

Research Article

Vertical versus Integrated/Decentralized Approach to RCH and Family Planning Services in India: The Role of Demography[#]

Shiva S. Halli¹

Abstract

After a decade, Srinivasan (2017) re-iterates his earlier statements based on new analysis on Indian RCH and family planning programs in his book just published, “at the national and international levels such integration did not prove effective....in the case of RCH and family planning”. I think the problem is not with the policy of integration or decentralization rather with problems of implementation and hence, it makes more sense to focus on the processes, and measure process indicators. Process and outcome indicators should be developed to reflect equity, quality, efficiency and responsiveness.

Introduction

I attended the recent book launch in New Delhi titled “Population Concerns in India: Shifting Trends, Policies and Programs” by K. Srinivasan (2017). The take home message was, the chapter 4 titled, “Post-ICPD (1996-2015): Ineffective Integration of Programs”. In fact, this is a continuation of his earlier paper with his IIPS colleagues ChandraShekhar and Arokiasamy. Their argument is that decentralization and integration of health services have not worked. Based on extensive analysis of DLHSs and NFHSs data they conclude that “the state level effects of various RCH indicators significantly higher than those at the district level. The pace of annual progress after 1998 in many RCH indicators is slower than before and a few indicators (e.g., child-immunisation) have worsened, despite the expenditure on the programme being doubled”. Srinivasan re-iterates these statements based on new analysis in his book just published. In his own words, “at the national and international levels such integration did not prove effective....in the case of RCH and family planning”.

The National Health Mission is innovative in its approach. According to the policy, the central government is responsible for designing national health programs but with active participation of state governments. In addition, monitoring and evaluation at the national level would be by the Centre. Moreover, the RCH integration process is supposed to be gradual in order to optimize the utilization of the public health infrastructure at the primary level. However, based on available data, Srinivasan et.al (2007) noted that in 25 out of 29 MCH and Family Planning indicators, pace of improvement during 1998 to 2005-06 is slower than the pace of improvement during the period 1992-93 and 1998-99 and that there is no synergy between different programs. The paper published in 2007 based on information up to NFHS-3, when NRHM was just introduced and its effects were yet to be felt. Now that NRHM (and NHM) has been in place for over a decade, a reassessment is in order.

Government Rationale for Integration and Decentralization

Government of India has an overall mandate of inclusive growth and sustainable development through implementation of various schemes and programmes by provisioning of basic infrastructure, self and wage employment and social assistance. However, besides Ministry of Rural Development and Panchayat Rajya, several other Ministries and Departments are also allocating financial resources under health, education, sanitation, drinking water, electricity, environment to impact the lives of the

¹Professor, Centre for Global Public Health, University of Manitoba Winnipeg, Manitoba, Canada

[#]Base on Sixteenth Dr. C. Chandrasekaran Memorial Lecture in IIPS, Mumbai

Email: shivahalli@yahoo.com

rural people. With the aim of reaching out to the last person in India, the Government conceptualized that converging all the social welfare schemes including health across ministries and departments towards ensuring sustainable programs for the rural people. It is important for the government to ensure last mile delivery, I think convergence approach is necessary to effective, efficient delivery of public services for the overall advancement of the rural areas.

India is the first country to launch a National Family Planning Program in 1952 which focused mostly on population control. After almost 25 years of operation, it was revealed that population control goals cannot be attained in isolation, without ensuring health and well-being of mothers and children. The 'welfare' concept was introduced in the National Family Welfare Programme launched in 1977. In year 1992, Child Survival and Safe Motherhood (CSSM) Programme was launched, where all MCH interventions, so long running vertically, were brought under single umbrella. Following the International Conference on Population Development (ICPD) held at Cairo in 1994, Reproductive and Child Health (RCH) approach was adopted in India in 1997. RCH approach integrated all existing MCH interventions with two additional components of adolescent health and management of RTIs & STIs.

Alternative Perspective

I think that the country like India does not have unlimited resources and vertical programmes cannot be sustainable. The policy of integration is not an ad hoc decision rather argued by the women's groups at the ICPD conference in 1994 that population polices should be not viewed with the sole concern of reduction in fertility rates but as an integral part of programs for women's development, women's rights, women's reproductive health, poverty alleviation and sustainable development. As a signatory to Cairo conference action plan as well as millennium development goals (MDGs), the government of India had to go on a mission mode with its comprehensive RCH and family planning programs in 2005 known as National Rural Health Mission (NRHM) not with an obsession of achieving desired goals of impact, instead its focus on inputs, strategies and programs. Hence, our assessment should include on understanding the processes and thereby the ultimate impact as an outcome of what is done.

I believe that rolling out of Indian health policies is not like rolling out a product such as iPhone 10. When iPhone 10 was rolled out in India, it was guaranteed that all the iPhone stores will have enough supply before the morning of the roll out day, and we knew for sure if we line up before opening of the store, everyone would get an iPhone. The challenges in rolling out of health programmes are coverage and scale with quality especially in the remote rural areas, people with no or little education, which makes it difficult for accessibility and utilization. Therefore, rolling out of health care programs require successful planning at all health facilities and analyzing the base line conditions appropriately, and then need based planning may be prepared by engaging qualified professionals and skilled health care providers. This takes time!

Srinivasn et.al.(2007), observed declining CPR based on their analysis of first NHFS data. They also have observed declining TFR for the same period. However, the decline has not been uniform especially in large states like UP and Bihar, meaning that the pace of fertility decline in these states has been slow. Kulkarni (2017)with his elaborate analysis has shown that the slow pace of fertility transition in the states of UP and Bihar has traditionally been attributed to their relatively higher child mortality and poorer socioeconomic development. In 2013 the Infant Mortality Rate (IMR) in Uttar Pradesh was as high as 57 per 1000 as compared to 40 in India (India, Registrar General, 2014). With respect to the female literacy rate in India, it was 65 percent in 2011 and only 53 percent in Bihar and 59 percent in Uttar Pradesh (India, Registrar General, 2013a). Moreover, Bihar and UP are predominantly rural. If 31 percent of India's population lived in urban area in contrast to only 11 percent of Bihar and 22 percent of Uttar Pradesh. Dyson (2010) has shown that decline in child mortality as the most important and distal factor in fertility transition. Similarly, Cochrane (1979) and Jejeebhoy (1995) have demonstrated the importance of education, especially of females. More importantly, the roles of diffusion of a small family norm and contraceptive use are also recognized (Cleland and Wilson, 1987). Using innovative IEC campaign, Indian Family Planning has

been successful in efforts to popularize a small family norm and provide contraceptive services for fertility regulation. Kulkarni (2017) argues that just as socioeconomic development has not been uniform across the country, so has the implementation of the programme. If we think that contraceptive acceptance was poor particularly in UP and Bihar, there are historical reasons for this. During the 1975-77 internal emergency period, there was excess of coercion in the intensification of the family planning implementation especially sterilization program and the subsequent setback were also severe in this region. The four rounds of the National Family Health Survey (NFHS) have revealed that the unmet need for family planning is very large in these states (IIPS and Macro International, 2007 and 2017); this was 25.1 percent in Bihar and 30.1 in Uttar Pradesh compared to 19.5 percent in India in 1992-93 (NFHS-1), 24.5 percent in Bihar and 25.1 percent in Uttar Pradesh compared to 15.8 percent in India in 1998-99 (NFHS-2), and 22.8 percent in Bihar and 21.2 percent in Uttar Pradesh compared to 12.8 percent in India in 2005-06 (NFHS-3); 21.2 percent in Bihar and 18 percent in UP compared to 12.9 percent in India in 2015-16 (NFHS-4). Clearly, the population programmes in Bihar and Uttar Pradesh have fallen well short of meeting family planning needs of the couples. Hence, in examining the lag in fertility transition in Uttar Pradesh and Bihar, one needs to see whether it is attributable to shortcomings in development or in programme implementation. Based on his thorough analysis, Kulkarni (2017) has concluded that the lack of decline in TFR compared to national average in Uttar Pradesh and Bihar was 50% due to the low level of socioeconomic development in these states, and around 25% was on account of programme implementation deficiency, including effort and efficiency. In fact, way back in 1957 on October 14, inaugurating the WHO's Rural Health Conference for the South-East Asia region in New Delhi, the Union Health Minister, Mr. D. P. Karmakar stated that importance of enlisting the enthusiasm and active participation of rural communities in rural health programmes and important part women members of the community had to play in making it a success. The Minister pointed out that rural health programmes which were not accompanied by programs of rural reconstruction would have little impact of producing desired results.

An alternative approach for assessing the impact

Integration: The integration of health services began with the introduction of the official reproductive and child health (RCH) programs, including family planning services, immunization services for children, treatment of reproductive tract infections (RTIs) and sexually transmitted diseases (STDs) as well as special services for adolescent girls and boys in 1997. I think the effective push for the convergence of different reproductive and child health programs came with the launch of National Rural Health Mission (NRHM) in April 2005, a flagship program by the government of India, to tackle the high burden of maternal, neonatal and child morbidity and mortality among India's rural populations. More recently, the Government of India (GoI) named the program National Health Mission (NHM), to also include coverage of urban poor. Through the NHM, the GoI initiated programs such as the Janani Suraksha Yojana (JSY) in 2005 which provides conditional cash transfers to incentivize women to give birth in a health facility rather than at home. Key aspects of the NHM are its enormous scale, its focus on extending services to the poor, and its inherent flexibility for introducing innovative approaches for improving health system responses to improve reproductive, maternal, newborn, child and adolescent health (RMNCH+A) outcomes. Because the program is new and young, I do not think that comparing the outcome indicators of MNCH services using the first three NFHS data would work. The third NFHS coincides with the launch of NRHM and the fourth NFHS data would have been more suitable. Moreover, the impact assessment of NHM should not only include impact indicators but also the process indicators. To be more specific, the objectives of the assessment should be:

- To identify the strengths and weaknesses in organizational structures, managerial processes, provision of priority health activities, community participation and empowerment, and the management of resources in the health system.
- To provide information on the impact of health sector reform at the level of the district health system.

Through the assessment process, one should be able to identify and describe the health status of the community; factors in the community that contribute to health challenges; and existing community assets and resources that can be mobilized to improve the health status of the community. The community health assessment, therefore, assures that local resources are directed toward activities and interventions that address critical and timely public health needs. Broad community participation via community meetings, focus groups, and other mechanisms, is necessary to ensure that the processes result in a community-driven and owned community health improvement plan. In this regard, government provides lots of inputs into the program. For instance, under inputs, it talks of committees to be formed at each level-village, district, state and national levels-and the activities, including training and monitoring programs. Regarding evaluation, a community health assessment is a useful first step for understanding health status and health risks in a community. This information can help evaluate the impact of prevention activities. In addition, the national level bottleneck analysis of December 2012 of coverage of RMNCH+A interventions identifies following major gaps:

- Limited availability of skilled human resources, especially nurses
- Low coverage of services and of skilled staff posting among marginalised communities
- Inadequate supportive supervision of front-line service providers
- Low quality of training and skill building
- Lack of focus on improving quality of services
- Insufficient information, education and communication on key family practices

It shows that the National Government is aware of the implementation problems. I think the problem is not with the policy of integration or decentralization rather with problems of implementation and hence, it makes more sense to focus on the processes and measure process indicators. Process and outcome indicators should be developed to reflect equity, quality, efficiency and responsiveness. Any way, if I examine Srinivasan's et.al (2007) paper, it shows that all the 25 outcome indicators of RCH programme have shown increasing trends. Only 7 indicators have shown extremely small negative annual percentage changes. The exceptions are annual difference in percentages of age at marriage before 18 years, median age at first birth, those who have two daughters, male sterilization, IUD, condom, mothers who had at least 3 ANCs and children 12-23 months who have received 3 doses of polio vaccine. The age at marriage before the age of 18 is not really a RCH indicator, and median age at first birth to large extent influenced by socio-cultural conditions such as a young bride has to prove her fecundity as soon as she gets married. More importantly, annual percentage difference of negative 0.70 and 0.02 cannot be statistically significant. This argument applies to all the negative differences and the differences that they found are very small. I think better test could have been presentations of the confidence intervals and the position of the estimated percentage differences in the confidence intervals could have helped us to understand whether the differences are meaningful or not in assessing the impact of RCH programme. Besides, sample sizes of NFHS (1992-93) and NFHS (2005-06) such as number of households, and the number of ever married women are not the same. Similarly, we cannot assume that the number of women who gave birth to their first child during the last ten years are similar.

Regarding the indicators such as practice of male sterilization, condom usage and IUD usage, cannot be used to assess the impact of the RCH programme since these indicators were low even during the vertical programme. However, the indicators show that during integration programme there has been steady increase. If at all there is a concern, it should be about mothers receiving at least 3 ANCs. The negative difference of 0.05 is in-significant. Moreover, mothers receiving 3 ANCs has gone up from 43.9 percentage in 1992-93 to 50.7 percentage in 2005-06.

Decentralization: With respect to decentralization, I would like to quote one of my all-time favorites of Gandhiji's Talisman. Gandhiji says:

“Whenever you are in doubt or when the self becomes too much with you, apply the following: Recall the face of the poorest and weakest man whom you may have seen and ask yourself if the step you contemplate is going to be any use to him. Will he gain anything by it? Will it restore him to control over his own life and destiny? In other words, will it lead to Swaraj for the hungry and spiritually starving millions? Then you will find your doubts and yourself melting away”.

I think Government of India delayed in decentralization and there by depriving especially rural Indians the Swaraj, Gandhiji talked of. I think the true success of the decentralization approach is when the community ownership occurs, and the community is not only demand the services and also involve in accountability of government programs. The government has set up autonomous bodies at state level, district level and at village level. The village health and nutrition committees are some of the examples. The government has to make sure that these committees are functional and effective, and if needed focus should be on building the capacity of these committees with respect to their roles and responsibilities.

Srinivasan et.al (2007) analysis whether decentralization is indeed a good policy or not suffers from data limitation. There are a very few cases when we consider states, less than 30. Moreover, the authors have seen lot of variation in RCH indicators among the states especially between north and south. For instance, states such as Uttar Pradesh, Bihar, Madhya Pradesh, Rajasthan, Jharkhand and Chhattisgarh are all having very poor RCH indicators compared to southern states. Naturally, the variance explained will be high. If we separate states with very poor RCH indicators from states who have very good RCH indicators, I am sure we will have different results. Similarly, if we consider northern states like UP, Bihar, Madhya Pradesh, Rajasthan, Jharkhand, Chhattisgarh, etc with poor RCH indicators, these big states will have nearly 50% of total districts, with little variation with respect to RCH indicators. Similarly, other 50% of the districts mostly from the south will have better RCH indicators, again little variation among them. The same argument can be made for villages as sampling units. In these cases, we will have low amount of variation explained and hence, this may not be a good test to verify the policy of decentralization.

Any policy that is based on top down approach, that is made in Delhi, may not become peoples' policy. There are not only regional differences but also district differences. That is why the government has identified not only high priority states and also high priority districts. The government has introduced annual district level Program Implementation Plan (PIP) in order to do the gap analyses in terms of availability, coverage, quality and utilization so that the interventions may be designed to bridge these gaps. In case district teams do not have the capacity for PIP preparation, effective training programs have to be implemented. I agree with Srinivasan et.al.,(2007) that "decentralization of basic healthcare services will not be effective unless backed by full time professional, medical, and para-medical, personnel at that level". Unless front line workers such as Anganawadi Workers and ASHAs are equipped with specialized skills and interests, they cannot be effective and efficient. For instance, ASHA, an acronym for Accredited Social Health Activist, is supposed to be a community liaison person (1 per 1000 people) in every village. She is supposed to be selected from the young, ever-married women of the village with at least middle school education and interested in the community. My experience in UP has shown that most of the ASHAs are illiterate and appointed by the Village Panchayat Head and its members, sometimes from their own relatives. Their thinking could be that similar to Anganawadi Workers (AWWs), one day ASHAs will become government health care employees.

Interestingly, I read an article in the Indian Express of November 28th, 2017 of Delhi edition that Ms. Chandrika Solanki, who had led a protest seeking better wages, benefits and working conditions for ASHA workers, has become a celebrated politician and contesting assembly elections in Gujarat. Similarly, I have seen ASHAs protesting in front of the Government offices and leaders asking for increase in their incentives. These kinds of protests and strikes have worked in favour of AWWs. Sadly, the Government Health Care Officers themselves treat them as Government Health Care Workers and expect them to provide primary health care services, focusing on maternal and child health by taking care of the pregnant women and arranging for and caring during institutional delivery as well as post-natal care. Similarly, AWWs are dumped with many responsibilities as and when new government programs are introduced at the village level. If this is the case, the program effectiveness and efficiency will be compromised.

When the University of Manitoba asked to provide technical support to the government of Karnataka to implement the NRHM program, based on situational assessment of the frontline workers, the university of Manitoba team concluded that the various community interventions should target the front line health worker and community structures. The package of interventions should

comprise of tools, processes and support systems toward achieving the following objectives of community interventions:

- To increase the frequency and quality of interactions between beneficiaries and frontline health workers (FLWs).
- To ensure that all pregnant and postpartum women, newborns and infants enter into MNCH care continuum.
- To ensure that all pregnant and postpartum women, newborns and infants continue in MNCH care continuum.
- Enhance participation of community-level structures in supporting and monitoring the utilization and coverage of MNCH services

In order to ensure that the tools and processes are implemented effectively by the FLWs and VHSCs, a strong capacity building and support system is critical. Particularly the scale of the community interventions need to be considered while designing a project management and support system. The National Health Mission policy is quite flexible and ensures the provisioning of financial resources in addition to technical support but the district level teams have not yet completely comprehended this. During my field trips, I have noticed not only in states like UP and Bihar, and also in Karnataka that District teams are unable to prepare proper PIPs to reflect their needs and required financial resources. Neither the gap analysis nor usage of data have become part of their culture in preparing PIPs. However, efforts are being made by the national and state governments to transform past practices but it takes time.

Role of Demographers in Analysis

IIPS colleagues have made an attempt to address most important policies, especially health policies, of the government of India. They have successfully stimulated better public policy debate and they have gotten everyone to look at the smoke. Now we need to find the source of the fire. Towards this effort, how can demographic analysis contribute to the assessment of the programme? How can demographers answer the questions using their analytical techniques? For instance, demographers can answer why both CPR and TFR are declining. TFR has reached the replacement level and in some states it is below replacement. For a demographer, the immediate answer to this question is Bongaarts TFR decomposition model:

$$TFR = TF * C_m * C_c * C_i * C_a$$

Where TFR=total fertility rate; TF= total fecundity rate; C_m =index of marriage; C_i=index of postpartum infecundability; C_a=index of abortion; C_c=index of contraception;

Just to get some understanding of the puzzle, I computed the following ratios using some preliminary data from NFHS and SRS:

$$\frac{TFR_{IV}}{TFR_{III}} = \frac{TF}{TF} \times \frac{C_{cIV}}{C_{cIII}} \times \frac{C_{iIV}}{C_{iIII}} \times \frac{C_{aIV}}{C_{aIII}} \times \frac{C_{mIV}}{C_{mIII}}$$

Used NFHS-III and NFHS-IV data for TFR; C_c (average effectiveness= 1-1.08 is calculated using the two contraceptive prevalence rates from two NFHS); SRS data is used for C_m (TMFR); and there is no reason to believe that there has been change in C_i; The only unknown is C_a as there is no reliable data on abortion, and this could be estimated to understand the effect of abortion on declining TFR.

$$2.2/2.8=0.786=1 \times 0.98 \times 1.0 \times (?) \times 0.9$$

This shows that nearly 10% reduction in TFR is due to abortions. This could be a plausible explanation since our experience in UP has shown that abortions have increased. We have also anecdotal evidences where there has been use of emergency contraceptive pills to terminate the conception.

Westoff and Bankole (1996) have proposed alternate method to examine the impact of the family planning programme implementation, including effort and efficiency. It is almost impossible to meet all the family planning unmet need. It is possible to compute the prevalence level if need is met realistically following the Westoff-Bankole model. In order to compute the TFR implied by the new prevalence rate, the Bongaarts model (Bongaarts and Potter, (1983)) can be used. Incidentally, Kulkarni (2017) who has done a thorough job in applying Bongaarts model to some of the high fertility states and published in an edited book by Sahoo et al. (2017). It may be useful to refer to the methodology and results of the paper.

Suppose TFR₀ is the actual TFR of the state, and CPR₀ the contraceptive prevalence rate. The multiplier Cc₀ can be computed from the Bongaarts method; If CPR₁ is the prevalence rate after the unmet need is met realistically, the new value of multiplier Cc₁ can be obtained in a similar manner. The implied TFR, say TFR₁ will then be given by $TFR_1 = TFR_0 * (Cc_1 / Cc_0)$. However, even at the national level there is some unmet need. Therefore, an adjustment is required to obtain the TFR if the programme in the state operates at the same level as at the national level. This is done by computing a similar ratio of the multiplier at the national level; the implied TFR (on the assumption of national level programme implementation), say TFR₂, will be given by $TFR_2 = TFR_0 * (Cc_1 / Cc_0) / (Cc_{1N} / Cc_{0N})$. The difference TFR₀ – TFR₂ is then attributable to the programme deficiency relative to the national level. Note that is unmet need in a state is lower than the national level, this will be negative. The unexplained gap, equaling (TFR₂ - TFR_{pred}) is due to other unaccounted factors and interaction between socioeconomic conditions and programme implementation. Thus, the total gap between the TFR of a state, denoted by TFR₀, and the national TFR, denoted by TFR_N, is decomposed as:

$$TFR_0 - TFR_N = (TFR_{pred} - TFR_N) + (TFR_0 - TFR_2) + (TFR_2 - TFR_{pred}).$$

The three components are attributed to deficiency in socioeconomic development, programme implementation, and residual factors respectively. Kulkarni (2017) has done this exercise and applied to the states with above national average TFR and unmet need. (I do not think it is necessary to repeat these computations). If we take case of Bihar and Uttar Pradesh, both of them had the highest TFR, 4.2 in 2006, 1.4 points above the national average of 2.8 for the year. According to Kulkarni's computations, more than half of this was due to the low levels of socioeconomic development, and 0.23 and 0.27 can be attributed to programme deficiency respectively. The results for other big states such as Rajasthan and Madhya Pradesh, the gap is mainly due to poor socioeconomic development. These results have implications to the argument that family planning programs have been overlaid with so many other programs that it has become ineffective in the field. It appears that changes in the programme strategies and practices is justifiable. Couples are motivated and accepted small family norm, there is no need to regulate fertility and persuade them to accept contraception (Kulkarni 2015). Couples seem to control fertility and the challenge for the programmers is to meet unmet need.

Conclusions

In the recent years, the government of India along with other countries in the World are very much concerned in achieving the Millennium Development Goals, specially RMNCH+A outcome indicators.

- In line with the commitment that India made towards achieving the Millennium Development Goals, the Government of India invested significant amount of resources towards the RMNCH+A activities
- Recognizing the varying regional characteristics, a shift in approach was adopted by the government by decentralizing and integrating the health care services
- In examining the challenges with decentralization and integration policies in achieving the MDGs, Prof. K Srinivasan and his co-authors have made significant contribution in highlighting the issues

However, a deeper analysis and debate is needed to ensure that policies are made and implemented properly so that the government's resources are spent in a way beneficial to the billion people in the country.

References

- Bongaarts, J. and R.J. Potter, 1983. *Fertility biology and behavior: An analysis of the proximate determinants of fertility*. New York: Academic Press.
- Cochrane, Susan Hill, 1979. *Fertility and Education: What do we really know?* Washington D.C., Johns Hopkins University Press.
- Cleland, John and Christopher Wilson, 1987. "Demand Theories of the Fertility Transition: An Iconoclastic View", *Population Studies*, 41(1): 5-30.
- Dyson, Tim, 2010. *Population and Development: The Demographic Transition*. London: Zed Books.
- International Institute for Population Studies (IIPS). 1995. *National Family Health Survey (NFHS), India, 1992-93*. Mumbai: IIPS.
- International Institute for Population Sciences and ORC Macro. 2000. *National Family Health Survey (NFHS-2), India, 1998-99*. Mumbai: IIPS.
- International Institute for Population Sciences and Macro International. 2007. *National Family Health Survey (NFHS-3), India, 2005-06*. Mumbai: IIPS.
- International Institute for Population Sciences and Macro International. 2017. *National Family Health Survey (NFHS-4), India, 2012-13*. Mumbai: IIPS.
- International Institute for Population Sciences (IIPS). 2010. *District Level Household and Facility Survey, 2007-08*. Mumbai: IIPS.
- Jejeebhoy, Shireen, 1995. *Women's Education, Autonomy, and Reproductive Behaviour: experience from developing countries*. Oxford: Clarendon Press.
- Kulkarni, P.M., 2015. "Fading out of Neo-Malthusianism in India", VedaPrakasha Memorial Oration, National Institute of Health and Family Welfare, New Delhi
- Kulkarni, P.M., 2017. "Why are Uttar Pradesh and Bihar Lagging in Fertility Transition?" in H. Sahoo, F.Ram, P Paswan, H. Lhundim and Dipti Goyal (eds) *Population Issues : Studies from Uttar Pradesh and Bihar*. New Delhi: Rawat Publications.
- Registrar General, India. 2013a. *Census of India 2011: Primary Census Abstract: Data Highlights, India, Series 1*. New Delhi: Controller of Publications.
- Registrar General, India. 2014. *Sample Registration System Statistical Report, 2013. Report No. 1 of 2014*. New Delhi: Controller of Publications.
- Srinivasan, K, 2017. *Population Concerns in India: Shifting Trends, Policies and Programs*. New Delhi: Sage.
- Srinivasan, K., Chandra Shekhar, and P Arokiasamy, 2007. "Reviewing Reproductive and Child Health Programmes in India", *Economic and Political weekly*, 2931-2939.
- Westoff, C.F. and A. Bankole, 1996. "The Potential Demographic Significance of Unmet Need", *International Family Planning Perspectives*, 22(1): 16-20.