0	0	1	2	15	30	3499.5	private	cheapest
39	1	18	1	30	5	10	1	1	0	0	1	0	0		1		0	1	0	2	60	30	3499.5	public	cheapest
40	1	8	0	24	4	6	1	1	0	0	1	0	0		1		0	1	1	2	60	120	3499.5	mission	best
41	1	19	1	25	1	6	1	1	0	0	0	1	0		0		0	1	1	2	30	60	5499.5	mission	best
42	1	30	0	21	0	3	1	1	0	0	1	0	0		0		0	1	0	2	30	180	3499.5	public	cheapest
43	1	6	1	36	5	9	1	1	0	0	0	1	0		0		0	1	1	7.38	5	30	10499.5	private	best
44	1	24	0	28	1	3	0	0	1	0	***	****	****		0	****		1	1	7.38	5	0	3499.5	mission	nearest
45	1	3	0	20	1	6	1	0	1	0	0	1	0		1		0	1	0	2	30	180	3499.5	public	best
46	1	4	0	17	0	3	1	1	0	0	1	0	0		1		0	1	0	3	60	120	1499.5	public	best
47	1	4	1	20	1	4	1	1	0	0	0	1	0		1		0	1	1	3	120	3	3499.5	private	nearest
48	1	12	1	23	2	4	1	1	0	0	1	0	0		1		0	1	0	2	30	120	3499.5	public	cheapest
49	1	8	0	24	0	3	1	0	1	0	0	0	1		0		1	1	1	2.46	5	60	8499.5	private	nearest
50	0	36	0	18	1	3	1	0	1	0	1	0	0		0		0	1	1	4.92	30	3	3499.5	chemist	nearest
51	1	6	1	22	0	5	1	0	1	0	0	0	1		1		1	1	0	7.38	10	60	7499.5	public	nearest
52	1	1	0	24	1	5	1	0	1	0	0	1	0		0		0	1	1	7.38	10	5	8499.5	public	cheapest
53	1	8	0	25	1	5	1	1	0	0	0	1	0		1		0	1	1	7.38	10	10	3499.5	public	cheapest
54	0	36	1	39	4	7	1	0	0	1	0	1	0		0		0	1	1	3.69	5	2	4499.5	self	nearest
55	0	18	1	26	1	4	1	0	1	0	0	1	0		1		0	1	1	3	60	0	6499.5	chemist	nearest
56	1	8	1	20	0	3	1	0	1	0	0	1	0		0		0	1	1	2	30	5	6499.5	mission	best
57	1	11	1	23	1	4	1	1	0	0	0	1	0		1		0	1	0	2	30	180	3499.5	public	best
58	0	48	1	35	5	7	1	1	0	0	0	1	0		0		1	1	1	0.01	2	1	3499.5	self	cheapest

59	1	48	0	27	1	7	1	0	1	0	0	0	1	0		1	1	1	0.5	20	10	45000	private	best
60	1	0.75	0	22	0	5	1	0	1	0	0	1	0	1		1	1	1	0.5	10	3	4499.5	public	cheapest
61	1	40	0	26	3	4	1	0	1	0	0	1	0	1		1	1	1	1	20	20	4499.5	mission	best
62	1	54	1	26	3	6	1	0	1	0	0	1	0	1		1	1	1	1	60	20	5499.5	private	best
63	1	26	1	24	2	7	1	0	1	0	0	1	0	1		1	1	0	0.5	10	2	5499.5	public	nearest
64	1	36	1	26	2	5	1	1	0	0	0	1	0	1		0	1	1	0.5	20	10	2499.5	public	cheapest
65	1	18	1	25	1	5	0	0	1	0	***	***	***	0	***		1	1	0.5	5	20	3499.5	public	nearest
66	1	36	0	28	2	6	1	0	1	0	0	1	0	1		0	1	1	0.5	30	35	2499.5	public	cheapest
67	1	5	0	28	3	6	1	1	0	0	0	1	0	1		1	1	1	0	1	30	20	5499.5	mission	best
68	1	3	1	23	0	3	0	0	1	0	***	***	***	0	***		1	1	0.5	20	30	2499.5	public	nearest
69	1	19	0	19	0	3	0	1	0	0	***	***	***	1	***		1	1	0.5	10	3	1499.5	private	best
70	1	24	0	36	2	4	1	1	0	0	1	0	0	1		0	1	0	2	20	45	2499.5	private	cheapest
71	1	36	0	25	1	5	1	0	1	0	0	1	0	1		1	1	1	0.5	15	25	4499.5	public	cheapest
72	1	10	1	25	1	4	1	0	1	0	0	1	0	1		0	0	0	0.5	20	15	2499.5	public	cheapest
73	1	24	0	32	4	7	1	1	0	0	0	1	0	1		0	0	0	1	0.5	20	10	499.5	T healer	cheapest
74	1	9.5	1	30	2	6	1	1	0	0	0	1	0	1		1	1	1	0	1	30	120	3499.5	mission	best
75	1	4	1	20	1	4	0	1	0	0	***	***	***	1	***		0	0	2	20	120	1499.5	public	cheapest
76	1	24	1	30	2	8	1	1	0	0	1	0	0	1		0	1	0	2	40	120	3499.5	public	cheapest
77	1	8	1	34	4	8	1	0	1	0	0	1	0	1		1	1	1	2	10	2	4499.5	private	best
78	1	30	1	28	3	7	1	1	0	0	0	1	0	0		1	1	1	3.5	45	2	5499.5	mission	best
79	1	24	1	31	2	3	1	1	0	0	0	1	0	1		0	1	1	20	45	10	3499.5	private	nearest
80	1	48	0	21	0	3	1	1	0	0	0	1	0	0		0	0	0	2.5	45	60	3499.5	public	cheapest
81	1	18	1	28	1	5	1	1	0	0	0	1	0	1		1	1	1	1	30	10	5499.5	mission	best
82	1	6	1	32	3	7	1	0	1	0	0	1	0	0		1	1	1	0.5	40	10	8499.5	mission	best
83	1	36	1	25	2	6	1	1	0	0	0	1	0	1		0	1	1	2	30	20	1499.5	public	cheapest
84	1	36	1	26	1	5	1	1	0	0	1	0	0	1		0	1	1	1	30	60	1499.5	public	cheapest
85	1	24	1	23	1	4	1	1	0	0	0	1	0	1		1	1	1	2	20	10	3499.5	private	best
86	1	2	0	20	0	5	0	1	0	0	***	***	***	1	***		1	1	1	30	60	2499.5	public	cheapest
87	1	36	1	23	0	6	0	1	0	0	***	***	***	1	***		1	1	1	30	60	2499.5	public	cheapest
88	1	48	1	28	1	4	0	0	1	0	***	***	***	0	***		1	1	1	30	20	3499.5	mission	best
89	1	8	1	23	1	3	0	0	1	0	***	***	***	0	***		1	1	1	30	50	2499.5	public	cheapest
90	1	12	1	20	0	5	0	1	0	0	***	***	***	1	***		1	1	1	20	30	2499.5	public	cheapest

91	1	5	1	30	5	10	1	1	0	0	0	1	0	1	1	1	1	5	35	20	6499.5	public	cheapest
92	1	24	1	27	2	7	0	1	0	0	***	***	***	0	***	1	1	5	30	60	2499.5	public	best
93	1	3	1	25	1	6	0	1	0	0	***	***	***	0	***	1	1	5	30	30	2499.5	public	cheapest
94	1	60	0	27	2	5	1	0	1	0	0	1	0	1	1	1	1	7	120	5	7499.5	private	best
95	1	4	0	29	4	8	0	1	0	0	***	***	***	0	***	1	1	4	30	2	3499.5	mission	best
96	1	48	1	23	2	6	1	1	0	0	1	0	0	1	0	1	0	4	30	240	3499.5	public	cheapest
98	1	7	1	24	0	4	1	1	0	0	1	0	0	1	0	1	1	4	120	120	3499.5	mission	best
99	1	36	1	24	2	5	1	1	0	0	1	0	0	1	0	1	1	4	20	60	3499.5	mission	best
100	1	18	0	27	1	5	1	0	1	0	0	1	0	1	1	1	0	2.5	35	40	4499.5	public	cheapest
101	1	8	1	18	0	3	0	1	0	0	***	***	***	1	***	1	1	2	30	35	1499.5	public	cheapest
102	1	7	1	30	6	7	1	1	0	0	0	1	0	1	0	1	1	3	15	120	2499.5	public	cheapest
103	1	18	0	23	1	3	1	1	0	0	0	1	0	0	0	1	1	7.38	10	30	4499.5	private	nearest
104	1	0.75	1	20	1	5	1	1	0	0	0	1	0	0	0	1	1	3	15	30	3499.5	public	cheapest
105	1	36	0	30	1	4	1	1	0	0	0	1	0	0	1	1	0	4	20	180	5499.5	public	cheapest
106	0	60	0	54	0	4	1	0	0	0	1	0	0	1	0	1	1	4	15	3	3499.5	chemist	cheapest
107	1	1	0	21	1	4	1	1	0	0	1	0	0	0	0	1	1	3	15	60	4499.5	public	cheapest
108	1	36	1	20	1	4	1	1	0	0	1	0	0	1	0	0	0	3	120	60	4499.5	public	nearest
109	1	6	0	20	0	5	1	1	0	0	0	1	0	1	0	1	0	5	40	30	3499.5	public	best
110	0	30	0	28	1	4	1	0	1	0	0	0	1	1	1	1	1	2	150	0	35000	self	nearest
111	1	24	0	18	0	3	1	1	0	0	1	0	0	1	0	1	1	30	100	60	11499.5	mission	best
112	1	36	0	17	0	7	1	0	1	0	0	1	0	1	0	1	1	2	60	0	4499.5	private	best
113	1	9	1	20	2	5	1	1	0	0	1	0	0	0	0	1	1	7	120	30	499.5	public	cheapest
114	1	41	1	54	4	7	1	0	0	0	0	0	0	1	0	0	0	2.5	20	0	1499.5	private	nearest
115	0	26	0	24	2	5	1	1	0	0	1	0	0	1	0	0	1	2	60	0	4499.5	chemist	cheapest
116	1	4	0	23	3	9	1	1	0	0	0	1	0	1	0	1	1	3	150	0	3499.5	private	cheapest
117	1	12	0	18	0	9	1	1	0	0	1	0	0	1	0	0	1	3	150	2	3499.5	private	best
118	1	5	0	17	0	9	1	1	0	0	1	0	0	1	0	1	1	7	40	1	3499.5	public	best
119	0	6	1	22	0	3	1	1	0	0	1	0	0	1	0	1	1	7	180	3	3499.5	chemist	nearest
120	0	37	1	36	5	10	1	1	0	0	0	1	0	0	1	0	0	0	0	0	32000	self	nearest
121	1	7	0	18	0	3	1	0	1	0	0	1	0	1	0	1	1	2	36	240	20000	private	cheapest
122	1	1	1	27	2	7	1	0	1	0	0	1	0	1	0	1	0	7	60	180	5499.5	public	best
123	1	36	1	30	3	6	1	1	0	0	0	1	0	1	0	1	0	7	60	240	3499.5	public	cheapest

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