Malnutrition and Mortality in Sub Saharan Africa and India

A Structural analysis of Contrasts

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1. Introduction

This paper attempts a comparative analysis of the structure and dynamics of child mortality and malnutrition in Sub Saharan Africa (SSA) and South Asia - particularly India. As such the paper can be seen as a contribution to the contemporary debate investigating into relatively higher incidence of child malnutrition in India than in the countries of SSA, as against, significantly lower mortality ratio in India than in countries of SSA. Given that SSA lags considerably behind India in terms of growth as well as child survival indicators, the lower incidence of malnutrition in SSA countries as compared to that in India appears inexplicable and has been discussed and contested as well [Panagariya 2013]. Significant levels of malnutrition [higher than that in Sub Saharan Africa] in context of consistently decent annual growth of Indian economy for more than past two decades, has been particularly intriguing. Incidentally, the reference to gender as an explanation for relatively higher malnutrition in India than in Sub Saharan Africa despite better macroeconomic conditions in the former [referred as the *South Asian Enigma*], has been made at several places [Khasnobis and James 2010, Cohen 2007, Gragnolati et al 2005]. Yet a systematic comparative explanation of the role of gender as well as that of other non – food inputs of malnutrition between Sub Saharan Africa and South Asia, particularly India, remains scarce. One of the most recent and systematic examination of malnutrition – mortality contradiction between SSA and India has been provided by Arvind Panagariya (2013). Contrary to previous reflections on the issue, Panagriya, in fact, refutes the edge of Sub Saharan Africa over India in terms of nutritional well- being and the argument he puts forth to support his observation is the [in] applicability of child growth norms of World Health Organization (WHO) for estimating child malnutrition in India [Panagariya 2013]. It has been argued that the WHO growth standard, particularly, on child height does not account adequately for variation in genetic characteristics across the globe and therefore, ends up setting higher cut off for height – age ratio of Indian children, which in turn leads to an exaggerated estimation of child malnutrition [in terms of height-age ratio] in the country. Further, this over-estimation is cited as the reason for apparently higher level of child malnutrition in India as compared to countries of Sub Saharan Africa.

To begin with, the argument seems appealing and somewhat convincing. However, based on a deeper review of the trends of child mortality, economic growth rate and malnutrition in both heterogeneous as well as relatively uniform settings, this paper not only refutes the

sufficiency of genetic factors in explaining the intriguing contrast between countries of SSA and India, but also brings forth the role of structural determinants that are able to explain the contrast. The paper also revisits the problematization of malnutrition in Kerala – India's role model in better human development as well as in gender equality. This enables an insight into the relatively higher or comparable levels of malnutrition even in Kerala as compared to some of the SSA countries, questioned by Panagariya (2013).

The research has been done in two separate but inter-related parts; first, the paper illustrates how and why inconsistency between incidences of malnutrition and mortality is not a ground enough to refute the contrast between SSA countries and India. To this end, the paper makes use of mortality and malnutrition data for nations within the SSA, also for countries within South Asia and for states within India. In the second part, the research attempts to explain the contradiction between the SSA and India by undertaking comparative analyses of structural issues. The two broad components of the comparative analyses are as follows.

i.) The structure of other underlying determinants of malnutrition – level of social expenditure, basic quality of life, nutrition and care practices in Sub Saharan Africa, South Asia and India.

ii.) The social and institutional structure with respect to gender in both regions.

It is observed that once structural factors underlying child mortality and malnutrition are brought into consideration, contradictory trends between SSA and India hardly remain inexplicable. While gender remains a crucial link in nutrition dynamics, the linkages are not uniform and are mediated significantly by socio-cultural as well as policy factors.

Methodologically, the paper makes use of diverse sources of data. However, for reasons of uniformity and consistency required for cross – country analysis, country statistics provided by United Nations Children's Fund [UNICEF 2011][1], is used as the prime data source. Given that most studies on this issue have focused on 'stunting' as the indicator of child malnutrition, for the sake of comparability, this research chooses to concentrate on 'stunting. At the same time, an overview on malnutrition does present a picture with reference to other two indicators viz. underweight and wasting.

[1] http://www.unicef.org/statistics/index_countrystats.html

2. Lack of correspondence between Mortality and Malnutrition: Why genetics is not enough?

1.1 Case 1: 'India and Sub Saharan Africa' versus 'Sub Saharan Africa'

The much hyped issue of India versus Sub Saharan Africa on indicators of malnutrition and mortality, needs to be assessed in terms of a review of variations among the SSA countries.

Table 1. Mortality and Malnutrition levels in Sub Saharan Africa and India (2011)

	IMR	UFMR	Stunting	Underweight	Wasting	Maternal Mortality Ratio
Chad	97	169	39	30	16	1100
Cameroon	79	127	33	15	6	690
Nigeria	78	124	41	23	14	630
Mauritania	76	112	23	20	12	510
Togo	73	110	30	17	5	300
Niger	66	125	51	39	12	590
Lesotho	63	86	39	13	4	620
Gambia	58	101	24	18	10	360
Liberia	58	78	42	15	3	770
Kenya	58	73	35	16	7	360
Ghana	52	78	28	14	9	350
Ethiopia	52	77	44	29	10	350
Eritrea	46	68	35	44	15	240
Tanzania	45	68	42	16	5	460
Senegal	47	65	27	18	10	370
INDIA	47	61	48	43	20	200
Madagascar	43	62	50	36	15	240
Dijbouti	66	86	30.8	22.9	10	200
Congo	64	99	30	11	8	560
Guinea	79	126	40	21	8	610
Botswana	20	26	31	11	7	160
Malawi	53	83	47	13	4	460
Mali	58	176	38	27	15	540
Zambia	53	83	45	15	5	440
Zimbabwe	43	67	32	10	3	570
South Africa	35	47	24	9	5	300
Uganda	58	90	33	14	5	310

Source: UNICEF Country Statistics, 2011

As far malnutrition is concerned, Table 1 shows that the intriguing contrast often pointed out between relatively lower Infant Mortality Rate (IMR) and Under Five Mortality Rate (UFMR) and relatively higher malnutrition levels in India on the one hand, and, relatively higher IMR and UFMR and relatively lower malnutrition level in the countries of Sub Saharan Africa on the other, is as visible across the countries within SSA. Based on available data, Eritrea, Madagascar, Senegal as well as Kenya and Ghana have comparable levels of Infant Mortality Rate (IMR) with India (Panagariya 2013:100). In the case of under- five mortality rate (UFMR) as well, Madagascar, Eritrea and Ghana are at almost similar levels as India whereas Senegal and Kenya are at higher.

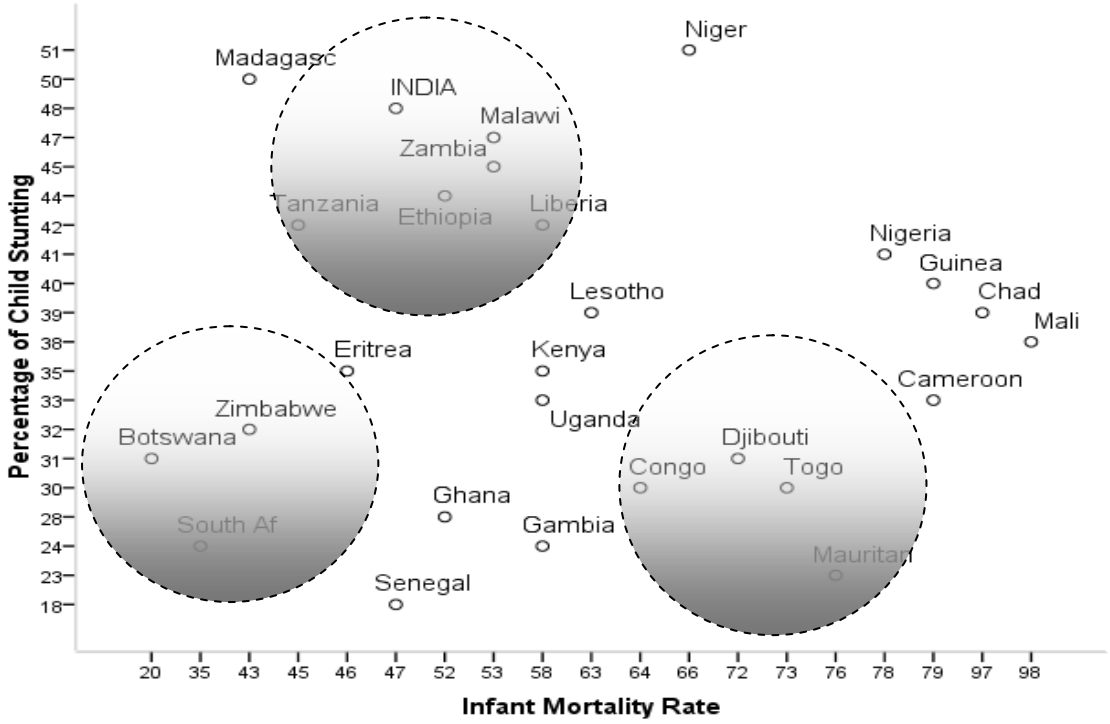

Figure 1: Clustering of India with countries of Sub Saharan Africa on the basis of infant mortality rate and incidence of stunting [Source: Constructed from UNICEF Country Statistics, 2011]

The rows in Table 1 marked in orange, indicate that several countries of SSA including Eritrea, Tanzania, Ethiopia, Malawi, Botswana, Zambia and Kenya have considerably lower mortality levels than Chad, Cameroon, Mauritania, Togo and Nigeria, yet relatively higher incidence of child stunting than the latter. In fact, Eritrea, Madagascar and Tanzania have similar levels of mortality as India, however, like India these countries also have relatively higher levels of malnutrition. Thus, if there is inconsistent movement in basic mortality and

malnutrition indicators, it is not so only between India and several SSA countries, but also *between* several countries of the SSA region itself.

Figure 1 reflects that on the basis of Infant Mortality Rate (IMR) and percentage incidence of stunting among children, countries in Sub Saharan Africa can be seen to form three clusters. One with relatively low IMR and higher child stunting, which converges with India, second with higher IMR and relatively lower child stunting and third with relative correspondence between levels of IMR and child stunting. Further, figure 2 depicts scatter plots between each of the three indicators of child malnutrition viz. stunting, underweight and wasting and the level of IMR across countries of Sub Saharan Africa. The lack of any definite pattern of correspondence in movements of infant mortality rates and malnutrition levels is conspicuous by its absence.

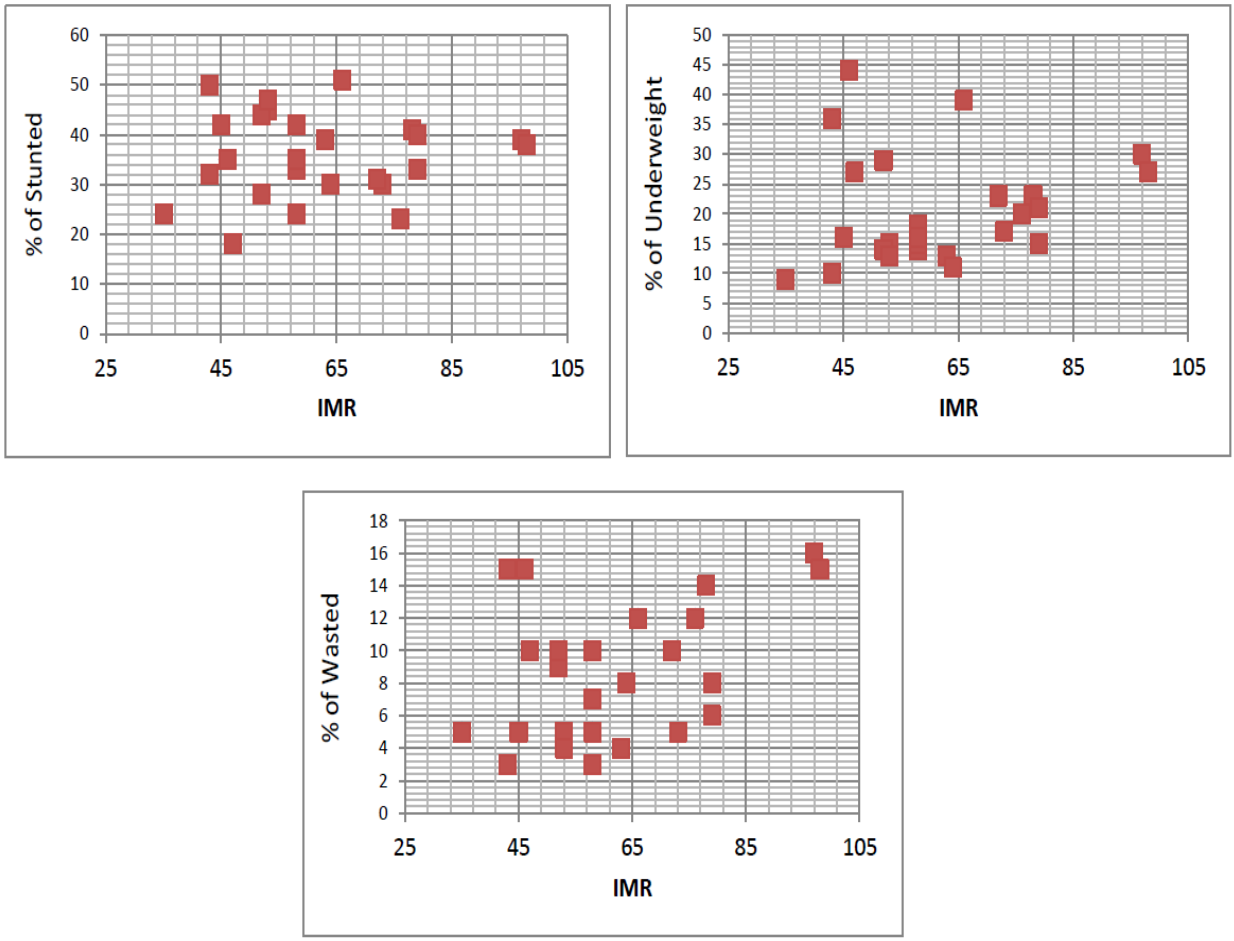

Figure 2: Lack of convergence between trends of infant mortality rate and incidence of child malnutrition within countries of Sub Saharan Africa [Source: Constructed from UNICEF Country Statistics, 2011]

1.2 Case 2: India versus her South Asian Neighbours; where are the genetic differences?

The second argument in this context is based on the analysis of the incidence of malnutrition and mortality across countries within South Asia. Table 2 gives levels of these indicators along with literacy and life expectancy for countries in South Asia. As seen from table 2, it is only in Pakistan that IMR and UFMR are higher than in India and even in Pakistan, the incidence of malnutrition, particularly of underweight and wasting, is considerably lower than that in India. Further, on mortality as well as malnutrition indicators, Sri Lanka and Maldives perform much better than India, using the same World Health Organization (WHO) reference standards. Bangladesh, Bhutan and Nepal also have comparable levels of mortality and life expectancy as India, however, incidence of malnutrition in these countries is consistently lower as compared to India. Thus, if the application of WHO's reference exaggerates the incidence of malnutrition in India, it would do so equally for all South Asian countries. This is especially so for Sri Lanka and Maldives, where malnutrition level is significantly lower than India, even though they share nearly similar genetic characteristics as the India population. In fact, the ethnic composition of Maldives represents mostly people of Indo- Aryan origin (Maloney 1980).

Table 2. Basic health and nutrition indicators among countries of South Asia

Country	UFMR	IMR	Underweight	Stunting	Wasting	Maternal Mortality Ratio
Sri Lanka	12	11	21	17	15	
Pakistan	72	59	32	44	15	260
Nepal	48	39	29	41	11	170
Maldives	11	9	17	19	11	60
Bangladesh	46	37	36	41	16	240
Bhutan	54	42	13	34	6	180
India	61	47	43	48	20	200

Source: UNICEF Country Statistics, 2011

Figure 3 further substantiates the convergence of higher IMR and relatively lower incidence of child stunting than India, in three countries of South Asia viz. Nepal, Bhutan and Pakistan. It is only in Sri Lanka and Maldives that both the infant mortality and child stunting are at significantly lower level than India.

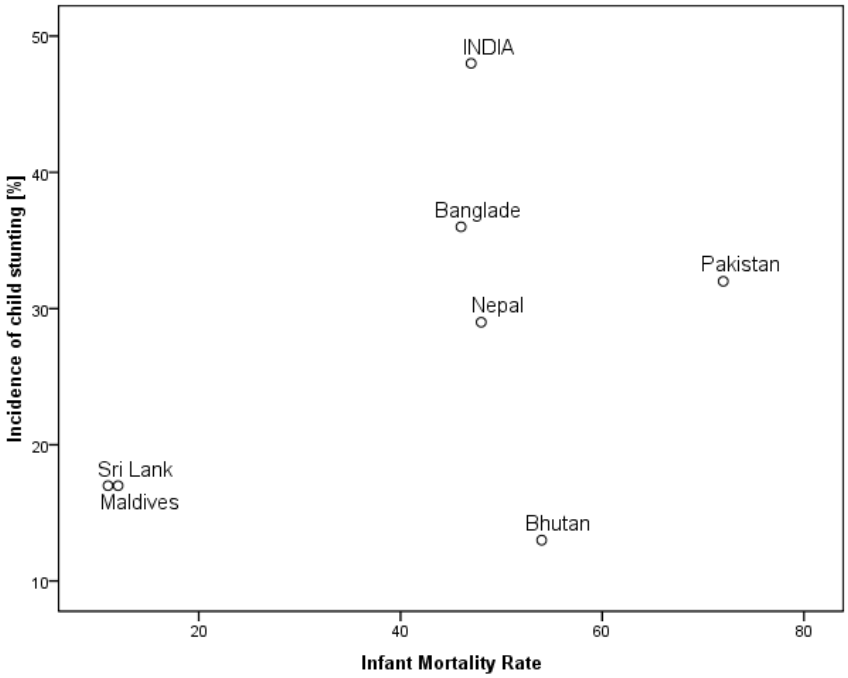

Figure 3: Infant mortality and incidence of child stunting across nations of South Asia
[Source: Constructed from UNICEF Country Statistics, 2011]

1.3 Case 3: 'India' versus her own states

Now if we look at mortality and malnutrition indicators within India, the inconsistency pointed out between India and countries of SSA, is conspicuous across several states within India itself. For example, table 3 shows that stunting and underweight in Maharashtra are very high but IMR and UFMR are much lower than the national average. Even in Punjab, the incidence of underweight and wasting is relatively much lower, but IMR and UFMR are not among the lowest in India. Kerala and even Goa and Tamil Nadu fare much better on all indicators of mortality and malnutrition (Table 3). At the same time, Manipur, Mizoram, Nagaland and Sikkim in India's north-east have significantly lower levels of mortality than the average level in India; however the incidence of malnutrition, particularly the incidence of stunting in these states is higher than or at comparable level to the Indian average.

Figure 4 reflects that whereas a broad corresponding movement in IMR and child stunting in many states [e.g. in Kerala, Haryana, Goa] in India is apparent, in several states such as Rajasthan, Chhattisgarh, Jharkhand and several North Eastern states, the level of IMR is much higher than national average. At the same time, several of these states have considerably lower level of child stunting than the average for India. This is particularly observed for Arunachal Pradesh, Mizoram, Tripura and Rajasthan [Figure 4].

Table 3. Mortality and malnutrition indicators across states in India (2005-06)

State	Stunting	Wasting	Underweight	IMR	UFMR
Delhi	42.2	15.4	**26.1**	39.8	46.7
Haryana	45.7	19.1	39.6	41.7	52.3
Himachal Pradesh	38.6	19.3	36.5	36.1	41.5
Jammu & Kashmir	35.0	14.8	25.6	44.7	51.2
Punjab	36.7	**9.2**	24.9	41.7	52.0
Rajasthan	43.7	20.4	39.9	65.3	85.4
Uttaranchal	44.4	18.8	38.0	41.9	56.8
Chhattisgarh	52.9	19.5	47.1	70.8	90.3
Madhya Pradesh	50.0	35.0	60.0	69.5	94.2
Uttar Pradesh	56.8	14.8	42.4	72.7	96.4
Bihar	55.6	27.1	55.9	61.7	84.8
Jharkhand	49.8	32.3	56.5	68.7	93.0
Orissa	45.0	19.5	40.7	64.7	90.6
West Bengal	44.6	16.9	38.7	48.0	59.6
Arunachal Pradesh	43.3	15.3	32.5	60.7	87.7
Assam	46.5	13.7	36.4	66.1	85.0
Manipur	35.6	**9.0**	**22.1**	29.7	41.9
Meghalaya	55.1	30.7	48.8	44.6	70.5
Mizoram	39.8	**9.0**	**19.9**	34.1	52.9
Nagaland	38.8	13.3	**25.2**	38.3	64.7
Sikkim	38.3	**9.7**	**19.7**	33.7	40.1
Tripura	35.7	**24.6**	39.6	51.5	59.2
Goa	**25.6**	14.1	25.0	15.3	20.3
Gujarat	51.7	18.7	44.6	49.7	60.9
Maharashtra	46.3	16.5	37.0	37.5	46.7
Andhra Pradesh	42.7	12.2	32.5	53.5	63.2
Karnataka	43.7	17.6	37.6	43.2	54.7
Kerala	**24.5**	15.9	**22.9**	15.3	16.3
Tamil Nadu	**30.9**	**22.2**	29.8	30.4	35.5
India	**48.0**	**19.8**	**42.5**	**57.0**	**74.3**

Source: International Institute of Population Sciences (2007)

Clearly the argued role of WHO norm in over-estimation of malnutrition in India, due to inherent negligence of genetic variations, while appears valid, fails to explain the stark inconsistencies in trends of mortality and malnutrition across several countries of Sub

Saharan Africa, several states within India, and across the countries of South Asia including India. Importantly, it needs to be questioned as to how the WHO international standard exaggerates malnutrition estimates for India only, when all other countries of South Asia also have lower levels of malnutrition.

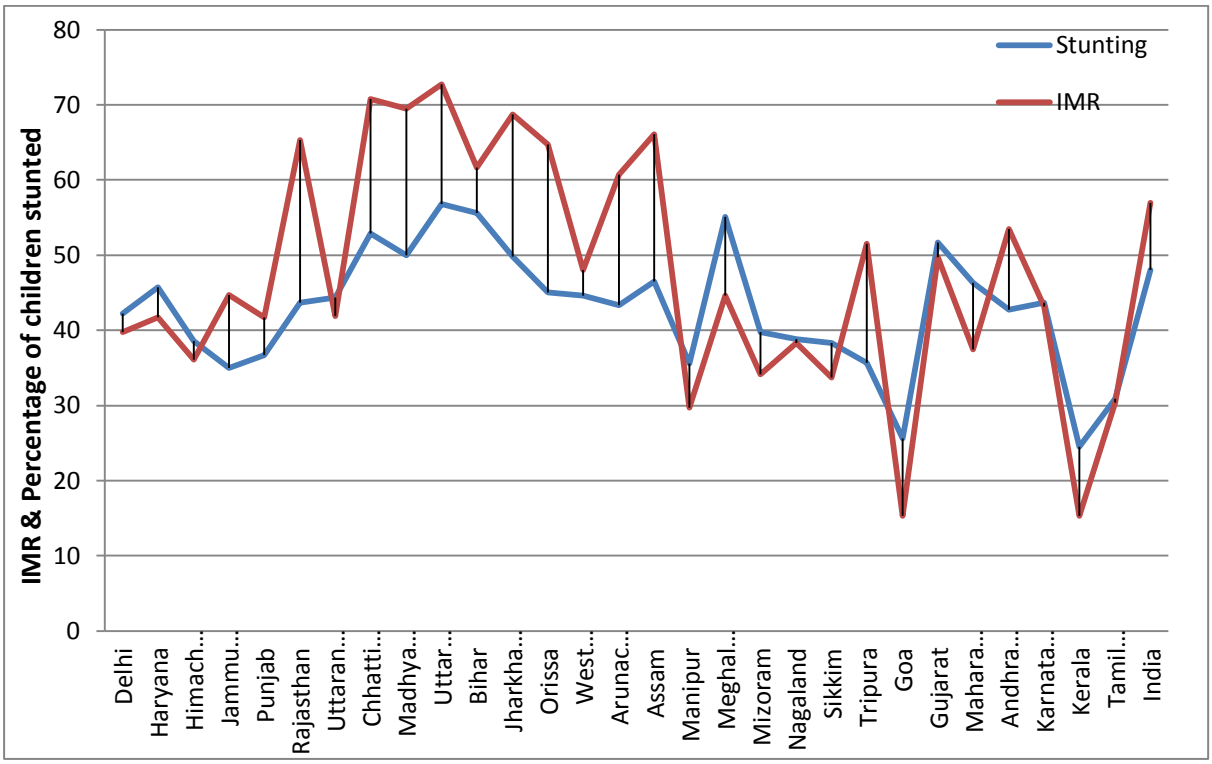

Figure 4: Lack of convergence between levels of IMR and incidence of child stunting across states in India [Source: Constructed from International Institute of Population Sciences (2007)]

The intent behind the foregoing review of intra - SSA and intra- India data on malnutrition and mortality, has been to underscore the fact, that mortality and malnutrition indicators do not necessarily move in similar direction, anywhere. Therefore lower levels of mortality in India against the higher levels of mortality in several SSA countries do not unequivocally imply that the former should have a commensurate edge over the latter, on all parameters of health and nutrition. Consequently, the contradictory performance of India and countries of SSA on reducing infant mortality and child malnutrition becomes as much an issue within SSA and within India. As noticed above, this also reflects the limitation of genetic factors in explaining mortality versus malnutrition contradiction between Sub Saharan Africa and South

Asia. Certainly, this limitation is indicative of the existence of some other factors underlying the divergence between behaviour of mortality indicators and that of nutrition indicators.

2. SSA versus India 'OR' Growth and Mortality versus Malnutrition?

Another argument questioning the inexplicable gap between malnutrition levels in Sub Saharan Africa and India, is made with reference to impressive growth performance of the latter in contrast to the former [Khasnobis and James 2010, Cohen 2007]. During 1991-2011 the per capita Gross Domestic Product (GDP) has grown at merely around 1.4% per annum in Sub Saharan Africa, whereas South Asia during the same period witnessed a growth rate of around 4% per annum [UNICEF 2011]. During the same period, the percentage of population below international poverty line of $ 1.25 declined in South Asia from 53.8 to 31 but it remains high in Sub Saharan Africa at staggering level of 48.5 (Global Monitoring Report 2013[2]). While, several countries of Sub Saharan Africa such as Niger, Djibouti, Eritrea and Zimbabwe actually witnessed a negative annual growth in per capita GDP during 1991-2011, per capita GDP in India grew at an average rate of 5% per annum during the same period [UNICEF 2011]. Given the near unanimous perception of growth as a fundamental precondition for reducing human poverty [Dreze and Sen 1989], relatively lower child malnutrition in many countries of Sub Saharan Africa than in India has been baffling for the research as well as policy arena across globe. This section inquires into this debate by examining the trend of growth, malnutrition and mortality across countries of Sub Saharan Africa and South Asia. In addition the role of HIV prevalence towards higher mortality levels in Sub Saharan Africa is examined separately, which is expected to dissolve part of contradiction between SSA and India. In the process, the need to consider separate characteristics of determinants of child malnutrition and mortality also comes forth strongly, wherein the role of growth and income becomes more important for the latter.

3.1 Growth and Nutrition: there is no convergence by default

Figure 5 depicts movements in percentage of population below international poverty line [BIPL] of $ 1.25 per capita per day and in incidence of child stunting against growth rate in per capita GDP per annum across countries of Sub Saharan Africa and South Asia. The figure depicts the trend separately as well as parallelly for SSA and SA. As seen from the figure,

[2] Joint publication of World Bank and International Monetary Fund

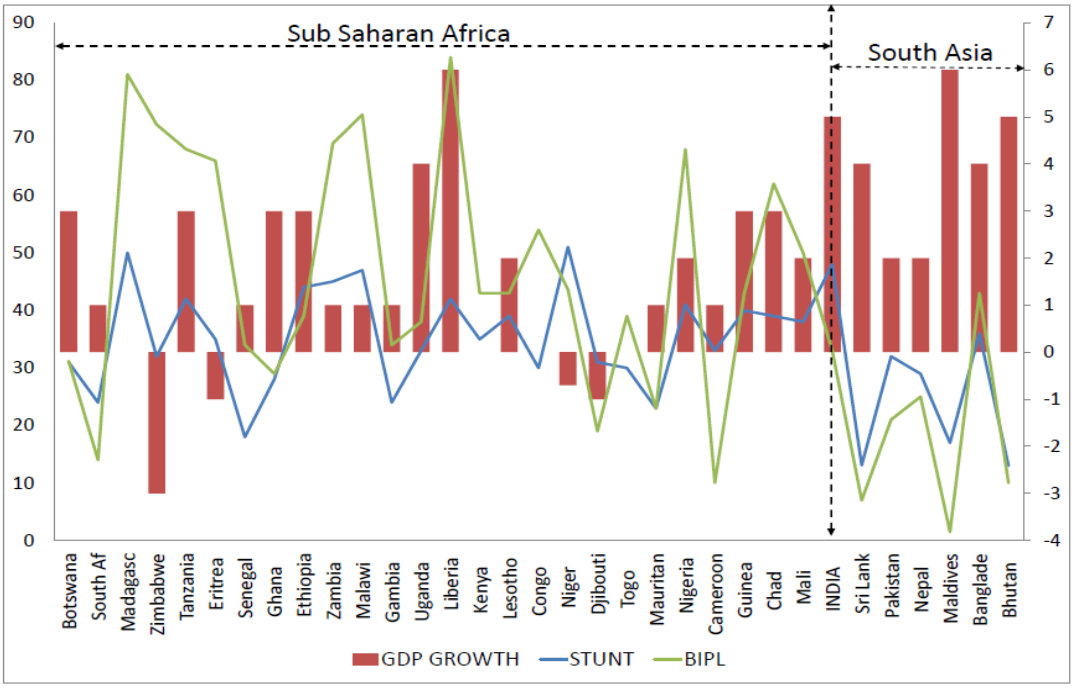

Figure 5: Annual Growth Rate in Per capita GDP [2007-11] and Percentage of stunted children across nations of Sub Saharan Africa and India [Source: Constructed from UNICEF Country Statistics 2011]

Uganda and Liberia appear to be achievers of relatively impressive growth rate within the context of SSA. While per capita GDP in Liberia grew at 6% per annum during 1991-2011, incidence of poverty and child stunting in the country is very high at 84% and 42% respectively. Ghana, Ethiopia and Tanzania have witnessed a growth rate in per capita GDP of 3% per annum, but incidence of poverty and malnutrition in the three countries differ significantly from each other. The percentage of population below poverty line in the three countries is 29, 39 and 68 respectively, whereas the percentage of stunting among children below five years of age is 28, 44 and 42 respectively. Again, while per capita GDP in Zimbabwe grew at negative rate of -3.0 % per annum, the incidence of child stunting in the country is comparable to that in Botswana and Uganda which grew at 3% and 4% per annum respectively. Clearly, there is no consistent convergence between improving growth scenario and declining poverty or malnutrition trend, as far as countries in Sub Saharan Africa are concerned. Levels of economic growth as well as incidence of poverty and malnutrition witness significant variations across countries of SSA.

Figure 5 also depicts growth, poverty and malnutrition scenario in countries of South Asia and it can be seen that South Asia has greater consistency as far as performance in per capita GDP per annum during 1991-2011 is concerned. Maldives is the highest growing economy and has, along with Bhutan and Sri Lanka, the lowest poverty and malnutrition levels in South Asia. At the same time, India despite having seen a per capita GDP growth rate of 5% per annum during 1991-2011, has 33% of its population below international poverty line and 48% of its children stunted. In addition, these rates of poverty and malnutrition in India are higher than that in Bangladesh and Pakistan which have grown at relatively much lower level.

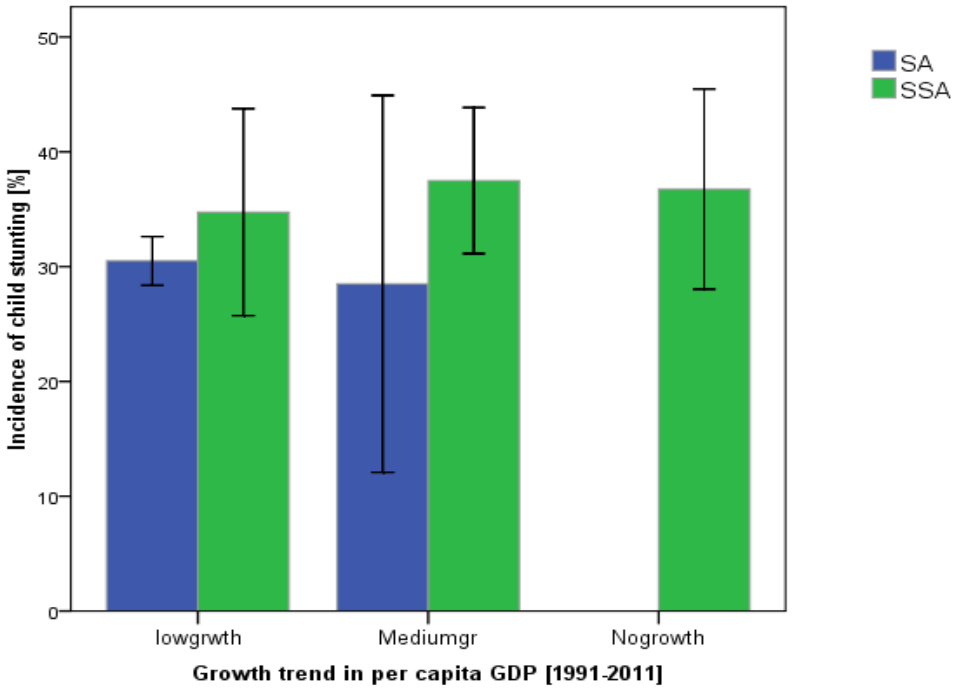

Figure 6A: Incidence of child stunting across three growth bands in SSA and SA [*Source*: Constructed from UNICEF Country Statistics 2011]

Figure 6 [A,B & C] shows incidence of child malnutrition by all the three indicators viz. stunting, underweight and wasting in Sub Saharan Africa and South Asia across three different growth bands. The three growth bands are defined as: low growth – per capita annual GDP growth rate of 1-3%; medium growth – per capita annual GDP growth rate of 4-6%; and no growth – per capita annual GDP growth rate of zero or lower. Figure 6A shows that irrespective of the growth band, incidence of child stunting in Sub Saharan Africa is higher than that in South Asia and there is high variability in incidence of stunting in low

growth countries of SSA and medium growth countries of SA. Incidence of underweight and wasting among children is lower in SSA than in SA regardless of growth contexts [Figure 6 B & C]. High variability in incidence of malnutrition in medium growth countries of SA could primarily be attributed to contradictory growth – malnutrition continuum in India.

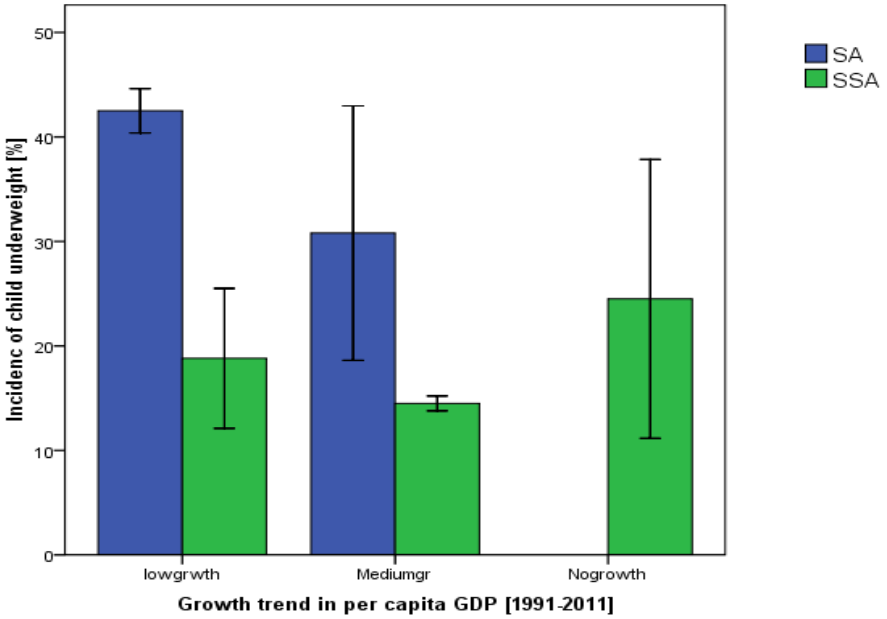

Figure 6B: Incidence of child underweight across countries with three growth bands in SSA and SA [*Source*: Constructed from UNICEF Country Statistics 2011]

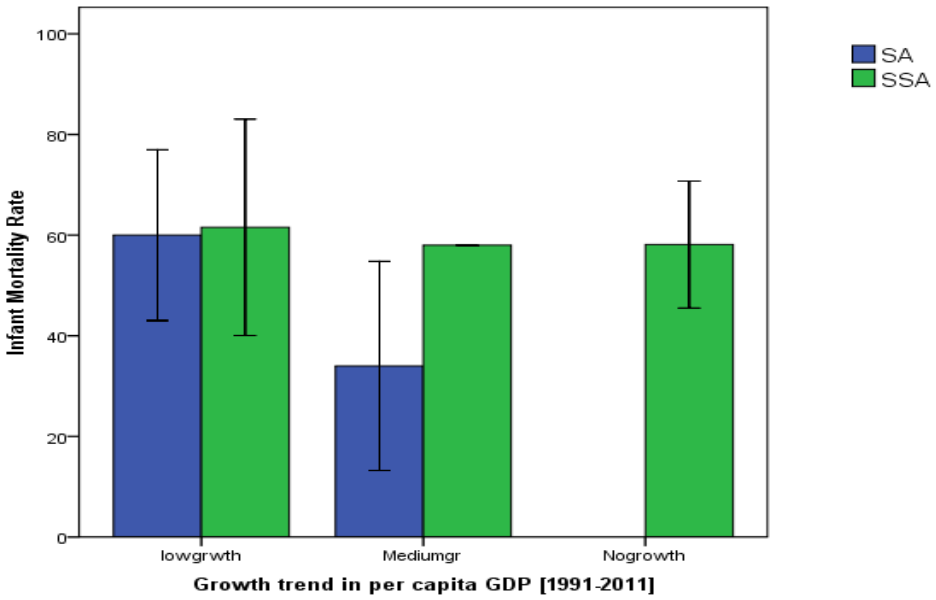

Figure 6C: Incidence of child wasting across countries with three growth bands in SSA and SA [*Source*: Constructed from UNICEF Country Statistics 2011]

Clearly again, the growth – nutrition relationships is as much a conundrum within South Asia and within Sub Saharan Africa as between Sub Saharan Africa and India. Further, figure 5 also reflects a unique 'poverty – malnutrition' relationship in SSA as different from SA. While in South Asian countries, poverty and malnutrition trail each other closely, in SSA, there is large gap between these two and in fact, there is no consistency in the movements of these two indicators of deprivation across countries of Sub Saharan Africa. While, this pattern again reinforces the argument put forth earlier that there are underlying factors – other than growth and income - functional behind given levels of child malnutrition, it also reflects the 'multidimensional and non income – based' characteristics of deprivation, of which malnutrition is crucial form.

3.2 Growth and mortality: Contribution of HIV towards higher MMR and IMR in Sub Saharan Africa

Figure 7 and figure 8 show scatter of IMR on annual per capita GDP growth rates in South Asia and Sub Saharan Africa respectively.

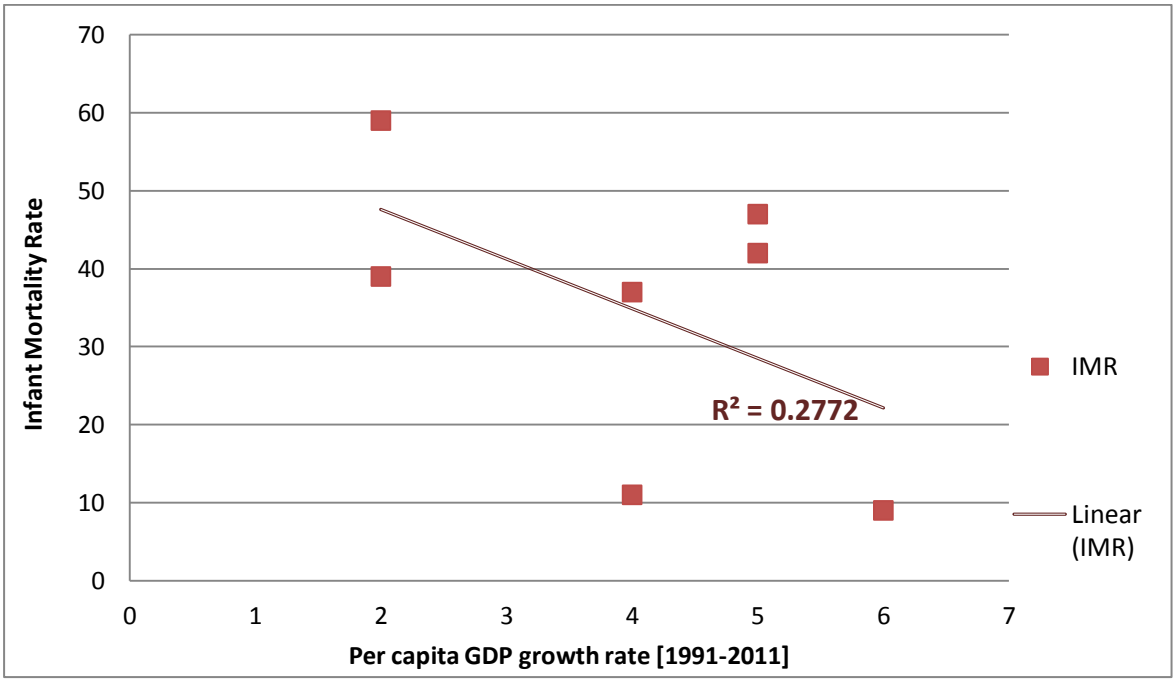

Figure 7: Scatter of Infant Mortality Rate on Per Capita GDP Growth Rate across countries of South Asia [*Source:* constructed from UNICEF Country Statistics, 2011]

The downward linear fit for countries in South Asia clearly reflects the general trend of declining IMR with improving growth scenario (figure 7). As per capita income on average improves, survival chances of children improve due to enhanced ability of parents to seek life saving medical services. However, this trend is not visible from scatter plot for countries of Sub Saharan Africa (figure 8). The linear trend of IMR is flatter and a poor fit, indicating the rigidity of infant mortality to respond to improving growth levels. Ostensibly, mortality in countries of SSA is mediated by additional factor i.e. prevalence of HIV, as discussed below.

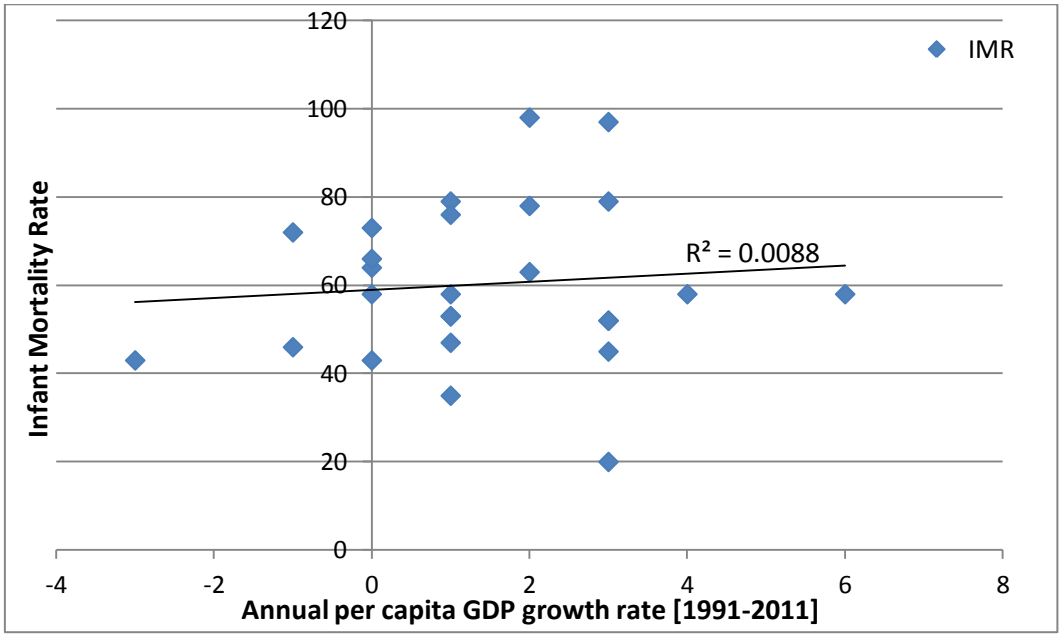

Figure 8: Scatter of Infant Mortality Rate on Annual Per Capita GDP Growth Rate across countries of Sub Saharan Africa [*Source:* constructed from UNICEF Country Statistics 2011]

Table 1 earlier presents the very high levels of Maternal Mortality Ratio (MMR) among most of the countries of Sub Saharan Africa as compared to India, which is another factor reinforcing the qualms on relatively higher malnutrition in India. Maternal Mortality Ratio (MMR) is consistently lower in India than all Sub Saharan African countries, wherein MMR in Chad, Liberia, Cameroon and Mauritania are the worst and are in fact, alarming. This significantly higher level of MMR in SSA as compared to India has also been used as an argument espousing over-estimation of child malnutrition in India relative to SSA countries [Panagariya 2013:101). However, what is often overlooked in analyzing alarming levels of MMR in SSA in context of malnutrition analysis, is the most marked prevalence of HIV in countries of Sub Saharan Africa, which makes pregnancy more vulnerable to death, leading to high rates of mortality and disability associated with HIV/AIDS (WHO 2009). In the year

2010, women comprised 59% of people living with HIV infection in the Sub Saharan Africa region (UNAIDS 2010). Thus, despite the strong momentum towards virtual elimination, AIDS is still one of the leading causes of death among women of reproductive age globally and one of the major causes of maternal mortality in generalized epidemic settings.

Figure 9 and figure 10 plot MMR and IMR respectively on HIV prevalence among women and girls [given by women's percentage share in country's population aged 15 years or above and living with HIV] in countries of Sub Saharan Africa. The upward sloping linear fit of MMR and IMR represents the positive contribution of HIV prevalence towards the level of mortality in Sub Saharan Africa. Again, the relatively flattened slope tells us that the movements in the two variables are less than proportionate. Indeed, some countries have been better able to reduce the vulnerability of HIV infected women/mothers to mortality (WHO 2009). Thus, some countries with higher share of HIV infected women, have been able to institute efficacious anti-retroviral regime and mechanism for prevention of mother to child transmission of HIV, resulting in lower MMR and IMR. However, countries which lag behind on this front but have higher proportion of women among HIV infected adult population witness significantly higher level of maternal and child mortality.

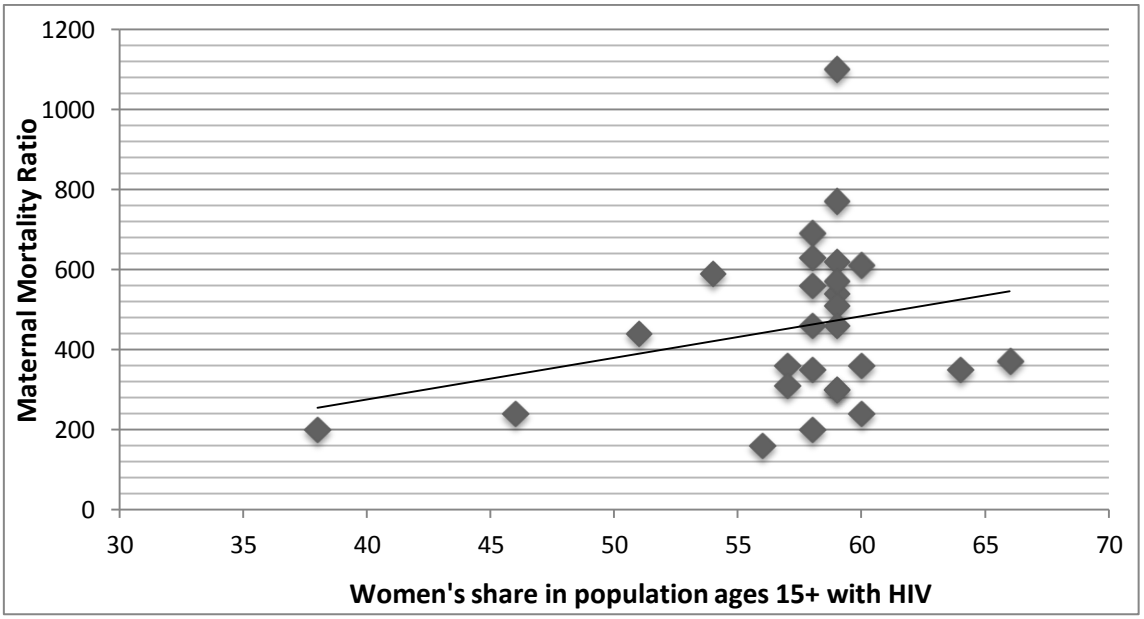

Figure 9: scatter of Maternal Mortality Ratio on proportion of women in population suffering from HIV across countries of SSA *[Source*: Constructed from World Bank[1], 2011]

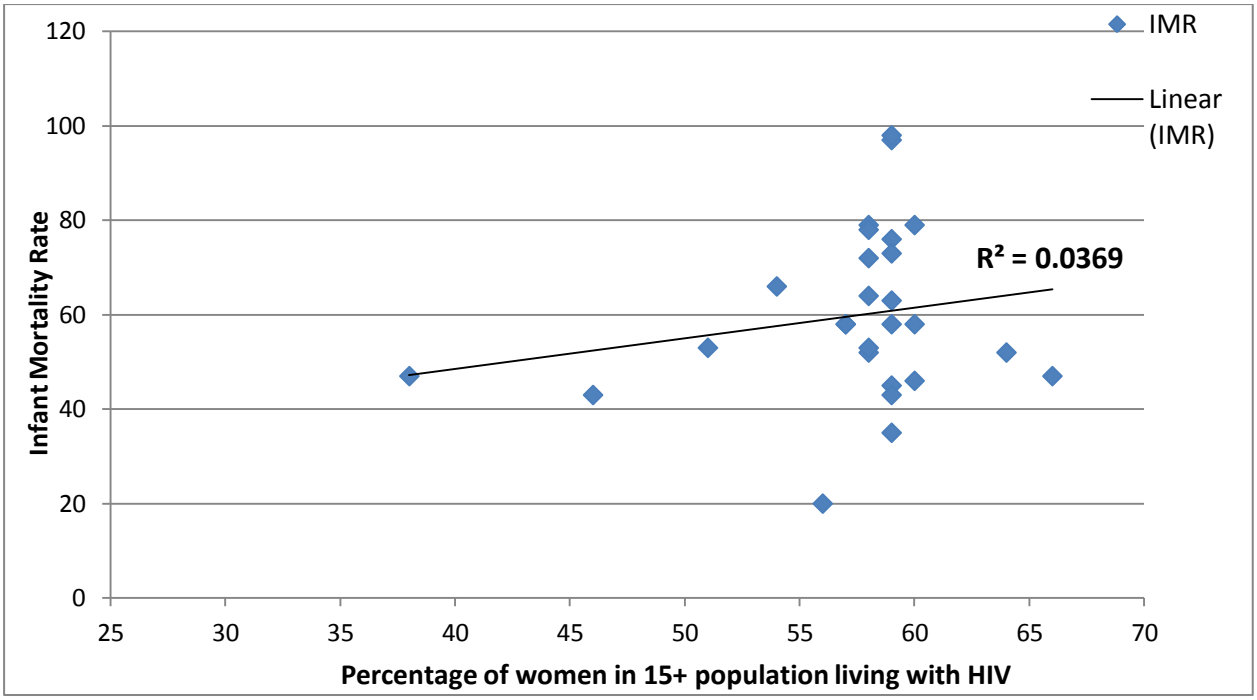

Figure 10: Scatter of Infant Mortality Rate on proportion of women in population suffering from HIV across countries of SSA *[Source*: Constructed from World Bank[2], 2011]

3. Explaining the malnutrition – mortality conundrum: Role of behavioural, structural and policy factors

The convergence and lack of convergence between growth and decline in mortality and between growth and malnutrition, respectively necessarily calls for a structural examination of the contradictory trends in SSA and India. This section makes an attempt in this direction. Using basic indicators on social expenditure, it is observed that more than growth it is the macro structure of a conscious distribution of growth that impinges upon people's nutritional well being. It is subsequently found that at micro level it is access to basic quality of life indicators, care practices and cultural aspect especially the structure of gender relation that has dominating impact on mal/nutrition outcome.

3.1 Sub Saharan Africa, India and the political economy of malnutrition

Malnutrition is not an apolitical issue and tackling it requires a consideration of the political economy and creation of an enabling environment (Gillespie et al 2013). Thus, political commitment to abate the crisis of malnutrition would reflect partly in resources mobilized toward this end and partly in inter- sectoral and inter- governmental coordination and

partnership. Beyond grass-root interventions, there are elements of macro economy that impinge upon the nutrition scenario of a country (Gillespie et al 2013). Public expenditure on issues identified as crucial for nutrition is one of the macro indicators reflecting political commitment and policy priority vis.-a-vis. the issue. Figures 11 and 12, depict this indicator for India as compared to countries of Sub Saharan Africa and South Asia.

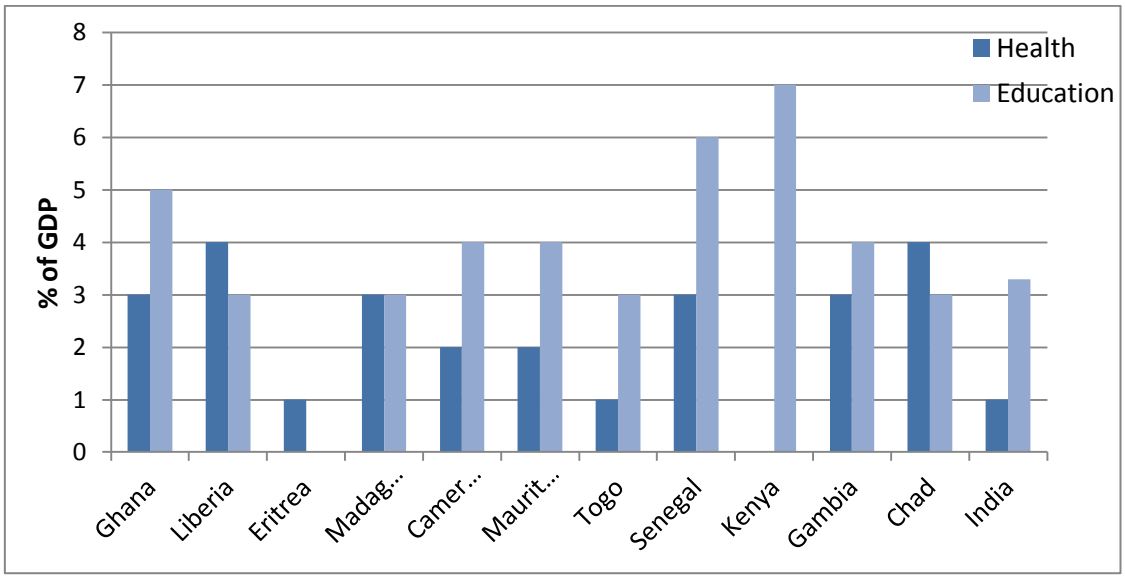

Figure 11. Percentage of Gross Domestic Product (GDP) spent on health and education among countries of Sub Saharan Africa and in India during 2007-10 *[Source*: Constructed from UNICEF Country Statistics, 2011]

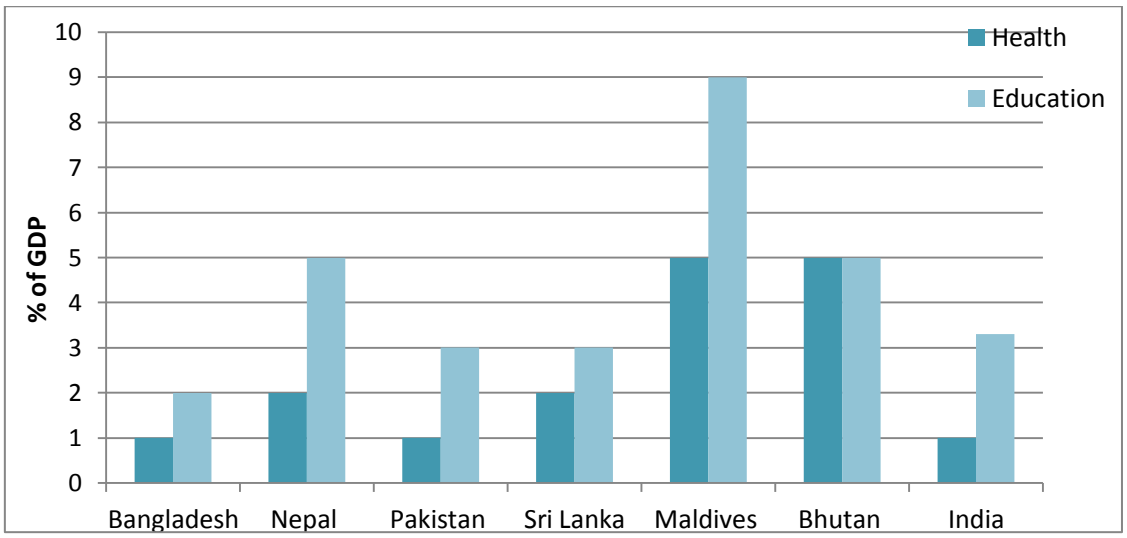

Figure 12. Percentage of Gross Domestic Product (GDP) spent on health and education among countries of South Asian Region *[Source*: Constructed from UNICEF Country Statistics, 2011]

It is seen from figure 11 that public spending on health in Sub Saharan Africa, except in Togo and Eritrea, is considerably higher than that in India. Even Chad spends 4% of its Gross Domestic Product (GDP) on health as compared to just 1% in India. In terms of public spending on education as well, India is significantly behind countries of SSA or is at comparable levels.

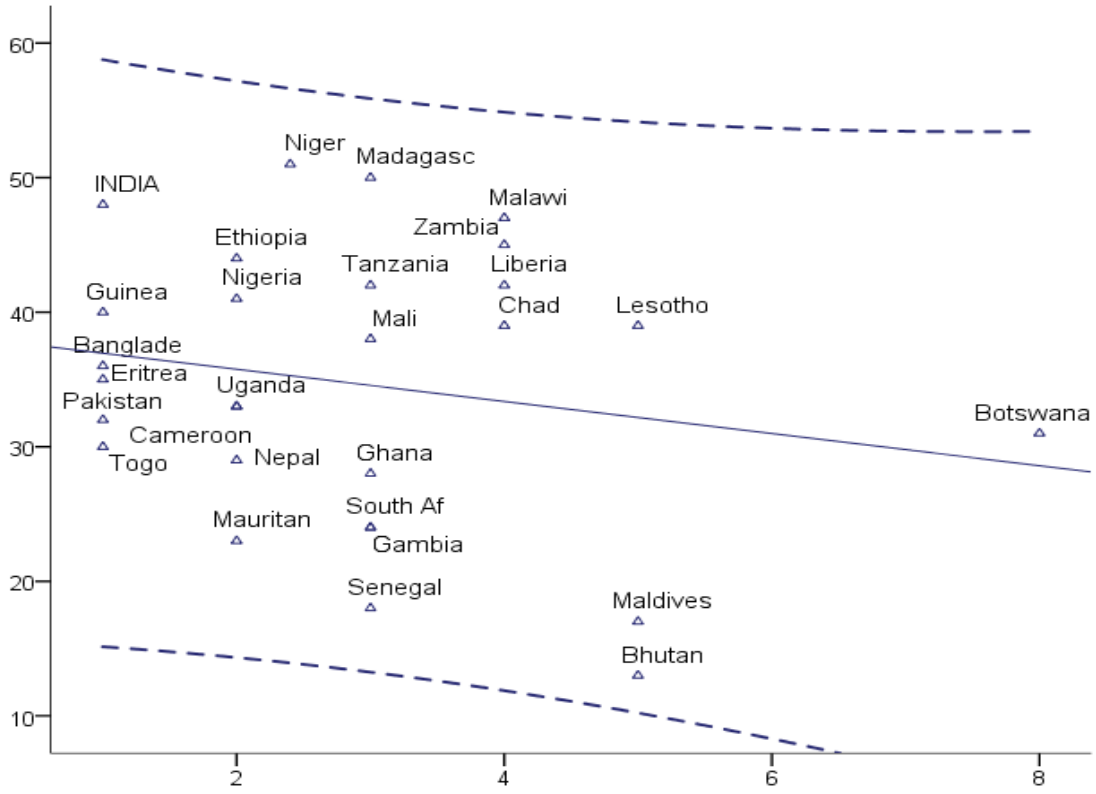

Figure 13: Percentage incidence of stunting among children across Sub Saharan Africa and South Asia *[Source*: Constructed from UNICEF Country Statistics, 2011]

Similarly, among countries of South Asia, only Bangladesh and Pakistan spend a percentage of their GDP on health that is equal to the percentage spent by India, whereas all other countries spend a higher percentage (Figure 12). At the same time, Nepal, Maldives and Bhutan spend considerably higher percentage of their GDP on education than India. Greater public spending on basic health and education is clearly reflected in better nutrition outcomes in nearly all developing countries as compared to India (Figure 13). The downward movement in incidence of child stunting with increase in percentage of GDP spent on health across countries of SSA and SA is clearly reflected in figure 13. Social sector spending, particularly channelled towards women's health and education has multiplier effect on child

nutrition outcomes. However, in India where skewed gender relation is accepted practice, public resources diverted to deal with it, has also been meagre. Thus, it has been aptly noted by Cohen (2007) that gender discrimination has been an important factor in food insecurity and malnutrition, but has been inadequately addressed as well.

3.2 Determinants of mortality versus of malnutrition: institutional structure and role of gender

The correspondence that is often sought between levels of malnutrition and levels of mortality (Panagariya 2013) is difficult to trace in less developed socio economic contexts because the determinants of the two indicators while having some overlaps, are far from being the same. As seen earlier, mortality level seems to be correlated with economic growth rates and is also affected by basic health infrastructure, malnutrition among children has more to do with behaviour, attitudes, and practices. Except for sex selective foeticide, other forms of mortality among infants and children are controllable through increased immunization coverage, access to medical services and parental affordability of emergency medical facilities. Ostensibly, if growth rate is decent, in India, the affordability factor ought to have improved alongside and so the likelihood of decline in mortality.

As shown in the framework on underlying determinants of malnutrition among children, malnutrition beyond starvation has its roots in cultural practices and social norms along with income, and therefore is difficult to control (Diagramme 1). Its correlates range from amount of food to dietary diversity, from shelter, water, hygiene and sanitation to social and cultural values (Cohen 2007). The constraints posed by the latter factors may not result in mortality of infants or children, but certainly carry the possibility of affecting children's nutritional health. This section offers an explanation to significantly higher child malnutrition in India as compared to Sub Saharan Africa, by looking at the performance of countries on underlying determinants of malnutrition.

Diagramme 1 also accommodates the role of gender as a crucial link in malnutrition outcomes. Women's reproductive role – both as the agents of [re]production as well as the primary care givers, positions gender as a crucial link in household food security and child malnutrition outcomes (Costa et al. 2009; Girma and Genebo 2002; Haddad et al 1996; Oniang'o and Edith Mukudi 2002; Smith et al. 2003). At the same time, gendered social norms vis.-a-vis. malnutrition comes into picture in terms of intra-household discrimination

against the female child in allocation of resources especially if these are limited (Choudhary and Parthasarathy 2009; Molini and Nube 2007; Smith et al. 2003).

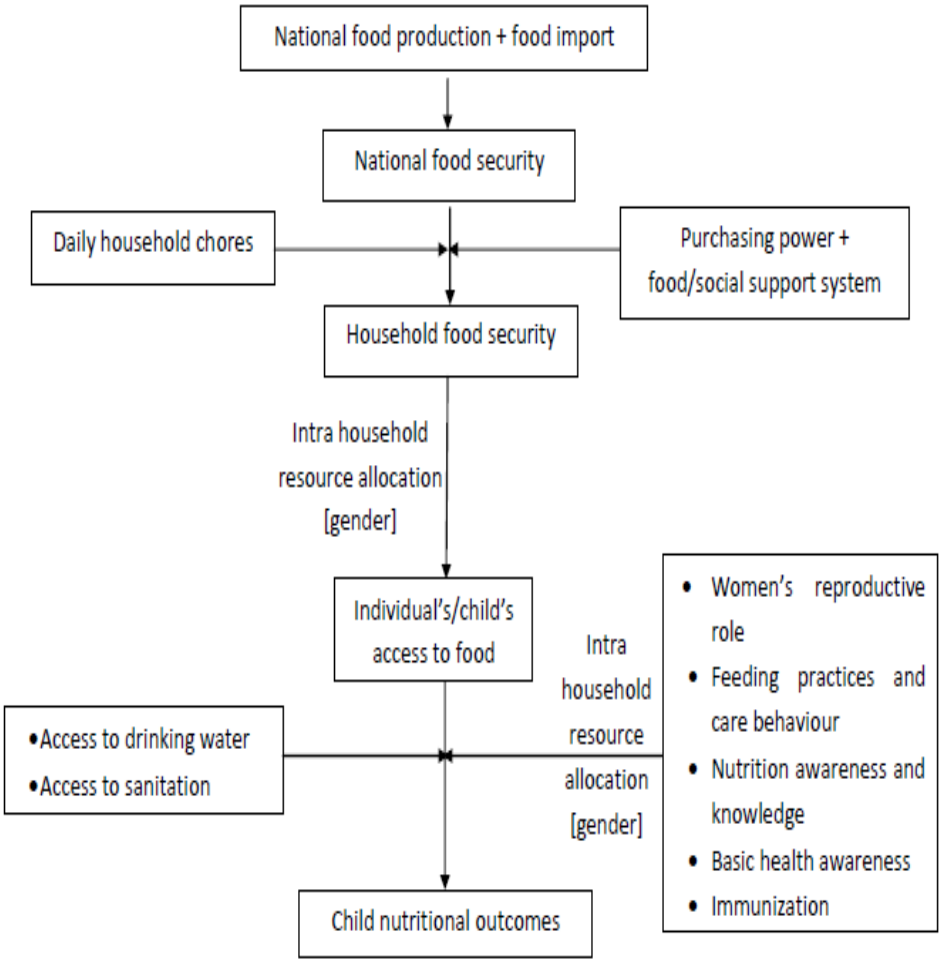

Diagramme 1: Framework on determinants of (child) malnutrition

In fact, greater incidence of child malnutrition in India is largely attributed in the literature to rigid gendered norms and low status of women (Haddad et al. 1999; Smith et al. 2003). Ryan and Spencer (2002: 14), in their comparative study of malnutrition between Semi Arid Regions of South Asia and Sub Saharan Africa (SSA), observe that even if per person food availability and women's education are increased to desired levels in South Asia, projected levels of malnutrition (24 %) in South Asia, as compared to its near-absence in Sub- Saharan Africa will remain inexplicable, which could be attributed to typical role played by gender. Not only are education levels - more importantly nutrition education and knowledge level, among women in India very low and their share in household decision making is determined and influenced by their disadvantaged position within the household. It is very important to underscore here that while better education opens the door to relatively decent work and

better quality of life in general, in India, social and cultural norms predominate in family decision making in almost all walks of life. More than formal education, it is the level and quality of that education (Glewwe 1999) along with exposure and overall progressive background that mediate,- i.) the influence of women's education on child's wellbeing outcomes and ii.) gender inequality outcomes. As is well known, sex selective abortions and foeticide are more practiced in urban areas where education in general and female education in particular, is known to be higher than the countryside. This happens because formal education has not been path breaking in bringing about drastic attitudinal change towards gender inequality. It is argued that education may be useful for nutrition only if it leads to better nutrition knowledge (Charmarbagwala et al. 2004; Girma and Genebo 2002; Glewwe 1999). Thus, better formal education of parents does not necessarily indicate better care practices on their part in India indicating that there is a strong possibility of an existing threshold level, only beyond which parental education and work can be assumed to be representative of better life style and gender equality.

3.21 DYNAMICS OF MALNUTRITION IN SUB SAHARAN AFRICA AND INDIA; GOING BEYOND GROWTH

Figure 14 provides top to bottom ordering of countries of SSA and India, on the basis of respective numbers of deprivations on nine underlying determinants of malnutrition, capturing the dimensions of basic health and civic infrastructure, nutrition knowledge and maternal care practices. For each indicator on underlying determinants, the scale of country performance has been divided in four quartiles. Except for the indicator on 'birth by age 18' countries falling in last quartile of 75-100 on any indicator are considered as non deprived on that indicator; countries that fall in third quartile of 50-74 on an indicator, are considered as relatively deprived on that indicator; countries falling in second quartile of 25-49 on an indicator are considered as absolutely deprived on that indicator and countries falling in first quartile 0-24 of an indicator are considered as chronically deprived on that indicator. Further, the four categories of [non] deprivation are indicated by white, grey, orange and red boxes respectively in the figure 14. For the indicator 'birth by age 18', the order of deprivation to non deprivation is reversed. Also, for indicator on 'difference between male and female under five mortality rates', all countries with positive difference are considered as not deprived, whereas countries with negative difference are considered as deprived.

As seen from the figure 14, in terms of number of deprivation, Djibouti and Malawi are the least deprived among countries of SSA, while Ethiopia falls at the bottom, facing deprivation

on all nine indicators. Interestingly, India is better than only Ethiopia, Chad and Togo in terms of number of deprivations. Moreover, India is consistently better off or comparable to the listed SSA countries only in terms of percentage access to improved drinking water facilities and extent of immunization coverage. The percentage of institutional delivery is low in India while it varies significantly across SSA countries. The percentage of institutional delivery in Ghana, Cameroon, Togo, Gambia and Senegal is considerably higher than India.

Djibouti	95	88	50	35	62	87	92	87	
Malawi	96	83	51	86	69	90	95	73	
Lesotho		78	26	68			92	59	13
Botswana	75	96	62	46	49	95	94	99	51
Ghana	--	86	14	76	37	92	96	67	16
South Africa	44	91	79	49	40	75	97	89	15
Congo		71	18	78	35	90	93	92	29
Zimbabwe	56	80	40	86	21	96	90	65	21
Madagascar	91	46	15	86	17	85	86	35	36
Kenya	--	59	32	85	39	82.37	92	43	26
Tanzania	97	53	10	92	44		88	50	28
Gambia	93	89	68	34	39	94.25	98	56	23
Liberia	96	73	18	51	--	58.4	79	37	38
Uganda	60	72	34	75			93	57	33
Guinea	88	74	18	32	33	79	88	39	44
Zambia	72	61	48	94	60		94	48	34
Eritrea	46	--	--	43	45	98.3	70	26	25
Mauritania	100	50	26	61	20	77.5	75	48	19
Senegal	--	72	52	61	22	85	93	73	22
Cameroon	--	77	49	63	17	73	85	61	33
Nigeria	73	58	31	76			58	35	28
Mali	96	64	22	25	14	80	70	45	46
India	66	92	34	56	26	78.57	74	47	22
Chad	--	51	13	46	13	32	53	16	47
Togo	22	61	13	44	11	82	72	67	17
Ethiopia	71	44	21	55	26	61.25	43	10	22
	Full coverage of Vitamin A supplement	**Improved drinking water**	**Sanitation**	**Introduction of Semi solid food**	**ORS coverage**	**Immunization coverage**	**Ante natal care**	**Institutional delivery**	**Birth by age 18**

Figure 14: Performance of Sub Saharan Africa and India on health and civic infrastructure and other nutritionally significant indicators on care practice and knowledge [*Source*: UNICEF Country statistics, 2011]

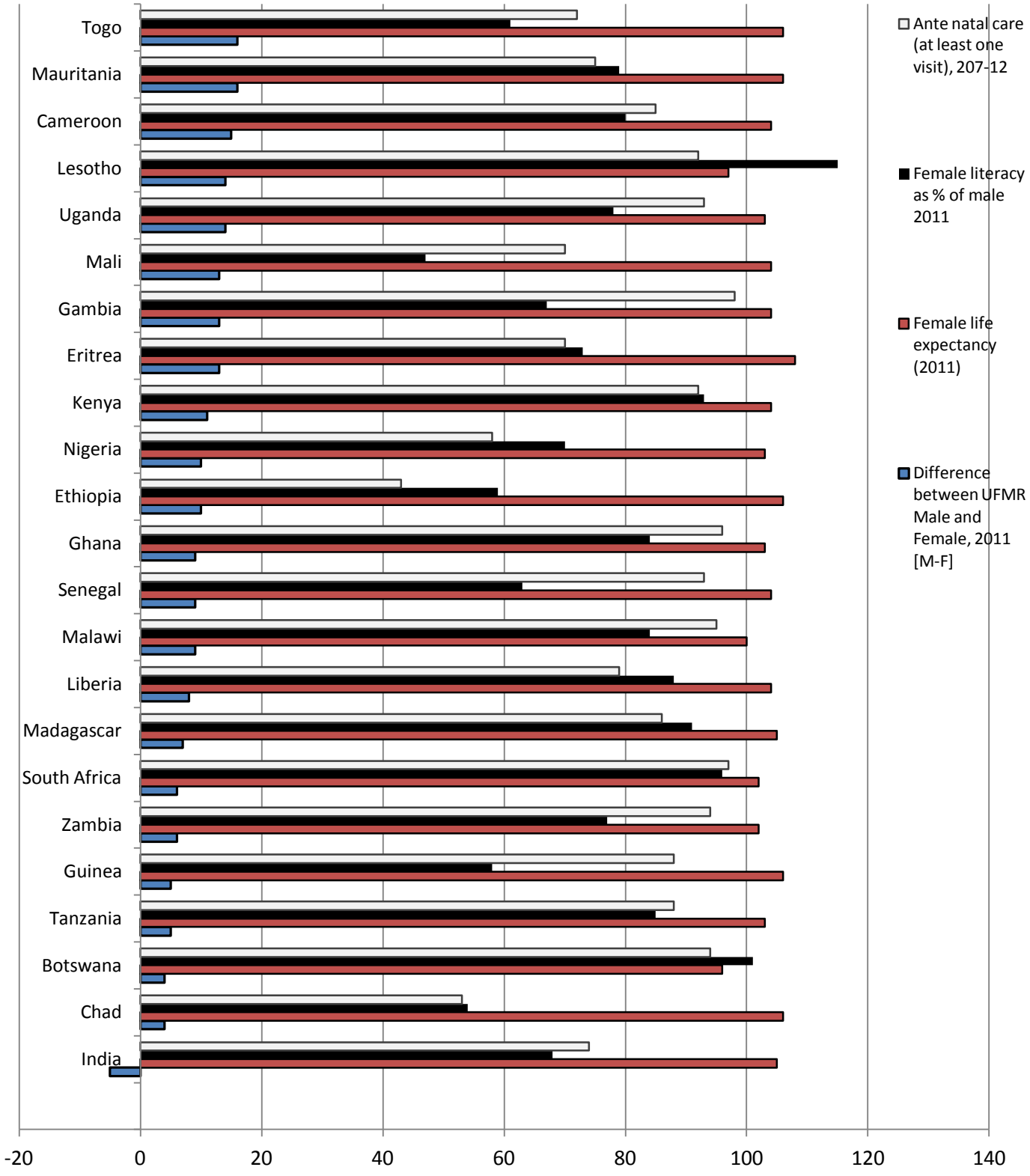

Figure 15: Sub Saharan Africa and India on fundamental indicators of gender inequality: underlying determinants of nutrition [*Source*: UNICEF Country statistics, 2011]

In terms of percentage of infant population introduced to semi solid food and percentage of Vitamin A supplementation, India is more deprived than many countries of SSA. If we look at the percentage of birth by maternal age of eighteen years, it is significantly low in Ghana, Mauritania and Togo, while in Eritrea, Senegal and Gambia, it is comparable to that in India. Maternal age during child birth is an important indicator of married women's own health as well as child nutrition. On all other determinants in the figure 14, the poorest of SSA countries growing with zero or one percentage annual growth rates, perform considerably better than India.

Figure 15 shows that among gendered indicators, adult female literacy in India as a percentage of male literacy rate is lower than nearly all SSA countries listed except Senegal and Togo. In fact, it is only in Chad that female literacy level is lower than in India. Under five mortality rate among females is higher than that for males only in India, which given the greater survival ability and life expectancy of females, is an important indicator of relatively very higher gender inequality in India as compared to the countries of SSA. Life expectancy among women is on average at a uniform level across the countries of Sub Saharan Africa and India. In Chad, which has received separate mention in the arguments of AP (2013), gender equality indicator is far better than India, while on several other indicators, Chad is not commensurately worse than India (figure 14). In terms of maternal care, India's performance is far from satisfactory and in terms of ante-natal care, only Chad is worse than India, while other Sub Saharan African countries are at a comparable level (figure 15).

3.22 Growing beyond growth in South Asia

Figure 16 shows that almost all South Asian countries perform better than India on nearly all underlying determinants of malnutrition – level of health and civic infrastructure and status of gender equality. Only Nepal and Pakistan lag behind India and that too on just two indicators viz. percentage of population with access to sanitation and percentage of infants introduced to semi-solid food. Thus, whereas mortality indicators for Pakistan are worse than India, the level of malnutrition is relatively lower. Similarly, the growth rate in Nepal has been relatively much lower than that in India, however the level of malnutrition in Nepal is lower too. Interestingly, all these countries seem to fare better than India on gender equality.

In terms of gender equality as well, all countries of South Asia are at a much better stage than India (Figure 16). None of the South Asian countries has a greater under - five mortality rate (UFMR) among female children compared to male children than in India. Female literacy is

lower than India, only in Pakistan and Bhutan. In terms of maternal care, Sri Lanka and Maldives fare extremely well whereas India is at the worst or at average on all maternal care indicators. Percentage of birth by maternal age of 18 years is lower in India than only Bangladesh.

		South Asian Countries and India						
		Bangladesh	Nepal	Pakistan	Sri Lanka	Maldives	Bhutan	India
Vitamin A supplementation, full coverage	Indicators of basic quality of life, care practices & nutrition knowledge	94	91	90	--	-	--	66
Improved drinking water		81	89	92	91	98	96	92
Sanitation		56	31	48	92	97	44	34
Introduction of Semi solid food		71	66	36	87	91	67	56
ORS		78	39	41	50	57	61	26
Immunization coverage		96	91.35	80	99	96.21	92	78.57
Ante natal care (at least one visit)		55	58	61	99	99	97	74
Institutional delivery		29	35	41	98	95	63	47
Birth by age 18		40	19	10	4	1	15	22
Difference between UFMR Male and Female [M-F]	Basic Indicators of Gender inequality: Underlying determinants of malnutrition	4	2	8	2	2	7	-5
Female life expectancy as percentage of male		102	103	103	109	103	106	105
Female literacy		85	66	59	97	100	59	68

Figure 16. Determinants of nutrition and mortality across South Asian countries and India

[Source: UNICEF Country Statistics, 2011]

Given that gender inequality and/or disadvantaged status of women as compared to male counterparts, is a crucial correlate of child health and malnutrition outcomes (Khasnobis and James 2010), it is not difficult to explain the strikingly higher incidence of child malnutrition in India as compared to its counterparts from Sub Saharan Africa and South Asia. In fact, it has been found that stunted children are clustered among those households where the position of women is comparatively poor (Khasnobis and James 2010). Moreover, India's performance on critical non food determinants of malnutrition including gendered indicators is considerably worse than many countries of Sub Saharan Africa and worst among countries of South Asia resulting into the persistent contrasts between these regions. These observations further substantiate earlier findings that household food security does not mean adequate diets for all members. Childcare practices (including infant feeding, food

preparation, health-seeking behaviour and supervision of children) can interact with household capabilities in a way that even in households that appear to be relatively well-off, children may be malnourished (Cohen 2007, Hampshire et al 2009).

3.3 Sub Saharan Africa and Kerala – the India's role model of Nutrition well being

The state of Kerala leads the human development achievements in India. Kerala's better performance in health, mortality and nutrition indicators within India has been often linked and perhaps rightly so, with relatively better status of women in the state as reflected from sex ratio, female literacy etc (Panagariya 2013). At the same time, it has been noted that even though Kerala is ahead of other states of India, nutritional indicators connected with under-nutrition are high in the state especially among the marginalized community (Gangadharan 2011). Figure 17 offers a comparison between Senegal and Mauritania from SSA and Kerala from India and provides interesting insight into level of calorie under-nutrition across them. The reason why Senegal and Mauritania have been selected for comparison with Kerala is the specific reference made to them in strong arguments of Panagriya (2013) for defending India's, specifically Kerala's nutrition achievements. Based on the calorie cut off level of 1632 Kilo Calories, (used to ensure comparability with countries outside India), calorie undernourishment in Kerala is 28.6% (Menon et al 2008), which is significantly higher than calorie undernourishment in Mauritania and Senegal at 8% and 19% respectively. While the comparable or higher level of Kerala's Hunger Index score than Senegal and Mauritania may be refuted by Panagariya (2013) due to inclusion of child underweight measure that is based on WHO standards, the higher calorie deficiency in Kerala than the average in India, does not owe itself to any such standard. In fact, as noted above, this incidence is based on calorie cut off level of 2632 Kilo Calories, while the cut off level adopted in India is 2400 Kilo Calories for rural areas and 2100 Kilo Calories for urban areas, by which the actual incidence of under-nutrition would be much higher in Kerala as compared to several other states of India.

Further, as Figure 17 shows, Mauritania and Senegal lag behind Kerala only in terms of sanitation coverage while on all other determinants of malnutrition, either the two SSA countries are at comparable level with Kerala or perform better. In terms of drinking water coverage and percentage initiation of semi-solid food among infants of six months old, Kerala is considerably below Senegal and Mauritania.

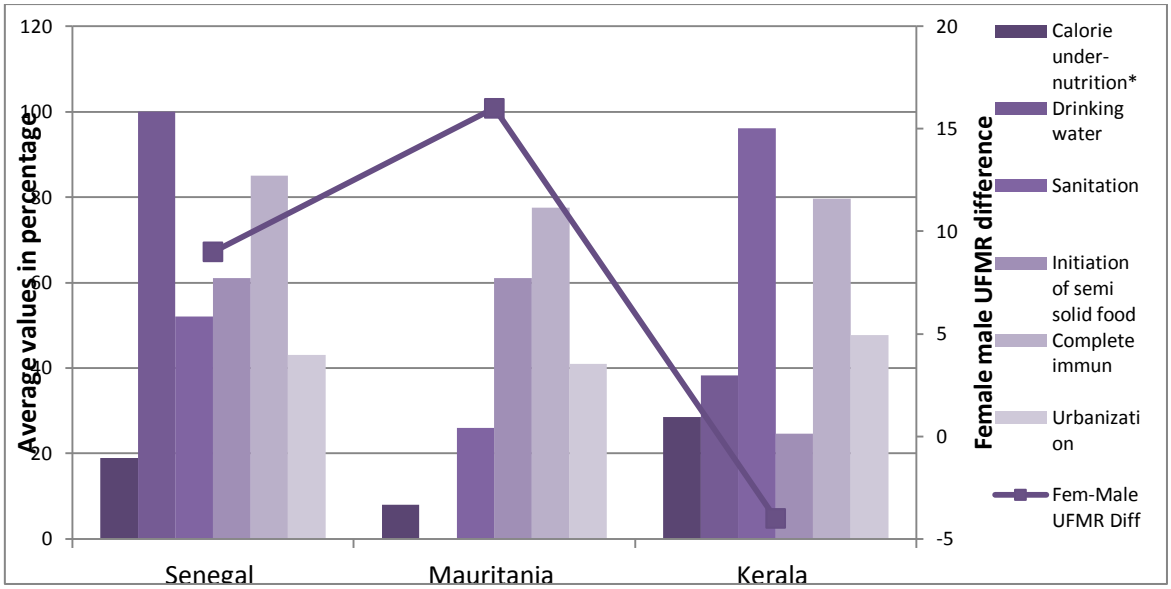

Figure 17. Percentage incidence of Calorie Under-nutrition and underlying indicators of malnutrition: Kerala versus Senegal and Mauritania [*Source*: Constructed from UNICEF Country Statistics, 2011 and Menon et al (2009)]

Moreover, scholars have consistently relied on women's better status in Kerala as an explanation for better nutrition and other health related development indicators in the state (Rondinone 2007). However, one issue that must be assessed in this regard, is the extent to which more-educated mothers (like those in Kerala) are empowered to make choices about their children's food and health care that increase their children's chances for optimal growth and nutritional status (Miller and Rodgers 2009). Indeed, better well being and literacy levels of women in Kerala, do not necessarily indicate transformation in gendered norms and attitude in the state. Rondinone (2007), in the article on sex ratio in Kerala, gives very interesting insights into the actual status of women in Kerala arguing that Kerala women owed their status to traditional matrilineal society which declined subsequently, thereby weakening the bargaining power of women. Rondinone (2007) further states that the women in Kerala despite their better educational and health performances suffer from significant levels of gender discrimination.

4. Concluding remarks

This paper has attempted to analyze the opposing trends of child malnutrition and mortality in Sub Saharan Africa and India with reference recent arguments proposed on this issue. This is followed by a causal framework developed to explain the contradictions and the role of structural factors towards the same. Beginning with an illustration of insufficiency of genetic

factors in explaining the contradictions, the paper attempts a structural explanation of levels of malnutrition in Sub Saharan Africa and South Asia, particularly India. in the proces , the paper also contributes to contemporary debate on role of growth and growth structure vis-a-vis., nutritional well being as form of multidimensional well being of people.

Based on these analyses, it is found that though the role of genetic factors is certainly of relevance in assessing child's growth potential (Kebede 2003), the difference in child mortality between countries does not suffice to establish the role of genetic factors in explaining the difference in malnutrition levels between those countries. Given that Sub Saharan African countries are members of a particular genetic group with higher potentials of height, variation in stunting levels among those countries remains intriguing unless explained by underlying factors. Similarly, the contrasting variations in incidence of malnutrition and mortality across states in India and across countries of South Asia remain unexplained since most of the countries in the region share similar genetic configurations. In this context, it is appropriate to quote Deaton and Dreze (2008: 23);

> *In many cases, being short or lean is not a serious impairment. However, there is evidence that pronounced stunting or wasting in childhood is associated with serious deprivations, such as ill health, diminished learning abilities, or even higher mortality..... While genetics are important at the individual level, they are much less so—and arguably completely unimportant—at the population level, so that populations with a high fraction of people who are stunted or underweight are populations where there is evidence of nutritional deprivation'.*

The observed divergence between growth and malnutrition on one hand and convergence between growth and mortality on the other, underscores the differential character of determinants underlying these phenomena. While mortality across regions is affected by growth and basic health infrastructure, malnutrition is mediated more by social expenditure patterns, civic infrastructure, behavioural factors and social structure, particularly gender. Gender in fact, appears to be a crucial link in malnutrition outcomes. Finally, the paper notes that once the multidimensional nature of human poverty particularly nutritional poverty – is incorporated into holistic analytical framework, the malnutrition – mortality conundrum between Sub Saharan Africa and India is largely resolved.

To conclude, the findings have significant context specific policy lessons for the developing and under-developed countries. Given the relative edge of Sub Saharan Africa on gendered social structure and child health care practices, the policy process can further leverage on this edge to give momentum to reduce child malnutrition. Dealing with AIDS and mother-child transmission of HIV remains the biggest challenge before public policy and international development organizations in addressing the issue of high infant and maternal mortality in Sub Saharan Africa. Of course, within the region, there are lessons to be learnt from countries such as Botswana and Uganda, which have taken innovative initiative and have been able to progress in this direction (UNAIDS 2010).

For India and similar South Asian countries, the public policy and development aid need to divert aggressive focus to underlying determinants of malnutrition viz. decent access to civic infrastructure, increased social expenditure on encouraging progressive care practices and proactive health seeking behaviour and radical initiatives towards gender equality for its instrumental significance for child well being as well as for its intrinsic importance. Systematic linking of these values to mainstream school education, especially in government schools, could expedite our achievements in combating malnutrition.

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