Female labor force participation, paid maternity, caste system and under-5 mortality in Nepal

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Abstract

Purpose – The under-5 mortality rate in Nepal remains high in comparison to neighboring countries and developed nations. The result of this problem on Nepal's social, economic, political and cultural development makes it an urgent priority requiring the Nepalese Government to address this issue. The purpose of this paper is to find out if Nepal's high female labor force participation (FLFP), the caste system and no paid maternity leave are contributing factors to under-5 deaths in Nepal.

Design/methodology/approach – Data for this study were taken from Nepal's cross-sectional demographic health survey 2016–2017. The study sample included 5,060 children born to 3,074 mothers in the five years preceding the survey. Data were collected by interviewing respondents via a structured questionnaire selected through stratified random sampling methods.

Findings – The study found that the hazard ratio for FLFP, the caste of the mother and paid maternity were 1.145, 1.485 and 0.556, respectively, with a p-value < 0.001. Therefore, the risk of death in children under-5 years for a working mother, a Terai caste mother and a mother who did not get paid maternity was 14, 45 and 48 percent, respectively, higher than for non-working mothers, mothers from other castes and mothers who got paid maternity.

Originality/value – This research demonstrated that FLFP, the caste of the mother and paid maternity leave are important factors for determining the risk of death in children under the age of 5.

Keywords Caste, Female labour force participation, Paid maternity, Under-5 mortality, Nepal

Paper type Research paper

Introduction

Child mortality rates are given prioritized attention in both developed and developing countries because of their dynamic relations to the social, economic, political and cultural circumstances of the country and relationship with the changing demographics of the world[1, 2]. Changing demography rates are well explained by the declining total fertility rate throughout the world. Most developed countries have already reached below replacement-level fertility of 2.1 and developing countries are on this track with a higher death rate compared to birth rates, if the effects of population momentum are not taken into consideration[3]. Given this scenario, it is important for both developed and developing nations to preserve all lives.

Nepal is a developing nation with a high child mortality rate. Looking at the trend in Nepal, the rate of under-5 deaths was 118 deaths per 1,000 live births in 1995 which reduced to 91 and 61 in 2000 and 2005, respectively, but only reduced to 54 deaths per 1,000 live births in 2010[4]. This under-5 mortality rate in Nepal is higher than its neighbors in the South Asian Association for Regional Cooperation countries such as Sri Lanka and

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the Maldives. Sri Lanka's under-5 mortality rate was 11 per 1,000 live births and the Maldives recorded 13 per 1,000 live births in 2011. The under-5 mortality rate in Nepal is significantly higher than compared to developed countries like the USA, Australia, Canada and Japan which all have less than seven recorded child mortalities per 1,000 live births[5]. The child mortality rate in Nepal not only differs among its neighbors and developed countries but also differs based on socioeconomic characteristics such as place of residence, education, wealth status, place of delivery and disparities in health care delivery systems. Under-5 death rates are higher among the poor, uneducated and rural people whose children are generally born at home[6, 7].

The major direct causes of childhood death in Nepal are mainly due to unsafe drinking water, lack of access to sanitation, lack of exclusive breast feeding and low birth weight. More than 80 percent of deaths by diarrhea are due to a lack of clean water and sanitation and children who are denied exclusive breast feeding making them five times more likely to die compared to children who are breastfed[8]. Birth weight is another important factor affecting neonatal, infant and childhood mortality and morbidity. Furthermore, low birth weight babies are more prone to infection, developmental delay, poor growth, impaired cognitive functions, chronic disease and mental disabilities later in life[9]. According to the demographic health survey of Nepal in 2011, 12 percent of children born in Nepal were underweight, and among them, 4 percent were born with very low birth weights. Other causes of death of children under-5 years in Nepal include infectious diseases such as malaria, pneumonia, measles and mumps. Beyond infectious diseases, other health-related behaviors and factors such as birth spacing, malnutrition and lack of vitamin supplements also kill hundreds of children every year in Nepal.

The above findings show that many social economic variables and their associations with child mortality were already established in Nepal. These established associations are similar throughout the world; however, Nepal has some different and unique traditional circumstances and characteristics such as higher rates of female labor force participation (FLFP), a caste system and rare or no paid maternity leave which may have impacted on the nation's increased rates of child mortality. However, the direct impact of these reasons for child mortality has not been previously studied or proved. The extent of information available is inconclusive because previous studies have not solely focused on finding an association between FLFP and mortality, but instead, results are explained as a byproduct of other studies that have tried to see determinants of child mortality[10].

Females make up the main labor supply in the informal agricultural sectors and formal sectors in Nepal. According to the Nepal Labor Force Survey 2013/2014, 80.1 percent of women participate in the nation's labor force. This number is higher in rural areas where 86 percent of women participate in the labor force. The FLFP rate in Nepal is much higher than other South Asian countries; other countries in South Asia have a 30.5 percent FLFP which is much lower than the global average of 50.3. Therefore, Nepal is an outlier for FLFP in South Asia[11, 12]. This high FLFP rate in Nepal may be due to social norms and cultural practices where women are responsible for taking care of livestock and are also required to work in the agricultural sector due to the high international migration of working age men[13].

Looking at the Nepalese social context, Nepal practice significant social inequalities based on the caste system where people are divided into an upper caste and a lower caste known as Dalit. In total, 26 castes in Nepal are categorized as Dalit that includes 7 Hill Dalit castes and 19 Tarai/Madhesi Dalit castes[14]. Among the Dalit, the Terai Dalits are the most disadvantaged as they are highly discriminated against in terms of their work. Higher castes are assigned higher level work whilst lower level jobs are assigned to the lower castes. The lower caste Nepalese work mainly in the agricultural sectors such as ploughing, weeding, carrying fertilizers and as semi-bonded laborers such as goldsmiths, shoe makers

and tailoring for survival[15]. They are not allowed to run their own business such as tea shops, hotels or sell milk products or any work related to food consumption as upper caste people do not eat food touched by them, including water[16]. Women who work in informal work sectors do not get any paid maternity whilst those who work in higher level jobs only get greatly reduced paid maternity leave (52 days), which is the second lowest in world. In this context, this study aims to find out the impact of FLFP, the caste system and paid maternity on under-5 mortality rates in Nepal. Results from the study will help reduce avoidable under-5 mortality rates by generating new knowledge on its social causes. These results can be recommended to the government and all stakeholders as a means of scientifically lowering child mortality rates in Nepal.

Data and methods

Source of data and sample size

Data for this study were taken from reliable data collected by the Nepal demographic health survey (NDHS) 2016–2017 through a cross-sectional survey. Data collection took place between June 19, 2016 and January 2017. After weighing the data, the final sample size was 5,060 and weights were applied to reduce the bias of sample distribution of the survey data.

Sampling procedure

Data were collected by interviewing respondents via a structured questionnaire selected through stratified random sampling methods. From the outset, seven provinces of Nepal were considered as seven strata and those seven provinces were divided into rural and urban areas. These rural and urban areas were divided into wards which are the smallest geographical units of the country. One ward in each rural area has an average of 104 households. The households for the purpose of this survey were chosen from these wards as the primary sampling unit. On the other hand, wards from urban areas have 800 households, on average, which makes the ward very large for a primary sampling unit. Therefore, in the urban areas, a three-stage sample design was developed. From the 58 old municipalities, the Central Bureau of Statistics frame of numeration areas (EAs) for each ward was selected as the primary sampling unit and samples were chosen from here. For the new 159 municipalities, old wards which were small in size were selected as the primary sampling unit and data samples were chosen from them.

Study population

All the children born in the last five years from the day of interview were included in the study. The study also included individual and household characteristics of all the mothers who had given birth to children in the last five years. Children who were born five years preceding the survey but who did not have a mother were excluded from the study.

Model specification

The under-5 mortality rates were the dependent variables in the study. The under-5 mortality is defined as the death of a child in the first four years of life (0–59 months) and was collected from data during the period of five years preceding the survey. Because the survey includes information of five years preceding the survey's commencement, it is likely that there would be some recall bias and wrong reporting which is a limitation of this study. Dependent variables were categorized as dummy variables (1 = death of child; 0 = survival of the child). Independent variables of the study included FLFP, the caste of the mother and paid maternity. FLFP is defined as women aged between 15 and 49 who are mothers and have been employed at any time during the survey in the following mentioned jobs; professional/technical/managerial, clerical sales and services, skilled manual, unskilled

manual, agriculture sectors, self-employed and did not work. In this study, FLFP rates were categorized as dummy variables. The woman who did not work were categorized as 0 and all other mothers working in different sectors were categorized as 1. The caste of the mother was defined as the caste of the family who participated in the study. All mothers from the Terai caste were recoded as 1 and all other mothers except Terai caste mothers were recoded as 0. Sub groupings under the Terai caste included Terai Dalit, Terai Janajati, Terai Brahamin/Chhetri whilst the other Terai castes included all others castes except for the Terai caste which are Hill Brahamin/Chhetri, Hill Janajati, Hill Dalit and Muslims. Paid maternity was defined based on the mother's occupation. All mothers who work in the government sector and who were working in skilled manual jobs were considered as mothers getting paid maternity and were recoded as 1. All other mothers who did not work were unskilled manual workers, or employed in small businesses were not considered as getting paid maternity and were recoded as 0. Independent variables were chosen based on gender stratification perspective (GSP), feminist perspectives and Eagly's social role theory. The GSP theory explains that within societies which have a higher social status, autonomy and empowerment among woman, the child mortality rate was lowered[17]. Furthermore, according to feminist perspectives, gender is central to the analysis of the family and male dominance in society and within the family unit is oppressive to woman resulting in inequality of power. This leads to domestic violence and heavy and tremendous amounts of work for the woman in the family, making it harder for her to take care of her own and her children's health[18]. At the same time, Eagly's social role theory suggests that the sexual division of labor in society produces different gender roles and work[19].

The control variables included in this study were maternal characteristics and child characteristics. Maternal characteristics included: number of births by mother, categorized as 0 = giving birth for the first time, 1 = having more than 1 birth, age of mother categorized as 1 = ages other than 45–49 years, 0 = age 45–49 years. Mothers aged above 45 years were categorized differently because they had a higher risk of morbidities and life style-related diseases such as diabetes, hyper tension and diseases of genetic origin, multiple pregnancies and miscarriages. The education of the mother was categorized as 0 = no education, 1 = educated while wealth quantiles were categorized as 0 = other wealth quintiles, 1 = rich wealth quintiles. The wealth quintile was calculated based on "Extraction Method: Principal Component Analysis" based on the availability and source of drinking water, type of toilet facility, type of cooking fuel, assets present on the house, bank account, main floor material, main roof material, main wall material, owns a house, owns land, number of members per sleeping room. For this study, the wealthiest quintile was taken as 1 and all other quintiles as 0. Place of residence was categorized as 0 = living in rural areas and 1 = living in urban areas.

Child characteristics included in the study were sex of child categorized as 0 = female, 1 = male, size at birth was categorized as 0 = born other than average, 1 = born average, breast feeding was categorized as 0 = did get breast feeding, 1 = used to receive breast feeding for a child above two years. For the place of delivery, 0 = home delivery 1 = institutional delivery. These control variables were very cautiously chosen based on proved theory such as the child mortality framework by Mosley[2] and the Flexible Parametric Framework of child mortality[20].

Data processing and analysis

Data processing consisted of two stages including data editing and data appraisal. Data editing and cleaning was carried through CSPro software packages for checking the incompleteness, omission, duplication, inconsistencies and outliers. Data appraisal consisted of estimating of the sampling error which was done through Taylor linearization. Once data were processed, data were analyzed in three stages: univariate analysis, bivariate analysis

and a final conclusion was made through multivariate analyses. Multivariate analyses included the cox hazard analysis. The Cox hazard analysis was preferred as this study is focused on risk to death of under five years old children when concentrating on time in each month. The time variation here is measured by current age of child in months (months since birth for dead children). Importantly, a robust cluster was also applied because one mother can have more than one child in this model.

Results and discussion

The total number of live births and deaths of under-5 children between 2012 and 2016 with corresponding maternal and child characteristics is shown in Table I. There are 5,060 live births of children. Of these, 173 children died before reaching five years of age which is 3.4 percent of the total birth. The table also shows that the FLFP was 62 percent compared to 38 percent of non-working mothers. Death for working mothers was 3.5 percent compared to 3.6 percent for non-working mothers. There were 36 percent of Terai caste mothers and 64 percent were mothers from other castes besides Terai. Percentages of child death for Terai caste mothers was 4.5 percent compared to just 3 percent for other castes mothers. Looking at the paid maternity, very few (only 6.3 percent) of mothers got paid maternity and these mothers had a child death percentage of 1.66 percent compared to 3.5 percent of child deaths for mothers who did not get paid maternity.

The FLFP and under-5 child deaths

Looking at the robust hazard ratio value from Table II, it can be said that an FLFP system has a higher chance of risk of death of under-5 children compared to those mothers who do not work. Numerically, the risk of death of under-5 children for working mothers was 13 percent higher compared to that of non-working mothers. In the Nepali context, this result is due to the time conflict and role conflict of mothers. When a mother goes to work outside home for long periods of time, she will have role conflict in terms of managing her time for caring and rearing of her child and focus on her job. Children are very vulnerable to catch infectious diseases, fall and injury but they may not get access to hospitals on time as his/her mother is at work. This situation is worse in Nepal because most of the health services such as sub health posts, health posts and primary health care services in rural areas open from 9 a.m. to 4 p.m., the same time women have to go to work, therefore there will be an overlap in the ideal time for taking the baby to hospitals and for mothers to go to work. This result is similar to results from a case study from India which found that child mortality is higher among mothers who work[10]. Another study conducted in India from census data also found that FLFP has more deaths among children[21]. A study in Malaysia also found that children born from working women had fewer cases of breast feeding that had an adverse effect on child health. Further, adverse effects on child health were more common in mothers who had to participate in work soon after delivery because of financial reasons[22]. Figure 1 explains the risk of death of children divided by age and the months of the child. According to this figure, it can be seen that the risk of under-5 deaths for working mothers was higher compared to not working mothers until the child reached 24 months old. This result is the opposite after the child is above 24 months. Therefore, 24 months is an important time period that we need to concentrate on and some care of mothers is required during this period. This is the period when children have equal chances of survival or death based on the care they receive. This result may be because children are comparatively independent of mothers after reaching two years of age and are more likely to consume food and gain additional nutrients. Additional food and nutrients are more affordable to working mothers because of money generation from work making them more empowered with higher decision-making powers[23]. Care and support from other family members, specially grandparents and older siblings, become more effective for child above two years of age

Mother and child characteristics	Under-5 children $n = 5{,}060$ Dead	Alive	Total
Number of birth by mother			
First birth	51 (1.7%)	2,979 (98.3%)	3,030 (100%)
More than 1 birth	122 (6%)	1,907 (94%)	2,030 (100%)
Age of mother			
Mothers age 45–49	4 (16.7%)	21 (83.3%)	24 (100%)
Other age group	169 (3.4%)	4,866 (96.6%)	5,036 (100%)
Education of mother			
No education	70 (4%)	1,664 (96%)	1,733 (100%)
Have some education	103 (3.1%)	3,223 (96.9)	3,327 (100%)
Place of residence			
Rural	91 (2.8%)	3,147 (97.2%)	3,238 (100%)
Urban	82 (3%)	2,649 (97%)	2,731 (100%)
Caste of mother			
Terai caste	82 (4.5%)	1,740 (95.5%)	1,822 (100%)
Other caste	91 (3%)	3,147 (97%)	3,238 (100%)
Wealth index			
Other than rich	157 (3.7%)	4,154 (96.3%)	4,312 (100%)
Rich	16 (2.1%)	732 (97.9%)	748 (100%)
Female labor force participation (FLFP)			
Did not work, self-employed	67 (3.2%)	1,995 (96.8%)	2,062 (100%)
Work	106 (3.5%)	2,892 (96.5%)	2,998 (100%)
Place of delivery			
Home delivery	103 (4.4%)	2,225 (95.6)	2,328 (100%)
Institutional delivery	70 (2.6%)	2,662 (97.4%)	2,731 (100%)
Paid maternity			
No paid maternity	168 (3.55)	4,574 (96.5%)	4,742 (100%)
Paid maternity	5 (1.6%)	313 (98.4%)	318 (100%)
Sex of child			
Female	89 (1.9%)	2,324 (98.1%)	2,413 (100%)
Male	84 (3.2%)	2,563 (96.8%)	2,647 (100%)
Size at birth			
Born else than average	85 (5%)	1,612 (95%)	1,697 (100%)
Born average size	89 (2.6%)	3,275 (97.4%)	3,364 (100%)
Breast feeding			
No	88 (7.1%)	1,147 (92.9%)	1,235 (100%)
Yes	85 (2.2%)	3,740 (97.8%)	3,825 (100%)
Total	173	4,887	5,060

Table I. Frequency distribution of maternal and child characteristics for under-5 death in Nepal 2012–2016

who do not depend entirely on their mother's milk. Thus, the government, support agencies and all stakeholders need to provide incentives or income generating ways to mothers who do not go to work.

Caste system and under-5 child death

Looking at the robust hazard ratio value from Table II, it can be said that statistically, the risk of death of under-5 children from Terai castes mothers is 48 percent higher compared to

Variables	Robust hazard ratio	SE	Z	p-value	95% confidence interval	
Number of births by mother	5.842	1.210	8.52	0.000	3.892	8.769
Education of mother	1.35	0.272	1.51	0.130	0.914	2.010
Place of residence	0.804	0.0257	−6.82	0.000	0.755	0.856
Age of mother	2.739	0.796	3.47	0.001	1.549	4.842
Wealth index	0.855	0.0521	−2.56	0.010	0.758	0.963
Female labor force participation (FLFP)	1.145	0.003	50.62	0.000	1.139	1.151
Caste of mother	1.485	0.181	3.23	0.001	1.168	1.887
Paid maternity	0.556	0.128	−2.53	0.011	0.353	0.876
Place of delivery	0.928	0.0149	−4.61	0.000	0.899	0.958
Sex of child	0.955	0.039	−1.11	0.266	0.881	1.035
Size at birth	0.538	0.033	−10.03	0.000	0.477	0.607
Breast feeding	0.268	0.125	−2.81	0.005	0.107	0.670

Notes: $n = 5{,}060$. Log pseudo likelihood $= -1{,}204.177$, prob $> \chi^2 = 0.005$, time at risk $= 151{,}606.613$. Analysis time: current age of child in months (months since birth for dead children), SE: adjusted for two clusters in repeated mother

Table II.
Results of the cox hazard analysis for selected predictor variables associated with under-5 mortality, NDHS 2012–2016

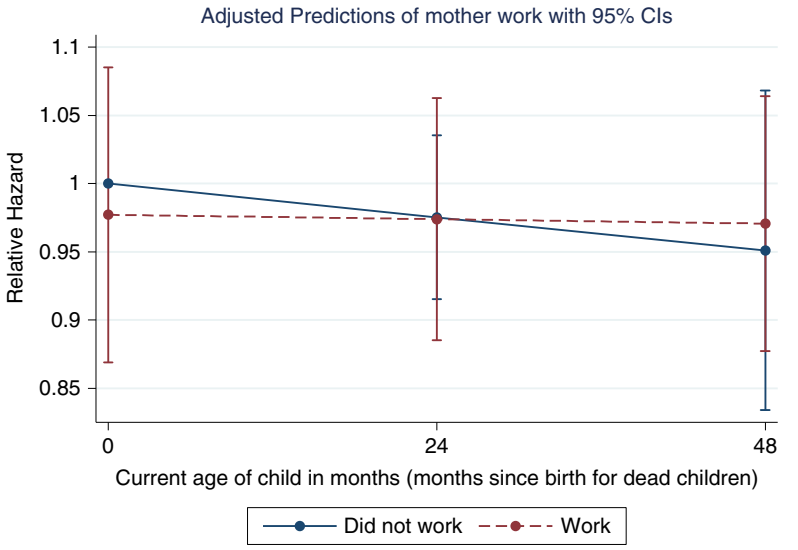

Figure 1.
Predication of survival of child by work of mother, 2012–2016, Nepal

that of other caste mothers. This is due to high caste-based discrimination in Terai regions bordering India. Most of the lower castes (Dalits) lived in Terai areas: among the 26 Dalit in Nepal, 19 of them live in Terai regions of Nepal[14]. Terai regions of Nepal include more than 50 percent of agricultural land. There are many landlords in Terai regions with many hectares of land possessed by them. Therefore, Terai caste mothers who are from lower castes and are poor, work for the landlords in their land forcefully both for their livelihood and to satisfy their landlords. This forceful work leads to role conflict and time conflict regarding the care of their children which may lead to risk of child death. This logic is well supported by Figure 3 which shows that the survival of the child significantly increases if all Terai castes mothers were provided with paid maternity. Figure 2 explains the risk of

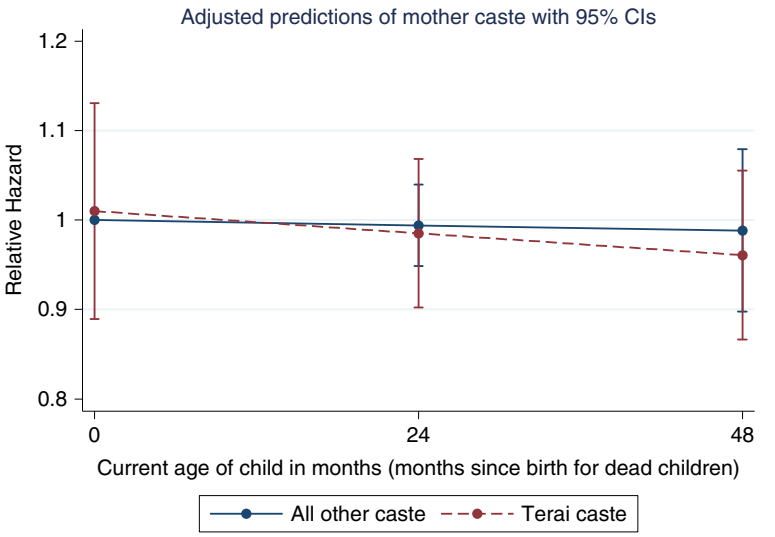

Figure 2.
Predication of survival of child by caste of mother, 2012–2016, Nepal

death of the child divided by age in months of the child by caste. Figure 2 shows that the risk of death of under-5 children is higher for Terai castes mothers after the child reached more than one year. The risk of death for children of Terai caste mothers increases, as seen in the cross-over line of the graph when the child reaches about 14–15 months or so. At this stage, a baby who has just passed the first year of life has a 50 percent chance of survival. It is at this crucial stage when Terai caste mothers should be given all support by all stakeholders and all available strategies and policies in order to ensure the survival of her child. Terai Mothers should be made aware of the importance of child nutrition and health facility visits when their child is sick. Furthermore, the government should make sure that equipped health services and health workers are available in health facilities. There are no studies that make a direct link between the caste of the mother and child mortality rates, however, a study from the 2011 NDHS indicates that mothers from Terai castes and lower caste mothers are less likely to visit health care facilities and spend less time utilizing these facilities compared to mothers from higher castes. It appears that lower caste mothers do not take time to visit a health facility when their child is sick. Studies in the Terai regions of Nepal also found that more than 50 percent of children suffered from being underweight and one-third of the children suffer from stunting[24, 25].

Paid maternity and under-5 child death

Table II shows that the risk of death for under-5 children from mothers who do not get paid maternity leave is higher compared to that of a mother who does get paid maternity. Statistically, the risk of death of under-5 children from a mother who does not get paid maternity is 45 percent higher compared to that of a mother who gets paid maternity in that particular time period when the event occurred. Paid maternity helps to provide adequate care of the new born as well as the mothers during the pre- and post-delivery period. Mother will have extra money to take care of herself and her child. A quasi study in low income countries showed positive effects of paid maternal leave on child survival[26, 27]. A single week extension of paid maternity leave could reduce 0.5 infant deaths per 1,000 births and a study by Ruhm in 20 low and middle income countries predicted that a ten-week extension of paid leave would reduce child mortality rates by 2.5–3.4 percent[28].

The importance of paid maternity is also shown in Figure 3, which indicates that if Terai mothers get paid maternity leave, the risk of death of her child decreases. It can be seen from the figures that child survival is similar for both paid mothers and unpaid mother of Terai castes until the child reaches one year. This is due to the reason that a child depends on breast feeding for food. However, there is a cross-over of the line graph when the child reaches about 14–15 months indicating that the baby who had just passed their first year of life has a higher risk of death if their mother was not paid. The reasons behind it are that those mother who do not get paid are from lower level jobs and therefore cannot afford sufficient nutrients and medicine. Terai regions are geographically favorable to mosquitoes and diseases related to it, so those mothers who do not get paid leave cannot afford mosquito nets and cannot prevent their babies from being bitten by mosquitoes when they can only access lower level work without flexible time or leave. Therefore, all stakeholders and the government should launch programs such as nutrition campaigns, distribution of insecticides and mosquito nets as well as raise awareness through campaigns about the importance of salt solution during diarrhea and free distribution of simple antibiotics during cases of pneumonia and infections.

Conclusion

This study provides the evidence to prove the importance of paid maternity and longer work leave in order to ensure the survival of the child. The study also provides evidence that children born of Terai caste mothers are at a higher risk of death compared to mothers from other castes. Furthermore, mothers who work are at a higher risk of experiencing child death compared to mothers who do not work until the child is two years of old in which case the child mortality rate was reduced. This shows that mothers should be given paid work leave or flexible working time until their child is two years old. The child survival rate of Terai caste mothers is minimal compared to mothers from other castes. However, if Terai caste mothers were given paid maternity leave, then there would be no significant difference in child death based on castes. However, very few mothers who work get paid maternity leave in Nepal, and those that do have this advantage are given leave for a very short period of time. Paid maternity leave in Nepal is 52 days which is much less than the recommended time period of 18 weeks according to the International Labor Organization[29]. This leave is

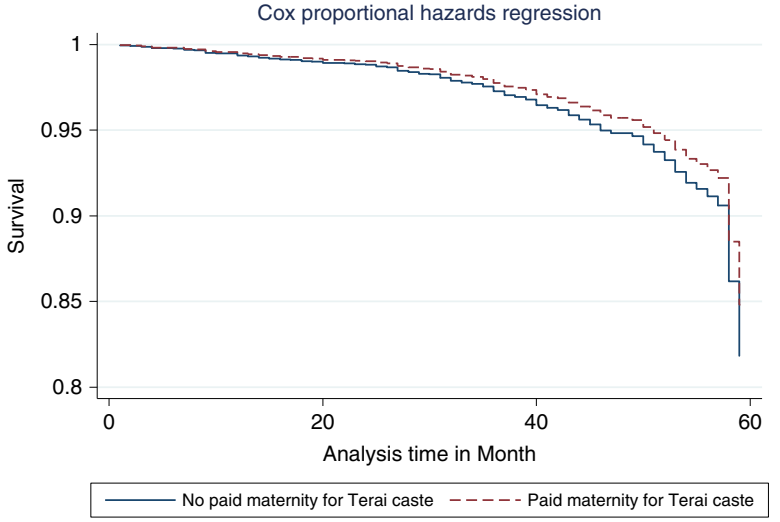

Figure 3.
Predication of survival of child by caste of mother and paid maternity, 2012–2016, Nepal

significantly less than some of the best parental policies from European countries such as France, Spain, Finland, Denmark, Sweden, UK, Austria and Norway, among others, who provide more between 18 weeks to 1 year of paid maternity leave at full pay, with the flexibility to take a few weeks off before the estimated due date, along with some form of paternal leave[30]. Institutional delivery, exclusive breast feeding and average size at birth all have positive relations to child survival; therefore, policies should be directed toward achieving these parameters. In a similar way, the under-5 death rate for multiple births is strongly associated with child death rates and therefore, special attention through screening and referral services should be implemented for mothers who are giving birth to more than one child.

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