"Health first" needs a clear vision: Understanding the AP Vision 2020 health goals.

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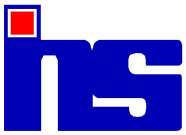

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"Health First" needs a clear vision: Understanding the AP Vision 2020 Health goals[1].

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The "Health First" title of the AP Vision 2020 document's a health chapter and quite aptly summarizes the popular sentiment towards the health sector. The AP vision is to stabilize the population growth and sustain high levels of health by improving nutrition, sanitation, personal hygiene, disease control and prevention. People should have access to responsive basic health care services. The poor and vulnerable should have access to free health care. By 2020 malnutrition will have been eliminated. Pregnancies will be safe. Infant mortality due to diarrhea, respiratory infections etc., will have drastically reduced. The state hopes that these gains in health status will translate as targeted improvement in key health and development indicators. But, there appears some contradictions between the mortality indicator targets set by the Vision 2020 document. For example the document targets to bring Infant Mortality Rate (IMR) down to 10 / 1000 live births and Child Mortality Rate (CMR) down to 20/1000 population. This paper examines the Health First targets set in the Vision 2020 document, discusses plausible arguments that might have contributed towards identification of the targets and examines the feasibility of achieving the targets. We show that the "Health First" targets are unrealistic and require comprehensive revision.

The IMR is conventionally defined as the number of infants, i.e., less than one year, deaths per 1000 live births (WHO, 1981. Pg 67). Where fertility and mortality transition is gradual, which is the case for AP, it would represent well the probability of deaths in the first year of life i.e. q_o (Shryock & Siegel, 2001 Pg 236). CMR is the number of deaths of children aged 1-4 years during a year per 1000 children in the same age group at the middle of the year (WHO, 1981 Pg 68; NFHS - AP[3], 1992, P 128). CMR is same as the age specific death rate for the age group 1-4 ($_4M_1$) which is close to the probability of dying before five years for those surviving till their first birthday ($_4q_1$).

For AP, as in case of India, the Sample Registration System is the primary source of mortality estimates. The National Health and Family Welfare Survey (NFHS) conducted during 1992-93 and 98-99 provide an additional source of mortality estimates. The SRS data is based on half yearly prospective follow up of a state wide sample population. Mortality indicators are directly computed by the SRS from the prospective follow up data. The NFHS

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[1] A draft of this paper titles as "Understanding the Vision 2020 Health Goals" was communicated to the Principal Secretary to Government of AP; Health, Medical and Family Welfare Department; and the Commissioner Family Welfare for their comments, vide the Institute's letter dated 26 October, 2002. No comments were received from either office. The same draft was also communicated to as many members of the Health Task Force, as could be located by the Institute, with a request for their comments. No comments were received as of December, 2003.

[2] Both authors were based at the Institute of Health Systems at the time of the study which took place between June 2002 and February 2003. Their locations as of December, 2003 are as follows. Prasanta Mahapatra: Principal Secretary to Government of AP, Women and Child Welfare Department. Panati Samatha Reddy: MPH Candidate, Boston University School of Public Health.

[3] NFHS 1 correctly and clearly defines child mortality as deaths in 1-4 year age group. NFHS 2 carries a sentence "The annual child mortality rate (deaths of children age 1-5 years)....." in Pg. xxii, NFHS 2, AP 1999 which might give an impression that the authors are referring to 1-5 year age group. A detailed reading of the entire paragraph would show that there is no change in definition of CMR between NFHS 1 & 2.

also provides direct estimate of IMR and CMR, but the data is based on a five year recall by women. Hence the SRS estimate is considered more reliable[4].

Table 1 shows estimates of child mortality in AP during the 1990s from the two major sources, namely (a) the SRS and (b) NFHS. As per SRS data the CMR for the years 1996 to 1998 is 4.9, 3.4 and 4 respectively. Thus according to the SRS estimates child mortality in Andhra Pradesh was already between 3-5 per 1000 children in 1-4 year age group, during the 1990s. Hence the Vision 2020 goal of reducing CMR to 20 by the year 2020 would be redundant. The SRS age specific death rates of 1996-98 give rise to an estimated life expectancy at birth of about 60 years. This corresponds to Coale and Demeny model West Level 17 where IMR equals 70 and CMR could be about 13. Hence the Child mortality levels reported by SRS appears to be underestimates. Even then the Vision 2020 goal of reducing CMR to 20 would not arise. Suppose, members of the Vision 2020 Task Force for Health and Family Welfare, used the NFHS estimate of child mortality, which was about 21-22. Even then, the Task Force in all probability would not set a trivial goal of reducing CMR by 1-2 deaths over a period of 20 years. Hence we conjecture that the Vision 2020 Health Task Force probably meant to target for reduction of IMR down to 20 per 1000 live births and Child mortality down to 10 per 1000 children in 1-4 year age group.

Table 1: Estimates of Child Mortality in AP

Year	Source	Sample Size	CMR $_4M_1$ / 1000
1998	SRS An Rpt, 1998, Tbl-8, p170.	306,000	4.0
1997	SRS An Rpt, 1997, Tbl-8, p170.	312,000	3.4
1996	SRS An Rpt, 1996, Tbl-8, p172.	313,000	4.9
1991	NFHS-1, AP, Tbl-8.3, p130.	4,208	22.4
1998	NFHS-2, AP, Tbl-6.2, p118.	3,872	21.0

Another way of looking at the vision 2020 mortality reduction goals is to examine internal consistency of different mortality indicators to be achieved by the year 2020. For program monitoring and policy planning purposes we use different mortality indicators depending on the context. For example, life expectancy is used to describe the overall mortality level of a population. We use IMR while discussing about socioeconomic status and infant survival issues. Child mortality indicators help focus on interventions targeted at this age group. But the mortality experience of one age group is not entirely independent of the mortality experienced by other age groups. In fact mortality experience at different age groups are known to be closely related. This observation is the basis of various age sex models of mortality such as the (a) Coale and Demeny Regional Model Life Tables (Coale & Demeny, 1983; Coale & Guo, 1989)[5], (b) Brass Logit System of life tables (Brass, 1975) (c) the United Nations Model life table (United Nations, 1982) etc. An important use of these descriptive models of mortality is to check the plausibility of

[4] The reliability of mortality estimates calculated from retrospective birth histories depends upon the completeness with which deaths of children are reported and the extent to which birth dates and age at deaths are accurately reported and recorded. Underreporting of deaths in early childhood (which would result in an underestimate of mortality) and misreporting the date of birth or age at death (which would distort the age pattern of under five mortality) result in non sampling errors. Both problems are likely to be more pronounced for children born further in the past than for children born recently. The NFHS recall period is 5 years compared to prospective follow up by SRS and hence our preference for the later.

[5] The Coale and Demeny model life table functions were first estimated by Coale and Demeny (1966). These were revised by Coale with help of Vaughan (1983). Later Coale with the help of Guo (1989) computed life table functions for low mortality populations. Here we use the nomenclature of Coale and Demeny models to mean the entire set of model life tables estimated by Coale at different points of time with help of Demeny, Vaughan and Guo respectively. This is keeping with common practice among demographers. Where possible we cite Coale's appropriate Co author depending on the source of our figures.

mortality estimates for different age sex groups. Here we seek to use demographic mortality models to asses plausibility of realising all the mortality indicator values targeted in the Vision 2020 document.

The Coale and Demeny regional models include four different mortality patterns, labeled as North, South, East and West models. The West Model is believed to represent the most general mortality pattern because it is derived from the largest number and broadest variety of cases. Among these four the South model represents most high mortality populations. The West model represents most low mortality population. For this reason the West Model is often recommended as a first choice to represent mortality in countries where lack of evidence prevents a more appropriate choice of model (United Nations, 1983). Mahapatra, (2001, Pg 41) examined fit of various descriptive demographic models to Andhra Pradesh, and found that APs population around 1991 closely matched with the Coale and Demeny West model. It was also found that the state had moved from a similarity with the south model around 1960s (Bhat and others, 1984) to the West pattern of Coale and Demeny models. Hence it would be reasonable to assume that the mortality experience of the state would follow the Coale and Demeny West pattern, but with gradually increasing life expectancy. Difference in life expectancy are represented as mortality level in the Coale and Demeny model. For example west model mortality level 14 corresponds to life expectancy at birth of 55 years and level 17 corresponds to 60 years. The AP Vision 2020 health goals targets to achieve life expectancy at birth of 70.6 years for women by 2020. This would correspond to Coale and Demeny west level 21.

Figure 1: Comparison of Vision 2020 goals with Model Life table, NFHS & SRS data.

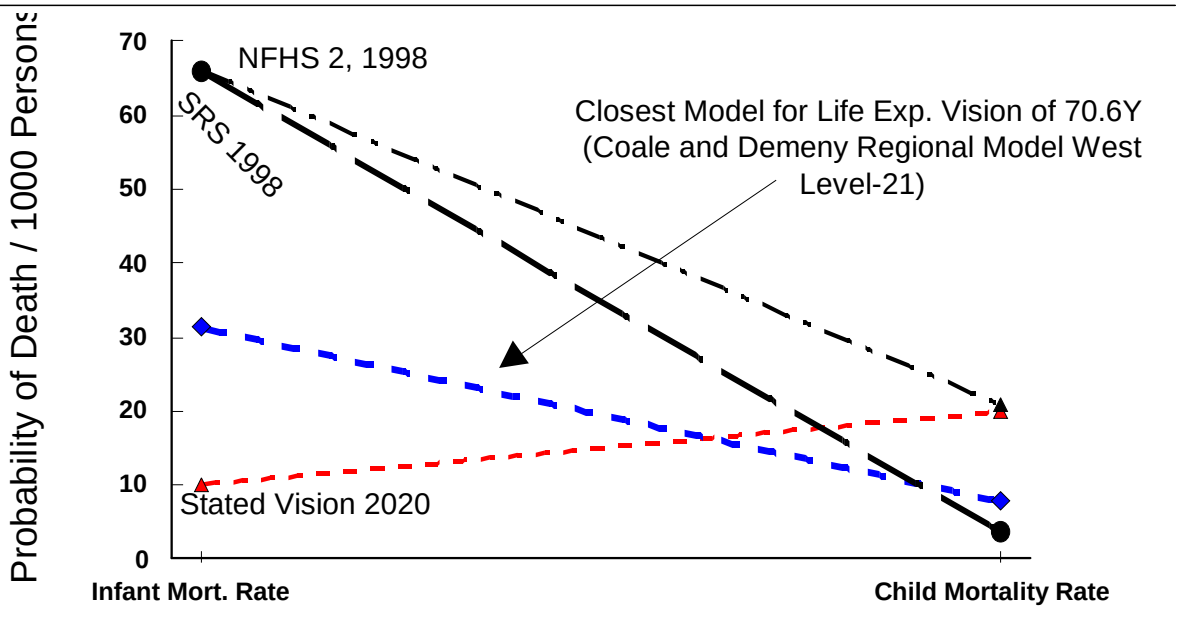

Figure 1 compares the Vision 2020 health goals with model life table and recent data available from SRS and NFHS. The SRS and NFHS data is from the year 1998 and the Coale and Demeny Regional West Model Level 21 is taken as the model life table.

The West Model of Coale and Demeny shows that at Level 21 the life expectancy is 70 which is closest to the life expectancy target of 70.6 in the Vision 2020. The IMR in this Model is 31.4 and CMR is 8 (Coale and Guo, 1989). The IMR target of 10 would correspond

to West Level 24 of the Coale and Guo models. The CMR of this level would be around 2.2 with a life expectancy of 77.5. It is clear from the figure that IMR is usually more than CMR at any level of mortality. The estimates from the SRS and the NFHS also shows similar pattern. But the Vision 2020 goals show exactly the reverse pattern, that appears implausible.

Leaving aside the demographic models, we look at the mortality indicators of selected countries (Table 2) showing IMR of around 10, in the year 1999. In all these countries child mortality ($_4q_1$) is considerably lower than the IMR. Of course these countries have comparatively much less population than Andhra Pradesh (2001 Population = 757 Lakhs, Census of India, 2001).

Table 2: Countries showing IMR around 10 for the Year 1999

Country	Population (Lakhs)	IMR ($_1q_0$)	CMR ($_4q_1$)*	Life Expectancy
Costa Rica	39	13	1	76.2
Bahrain	6	13	3	73.1
Quatar	6	12	4	69.3
Kuwait	18	11	1	76.0
Chile	150	11	1	75.2
Jamaica	26	10	1	75.1
Hungary	100	9	1	71.1
Slovakia	54	9	1	73.1
Poland	386	9	1	73.1

Source: UNDP, Human Development Report, P. 141-142, 154-155, 166-167, 2001. * The report actually gives under five mortality rate i.e. $_5q_0$. We have calculated $_4q_1$ by subtracting IMR from under five mortality rate.

The Health First chapter of Vision document states that by 2020 health indicators in the state will reach international levels. But no specific country is identified in this chapter. In the overview of the Vision document[6], government have referred to various countries as their model of economic development. These include Malaysia, Singapore, Philippines, Korea, China, Japan, Israel, Chile, Mexico, Argentina, Western Australia, New Zealand, US, Canada, UK, Netherlands, Germany, etc. It is possible that authors of the "Health First" chapter are referring to the health status achieved by at least some of these countries. Hence we have tabulated (Table 3) mortality indicators of various countries cited in the Vision document to explore if the AP Vision 2020 target corresponds to any of them.

Philippines has a population similar to Andhra Pradesh and its life expectancy at birth is about 69 years which is close to AP Vision 2020 target of 70.6 years. In 1999, IMR in

[6] For example: Malaysia is cited for infrastructure, electronics assembly , IT and Multimedia. Singapore for its free port, trading and logistics hub. Philippines has been mentioned for infrastructure. Korea has been cited for industrial growth, infrastructure, governance and education etc. China has been cited for agriculture, industry, infrastructure, business promotion, services sector growth etc. Japan has been cited for excellence in manufacturing, infrastructure and governance. Israel is cited for IT and biotechnology. Chile is mentioned for agriculture and Mexico for deregulation to encourage investments. Argentina is cited for the infrastructure. Western Australia has been mentioned for mining industry and New Zealand for dairy industry. US is cited for educational and R&D institutions, trade and logistics centers. Canada and UK are referred in connection with improved responsiveness, accountability and quality of service. Netherlands is recognized as a trade and logistics center. Germany has been cited for manufacturing.

Philippines was 31 and Child mortality rate was 11. i.e. less than one third of the IMR. Mexico is slightly bigger than AP in terms of population. Mexico's life expectancy in 1999 was about 72 years, slightly higher than the AP Vision 2020 goal. Its IMR in 1999 was 27 and CMR was 6, i.e. about one fourth of the IMR. China is of course a much bigger country, but its life expectancy in 1999 was about 70.2 years which is pretty close to the Andhra Pradesh Vision 2020 goal of 70.6 years. IMR in china was 33. China's Child mortality rate was 8 which is less than one fourth of the IMR.

Table 3: Countries cited in Vision document showing population, IMR, CMR and Life Expectancy for year 1999

Country	Population (Lakhs)	IMR ($_1q_0$)	CMR ($_4q_1$)*	Life Expectancy
China	12648	33	8	70.2
Philippines	742	31	11	69.0
Mexico	974	27	6	72.4
Argentina	366	19	3	73.2
Chile	150	11	1	75.2
Malaysia	218	8	1	72.2
US	2804	7	1	76.8
New Zealand	37	6	< 0.5	77.4
Canada	305	6	< 0.5	78.7
UK	593	6	< 0.5	77.5
Israel	59	6	< 0.5	78.6
Germany	820	5	< 0.5	77.6
Australia	189	5	< 0.5	78.8
Netherlands	158	5	< 0.5	78.0
Korea	464	5	< 0.5	74.7
Japan	1268	4	< 0.5	80.8
Singapore	39	4	< 0.5	77.4

Source: UNDP, Human Development Report, P. 141-142, 154-155, 166-167, 2001. * The report actually gives under five mortality rate i.e. $_5q_0$. We have calculated $_4q_1$ by subtracting IMR from under five mortality rate. Where CMR is 0 we have shown it as < 0.5, assuming that IMR and under 5 mortality are shown as equal because of rounding.

Looking at more developed countries with fairly large populations, we find that the UK's life expectancy in 1999 was 77 years, its IMR was 6 and Child mortality rate was less than 0.5. The Child mortality rate in UK was less than one 12th of the IMR. Similarly in case of Germany we find that life expectancy was about 77.6 years and IMR was 5 for 1000 live births. The CMR was less than 0.5 which is less than one tenth of the IMR. Thus we find that Asian countries that have achieved life expectancy close to APs Vision 2020 goal have IMR roughly 30. The child mortality figures in these countries are less than one third to one fourth of the IMR. If we look at more developed economies which have achieved life expectancy higher than AP we find that the IMR is less than 10 and the Child mortality figure is usually less than one tenth of the IMR value. None of these countries have child mortality value higher than infant mortality. Suppose we assume that the Vision 2020 health task force actually meant to fix the IMR target as 20 and CMR target as 10. Even then the child mortality target is clearly much worse than what can reasonably be achieved based on experience from many countries in the world. There is hardly any country where child mortality figure is half the size of the IMR figure. Another possibility could be that the health task force actually had under

five mortality in mind while talking of child mortality. The difference between under five mortality and child mortality is that the former includes IMR with in it and hence its size will be higher than the IMR figure. Thus under five mortality represents the sum of the IMR and child mortality. Since the Vision 2020 sets a target of 10 for IMR and 20 for child mortality which is higher than the IMR we are considering such an interpretation. This would mean that IMR and child mortality figures would be equal i.e. 10 for IMR and 10 for child mortality. That again is implausible considering the empirical experience that in almost every country child mortality figure is much smaller than the Infant Mortality figure.

Hence our conjecture that the Health Task Force might have actually meant to reduce IMR to 20/1000 live births and CMR to 10/1000 live births gains some credence. Even then setting the child mortality target of 10/1000 children, along with an IMR target of 20/1000 live births would imply that we are planning on deliberately neglecting 1-4 year children. This certainly is not the intention of the Vision 2020 document.

The pace and extent of feasible mortality reduction in a given country is dependent on its cause of death pattern and socioeconomic development trends. However certain broad generalizations have been attempted by demographers on the basis of experience from various developed and developing countries. Ariaga (1989) examined trends of mortality decline in various countries during the second half of 20th century. Regarding India, Ariaga finds that mortality declined slowly during 1950s and 60s followed by a more rapid decline during the 1970s. Ariaga believed that pace of mortality decline in India would slow down, after a short period of faster decline. D'Souza (1989) estimated an index of preventable death at various levels of infant mortality. Immunization programs are effective to bring IMR down from a level of around 100, provided under nutrition is under control. Where IMR is between 100 and 30 diarrhea control is required in addition to immunization, to reduce mortality. Where IMR is below 30, one can assume that deaths due to infection and parasitic causes have largely been controlled. A large percentage of deaths at this level of IMR are attributable to congenital and other neonatal causes. D'Souza describes the difficulty of preventing deaths at various levels of IMR and child mortality using a " hard rock" - "soft rock" analogy as shown in Table 4.

Table 4: D'Souza's Index of preventable deaths at various levels of Infant and Child Mortality

IMR	Index of preventable deaths	Rock Analogy	CMR
300	70	Soft rock ie., largely infectious disease. Easily preventable	150
100	40		44
70	30	Intermediate rock, Social change needed	29
30	10		12
20	0	Hard rock. Largely congenital and other neonatal deaths	8

Source: D'Souza Stan. Measures of Preventable Deaths in Developing Countries: Some Methodological Issues and Approaches. in: Ruzicka Lado ,Wunsch Guillaume, Kane Penny, Editors. Differential mortality: methodological and biosocial factors. Oxford: Clarendon Press, 1989

To over come the above inconsistencies between the various morbidity indicator targets, we have to choose one indicator and ignore the others. The female life expectancy target of 70.6 years appears more reasonable to us. Considering the experience of most Asian countries we

think that the IMR target could be reviewed to about 30/1000 live births and child mortality target should be revised to less than 8 per 1000 children.

The power of long term vision and clear goals has been extensively documented. See for example, Collins and Porras (2002, p 219-239). Schiemann and Lingle (1999, p115) have summarized principles for setting effective performance targets. Research shows that targets should be realistic and achievable. People are motivated when there is moderate probability of success. Too difficult and unrealistic goals debilitate rather than motivate. Most people, faced with an unrealistic target simply give up. As Lucas (1997, p 39-48) has pointed out, setting the vision too high may leave those who are actually doing the work out of the process. We are sure that people of Andhra Pradesh want to move ahead. We think that the government's aim is to push the state ahead. Accordingly a realistic revision of vision 2020 health indicator targets is called for. Clearly there are some inconsistencies between various mortality targets. We did not have the time and resources to study other indicators used by the Vision 2020 document. A more detailed study is required to review and recast the Vision 2020 health goals and targets.

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