

# Review of Health and Health Service Improvements in Nepal

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## ABSTRACT

Nepal has made great progress regarding maternal and childhood mortality over the past two decades. A visionary leadership, coupled with the implementation of targeted interventions and programmes have resulted in improved MNCH indicators and marked decline in mortality. Maternal deaths have dropped by almost half from 539 per 100,000 live births in 1996 to 281 in 2006. Although neonatal mortality rates have stagnated in recent years, the overall childhood mortality has improved. This article tracks changes made in key indicators (mortality, fertility and service indicators including immunisation, family planning, maternal, neonatal and child over time and provides an overview of successful programmes that have led to this accomplishment.

**Keywords:** child mortality; contraceptive prevalence rate; diarrhoea; maternal and neonatal programmes; maternal mortality; nutrition; pneumonia.

## INTRODUCTION

Nepal has experienced remarkable improvement in maternal and childhood mortality over the last two decades. As a signatory of several international conventions, including the Declaration of Alma Ata, the International Conference on Population and Development and the Millennium Declaration,<sup>1,2</sup> Nepal has committed to improving the health of its people, using an approach that is rooted in primary health care and targets those most marginalised and excluded.<sup>3</sup> The Government's approach is espoused in key national health policies and strategies - including the Second Long Term Health Plan 1997-2017,<sup>4</sup> Health Sector Strategy 2004,<sup>5</sup> Nepal Health Sector Programme (NHSP), Implementation Plan 2004-2009<sup>6</sup> and NHSP-2.<sup>3</sup> The Government's commitment is reflected in the improvement of maternal and child health (MNCH) indicators observed during the last several decades, which included the civil conflict from 1996 to 2006.

This article tracks historic changes made in key indicators such as mortality, fertility and service indicators including immunisation, family planning,

maternal, neonatal and child over time and provides an overview of successful programmes that have led to this accomplishment.

## LITERATURE REVIEW

Secondary desk review was conducted for this article. Also from published documents, reports, journal articles, as well as relevant websites.

## SOCIO-DEMOGRAPHIC CHANGES IN NEPAL

Rapid socio-demographic change was observed in the country from 1971 to 2011, during which the population grew twice-fold from about 12 million to 27 million.<sup>7</sup> Growth accelerated from 2.1% in 1971 to 2.6% in 1981,<sup>8</sup> but declined between 2001 and 2011 from 2.2% to 1.4% (Table 1).<sup>7</sup>

Similarly, life expectancy for Nepalese increased by about 20 years from 1971 to 2011.<sup>9</sup> Contrary to global trends,<sup>10</sup> Nepal was one of the few countries where female life expectancy was consistently lower than

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male life expectancy prior to 2001. The trend changed in 2001, when female life expectancy changed to 60.7 years and male life expectancy to 60.1 years (Table 1).<sup>9</sup> Literacy rates also increased drastically for women from about 4% to 43% between 1971 and 2001.<sup>8,11</sup> Half of the population (50%) in 2011 was residing in the flat agricultural terai region, up from 44%, 47% and 48% in 1981, 1991 and 2001, respectively.<sup>8,11</sup> The increase is likely due to high rates of migration from the hill and mountain regions to the terai, which has comparatively better infrastructure, access to health, education and communication services.<sup>12</sup>

**Table 1. Basic Socio-Demographic Indicators(7-9, 11)**

	1971 Census	1981 Census	1991 Census	2001 Census	2011 Census
Populations (millions)	11.6	15	18.6	23.2	26.6
Intercensal growth rate (%)	2.1	2.6	2.1	2.2	1.4
Life expectancy (years)					
Male	42	50.9	55	60.1	NA*
Female	40	48.1	53.5	60.7	NA*
Literacy					
Male	23.6	34	54.5	65.5	NA*
	3.9	12	25	42.8	NA*
Female					

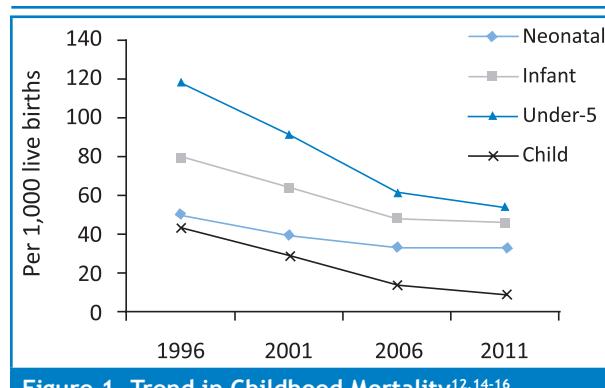
\*The Census occurs every ten years. The most recent was conducted in 2011. Please note that at the time of this article's publication, only preliminary data was available from the Census, in which life expectancy and literacy were not provided.

#### Trends in Childhood Mortality

Due to the non-functional vital registration system in Nepal, estimating childhood mortality rates has been a challenge and the country has had to rely on estimates from censuses and surveys.<sup>13</sup> Demographic surveys have been conducted in Nepal since 1976. The first Demographic and Health Survey (DHS) was carried out in 1996 and have since been conducted every 5 years, 2001, 2006 and 2011.<sup>7</sup> The DHS provides quality data on demographic trends, health status of women and children, and a number of programmatic indicators.

Overall childhood mortality has declined markedly over the past 15 years, slowing down somewhat in the last five years (Figure 1). Infant mortality and under-5 mortality declined to 46 and 54 in 2011,<sup>14</sup> from 79 and 118 in 1996,<sup>15</sup> respectively. The child mortality rate also decreased from 43 in 1996<sup>15</sup> to 9 in 2011.<sup>14</sup> The neonatal mortality rate (NMR) has come down from 50 per 1000

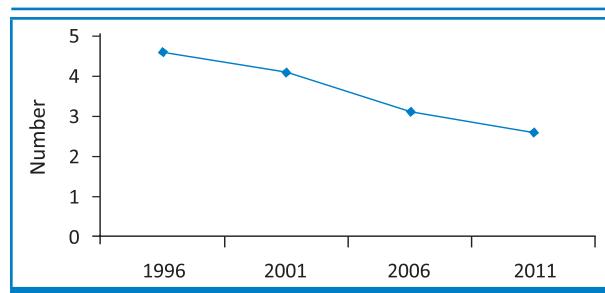
live births in 1996<sup>15</sup> to 33 in 2006,<sup>16</sup> but has not declined since, posing a major barrier in further reduction in the infant mortality rate and subsequently hinders the fulfillment of the Millennium Development Goal (MDG) 4. It should be noted that NMR is of major concern in most developing countries.<sup>17</sup>



**Figure 1. Trend in Childhood Mortality<sup>12,14-16</sup>**

#### Trends in Fertility

The total fertility rate (TFR) declined from 4.6 in 1996<sup>15</sup> to 2.6 in 2011,<sup>14</sup> surpassing the target of 3.05 by 2017 as envisaged in the SLTHP<sup>4</sup> and almost that of the NHSP II target of 2.5.<sup>3</sup> The most rapid decline was observed between 2001 and 2006, during which a decrease of almost one child per woman was observed (Figure 2). Median age at first marriage increased from 16.2 years in 1996 to 17.5 in 2011, as has age at first birth from 19.8 to 20.2.<sup>15,16</sup>



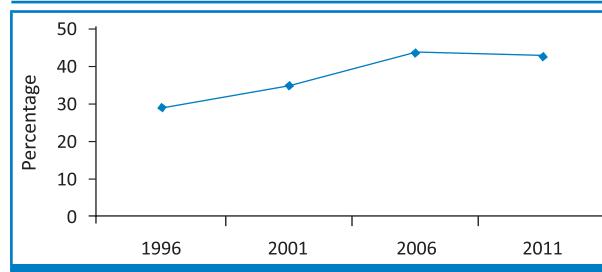
**Figure 2. Trends in Fertility<sup>12,14-16</sup>**

### FAMILY PLANNING, MATERNAL AND CHILD HEALTH ACHIEVEMENTS

#### Family Planning Programmes

Family planning programmes have been implemented by the government of Nepal (GON) since the late 1960s.<sup>18</sup> Between 1996 and 2006, use of modern family planning methods increased by about 1.5% per annum.<sup>16</sup> The most current DHS shows a leveling off, however, from 44% in 2006 to 43% in 2011 (Figure 3).<sup>14</sup> One reason for this lack of continued increase is due to spousal separation, a result of increasing migration within and outside the

country<sup>19</sup> However, the contribution of spacing methods has increased over the years, from almost 7% in 1996<sup>16</sup> to 20% in 2011.<sup>14</sup>

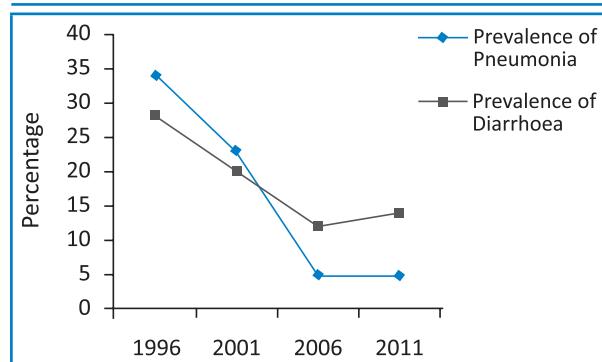


**Figure 3. Use of Modern Contraception<sup>12, 14-16</sup>**

#### Childhood Illnesses and Immunisation

Nepal also has a long-standing history of child health programming, beginning with early efforts to reduce mortality from the leading causes of death, pneumonia and diarrhoea.<sup>20</sup> This included introduction of community-based management of pneumonia and diarrhoea, with a cadre of Female Community Health Volunteers (FCHVs) providing these services. FCHVs are chosen by their respective communities to work voluntarily and contribute significantly to key public health programmes, including family planning, maternal and child health, vitamin A distribution and immunisation, among others. Nepal was also early to adopt the integrated management of childhood illness or IMCI approach from facility to community care.<sup>21</sup>

There has been a marked decline in the prevalence of pneumonia and diarrhoea in the last 15 years. The percent of children with pneumonia and diarrhoea in the 2 weeks before being surveyed, dropped substantially between 1996 to 2006, after which it stabilized (Figure 4).<sup>14,15</sup>



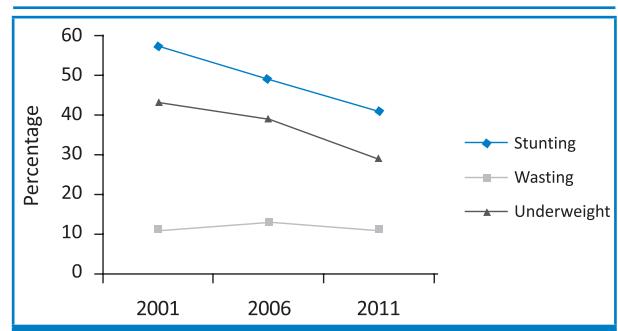
**Figure 4. Prevalence of pneumonia and diarrhoea<sup>12,14-16</sup>**

FCHVs manage over 50%<sup>22</sup> of pneumonia cases recorded in the public health system, and the proportion of cases reaching facilities that are severe has declined from 12% in 1996<sup>23</sup> to 0.5% in 2011.<sup>22</sup>

During the same time period, health services for basic preventive and curative services have also improved. The percentage of children who received complete vaccination (BCG, DPT1, DPT2, DPT3, polio and measles) increased rapidly from 43% in 1996,<sup>15</sup> 66% in 2001,<sup>12</sup> 83% in 2006<sup>16</sup> and 87% in 2011.<sup>14</sup> Nepal will likely meet the MDG target on measles coverage if current trends continue.

Nepal also pioneered a twice-yearly vitamin A supplementation programme in 1993 and later added de-worming.<sup>24,25</sup> The Department of Health Service's 2009/2010 Annual Report shows that FCHVs distributed vitamin A to a total of over 2.6 million children,<sup>22</sup> consistently covering over 80% of under 5 children.<sup>26</sup>

The nutritional status of under-5 children has shown slow overall improvement, with declines in stunted and underweight children,<sup>12,14</sup> wasting has remained constant (Figure 5). Much of this improvement is among the upper wealth quintiles.<sup>14,16</sup> Breastfeeding practices however, have greatly improved: the 2011 DHS shows that 70% of children under six months of age are exclusively breastfed, a 17 point percentage increment from 2006.<sup>14,16</sup>

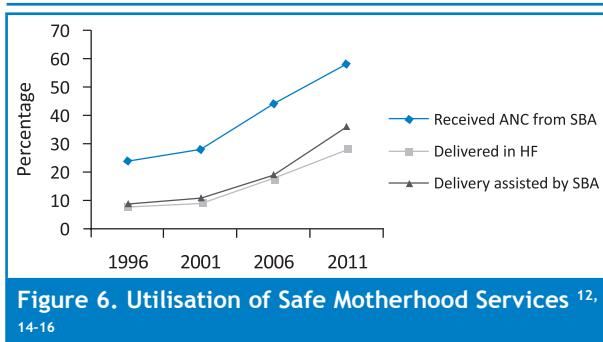


**Figure 5. Nutritional Status in Children<sup>12,14,16</sup>**

#### Maternal and Neonatal Programmes

Nepal was slower to initiate safe motherhood programmes than child health despite having one of the highest maternal mortality ratio (MMR) in the world and despite having endorsed the reduction of MMR in the 1991 National Health Policy.<sup>27</sup> However, after the launch of the Safe Motherhood Programme in the late 1990s, maternal deaths also declined sharply, by almost half between 1996 and 2006, from 539 to 281 per 100,000 live births.<sup>16</sup> There are several likely contributing factors for this, including an increase in the utilisation of antenatal care (ANC) and postnatal care (PNC), an increase in institutional deliveries and deliveries by skilled birth attendants and overall improvements in the quality of maternal care. The maternal financing scheme has also greatly contributed to the increase in utilisation of services at health facilities.<sup>28</sup>

There was a remarkable 34% increment between 1996 and 2011 in the percentage of mothers receiving antenatal care (ANC) from SBAs (Figure 6).<sup>14,16</sup> Services include tetanus toxoid, and currently 82% mothers with a birth in the five years preceding the survey are protected from neonatal tetanus.<sup>14</sup> According to the 1996 DHS only 9% of total deliveries were assisted by skilled birth attendants (SBAs) which increased to 36% in 2011.<sup>15,14</sup> Likewise, in 1996 a mere 8% of deliveries took place in a health facility which increased to 35% in 2011.<sup>15,14</sup> The MoHP has placed an emphasis on enhancing efforts to increase institutional deliveries through the establishment of more birthing centers, and providing transportation incentives to mothers who deliver at health facilities. These efforts need to be sustained and improved upon if Nepal is to meet the MDG target of reducing MMR by three-quarters or declining to 134 per 100,000 by 2015.<sup>3</sup>



**Figure 6. Utilisation of Safe Motherhood Services** <sup>12, 14-16</sup>

In addition to the maternal incentive scheme,<sup>29</sup> which involves providing transportation costs to mothers who deliver at health facilities, other innovative approaches have been implemented by the MoHP to address the large number of maternal deaths in the country. This includes a programme that focuses on the distribution of misoprostol to pregnant women so that they can administer it immediately after delivery during home births, to prevent post-partum hemorrhage, a major cause of maternal death in Nepal.<sup>29</sup> Moreover, the expansion of birthing centers, which will continue to increase in the future, has resulted in an increase in institutional delivery and will undoubtedly contribute to a further declines in maternal mortality over time.<sup>3</sup>

Neonatal mortality is also of paramount concern, as it accounts for 72% of infant mortality<sup>14</sup> and as mentioned above, the NMR has not changed in the past 5 years. However, according to the DHS 2011, delivery practices during homebirths and early care of the neonate have improved over the years, for example, 68% used a new or boiled blade for umbilical cord cutting during homebirths. In addition, with respect to keeping umbilical cord stumps dry and clean, almost 60% of newborns had nothing applied to the cord stump.

However, nearly three-quarters of newborns were bathed before 24 hours, contrary to recommendations.<sup>16</sup>

To acknowledge and address the large number of neonatal deaths, the MoHP has adopted several programmes and pilots to improve newborn care. These include the Community-Based Newborn Care Package (CB-NCP) which has a birth-preparedness package; chlorhexidine (CHX); and newborn vitamin A supplementation (NVAS). These pilots are comparatively new, the oldest (CB-NCP) having started in 2009 - have not been fully implemented, but preliminary reports demonstrate they have achieved significant coverage and are scalable.

## WAY FORWARD

The dramatic improvement in mortality among women and children reflects the improvements in service delivery as well as demographic changes occurring rapidly in Nepal. Increased urbanisation, high levels of out-migration for work, and the concomitant inflow of remittances is changing the world view of more and more Nepalese. Educational achievement, particularly among women and other socio-economic changes all affect health outcomes. However, service delivery has also improved remarkably, with measurable service statistics documenting these improvements. It is likely that proven interventions such as management of pneumonia, immunization, provision of vitamin A supplements and the emphasis on improved maternal and neonatal care have contributed significantly to the improvement in mortality. Underpinning this success has been the strength and vision of the national leadership which (despite Nepal's difficult geography and underdeveloped infrastructure) contributed to the successful implementation of targeted MNCH interventions at the community level, focusing on marginalized and excluded groups.

Other countries in South Asia have experienced similar improvements (Figure 7). With regards to mortality trends, results from the Bangladesh Maternal Mortality Survey 2010 showed a dramatic drop in maternal deaths from 322 to 194 per 100,000 live births between 2001 and 2010- an incredible 40% decline.<sup>30</sup> Similarly, child health indicators have improved considerably: under-five, infant and neonatal mortality all declined from 133, 87 and 52 in 1993<sup>31</sup> to 52, 41, 30 in 2007.<sup>32</sup> India's 2006 National Family Health Survey showed under-five, infant and neonatal mortality rates at 74, 57 and 39 respectively, down from 109, 79 and 49 in 1996, while the maternal mortality ratio is 300,<sup>33</sup> higher than both Bangladesh and Nepal. In Pakistan, under-five, infant and neonatal mortality have all decreased, albeit modestly from 103 in 1990 to 94 in 2007, 86 to 78 and 56 to 54.<sup>34</sup> The 2006 Pakistan Demographic and

Health Survey measured maternal mortality at 276.<sup>34</sup> Sri Lanka has the lowest childhood mortality in the region: under-five mortality is at 21, infant mortality at 15 and neonatal mortality at 10.<sup>35</sup> Sri Lanka also has the lowest maternal mortality ratio in the region - 39 per 100,000 live births.<sup>36</sup>

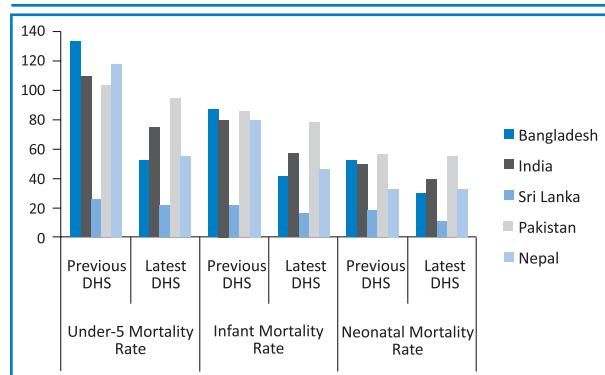


Figure 7. Comparison of Childhood Mortality in South Asia<sup>14,31-35</sup>

Progress is also evident in programmatic indicators. In Pakistan for example, 61% of pregnant women received ANC in 2007 compared to 33% in 1996.<sup>34</sup> Similarly, in India and Bangladesh it increased from 66% in 1999 and 49% in 2004 to 76% in 2006 and 52% in 2007.<sup>32,33,37</sup> Delivering at health facilities instead of at home has also improved: in India from 34% in 2004 to 41%,<sup>33</sup> Bangladesh 9% to 15%,<sup>32</sup> Pakistan 23% to 34%.<sup>34</sup> Both ANC coverage and delivering at health facilities in Sri Lanka were very high- at 99% and 98%, respectively.<sup>35</sup> Data from these countries also indicates progress in child health. Six percent of under-5 children in India showed symptoms of pneumonia. Of these children 69% went to a health facility for treatment.<sup>33</sup> Pneumonia symptoms were higher in Pakistan at 14%, but lower in Bangladesh at 5%.<sup>32,34</sup> However, 66% of these children received treatment in Pakistan while only 37% did in Bangladesh About 60% of Sri Lankan children with pneumonia symptoms (4.4%) went to a health facility for treatment.<sup>35</sup> Vitamin A supplementation coverage is relatively high in these countries, 88% in Bangladesh, 60% in Pakistan, but significantly low in India at 18%.<sup>32-34</sup> It is evident from these numbers that Nepal has one of the best vitamin A supplementation programmes in the region.

Nepal has agreed to meet the MDGs by 2015 and with the current trend, it is likely that it will meet the goals of reducing child mortality by two-thirds, provided increased emphasis and efforts are placed on neonatal and maternal mortality. Meeting the MDG of reducing maternal deaths by three-quarters and reducing neonatal deaths will be challenging, but considering the achievements made so far, it is certainly possible

through strong leadership and focused interventions

## CONFLICT OF INTEREST

We declare no conflict of interest

## REFERENCES

- Report of the International Conference on Population and Development. United Nations Population Information Network (POPIN), UN Population Division, Department of Economic and Social Affairs; 1994; Available from: <http://www.un.org/popin/icpd/conference/offeng/poa.html>.
- Dixit H. Nepal's Quest for Health. Kathmandu: Educational Book Publishing (P) Ltd.; 1995.
- Government of Nepal, Ministry of Health and Population. Nepal Health Sector Programme II (NHSP-II) 2010-2015. 2010.
- Government of Nepal, Ministry of Health and Population, Health Sector Reform Unit. Second Long Term Health Plan 1997-2017: Perspective Plan for Health Sector Development. 2007.
- His Majesty's Government, Ministry of Health. Health Sector Strategy: An Agenda for Reform. 2004.
- His Majesty's Government, Ministry of Health. Nepal Health Sector Programme - Implementation Plan (2004-2009). 2004.
- Central Bureau of Statistics, National Planning Commission Secretariat, Government of Nepal. Population census preliminary report 2011. 2011.
- Central Bureau of Statistics, National Planning Commission Secretariat, His Majesty's Government. Population Monograph of Nepal. Sajha Prakashanko Chhapakhana, Pulchowk, Nepal; 1987.
- Central Bureau of Statistics, National Planning Commission Secretariat, His Majesty's Government. Population Monograph of Nepal: Volume II. Union Press Pvt. Ltd., Putali Sadak, Kathmandu, Nepal; 2003.
- Barford A, Dorling D, Davey Smith G, Shaw M. Life expectancy: women now on top everywhere. *Bmj*. 2006 Apr 8;332(7545):808.
- Central Bureau of Statistics, National Planning Commission Secretariat, His Majesty's Government. Population Monograph of Nepal: Volume I. Union Press Pvt. Ltd. Putali Sadak, Kathmandu, Nepal; 2003.
- Ministry of Health, New ERA, ORC Macro. Nepal demographic and health survey 2001. 2002.
- Patel SP. A method for estimating infant mortality rate in Nepal. *Contributions to Nepalese Studies*. 2004;31(2).
- Ministry of Health and Population, New ERA, ICF International Inc. Nepal demographic health survey 2011. 2012
- Ministry of Health, New ERA, Macro International Inc. Nepal family health survey 1996. 1997.
- Ministry of Health and Population, New ERA, Macro International Inc. Nepal demographic and health survey 2006. 2007
- Gruskin S, Cottingham J, Hilber AM, Kismodi E, Lincetto O, Roseman MJ. Using human rights to improve maternal and

- neonatal health: history, connections and a proposed practical approach. *Bull World Health Organ.* 2008;86:589-93.
18. United States Agency for International Development, Nepal Family Health Program, United Nations Population Fund. Repositioning Family Planning Strategic Review of the Nepal National Family Planning Program: Outcomes of a national consultative meeting. 2006.
  19. USAID, Nepal Family Health Program II, New ERA. Family planning, maternal and child health situation in rural Nepal: a midterm survey for NFHP II. 2010
  20. Bhutta ZA, Chopra M, Axelson H, Berman P, Boerma T, Bryce J, et al. Countdown to 2015 decade report (2000-10): taking stock of maternal, newborn, and child survival. *Lancet.* 2010 Jun 5;375(9730):2032-44.
  21. Dawson P, Pradhan YV, Houston R, Karki S, Poudel D, Hodgins S. From research to national expansion: 20 years' experience of community-based management of childhood pneumonia in Nepal. *Bull World Health Organ.* 2008;85(5):339-43.
  22. Department of Health Services, Ministry of Health and Population, Government of Nepal. Annual report 2066/2067 (2009/2010). Department of health services; 2011.
  23. Ministry of Health and Population, Department of Health Services, Government of Nepal. Annual report 2053/2054 (1996/1997). Department of health services; 1998.
  24. Fiedler JL. The Nepal National Vitamin A Program: prototype to emulate or donor enclave? *Health Policy Plan.* 2000 Jun;15(2):145-56.
  25. World Health Organization, UNICEF. How to add deworming to vitamin A distribution. 2004.
  26. Ministry of Health and Population, John Snow Inc., USAID, National Technical Assistance Group, UNICEF. Elements of success - the national vitamin A program in Nepal. 2000.
  27. World Health Organization, Country Office for Nepal. Policy papers on health Nepal. 2007.
  28. Pant PD, Suvedi BK, Pradhan A, Hulton L, Matthews Z, Maskey M. Investigating recent improvements in maternal health in Nepal: further analysis of the 2006 Nepal demographic and health survey. Calverton, Maryland, USA: Macro International Inc., 2008.
  29. Rajbhandari S, Hodgins S, Sanghvi H, McPherson R, Pradhan YV, Baqui A, et al. Expanding uterotonic protection following childbirth through community-based distribution of misoprostol: operations research study in Nepal. *Int J of Gynecol Obstet.* 2010;108:282-8.
  30. USAID, AusAID, UNFPA, Measure Evaluation, ICDDR-B, National Institute of Population Research and Training. Bangladesh maternal mortality and health care survey 2010: summary of key findings and implications. 2010.
  31. National Institute of Population Research and Training, Mitra and Associates, Macro International Inc. Bangladesh Demographic Health Survey 1993-1994. 1994.
  32. National Institute of Population Research and Training, Mitra and Associates, Macro International Inc. Bangladesh Demographic Health Survey 2007. 2009.
  33. International Institute for Population Sciences, Macro International. National family health survey (NFHS-3), 2005-06: India: volume I. 2007.
  34. National Institute of Population Studies, Macro International Inc. Pakistan Demographic and Health Survey 2006-07. 2008.
  35. Department of Census and Statistics, Ministry of Health Care and Nutrition. Sri Lanka Demographic and Health Survey 2006/7: Preliminary Report (Draft). 2008
  36. UNICEF. Sri Lanka Statistics. 2010 [updated March 2, 2010; cited 2011 November 12, 2011]; Available from: [http://www.unicef.org/infobycountry/sri\\_lanka\\_statistics.html](http://www.unicef.org/infobycountry/sri_lanka_statistics.html).
  37. National Institute of Population Research and Training, Mitra and Associates, ORC Macro. Bangladesh Demographic and Health Survey 2004. 2005.