

Impact of birth interval and wealth index on infant mortality in Nigeria

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Abstract

Backgrounds: Worldwide four million infants die in the first 28 days of life each year. Three quarters of these neonatal deaths occur in the first week of life and more than one quarter occurs in the first 24 hours after birth. It is well known that the Millennium Development Goal for child survival cannot be met without substantial reduction in the infant mortality. Due to this, most of the study were carried out on infant mortality and its determinant but no one study demonstrate that the effect of birth interval and wealth index on infant mortality in Nigeria. Hence, this study tried to understand the effect of birth interval and wealth index on infant mortality in country of Nigeria.

Materials and Methods: This study used Nigerian Demographic and Health Survey (NDHS-2013) data, which were analyzed by Bi-variate, multivariate: Cox Proportional Hazard Technique.

Result: Infant deaths decrease as wealth increases. The incidences of infant deaths were more in catholic, Christian, and Islam than other religion. Level of education of women, age of mother at first birth shown inverse relationship with infant mortality. A negative association were exist between the size of child at the time of birth and infant deaths. Infant mortality was found more in rural area as compared to urban. It was high among male child as compare to female. Infant deaths were found more among women had no institutional delivery than had institutional delivery in the country.

Conclusion: Negative correlation were observed in between birth interval and infant mortality. Further, this mortality was also shown negative correlation with wealth index.

Keywords: Infant mortality, wealth index, birth interval, Nigeria

Introduction:

It is well known that the Millennium Development Goal for child survival cannot be met without substantial reduction in the infant mortality (UNICEF, 2009). Infant and child mortality rates are important indicators of the health status of a country. In other word, Infant and child mortality rates are widely accepted index of socio-economic development and a reflection of a country's health care system and quality of life. The decline of infant mortality in Nigeria over the past few years has been inadequate (Aigbe & Zannu, 2012). More specifically, with the decrease in infant mortality, there has been increased concentration of deaths in the first week of life. It is generally argued that two-third of all deaths in the first five years of life in the developing countries are infant deaths and two-third of the infant deaths are confined to the neonatal period (Cleland and Sathar, 1984). In Nigeria, newborn death rate especially in neonatal mortality period is almost 528 per day. This mortality is one of the highest in the world. More than a quarter of the estimate one million children who die under the age of five years annually in Nigeria. it occurs during the first 28 days of life especially in neonatal period. One important thing in this mortality is that about nine out of ten newborn deaths are preventable. In Nigeria about 5.3 million children are born yearly, which is about 11,000 every day; 1 million of these children die before the age of five year (http://www.unicef.org/nigeria/ngpublicationsadvocacy_brochure.pdf).

Globally, around four million infants die every year within the first 28 days of life. Three quarters of these deaths occur in the first week of life while more than one quarter occurs in the first 24 hours of life. Although, there has been a considerable decline in under-five and infant mortality rates throughout the world in the past two decades, yet infant mortality remains largely unchanged, especially in the developing countries (UNICEF, 2009).

An important determinant of the risk of death in the first five years of life that has been repeatedly highlighted in many studies is the birth interval (Winikoff, 1983). It has been conclusively argued that newborns having a short birth interval have higher probability of dying in the first five years of life than newborns having a birth interval of at least three years (Gubhaju, 1986). In any analysis of mortality in children, it is therefore necessary to distinguish conceptually and analytically between short and long birth intervals since they imply separate causal mechanisms for analyzing death (Koenig et al, 1990) that could be biological or behavioral.

It is in the above context that the present study examines the effect of the length of the birth interval & wealth index on the risk of deaths during infant period in Nigeria. Nigeria is one of those countries in Sub-Saharan Africa countries where the risk of death during the first five years of life is high. Another hand, out of these deaths, the probability of death during the first years of life is highest in Nigeria.

Need of the study:

It has been evident from many studies that the IMR has a direct relation with the health of the mother. The woman with good health as defined by WHO, is more likely to save her baby from the clutches of death. The child mortality is largely concentrated from the period of child birth up to 1 year which is known as the infant death. Worldwide four million infants die in the first 28 days of life each year, which is known as neonatal period. Most of the study has done already on infant mortality but no one study shows that the effect of birth interval & wealth index on infant mortality in Nigeria. So, Current study is about access to understand the effect of birth interval and wealth index on infant mortality in Nigeria by different background characteristics.

Materials and Methods:

This study used demographic health survey (DHS) data of Nigeria which was conducted in 2013. Survey provides kids file which covers important aspects of neonatal and post neonatal care and Infant death, birth spacing, family planning etc. The specific objective of the study is: To assess the risk of infant mortality associated with birth interval and wealth index by different selected background characteristics.

Preliminary results:

- An inverse relationship is found between birth interval and infant mortality i.e. if birth interval increases then infant deaths decreases. Also same relationship exists between wealth index and Infant mortality i.e. infant deaths decreases as wealth index increases.
- Study observed that the level of education of women and birth interval have also inverse relationship with the infant mortality.
- Infant mortality almost same in working and not working women for both the groups of birth interval and wealth index.

- An adverse relation is observed among wealth index, as the economic condition of the households increase the incidence of infant mortality decreases.
- The incidences of infant deaths are more in catholic, Christian and Islam than the women from other religion, either woman's have less than two year, two to three years or more than three year birth interval. Whereas infant deaths are high in poor and middle households of catholic, Christian and Islam as compare to richer households.
- Study has been observed an inverse association between age of mother at first birth and infant deaths i.e. the age of mother at first birth increase the incidence of infant deaths decrease.
- A negative association exists between the size of child at the time of birth and infant deaths have observed in both the group of birth interval and wealth index in Nigeria.
- There is adverse association between the education and incidence of infant deaths as well as birth interval and incidence of infant deaths in Nigeria i.e. increase in the educational level and birth interval has reduced the incidence of infant deaths in the Nigeria.
- There is a negative association between size of child at birth and incidence of infant deaths observed in the country of Nigeria. As the size of the child increase the incidence of infant deaths declines.
- Infant mortality is more in rural area as comparison to urban for both the group of birth interval and wealth index.
- Infant mortality is high among male child as compare to female child for both the group of birth interval and wealth index.
- Women who have taken no antenatal care have more infant deaths as comparison to the women who have taken at least one antenatal care in both the group of birth interval and wealth index.
- Infant deaths are more in women those who have taken no institutional delivery than those who have taken institutional delivery in both the group of birth interval and wealth index.

Table1: Percentage distribution of infant mortality in different categories of **birth interval** by selected background characteristics in Nigeria, 2013 (N=1657)

Background Characteristics	Birth Interval (%)		
	<2 Years	2-3 Years	>3 Years
Respondent Education			
Not educated	11.7	6.7	4.5
Educated	7.4	5.3	4.6
Respondent Occupation			
Not working	9.1	6.2	4.0
Working	9.9	6.0	4.8
Mother Age at First Birth			
<20 Year	10.6	6.1	4.5
>20Year	7.5	5.9	4.7
Institutional Delivery			
No Institutional Delivery	10.0	6.4	4.4
Institutional Delivery	9.0	5.3	4.9
Antenatal Care			
No ANC	7.3	5.6	3.5
At least one	4.7	3.6	3.6
Birth Size			
Small	13.8	9.1	6.8
Average or Larger	8.0	5.3	4.0
Religion			
Islam	10.6	6.6	4.3
Others	8.1	5.1	5.0
Residence			
Urban	7.1	4.7	4.0
Rural	10.9	6.7	4.9
Sanitation			
No facility	10.1	6.5	4.5
Facility	9.5	5.9	4.5
Child Sex			
Male	10.3	6.5	5.2
Female	8.9	5.6	4.0
Wealth Index			
Poor	11.7	7.3	4.9
Middle	9.3	4.6	4.0
Rich	6.6	4.8	4.5

Note: For ANC, Information has taken only for first birth. In case of **birth interval**, First birth has excluded

Table2: Percentage distribution of infant mortality in different categories of **wealth index** by selected background characteristics in Nigeria, 2013 (N=2148)

Background Characteristics	Wealth Index (%)		
	Poor	Middle	Rich
Respondent Education			
Not Educated	8.3	5.6	6.4
Educated	7.7	6.4	5.0
Respondent Occupation			
Not working	8.0	6.0	5.5
Working	8.3	6.0	5.1
Mother Age at First Birth			
<20 Year	8.2	5.9	5.3
>20Year	8.3	6.3	5.1
Institutional Delivery			
No Institutional Delivery	7.8	4.9	6.0
Institutional Delivery	10.7	7.8	4.9
Antenatal Care			
No ANC	5.4	4.5	6.6
At least one	5.5	4.0	3.4
Birth Size			
Small	10.0	9.3	10.0
Average or Larger	7.4	5.2	4.2
Religion			
Islam	8.3	5.5	4.9
Others	7.7	6.6	5.4
Residence			
Urban	8.6	5.0	4.9
Rural	8.1	6.5	6.2
Sanitation			
No Facility	7.6	5.9	6.5
Facility	8.5	6.0	5.0
Child Sex			
Male	8.8	6.1	5.8
Female	7.5	5.9	4.6
Birth Interval			
<2 Year	11.7	9.3	6.6
2-3 Year	7.3	4.6	4.8
>3 Year	4.9	4.0	4.5

Note: For ANC, information has been taken for only first birth

Table 3: Result of Cox regression analysis for the effects of birth interval and wealth index on infant mortality in Nigeria, 2013

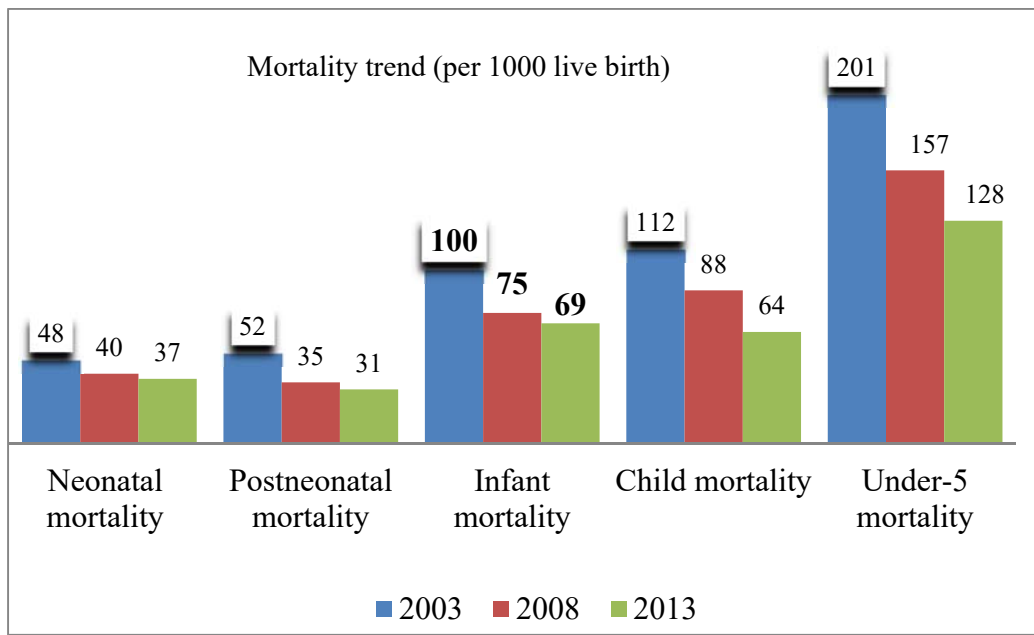
Covariates	95% C.I. for Exp(B)		
	Model 1	Model 2	Model 3
Birth Interval			
< 2 Year®	1.000		1.000
2-3 Year	0.882(0.729-1.067)		0.882(0.730-1.067)
> 3 Year	0.755***(0.621-0.918)		0.762***(0.627-0.926)
Wealth Index			
Poor®		1.000	1.000
Middle		0.786**(0.646-0.958)	0.756**(0.603-0.949)
Rich		0.651***(0.513-0.825)	0.728**(0.556-0.953)

® reference, **significant at 5 %, ***significant at 1 %,

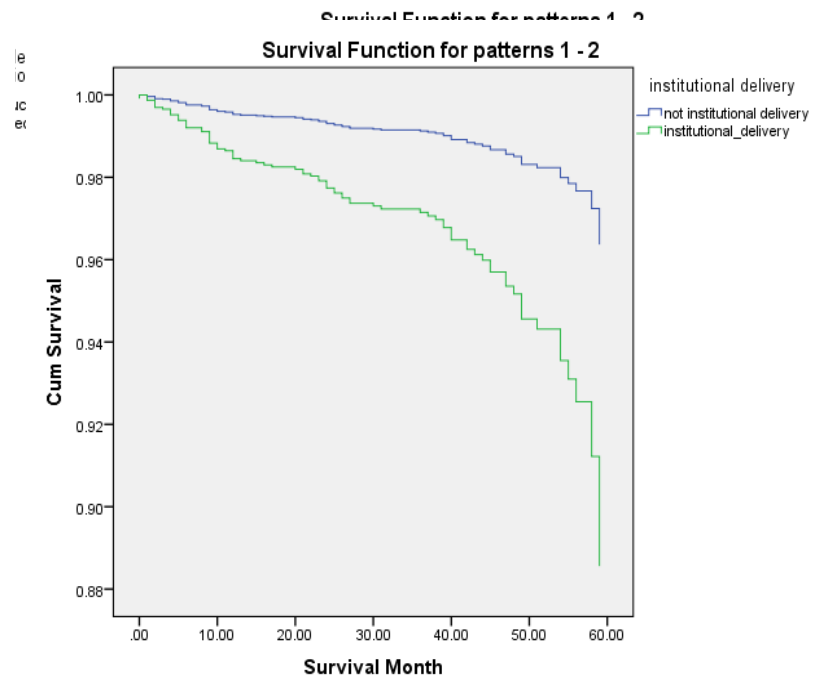
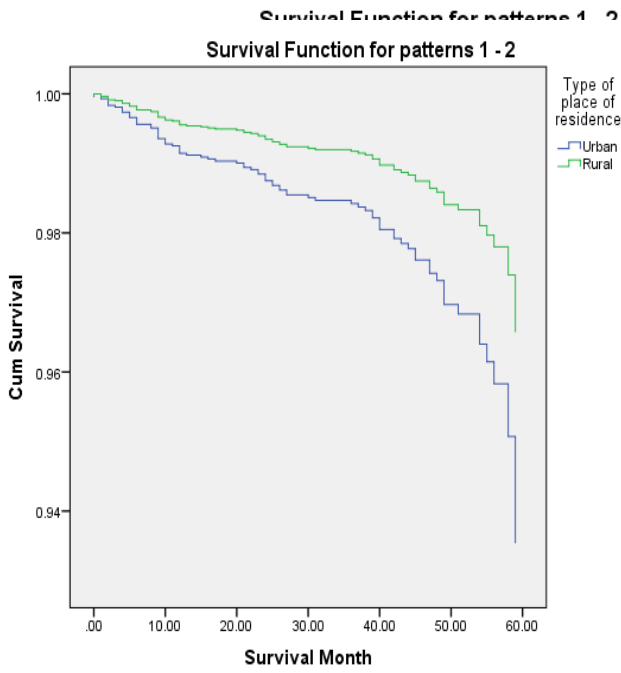
Model 1-Unadjusted for Wealth Index, **Model 2** - Unadjusted for Birth Interval

Other control variable: Respondent education, Respondent occupation, Mother age at first birth, Institutional delivery, ANC, Birth Size, Religion, Place of residence, Sanitation and Sex of child.

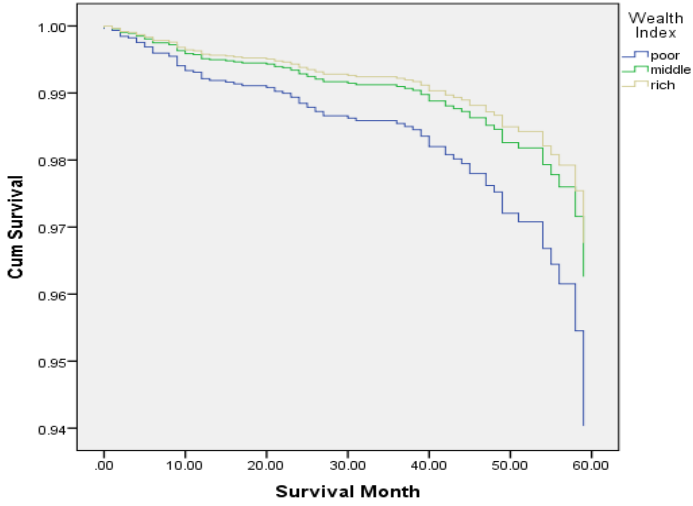
Figure1: Mortality trend in Nigeria, 2013



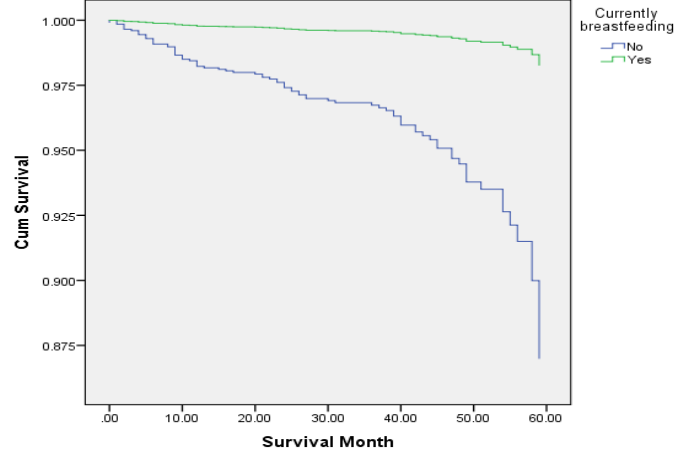
Result of Cox proportional hazard model (Survival curve for Infant Mortality):



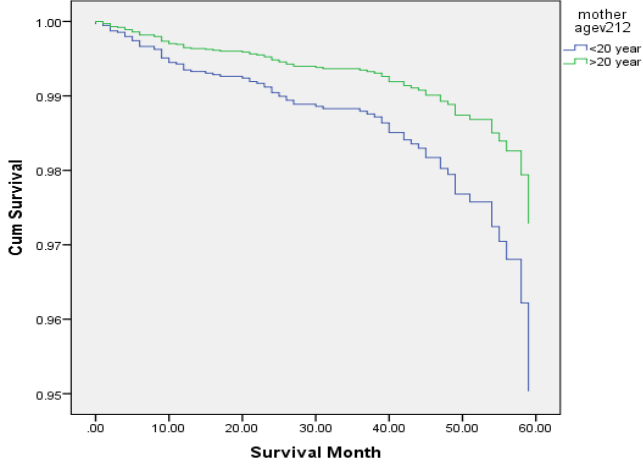
Survival Function for patterns 1 - 3



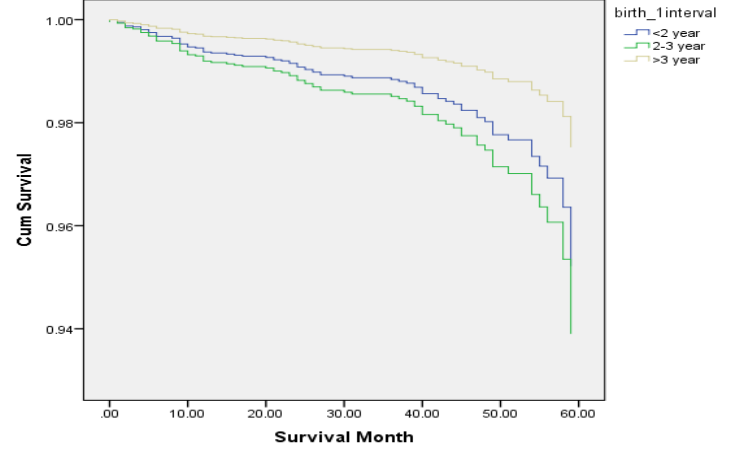
Survival Function for patterns 1 - 2



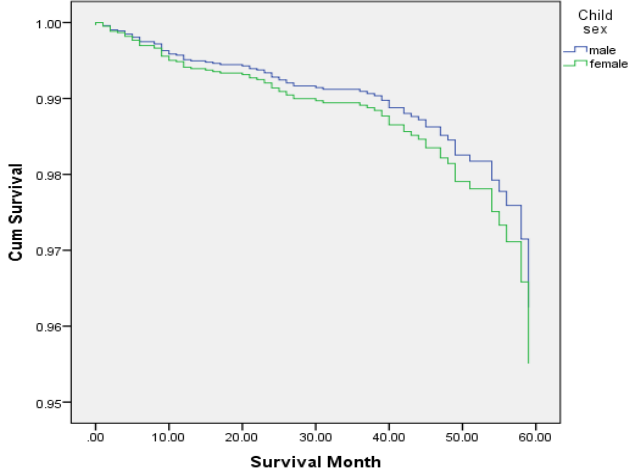
Survival Function for patterns 1 - 2



Survival Function for patterns 1 - 3



Survival Function for patterns 1 - 2



Survival Function for patterns 1 - 2

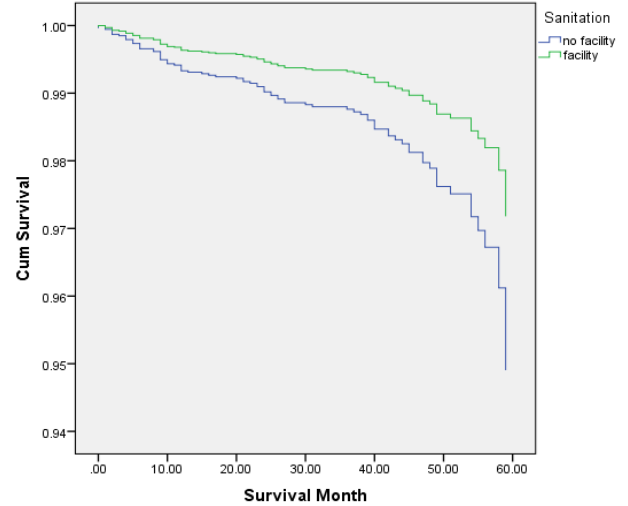


Figure: Survival function for infant mortality with wealth index

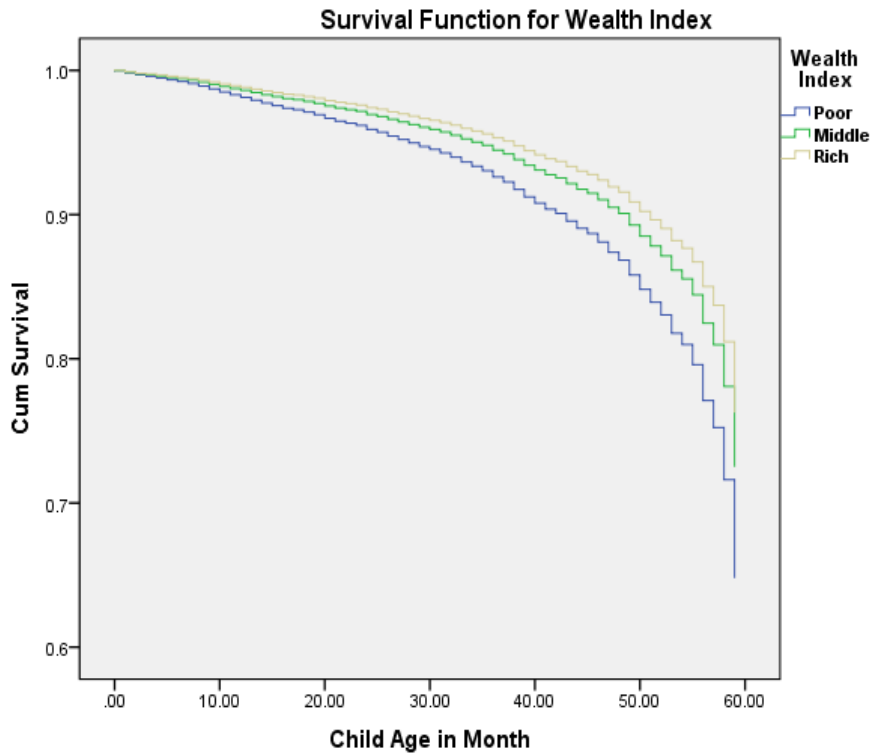


Figure: Survival function for infant mortality with birth Interval

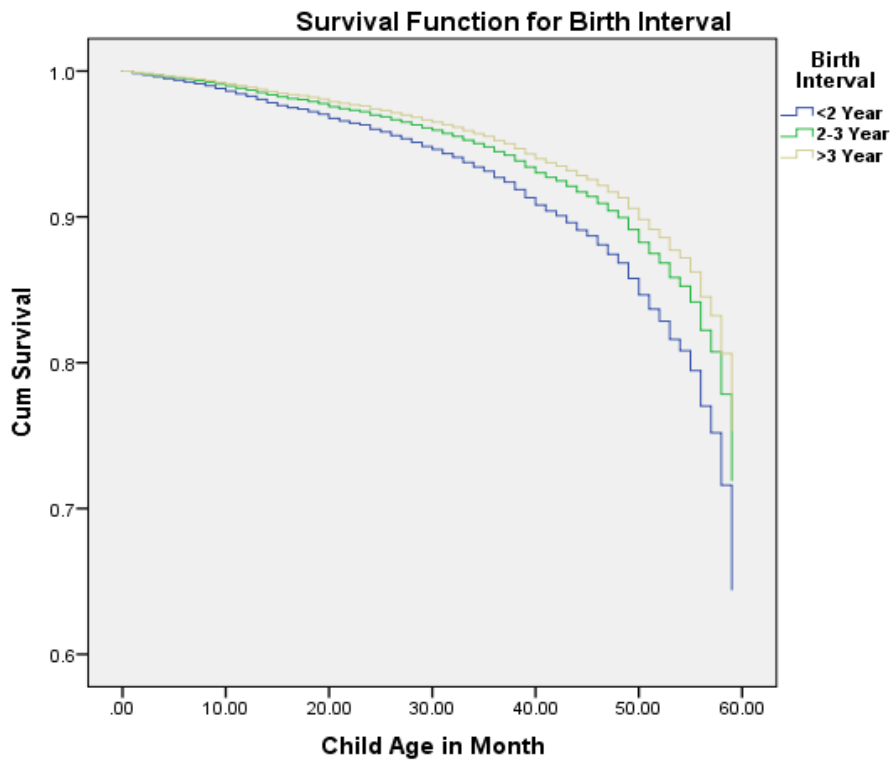


Figure 1: Effect of birth interval on infant mortality

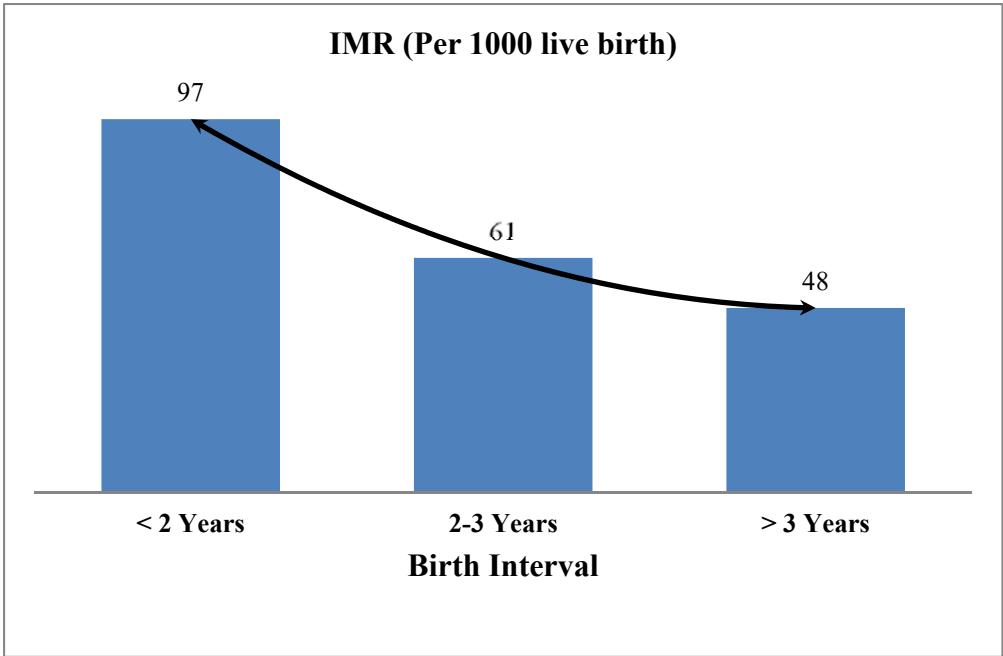
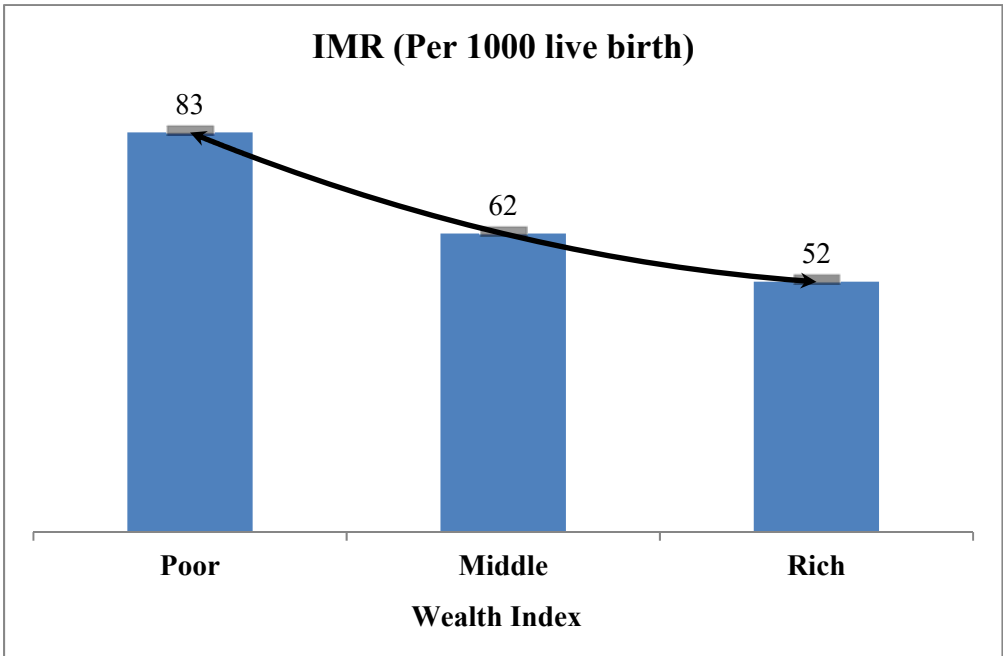


Figure 1: Effect of wealth index on infant mortality



Reference:

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