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**Tracking of Outcomes
for Women and Children**

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Background

Meeting the health and family welfare needs of the people remains a major development challenge in India. The National Rural Health Mission has been launched by the Government of India to induce architectural corrections in the public health care delivery system so that the system can effectively meet the health needs of the people of the country. The Mission focuses on: 1) increased public spending on health and family welfare; 2) decentralisation of the public health care delivery system; and 3) empowering the community. Improvement in the reproductive and child health status of the population is one of the focus areas of the Mission. The Mission aims at an accelerated reduction in maternal, infant and child mortality. The Mission covers the entire country but the current focus is on 18 priority states with unsatisfactory status of women and children.

The Government of India has recently introduced the mother and child tracking system (MCTS) to identify and meet the health and family welfare needs of women and children, which constitutes the most vulnerable group of the population. MCTS are designed to track events related to pregnant women and infants. It involves registering all pregnant women at the first sign of the pregnancy by the field level health functionaries and tracking the registered women through the antenatal, natal and the post natal period to ensure that they receive services as per Indian Public Health Standards. MCTS also involve tracking all live births up to five years of age to make sure that they also receive services as per Indian Public Health Standards. MCTS aim at capturing all pregnancies and all live births so as to achieve universal coverage of maternal and child health services which will ultimately lead to significant reduction in maternal, infant and child mortality in the country. Launched in 2009, MCTS is now being implemented in all states and Union Territories of the country after necessary local adaptation.

It is obvious that the MCTS must serve two purposes. First and the foremost, it must facilitate health and family welfare service providers in delivering services to women and children according to their specific needs and as per Indian Public Health Standards so as to achieve universal coverage of 'full' maternal and child health services as guaranteed under the National Rural Health Mission. Delivery of 'full' services to all pregnant women and children, it may be emphasised, is necessary to improve the effectiveness of the maternal and child health services in reducing infant, child and maternal mortality. Exceptionally high maternal, child and infant mortality continue to

be a major population, health and development challenge in India. The National Rural Health Mission also envisages accelerated reduction in the risk of death associated with pregnancy and delivery and the first five years of life.

Second, the MCTS must be able to support health and family welfare managers at different tiers of the public health and family welfare services delivery system in monitoring and evaluating the needs effectiveness and the capacity efficiency of the health and family welfare services delivery system in meeting the needs of pregnant women and children. In the context of maternal and child health services, needs effectiveness means the extent up to which the health and family welfare services delivery system is reaching pregnant women and children. A services delivery system is cent-per-cent needs effective if it is able to reach all pregnant women and children in a community, village or district or state, etc. Capacity efficiency, on the other hand, measures the extent up to which the health and family welfare services delivery system is able to provide 'full' maternal and child health services to pregnant women and children already registered under the system. A health and family welfare services delivery system is cent-per-cent capacity efficient if it is able to provide 'full' maternal and child health services to all registered pregnant women and children.

The needs effectiveness (NE) and the capacity efficiency (CE), in combination, leads to the realised efficiency (RE) of the health and family welfare services delivery system. It can be shown that the realised efficiency is the product of needs effectiveness and the capacity efficiency of the system. In other words,

$$RE = NE * CE$$

A health and family welfare services delivery system may have a low level of needs effectiveness but a high degree of capacity efficiency. On the other hand, the needs effectiveness of the system may be high but its capacity efficiency may be low. In both the situations, improvements in the realised efficiency of the system may be poor and the system may not yield the desired results in terms of the universal coverage of 'full' maternal and child health services. When the capacity of the services delivery system is weak, a high degree of capacity efficiency is generally achieved at low to very low level of needs effectiveness. In such a situation, the system is not able to reach the majority of pregnant women and children who are in need of services and the worst affected are the women and children from the poor, marginalised and the deprived sections of the community and where maternal, infant and child mortality is amongst the highest. Similarly, a high level of needs effectiveness is of little meaning if the capacity

efficiency of the services delivery system is poor. In such a situation, the system may not be able to provide 'full' services to a large proportion of pregnant women and children who are already registered under the system. For improving the realised efficiency of the health and family welfare services delivery system, it is imperative that the delivery of services through the system must be needs effective as well as capacity efficient. It is in this context that increasing the needs effectiveness and improving the capacity efficiency of the health and family welfare services delivery system in delivering maternal and child health services is necessary to achieve the goals and objectives of the National Rural Health Mission. The Mother and Child Tracking System (MCTS) is essentially designed to monitor the needs effectiveness and capacity efficiency of the health and family welfare services delivery system in order to improve the realised efficiency of the system in meeting the health and family welfare needs of pregnant women and children. The realised efficiency of the health and family welfare services delivery system will be 100 per cent when universal coverage of 'full' services to all pregnant women and children will be achieved.

The above considerations constitute the background for the present paper which outlines the conceptual and operational foundations of the Mother and Child Tracking System that may contribute to improving the needs effectiveness and capacity efficiency of the health and family welfare services delivery system in terms of universal coverage of 'full' maternal and child health services. An understanding of the conceptual basis of MCTS will also help in analysing the extent up to which MCTS is able to provide the information necessary for assessing the coverage of maternal and child health services in the context of the goals and objectives of the National Rural Health Mission. This analysis is necessary for concomitant evolution of MCTS as an important architectural correction in the health and family welfare services delivery system.

Needs Effectiveness and Capacity Efficiency of MCH Services in India

A preliminary assessment of the needs effectiveness and the capacity efficiency of the health and family welfare services delivery system in delivering maternal and child health services in India and in its constituent States and Union Territories can be made on the basis of the information related to the proportion of pregnant women receiving 'any' antenatal care services and the proportion of pregnant women receiving 'full' antenatal care services during their last pregnancy. This information is available

through the latest District Level Household Survey (DLHS 2007-08). If the proportion of the pregnant women receiving 'any' antenatal care service is 100 per cent, then it is obvious that the needs effectiveness of the health and family welfare services delivery system is 100 per cent as the system is reaching or covering all pregnant women in the community and the smaller is this proportion, the lower is the needs effectiveness of the system.

On the other hand, the ratio of the proportion of the pregnant women receiving 'full' antenatal care services to the proportion of the pregnant women receiving 'any' antenatal care services is an indicator of the capacity efficiency of the system in delivering 'full' antenatal care services to registered pregnant women. If this ratio is one, then the capacity efficiency of the services delivery system is 100 per cent as the system is able to provide 'full' antenatal care services to all registered pregnant women. It is obvious that this ratio can never be more than one and smaller is this ratio, the poorer is the capacity efficiency of the health and family welfare services delivery system in delivering 'full' antenatal care services to those pregnant women who are registered in the system.

According to the DLHS3, the proportion of pregnant women who received 'any' antenatal care service during their last pregnancy were 75 per cent - 70 per cent in rural areas and 87 per cent in urban areas. This proportion includes both pregnant women who had received any antenatal care service from a public health facility or pregnant women who received any antenatal care service from a private health facility. In any case, it is very much clear that the needs effectiveness of the health and family welfare services delivery system in India is quite satisfactory and, in the urban areas, it covers almost all pregnant women, although, there are significant interstate variations. In Bihar, Jharkhand, Meghalaya, Rajasthan and Uttarakhand, this proportion is estimated to be less than 60 per cent which indicates that the needs effectiveness of the health care delivery system in these states is very low in terms of reaching the pregnant women. By contrast, the proportion of pregnant women who reported that they received 'any' antenatal care during their last delivery were almost 100 per cent in Kerala and Lakshadweep which implies that the needs effectiveness of the health and family welfare services delivery system is almost cent-per-cent in terms of reaching pregnant women. Information available through DLHS 2007-08 also suggests that in many States and Union Territories of the country a needs effectiveness of more than 90 per cent has been achieved but in eight States and Union Territories, it is estimated to be less than 70 per cent according to the information available through DLHS 2007-08.

Table 1
Needs Effectiveness and Capacity Efficiency of Health and Family Welfare Services
Delivery System in India, states and Union Territories
in the context of maternal and child health services delivery

State/Union Territory	Needs effectiveness (%)	Capacity efficiency (%)	Realised efficiency (%)
India	75.2	25.0	18.8
States and Union Territories			
1. Andaman and Nicobar Islands	96.4	50.4	48.6
2. Andhra Pradesh	95.9	42.2	40.5
3. Arunachal Pradesh	63.1	8.6	5.4
4. Assam	74.3	11.4	8.5
5. Bihar	59.1	7.8	4.6
6. Chandigarh	85.9	35.2	30.2
7. Chhattisgarh	79.6	17.2	13.7
8. Dadra and Nagar Haveli	72.1	31.9	23.0
9. Daman and Diu	95.8	45.3	43.4
10. Delhi	91.6	36.7	33.6
11. Goa	99.0	91.8	90.9
12. Gujarat	71.5	27.8	19.9
13. Haryana	87.2	15.1	13.2
14. Himachal Pradesh	86.6	36.3	31.4
15. Jammu and Kashmir	84.3	34.5	29.1
16. Jharkhand	55.3	16.3	9.0
17. Karnataka	90.2	56.5	51.0
18. Kerala	99.8	72.3	72.2
19. Lakshadweep	99.8	68.3	68.2
20. Madhya Pradesh	61.7	13.9	8.6
21. Maharashtra	91.8	36.9	33.9
22. Manipur	75.1	16.4	12.3
23. Meghalaya	55.4	26.0	14.4
24. Mizoram	89.5	36.8	32.9
25. Nagaland	na	na	na
26. Orissa	84.0	27.7	23.3
27. Puducherry	92.8	52.4	48.6
28. Punjab	83.3	17.2	14.3
29. Rajasthan	56.6	11.7	6.6

State/Union Territory	Needs effectiveness (%)	Capacity efficiency (%)	Realised efficiency (%)
30. Sikkim	95.2	28.8	27.4
31. Tamil Nadu	98.9	52.4	51.8
32. Tripura	67.2	19.6	13.2
33. Uttar Pradesh	64.2	5.1	3.3
34. Uttarakhand	55.3	28.2	15.6
35. West Bengal	96.1	20.4	19.6

Source: DLHS 2007-08

- Remarks:
1. Needs effectiveness is defined as the proportion of pregnant women receiving 'any' antenatal care during their last pregnancy.
 2. Capacity efficiency is defined as the ratio of the proportion of pregnant women receiving 'full antenatal care to the proportion of pregnancy receiving 'any' antenatal care during their last pregnancy.
 3. Realised efficiency is defined as the proportion of pregnant women receiving 'full' antenatal care services during their last pregnancy. It is the product of needs effectiveness and capacity efficiency.
 4. In DLHS 2007-08, 'full' antenatal care services include at least three check-up during the antenatal period, either two or a booster dose of Tetvac, and at least 100 IFA tablets.

On the other hand, the capacity efficiency of the health and family welfare services delivery system in providing 'full' antenatal care services to the pregnant women who received any antenatal care service is only 25 per cent for the country. This implies that the health and family welfare services delivery system - either public or private - could provide 'full' antenatal care service to only 25 per cent of the pregnant women who received 'any' antenatal care service during their last pregnancy. More importantly, in Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Haryana, Jharkhand, Madhya Pradesh, Manipur, Punjab, Rajasthan, Tripura and Uttar Pradesh, the capacity efficiency is estimated to be less than 20 per cent whereas Goa is the only state in the country where the capacity efficiency of the health and family welfare services delivery system in delivering 'full' antenatal care service has been estimated to be more than 90 per cent.

The prevailing levels of the needs effectiveness and the capacity efficiency get translated into the realised efficiency of the health and family welfare services delivery system. In India as a whole, the realised efficiency of the health and family welfare services delivery system has been estimated to be less than 19 per cent in terms of providing 'full' antenatal care services to all pregnant women. In 15 states of the

country, the realised efficiency is estimated to be less than 20 per cent with the lowest realised efficiency of just around 3 per cent in Uttar Pradesh. In addition, in Arunachal Pradesh, Assam, Bihar, Jharkhand, Madhya Pradesh and Rajasthan, the realised efficiency has been estimated to be less than 10 per cent on the basis of DLHS 2007-08. Goa is the only State in India where a realised efficiency of more than 90 appears to have been achieved.

If the analysis presented above is any indicator, then it is obvious that with the prevailing levels of the realised efficiency of the health and family welfare services delivery system - public as well as private - there is little scope for the universal coverage of 'full' maternal and child health services which is critical for the realisation of the goals and objectives of the National Rural Health Mission. It is also obviously that improvement in the realised efficiency requires both increase in the needs effectiveness and improvements in the capacity efficiency in most of the States and Union Territories of the country.

Essentials of the Tracking System

There are four key elements in building a tracking system. These are:

- a) Who is to be tracked or the specification of the target group
- b) What is to be tracked or specification of tracking parameters
- c) What are expected outputs of the tracking system, and
- d) What are the outcomes that can be monitored through the tracking system.

A careful consideration to these four essentials elements of any tracking system is necessary to ensure that the tracking system contributes to improving the realised efficiency of the system through increasing the needs effectiveness and improving the capacity efficiency.

The ultimate objective of any tracking system is to improve the realised efficiency in the delivery of services. This means that primary users of the tracking system should be the grass roots level services providers. The tracking system should therefore be designed to suit the grass roots level service providers and should be tailored to their capacity - skills and knowledge. This is necessary to ensure that the tracking system is adopted by the grass roots level service providers and institutionalised within the services delivery system. Once the tracking system is institutionalised within the services delivery system,

it will automatically generate information necessary for monitoring the realised efficiency of the service delivery system and can even generate information to evaluate the impact on services delivery. It is important that the tracking system should not be designed and used as a control mechanism.

An important consideration in designing the tracking system is related to the purpose of tracking. A tracking system may be limited to tracking only inputs or it may track both inputs and processes. Finally, rather ambitious, idea is that the tracking system should track all - inputs, processes, outputs, outcomes, and the impact. Another important consideration in designing the tracking system is that it must have an in-built mechanism to ensure the quality, relevance and timeliness of the information generated.

The part of this section discusses key issues related to the four essential elements of a tracking system, namely the target, tracking parameters, expected outputs and outcomes of the tracking system.

The Target

The first and perhaps the most important issue in designing the tracking system is the target group that needs to be tracked. There are two important considerations in this regard. The first is the identification of the target group in the community. It is important that the identification mechanism should be simple and straightforward so that complexities of identification do not result in the loss of the needs effectiveness of the tracking system. For improving the realised efficiency of the system, identification of the target population at right time is the most important.

The second issue in deciding the target group or population is a clear understanding of the purpose of tracking so that the relevance of the target group in the context of outputs and outcomes of the tracking system is clear and known to all, especially the grass roots level service providers. The outputs and outcomes of the tracking system must be related to immediate, intermediate and ultimate goals and objectives of the maternal and child health services - universal coverage of 'full' maternal and child health services.

Tracking Parameters

There are two perspectives in this regard - the user perspective and the provider perspective. The user perspective is related to the beneficiary of the services delivered through the system. The provider perspective, on the other hand, is related to the services provider. Sometimes, services provided may be related to the given condition

of the beneficiary. Sometimes, they are independent in the sense that services are to be provided to 'all' members of the target group. For a good tracking system both the perspectives are important. The usual practice is to include all possible tracking parameters. This approach should be avoided as increasing the number of tracking parameters will make the system bulky and complex. The tracking parameters should be simple, straightforward and clearly defined. They must be directly relevant to the services being provided so that the importance of tracking is readily recognised. A careful selection of the tracking parameters is very crucial in making the tracking system relevant, especially to the grass roots level service providers.

Tracking Outputs

Tracking outputs are essentially in the form of a trigger mechanism. This trigger mechanism serves two purposes. First it informs the service providers in advance about the beneficiaries registered in the tracking that are to be followed-up for the delivery of specific services. This trigger mechanism can also provide information about the services that are to be provided so that the service provider can plan in advance the service delivery schedule. Second, the trigger mechanism helps in identifying that group of the target population who has not been able to receive services as per the schedule. This identification may help in improving the capacity efficiency of the service delivery system.

The trigger mechanism can also inform the target population in advance about services that are scheduled so that they could avail these services either from any source. In other words, the trigger mechanism helps in generating the demand for services. In this way, outputs of any tracking system have both supply side as well as demand side effects.

Tracking Outcomes

Tracking must ensure improvements in the realised efficiency of the services delivery system through an increase in the needs effectiveness and an improvement in the capacity efficiency. Information available through the tracking system also facilitates analysing the trend in the realised efficiency, needs effectiveness and capacity efficiency of the services delivery system and decomposing the trend in the realised efficiency into the trend in needs effectiveness and the trend in the capacity efficiency. Outcomes of the tracking system thus facilitate programme managers at the State, district and below district levels in planning and programming for the delivery of services and in measuring and monitoring the extent up to which the plan and the programme are able to meet the needs of the target population.

Tracking Health and Family Welfare Outcomes for Women and Children

Based on the foregoing considerations, possible options for designing a system for tracking outcomes for pregnant women and children is outlined in table 2. These options are related to the description of the target population, identification of tracking parameters and tracking outcomes. The most important consideration in designing the tracking system is the selection of the target population. The selection of the target population decides identification of the tracking parameters which determines the tracking outputs and outcomes.

Table 2

Possible options for designing a tracking system in terms of the specification of target population, tracking parameters, tracking outputs and tracking outcomes in the context of outcomes for women and children

Target Population

Who is to be tracked	Base	Issues in identification?
Women	Total women's	Identification of women is relatively a simple. A rapid family survey can provide information about the total number of women that need to be tracked.
Women in the reproductive age group	Total women in the reproductive age group.	Identification of women in the reproductive age group requires count of women by age. Ascertaining age may be problematic when the birth certificate is not available. There are also errors due to digit preferences.
Currently married women	Total number of currently married.	Identification of the currently married women in the community is very simple as marriage is a socially recognised event. Identification of married women is also important in the sense that marriage signals the beginning of socially recognised sexually active reproductive life.
Pregnant women	Total pregnant women in the area.	Identification of pregnant women is difficult because of various factors. In the rural areas, pregnant women are generally identified only when pregnancy is at least 4-5 months old. People generally conceal pregnancy, specially during the first trimester.

Who is to be tracked	Base	Issues in identification?
Live birth	Total live births in the area.	Identification of a birth in the community is also simple as birth of a child is a socially recognised event. One problem in the identification of live births in the community is the problem in distinguishing a live birth from a still birth. This distinction is quite difficult at the community level.
Children (1-4 years)	Total children (1-4 years)	Identification of children 1-4 years of age is associated with the problem of ascertaining the age of the child. In the absence of proper birth record, ascertaining age of the child is quite problematic and requires special enquiry skills.

Tracking Parameters

Target group	Tracking parameters (Illustrative)	How is to be tracked
Women	Age Marital status Pregnancy ANC/Natal Care/PNC	<p>There are two approaches. The first is that the beneficiary visits the health facility. This approach is not very effective as only a small proportion of beneficiaries visit the health facility. A beneficiary may not necessarily visit the same health facility every time. Beneficiaries visit the health facility only in need. If the beneficiary perceives that there is no need than she or he may not visit the facility at all.</p> <p>The second approach is that the service provider regularly visits the beneficiary to deliver services. Here, time budgeting of the service provider is an important consideration. Tracking also requires developing appropriate tracking skills. Training requirements of the tracking system may be enormous.</p>
Women in reproductive age group	Marital status Pregnancy ANC/Natal Care/PNC	
Currently married women in the reproductive age group	Pregnancy ANC/Natal Care/PNC Pregnancy outcome	
Pregnant women	Pregnancy ANC/Natal Care/PNC	
New born	Weight, Height/length Immunisation Breast feeding/Weaning Diarrhoea, ARI, Tetanus	
Children (1-4 years)	Weight, Height/length Diarrhoea, ARI, Tetanus, breast feeding, etc.	

Tracking Outputs

Target group	Tracking output (Illustrative)	Generation of output
Women	<ul style="list-style-type: none"> Distribution by age Distribution by marital status Distribution by use of family planning methods Distribution by pregnancy status Distribution by care received during pregnancy Distribution by pregnancy outcome 	Information generated needs to be processed and tabulated to generate outputs. This is a challenging issue as necessary institutional mechanism does not exist at present.
Women in reproductive age group	<ul style="list-style-type: none"> Distribution by marital status Distribution by use of family planning methods Distribution by pregnancy status Distribution by care received during pregnancy Distribution by pregnancy outcome 	Information technology based solutions are generally used for processing and tabulating the information but institutionalising IT based solution is cost intensive.
Currently married women in reproductive age group	<ul style="list-style-type: none"> Distribution by use of family planning methods Distribution by pregnancy status Distribution by care received during pregnancy Distribution by pregnancy outcome 	A major issue in generating outputs is the coverage, quality and reliability of the information available through the tracking system.
Pregnant women	<ul style="list-style-type: none"> Distribution by care received during pregnancy Distribution by pregnancy outcome 	The tracking system has no mechanism to assess the coverage.
New born	<ul style="list-style-type: none"> Distribution by age and weight Distribution by age and height/length Distribution of breastfeeding status by age Distribution of weaning status by age Immunisation status by age Cases of diarrhoea by age Cases of ARI by age Cases of tetanus by age 	The quality and the reliability of the information can be assessed through consistency checks which requires considerable skills development and may over burden the service provider whose primary task is to deliver services.
Children (1-4 years)	<ul style="list-style-type: none"> Distribution by age and weight Distribution by age and height/length Fully immunised children by age Cases of diarrhoea by age Cases of ARI by age Cases of tetanus by age 	An important issue is at what tier what outputs are to be generated. At the grass roots level, the outputs should be straightforward and simple so that they can be easily generate from the track records.

Tracking Outcomes

Target group	Tracking outcome (Illustrative)	Estimation of outcome
Women	Proportion marrying before 18 years of age Contraceptive prevalence rate Proportion of safe deliveries Proportion of institutional deliveries Age specific fertility rate Total fertility rate	Converting outputs into outcomes requires analytical capacity. An important issue is where to create the capacity. One option is district. The second option is the development block.
Women in reproductive age group	Proportion marrying before 18 years of age Contraceptive prevalence rate Proportion of safe deliveries Proportion of institutional deliveries Age specific fertility rate/Total fertility rate	At present, the analytical capacity to translate tracking outputs into tracking outcomes is non existent at the district or at the development block level.
Currently married women in reproductive age group	Contraceptive prevalence rate Proportion of safe deliveries Proportion of institutional deliveries Age specific marital fertility rate Total marital fertility rate	Some outcomes that can be generated at the local level. This will improve the relevance of the system.
Pregnant women	Proportion of safe deliveries Proportion of institutional deliveries	Information technology based tools may be developed for the purpose.
New born	Proportion low weight for age Proportion low weight for height Proportion exclusively breastfed by age Proportion completely immunised for age Proportion suffered from diarrhoea Proportion suffered from ARI Proportion suffered from tetanus	In order to ensure that the tracking system contributes to health and welfare programme planning, monitoring and evaluation at the district level, it is necessary that the analytical capacity is developed at the district level.
Children (1-4 years)	Proportion low weight for age Proportion low weight for height Proportion fully immunised Proportion suffered from diarrhoea Proportion suffered from ARI Proportion suffered from tetanus	Developing analytical capacity at the district and below district levels requires strengthening human resources component of health and family welfare information system. At present, such human resources are lacking at state and district levels. There is a need to strengthen human resources for health information.

Operationalising the Tracking System

The foregoing discussions clearly emphasise the need and importance of a tracking system that can track delivery of maternal and child health services in a manner to ensure universal coverage of 'full' services to reduce maternal, infant and child mortality. The following are the essential ingredients of such a tracking system:

- a. A well-structured yet simple plan to identify the target population that needs tracking. The key consideration here is that identification is to be done by the grass roots level service providers or by village-based voluntary workers or by the community. The identification plan must therefore very clearly specify the target population and its structure should be straightforward so that it is readily accepted at the grass roots level.
- b. Creation and management of the database of the target population to facilitate tracking. The best way to implement the database is to develop an information technology based database applications including provision for regular updating of the database.
- c. Designing the trigger mechanism to inform different target groups about the schedule of service delivery as well as raising alarm about those who have defaulted. Information technology tools may be used for designing and institutionalising this trigger mechanism.
- d. Linking tracking with the delivery of services. The entire tracking system must be linked to the delivery of services. It is important to emphasise that tracking alone cannot lead to improvements in the realised efficiency if the delivery of services is poor. Tracking has a meaning and relevance only when it is associated with the delivery of services. If, despite all tracking, delivery of services is not assured, then the very purpose of tracking will be lost.
- e. Analytical capacity at different tiers of the services delivery system. It is important for the success of any tracking system that the tracking data are transformed into information that leads to appropriate action. The tracking system generates huge data at regular intervals. It is important that the analytical capacity is developed for processing this data. In the absence of the analytical capacity, the tracking data quickly gets redundant.
- f. Institutionalising an appropriate feed back system to ensure that tracking actually leads to appropriate follow-up and corrective action. In the absence of the feed back system, tracking may not contribute to improving the needs effectiveness or capacity efficiency and hence realised efficiency of the services delivery system.

- g. Developing appropriate analytical capacity at different tiers of the services delivery system for analysing the data available through the tracking system. It is important that the tracking data must be transformed in a form that can be used by the service providers as well as by programme managers to improve the realised efficiency of the services delivery system. Building the capacity of analysing the tracking data at different tiers of the services delivery system is therefore necessary.
- h. Finally, involvement of the community and its organisations is critical to the success of any tracking system. Building community awareness and sensitising people is necessary for behaviour change. Community and its organisations can play a major facilitating and motivating role in institutionalising the tracking system at the grass roots level.

Proposed MCTS Architecture

This section describes an architecture for the Mother and Child Tracking System (MCTS) based on the conceptual foundations and operational considerations described in the foregoing pages. The proposed architecture may serve as the guidelines for evolving MCTS at different tiers of the health care services delivery system and linking it with maternal and child health services.

Core components of the architecture of the proposed system are described below:

1. At the village level, all currently married women in the reproductive age group and children below 5 years of age should be identified by ASHA with support from the Gram Panchayat, especially members of the Village Health and Sanitation Committee of the Gram Panchayat. ASHA should maintain a family register which should contain identification details of all currently married women in the reproductive age group and all children below 5 years of age in the family.
2. ASHA should update the family register through regular monthly visit to every household to enquire the pregnancy status of all currently married women in the reproductive age group in the family. She should also enquire about any marriage in the family, any delivery in the family and death of any child below 5 years of age in the family to regularly update the family register.
3. ASHA should report all pregnant women and children below 5 years of age identified by her in the village to the ANM for follow-up action and for the delivery of services as per the schedule.

4. The ANM should visit all families in the village where a pregnant woman or a child below 5 years of age is reported by ASHA. During this visit, the ANM should contact the pregnant woman and issue the Maternity Card to the pregnant woman. This card will keep the record of the progress of the pregnancy and its outcome as well as all services delivered to the pregnant woman during ante natal, natal and the post natal period irrespective of the health facility from where the service is received. The proposed Maternity Card will also serve as a reminder to the pregnant woman and her family regarding examination and check up to be carried out during the pregnancy.
5. The ANM should also motivate and counsel the pregnant woman and her family members to carry the Maternity Card with her whenever the pregnant woman visits any health facility - public or private - for any examination or check up or to avail any service and must get all examinations and services received by her entered in the Maternity Card by the service provider. This is necessary as the services received by pregnant women outside the public health care delivery system can be monitored only at the level of the pregnant women and not at the level of the service provider.
6. The ANM should also examine every child below five years of age in the village reported by ASHA and should issue a Child Health Card to the child concerned. The parents and family members of the child should be motivated by the ANM to carry the Child Health Card with them whenever they take the child to a health facility for examination, check up and service and get all entries completed in the Card. This will ensure that the information related to all services received by the child are available through the Child Health Card.
7. A database of all pregnant women and all children identified at the village level may be created and maintained at either the PHC or the CHC level to facilitate tracking of pregnant women and children below five years of age for follow up and for the delivery of services delivery to ensure that all pregnant women and children registered in the database receive 'full' services as per Indian Public Health Standards.
8. The ANM should report all services received by pregnant women and children either through the ANM or from elsewhere to PH/CHC for updating the database. After updating the database, a report may be generated for feed back and for corrective action. The report should specifically identify those pregnant women and children who could not be followed up during the month. This will facilitate ANM and other field staff to trace the pregnant women and children lost to follow and deliver services to them.

Proposed MCTS architecture

Component of MCTS	Target	Agent
Identification	Currently married women in reproductive age group	ASHA
	Pregnant women and children below 5 years of age	ASHA
Follow-up and services delivery Feedback	Pregnant women	ANM/LHV
	Children below 5 years of age	
Database application	Database of pregnant women	Computer/BEE
	Database of children	
Data analysis and feedback	Tracking outcomes	Computer/BEE BMO/CMHO/ State Nodal Officer MCTU
Community involvement	Publicity campaign	Media wing at different tiers of the system
Monitoring implementation	Institutionalisation of MCTS within the existing system	MCTU State Nodal Officer

9. The health and family welfare services delivery system must ensure that all pregnant women and children below 5 years of age receive 'full' services as laid down in the Indian Public Health Standards. The ANM should also motivate the pregnant woman and her family members to go to a health facility for regular check up and examination as per the schedule specified in the Maternity Card. Similarly, the ANM should also motivate the parents of children below 5 years of age to take the child to a health facility for regular check up as specified in the schedule prescribed in the Child Health Card.
10. Database applications should be developed for generating estimates of needs effectiveness, capacity efficiency and realised efficiency at different tiers of the health and family welfare services delivery system right from the PHC level up to the national level. The report generated at the PHC level should provide estimates of needs effectiveness, capacity efficiency and realised efficiency at the village level. Report generated at the CHC level should provide estimates of realised efficiency, etc. at the PHC level while the report generated at the district level should provide estimates at the block level. Similarly, state level report should provide district level estimates while national level report should provide estimates of the outcomes of the tracking system at the state level. This type of report generation will facilitate identifying the bottlenecks in the mother and child tracking system right up to the village level. If the database applications are not possible then tracking data should be analysed by other approaches. Analysis of the tracking data is a must for justifying the tracking of pregnant women and infants.
11. Members of the Gram Panchayat and members of the Village Health and Sanitation Committee as well as other community representatives and peer leaders should be actively involved in operationalising the entire mother and child tracking system at the grass roots level. Sustained involvement and continued active support of the people and their peers and representatives is very much necessary to ensure that all pregnant women and all children below 5 years of age receive 'full' maternal and child health services. Orientation cum training programme for people's representatives including members of the Village Health and Sanitation Committee and other members of local level Panchayat Raj institutions should be organised for the purpose at regular intervals to generate the demand for maternal and child health services. At the same time a campaign should be launched based on both the mass media and the traditional folk media to increase community awareness about mother and child health. This campaign should emphasise that every pregnant woman has the Maternity Card and every child below 5 years of age has the Child Health Card.

Epilogue

Way back in 1946, the First Health Survey and Development Committee constituted during the colonial rule had recommended that every child must be followed right since conception up to five years of age to ensure its survival, growth and development. It is expected that the MCTS initiative of the Government of India shall evolve in the spirit of the recommendations of the First Health Survey and Development Committee.

In this paper, we have attempted to develop a framework for implementing the MCTS right up to the village level. The framework outlined may serve as broad guidelines for evolving the system at the PHC/CHC level which has been assumed to be the hub of the activities related to the tracking of women and children in an attempt to ensure universal coverage of maternal and child health services according to Indian Public Health Standards to reduce maternal, infant and child mortality.