DETERMINANTS OF IMMUNIZATION COVERAGE IN KENYA

BY

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A RESEARCH PROJECT SUBMITTED TO THE SCHOOL OF ECONOMICS, UNIVERSITY OF NAIROBI IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF SCIENCE IN HEALTH ECONOMICS AND POLICY.

November, 2014

DECLARATION

I declare that this is my original work and that it has not been submitted in any University for any degree award.

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DEDICATION

I dedicate this research paper to my loving Daughter Kayla Njoki Wanjala for her patience during my studies.

ACKNOWLEDGEMENT

I would like to thank the Director School of Economics and the staff who taught me through this course. I am grateful to my supervisor Dr. Urbanus Kioko for his guidance and ensuring that I have completed this paper. I appreciate His effort and continued input through encouraging comments and suggestions. My husband and children have been of great contribution to the far I have come with this research project. I particularly appreciate them for their endurance for the times I have had to reach home late and at times for being away over the weekends.

I would like to appreciate the encouragement I received from my classmates and friends. I would also like to remember many other people who contributed either directly or indirectly in my studies, although I have not mentioned their names, thank you for every support you accorded me this paper. I shall take responsibility for any errors or omissions which may be found in this paper.

ABSTRACT

The Division of Vaccines and Immunization under the ministry of health strives to ensure that vaccines are available at all levels of the health care system. This is in line with the vision 2030 where all forms of health care services are available and affordable in order to improve the health status of the people. This study is mainly concerned with establishing key factors that determine utilization of immunization services in Kenya with evidence from Kenya Demographic and Household Survey 2008-2009. Specifically, the study explores the pattern of children immunized across different regions and estimates the factors that are necessary for usage of immunization services in Kenya. Binary probit model has been used in estimation process. Age of the mother, education levels, marital status, literacy levels, place of delivery, household size and birth order are the study variables. The study results show that at 5% significance level, the age of the mother, literacy levels, place of delivery, and birth order are significant factors that determine utilization of immunization of services in Kenya. The study findings further indicate that the age of the mother, literacy levels and place of delivery were positively related to the utilization of immunization services in Kenya while birth order was found to be negatively related to childimmunization. The study suggests that the ministry of health under which department of immunization lies need to allocate a good proportion of their expenditure in educating people on the importance of family planning as well as reproductive health to improve immunization coverage in the long run.

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ABBREVIATIONS AND ACRONYMS

BCG: é é é é é é é é é é é é é Bacterium of Calmette Guerin

EPI: é é é é é é é .....Expanded Programme on Immunization

GDP: é é é é é é é é é é é é é .Gross Domestic Product

DTP: é é é é é é é é é é é é é .Diphtheria Toxoid, Tetanus Toxoid and Pertussis Vaccine

GIVS: é é é é é é é é é é é é é .Global Immunization Vision and Strategy

UHC: é é é é é é é é é é é é é .Universal Health Coverage

KEPH: é é é é é é é é é é é é é .Kenya Essential Package for Health

KHP: é é é é é é é é é é é é é .Kenya Health Policy

KHSSP: é é é é é é é é é é é é ....Kenya Health Sector Strategic Programme

KDHS é é é é é é é é é é é é é .Kenya Demographic and Household Survey

MDG: é é é é é é é é é é é é ...Millennium Development Goals

NHIF: é é é é é é é é é é é é ...National Hospital Insurance Fund

ME:é é é é é é é é é é é é ...Marginal Effects

WHO: é é é é é é é é é é é é ..World Health Organization

CHAPTER ONE: INTRODUCTION

1.1 Background Statement

1.1.1 Introduction

The achievement of the physical and mental well-being of the people is critical to the development of human resources. The development and expansion of health services and facilities in terms of spatial coverage, training of personnel and in tertiary healthcare delivery services in Kenya have been impressive since independence. This has resulted in improved life expectancy and reduced mortality rate.The health status of the population can be assessed by a number of indicators including infant, child and maternal mortality and morbidity rates, crude death rate, life expectancy at birth, and the number of medical staff and facilities available per unit of population. These are the basic indicators of a countryôs health, socio-economic situation, and quality of life.

Health indicators in Kenya are worsening and the gap between the demand for and supply of health services continues to widen. There is also a problem of service quality. The sector has not been able to expand as rapidly as the population to ensure adequate coverage, accessibility and acceptable quality of health services. This situation has been exacerbated by low levels of financial resources, the emergence of new diseases, and the growing appreciation of modern healthcare.

Unlike the market for many other goods and services, government is expected to intervene in the market for healthcare services, generally because of the presence of market failure, which is why actions of producers and consumers alone will not yield a socially optimal or economically efficient result. Governments have an important role to play in supporting the provision and consumption of services that are more public in nature (e.g. sanitation) or have important positive externalities (such as the prevention and treatment of communicable diseases). In addition, governments need to take measures to address the average consumerôs relative lack of information (compared to providers) regarding his or her health and the options available to improve it. Government intervention can take several forms, including direct provision of services, financing of services, regulation of private service provision or a combination of these. Poverty alleviation is another rationale for government involvement. One way to reduce poverty

is to increase the human capital of the poor by increasing their access to basic healthcare, education and nutrition.

1.1.2 Immunization Coverage

WHO considers that a child is fully vaccinated if he has received one dose of Bacterium of Calmette Guerin (BCG), three doses each of Diptheria Pettussis and Tetanua (DPT) and polio, and one dose of measles vaccine. BCG should be given at birth or at first clinic contact; it protects against tuberculosis. DPT protects against diphtheria, pertussis, and tetanus. DPT and polio require three vaccinations at approximately 6, 10 and 14 weeks of age. Measles should be given at or soon after reaching nine months of age. The WHO recommends that children receive the complete schedule of vaccinations before 12 months of age (Government of Kenya, 1998). Immunization coverage rose to 79 percent in 1993 from less than 30 percent in 1963.

According to the Kenya Demographic and Health Survey of 1998 (Government of Kenya, 1999), the percentage of children with a vaccination card dropped from 69 in 1993 to 55 in 1998. This may indicate decreased access to services. Full coverage (all vaccines) increased from 63 percent in 1989 to 79 percent in 1993 but dropped to 65 percent in 1998. Between 1993 and 1998, there was a general decline in immunization across the provinces.

In 1998, 84.8 percent of the children aged 12-23 months in Central Province had received all the vaccination compared to 92.6 percent in 1993. Nyanza and Western provinces recorded all vaccination coverage of 46.5 and 56.2 percent in 1998, respectively, compared to 69.7 and 69.5 percent in 1993, respectively. Children of mothers with secondary education and above had the highest level of vaccination (79.2%) in 1998 while those with mothers with no education had the lowest level of 53.4 percent.

1.1.3 Routine immunization

Between 2000 and 2004, the African Region made progress in increasing routine immunization coverage. Although the region fell well short of the target of 80% of countries achieving at least 80% coverage nationwide, coverage increased in a majority of countries. DTP-3 coverage is widely recognized as a good indicator of the strength of routine immunization services, and this coverage increased from 54% in 2000 to 69% in 2004 across the African Region; 22 (48%) of the countries reported achieving at least 80% DTP-3 coverage in 2004, an increase from 11

countries in 2000. The same number of countries, although not the same list of countries, also reported that 50% or more of their districts achieved DTP-3 coverage of 80% or higher in 2004. As a result, we estimate that the number of non-immunized children, defined as children who had not received the third dose of DTP-3 by their first birthday, declined dramatically across the region from 1.4 million in 2002 to less than 900 000 in 2004.

Despite these gains, more than one-third of African Region districts did not acquire 50% DTP-3 coverage by the end of 2004. Coverage levels of other routine vaccines, including measles, oral polio, Bacillus Calmette Guerin (BCG) and tetanus toxoid also lagged in many of the same areas. Factors holding back routine immunization services in the African Region included civil unrest, lack of human resources within health ministries, limited funding for routine immunization services, and competition for staff time among individuals involved in polio and measles supplementary immunization activities.

1.1.4 Immunization Coveragein Kenya

Since its inception in 1980, KEPI has increased immunization of the target population, achieving and maintaining coverage of over 75% by the early 1990s. In the two refugee camps in Kenya, namely Daadab and Kakuma situated in eastern and rift valley respectively, the immunization coverage is unknown though the reported antigen coverage is high, which may be attributed to the children who are getting immunization past the recommended age. There is no literature on the full immunization coverage in any of the refugee camps in Kenya (Kakuma Refugee Camp Report, 1997-2000).

The 1998 KDHS documented a significant decline in coverage of approximately 15% to the coverage of approximately 60%. This has further declined to unacceptable levels in the 1999. There are marked disparities between districts and provinces, with Nyanza having coverage as low as 44.4% and western province as low as 51.2% (Kenya Health Policy Framework 1994 ï 2010).Major measles out breaks throughout the country in 1998-99 may have contributed to this significant decline in coverage according to KEPI reports from 1996-99 (East African Medical Journal, July 2003).

Immunization coverage is closely linked to the quality of services offered. For the coverage to increased and sustained, the following critical areas of quality of immunization must be

addressed and sustained: missed opportunity and drop-out rates; unsafe injection practices; and adverse effects following immunization (Abilla *et al*., 1993).

Kenya introduced a, Pentavalent vaccine including the DPT, Haemophilus influenza Type B and Hepatitis B virus antigens, in November 2001 and strengthened immunizations service (Ministry Of Health, 2001).

The Division of Vaccines and Immunization strives to ensure that vaccines are available at all levels of the health care system; reduce measles morbidity by 95 per cent, mortality by 90 per cent and incidence of neo-natal tetanus to less than one death per thousand live births. The levels of immunization coverage have steadily increased. In 2007, immunization coverage was at 76% and measles 80% (KNEPI, 2006-2010).A series of priorities is focused on during the KHSSP period for attainment. These are defined at the impact, outcome, output and input levels to assure a logical link across sector actions which are drawn from the KHP framework.

Health services and programmes in Kenya are financed from three main sources: the government through the Exchequer both, directly to the ministry of Health and indirectly to other sectors with health-related functions, donors who fund Ministry of Health programmes; the private sector and NGOs. The Ministry of Health since independence has employed and survived through several financing mechanisms to support the health sector, for example cost sharing, social insurance, taxation and direct community contributions. The Ministry of Health is the main provider of health services to majority of Kenyans through its network of dispensaries, health centres, district, provincial and national referral hospitals. An assessment conducted by Kenya Human Development Report - KHDR, (1999), revealed that government financing of health expenditure is about 60% of what is required to provide minimum health services, therefore implying that healthcare delivery in Kenya is under-funded. This is emphasized by inefficiency of the system, including lack of cost-effectiveness in service delivery.On the other hand, Obonyo *et al*.(1997) claims that the government finances 50%, private payments[1] (insurance and out of pockets) finances 42% and donors, NGOs, missions and other institutions finance 6% of recurrent healthcare costs.

[1]However, Kenyaôs national health accounts shows that the financial contributions of households (out of pocket expenses) exceed those of the government.

The government spends a higher share of the Ministry of Health recurrent expenditure on curative care despite the fact that the major causes of morbidity and mortality are conditions that can be prevented through aggressive primary and preventive healthcare programmes. The impact of this pattern of funding manifests itself in poor quality of services and frequent shortages of essential inputs, (including drugs) to health delivery. Failure to adequately fund preventive and promotive services in a sustainable manner implies that the existing facilities will continue to be burdened with cases of illness that could have been averted.

1.1.5 Challenges related to realization of the set national goals

Although the ministry of healthis a provider of health care services, it is no longer the only provider of health care in Kenya. Ministry of health is therefore not well positioned to fully control all available health care resources. Of the total health sector expenditure, the government accounts for only 43.26% with the remaining 56.74% being spent by the non-governmental sector which includes the religious health institutions, NGOs, and private (for profit) providers. The non-government sector accounts for 50% of all hospitals and 36% of the available hospital beds. In addition, it accounts for 21% of all health canters and 51% of all outpatient facilities.

Private providers of health care have grown from very few at the time of independence in 1963 to nearly 1500 in 1993. Because of lack of clearly defined and functioning mechanisms for coordinating the non-governmental providers, they are not in practice, accountable to the government. The large number of non-governmental providers are hence not regulated and not required to focus on National Health Sector vision and goals for instance working towards improving immunization coverage in the country. Thus while there exists a great potential to mobilize additional resources from the non-governmental sector, it is difficult, at present, to regulate and gain continuity of their contributions towards the achievement of the national health goals of child vaccination. This is despite the various health outcome targeted by the government.

1.2 Problem Statement

Human health has a major role to play in economic development. There is a direct link between the health of a population and its productivity, and this relationship has been demonstrated in industrial countries, which are now benefiting from years of investment in health services (Schultz, 1993).

Health service provision on child vaccination in Kenya is worsening and the gap between the demand for and supply of various vaccines continues to widen. The WHO recommends that children receive the complete schedule of vaccinations before 12 months of age (GoK, 1998). There is however, a problem of service quality. The sector has not been able to expand as rapidly as the population to ensure adequate coverage, accessibility and acceptable quality of the same health services. KDHS(2003) indicates that the percentage of children with a vaccination card dropped from 69 in 1993 to 55 in 1998. Also immunization coverage for children aged below 1 year dropped from 67% in 1998 to 51.5% in 2003. This may indicate decreased access to services. Full coverage (all vaccines) increased from 63% in 1989 to 79%in 1993 but dropped to 65% in 1998. Between 1993 and 1998, there was a general decline in immunization coverage levels across the provinces. The trend was shown to be worse in marginalized areas where health facilities are scarce and the means of transport is worse KDHS (2008). Outbreaks of measles and polio had also been reported in the country and there has been a great sensitization campaign on the importance of immunization. Occasionally there has been a problem of lack of some antigens prompting rescheduling of the visits to health facilities.There is some evidence that there are continuing weaknesses in the immunization and health systems that impede the absorption capacity and prevent sustained gains (Alliance for Health Policy and Systems Research, 2007). Given the multiple demands for health resources in low-income countries, the governmentôs contributions may not be affordable or sustainable (SOWVI, 2010). Considerably more investigation of these possible realities is required.

The desire to understand the factors that lead to the decline of immunization coverage from the early 1990ôs despite heavy government investment in health infrastructure since independence is the underlying motivator for this study. This is regardless of emergence of new diseases such as HIV/AIDS and the re-emergence of diseases such as tuberculosis in Kenya. In this regard, establishing factors determining immunization coverage in Kenya informs on better health policies.

1.3 Research Hypothesis

What is the pattern of immunization coverage across Kenya?

What is the influence of factors identified on immunization coverage in Kenya?

1.4 Study Objectives

1.4.1 General Research Objective

The overall objective is to analyse the determinants of immunization coverage in Kenya.

1.4.2 Specific Objectives

i. Todetermine the pattern of immunization coverage in Kenya.
ii. Toestimate the demographic, socio-economic and health service factors affecting utilization of immunization services by mothers with children aged below one year in Kenya.
iii. To provide key policy recommendations based on the findings in (i) and (ii) above.

1.5 Justification of the Research

Every year more than 10 million children in low- and middle-income countries die before they reach their fifth birthdays. Most die because they do not access effective interventions that would combat common and preventable childhood illnesses. Infant immunization is considered essential for improving infant and child survival. Although global immunization coverage has increased during the past decade to levels of around 78% for diphtheriaï tetanusï pertussis-3 (DTP-3), WHOôs African Region has consistently fallen behind, reaching only 69% DTP-3 coverage by 2004.

In response to challenges in global immunization, WHO and the United Nations Childrenôs Fund (UNICEF) set up the Global Immunization Vision and Strategy (GIVS) in 2003. The main goal of GIVS is to reduce illness and death due to vaccine-preventable diseases by at least two-thirds by 2015 or earlier. These goals aimed to ensure that the immunization performance of the African Region caught up with other regionsô performance.Despite these gains, more than one-third of African Region countries did not acquire 50% DTP-3 coverage by the end of 2004. Coverage levels of other routine vaccines, including measles, oral polio, Bacillus Calmette Guerin (BCG) and tetanus toxoid also lagged in many of the same areas. Factors holding back routine immunization services in the African Region included civil unrest, lack of human

resources within health ministries, limited funding for routine immunization services, and competition for staff time among individuals involved in polio and measles supplementary immunization activities.

Although a relatively small amount of national funding is available for routine immunization programmes in Kenya, resources available to control polio and measles and to introduce new vaccines have been used to support their critical functions. Therefore it is imperative to determinants of immunization coverage across the country. Recommendations will be given on test strategies that could raise routine coverage and expand these campaigns to improve coverage uniformly to high levels as we strive to realize the vision 2030.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Vaccine-preventable diseases are a challenge in most developing countries, especially in sub-Saharan Africa where it accounts for 25% of the deaths in infants (World Bank, 2006). Despite vigorous vaccination campaigns, immunization coverage for Polio, DPT and Measles remains low in many sub-Saharan countries such as Kenya, Uganda and Zambia (American Red Cross, 2004). Kenya is no exception, as infant deaths from immunizable diseases are evident in many parts of the country. Infant mortality rate deteriorated in Kenya from 88 deaths per 1,000 live births in 2000 to 90 deaths per 1,000 live births in 2005 (MFPED, 2007). The vast majority of deaths to children were caused by immunizable childhood diseases. Others were as a result of prenatal and early neonatal conditions, malaria, meningitis, pneumonia and HIV/AIDS (MFPED, 2007).

2.2 Theoretical Literature Review

The emphasis on attaining universal coverage also helped to induce improved programme management and there was a noticeable increase in equitable access (Cooley, 2004). With the universal coverage approach the effort may be more likely seen as a safe and worthwhile investment of public funds (Hay, 1987). However, sustained coverage ï especially at the peripheral levels - can be challenging as it significantly increases the costs, and requires improvements in staffing, financing and guidelines, as well as in the ability to procure a constant vaccine supply (Milstien, 2007 and Lauria, 2009).

One possible explanation of the failure to improve access to the immunization system may be related to the socio-cultural acceptability of some of the new vaccines. Vaccines - for example HPV vaccines ï may be associated with sexually transmitted infections [STIs] and therefore can encourage stigmatization. It has been found that the introduction of HPV led to media messages that adversely affected HBV uptake (Watson, S.*et al*. 2009). Similarly, messages need to be more pertinent to the situations of migrant and ethnic minorities (Pulido, 2001., Allen 2009 and Wong, 2009). Opposition from socially conservative groups and ethical considerations have been

found to negatively affect the social acceptability of new vaccines (Schneider, 2007). Indeed, it has been found that an increase in uptake sometimes required changes in the types of messages provided (Goldstein, 2001 and Watson, 2009 *et al*).

It has been suggested that the increased training can increase a brain-drain out of the health sector, if the training programmes are not accompanied by necessary adjustments to the human resource frameworks and career paths, or to adequate remuneration arrangements (Pfeiffer, 2008)**.**In some instances ï especially where the levels of financial involvement and commitment by the national governments have been very limited, it may not be possible to sustain the necessary level of effort - with negative outcomes for the longer term sustainability of the immunization programme**.**

2.3 Empirical Literature Review

Various socioeconomic and demographic factors may influence immunization services utilization. Maternal characteristics, sex of child and birth order of the child, place of delivery and antenatal care (ANC) follow up, household income/economic status, knowledge about immunization and vaccine preventable disease, and residence are the main factors associated with immunization coverage and immunization services utilization among children.

Maternal characteristics are the most known determinant factors of child immunization. A comparative study done among slum and non-slum dwellers in Bangladesh children age below 2 years in three zone of Dhaka demonstrated that complete coverage is associated with educational status of the mother, income and living conditions (Kidane, T*et al*., 2006). The study revealed that mothers with lowest education, households with limited monthly income and people living in slum area were less likely to complete a child immunization. It also indicated that children whose mothers were born in a rural area or an urban slum, and those whose mothers were aged less than 30 years are 0.35 and 0.43 times less likely to be fully immunized respectively (Perry, R, *et al*., 1998). But in Kenya young age of mothers was associated with high immunization coverage as compared with the older mother (Kamau and Esami 2001).

Knowledge is another factor which affects the immunization status of the child. These include knowledge and attitude toward vaccination and vaccine preventable disease. Study done in Nigeria on determinants of immunization status children in rural area showed that mothers of

higher knowledge score more fully immunize their children. Also more than half of mother can correctly calls the symptoms of vaccine preventable disease. And 99% the mothers felt immunization is good for the child (Olumuyiwa O, *et al*., 2008).

Health facility is another factor which contributed to full immunization of the child. Different studies showed the importance of availability and accessibility of health facility in immunization coverage. Families nearer to the health facility are more likely to complete the immunization than those far from it. In a cross sectional study done in India, Assam district showed that immunization status of the children was significantly higher where the distance of the health centre was less than 2km compared with those residing in remote inaccessible areas with a distance of more than 5km to the health centre (Rup KP, *et al*., 2008).

In the study of Bangladesh mothers near to health facility (less than1km) were 2.11 times more likely to fully vaccinate than those who were far away from health facility (Mosiur and Sarker 2010). In contrast, a study done in rural Mozambique showed that accessibility to health facility in terms of distance and need of transport to get vaccination site doesnôt significantly associate with the complete immunization (Jagrati V.J *et al*., (2008).

Ibnouf, A. *et al*., (2007) undertook a cross sectional study in Sudan and showed that walking time to the nearest place of vaccination strongly influenced the correct vaccination status of the child. Children of mothers who have better access to vaccine services (less than 30 minutes walking time to the nearest place of vaccination) were 3.4 times more likely to have had the correct vaccinations than were children of mothers who have to walk 30 minutes or longer

In a study done by (Jagrati V.J. *et al*., (2008) in rural Mozambique showed that home delivered children have a 2.27 times higher risk of not completing their vaccination program. Maternal health utilization like antenatal care, TT status of mother and place of delivery are those factors that are associated with the immunization status of children. The authors argued that mothers who follow ANC and give birth at health facility are more likely to fully vaccinate their children. They further claim that attendant at birth has an impact on the immunization status of children.

Partha D, B. N. B. (2002) conducted a study in India and found that mothers who received ANC services, were two to three times more likely tovaccinate their children than the percentage of those who did not receive any antenatal care. And mothers who received ANC service from a

trained or traditional birth attendant appeared to be aware of child immunization. Also mothers who received tetanus toxoid vaccination during pregnancy more likely to complete immunize their child. In Bangladesh, number doses of doses tetanus toxoid immunization mother received associated with full immunization of the child (Mosiur R, Sarker O-N. 2010).

Studies have shown that sex of the child found to predict the immunization status of the child in the societies in which gender inequality is prevalent. A review done in India from 1996- 2006 showed girls were found to have significantly lower immunization coverage than boys for BCG, DPT, and measles (Daniel, J.*et al*. 2009). Inother studies done in Bangladesh also females are 0.84 times less likely to be fully vaccinated than male children (WHO, 1998). But another study done Nigeria in 2003 showed no any significant sex difference (Diddy A. 2009). In 2006 Ethiopian EPI survey also showed that no statistically significant difference between girls and boys with regard to their immunization status (Kidane T, Yigzaw A, Sahilemariam Y, Bulto T, Mengistu H, Belay T, *et al.* 2006)..

Birth order has a close relationship with vaccination coverage. According to the Ethiopia Demographic and Household Survey (EDHS, 2005) vaccination coverage generally decreases as birth order increases, 27% of first-born children have been fully immunized, compared with 18% of children of birth order six and above (Central Statistics Agency, ORC Macro, 2005).

Abdul, Q., *et al*. (2010) investigated reasons for immunization drop outs in Bangladesh whereby different reasons were given by mothers/caretakers not to immunize their children. These include parental lack of knowledge of benefit of immunization and immunization schedules, health facility related problems, cultural and religious reasons, maternal and children illnessô are identified by many studies. In their study, they argued that lack of information about schedule of session and non-holding of session according to schedules was commonly cited reasons for dropouts. In a similar study done in Nigeria on the reason for defaulting child illness and perceived contraindication by the health worker are the significant reason given by the care takers for defaulting (Onyiriuka A. 2005).

Tadesse H, *et al*. (2009) conducted a study in southern of Ethiopia, Wanago Woreda and found that mothers who had poor knowledge about the benefit of vaccines were 6 times more likely to have defaulted than mothers who had good knowledge, also mothers who had negative

perception towards health institution support were 2.3 times more likely to have defaulter children than mothers with positive attitude. They concluded that knowledge on the benefit of immunization is also an important reason for the defaulting and non-immunization.

Chhabra, *et al*. (2007) used systematic random sampling method in selecting the respondents where every nth member of the population was sampled. The study was meant to assess the immunization coverage of BCG, DPT, OPV and Measles, and factors affecting the coverage in 693 children aged 24 to 47 Months in two urban villages of East Dehli. The authors showed that immunization coverage was: 82.7% for BCG, 81.5% for DPT1/OPV1, 76.8% for DPT2/OPV2, 70.7% for DPT3/OPV3 and 65.3% for Measles vaccine. The coverage levels were associated with education of mothers and fathers, fatherôs occupation, residential status and place of delivery.

Singh, (2007) undertook a survey to describe the immunization coverage in a rural part of North India. The study sampled 747 children and the results revealed that 94.8 % eligible children were immunized and had received the required doses of the primary schedule vaccines. The coverage was (BCG (94.8%), OPV/DPT (91.6%), and Measles (72.6%). Only 39 (5.2%) of the eligible children had not completed immunization schedule for BCG, DPT, Polio and Measles due to temporary or permanent migration of the children or family to the village or went back to the parentsô home or divorce or the child was adopted by relative.

Vaahtera, *et al*. (2000) conducted a cohort study of childhood immunization on 760 new-borns in Malawi. The study found out that at 1 year of age, 91% were vaccinated against Polio, 90% against DPT and 64% against Measle. Meanwhile at 2 years of age, the corresponding vaccination coverage were 93%, 93% and 84%, respectively. The study further revealed that low coverage was associated with living in villages with no access to mobile vaccination teams, and birth at home.

Kidane and Tekie, (2000) conducted a study to explore factors influencing urban and rural immunization coverage in 220 households with children 12-13 months of age in Ethiopia. The authors revealed that higher community awareness was associated with effective community mobilization for immunization. The study also found out that immunization coverage for DPT,

Polio and Measles in these areas were 97.3% for DPT1/OPV1, 92.7% for DPT3/OPV3 and 75.5% respectively and the reason for this high coverage was that mothers were literate.

Anah, *et al*. (2006) carried a prospective study on eliminating a missed opportunity as one of the barriers to immunization in 919 children aged 5 years and below in Nigeria. The results showed that 60.9% of the children whose immunization status was ascertained were fully immunized, while 26.6% were partially immunized and 12.5% had no form of immunization. The study further revealed that immunization coverage for BCG was 65.7%,OPV0 65.7%, DPT1/OPV1 64.1%, DPT2/OPV2 62.7%, DPT3/OPV3 62.4% and 61.3% for Measles. Some of the reasons cited by the respondents for missing scheduled immunization included child being ill at the time of immunization, ignorance about repeat visits, change of residence and fever following previous immunization. This was a hospital based study which used immunization cards and immunization history method.

Nuwaha,*et al*. (2001) investigated attendance at National Immunization days and routine immunization involving 48 mothers and fathers in Uganda. They found that immunization coverage was 95% for BCG, 82% for DPT, 81% for Polio and 77% for Measles.The study revealed that the coverage was due to knowledge of immunization, attitudinal beliefs and social influence of the mothers and fathers. The mothers and fathers believed that routine immunization were well intentioned and meant to eradicate childhood diseases. In terms of social influence, the study revealed that while it was the woman who decides the issue of routine immunization, the man was regarded as the one who makes the very important decision not to immunize in exceptional situation when immunization strengthens disease.

Cheyne (1994) carried out a study on immunization in urban areas in China. The study revealed that poor uptake of immunization in urban areas was associated with lack of motherôs awareness about repeat visits to achieve complete immunization rather than overall vaccine awareness. Furthermore, anti-vaccine rumours such as pathogenicity of a vaccine and propaganda of vaccines weakening their children which were encountered in the community, affected immunization coverage attained. Negative perceptions as well about vaccination and anti-vaccine rumours in some communities were found to affect the level of immunization coverage. Mis-information about the side effects of vaccine during illness and false contraindications also contributed to the level of immunization coverage.

Sebahat and Nadi (2006) investigated the reasons for non-vaccination and the effects of socio-demographic factors on vaccinations in a district of Istanbul, Turkey. The study revealed that distance from the health centre and internal migration from less developed parts to more developed parts of the country, were significantly related to the level of immunization coverage whereas immunization coverage was associated with educational level of the father and the mother. Children whose mothersô education level was at least primary school were more likely to be fully immunized than those whose mothers had no education.

Rafiqul, *et al*. (2007) conducted a study on child immunization coverage in 700 households in the slum areas of Rajshahi City, Bangladesh. They revealed that full immunization was higher (92.3%) in the higher ages (24+ months) than the age 12-23 months (89.5%). The high coverage in the higher ages of 24+ months was attributed to demographic and socio-economic factors such as mother's education, husband occupation and family's monthly income. The study found that the place of delivery and exposure to mass media had highly significant effects on child immunization. In other words, the mothers who were exposed to any mass media were more likely to have their children immunized compared to the mothers who were not exposed to any mass media. Furthermore, mothers who delivered at health institutions such as hospitals and clinics were more likely to have their children given the Polio vaccine on delivery than those who delivered at home.

Nath *et al*. (2007) explored the determinants of immunization coverage in 510 children aged 12-23 months in urban slums in India. They reported that only 44% of the children were fully immunized. Incomplete immunization and unimmunized status of the children were associated with low socio-economic status which constrained the poor parents to take their children for repeated visits to complete immunization schedules, higher birth orders which are associated with low child care with a mentality that high numbers act as insurance for those that may die, home delivery and Muslim religion which limit access to immunization centres.

Singh and Yadav (2001) undertook an investigation into childhood immunization of 6300 children in urban slums of India. They found that slum dwellers did not demand immunization services. The authors argue that slum dwellers are unable to demand for services owing to weak community organization and low collective confidence, which is known to increase utilization of health services in public institutions. This is possibly related to the observed low utilization of

health services including immunization services. This study also used WHO 30- cluster survey method with modification similar to the one used in a study by Kidane and Takie (2000). This method includes all the eligible children in the household in the sample and only the first household in each cluster is randomly selected.

Odiit and Amuge (2003) carried out comparison of vaccination status of children born in health units and those born at home of 486 children under five years in Jinja, Uganda. The duo used a cross-sectional descriptive study which revealed that 68% of the children were up to-date with their vaccines.The study showed that a child born in a health unit was more likely to be up to-date with their vaccination compared to a child born at home. Being born at home was found to be a risk factor for incomplete or non- vaccination. Continuation of vaccination was similarly observed to be poor in children born at home and those born in health centres.

Ibnouf, *et al*. (2007) used a cross-sectional survey on factors influencing immunization coverage among 410 children under five years of age in Khartoum State Sudan. They found out that children in urban and rural areas differed significantly in their reported vaccination coverage and their receipt of each vaccine. In urban areas, accessibility to immunization centres is high compared to rural areas where amidst the few centres immunization is schedule based. The study also confirmed that vaccination coverage increased with an increase in the age of the children and the education level of the mother. Furthermore, the study found that the mothersô knowledge of and attitude to vaccination showed a strong relationship with the vaccination status of their children.This study used a similar method as applied by Chabra *et al*. (2007).

Datar *et al*.(2005) conducted a study on health infrastructure and immunization coverage of 43,416 children aged 2-35 months residing in rural India. They found that the availability of health infrastructure significantly improved immunization coverage for non-Polio vaccines. The study further revealed that larger and better equipped facilities such as hospitals and health centres had bigger effects on immunization coverage including the nature of health infrastructure i.e. hospitals and health centres play an important role in increasing immunization coverage.

Tugumisirize,*et al* (2002) used cross-sectional descriptive study of 408 care takers with children aged 12-23 months. They exploredthe missed opportunities and caretaker constraints to childhood vaccination in Kiyeyi, Uganda. They established that complete vaccination coverage

was 44.6% where reasons for non-completion of vaccination included caretaker not being bothered, being busy or ill, and feared health workers. Other reasons were; not knowing immunization schedule, low level of formal education, fear of vaccine side effects and perceived contraindications to vaccinations.

Baluka (2003) conducted a participatory study of 114 participants to assess the impact of decentralization of health services in Ntungamo District in Western Uganda. The study revealed that routine immunization coverage in infants below one year for DPT, Polio, Measles and BCG was high, averaging 80% since 2000. The study found that the decentralization of services as reported by community members was instrumental in improving accessibility to health services. Hence the existence of decentralized health services could be important in explaining factors associated with immunization coverage in Kenya given the country is under devolved governments.

Ndiritu *et al*. (2006) investigates immunization coverage and risk factors for failure to immunize children below one year for DPT. They carried out a cluster survey[2] with sample size of 204 children aged 9-23 months. Simple random sampling which requires a population listing was applied and each chosen subject was located and questioned. The study reveals that immunization coverage decreases with increasing distance from the vaccination clinics. The findings further showed that immunization coverage was more strongly associated with annual patterns of rainfall.

Borus (2004) used cross sectional study on missed opportunities and immunization coverage of 418 children under two years in Nairobi slum areas. The study found that 80% of the children were immunized against Measles, 96.7% had received BCG, 85% against DPT and 75% against Polio. Overall 84% of the children were fully immunized. The reasons revealed by the study for child not being fully vaccinated included vaccine was out of stock, vaccine scheduled not to be given that day, child was sick or under-weight, child not yet of age and syringe out of stock. The researcher argues that the lower immunization coverage for Polio which had a representation of

[2]A WHO 30-cluster sampling method together with simple random sampling method was used in the study.

75% compared to DPT with 85% was due to missed opportunities arising from shortage of Polio vaccine that was reported in the period proceeding to and during the survey.

2.4 Overview of the Literature

In summary, much as the literature reveals several factors affecting immunization coverage in children aged 12 to 18 months, the main demographic and socio-economic factors associated with vaccine coverage are: distance from health centre facility, family migrations, place of delivery, the role of the mass media, availability of health infrastructure or facilities, motherôs education, age, birth order, knowledge, attitudes, weather conditions, decentralized health services and community awareness. Since little is known and reviewed by the above literature in relation to public resource utilization, a relevant study of the impact of public health expenditure on immunization coverage ought to be undertaken to establish trends of immunization coverage and this will set pre-requisites and also inform on allocation of resources in the national budget. As indicated by Singh and Yadav (2001), demand immunization services require acceptability, clear understanding of the benefits, no fear of vaccines, specific knowledge of the vaccine doses, motivation to avail services and overcoming barriers for seeking immunization. This study will unveil results which may form part of the immediate sought solution to those challenges. Moreover, most of the studiesas indicated in the literature, cross sectional data have been widely used failing to account for dynamic transformations due to time variation. This research is going to adopt a cross sectional survey and fill the gap.

CHAPTER THREE: METHODOLOGY

3.1 Analytical Framework

This study borrows from a theory described by Pindyck and Rubinfeld, (2005) which relates individual demand curve to preferences, indifference curves and budget constraints. According to this theory of consumer behaviour, we made an assumption that a consumer allocates income to different goods and services from which the utility is maximized. The consumer or individual maximizes his utility depending on the decision of either utilizing or failing to utilize immunization services. The utility includes consumption of the necessary doses of recommended vaccines subject to the health production function and budget constraints. The consumer optimization problem which is utility maximizationis expressed as follows:

CU=f(C, H) é é é é é é é é é é é é é é é é é é .é é é é é é é é é é ..é (1)

Where CU is the utility derived by the child from consuming immunization services, C is the other consumption goods which provide utility to a child which contains indirect effect on health and H is the childôs health status. Therefore, utility is maximized subject to budget constraint and a production function as indicated by equation (1) and (2) below;

$INC=CP_c+NP_n+VP_v$é ..(2)

Where INC is income, C areother consumption goods, N are the market purchased inputs and V is immunization services. P_c, P_n and $P_v$are respectively price of other consumption goods, price of market purchased inputs and cost of the accessing and usage of immunization services. On the other hand, the health production function is given by:

H=f(V,N,M)é (3)

Where V is the immunization services and N is the market purchased inputs by the children and M is the maternal characteristics (Socio- Demographic characteristics of a mother) as well as other enabling factors. Therefore, the solved optimization problem throughLagrangian function led to the function given by equation 4 below:

$LN= Ŭ(INC-CP_c-NP_n-VP_v) + ß[(H-f(V,N,M)]$é é é .é é é ..é é é é é é é (4)

This equation yields a demand function for each type of a commodity. Hence, we get the reduced form of demand function for utilization of immunization services as follows:

$V=f(P_c, P_n, P_v, INC,)$é é é é é é é é é é é é é é ..é é é é é é é é é .(5)

Where the Demand for vaccines or immunization services utilized by the children under one year and P_c,P_{Cs},P_n,INC, and M are as indicated by equation (2) above. We observed that utilization of immunization vaccines services determined by price of other goods and services as indicated, income(INC) and immunization services (V), including socio-economic and demographic characteristics of a mother (M) maternal characteristics.

3.2 Econometric model

We employ a Binary Probit Regression Model (BPRM) where we shall estimate the probability of utilizing immunization services. This is because the dependent variable is a dummy. We made an assumption that the variables or immunization followed normal distribution therefore leading to the utilization of the probit model in analysing the various explanatory variables as indicated in equation (6) below.

Let us assume that there exists a direct linear relationship between the unobservable dependent variable and explanatory variables ( ) as described in the equation below;

 = + and = 1 if > ; 0 if ≤ (6)

Where is unobserved latent dependent variable which is continuous

 is a vector of independent variables

 are the coefficients to be estimated in the model

 is the stochastic error term

 is the threshold point of which if it exceeds, the mother utilizes immunization services

 is the probability of utilizing immunization services as describe earlier.

.In our probit model, we assume that the errors follow a standard normal distribution with a probability distribution function. Based on this assumption, we can define

the probit model by transforming into a probability. The probit model is given by the cumulative distribution function as illustrated in equation (7) below;

$$= 1 = \Phi = \int \frac{}{\sqrt{}} \, \quad (7)$$

And the log likelihood function is:

$$= (/,) = \prod \log\Phi + 1 - \{1 - \Phi\} \quad (8)$$

To interpret the probit model, estimation of marginal effects is necessary which reflect the change in the probability of observing or experiencing an event in this case utilizing immunization services, given a unit change in any independent variable. Marginal effects can be estimated either as the average of the individual marginal effects or for the average person in the sample. Either wayproducesmatching results but in the later method, the average person may not be in the sample.

This study analysed the following variables that is the age of the mother, maternal education, and size of the household, birth order, literacy, marital status and access of health information through mass media.

The Multiple Regression Model is of the form:

$$\mathbf{Y=\alpha_0+ \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6+ \beta_7X_7 +\varepsilon} \quad \mathbf{(9)}$$

Where Y = whether child ever received vaccination or not

X_1 =Motherôs age

X_2 = Education Levels

X_3= Place of Delivery

X_4= Marital Status

X_5=Literacy Level

X_6= Birth Order

X_7= Household Size

= error term

3.3: Variables, Measurement and Expected Sign

Table 3.1: Variables, Measurement and expected sign

Variables	**Measurement of the variables**	**Expected sign**
Dependent Variable		
Demand for Immunization services (any vaccinations in last 2 years part of campaign)	Had immunization services=1 if child has ever received any immunization and 0 never had received immunization services	
Explanatory variables		
Age	Age of the mother in years	Negative
Education levels	Education=1 if no education Education=2 if primary level Education=3 if secondary level Education= 4 if tertiary level	Positive
Place of delivery	Place of delivery= if hospital delivery, 0 if home delivery	Positive
Marital Status	Marital status= 1 if Married and 0 if otherwise	Positive
Household size	The number of household members under one household head	Negative
Literacy	Literacy levels= 1 if can read, 0 if cannot read	Positive
Birth Order	Number of children born by a single mother	Positive

3.5 Data Source

The Kenya Demographic and Health Survey (KDHS) 2008-2009 was used in studying the demand for fullimmunization services in Kenya. This survey is usually carried out after every five years. It is meant to deliver data to monitoring health and the population situation in Kenya.It used a representative sample of 8,444 women aged between15-49 years. Apart from the mode of deliveries (normal and caesarean section), the survey obtained comprehensive information on fertility levels, marriages, place of delivery, household size, maternal characteristics, childhood and maternal mortality, maternal and child health. The survey further collected information on full immunization coverage for children less than one year.

The data has a component of both rural and urban residents. Out of the 8,444 women respondents, 6,296 came from rural areas while 2,148 came from urban areas. One of the inadequacies of this survey is that it doesnôt measure such variable like distance to health facilities which is expected to have a significant impact on consumption of full immunization services.

CHAPTER FOUR: RESULTS

4.1 Introduction

This chapter presents the study results and widely investigates factors that influence demand for full immunization services in Kenya. Through literature review, a good number of study variables have been identified to provide information on what causes low utilization of immunization services across Kenya. We examined the core objective of the study and explored their relationship through a probit model. In presentation of the results, we made use of used both descriptive statistics and econometric estimation of the model and computation of the average marginal effects for interpretation.

4.2 Descriptive statistics

Total children who were vaccinated were 82.73% and the average age of the mothers was 28 years with the youngest being 15 years and the oldest being 49 years (see Table 4.2). Considering the pattern of consumption of immunization services across regions in Kenya, Table 4.1 show that Nyanza, rift valley, North Eastern, Coast and Western regions had high immunization coverage rates compared to other regions. Similarly, a comparison across the same regions, it was found that north eastern, Nyanza, Rift valley, Western and Coast regions still remained with the highest percentage of children who were not immunized.

Table 4.1: Pattern of immunization coverage across regions

Region	Ever received vaccination (% of the total)	Never received vaccination(% of the total)
Nairobi	5.7%	1.6%
Central	5.8%	7.3%
Coast	12%	10.5%
Eastern	8.1%	7.8%
Nyanze	19%	18.9%
Rift valley	17.7%	14.2%
Western	11.5%	11.3%
N. Eastern	14.7%	29.3%

Source: Authorôs calculation based on KDHS 2008

Table 4.2 shows that most mothers had primary education while 79.6% were found to be married. It was revealed that 68.6%b of the mothers were literate.

Table 4.2: Summary statistics

Variable	Observation	Mean	Std. Dev.	Min	Max
Vaccinated	2154	0.8272981	0.3780772	0	1
Age of the mother	6079	28.23557	6.664807	15	49
Education levels	6079	1.061523	0.7697162	0	3
Marital status	6079	0.7956901	0.4032296	0	1
Literacy levels	5210	0.6861804	0.4640886	0	1
Household size	6079	5.908702	2.475558	1	19
Hospital delivery	6074	0.4354626	0.4958583	0	1
Birth Order	6079	3.445139	2.322099	1	13

Source: Authorôs Calculation Based on KDHS 2008

Most children came from household with an average household size of 6 members with the least being single and the largest being 19 members with a variance of approximately two household memberships from the mean. On the place of delivery, it was shown that 43.5% of the children were delivered in the hospital while the rest were delivered at home. This implies that home deliveries (56.5%) were more compared to hospital deliveries.The deviations between the two modes of deliveries were 49.6% of the deliveries. Finally, birth order was assessed as well whereby the highest number of children born by a single mother was 13 and the least was one child. However, there were approximately about two birth orders given the average of three birth orders.

4.3Estimation Results

This section addresses the general and specific objectives, which sought to investigate the factors that determine immunization utilization in Kenya. A multiple regression model was estimated using probit regression model. The independent variables included Age of the mother, Education levels,marital status, Literacy levels,Household size, Hospital delivery and Birth order. The regression was done at 95% confidence level and the results are presented in table 4.3.

Table 4.3: Probit regression results for children who have ever received vaccination

Robust				
INDEPENDENT VARIABLES	**Coefficients**	**Std. Err.**	**z**	**P>z**
Age of the mother	0.0244554	0.0097349	2.51	0.012
Education levels of the mother	0.0043201	0.0764338	0.06	0.955
Marital status	0.0422274	0.0682121	0.62	0.536
Literacy levels	0.3535173	0.1201865	2.94	0.003
House hold size	0.026588	0.0186464	1.43	0.154
Hospital delivery	0.3969529	0.0932731	4.26	0.000
Birth Order	-0.0717265	0.028731	-2.50	0.013
Constant	-0.0251874	0.234446	-0.11	0.914
Probit regression Number of observation = 1650 Wald chi2(8) = 90.42 Prob > chi2 = 0.0000 Pseudo R2 = 0.0628				

Source: Authorôs computation

Table 4.3 show that age of the mother, literacy level, place of delivery and birth order were significant factor whereas, education level of the mother, marital status and household size were insignificant. However, we interpreted significant factors only. The coefficients in Table 4.3 above are interpreted as changes in the probit index which required estimation of the Average marginal effects of the variables. On assessing the overall model fitness, the log likelihood chi square ratio and the p value of 90.42 and 0.0000 respectively show that all variables used in the model were jointly significant in explaining immunization coverage in Kenya. The probability of the child being immunized depends on the marginal effects computed for various independent variables which show the change in the probability. Table 4.4 below indicates the respective Marginal effects of child immunization;

Table 4.4: Average marginal effects of children who were immunized

INDEPENDENT VARIABLES	ME	Std. Err.	Z	P>z
Age of the mother	0.0058	0.0023	2.52	0.012
Education levels of the mother	0.0010	0.0182	0.06	0.955
Marital status	0.0100	0.0162	0.62	0.536
Literacy levels	0.0839	0.0283	2.96	0.003
House hold size	0.0063	0.0044	1.43	0.153
Hospital delivery	0.0943	0.0220	4.29	0.000
Birth Order	-0.0170	0.0068	-2.50	0.012

Source: Authorôs computation

4.5 Interpretations and Discussion of the results for child immunization

The average marginal results (Table 4.4) show a positive and significant relationship between age of the mother and child immunization. This implies that the probability of a child being immunized increases with increase in motherôs age. The results reveal that an additional year, leads to an increase in the probability of child being vaccinated by 0.58% holding other factors constant. These findings contradicts with the study results obtained by Kamau and Esami (2001) who found out that in Kenya young age of mothers was associated with high immunization coverage as compared with the older mothers.

The study showed that motherôs literacy levels contribute positively and significantly to child immunization. For literate mothers, the probability of a child being immunized increases by 8.39% holding other factors constant. This implies that literate mothers can be able to read and understand the importance of vaccination. This study finding is in line with studies conducted by Kidane and Tekie, (2000) in an effort to explore factors influencing urban and rural immunization coverage in 220 households with children 12-13 months of age in Ethiopia. The study found out that high immunization coverage for various vaccines in these areas were associated with high literacy levels of mothers.

Place of delivery was found to have a significant and positive relationship with child immunization. The probability of a child being vaccinatedwas likely to be significantly higher by 9.4% for children delivered in hospital compared to children delivered at home holding

other factors constant. This study concurred with the study done by Odiit and Amuge (2003) who carried out comparison of vaccination status of children born in health units and children less than five years in Jinja, Uganda. Their study showed that a child born in a health unit was more likely to be up to-date with their vaccination compared to a child born at home. Being born at home was found to be a risk factor for incomplete or non- vaccination. Continuation of vaccination was similarly observed to be poor in children born at home and those born in health centres. Similarly, Nath *et al*. (2007) found that found that home delivery limits access to immunization centres.

Finally, the average marginal effect of -0.0170 implies that as the number of children born by a same mother increases, the probability of child being immunized reduces by 1.7% holding other factors constant. This implies that an additional child declines the likelihood of child immunization significantly. This may be attributed to the fact that as the number of children increases, the cost of upkeep also increases and the opportunity cost of leaving work to go for immunization increases. This is in line with the findings of Nath *et al*. (2007) who explored the determinants of immunization coverage in India. They found out that unimmunized status of the children were associated with higher birth orders which are associated with low child care with a mentality that high numbers act as insurance for those that may die.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND POLICY RECOMMENDATIONS

5.1 Introduction

This chapter presents summaries of the study findingsrelating to the objectives and literature. Substantive conclusions based on the revealed determinants of the immunization coverage in Kenya from which key recommendations are made. Suggestions for further areas of study are given.

5.2 Summary and Conclusions of the study findings

The study has reviewed major theoretical and empirical literatures to establish the key factors behind utilization of immunization services in Kenya. The study has made use of Kenya Demographic and Household survey (KDHS, 2008) which contains factors associated with utilization immunization services. Probit regression model has been used in estimation. The variables used include the age of the mother, education levels of the mother, marital status, literacy levels of the mother, place of delivery, household size and birth order. The study results show that at 95% confidence interval, the age of the mother, literacy levels, place of delivery, and birth order are significant factors that determine utilization of immunization of services in Kenya.Education levels, marital status and household size were found not to be statistically significant.The study findings further indicate that the age of the mother, literacy levels andplace of delivery were positively related to the utilization of immunization services in Kenya while birth order was found to be negatively related to child immunization.

In conclusion, the study indicates that in as much as age of the mother increases immunization coverage, its probability is low compared to literacy levels and place of delivery. Birth order was found to reduce the probability of child immunization which implies that it is the key factor requiring much attention.

5.3 Policy recommendations

Based on the analysed factors affecting immunization in Kenya, the study suggests that there is a need to create more awareness on the essence of both young and old mothers who have children who have not been immunized to go for immunization. This could be done by

introducing better incentives to mothers to encourage them to go for immunization. Also, through the relevant ministry (Ministry of Health) we recommend widening the campaign on family planning through educating women who are at the reproductive age the importance of having the manageable number of children who can get enough support.

5.4 Areas for further studies

In this study, we considered factors which extensively determine immunization coverage in Kenya. From the literature we noted that among the possible explanation of the failure to improve access to the immunization system may be related to the socio-cultural acceptability of some of the new vaccines. Therefore,similar studies are suggested focussing on the factors determining uptake of new vaccines in Kenya.

Similarly, Baluka (2003) assess the impact of decentralization of health services Uganda decentralization of services as reported by community members was instrumental in improving accessibility to health services. The study concluded that the existence of decentralized health services could be important in explaining factors associated with immunization coverage. Therefore, a similar study is recommended in Kenya with the devolved system of governance and health services in place.

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