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Mortality in an Indian Tamil Community: An Examination of Trends and Possible Causes in the Osborne Estate in Nuwara-Eliya District Sri Lanka

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ABSTRACT

Mortality refers to the state or condition of being subject to death that occur within a population. It is a basic demographic component of population change. Mortality and its causes vary both in space and time due to the factors such as advancement in medicines, propagation of education, improvement of nutritional level and improvement in general conditions of sanitation. Many demographic studies have revealed that mortality levels vary with the racial characteristics since every ethnic society has their own culture, socio-economic background, and attitudes. Sri Lanka has a multi ethnic condition and the levels of mortality in such ethnicities are diverse from one to another. Main purpose of this paper is to identify the trends in CDR, NMR, IMR, CMR, ASDR and CSDR and causes for the mortality in Indian Tamil population in Osborn Estate in Nuwara-Eliya District after 1980s. Finding the causes for the prevailing trends and examination of current socio-economic and health situation in the estate are the minor objectives. Both primary and secondary data were used for this study. Mortality trends were analyzed by using relevant annual death reports from 1984 to 2012 collected from the Osborne Estate Hospital. Questionnaire survey was conducted to identify the socio-economic and health care situation in the estate with the help of 75 households those who were selected randomly from six divisions in Osborne Estate. Analysis was done with the help of SPSS 17.0, Minitab and Microsoft Excel 2010 computer tools. According to the trend analysis, downward trends were found for CDR, NMR, IMR and CMR and slight upward trend for ASDR in 15-30 age group and downward trend for ASDR in 60 + age group in the target population. Causes for the deaths have totally changed from 1984 to 2012 and specifically hypertension was found as the major cause for the general mortality in present day. Suicide is one of the major causes for deaths among youth population due to poor thinking. Advancement of health condition is the main reason for declining trend of child mortality in currently. The study suggests to draw an extensive attention to youth population and to conduct counseling programs in order to minimize the suicide cases. Increasing of workers' wages is positive impact for improving their demographic condition further.

Introduction

Mortality refers to deaths that occur within a population. United Nations (1991) has defined 'Death is the permanent disappearance of all evidence of life at any time after a birth has taken place'. Accordingly, a death can happen only after a live birth. It is a basic demographics component of population change. Population change is often used to mean the change in number of inhabitant of territory during a specific time. Changes that have taken place in the mortality pattern of a population, during time, by far, constitute the most significant aspect of demographic transition. Furthermore, demographic transition which is generally presented as a specific model explains the changes occurred in the demographic background of a population through the time. Historically, populations have tended to shift over time from being characterized by high fertility and mortality to low fertility and mortality. With a view to measuring the incidence of mortality, various indices are used including Crude Death Rate (CDR), Age Specific Death Rate (ASDR), Neo-natal Mortality Rate (NMR), Infant Mortality Rate (IMR), Child Mortality Rate (CMR) and Cause Specific Death Rate (CSDR).

In view of causes related to mortality, causes vary in both space and time. Spatially, different regions are at different stages of socio-economic development and technological advancement. Similarly, with the time passes, the causes of mortality also undergo a change due to advancement in medicines, propagation of education, improvement in nutritional level and upgrading of general conditions of sanitation. During the twentieth century, mortality experienced the most rapid decline in the history of humanity. Though the reduction of mortality started in the eighteenth century, it gained momentum in the early part of the twentieth century as better hygiene, improved nutrition and medical practices based on scientific evidence became the rule in the more advanced countries. After the period of 1950, the widespread use of antibiotics and vaccines had contributed to reduce mortality significantly in the more developed regions.

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The mid- twentieth century was also marked an important turning point in the less developed regions. With the expanded use of antibiotics, vaccines and insecticides, mortality in the developing world began to decline rapidly. United Nations (2011) notes that the CDR in developing region has declined from 19 deaths per 1000 population in the period of 1950-1955 to 8 deaths per 1000 population in the period of 2005-2010 showing a sharp drop in mortality. CDR is observed to be constant as lowest in those both periods as 10 deaths per 1000 persons in the more developed region.

Demographically, the age structure, sex composition and urban development are significant factors. Socially, incidence of infanticide, restrictions on widow remarriage, adequacy of medical facilities, general conditions of nutrition, housing and sanitation, literacy standers, religious beliefs are important. Among the economic factors, per capita income, types of economy are considered significant (Chandna, 2002). Age structure of a population is also a most prominent demographic factor governing the incidence of mortality. It is commonly agreed that the mortality risk declines as the child matures but begins to increase in the middle age. It is universally accepted that males and females have different resistance power. Biologically females are stronger than males. Therefore, males and females have different mortality rates even if they are given equal care. In almost all the countries, the male mortality rate is higher than that of the females (United Nations, 1953). As well, the probability of death in any person depends on age pattern. Generally, death occurs in old age due to biological deficiencies and cessation of life in cells and other life giving organs. Age also influences the maternal and infant mortality. There is highest chance for maternal mortality among women aged less than 20 years and more than 45 years. Similarly, the risk of death is highest in the first few hours, days and months after delivery in the case of infants. In the age gap about 10-14 years the person's death probability may be very low. This confirms that there is a significant relationship between age and mortality differentials. Because of that, general mortality gets its shape as 'J' shape. In developed countries with the low amount of infant deaths, its mortality curve is represented as "J" shape. In developing nations, both infant and adult deaths are relatively high and the shape of mortality curve is symbolized as 'U' shapes (De Silva, 2004).

Moreover, it is important to mention that the ethnic condition of some particular populations deeply affect increase of mortality in their case. Countries in the world have multi ethnic characteristics of population groups. Most of demographic studies have shown that infant and maternal mortality changes depended on ethnic situation. In United Kingdom and Wales, infant mortality rates on some ethnic group are higher than the rate of overall population. United Kingdom says that such ethnic groups have their own cultural condition, socio-economic position and maternal behaviors (Gray et al, 2009). Sub Saharan Africa has raised afflictions may widen the inequalities in mortality, health, and survival among ethnic groups throughout the region, particularly between children (Brockerhoff and Hewett, 2000).

In Sri Lankan context, statistics of CDR in 2012 is shown as 6 deaths per 1000 population as well as 9.47 infant deaths per 1000 live births. Average Life Expectancy at birth is reported as 75.94 years. Average Life Expectancy at birth is 72.43 for males and 79.5 years for females (Department of Census and Statistics, 2013). The mortality levels in Sri Lanka remained high until the beginning of the second decade of this century.

The CDR has fluctuated around 28 deaths per 1000 population during the period of 1881 to 1920. The high level of mortality that prevailed at that time was due to the epidemics, endemic diseases, inadequate preventive and curative services, low standards of living and literacy among the mass of the population. A definite declining trend in the death rate was observed since 1921. From 1941 to 1945, the CDR declined to an average of about 20 per 1000 of the population. This decline was followed by a sharp decline during 1946 to 1950 that coincided with the initiation or the intensive campaign to eradicate Malaria and the expansion of health services particularly in Dry Zone. It resulted in almost eliminating the geographic differentials in mortality by early 1960. Further reductions in the death rate that followed the rapid decline and sustained through the subsequent decades is the result of the growth and spread of the country's health care system, improved production and distribution of food, improvements in personal hygiene, environmental sanitation and educational attainment (Abeykoon, 1998).

Sri Lanka has multi ethnic condition and those ethnic groups are showing different demographic shapes with each other. Sinhalese, Sri Lanka Tamils, Indian Tamils, Sri Lankan Moor, Malays are the major ethnic societies in Sri Lankan context. The mortality trends among these groups are varying in each other. Because each of ethnic groups have their own socio-economic, cultural and behavioral patterns which are very different from one another. According to CDR of these ethnic groups, there is a gradual decline in all ethnic groups from 1962 to 1995. It was for Sinhalese 7.9, 5.8, 5.5, and 5.9 deaths per 1000 population in respective years of 1962-1964, 1981, 1991 and 1995. CDR for Sri Lanka Tamil was 10.0, 5.1, 5.9, and 5.8 in corresponding years. It for the Indian Tamil community was 11.4, 10.7, 6.8, and 5.9 and for the Sri Lankan Moors was 10.2, 5.6, 5.0, 5.8 in relevant years (Abykoon, 2001). As well at the past time, the IMR was 102 in1962-1964, 72.8 in1981, 32.9 in 1991 and 21.4 in 1995 for Indian Tamils. For the Sinhalese IMR has reduced from 49.2 in 1962-1964, 26.9 in 1981, 18.2 in 1991 and 17.5 in 1995. Decline in IMR for Sri Lankan Tamil was recorded as 52.2 in 1962-1964, 20.6 in 1981, 12.2 in 1991 and 12.6 in 1995 while Sri Lankan Moor has a decline their IMR from 62.2 in 1962-1964, 27.3 in 1981, 17.4 in 1991 and 12.7 in 1995(Abykoon, 2001). Among those groups, Indian Tamil community has somewhat high rate of mortality than the other groups.

General mortality as well as infant mortality level also gets higher rank in Indian Tamils rather than other ethnic groups. Most of Indian Tamil people are living in hill country plantation areas. Their whole life is spending with tea plantation related activities. Indian Tamil population has their own socio-economic characteristics as well as demographic structure rather than the other ethnic groups in Sri Lanka. These differences act as key elements for their demographic changes. Poor housing and sanitation, low incomes, lack of education, inadequacy of medical facilities are some of key determinants in their mortality trend.

Consequently, child and maternal mortality are somewhat higher than the other population groups according to estimates. Due to such reasons, this study is more specific to be conducted to examine the trends of mortality in Indian Tamil Population, and identify the causes for their mortality trends focusing the socio-economic and health care background of them. In this context, this paper focuses on trends of mortality and its causes in Indian Tamil population from 1984 to 2012 with special reference to Osborn Estate. The Osborne Estate is in Lethente Grama Niladari Division in

Nuwara-Eliya District that has the largest proportion of Indian Tamil community in the country. The total population of 3886 in the Osborne Estate belongs to the Indian Tamil community and it is a significant reference to carry out this sort of inquiry to identify resent mortality trends and governing factors related to mortality in this Community.

Materials and Methods

Both primary and secondary data were used for this study. Mortality trends were analyzed by using relevant annual death reports from 1984 to 2012 given by the Osborne Estate Hospital in target estate. Annual health reports from Plantation Human Development Trust, data from Department of Census and Statistics and other books and web articles were collected as secondary data. Questionnaire survey was conducted to identify the socio-economic and health care situation in the estate. Under that, 75 households were selected randomly as the samples from six divisions in Osborne Estate. Doctor, Midwife, Estate manager, Welfare manager and other relevant officers in the estate were interviewed to get the necessary information. Time seriesstatistical analysis was done to study the trends of mortality in Indian Tamil Community in estate. CDR, IMR, NMR, CMR and ASDR, which have been recognized as measurements of mortality, were calculated by using proper statistical equations. Statistic Package for Social Sciences (SPSS) 17.0, Mini Tab and Microsoft Excel 2010 Computer tools were used to analyze data.

Results

Mortality Trend in Osborne Estate

Results of the analysis show that the mortality in Indian Tamil population in Osborne Estate has significantly changed over the period of 1984 to 2012. The general mortality trend was shown a gradual declining trend from past to present (Figure 1). From 1984 to 1986, the trend was at a high level after that it has dropped down. Occurrence of this declining trend in general mortality (CDR) is related basically to the health improvements and socio-economic advancements of neighborhood in the estate.

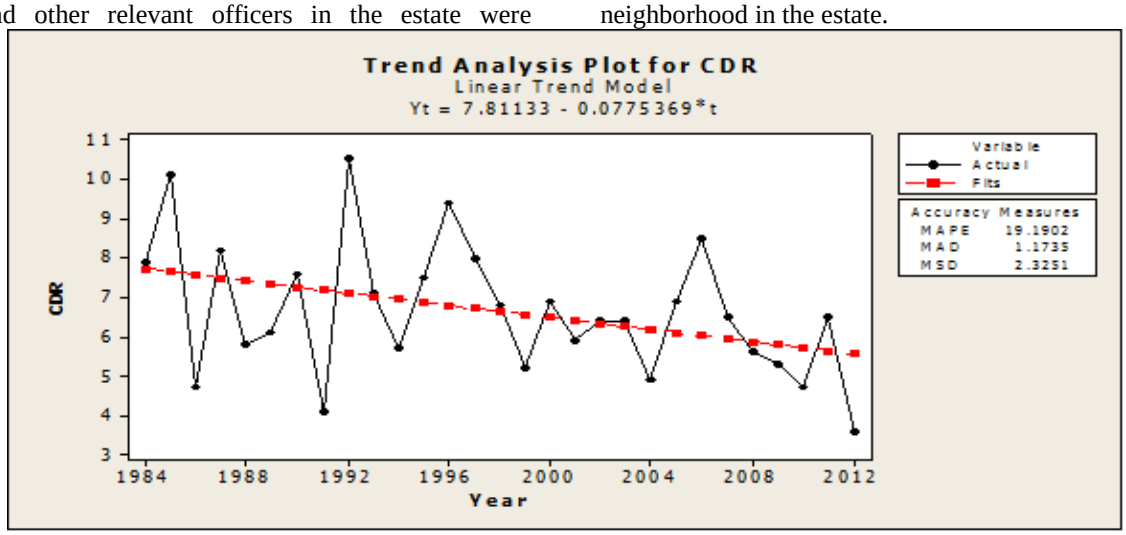

Figure 1. Trend in CDR in Indian Tamil population in Osborne Estate.

Source: Osborne Estate Hospital, 2012

Neo-natal mortality illustrates a rapid descend characteristic from earlier period to current (Figure 2). Reduction of home delivery, high awareness of pregnant women, maternity cares and nutrition level and enlargement of health facilities are the factors for this dropping trend.

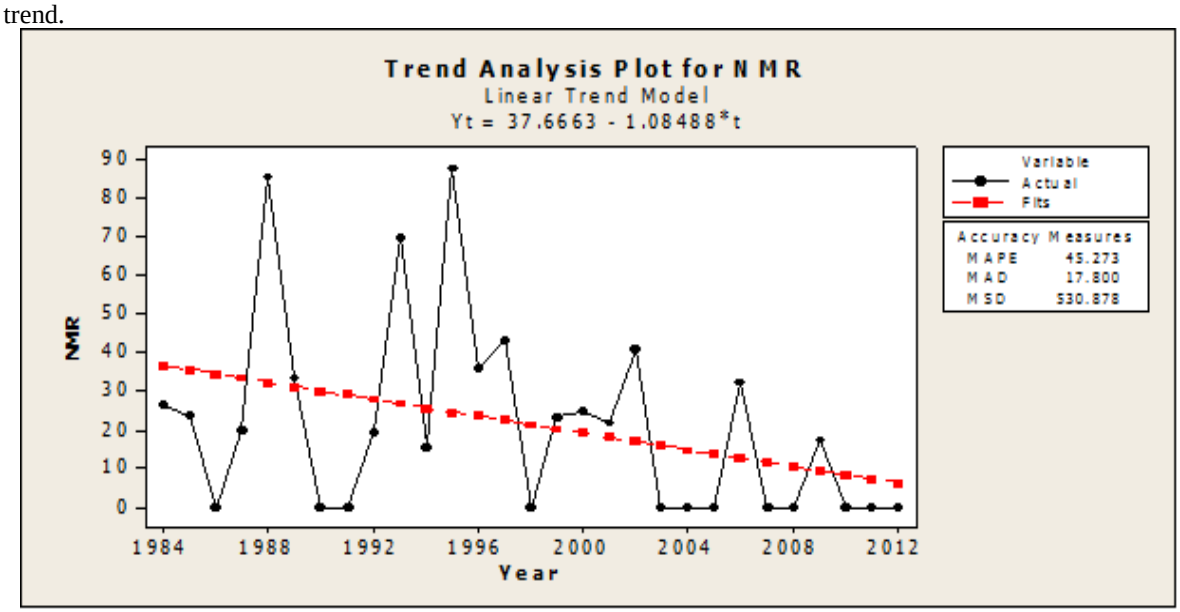

Figure 2. Trend in NMR in Indian Tamil population in Osborne Estate.

Source: Osborne Estate Hospital, 2012

Infant mortality also presents a plummet trend from 1984 to 2012 (Figure 3). It should be the indirect results from mothers' well education, quality of sanitary condition and healthy environment of the estate.

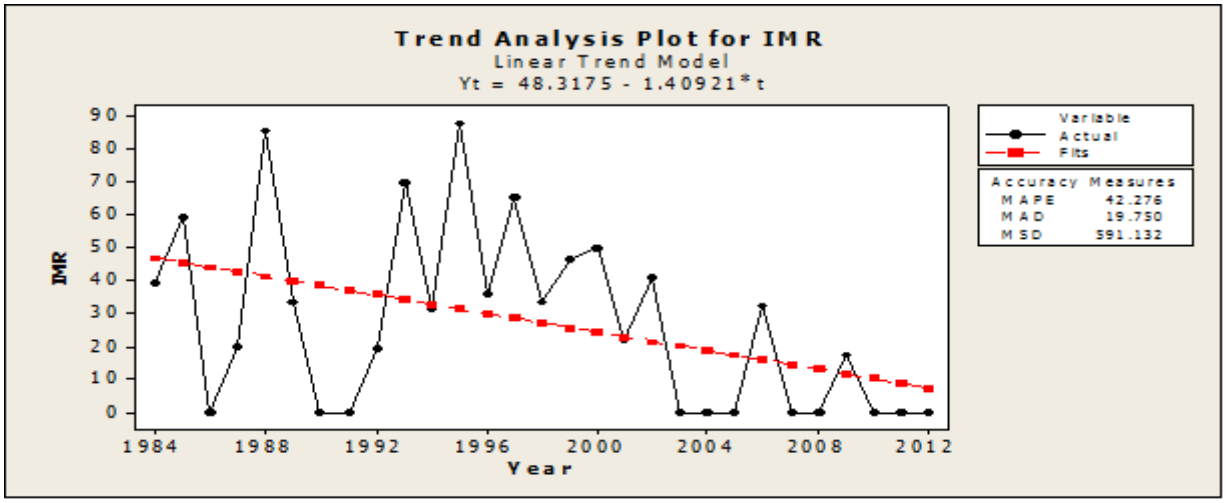

Figure 3. Trend in IMR in Indian Tamil Population in Osborne Estate.

Source: Osborne Estate Hospital, 2012

Child mortality trend in the estate has declined from past to present remarkably (Figure 4). In the past, there were many causes for deaths of children but today the situation has changed because of the improvement of health services, nutritional of feeding patterns and best awareness of parents.

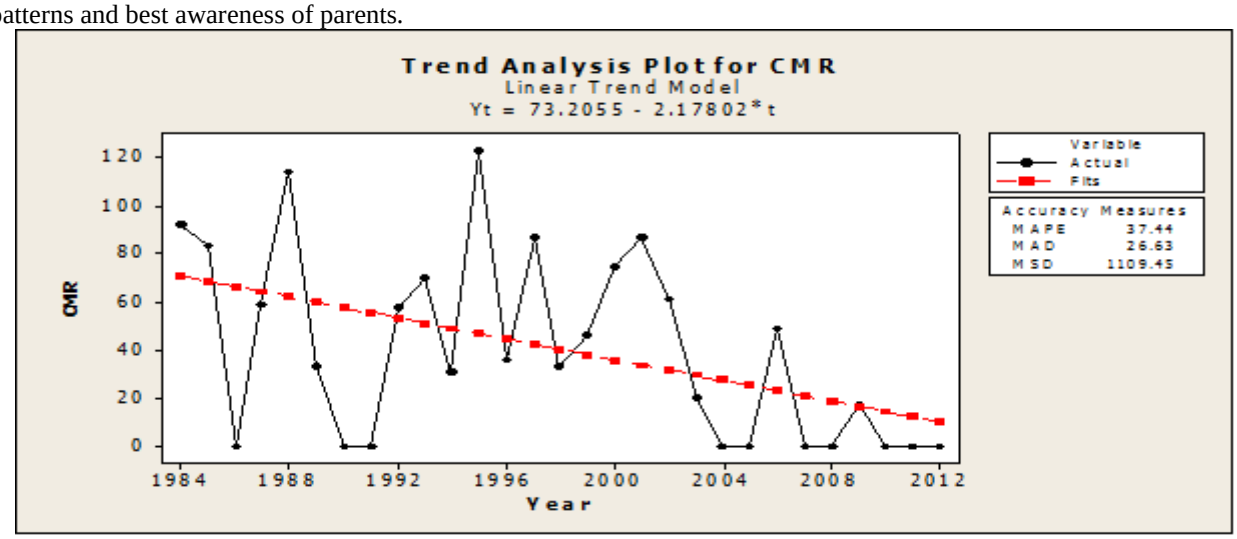

Figure 4. Trend in CMR in Indian Tamil Population in Osborne Estate.

Source: Osborne Estate Hospital, 2012

Age specific mortality trend for age gap in 15-30 has proved a somewhat different pattern compared with the other measurements (Figure 5). As it illustrated there is a slight growth in mortality during the corresponding period and specific reason for that has not been identified. For the other age group that is over 60 years' mortality trend has determined a very slight drop down feature in relevant period (Figure 6). Better health services can influence the situation.

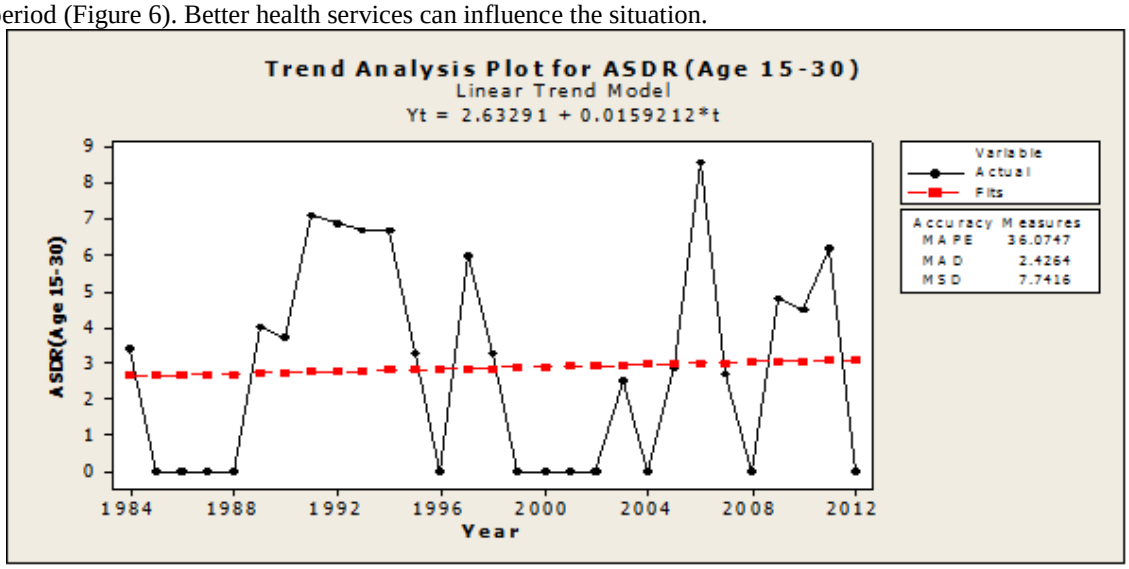

Figure 5. Trend in ASDR (Age 15-30) in Indian Tamil Population in Osborne Estate.

Source: Osborne Estate Hospital, 2012

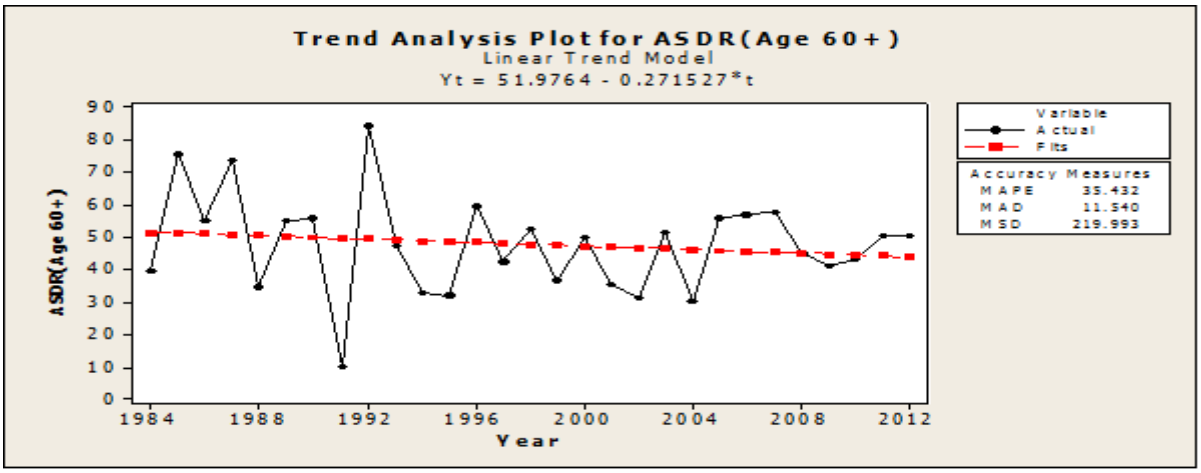

Figure 6. Trend in ASDR (Age 60+) in Indian Tamil Population in Osborne Estate.

Source: Osborne Estate Hospital, 2012

In the case of maternal mortality, no any significant maternal deaths have been reported in the estate. It is a remarkable achievement in mortality context in the Indian Tamil population. Clinical facilities, reduction of home delivery and high attention from doctors/midwifes and good feeding patterns were the major aspects for this remarkable achievement of maternal deaths in the estate.

Mortality according to Age Structure in Osborne Estate

As shown below the mortality curves drawn based on age structure in different years clearly demonstrate a considerable change from 1984 to 2012. The major change has brought by infant and child mortality with continuous declining trends over the corresponding period. Mortality curve in 1984 (Figure 7) illustrates a high mortality level in infant as well as child age structures and ages in 15-30 got low level but over 60 age gaps represented higher. After 8 years in 1992 infant mortality has recorded a sharp decline with a 50 percent decline. In 1996, it shows a slight increase from 20 to 28 deaths per 1000, but again it records a lowest value in 2012. Attempting to look at the child mortality is also seen a continuous turn down in each corresponding year and has shown a lowest level in 2012. Mortality is observed to be the lowest in case of the age group of 15-30 that is the youngest group and confirms the general nature of mortality in same age of any population. Mortality for the age group over 60 also confirms the general nature of mortality curve of any population with a high level of elderly mortality. Accordingly, the crucial factor of conversion of mortality curve into 'U' shape is decline of infant and child mortality. "U' shaped curve of mortality of a community reflects the low infant and child mortally and high elderly mortality which is the general pattern of mortality curve under the good health condition.

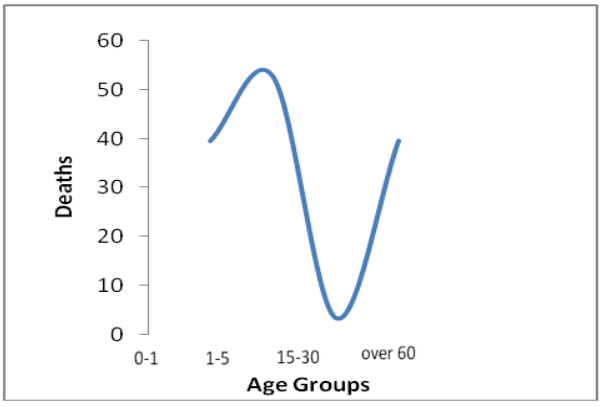

Figure 7 . Mortality curve for the year 1984.

Source: Osborne Estate Hospital, 2012

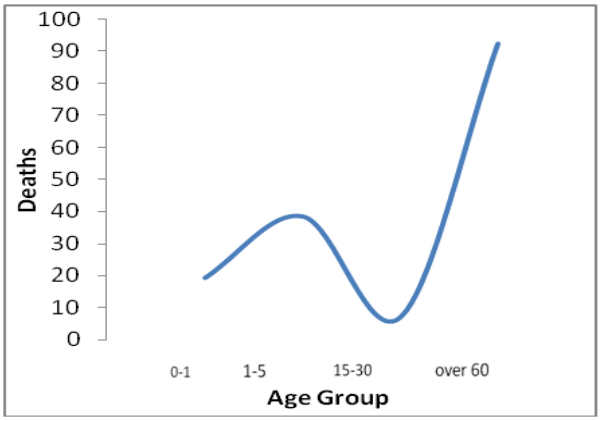

Figure 8. Mortality curve for the year 1992.

Source: Osborne Estate Hospital, 2012

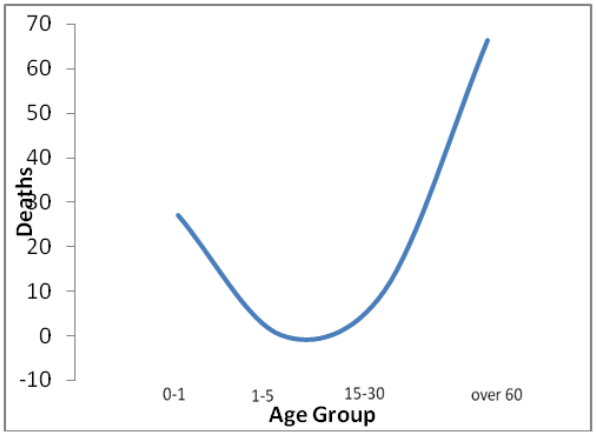

Figure 9. Mortality curve for the year 1998.

Source: Osborne Estate Hospital, 2012

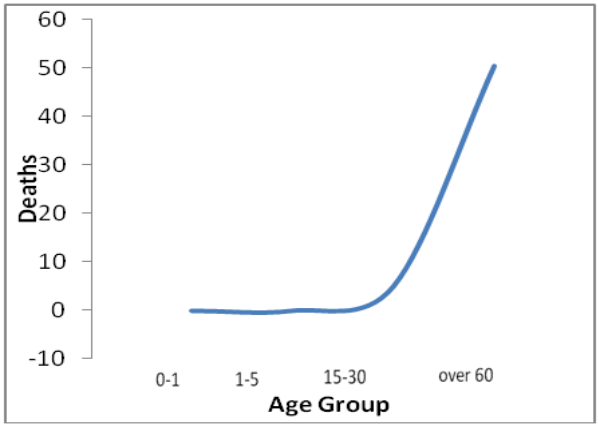

Figure 10. Mortality curve for the year 2012.

Source: Osborne Estate Hospital, 2012

Causes of Mortality in Osborne Estate

Causes for mortality vary according to age structure. In this community, twelve diseases were identified as causes for general mortality (Figure 11). Highest percentages were shown by the disease of hypertension (16.5%), heart problems (16.5%) and Asthma (15.5%) which can be identified as common causes for mortality in this estate community. Most of the adult aged deaths are associated with these causes. Careless feeding patterns, hard works, congenital diseases of community and cold climate of the estate could be the reasons for these three diseases.

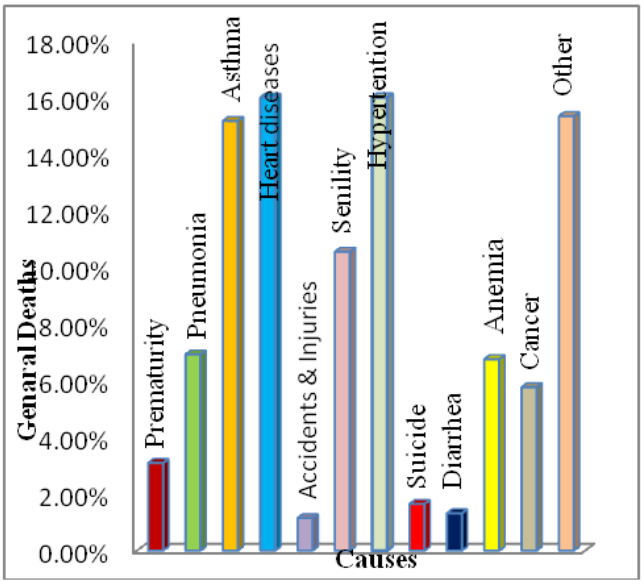

Figure11. Causes for General Mortality.
Source: Osborne Estate Hospital, 2012

Infant deaths have mostly occurred due to the causes of mainly prematurity and Pneumonia, diseases (Figure 12). Prematurity is responsible for a higher percentage of 44 while Pneumonia is 27%. Occurrence of infant deaths due to toxic and congenital diseases also is considerably high in this community. Low level of nutritional condition of mother or infants, bad feeding patterns, mother's lack of education, low-level knowledge of contraception methods or poor income, deprived sanitary and health condition of estate could be the reasons for such causes.

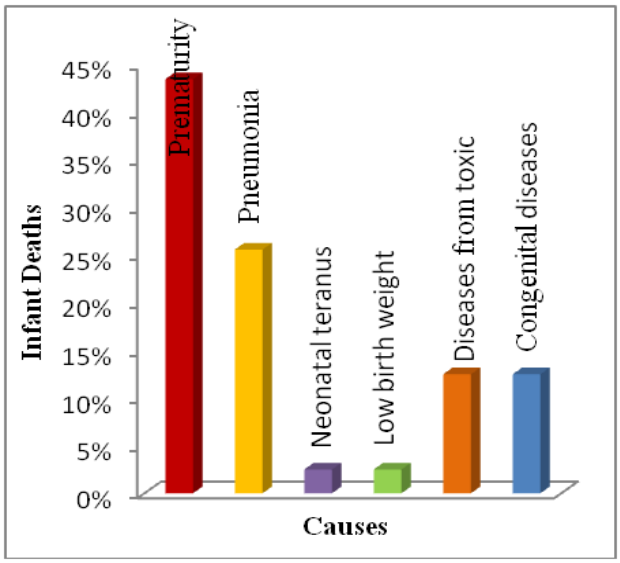

Figure 12. Causes for Infant Mortality.
Source: Osborne Estate Hospital, 2012

Causes of the child mortality are related with immaturity, pneumonia, diseases from toxic and diarrhea. Pneumonia gets a higher percentage of occurrences of child mortality (Figure 13). Improper feeding pattern in the community, inadequacy of parents' education and socio-economic imbalance could be the chief factors for these causes in child deaths.

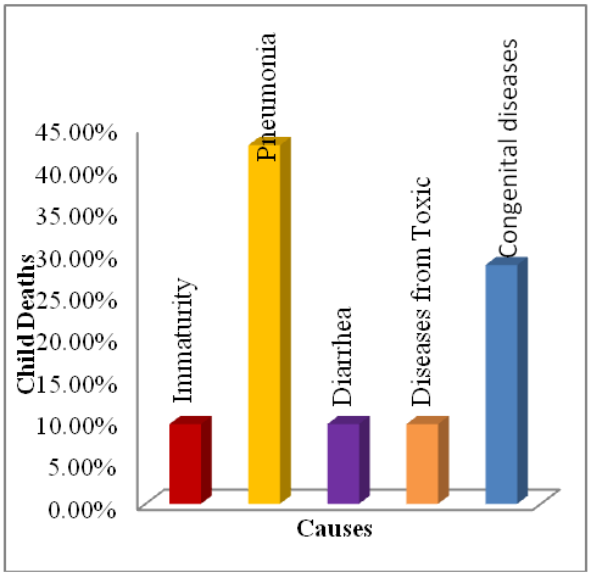

Figure 13. Causes for Child Mortality.
Source: Osborne Estate Hospital, 2012

Deaths in age gap in 15-30 were reported due to specific causes in the estate. According to findings suicide cases, accidents & injuries, cancer & meningitis, anemia and heart diseases are basic reasons for the mortality (Figure 14). Most of suicide cases could be recognized in the young ages (ages 15-30) and it may be a consequence of inadequacy of education, social isolation, social stress and poor thinking patterns & decision making of young people in the estate. Accidents & injuries also received a high rate for deaths and it can be the base of lack of technological knowledge and improper usage or over usage of materials such as fertilizer, kerosene oil, fire and electricity power.

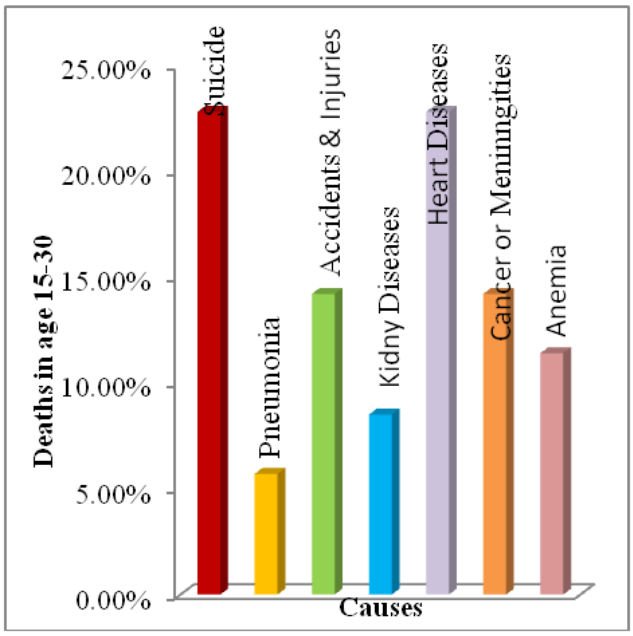

Figure 14. Causes for Age Specific Mortality (Age 15-30).
Source: Osborne Estate Hospital, 2012

Hypertension and Anemia have revealed significant differences of its impacts on deaths temporally. Hypertension has illustrated a lower tendency for deaths in 1984 while a higher tendency by the anemia (Figure 15). This situation has changed when reaching 2012 showing Anemia a low trend of impacts for death and significantly hypertension has proved a very high trend of impact for deaths in the estate.

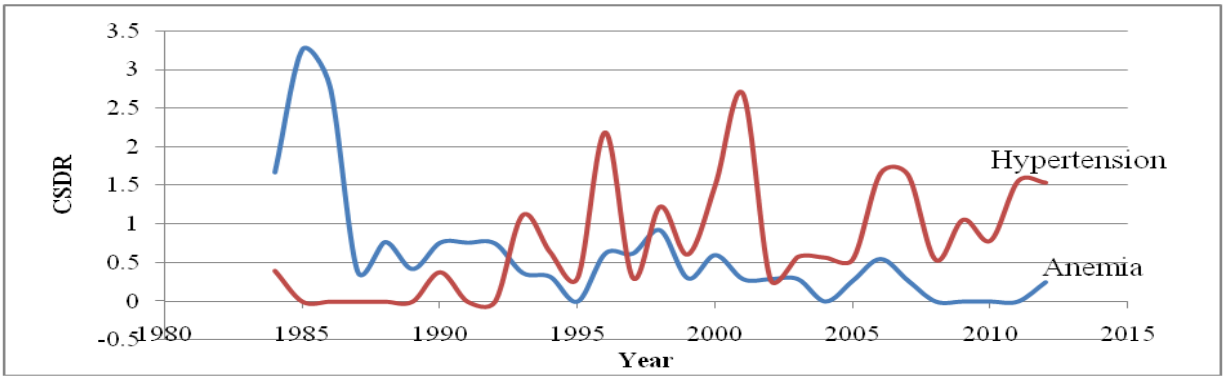

Figure 15. CSDR for Hypertension & Anemia in Osborne Estate.

Source: Osborne Estate Hospital, 2012

Prematurity and Senility has different trend features from 1984 to 2012(Figure 16). Senility has reported a steady growth of trend while prematurity declined from past to present. As these data reveals the cause impacted for the deaths has changed temporally.

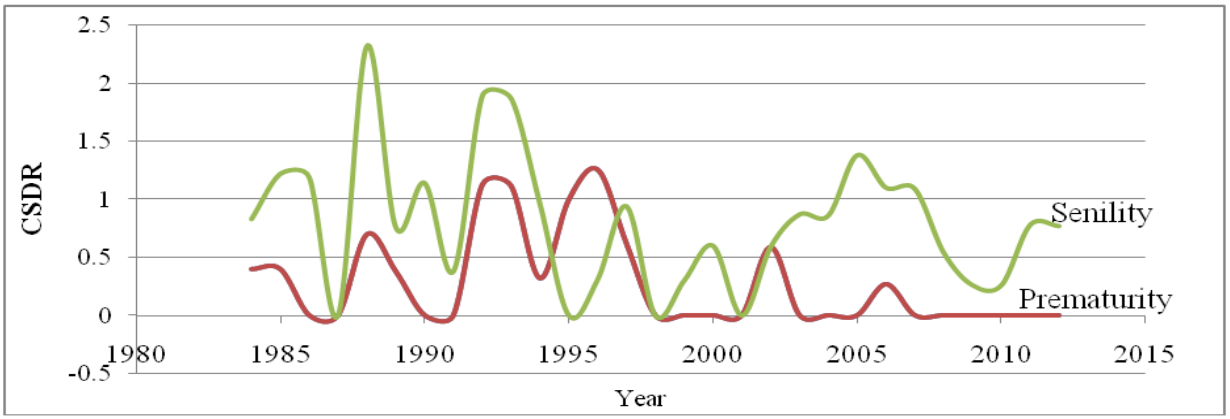

Figure 16. CSDR for Prematurity and Senility in Osborne Estate.

Source: Osborne Estate Hospital, 2012

Current Socio-Economic and Health Situation in Osborne Estate

Low level of education of families can create many of socio-economic disparities and such things can affect their mortality level as well. According to the questioner survey, it was found that overly 75% of them have attended to the school for fulfillment of their education. Only 26% of them are in the category of 'No schooling'. This situation regarding the educational level is a positive factor of this estate because new generation is involving with the education and other relevant activities. Education can influence the improvement of socio-economic condition in any kind of population and it can help to reduce the mortality level in particular estate people.

Income level reflects a diversified nature in estate. Majority (57%) of householders is estate workers and they could not earn high wages from estate. This majority earned Rs. 5000-10000 of payments and their living condition can be limited into such range of income.

60% of families in the estate live in line rooms. Line rooms are provided with very limited facilities rather than the separated home. This situation definitely influences the householders' socio-economic and health situation. In case of sanitary facilities, 94% of families have individual latrines and is a better situation for their own health condition called "Family Health" through this individual latrine condition.

Daily consumption pattern of the community also one of the important determinants of health condition. Four food items are common in the daily consumption pattern in the community. Rice is the most common food item that is daily consumed by 96% of households. It provides powerful energy and other nutrition for hardworking of estate workers. In addition, Rottee, Pittu and bakery foods are consumed. It was found that pregnant women in the estate consume high nutritional food items. Children's feeding pattern is also in a better condition. It reflects that the present condition of health and welfare situation is in a satisfactory level in the estate. Such improvements in terms of health directly influence the mortality level of the community. Enhanced capacity of socio-economic level reduces the infant and child mortality.

Conclusion

The mortality level in Indian Tamil Population in Osborne Estate currently has diverse characteristics due to the age structure. Infant and child mortality is significantly getting low than the adult mortality level. Therefore, it is needed to improve healthy environment for the adult population.

Existing health condition in the estate is satisfactory for the infancies, children and pregnant women. Further, it was found that the provision of ambulances, maternity wards, laboratory facilities and pharmacy services are required facilities to enhance the health situation in the estate. Recruitment of a number of midwives also is important because existing midwife services is not sufficient to cover all six divisions in the estate.

Development of self-confidence of youth population in the estate by counseling programs to enhance their ability of critical thinking, good decision-making, and knowledge of society is more significant aspects to reduction of suicide deaths among youth population. Programs aiming at providing technological knowledge and introduction of proper usage of materials or chemicals are also vital to reduce the deaths in estate.

It is also necessary to pay thorough attention to the diseases of hypertension, heart diseases, pneumonia in the context of adult population.

Improvement of monthly wages and housing condition for workers will be more beneficial to increase their life style, better feeding pattern, socio-economic advancement and it can be positively exaggerating to mortality level in Indian Tamil Population in Osborne Estate.

References

Abeykoon, A.P.T.L. (1998) Population and Manpower Resources of Sri Lanka, Natural Resources, Energy and Science Authority of Sri Lanka, Colombo 7.

Abykoon, A.T.P.T. (2001) Demographic Trends among Major Ethnic Groups in Sri Lanka, Vol.4, Sri Lanka Journal of Population Studies.

Brockerhoff, M., and Hewett, P., (2000) Inequality of Child Mortality among Ethnic Groups in Sub-Saharan Africa, accessedon28/04/2012.http://www.ncbi.nlm.nih.gov/pubmed/10686731pdf.

Chandna, R.C. (2002) Geography of Population: Concept, Determinants and Patterns, Kalyani Publishers, New Delhi.

Department of Census and Statistics. (2013) Statistical Data Sheet-2012, Colombo, Sri Lanka.

Gray, R., Headley, J., Oakley, L., J Kurinczuk, J., Brocklehurst, P. and Hollowell, J. (2009) Inequalities in Infant Mortality Project Briefing Paper 3: Towards an understanding of variations in infant mortality rates between different ethnic groups in England and Wales, accessed on 28/04/2012. https://www.npeu.ox.ac.uk

Osborne Estate Hospital (2012) Annual Death Report (1984-2012), Hatton, Sri Lanka.

United Nations (1953) Determinants, Consequences of Population Trends, Population Studies No.17.United Nations, New York.

United Nations (1991) Handbook of Vital Statistics Systems and Methods, Volume 1: Legal, Organizational and Technical Aspects. United Nations Studies in Methods, Glossary. Series F., No. 35, New York.

United Nations (2011) World Mortality Report, Population Division, Department of Economic and Social Affairs.o is,ajd" bkaÞ,d,a ^2004& ck.yk wOHhkh(Ys% ,xldj weiqßka" l¾;D m%ldYkhls'