A Framework for Integrating Childhood Tuberculosis into Community-based Child Health Care

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Abstract:

The World Health Organization (WHO) estimates that approximately 500,000 children each year are diagnosed with tuberculosis (TB) and 64,000 HIV-negative children die annually due to TB. The true burden of childhood TB is unknown; children are often undiagnosed and therefore do not receive appropriate care. Childhood TB is often seen with other common childhood illnesses such as HIV/AIDS, pneumonia and malnutrition, and should be considered in sick children, particularly in areas of high TB burden. Family-centered and community based care models and strategies can be used for TB prevention, identification of children with presumptive TB, and for diagnosis and management of children with TB. Frameworks such as the Integrated Community Case Management (iCCM) and Integrated Management of Childhood Illness (IMCI) can be modified and used to asses TB risk in children, provide contact tracing, refer to higher level facilities for appropriate diagnosis, and provide treatment support. Introducing basic questions into these algorithms and raising the level of suspicion for TB can improve diagnosis and care for children with TB. Suggested modifications and applications for childhood TB into community-based care models are provided. These models may rely on community health workers who will benefit from strong feedback and adequate support systems in these roles. A strategy that utilizes existing maternal and child health care models integrated in a community approach is needed to better identify children with TB and increase access to health care for children with TB. In addition, demonstration projects and operational research (OR) likewise are urgently needed to develop best practices and assess the impact of addressing childhood TB in child care models at both the facility and community level.

Recommended citation

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Acronyms and Abbreviations

AIDS	Acquired Immunodeficiency Syndrome
CAB	Community Advisory Board
CHW	Community Health Worker
C-IMCI	Community IMCI
EPTB	Extrapulmonary Tuberculosis
HCW	Health Care Workers
HiB	Haemophilus influenzae B
HIV	Human Immunodeficiency Virus
ICATT	Integrated Management of Childhood Illness Adaptation and Training Tool
iCCM	Integrated Community Case management
IMCI	Integrated Management of Childhood Illness
IPT	Isoniazid Preventive Therapy
M&E	Monitoring and Evaluation
MOH	Ministry of Health
MTB	Mycobacterium tuberculosis
NGO	Non-governmental Organization
NTP	National Tuberculosis Program
OR	Operational Research
RIF	Rifampicin
TB	Tuberculosis
UNICEF	United Nations Children's Fund
WHO	World Health Organization

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I. Introduction: The Need for a Community-based Approach for Childhood TB

Tuberculosis (TB) is often an unrecognized underlying disease in children with pneumonia, respiratory illness, HIV/ AIDS, or malnutrition, and contributes to child mortality and morbidity; yet, it is preventable and treatable. Childhood TB frequently goes undiagnosed because children with TB often have families that are poor and live in overcrowded settings, lack knowledge about the disease, and live in communities with limited access to health care. Even when the quality of care at health facilities is good, many caregivers may not be knowledgeable about these facilities, or they may be unwilling to seek care if the facility- based care is perceived as culturally inappropriate, inaccessible, or unaffordable. Improving the quality of care at health facilities solely would not be effective in reducing childhood deaths and illness because numerous caregivers do not seek or cannot access care at health facilities.[1]

A community approach to TB prevention, case finding, and supportive care is needed to ensure that all infants and children with TB receive high quality care, and to ultimately eliminate TB deaths in children.[2] This need was recently outlined in a roadmap for childhood TB, published by the World Health organization with broad support by UNICEF, The Union, USAID and others.[3] However, community approaches are generally not included in the guidance for National TB Programs (NTP) on management of childhood TB. Similarly, health initiatives that operate at primary health care and community levels often do not include childhood TB as one of their target illnesses, even in countries with a high TB burden. Policy makers as well as health care providers for maternal and child health, HIV/AIDS, and nutrition need to be sensitized to the importance of childhood TB.

This document outlines community-based strategies for integrating childhood TB activities with other maternal and child health care services through existing diagnosis and management algorithms. Such activities include prevention, identification of children with presumptive TB, and referral to higher level facilities. The extent to which community- or facility-based tools and strategies such as integrated Community Case Management (iCCM) of common childhood illnesses or Integrated Management of Childhood Illness (IMCI) can support TB identification and care depend on the setting, availability of services, training of health care workers (HCW), and agreements among all stakeholders involved.

This document is written for decision-makers, program managers, and officials at the global policy and national Ministry of Health (MOH) levels who can (in collaboration with NTPs) make changes to country specific child health frameworks, and also to those in the field who can implement interventions directly. The aim of this guide is to emphasize the importance of childhood TB, stimulate discussion and move toward early integration of childhood TB into other maternal and child care activities.

Demonstration projects and operational research (OR) likewise are urgently needed to develop best practices and show the impact of adding different aspects of childhood TB into child care models at both the facility and community level. Some important OR questions are outlined in the document.

II. Epidemiology of Childhood Tuberculosis in the Context of Global Child Health

About 6.9 million children under-five years of age died in 2011 (51/1000 live births), mostly due to infectious diseases.[4] Pneumonia is the leading killer of children under-five, causing 18% of all under-five deaths worldwide. About one third of deaths are attributable to malnutrition, and HIV-associated mortality contributed to 10-28% of deaths in children under-five.[5]

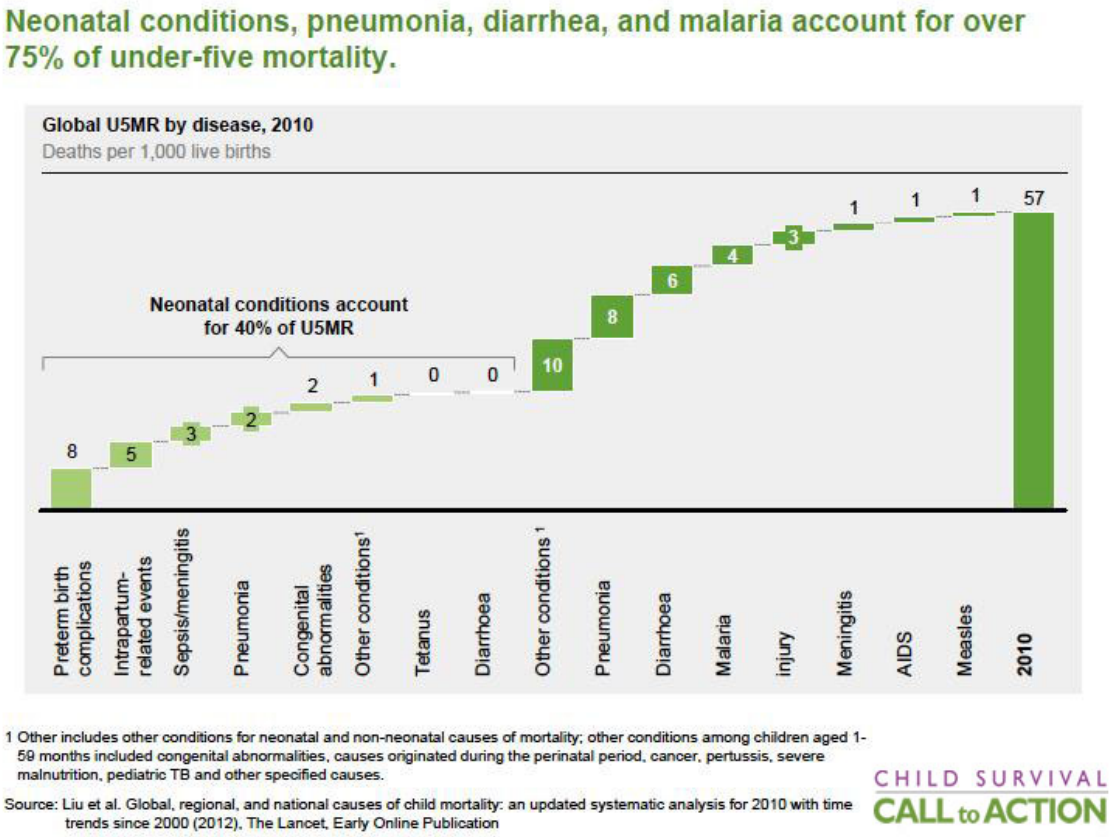
Childhood TB has been included in the "other diseases" category amongst the causes of under-five mortality but contributes to significant morbidity and mortality particularly in TB high-burden settings. Many cases of pneumonia, malnutrition, and other illness are likely undiagnosed TB, and TB is a larger contributor to overall childhood illness than current data describe.[6-9] TB is among the three leading causes of death in HIV-infected children in Africa.

At least 500,000 children are newly diagnosed with TB each year, and due to difficulties in diagnosis, and under-reporting, this number is probably under-estimating the true burden.[2,10] TB in pregnancy, congenital TB, and perinatal TB are also under-recognized and need attention particularly in areas of high TB/HIV co-infection.

Most of the TB cases are concentrated in 22 high burden countries, and these countries contribute 75% of childhood TB cases.[11] Many of these countries also report high rates of under-five mortality. Nearly 200 HIV negative children die every day of TB—the number who die from HIV-related TB is anticipated to be large but unknown—and WHO estimated that 10 million children were orphaned due to maternal TB in 2009.[12]

Infants and children under-five are the most vulnerable group, and are at increased risk for developing both TB infection and disease; they often develop severe forms of TB such as meningitis and miliary TB, both associated with increased mortality. Immune-suppression (e.g. due to HIV-infection or measles) and malnutrition further increase the risk of disease. Maternal TB increases a child's risk for TB and overall child morbidity and mortality.

Figure 1: Global under-five mortality rate 2010.
(Source: Child Survival Call to Action. Summary roadmap 2012)



Childhood TB often co-exists with other illness, or is an unrecognized cause of disease. Malnutrition, which is associated with one third of all childhood deaths,[5] increases susceptibility to TB, but TB can also clinically present with the features of malnutrition and can therefore easily be overlooked.[13] Pneumonia contributes to about 18% of under-five childhood deaths, but as many as 15 -20% of these cases may actually be due to TB in high burden settings as shown in autopsy and other studies.[6,8] Childhood TB can, due to super-infection, present as acute pneumonia. With increased use of *Haemophilus influenzae B* (HiB) as well as Pneumococcal vaccines, TB may increase as a pathogen, and therefore needs to be considered in the context of pneumonia and meningitis. The most common presentation of extrapulmonary TB (EPTB) is lymph node disease and should always be a part of differential diagnosis of unilateral swelling of the neck.

Frameworks for IMCI or iCCM focus on the identification and management of the main contributors to child mortality, among them malnutrition, pneumonia, and fever. In TB high burden settings, childhood TB is likely affecting a number of children who are evaluated but is not being considered and diagnosed. **By introducing some basic questions into those algorithms and raising the level of suspicion, this gap can be closed, and the children can be appropriately assessed and referred to the next level of care.**

III. Principles of Prevention and Management of Pediatric TB

Many children often are not diagnosed with TB because traditional sputum-based diagnostic tests do not detect small numbers of bacteria. Symptom-based screening and diagnosis can be more extensively used in many settings to identify children with presumptive TB to make a diagnosis if there is limited access to diagnostic tools, and can be used for referral and further evaluation at facilities with laboratory support.[14] Additionally, new diagnostic tests like the Xpert MTB/RIF are being increasingly rolled out at country level and more health facilities will have access to bacteriological diagnosis of TB.

Contact tracing is hardly implemented in high-burden settings and there is an urgent need for new approaches to identify children at risk and provide early treatment or isoniazid preventive therapy (IPT). Community-based approaches provide an ideal platform to conduct contact tracing, identify children at risk of TB or to provide other TB services such as treatment support, particularly if good linkages and referral mechanisms exist between community and facility programs.

Health care workers can be trained to recognize risk factors and clinical presentations of TB in children and these can be included in existing algorithms at the community and primary health care level: health workers can ask about risk factors such as TB or chronic cough and HIV-infection in other household members, as well as TB-associated signs and symptoms in the child.

A majority of household contacts under five years of age who are treated for intra-thoracic tuberculosis initially presented with the following symptoms: cough for longer than two weeks and/or prolonged or recurrent fever and/or failure to thrive.[15] The negative predictive value of this approach is high (> 95%), supporting the argument that asymptomatic children can be identified for IPT without further testing. However, there are limitations of this approach in children under three years of age as well as HIV-infected children, who may require referral for further diagnostic workup.[16] TB in HIV-infected children may be more frequently missed: these children often do not have a chronic cough and may present only with fever or chronic weight loss. Therefore, HIV-infected children with a contact history of TB or fever and weight loss should always be evaluated for underlying TB.

Once TB is considered in a child, he/she should be evaluated for TB disease. The Community Health Worker (CHW) or first level health facility can make the appropriate referral to higher level care facilities that have diagnostic capabilities (such as chest X-rays to identify peri-hilar lymph node enlargement or parenchymal changes indicating possible TB, and microscopy and culture, to identify the mycobacteria from sputum samples or gastric aspirates). Some regions may have access to newer diagnostics, such as the Xpert MTB/RIF assay, which allows for the rapid diagnosis of both TB and drug resistance to rifampicin (as surrogate for multidrug-resistance), and has shown promising results in diagnosis compared to smear microscopy in children.[17]

Ideally, all childhood TB disease and infection should be prevented. This can occur through sensitizing health care providers to raise awareness for the need to identify adult TB cases early and to perform contact tracing in the household to identify children with presumptive TB and children eligible for IPT. TB disease can be prevented in children who have become infected with TB by providing IPT. CHWs can play a crucial role in this area by strengthening linkages with TB services and other maternal and childcare providers. In addition, community health workers are ideally placed to provide education to families and communities about TB, infection control, and how to improve key family practices such as exposure to tobacco smoke, which has been shown to increase a child's risk of TB infection and disease.[18,19]

At country level, most adult TB activities are managed by the NTP. The NTPs are overseeing the diagnostic and therapeutic management of those with presumptive TB, monitoring and evaluation (M&E) activities, and the recording and reporting of data to monitor their program. They should coordinate preventive services such as contact tracing and provision of IPT, but implementation of these services for children is scarce in most countries. Childhood TB, however, is often managed outside the program by child health care workers, who diagnose, initiate treatment and manage contacts – one reason that leads to under-reporting of childhood TB cases to NTPs.[20]

The need to improve TB services for children is increasingly recognized by NTPs, and a number of guideline documents as well as training opportunities have become available.[14,21,22] But children do not necessarily access TB services, and NTPs can use outside support to find and treat exposed or diseased children. Many children are never referred as contacts of adult cases, or they are not identified and referred as presumptive TB cases. Many health care workers whether within the TB or other childcare services are not trained in considering and recognizing TB in children. Therefore, case finding in children is often very limited. In addition, NTPs may require assistance in providing treatment support to TB patients to promote adherence, and may also struggle to provide IPT to eligible children. Collaboration with other child-care services and relying on these for referrals would greatly support TB facilities. Along with these, referral systems will likely need to be improved and diagnostic services and management of childhood TB strengthened at receiving health facilities.

IV. Why Community-based Health Care?

Utilization of health facilities remains low in many parts of the world and many children are treated at home through the informal sector or by traditional healers. Studies consistently confirm that many sick children do not reach health facilities and children from poorer families are less likely to obtain care.[23] A community health approach is a feasible way to bring culturally–sensitive health information and basic services to the many millions of people who currently do not have access to them. This strategy works in tandem with many governments' focus on shifting tasks of improving prevention and care in the household and community to community health workers so that higher trained health facility workers can focus on emergency and more complex illeness. It enhances community structures, involves and empowers the community in caring for its citizens, and builds bridges between communities and government services so community health workers are perceived as a more valuable community resource.

The following strategies and approaches have been developed to provide targeted health care to children at the most primary levels of care:

A. Integrated Management of Childhood Illnesses (IMCI) and Household/Community IMCI

IMCI is a strategy to reduce mortality, morbidity and disability in children under five years of age. This program has both health care facility-based interventions and community based platforms. Both may not exist in all locations: based on a country or region's resources, a health facility based program alone or in combination with a community-based program (C-IMCI) can be used to identify and manage sick children. A country IMCI program is managed by a committee or working group from government, academia and other relevant stakeholders. It is usually chaired by a senior official of the MOH that has decision-making authority, and oversees and coordinates the technical process of adaptation of the IMCI guideline.[24] Implementing an IMCI strategy is a phased process (introduction, early implementation and expansion) aimed at upgrading care in local clinics by training of health workers, strengthening facility systems and developing a support system to prevent disease with proper referral when needed.

Household/ Community (C-IMCI) programs are often implemented by the MOH in collaboration with a non-governmental organization (NGO).[25] C-IMCI cannot exist as a stand- alone entity separate from facility-based services. It must be an integrated part of the larger health system.

The core interventions addressed by IMCI include early recognition of illness, appropriate referral, integrated case management, and treatment adherence. Health workers also provide preventive and growth promotion services, to both the child and the family.

The IMCI platform focuses on the following main illnesses:

1. Pneumonia, or acute respiratory infections*
2. Diarrhea
3. Malaria
4. Measles
5. Malnutrition*
6. Ear problems

(*Significant interaction with tuberculosis)

WHO recommends adapting IMCI frameworks to suit individual country needs taking into account conditions that are important in individual countries, for which effective treatment and/or preventive practices exist, and which can be adapted by health care workers.[26] Examples of these adaptations include Dengue [24], e.g. in the Philippines, and HIV.[27]

In addition, WHO has developed tools to facilitate the adaptation of the standard IMCI booklet, charts and training materials: Integrated Management of Childhood Illness Adaptation and Training Tool (ICATT). ICATT is a software application to support the implementation of the WHO/UNICEF IMCI strategy. The tool provides the possibility to adapt the generic IMCI guidelines at national and sub-national levels, and to develop ICATT-based training courses that fit into various training approaches.[28]

B. Community Case Management

Household or Community IMCI was originally meant to concentrate on awareness and education and provide linkages to health facilities. With an increased recognition of the need to shift tasks to lower levels of care, particularly to the community, WHO and UNICEF with other partners developed tools and materials to train CHWs to provide direct care, including treatment for certain conditions, to pregnant women, newborns and sick children in the community.[29-31] Materials for pregnant women and newborns focus on education as well as the recognition of danger signs followed by referral. CHWs visit the homes of pregnant women several times in the pre-/peri- and postnatal period. The materials for iCCM focus on pneumonia, diarrhea and fever, or malaria as the main contributors to child mortality. The approach is meant to be minimalistic, providing clear guidance and actions.

IMCI and iCCM are but two optional frameworks to manage common diseases in children, there are many different approaches to deliver health care at the community level. In any of those there will be opportunities to integrate some basic TB-related considerations.[32]

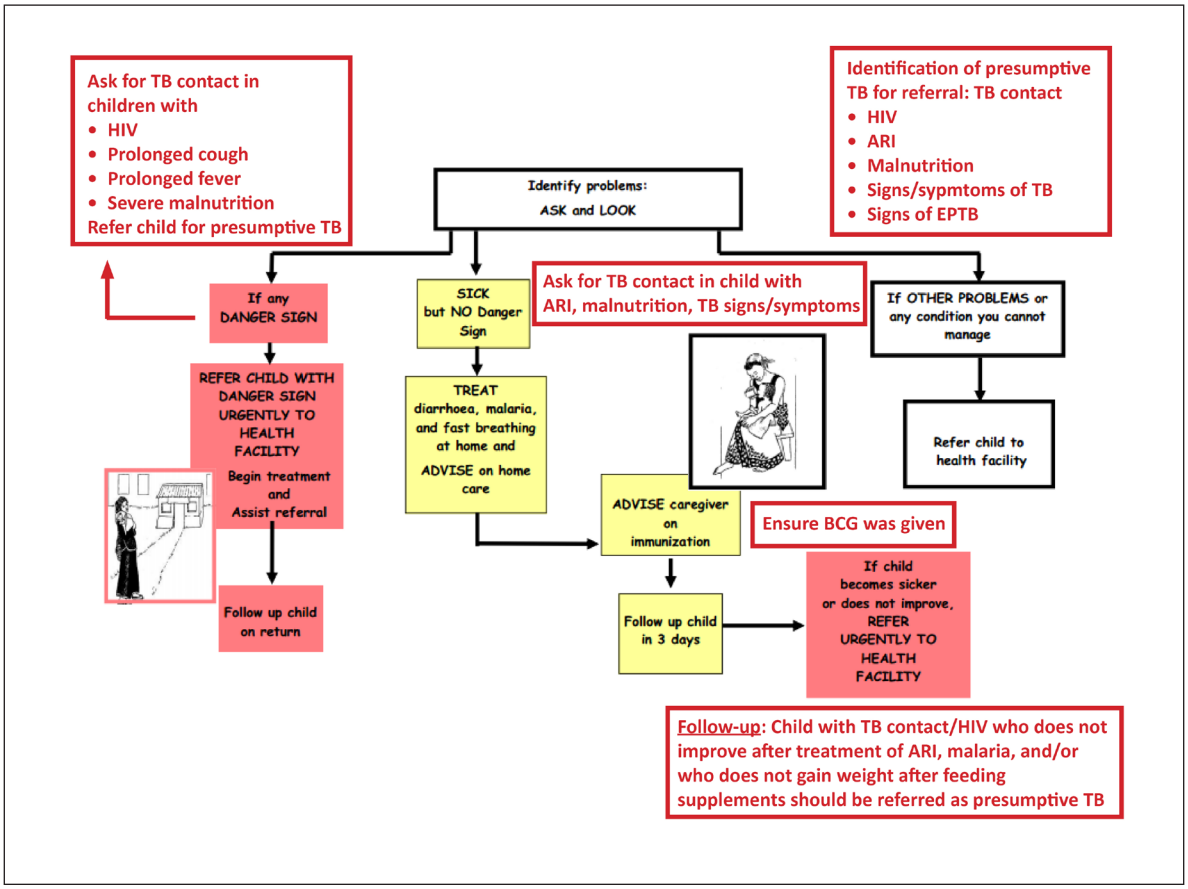
V. A Framework for Integrating Childhood TB into Community-based Child Health Care Models

Given the extent to which childhood TB is under-diagnosed and that the diseases targeted by models such as IMCI/iCCM often serve as a first entry point for children into a primary health care system, these frameworks offer an ideal pathway to improve TB services for children.

Community based services enable a more family centered approach for TB care, increase awareness and help to reduce stigma. Trained workers with a heightened awareness for possible TB can increase referrals and diagnosis of children with presumptive TB. This can be supported by the increasing access to bacteriological diagnosis of TB through the roll-out of new diagnostic tests such as Xpert MTB/RIF. Community- and family-centered approaches can play a key role in implementing and improving contact tracing and provision of IPT.

Starting points for TB-related actions can be a) a sick child (Figure 2) or b) a general visit of a CHW to a household, or, c) community meetings. They can range from educational activities to assessing risk, diagnosis, as well as management of TB.

Figure 2: Caring for the sick child in the community and potential TB-related actions[31]



The guiding principle is to start with basic actions or interventions that are obvious and relatively easy to add to existing algorithms (such as the identification of presumptive TB among symptomatic children) and then add levels of complexity, depending on the setting and agreements between providers of community, facility health care and NTPs.

It is important that any interventions added to already complex tasks of health care workers, many of whom may not have formal education, should be minimal but will have the greatest benefit to the children. The overall workload of the health care worker and his/her training and skills should be considered. Basic requirements are existing referral mechanisms and the development of support structures with higher level health facilities, TB services and the NTP. For each activity, there should be a clear rationale and the intervention should be straightforward. In general, facilities will probably be able to provide more advanced services whereas basic services can be introduced at the community level with clear referral mechanisms in place. Following are some concrete tasks to integrate TB into facility and/or community algorithms and activities.

1. Assess for TB risk in existing algorithms

TB is actually already 'hidden' in the existing generic IMCI/iCCM algorithms, where a child with 'common cold' should improve in one to two weeks, but a child with chronic cough (more than 21 days) warrants referral to a higher level health facility for further assessment for TB, asthma, whooping cough and other problems. Likewise the IMCI/iCCM algorithms identify a child with malnutrition and determine whether he/she could be treated at home or referred to a hospital.[33]

Health care workers can quite easily identify children at risk for TB and those with possible TB, and can refer these children to the next level health facility that can provide TB services. Ideally, these facilities have the necessary diagnostic capabilities, such as skin testing, microscopy, culture, rapid diagnostics, and X-ray facilities. In some situations (depending on the skill of the health care worker, the linkage and collaboration with the TB services, the epidemiology of TB in the area, and the availability of TB drugs) the worker may be able to make a symptom-based diagnosis, a phone referral, and then begin therapy for TB. In these cases, it is important that children are reported to the NTP.

Action: Assess the Risk	
1. Ask for HIV in the household/the child	→ Refer for HIV-testing unless already done
2. Ask for 2. TB contact in any child with: • HIV • Prolonged cough • Prolonged fever • Malnutrition • Swelling of the neck or other signs of EPTB	→ Refer and mark "TB contact" on referal card
3. Look for a combination of symptoms (prolonged cough, loss of weight, reduced playfulness) and ask for TB contact	→ Depending on the setting and agreements with NTP, the HCW can • refer a child considered to have TB or • make a diagnosis, initiate treatment, report to NTP

2. Include TB into follow-up considerations

Follow-up of sick children is often within the scope of work of Community Health Workers

Action: Assess the Risk	
1. Ask for TB contact in a child that • initially presented with cough, was treated with antibiotics for pneumonia and did not respond • does not respond to nutritional support for malnutrition • has recurring pneumonia	→ Refer and mark "TB contact" on referal card

3. Contact tracing

Another missed opportunity for community TB management is contact tracing by community health workers. Being well connected with their community, CHWs have ideal access to not only the sick children but to their whole families. Their activities might range from referring those with presumptive TB, collecting specimens for TB diagnosis to making a clinical diagnosis of TB and initiating treatment or IPT.

Action: Evaluate the Household of a Child Newly Diagnosed with TB	
If there is no known TB contact:	
1. Find out if there is an adult with chronic cough = reverse contact tracing	→ Presumptive TB, collect sputum specimen and/or refer for diagnosis
2. Are there other children who are either symptomatic (cough, fever, weight loss) or asymptomatic and qualify for IPT (< 5 years and/or HIV-infected)	→ • Refer symptomatic children for diagnosis • Refer asymptomatic children for IPT or, depending on setting, initiate IPT

Action: In Any House that CHW Visits	
1. Recognize if someone has a chronic cough	→ Presumptive TB, collect sputum specimen and/or refer for diagnosis
2. Find out if there is a newly diagnosed TB case in the HH or amongst close contacts	→ Screen family members for TB: • If symptomatic: collect sputum specimen and/or refer for TB diagnosis • If asymptomatic and eligible: refer for ITP or, depending on setting, initiate IPT

4. Treatment support

This may be possible in settings where community health workers are allowed to provide treatment to their clients. In some cases, CHWs might already provide Directly Observed Therapy (DOT) to adults with TB. This can be extended to include other family members and support of TB treatment as well as delivery of IPT.

Action: Support All Household Members on TB Treatment or IPT
1. Provide treatment support to families, including basic education on • Adherence • Nutritional support • Infection control 2. Learn to recognize common side effects from anti-TB treatment, refer patients if necessary

5. Preventive services

Besides providing support in case finding and IPT delivery, community health workers can play an important role in educating the community about TB and ensuring access to TB care.

Action: TB Prevention in Household and the Community
1. Ensure that all newborns received BCG vaccine 2. Perinatal care: Evaluate all pregnant mothers for HIV as well as symptoms and signs of TB, refer for diagnosis and treatment (if necessary) and ensure the newborn is evaluated for TB or receives IPT 3. Provide basic education and awareness to families and the community about (TB, TB/HIV, danger of second hand smoke to children, etc.) 4. Promote key family practices to protect children against TB (improved feeding practices, immunization and appropriate care seeking, etc.) 5. Help to foster awareness of and relationships between the community and next level health centers

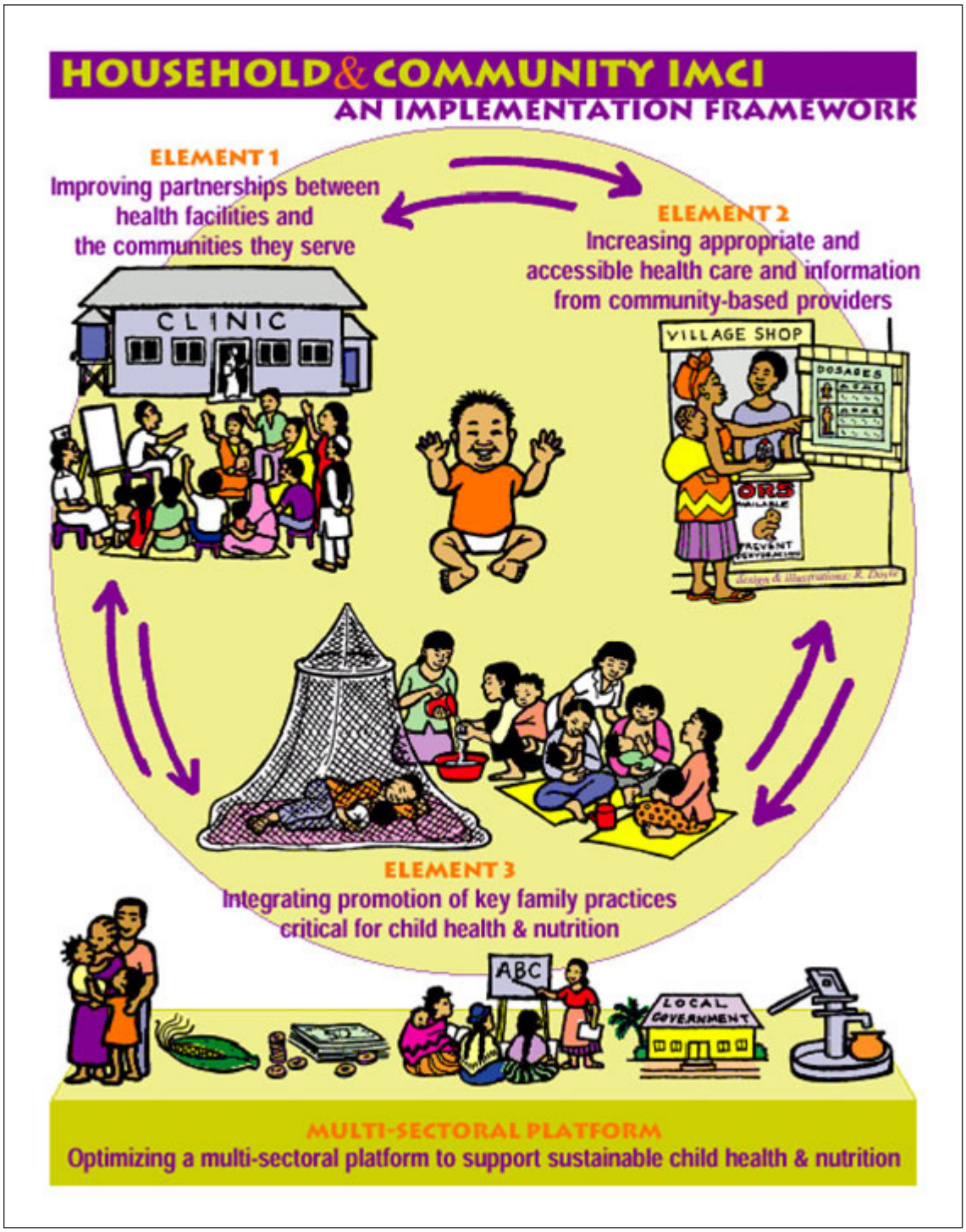
6. TB in special services

Special services in the communities or at facility-level are needed to increase awareness of TB. Health Care Workers should be able to perform basic health assessments, in particular

- nutrition services
- services managing acute respiratory infections
- HIV-services
- maternal health services

TB awareness should be increased in services that manage children with malnutrition and acute respiratory infections. All children should be evaluated for contact with TB source cases. Children who do not respond sufficiently to nutritional supplements and children who do not respond to antibiotic treatment for pneumonia should be evaluated for specifically for TB.

Figure 3: Key Elements to Implement Community Child Health Services
(Source: Reaching Communities for Child Health and Nutrition. Basics, CORE Group 2001)



VI. How to Get Started—Integrating TB into Existing Community-based Child Health Frameworks (IMCI, C-IMCI, iCCM)

Childhood TB is a significant underlying factor in mortality of children under-five in TB high burden areas and yet, it is often not reflected in countries' integrated community- based frameworks such as IMCI, C-IMCI and iCCM, and therefore not included in the modules, activities, algorithms nor in the trainings and training materials that are currently used.

Strong links between the MOH, providers of community health care and the NTP are crucial to integrating childhood TB activities with the existing community based frameworks. A technical working group should be convened to build an effective collaboration for childhood TB, including all stakeholders involved in either TB or maternal and child health (MOH, NTP, MCH services, implementers, including the private sector). An initial analysis of existing services should be conducted.

The working group should perform an initial analysis of services that are suited for childhood TB integration as well as what child TB activities are already in place. The group should assess the following questions: What are the entry points for children to access care, and do health workers at these points have access to TB diagnosis? What are the available treatment options and supplies for children? Who does treatment support for children? Who conducts contact tracing? Who is providing IPT? Additionally, the scope of community-based child health activities and their capacity for adding interventions should be assessed. Who are the providers and where are these services most utilized? Do both, facility- based and community- based services exist that could be involved in child TB activities? Guidelines and algorithms across both groups should be shared to understand the best points of working together.

After an understanding of available services, the working group can begin to answer what TB activities could/should be taken on by providers using the iCCM or any other suitable community health approach. These may be case finding and referral, but also treatment support, contact tracing, and/or provision of IPT.

Guidelines and definitions for referring children to either the next level facility or specialized TB services will be needed, as will clear materials and procedures for recording and reporting. The working group should develop monitoring and evaluation (M&E) mechanisms while in the planning stages, and establish how these will be included in the program. Existing training materials, chart booklets etc. need to be adapted. Training will be an important issue to address, and must include training of health care workers in infection control, both at health facilities and within households and in the communities.

Working groups can begin implementation in one or two pilot sites with continued monitoring and evaluation, and operational research. Any existing tools from IMCI/iCCM and from TB programming can be evaluated for monitoring and evaluation purposes. Scale-up can be planned and implemented once the approach is optimized.

Box 1 provides some suggested steps for developing integrated community-based child health care models that include Childhood TB.

Box 1: Steps to Take in Developing Integrated Community-based Health Care Models for Childhood TB

1. Advocacy for country adaptation of guidelines and training materials for c-IMCI/iCCM/other programmes for CHWs to include Childhood TB (addition of a classification box for Childhood TB) as among the most common serious illnesses that first-level health worker must be able to recognize.
2. Improve quality of care of childhood TB at first-level public health facilities and ensuring they are financially, logistically and geographically accessible.
3. Improve quality or care /or recognition of childhood TB of private sector, such as drug distributors, traditional healers and private doctors/practitioners.
4. Increase access to quality of care through community-based services and include childhood TB interventions.
5. Improve partnership between health facilities or services and the communities they serve. Activities include:
   - Increase scope of appropriate utilization of health services
   - Increase community input and feedback on health services using participatory research methods to illicit community feedback on health services
   - Creation of community advisory board (CAB) consisting of community representatives who meet regularly with facility-based health workers and serve as a channel of communication from the community to the deal
6. Increase appropriate, accessible care of and information on childhood TB from the CB providers. Activities are:
   - Upgrade the skills of community-based providers in community case management of childhood TB along with other common causes of illness in the community. Interventions could range from identification of children at risk (TB contact) to case detection, contact tracing, treatment support and IPT
   - Engage community-based providers in the promotion of prevention, nutrition and development
   - Ensure supply of essential drugs needed for prevention and treatment of childhood TB at the community level
   - Develop interventions to decrease harmful practices associated with treatment outside of health facilities of Pediatric TB
   - Institute appropriate incentives to decrease rates of attrition among CHWs and other volunteers
   - Institute systems to improve referral of patients and communications between households, community- and facility- based providers
7. Integrate promotion of key family practices critical for childhood TB together with child health and nutrition. (Immunization, care of HIV/AIDS, infection control etc.)
   - Develop Integrated Behavior Change strategies relevant to childhood TB (Develop counseling materials for community educators, use of mass media for promotion and social marketing of positive behavior for care and prevention of childhood TB
   - Develop methods for participatory community assessment of and planning for childhood TB; integrate assessment and surveys to measure household practices pertaining to childhood TB

Adapted from: Reaching communities for child health and nutrition. Basics, CORE Group 2001, WHO IMCI Adaptation Guide 2004 and Management of Pneumonia in Community Settings. WHO /UNICEF Joint Statement 2004.

VII. Research Needs

There are very few data on the integration of childhood TB into community-based child health approaches in TB high-burden countries. In order to define best practices and approaches, below are some questions that should be addressed through operational research and demonstration work:

- In a TB high-burden setting: how many children presenting to community child health providers have
    - a TB source case in the house and/or
    - signs and symptoms of TB disease?
- How many children identified and referred as presumptive TB
    - present to TB services?
    - are diagnosed as TB cases and started on treatment?
- Certainty of clinical diagnosis: How many children clinically diagnosed with TB are shown to have bacteriologically confirmed TB?
- What is the role of Xpert MTB/RIF in improving diagnosis of TB in children?
- Of the above, how many children improved on TB therapy?
- Evaluate approaches for contact tracing within the context of community health care programs
- What are different ways for CHWs to provide IPT in the community?
- What is the proportion of children correctly assessed for signs and symptoms for TB?
- How many children are identified as either having presumptive TB or needing IPT as a result of contact tracing in households initiated through CHWs?

Conclusion

Childhood TB is an underdiagnosed illness contributing to significant global morbidity and mortality but the burden of disease for these children can be improved through community based care. Many global child health programs can be easily adapted to find more children with possible TB, refer them appropriately for higher level services, and provide treatment support to those with TB disease. Including operational research and evaluating community based childhood TB programs are essential to understand best practices in community-based childhood TB management. Actively evaluating children who present to child health programs for TB contact and TB disease can reduce TB illness globally and bring us closer to the goal of zero TB deaths in children.

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