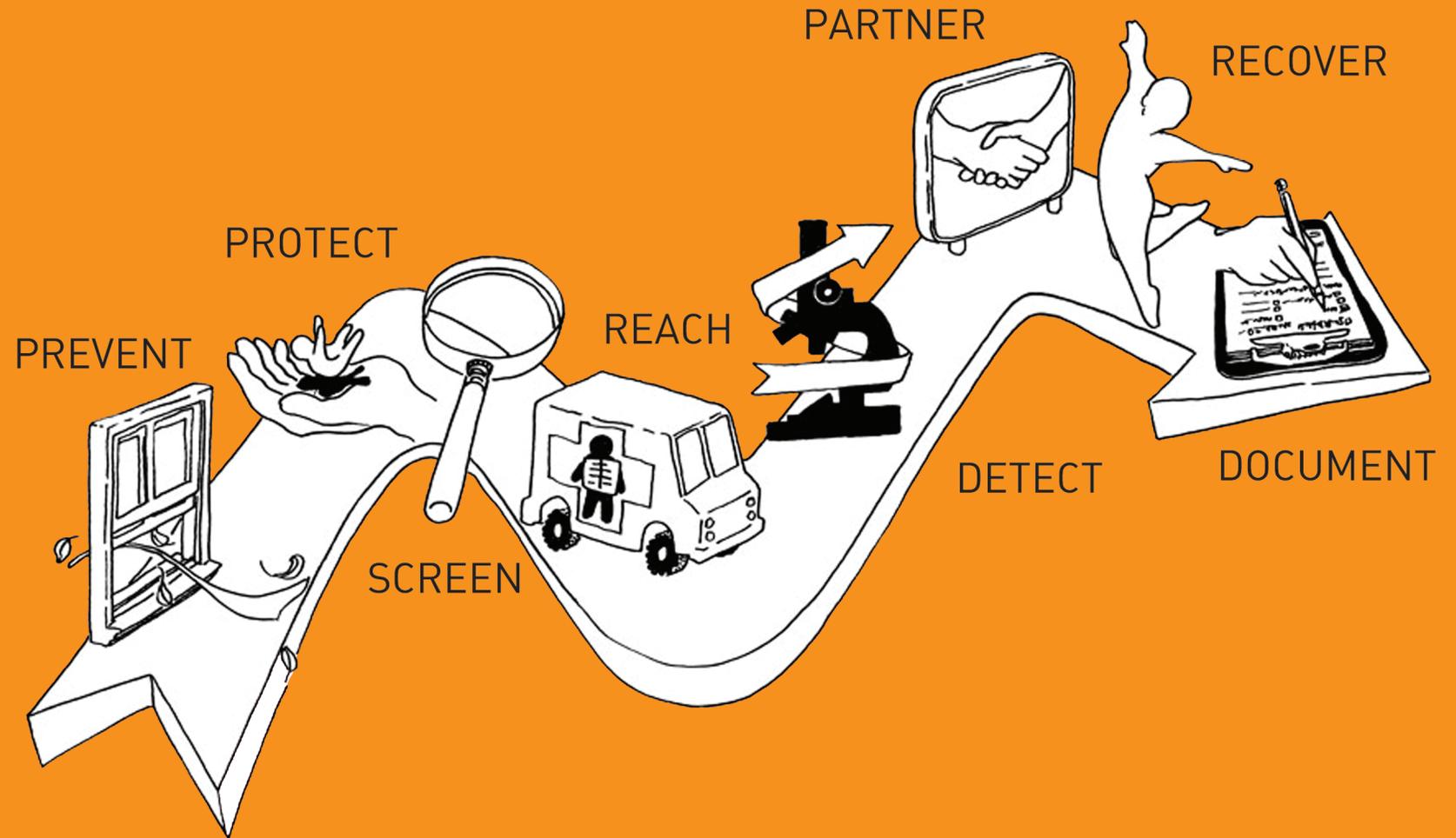


COMPENDIUM OF TOOLS & STRATEGIES



TO ACHIEVE UNIVERSAL
ACCESS TO TB CARE FOR
AT-RISK & VULNERABLE
GROUPS

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We are very grateful to the many people who gave their time and expertise (often without compensation) to help compile this document.

The Global Health Bureau, Office of Health, Infectious Disease and Nutrition (HIDN), US Agency for International Development, financially supports this compendium through TB CARE I under the terms of Agreement No. AID-OAA-A-10-00020. This compendium is made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of TB CARE I and do not necessarily reflect the views of USAID or the United States Government.

Suggested Citation:

Mitchell, E. M.H., Pray, R., Ngamvithayapong-Yana, J. Ryan, T., Lemaine, I., Lonroth, K., Reeves, R., Turusbekova, N. Verduin, R., Stickers, B., Voskens, J., Massaut, S., Suarez, P. Compendium of Tools and Strategies to Achieve Universal Access to TB Care for Vulnerable and At-Risk Groups. 2014 TB CARE I



TB CARE I

INTRODUCTION

Who is this compendium for?

The information compiled here is for the use of national TB program staff in high burden settings who are trying to identify strategies to reach at-risk and vulnerable communities more effectively.

How is the Compendium intended to be used?

The goal is to introduce users to the range of tools and strategies available in TB control. The TB community is encouraged to browse the Compendium to select approaches that meet the needs of specific types of TB patients.

This information will ultimately be available on the web and will be part of an interactive, searchable tool to link users to the evolving guidance on innovative TB control strategies suited for particular groups at risk. In many fields the evidence is still emerging and the particular risk groups that benefit from some approaches are still being defined. Indeed if the box on proven benefit is blank, it does not mean that the intervention is not beneficial, but may imply that the data are simply inconclusive at the time of publication.

This compendium is therefore to be considered a snap shot of the current state of affairs, and should be updated regularly as more evidence emerges in this rapidly changing field.

The Compendium is not designed to be read from cover to cover because it covers overlapping and inter-related concepts. The multiple references to some tools are intentional, as often TB control experts use different terminology and key words to refer to subtle variations on a theme. For example:

- Active case finding
- Screening
- Enhanced case finding
- Intensified case finding



These are all distinct, but closely inter-related strategies that we have covered separately because we will use a 'tag' system in the searchable tool

What does it contain?

Very summarized descriptions of over 120 approaches to reach and serve at-risk and vulnerable populations. This compendium contains links to over 650 tools and reference materials.

How is it organized?

The strategies are organized chronologically in a ten step pathway. Beginning with primary prevention approaches, secondary prevention, early diagnosis, treatment, and finally full recovery and sustained long-term health.

How was it compiled?

Brief texts were compiled from pre-existing documents or drafted where necessary by partner organizations KNCV, JATA, WHO, MSH, ATS as well as consultants. Large sections were adapted from the work of Tim Ryan (CDC) and the INAT subgroup of the STOP TB Partnership. Quite a number of sections are simply cut and pasted with attribution from existing publications.

Brief Description of the Approach

TB is a disease of poverty and exclusion. Efforts to control the disease should target poverty and exclusion as a form of primary prevention of TB. This expands the mandate of TB control program and has been controversial. However new evidence suggests it is successful and can build on synergies with other vertical (silo) disease programs that are also fighting the same social determinants.

List of alternative names (if applicable)

Primary prevention approach, reduction of vulnerability, address socio-economic factors, equity, social protection

Shown to benefit

Residents of poor urban areas

Potential Beneficiaries

HIV-infected, Children under 5, Elderly, Peri-partum women, Mentally ill, Alcohol dependent, Drug dependent, Smokers, Malnourished, Factory workers, Residents of poor areas, Prisoners, Refugees, MSM, Sex workers, Transgender, Migrants, Indigenous populations, homeless, Street children/Orphans and Vulnerable Children, Miners

Example of Good Practice

Rocha, C., et al., The Innovative Socio-economic Interventions Against Tuberculosis (ISIAT) project: an operational assessment. *Int J Tuberc Lung Dis*, 2011. 15 Suppl 2: p. S50-7.

Tuberculosis (TB) affected households in impoverished shantytowns, Lima, Peru.

OBJECTIVE:

To evaluate socio-economic interventions for strengthening TB control by improving uptake of TB care and prevention services.

DESIGN:

Barriers to TB control were characterized by interviews with TB-affected families. To reduce these barriers, a multidisciplinary team offered integrated community and household socio-economic interventions aiming to: 1) enhance uptake of TB care by education, community mobilisation and psychosocial support; and 2) reduce poverty through food and cash transfers, micro-credit, micro-enterprise and vocational training.

An interim analysis was performed after the socio-economic interventions had been provided for 2078 people in 311 households of newly diagnosed TB patients for up to 34 months. RESULTS: Poverty (46% earned <US\$1 per day), depression (40%), stigmatization (77%), and perceived isolation (39%) were common among TB patients (all $P < 0.05$ vs. non-patients). The project had 100% recruitment, and involved 97% of TB-affected households in regular visits, 71% in community groups, 78% in psychosocial support and 77% in poverty-reduction interventions. The socio-economic interventions were associated with increases in household contact TB screening (from 82% to 96%); successful TB treatment completion (from 91% to 97%); patient human immunodeficiency virus testing (from 31% to 97%); and completion of preventive therapy (from 27% to 87%; all $P < 0.0001$).

CONCLUSION:

Socio-economic interventions can strengthen TB control activities.

Selected List of Guidances, Tools and Manuals

Social determinants and TB:

http://whqlibdoc.who.int/publications/2010/9789241563970_eng.pdf

Poverty and TB:

<http://www.who.int/tb/challenges/poverty/en/index.html>

Engage-TB:

Integrating community-based tuberculosis activities into the work of nongovernmental and other civil society organizations: operational guidance Getahun, Haileyesus II. Joseph, Thomas. III. Tomaskovic, Lana. IV. Raviglione, Mario C. World Health Organization. ISBN 978 92 4 150450 8 (NLM classification: WF 200)
http://apps.who.int/iris/bitstream/10665/75997/1/9789241504508_eng.pdf

Action:

SDH houses knowledge on the social determinants according to the five action areas of the Rio Political Declaration on Social Determinants of Health that was ratified by the 65th World Health Assembly (WHR 65.8) in May 2012.

http://www.actionsdh.org/Contents/Action/Governance/Building_governance/Health_in_All_Policies_approach3.aspx

http://www.actionsdh.org/Contents/Action/Governance/Public_health_legislation/Norway.aspx

Selected Bibliographic References of Uses of this Strategy

Hargreaves, J.R., et al., The Social Determinants of Tuberculosis: From Evidence to Action. American Journal of Public Health, 2011. 101(4): p. 654-662.

Ahlburg D: The economic impacts of tuberculosis. Geneva: World Health Organization; 2000.

Gwatkin DR, Guillot M, Heuveline P: The burden of disease among the global poor. The Lancet 1999, 354(9178):586-589.

Nhlema B, Kemp J, Steenbergen G, Theobald G, Tang S, Squire B: The state of existing knowledge about TB and poverty. International Journal of Tuberculosis and Lung Disease 2007 (supp 2):116.

Spence DPS, Hotchkiss J, Williams CSD, Davies PDO: Tuberculosis and Poverty. British Medical Journal 1993, 307(6907):759-761.

Ooms, G., K. Derderian, et al. (2006). "Do We Need a World Health Insurance to Realise the Right to Health?" PLoS Medicine 3(12): 530.

Needham, D. (1996). "Economic barriers for TB patients in Zambia." The Lancet 348(9020): 134 - 135.

Suhrcke M, Stuckler D, Suk JE, Desai M, Senek M, McKee M, et al. The impact of economic crises on communicable disease transmission and control: a systematic review of the evidence. PLoS One. 2011;6(6):e20724.

Freudenberg N, Fahs M, Galea S, Greenberg A. The impact of New York City's 1975 fiscal crisis on the tuberculosis, HIV, and homicide syndemic. Am J Public Health. 2006;96(3):424-34.

Brief Description of the Approach

Poor and vulnerable groups are at greater risk of TB infection compared with the general population because of overcrowded and substandard living/working conditions; poor nutrition; other diseases (such as HIV/AIDS); and migration between higher-risk communities or nations. Economic, geographical and cultural barriers limit their access to effective TB diagnosis and treatment. Governments should include pro-poor objectives in their plans that enhance efforts to detect and successfully treat more TB patients. Based on best practices from countries, the following six principal steps are recommended: identify the poor and vulnerable groups in the country/region; determine which barriers prevent access of the vulnerable groups to services; assess potential actions to overcome the barriers; review the situations and population groups requiring special consideration; explore possibilities for harnessing additional resources; and evaluate the impact of pro-poor measures.

Reducing delays in diagnosis, decentralization of services, integration of TB/HIV care, integration of TB in health insurance schemes, and increasing insurance coverage are promising approaches to alleviate the economic burden of TB care.

List of alternative names (if applicable)

Primary prevention strategies, development, reduction of vulnerability

Shown to benefit

Elderly, Mentally ill, Alcohol dependent, Drug dependent, Malnourished, Residents of poor areas, Prisoners, MSM, Sex workers, Transgender, Migrants, Indigenous populations, Homeless, Street children/Orphans and Vulnerable Children

Potential Beneficiaries

Persons with diabetes, smokers, miners, factory workers, military

Example of Good Practice

Reaching the poor: challenges for TB programs in the Western Pacific Region. Manila,

World Health Organization Regional Office for the Western Pacific, 2004 (WHO/HTM/TB/2005.352;

http://www.wpro.who.int/NR/rdonlyres/3EB32584-9853-47D4-9AAE-BDC.5F15708EA/0/Reaching_the_Poor.pdf

Selected List of Guidances, Tools and Manuals

Social determinants and TB

http://whqlibdoc.who.int/publications/2010/9789241563970_eng.pdf

Poverty and TB

<http://www.who.int/tb/challenges/poverty/en/index.html>

Addressing Poverty In TB Control: Options For National TB Control Programmes. Geneva, World Health Organization, 2005 (WHO/HTM/TB/2005.352).

http://whqlibdoc.who.int/hq/2005/who_htm_tb_2005.352.pdf

Guidelines for Control of Tuberculosis in Prisons. Tuberculosis Coalition for Technical Assistance (TBCTA), 2009.

http://www.tbcare1.org/publications/toolbox/tools/access/download.php?file=Guidelines_for_control_of_TB_in_prisons.pdf

Treatment of Tuberculosis: guidelines for national programmes, Geneva, World Health Organization, 2010 (WHO/HTM/TB/2009.420).

http://whqlibdoc.who.int/publications/2010/9789241547833_eng.pdf fourth edition.

International Standards for Tuberculosis Care (ISTC). The Hague: Tuberculosis Coalition for Technical Assistance, 2014.

http://www.tbcare1.org/publications/toolbox/tools/access/download.php?file=ISTC_3rdEd_final_inter.pdf

Selected Bibliographic References of Uses of this Strategy

Hanson C et al. Tuberculosis in the poverty alleviation agenda. In: Raviglione M. ed Reichman and Hershfield's tuberculosis: a comprehensive international approach. Third Edition. Part B. New York, Informa Healthcare USA, Inc., 2006: 1097-1114

Ooms, G., K. Derderian, et al. (2006). "Do We Need a World Health Insurance to Realise the Right to Health?" PLoS Medicine 3(12): 530.

Muniyandi, M., R. Ramachandran, et al. (2006). "Socio-economic dimensions of tuberculosis control: review of studies over two decades from Tuberculosis Research Center." Journal of Communicable Diseases 38(3): 204 - 215.

Mauch, V., N. Woods, et al. (2011). "Assessing access barriers to tuberculosis care with the Tool to Estimate Patients' Costs: pilot results from two districts in Kenya." BMC Public Health 11(1): 43.

D Boccia, J Hargreaves, K Lonroth et al Cash Transfer and microfinance interventions for tuberculosis control: review of the impact evidence and policy implications, IJTLD 2011; 15(6):S37-S49;

A Beith, R Eichler, D. Weil Worldwide: Incentives for Tuberculosis Diagnosis and Treatment, in Performance Incentives for Global Health: Potential and Pitfalls. Center for Global Development, Washington, DC, 2009;

Brief Description of the Approach

Food security is a big issue for communities affected by TB. A comprehensive approach to malnutrition as a root cause and consequence of TB might include efforts to:

- Engage community health workers in finding families and individuals at risk
- Aid in the development of a locally-produced therapeutic food to treat acute malnourishment
- Boost the local economy by promoting sustainable sources of income for local farmers via home gardening and nutritional support
- Improve clinical care processes for integrating nutrition care into TB treatment

List of alternative names (if applicable)

Address malnutrition, secondary and tertiary prevention

Shown to benefit

Malnourished

Potential Beneficiaries

Children under 5, Peri-partum Women, Elderly, Homeless, Street Children/OVC, HIV-infected

Example of Good Practice

NuLife - Food and Nutrition Interventions for Uganda, was a technical assistance program to support improved health and nutrition outcomes for people living with HIV/AIDS in Uganda and therefore served a community at very high risk for TB.

NuLife was unique in its comprehensive approach: it simultaneously improved the organization of HIV clinical services and processes to integrate nutrition care into treatment, engaged community health workers in referral and follow-up, aided in the development of a locally-produced ready-to-use therapeutic food to treat malnutrition, supported the central government to develop standardized guidelines for IMAM and IYCF, and boosted sustainable livelihood opportunities for local farmers, especially those living with HIV/AIDS.

The Government of Uganda has adopted new guidelines and has included RUTF in the list of essential medicines and supplies, and documented best practices are ready to be scaled up to all health facilities.

http://pdf.usaid.gov/pdf_docs/PDACO008.pdf

Selected List of Guidances, Tools and Manuals

Social determinants and TB:

http://whqlibdoc.who.int/publications/2010/9789241563970_eng.pdf

Poverty and TB:

<http://www.who.int/tb/challenges/poverty/en/index.html>

Food Security:

<http://www.wfp.org/content/comprehensive-food-security-and-vulnerability-analysis-cfsva-guidelines-first-edition>

<http://www.wfp.org/content/unhcrwfp-joint-assessment-missions-jam-guidelines>

Selected Bibliographic References of Uses of this Strategy

Nutritional care and support for patients with tuberculosis Guideline World Health Organization

http://www.who.int/tb/publications/nutcare_support_patients_with_tb/en/

Mauch, V., N. Woods, et al. (2011). "Assessing access barriers to tuberculosis care with the Tool to Estimate Patients' Costs: pilot results from two districts in Kenya." BMC Public Health 11(1): 43.

Brief Description of the Approach

Infection control practices are an effective means of preventing TB and this field has become very dynamic in recent years. Concerted actions for effective TB Infection Control (TB-IC) have been proposed, including:

1. Engaging TB patients and the community in advocacy campaigns to prevent infection
2. Develop an IC plan in all congregate facilities, workplaces, schools, and health care venues
3. Ensure safe sputum collection
4. Promote cough etiquette and cough hygiene
5. Triage TB suspects for "fast-track" care or separation
6. Assure rapid diagnosis and initiation of TB treatment
7. Improve room air ventilation
8. Protect health care workers
9. Build capacity to prevent infections in congregate and community settings
10. Monitor infection control practices

TB-IC should not be viewed as an isolated intervention, rather it is part of general infection prevention and control (IPC) and an important part of a TB prevention and treatment package, along with Isoniazid Preventive Therapy (IPT), Intensified TB Case Finding (ICF), TB treatment and access to early ART.

Health care workers involved in TB and TB/HIV service delivery need to be informed about TB relates issues and equipped with all necessary supplies and equipment to practice precautions and prevent transmission of TB.

List of alternative names (if applicable)

Screening health care workers, prevent nosocomial transmission, Good laboratory practice (GLP), laboratory biosafety

Potential Beneficiaries

All clinical risk groups are likely to benefit.

Shown to benefit

All Congregate/occupational risk groups benefit from effective infection control practices: Deep Mine Miners, Factory workers, Transportation workers/Truck drivers, Shantytown/favela/slum residents, Prisoners & prison staff, HCWs/Lab staff, Military/Soldiers, Refugees/internally displaced populations (IDPs), Contacts of TB cases, Attendees of health care facilities (outpatient & in-patient) and the homeless. In addition, clinical risk groups such as HIV infected individuals and those with diabetes have Shown benefit from good IC.

Example of Good Practice

PLoS One. 2012; Volume 7, Number 1: e29589. Epub 2012 Jan 9. Wind-Driven Roof Turbines: A Novel Way to Improve Ventilation for TB Infection Control in Health Facilities; Cox, H., Escombe, R., McDermid, C., Mtshemla, Y., et al.

Researchers assessed the efficacy of wind-driven roof turbines to achieve recommended ventilation rates, compared to current recommended practices for natural ventilation (opening windows), in primary care clinic rooms in Khayelitsha, South Africa. Room ventilation was assessed (CO₂ gas tracer technique) in 4 rooms where roof turbines and air-intake grates were installed, across three scenarios: turbine, grate, and window closed; only window open; and only turbine and grate open; with concurrent wind speed measurement. 332 measurements were conducted over 24 months. For all 4 rooms combined, median air changes per hour (ACH) increased with wind speed quartiles across all scenarios. Higher median ACH were recorded with open roof turbines and grates, compared to open windows across all wind speed quartiles. Ventilation with open turbine and grate exceeded WHO-recommended levels (60 Litres/second/patient) for 95% or more of measurements in 3 of the 4 rooms; 47% in the remaining room, where wind speeds were lower and a smaller diameter turbine was installed. High room ventilation rates, meeting recommended thresholds, may be achieved using wind-driven roof turbines and grates, even at low wind speeds. Roof turbines and air-intake grates are not easily closed by staff, allowing continued ventilation through colder periods. This simple, low-cost technology represents an important addition to the tools for TB infection control.

Selected List of Guidances, Tools and Manuals

TB Infection Control Section of the TB CARE I Website:

<http://www.tbcare1.org/publications/toolbox/ic/>

Tuberculosis care and control in refugee and displaced populations: an interagency field manual, second edition. Geneva, World Health Organization, 2007 (WHO/HTM/TB/2007.377).

https://extranet.who.int/iris/restricted/bitstream/10665/43661/1/9789241595421_eng.pdf

WHO policy on TB infection control in health-care facilities, congregate settings and households. WHO, 2009 WHO/HTM/TB/2009.419.

http://whqlibdoc.who.int/publications/2009/9789241598323_eng.pdf

Tuberculosis Coalition for Technical Assistance (TBCTA). Implementing the WHO policy on TB infection control. The Hague: TBCTA; 2010.

http://www.tbcare1.org/publications/toolbox/tools/ic/download.php?file=TB_IC_Implementation_Framework.pdf

http://www.tbcare1.org/publications/toolbox/tools/ic/download.php?file=Biosafety_Guidance.pdf

http://www.tbcare1.org/publications/toolbox/tools/ic/download.php?file=TB_Infection_Control_Simplified_Checklist.pdf

http://www.tbcare1.org/publications/toolbox/tools/ic/download.php?file=download.php?file=TB_IC_Liste_de_controle_simplifiee.pdf

http://www.tbcare1.org/publications/toolbox/tools/ic/download.php?file=TB_IC_Lista_de_Verificacao_Simplificada.pdf

http://www.tbcare1.org/publications/toolbox/tools/ic/download.php?file=10_Essential_Actions_for_Effective_TB_Infection_Control.pdf

http://www.tbcare1.org/publications/toolbox/recent/download.php?file=TB_IC_at_Community_Level_Training_Handbook.pdf

http://www.tbcare1.org/publications/toolbox/tools/ic/download.php?file=fac_guide.pdf

Practical Solutions for TB Infection Control: Infectiousness and Isolation

This presentation provides information on how to determine whether a TB patient is infectious and demonstrates practical ways to prevent TB transmission in the clinic, in transit, and in the patient's home.

<http://www.nationaltbcenter.ucsf.edu/tbicweb/>

Selected Bibliographic References of Uses of this Strategy

FHI 360. Collaborative TB/HIV services — Standard operating procedures for implementation of TB activities at HIV/AIDS delivery sites. Research Triangle Park, NC: FHI 360; 2009.

Republic of Kenya, Ministry of Public Health and Sanitation. Guidelines for tuberculosis infection prevention in Kenya. Nairobi, Kenya: Division of Leprosy, Tuberculosis and Lung Disease; 2009.

Republic of Zambia, Ministry of Health. National tuberculosis infection control guidelines for health care and congregate settings. Lusaka, Zambia: National TB and Leprosy Programme; 2010.

Woith, W., G. Volchenkov, and J. Larson, Barriers and motivators affecting tuberculosis infection control practices of Russian health care workers. *Int J Tuberc Lung Dis*, 2012

Infection control Job Aids

http://www.tbcare1.org/publications/toolbox/tools/ic/download.php?file=TB_IC_Job_aid.pdf

Brief Description of the Approach

Isoniazid preventive therapy (IPT) has been shown to prevent the development of active TB disease in individuals with latent TB infection. Bucher and Griffith (1999) pooled the results of seven trials and found a risk ratio for HIV+ persons treated with isoniazid for developing tuberculosis of 0.58 [95% confidence interval (CI), 0.33-0.80] and 0.94 [95% CI, 0.83-1.07] for death.

IPT has been a key public health intervention preventing TB among people living with HIV since 1998. In 2011, WHO published new guidance for IPT, including a simplified screening algorithm that relies on four clinical symptoms to identify those eligible for either IPT or further diagnostic work-up for TB and other conditions.

Adults and adolescents living with HIV who have an unknown or positive TST status and who are unlikely to have active TB should receive at least 36 months of IPT. IPT should be given to such individuals irrespective of the degree of immunosuppression, and also to those on ART, those who have previously been treated for TB and peri-partum women.

Despite solid evidence in its favor and WHO recommendations supporting its use, TB programs have hesitated to implement IPT for TB due to fears that poor adherence would lead to INH resistance. Providing IPT to people living with HIV does not increase the risk of developing INH-resistant TB. Therefore, concerns regarding the development of INH resistance should not be a barrier to providing IPT.

IPT works in people without HIV as well, Isoniazid for 6-12 months reduced the risk of TB by 60% over two years or longer (Smieja et al 2010).

List of alternative names (if applicable)

Chemoprophylaxis

Shown to benefit

Person living with HIV(including peri-partum women and children), Children under 5, prisoners, miners, Contacts of TB cases

Potential Beneficiaries

Adolescents, Diabetes, Elderly (institutionalized), Malnourished, Mentally ill (institutionalized), Peri-partum women, HCWs/Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban residents of poor areas, Transportation workers, Homeless, Indigenous and minority ethnic groups

Example of Good Practice

Cegielski JP, Griffith DE, McGaha PK, Wolfgang M, Robinson CB, Clark PA, Hassell WL, Robison VA, Walker KP Jr., and Wallace C. Eliminating tuberculosis one neighborhood at a time. *AJPH* 2012; published online ahead of print October 18, 2012: e1-e9. doi:10.2105/AJPH.2012.300781.

Authors evaluated a strategy for preventing TB in communities most affected by it. In 1996, they mapped reported TB cases (1985-1995) and positive tuberculin skin test (TST) reactors (1993-1995) in Smith County, Texas, and delineated the 2 largest, densest clusters, identifying 2 highest-incidence neighborhoods. After extensive community preparation, trained health care workers went door-to-door offering TST to all residents unless contraindicated. TST-positive individuals were escorted to a mobile clinic for radiography, clinical evaluation, and if TB was ruled out, offered isoniazid preventive treatment (IPT) as indicated. To assess long-term impact, they mapped all TB cases in Smith County during the equivalent time period after the project. Of 2258 eligible individuals, 1291 (57.1%) were tested, 229 (17.7%) were TST positive, and 147 were treated for TB. From 1996 to 2006, there were no TB cases in either project neighborhood, in contrast with the pre-intervention decade and the continued occurrence of TB in the rest of Smith County. Targeting high-incidence neighborhoods for active, community-based screening and IPT may hasten TB elimination in the United States.

Selected List of Guidances, Tools and Manuals

Guidelines for intensified tuberculosis case-finding and isoniazid preventive therapy for people living with HIV in resource-constrained settings. WHO, Department of HIV/AIDS Stop TB Department. 2010

http://whqlibdoc.who.int/publications/2011/9789241500708_eng.pdf

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http://www.tbcare1.org/publications/toolbox/tools/tb_hiv/download.php?file=SOPCollaborativeTBHIVServices.pdf

Selected Bibliographic References of Uses of this Strategy

Bell JC et al. Tuberculosis preventive therapy for HIV-infected people in sub-Saharan Africa is cost-effective. *AIDS*, 1999, 13(12):1549-1556.

Golub JE et al. The impact of antiretroviral therapy and isoniazid preventive therapy on tuberculosis incidence in HIV-infected patients in Rio de Janeiro, Brazil. *AIDS*, 2007, 21(11):1441-1448.

Bucher, H. C., L. E. Griffith, et al. (1999). "Isoniazid prophylaxis for tuberculosis in HIV infection: a meta-analysis of randomized controlled trials." *Aids* 13(4): 501-507.

Thibela TB: Design and methods of a cluster randomised trial of the effect of community-wide isoniazid preventive therapy on tuberculosis amongst gold miners in South Africa. Fielding KL, Grant AD, Hayes RJ, Chaisson RE, Corbett EL, Churchyard GJ. *Contemp Clin Trials*. 2010 Dec 28. [Epub ahead of print]

'Team up against TB': promoting involvement in Thibela TB, a trial of community-wide tuberculosis preventive therapy. Grant AD, Coetzee L, Fielding KL, Lewis JJ, Ntshela S, Luttig MM, Mngadi KT, Muller D, Popane F, Mdluli J, Mngadi N, Sefuthi C, Clark DA, Churchyard G. *AIDS*. 2010 Nov;24 Suppl 5:S37-44.

Adverse events with isoniazid preventive therapy: experience from a large trial. Grant AD, Mngadi KT, van Halsema CL, Luttig MM, Fielding KL, Churchyard GJ. *AIDS*. 2010 Nov;24 Suppl 5:S29-36.

Tuberculosis outcomes and drug susceptibility in individuals exposed to isoniazid preventive therapy in a high HIV prevalence setting. van Halsema CL, Fielding KL, Chihota VN, Russell EC, Lewis JJ, Churchyard GJ, Grant AD. *AIDS*. 2010 Apr 24;24(7):1051-5.

Symptom and chest radiographic screening for infectious tuberculosis prior to starting isoniazid preventive therapy: yield and proportion missed at screening. Churchyard GJ, Fielding KL, Lewis JJ, Chihota VN, Hanifa Y, Grant AD. *AIDS*. 2010 Nov;24 Suppl 5:S19-27.

Smieja M, Marchetti C, Cook D, et al. Isoniazid for preventing tuberculosis in non-HIV infected person. *Cochrane Database Syst rev* 2010; 1:CD000171.]

Brief Description of the Approach

ART has been found to significantly reduce the risk of morbidity and mortality due to TB. A recent WHO-led meta-analysis (in press) found that ART reduces the individual risk of TB disease by 65%, irrespective of the CD4+ cell count. Isoniazid preventive treatment and ART given together can reduce the risk of TB among people living with HIV by up to 97%. Expanded access to ART has been shown to have a significant impact on community-level TB incidence, morbidity and mortality. Modeling data from nine African countries on the impact of starting to expand ART in 2010 with results determined for the years 2015 and 2050 suggest that initiating ART two years after HIV seroconversion would reduce the incidence of TB by 63%; delaying ART until five years after seroconversion would reduce the incidence of TB by 48% by 2015. WHO recommends ART for all TB patients irrespective of CD4+ count.

List of alternative names (if applicable)

Chemoprophylaxis

Shown to benefit

Person living with HIV (including peri-partum women and children), Children under 5, Prisoners, Miners, Contacts of TB cases

Potential Beneficiaries

Adolescents, Diabetes, Elderly (institutionalized), Malnourished, Mentally ill (institutionalized), Peri-partum women, HCWs/Lab staff, Military/Soldiers, Miners/ Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/ internally displaced populations (IDPs), Urban residents of poor areas, Transportation workers, Homeless, Indigenous and minority ethnic groups

Example of Good Practice

Implementing Joint TB and HIV Interventions in a Rural District of Malawi: Is There a Role for an International Non-Governmental Organisation?
R. Zachariah et al., *The international journal of tuberculosis and lung disease the official journal of the International Union against Tuberculosis and Lung Disease* **15**, 933-937 (2011).

In a rural district of Malawi that has embarked on scaling up ART, there appears to be a highly significant declining trend in TB case notification for both new and recurrent cases of TB. Whatever the exact reasons for the decline, a reversal in the trend of TB case notification associated with high ART coverage is very encouraging. First, an initial increase in TB case notification in the early years of initiating ART was followed by a decline. The initial increase may be related to better TB case detection through scale up of ART services.

The comprehensive support activities provided by MSF in the district from 1999 onwards, particularly in providing new TB infrastructure, human resources and consumables for the district laboratory, drug support to all peripheral health facilities, HIV testing, cotrimoxazole prophylaxis and management of opportunistic infections are all likely to have brought more ill patients into the health system and contributed to improved referrals and diagnosis of TB suspects. Furthermore, support for community TB/HIV-related activities, including screening and referral of TB suspects, would have contributed to enhanced case finding.

There is a progressive and highly significant declining trend in TB case notification from 2005 onwards associated with ART scale-up and increased access to ART services at peripheral health facilities. Although it is not known with certainty whether or not the observed reduction is linked to the ART roll-out, the association between the two is suggestive and intuitive. In a high HIV prevalence country such as Malawi, high TB incidence in the HIV-positive population is likely to be a very important contributor to community TB prevalence and transmission. A reduction in TB risk conferred by the 'ART protective effect' in this highly susceptible subgroup should therefore reduce TB incidence, and subsequently case notification, at the population level.

Selected List of Guidances, Tools and Manuals

Guidelines for intensified tuberculosis case-finding and isoniazid preventive therapy for people living with HIV in resource-constrained settings. WHO, Department of HIV/AIDS Stop TB Department. 2010
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PREVENT TB

PREVENT PROGRESSION TO DISEASE

Brief Description of the Approach

Vaccination with Bacille Calmette-Guérin (BCG) reduces the risk of severe (disseminated) TB in children and may have other (non-TB) protective benefits. BCG is the most widely given vaccines globally and is safe in immunocompetent individuals. The main effect of BCG is the reduction of the haematogenous spread of bacilli from the primary site of the infection and risk of immediate disease in young children. In countries with a high TB prevalence, for maximum protection BCG is given as soon after birth as possible, even though it is more efficacious if given later when the immune system is more functional.

BCG vaccination of HIV infected individuals can be hazardous, causing the development of BCG disease, which is often lethal. Recent evidence shows that HIV-infected infants who were routinely vaccinated with BCG at birth, when asymptomatic, and who later developed AIDS, are at high risk of developing disseminated BCG disease (estimated incidence 407-1300 per 100000).

Excerpt from the Union's BCG Working Group consensus statement summarizes the benefits:

Meta-analyses indicate a consistent BCG induced protective efficacy in young non-HIV-infected children against disseminated forms of TB (tuberculous meningitis or miliary disease), with a summary estimate protective effect of 73% (67-79%) against tuberculous meningitis and 77% (58-87%) against miliary disease. The protective effect of BCG against pulmonary disease in childhood is variable and there is no evidence of any BCG-induced protective effect in HIV-infected children.

The WHO and leading childhood TB experts have advised a continuation of BCG vaccination at birth among HIV negative infants. However since most children's HIV status is unknown at birth, the feasibility of implementation of these guidelines has been called into question.

List of alternative names (if applicable)

Immunization, primary prevention

Shown to benefit

Children under 5 **without HIV**

Potential Beneficiaries

Street children **without HIV**, Orphaned and vulnerable children **without HIV**

Example of Good Practice

In Hong Kong, BCG vaccination was first introduced in April 1952 as an organized campaign by the government with technical and material assistance from the UNICEF (United Nations International Children's Emergency Fund) and the WHO. Over the years, the BCG vaccination programs have been modified according to the local situation, availability of up-to-date scientific information, and international recommendations. For the past few decades, the BCG team of the TB&Chest Service has been offering the vaccination to two main target groups: newborns and primary school students.

The coverage for newborn babies has been persistently over 98% since 1980 and this has contributed significantly to the low rate of TB among the young age group locally. On the other hand, a statement was issued by WHO in 1995 stating that there is no shown value for BCG revaccination and it is not recommended. Hence, a review of the local BCG revaccination program for primary school children has been carried out. As the data did not suggest any additional protective efficacy offered by the revaccination, the program has been stopped recently in the school year starting from September 2000.

Hence, the current policy is to vaccinate the newborn babies, as well as children residing in Hong Kong and aged under 15 without any prior BCG vaccination'.

Selected List of Guidances, Tools and Manuals

Global Advisory Committee on Vaccine Safety. Revised BCG vaccination guidelines for infants at risk for HIV infection. 25 May 2007. *Wkly Epidemiol Rec* 2007;82:181-96. PMID:17526120

Strategic Advisory Group of Experts. Meeting of the immunization Strategic Advisory Group of Experts, April 2007: conclusions and recommendations. *Wkly Epidemiol Rec* 2007;82:181-96. PMID:17526120

Revised BCG vaccination guidelines for infants at risk for HIV infection. *WklyEpidemiol Rec* 2007;82:193-6. PMID:17526121

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AC Hesselning,a LF Johnson,b H Jaspan,c MF Cotton,c A Whitelaw,d HS Schaaf,c PEM Fine,e BS Eley,f BJ Marais,a J Nuttall,f N Beyersa & P Godfrey-Faussettg Disseminated bacille Calmette-Guérin disease in HIV-infected South African infants. *Bull World Health Organ* 2009;87:505-511 | doi:10.2471/BLT.08.055657

Trunz BB, Fine P, Dye C. Effect of BCG vaccination on childhood tuberculous meningitis and miliary tuberculosis worldwide: a meta-analysis and assessment of cost-effectiveness. *Lancet* 2006;367:1173-80. PMID:16616560 doi:10.1016/S0140-6736(06)68507-3

A. C. Hesselning, M. F. Cotton, C. Fordham von Reyn, S. M. Graham, R. P. Gie, G. D. Hussey. Consensus statement on the revised World Health Organization recommendations for BCG vaccination in HIV-infected infants *INT J TUBERC LUNG DIS* 12(12):1376-1379

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Trunz BB, Fine P, Dye C. Effect of BCG vaccination on childhood tuberculous meningitis and miliary tuberculosis worldwide: a meta-analysis and assessment of cost-effectiveness. *Lancet* 2006;367:1173-80. PMID:16616560 doi:10.1016/S0140-6736(06)68507-3

Brief Description of the Approach

Component five of the Stop TB Strategy is *empower people with TB and communities*. As described in the WHO document; *Community Involvement in Tuberculosis Care and Prevention (2008)*, this means creating strong partnerships between the NTP, health care providers, TB patients and the community. These initiatives are based on a strategy that addresses the needs of individuals in the community by involving community members and those affected by TB in the design and implementation of TB care initiatives. CBTC contributes to increased case detection and positive treatment outcome rates through active case finding, educating the community about TB, bringing services closer to the community and empowering the community to support TB care and control activities.

Social mobilization activities are intended to bring together stakeholders including community members to strengthen community participation for sustainability. It generates dialogue, ensure negotiation and consensus among a range of players which represent policy-makers, decision-makers, the media, NGOs, leaders, the private sector, professional associations, TB-patient networks, religious groups etc.

For successful social mobilization activities “involve people who are either living with active TB or have suffered from it at some time in the past”². Empowering TB patients and community helps to achieve early diagnosis/compliance to treatment and completion of prescribed treatment regime.

Engaging communities helps to improve the accountability/ownership of both TB problems and solutions. It is not enough to involve communities only in case finding, they also have an important role to play in TB control governance, advocacy, planning, monitoring and evaluation.

List of alternative names (if applicable)

ENGAGE!, Working with NGOs, Civil society involvement, Social mobilization, Community participation

Potential Beneficiaries

HIV-infected/PMTCT, Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs/Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban residents of poor areas, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender

Example of Good Practice

Kamineni, V.V., et al., *A rapid assessment and response approach to review and enhance advocacy, communication and social mobilisation for tuberculosis control in Odisha state, India*. *Bmc Public Health*, 2011. 11: p. 463.

BACKGROUND: Tuberculosis remains a major public health problem in India with the country accounting for 1 in 5 of all TB cases reported globally. An advocacy, communication and social mobilisation project for Tuberculosis control was implemented and evaluated in Odisha state of India. The purpose of the study was to identify the impact of project interventions including the use of ‘Interface NGOs’ and involvement of community groups such as women’s self-help groups, local government bodies, village health sanitation committees, and general health staff in promoting TB control efforts.

METHODS: The study utilized a rapid assessment and response (RAR) methodology. The approach combined both qualitative field work approaches, including semi-structured interviews and focus group discussions with empirical data collection and desk research.

RESULTS: Results revealed that a combination of factors including the involvement of Interface NGOs, coupled with increased training and engagement of front line health workers and community groups, and dissemination of community based resources, contributed to improved awareness and knowledge about TB in the targeted districts. Project activities also contributed towards improving health worker and community effectiveness to raise the TB agenda, and improved TB literacy and treatment adherence. Engagement of successfully treated patients also assisted in reducing community stigma and discrimination.

CONCLUSION: The expanded use of advocacy, communication and social mobilisation activities in TB control has resulted in a number of benefits. These include bridging pre-existing gaps between the health system and the community through support and coordination of general health services stakeholders, NGOs and the community. The strategic use of ‘tailored messages’ to address specific TB problems in low performing areas also led to more positive behavioral outcomes and improved efficiencies in service delivery. Implications for future studies are that a comprehensive and well planned range of ACSM activities can enhance TB knowledge, attitudes and behaviors while also mobilizing specific community groups to build community efficacy to combat TB. The use of rapid assessments combined with other complementary evaluation approaches can be effective when reviewing the impact of TB advocacy, communication and social mobilisation activities.

Selected List of Guidances, Tools and Manuals

Engage-TB: integrating community-based tuberculosis activities into the work of nongovernmental and other civil society organizations: operational guidance Getahun, Haileyesus II. Joseph, Thomas. III. Tomaskovic, Lana. IV. Raviglione, Mario C. World Health Organization. ISBN 978 92 4 150450 8 (NLM classification: WF 200) http://apps.who.int/iris/bitstream/10665/75997/1/9789241504508_eng.pdf

The Engage-TB Approach: Operational guidance integrating community-based tuberculosis activities into the work of nongovernmental and other civil society organizations. WHO 2013. http://www.who.int/tb/publications/2012/engage_tb_policy/en/

Good Practice Guide: Greater involvement of people living with HIV <http://www.aidsalliance.org/includes/Publication/GIPAGuideBW.pdf>

Guidelines for social mobilization. A human rights approach to TB: <http://www.who.int/hhr/information/A%20Human%20Rights%20Approach%20to%20Tuberculosis.pdf>

Community Involvement in TB: http://www.who.int/tb/people_and_communities/involvement/resources/en/index.html

Active Engagement of Civil Society Organizations http://whqlibdoc.who.int/hq/2010/WHO_HTM_TB_2010.15_eng.pdf

Community involvement in tuberculosis care and prevention: towards partnerships for health: guiding principles and recommendations based on a WHO review. Geneva, World Health Organization, 2008 (WHO/HTM/TB/2008.397). http://whqlibdoc.who.int/publications/2008/9789241596404_eng.pdf

Working with the media: how to make your messages on tuberculosis count. Geneva, World Health Organization, 2009 (WHO/HTM/STB/2009.57). Advocacy, communication and social mobilization (ACSM) for tuberculosis control: a handbook for country programmes. Geneva, World Health Organization, 2007. http://www.stoptb.org/assets/documents/resources/publications/acsm/ACSM_Handbook.pdf

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Community Systems Strengthening Framework. Geneva, the Global Fund to Fight AIDS, Tuberculosis and Malaria, 2010. http://www.theglobalfund.org/documents/core/framework/Core_CSS_Framework_en/

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Bertrand JT, O'Reilly K, Denison J, Anhang R, Sweat M. Systematic review of the effectiveness of mass communication programs to change HIV/AIDS-related behaviors in developing countries. *Health Educ Res*. 2006;21:567-97.

Brief Description of the Approach

To provide a patient centered approach it is important to involve informal providers in appropriate ways. These providers differ in their education, approach and responsibility levels and so it may take some time to harmonize and collaborate. Participation needs thorough planning and follow-up; financial and human investments will be needed from the TB program.

Involvement of a "lay health worker"³ will require some training to promote health or to carry out some healthcare services (giving help and advice about TB, dispense medicine, treat particular health problems) but not as comprehensive as for healthcare professionals. After training is provided they can be involved in either paid or voluntary care.

Involvement of community health workers (CHW) can address the growing shortage of health workers, particularly in low-income countries and in the communities where they come from to respond to local societal and cultural norms and customs to ensure community acceptance and ownership. For engaging CHW in the TB services they must be carefully selected, appropriately trained and - very important - adequately and continuously supported by the health system but not necessarily a part of its organization.

Large-scale CHW systems require substantial increases in support for training, management, supervision and logistics but are a good investment as in reality the only alternative or related option is NO care at all for those living in geographically unfavorable areas.

List of alternative names (if applicable)

Lay health worker, Village health committee, village health worker, Community health assistants, community health promoters, outreach workers, Task shifting

Shown to benefit

Drug Dependent, Peri-partum Women

Potential Beneficiaries

HIV-infected/PMTCT, Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs/Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban residents of poor areas, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

One of the main strategies to control tuberculosis (TB) is to find and treat people with active disease. Unfortunately, the case detection rates remain low in many countries. Thus, we need interventions to find and treat sufficient number of patients to control TB. We investigated whether involving health extension workers (HEWs: trained community health workers) in TB control improved smear-positive case detection and treatment success rates in southern Datiko and Lindtjørn carried out a community-randomized trial in southern Ethiopia from September 2006 to April 2008. Fifty-one kebeles (with a total population of 296,811) were randomly allocated to intervention and control groups. They trained HEWs in the intervention kebeles on how to identify suspects, collect sputum, and provide directly observed treatment. The HEWs in the intervention kebeles advised people with productive cough of 2 weeks or more duration to attend the health posts. Two hundred and thirty smear-positive patients were identified from the intervention and 88 patients from the control kebeles. The mean case detection rate was higher in the intervention than in the control kebeles (122.2% vs 69.4%, $p < 0.001$). In addition, more females patients were identified in the intervention kebeles (149.0 vs 91.6, $p < 0.001$). The mean treatment success rate was higher in the intervention than in the control kebeles (89.3% vs 83.1%, $p = 0.012$) and more for females patients (89.8% vs 81.3%, $p = 0.05$). The involvement of HEWs in sputum collection and treatment improved smear-positive case detection and treatment success rate, possibly because of an improved service access.

Health extension workers improve tuberculosis case detection and treatment success in southern Ethiopia: a community randomized trial. *PLoS One*. 2009;4(5):e5443. Epub 2009 May 8.

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Selected List of Guidances, Tools and Manuals

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Community health workers: What do we know about them? The state of the evidence on programmes, activities, costs and impact on health outcomes of using community health workers. Evidence and Information for Policy, Department of Human Resources for Health, Geneva, January 2007, WHO http://www.who.int/hrh/documents/community_health_workers.pdf

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Advocacy, Communication and Social Mobilization For TB Control: A Guide to Developing Knowledge, Attitude and Practice Surveys. http://www.stoptb.org/assets/documents/resources/publications/acsm/ACSM_KAP%20GUIDE.pdf

HRH Action Framework http://www.who.int/tb/health_systems/human_resources/hrh_action_framework/en/index1.html

Planning the development of human resources for health for implementation of the Stop TB Strategy: a handbook. WHO, 2008, WHO/HTM/TB/2008.407 http://whqlibdoc.who.int/publications/2009/9789241597715_eng.pdf

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Rao, M., K. D. Rao, et al. (2011). "Human resources for health in India." The Lancet 377(9765): 587-598.

Daniel G. Datiko, Bernt Lindtjørn Cost and Cost-Effectiveness of Smear-Positive Tuberculosis Treatment by Health Extension Workers in Southern Ethiopia: A Community Randomized Trial PLoS One. 2010; 5(2): e9158. Published online 2010 February 17. doi: 10.1371/journal.pone.0009158

Brief Description of the Approach

To promote health seeking for TB symptoms it is important to have answers to following questions:

- What motivates a person to seek diagnosis?
- What kinds of obstacles exist?

There are many factors that influence health-seeking behavior including: stigma, distance, money, competencies of the HCW, knowledge of individual- lack of symptom recognition)

Identifying what a person cares about helps in tailoring messages and interventions. For example, in a society where family is of great value, messages can emphasize the importance of staying healthy, and getting diagnosed and treated, so as to protect family members to be infected and to be able to take better care of the family. If a population trusts traditional healers, messages might be vectored that they are part of the team which endorses DOTS. If there is tendency to avoid public health sector, messages can emphasize that care can be obtained at the specific private sector facilities. All activities need to enable intended 'ideal behavior'. This means that a variety of activities should be undertaken to address the diversity of barriers to TB prevention and control and for all involved parties to facility mutual process.

List of alternative names (if applicable)

Passive case-finding, self-referral

Shown to benefit

Drug Dependent

Potential Beneficiaries

HIV-infected/PMTCT, Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs/Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban residents of poor areas, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

MacKian S., A review of health seeking behaviour: problems and prospects

In the study of Auer et al (2000) the health system appeared to play a large role in the health seeking behavior of patients. They chose private doctors over public facilities, as they believed their service to be more polite, more effective, more sympathetic and respectful of privacy. Auer et al stress that in the case of TB, with its lengthy treatment period, the fostering of a good doctor-patient relationship is crucial. Information is also needed regarding the availability of free drugs. Many patients in their survey continued to purchase privately prescribed drugs and were unaware these were available free of charge at public facilities. This has a potential impact on treatment compliance. They also found fear did not necessarily motivate health seeking and in fact may delay seeking treatment, and recommend it should therefore not be overstated in health education messages.

Selected List of Guidances, Tools and Manuals

Engage-TB: integrating community-based tuberculosis activities into the work of nongovernmental and other civil society organizations: operational guidance Getahun, Haileyesus II. Joseph, Thomas. III. Tomaskovic, Lana. IV. Raviglione, Mario C. World Health Organization. ISBN 978 92 4 150450 8 [NLM classification: WF 200] http://apps.who.int/iris/bitstream/10665/75997/1/9789241504508_eng.pdf

Community involvement in tuberculosis care and prevention: towards partnerships for health: guiding principles and recommendations based on a WHO review. Geneva, WHO, 2008 (WHO/HTM/TB/2008.397). http://whqlibdoc.who.int/publications/2008/9789241596404_eng.pdf?ua=1

Community health workers: What do we know about them? The state of the evidence on programmes, activities, costs and impact on health outcomes of using community health workers. Evidence and Information for Policy, Department of Human Resources for Health, Geneva, January 2007, WHO http://www.who.int/hrh/documents/community_health_workers.pdf

Assessing Financing, Education, Management and Policy Context for Strategic Planning of Human Resources for Health, WHO 2007 http://www.who.int/hrh/tools/assessing_financing.pdf

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Advocacy, communication and social mobilization (ACSM) for tuberculosis control: a handbook for country programmes. Geneva, World Health Organization, 2007. http://www.stoptb.org/assets/documents/resources/publications/acsm/ACSM_Handbook.pdf

Advocacy, communication and social mobilization for TB control: a guide to developing knowledge, attitude and practice surveys. http://www.stoptb.org/assets/documents/resources/publications/acsm/ACSM_KAP%20GUIDE.pdf

Working with the media: how to make your messages on tuberculosis count. Geneva, WHO, 2009 (WHO/HTM/STB/2009.57).

Theory at Glance. A guide for Health Promotion Practice, 2nd edition, US Department for Health and Human services, National Institute for Health, 2005, <http://www.cancer.gov/cancertopics/cancerlibrary/theory.pdf>

Bertrand JT, O'Reilly K, Denison J, Anhang R, Sweat M. Systematic review of the effectiveness of mass communication programs to change HIV/AIDS-related behaviors in developing countries. Health Educ Res. 2006;21:567-97.

Hoa NB, Tiemersma EW, Sy DN, Nhung NV, Vree M, Borgdorff MW, et al. Health-seeking behaviour among adults with prolonged cough in Vietnam. Tropical Medicine & International Health. 2011 Oct;16(10):1260-7.

Brief Description of the Approach

The communication is dynamic process with mutual interaction and being affected by many variables. Effective communication starts with hearing and understanding rather than talking and trying to convince.

“Ways to make health communication effective and efficient are:

- Know the topic - be clear about the subject and stick to the main theme
- Know your receiver/audience - to keep the receiver involved in the subject discussion it is important to be familiar with the background, personality, needs and value systems.
- Establish rapport - people communicate effectively when they are at ease with one another. Show interest in the other person, this is the best way of getting their attention/acceptance.
- Encourage questions - this will help to clarify doubts and misconceptions.
- Build trust - create an atmosphere of one in which people are able to speak openly.
- Do not antagonize people - take care of the feelings of people while talking to them.
- Avoid ambiguity - be specific. Avoid vague statements such as “take appropriate action”.
- Be brief it is best to be direct and to the point. Reinforce the main points with examples
- Ask questions to verify if your communication has been received in the way it was intended.
- Be aware of language - avoid using jargon or speaking in a way to impress the listener.
- Integrate your words, gestures and tone - remember to adjust your tone and volume
- Choose a proper time and place - ensure that enough time is available and that there are no unnecessary interruptions.
- Be sensitive to feedback - feedback from the listener needs to be recognized”⁴.

List of alternative names (if applicable)

Communication skills, interactive communication, active listening, feed-back, Inter-personal communication (IPC)

Shown to benefit

Drug Dependent

Potential Beneficiaries

HIV-infected/PMTCT, Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory & farm workers, HCWs/Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban residents of poor areas, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

Bérengère de Negri et al, Improving Interpersonal Communication Between Health Care Providers and Clients, Quality Assurance Project (QAP), USAID, Retrieved October 28, 2012, from [http://www.hciproject.org/sites/default/files/Improving IPC Between Providers & Clients_QAP_1997.pdf](http://www.hciproject.org/sites/default/files/Improving%20IPC%20Between%20Providers%20&%20Clients_QAP_1997.pdf)

IPC is effective when it leads to the following five outcomes: 1) the patient discloses enough information about the illness to lead to an accurate diagnosis; 2) the provider, in consultation with the client, selects a medically appropriate treatment acceptable to the client; 3) the client understands his or her condition and the prescribed treatment regimen; 4) the provider and the client establish a positive rapport; 5) the client and the provider are both committed to fulfilling their responsibilities during treatment and follow-up care.

Three studies (Honduras, Trinidad and Tobago, and Egypt) are presented, which evaluate the impact of IPC training on the performance of Health Care Providers. In a study among the participants from Honduras, overall, the IPC intervention resulted in more communication by trained providers, and more extensive use of practices that enhance the effectiveness of communication. Further, patients responded to these improvements in communication skills by communicating more and disclosing more medical information. Finally, patient satisfaction ratings were higher for providers who had received the training, and patients perceived more informative behaviors in these providers.

A health provider training program and an accompanying evaluation research component in Trinidad and Tobago showed that the trained physicians performed better, often statistically, in certain areas such as positive talk, attentive listening, open-ended questions and overall interaction with patients. More information was shared between physicians and patients within the context of a limited dialogue. There was no significant increase in counseling or lifestyle information, but a significant increase in psycho-social exchange. Increased use of positive talk and conversation facilitators enabled patients to more easily impart psycho-social information. This was evidenced by a significant increase in how much patients said and in the biomedical, lifestyle and psycho-social information they volunteered.

IPC training of health care providers in a public hospital in Egypt showed that the training succeeded in raising provider awareness about the importance of communication and encouraged providers to develop and maintain their IPC skills on par with their clinical skills. Trained doctors suggested that the training course be given to more hospital personnel and that it be added to the university curriculum of medical students to allow them to provide better care.

Selected List of Guidances, Tools and Manuals

Leadership and Strategic Management for TB Control Managers, Communication Skills, Module No.6, SEA-TB-274, WHO, 2008,
http://www.searo.who.int/linkfiles/training_materials_lsm-6.pdf

Advocacy, communication and social mobilization for TB control: a guide to developing knowledge, attitude and practice surveys.
http://www.stoptb.org/assets/documents/resources/publications/acsm/ACSM_KAP%20GUIDE.pdf

Interpersonal Communication and Counseling for Clients on Tuberculosis and HIV and AIDS.
<http://www.path.org/publications/detail.php?i=1770>

Selected Bibliographic References of Uses of this Strategy

Principles for the Greater Involvement of People with TB (GIPT)
http://data.unaids.org/pub/briefingnote/2007/jc1299_policy_brief_GIPA.pdf

Advocacy, communication and social mobilization (ACSM) for tuberculosis control: a handbook for country programmes. Geneva, World Health Organization, 2007.
http://www.stoptb.org/assets/documents/resources/publications/acsm/ACSM_Handbook.pdf

HRH Action Framework
http://www.who.int/tb/health_systems/human_resources/hrh_action_framework/en/index1.html

Communication Skills
<http://www.mindtools.com/page8.html>

HIV Voluntary Counseling and Testing:
 Skills Training Curriculum Participant's Manual. VCT TOOLKIT, FHI, 2005
http://pdf.usaid.gov/pdf_docs/Pnad072.pdf

Brief Description of the Approach

Ageism, racism, xenophobia, homophobia, and discriminatory attitudes toward vulnerable groups negatively impact health-seeking behavior. Efforts to create an environment where differences are tolerated (and even valued) can help reduce barriers to utilization of health care services. Health services that post statements that all patients are considered equal and will be treated with respect may create a climate where respect for all is the norm.

At times it can be challenging to differentiate between TB stigma and negative attributes ascribed to marginalized populations most at risk (MARPs) for TB/HIV.

List of alternative names (if applicable)

Stigma reduction, anti-discrimination, patient-centered approach, people centered-approach, justice, equity

Shown to benefit

Drug dependent

Potential Beneficiaries

HIV-infected, children under 5, elderly, mentally ill, alcohol dependent, smokers, malnourished, persons who previously had TB, residents of poor areas, prisoners, refugees, MSM, sex workers, transgender, migrants, indigenous populations, homeless, street children, orphans and vulnerable children, nomads.

Example of Good Practice

A rapid assessment of the accessibility and integration of HIV, TB and harm reduction services for people who inject drugs in Portugal; Final Study Report, April 2012. Grenfell P. et al.

The relationship between persons who inject drugs and the provider they viewed as their 'doctor' - typically a practitioner within a specialist treatment center and/or someone with whom (s)he had a family link - was central to feeling valued within services, particularly where social networks were lacking. This linked closely with service providers' emphasis on recognizing clients' individual needs and circumstances. Feeling known and treated equally helped clients feel accepted in specialist treatment centers.

Selected List of Guidances, Tools and Manuals

Southern African HIV/AIDS Information Service. Toolkit for Integrating LGBTI Issues Into HIV & GBV Prevention.

<http://saf aids.net>

TRIBAL EQUITY TOOLKIT: Tribal Resolutions and Codes to Support Two Spirit & LGBT Justice in Indian Country

<https://graduate.lclark.edu/live/files/12487-tribal-equity-toolkit-preview>

Oanh K, Muc PD, Kidd R: Safe and friendly health facility, trainer's guide. Institute for Social & Development Studies (ISDS); 2008.

<http://www.icrw.org/files/publications/Safe-and-Friendly-Health-Facility-Trainers-Guide.pdf>

The Council of the European Union's Working Party on Human Rights adopted the Toolkit to Promote and Protect the Enjoyment of all Human Rights by Lesbian, Gay, Bisexual and Transgender (LGBT) People.

<http://www.consilium.europa.eu/uedocs/cmsUpload/st11179.en10.pdf>

Kidd R, Prasad N, Joythsna, Tajuddin M, Ramesh D, Duvvury N: Reducing HIV Stigma and Gender Based Violence: Toolkit for healthcare Providers in India. New Delhi: International Center for Research on Women (ICRW); 2007.

<http://www.icrw.org/files/publications/Reducing-HIV-Stigma-and-Gender-Based-Violence-Toolkit-for-Health-Care-Providers-in-India.pdf>

UNAIDS guidance note on HIV and sex work.

http://www.unaids.org/en/media/unaids/contentassets/documents/unaidspublication/2009/JC2306_UNAIDS-guidance-note-HIV-sex-work_en.pdf

Our Lives Matter: Sex Workers Unite for Health and Rights

<http://www.opensocietyfoundations.org/reports/our-lives-matter-sex-workers-unite-health-and-rights>

Selected Bibliographic References of Uses of this Strategy

Niang CI, Tapsoba P, Weiss E, Diagne M, Niang Y, Moreau AM, Gomis D, Wade AS, Seck K, Castle C: "It's raining stones": Stigma, violence and HIV vulnerability among men who have sex with men in Dakar, Senegal. *Culture, Health & Sexuality* 2003,5(6):499-512.

White RC, Carr R: Homosexuality and HIV/AIDS stigma in Jamaica. *Culture, Health & Sexuality* 2005, 7(4):347-359.

Phillips R, Benoit C. Exploring stigma by association among front-line care providers serving sex workers. *Healthc Policy*. 2013 Oct;9(Spec Issue):139-51.

Wolf RC, Cheng AS, Kapesa L, Castor D. Building the evidence base for urgent action: HIV epidemiology and innovative programming for men who have sex with men in sub-Saharan Africa. *J Int AIDS Soc*. 2013 Dec 2;16 Suppl 3:18903. doi: 10.7448/IAS.16.4.18903.

van der Elst EM, Gichuru E, Omar A, Kanungi J, Duby Z, Midoun M, Shangani S, Graham SM, Smith AD, Sanders EJ, Operario D. Experiences of Kenyan healthcare workers providing services to men who have sex with men: qualitative findings from a sensitivity training programme. *J Int AIDS Soc*. 2013 Dec 2;16 Suppl 3:18741. doi: 10.7448/IAS.16.4.18741.

The Global Criminalisation Scan

<http://criminalisation.gnpplus.net/>

Brief Description of the Approach

TB related stigma is a social process or related personal experience characterized by exclusion, rejection, blaming or devaluation that results from experience or anticipation of an adverse social judgment about a person with TB, Weiss and Ramakrishna (2006) cited in Van Rie et al. 2008⁵.

TB Stigma reduction programs aim to enhance the solidarity and acceptance of TB patients by increasing knowledge, reducing fear of infection through casual contact, and enhance TB patient coping mechanism.

TB stigma can often be compounded by ageism, racism, xenophobia, homophobia and discriminatory attitudes toward vulnerable groups such as prisoners and sex workers. At times it can be challenging to differentiate between TB stigma and negative attributes ascribed to those populations most at risk (MARPs) or those with HIV.

Country specific legislation that promotes and legitimates stigma should be revisited and revised to reduce existing TB stigma. Reducing stigma requires a sustained program effort with sustained activities for community participants, particularly when initial levels are high.

List of alternative or related names and related topics

Counseling to enhance coping mechanisms, Early diagnosis and treatment to avoid side effects IEC materials that promote compassion rather than shame, blame and judgment of TB patients, Education to demystify and clarify negative perceptions, Lobbying and advocacy for a conducive stigma-free environment.

Shown to benefit

HIV infected, drug dependent

Potential Beneficiaries

Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Elderly (institutionalized), Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs/Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban residents of poor areas, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex.

Example of Good Practice

Nyblade L, Hong KT, Van Anh N, Ogden J, Jain A, Stangl A, Douglas Z, Tao N, Ashburn K: **Communities confront HIV stigma in Viet Nam: participatory interventions reduce HIV-related stigma in two provinces.** International Center for Research on Women (ICRW), Institute for Social Development Studies: Washington, D.C. and Hanoi; 2008.

Community activities included: (1) stigma-reduction sensitization workshops for authorities and representatives of social organizations; (2) a workshop for community members to develop their own stigma-reduction action plans; (3) communities implementing the action plans with technical support; and (4) monitoring and evaluating the program activities. Respondents at endline reported less fear of HIV infection by sharing an in-patient room, sharing a toilet, going to the dentist and having a manicure. Regression results indicate that the more activities a respondent reported being exposed to, the lower his or her score on the fear of casual contact index patient. Reducing stigma requires a sustained program effort with sustained activities for community participants, particularly when initial levels are high. Exposure to intervention activities reduced value-driven stigma in both communities. Although statistically significant, the changes observed were small in magnitude and the overall level of value-driven stigma remained high.

Selected List of Guidances, Tools and Manuals

WHO policy on TB infection control in health-care facilities, congregate settings and households. WHO, 2009 WHO/HTM/TB/2009.419.
http://whqlibdoc.who.int/publications/2009/9789241598323_eng.pdf

Kidd R, Clay S, Chiiya C: Understanding and challenging HIV stigma: toolkit for action. Second edition. Brighton: International HIV/AIDS Alliance, AED and ICRW; 2007.
<http://www.icrw.org/files/publications/Understanding-and-Challenging-HIV-Stigma-Toolkit-for-Action.pdf>

Tuberculosis care with TB-HIV co-management: Integrated Management of Adolescent and Adult Illness (IMAI).WHO, 2007, ISBN 978 92 4 159545 2
http://www.who.int/hiv/pub/imai/TB_HIVModule23.05.0.pdf

Essential prevention and care interventions for adults and adolescents living with HIV in resource-limited settings, WHO, 2008, ISBN 978 92 4 159670 1
http://www.who.int/hiv/pub/prev_care/QMS_EPP_AFF_en.pdf

Engage-TB: integrating community-based tuberculosis activities into the work of nongovernmental and other civilsociety organizations: operational guidance Getahun, Haileyesus II. Joseph, Thomas. III. Tomaskovic, Lana. IV. Raviglione, Mario C. World Health Organization. ISBN 978 92 4 150450 8 (NLM classification: WF 200)
http://apps.who.int/iris/bitstream/10665/75997/1/9789241504508_eng.pdf

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Nyblade L, Stangl A, Weiss E, Ashburn K. Combating HIV stigma in health care settings: what works? *J Int AIDS Soc* 2009;12:15
<http://www.biomedcentral.com/content/pdf/1758-2652-12-15.pdf>

Diagnostic and treatment delay in tuberculosis
An in-depth analysis of the health-seeking behavior of patients and health system response in seven countries of the Eastern Mediterranean Region, WHO-EM/TDR/009/E, 2007, <http://www.emro.who.int/dsaf/dsa710.pdf>

Weiss, M. G., Ramakrishna, J., & Somma, D. (2006). Health-related stigma: Rethinking concepts and interventions. *Psychology, Health and Medicine*, 11, 277.

The Importance of Addressing the Unfolding TB-HIV Stigma in High HIV Prevalence Settings
Bond, V. and Nyblade, L. (2006), The importance of addressing the unfolding TB-HIV stigma in high HIV prevalence settings. *J. Community. Appl. Soc. Psychol.*, 16: 452-461. doi: 10.1002/casp.893

Measuring stigma associated with tuberculosis and HIV/AIDS in southern Thailand: exploratory and confirmatory factor analyses of two new scales
Trop Med Int Health. 2008 Jan;13(1):21-30. doi: 10.1111/j.1365-3156.2007.01971.x. Measuring stigma associated with tuberculosis and HIV/AIDS in southern Thailand: exploratory and confirmatory factor analyses of two new scales. Van Rie A, Sengupta S, Pungrassami P, Balthip Q, Choonuan S, Kasetjaroen Y, Strauss RP, Chongsuivatwong V.

A rapid assessment of the accessibility and integration of HIV, TB and harm reduction services for people who inject drugs in Portugal; Final Study Report, April 2012. Grenfell P. et al.
<http://www.euro.who.int/en/health-topics/communicable-diseases/sexually-transmitted-infections/publications/2012/accessibility-and-integration-of-hiv-tb-and-harm-reduction-services-for-people-who-inject-drugs-in-portugal-a-rapid-assessment>

Brief Description of the Approach

It is important to identify needs, problems and barriers in the TB program delivery to be able to define possible solutions for improving quality and accessibility of provided services for TB patients.

Compliance with prescribed TB treatment is one of the determinants of the TB control in the specific setting. Knowledge of certain groups like TB patients and/or HCWs “may not be a direct determinant of compliance. Attitude has a lot of influence on compliance with TB treatment, indicating that attitude mediates the relationship between knowledge and compliance”⁶.

Comprehensive ACSM strategies and interventions are needed to be able to reach set NTP goals and objectives. Based on the needs assessment and areas of enquiry it is important to identify what kind of knowledge, attitudes and practices needs to be enhanced and for what kind of target group (HCW, patients, community). To be able to comply with treatment regimen and be adherent (compliant) throughout the treatment, involved parties has to be empowered with necessary knowledge and skills and need to have necessary attitude. To be able to act in an efficient way tools have to be employed as well all possible obstacles removed.

List of alternative names (if applicable)

TB Education; Knowledge, Attitude and Practice (KAP)

Potential Beneficiaries

HIV-infected/PMTCT, Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs/Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban residents of poor areas, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/ Pastoralists, Sex workers (SW), Street children/youth, Transgender,

Example of Good Practice

“Pakistan has the sixth highest TB burden globally. The national TB program led a KAP survey designed to study gender differences in knowledge and attitudes towards TB in urban and rural communities in Sindh Province, and to compare male and female TB health-seeking behavior.

Results: Knowledge of TB was generally poor, especially among rural women. Social isolation and rejection, as well as misconceptions about TB transmission, contribute to the idea that TB is a disease to be feared. TB was generally considered a “death penalty” by most females, whereas men considered it dangerous but curable.

Conclusions and recommendations: The study concluded that programs to raise awareness and fight stigma are urgently needed. The survey team concluded that a concentrated effort is required by the media, doctors and health workers to address misconceptions about TB and reduce stigma. Policy-makers and government workers, while planning the DOTS strategy, should keep in mind the constraint expressed by most females about visiting health facilities for supervised drug administration to prevent treatment non-adherence. Alternative or related strategies, such as involving female community workers, should be considered”⁷.

Selected List of Guidances, Tools and Manuals

Community involvement in tuberculosis care and prevention: towards partnerships for health: guiding principles and recommendations based on a WHO review. Geneva, WHO, 2008 (WHO/HTM/TB/2008.397).

http://whqlibdoc.who.int/publications/2008/9789241596404_eng.pdf

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Advocacy, communication and social mobilization for TB control: a guide to developing knowledge, attitude and practice surveys.

http://www.stoptb.org/assets/documents/resources/publications/acsm/ACSM_KAP%20GUIDE.pdf

Working with the media: how to make your messages on tuberculosis count. Geneva, WHO, 2009 (WHO/HTM/STB/2009.57).

Theory at Glance. A guide for Health Promotion Practice, 2nd edition, US Department for Health and Human services, National Institute for Health, 2005,

<http://www.cancer.gov/cancertopics/cancerlibrary/theory.pdf>

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A guide to monitoring and evaluation

For collaborative TB/HIV activities, WHO 2009 (revision) WHO/HTM/TB/2009.414, WHO/HTM/HIV/09.01

http://www.who.int/hiv/pub/tb/hiv_tb_monitoring_guide.pdf

Mubashir A., KNOWLEDGE, ATTITUDE AND PRACTICE OF PRIVATE PRACTITIONERS REGARDING TB-DOTS IN A RURAL DISTRICT OF SINDH, PAKISTAN, J Ayub Med Coll Abbottabad 2009;21(1),

<http://www.ayubmed.edu.pk/JAMC/PAST/21-1/Mubashir.pdf>

Bertrand JT, O'Reilly K, Denison J, Anhang R, Sweat M. Systematic review of the effectiveness of mass communication programs to change HIV/AIDS-related behaviors in developing countries. Health Educ Res. 2006;21:567-97.

Brief Description of the Approach

To improve health care workers performance implementation of structured supervision is a key to ensure that personnel carry out their activities in effective manner and become more competent at their work. "In health-care practice, supervision is linked to the delegation of tasks to auxiliary health-care staff. In low- and middle-income countries, where adequate numbers of qualified health-care personnel are often lacking, especially at peripheral levels of the health-care delivery system, supervision is largely limited to overseeing the work of auxiliary staff and community health workers"⁸. In health systems in low- and middle-income countries, supervision is generally viewed as one of the central tools for providing continuous on-job training to less qualified health-care workers entrusted with clinical and managerial tasks for which they may or may not have formal training. Many health-care programs rely on supervision to increase the quality of care. Although highly recommended, supervision is rarely carried out as a planned activity owing to the "lack of transportation means, fuel, financial resources, as well as inadequate training (of supervisors) in supervisory skills"⁹.

List of alternative names (if applicable)

Human resource management, performance appraisal system, pay for performance (P4P), performance management, team supervision

Potential Beneficiaries

HIV-infected/PMTCT, Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs/Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban residents of poor areas, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

Supervision is an essential management activity within Human Resource Management (HRM) and impacts both the performance of individual staff and the organization as a whole. Supervision also aids in planning or refining activities, organizing tasks, and monitoring performance. Perhaps most importantly, supervision provides the mechanism for staff to be aware of all standards, performance expectations and tasks in order to keep their organization running efficiently. But supervision is not just about the organization. Staff also needs on-going support and feedback with regard to their work. Supervision plays an essential role in the following areas:

1. Communication and implementation of the organization's goals and objectives;
2. Clarification of individual job description and work plans;
3. Resolution of problems;
4. Improving the quality of performance at all levels;
5. Staff support, direction and feedback;
6. Meeting performance goals and standards.

An effective and supportive supervision system is both a structure and an approach. It consists of these two components:

1. A supervisory structure, supervisory activities, and systems that support and monitor performance;
2. An approach for supervisors to recognize their roles and responsibilities in creating conditions that support or facilitate the work of providers and other staff.

A supportive supervision system guides supervisors in planning, directing and managing the performance of their employees. The system supports employees in the careful planning and implementation of their designated work in order to achieve the organization's mission.

Characteristics of an effective supervision system:

1. Supervision is valued and supported within the organization;
2. There are defined levels of authority and interaction in the organization;
3. Personnel policy is up to date and known by all staff;
4. Staff functions are defined and communicated throughout the organization;
5. There are trained supervisors;
6. Adequate resources exist for planning, implementing and evaluating supervision;
7. Supervision helps staff work more effectively and efficiently to serve clients;
8. There is a clear procedure for joint work planning and performance review.¹³

Selected List of Guidances, Tools and Manuals

Guide for Documenting and Sharing “Best Practices” in Health Programmes, WHO, AFRO, 2008, ISBN : 92 9 023 132 7 (NLM Classification: W 84 HA1), http://www.afro.who.int/index.php?option=com_docman&task=doc_download&gid=1981

Holding Health Workers Accountable: Governance Approaches to Reducing Absenteeism, by Rachel Deussom, Wanda Jaskiewicz, Sarah Dwyer, and Kate Tulenko. CapacityPlus, The technical brief is available as an interactive version and as a printer-friendly document. <http://www.intrahealth.org/page/holding-health-workers-accountable-governance-approaches-to-reducing-absenteeism>

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Selected Bibliographic References of Uses of this Strategy

Mkopi A, Range N, Amuri M, Geubbels E, Lwilla F, Egwaga S, et al. Health workers' performance in the implementation of Patient Centred Tuberculosis Treatment (PCT) strategy under programmatic conditions in Tanzania: a cross sectional study. BMC health services research. 2013;13:101. <http://www.biomedcentral.com/1472-6963/13/101>

Mitchell E.M.H., Colvin CE, Klinkenberg E, Heus M, Sitenei J. Return on investments in technical assistance for TB capacity building? Factors influencing Kenyan health workers' performance of TB skills. Open Infectious Diseases Journal. 2013;7(SPEC ISS1):72-85. <http://dx.doi.org/10.2174/1874279301307010072>

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Henderson L, Tulloch J. Incentives for retaining and motivating health workers in Pacific and Asian countries. Human Resources for Health. 2008;6(1):18.

Witter S, Fretheim A, Kessy FL, Lindahl AK. Paying for performance to improve the delivery of health interventions in low- and middle-income countries. The Cochrane database of systematic reviews. 2012;2:CD007899.

Brief Description of the Approach

Applying a patient approach is an important strategy to improve the quality and acceptability of TB services. At its core is the recognition that the needs and perspectives of the patient may not always be the same as the provider. Poverty, stigma and discrimination can be problems for patients with TB, especially TB/HIV, MDR-TB and being female patients. These psycho-social and clinical complications can lead to non-adherence to TB treatment.

Patient Centeredness Core Values:

- Assure Universal access to care and support
- Consider the needs, perspectives and individual experiences
- Respect the right to be informed and receive the best quality of care based on individual needs
- Establish mutual trust and partnership in the patient-care provider relationship
- Create opportunities to provide input into & participate in planning/management of own care
- Empower and activate to increase self efficacy, independence and involvement at all levels

Training and inspiring health staff to promote patients' right and PCA is an effective strategy to increase adherence to treatment and increase patients' satisfaction. Adherence can be promoted by using easily learned communication skills that are part of a PCA.

The approach is both philosophical and practical. Three domains of PCA to consider are:

1. Educational: Information conveyed verbally and in writing
2. Behavioral: Telephone reminders, patient contracts, skill building, drug packaging
3. Affective: Counseling, home visits, family support.

The PCA tools can be found here: <http://www.tbcare1.org/publications/toolbox/access/>

List of alternative names (if applicable)

GIPT Principle - Greater Involvement of People with TB, Rights-Based Approach, empowering patients

Potential Beneficiaries

HIV-infected/PMTCT, Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs/Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban residents of poor areas, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

Mkopi A, Range N, Amuri M, Geubbels E, Lwilla F, Egwaga S, et al. Health workers' performance in the implementation of Patient Centred Tuberculosis Treatment (PCT) strategy under programmatic conditions in Tanzania: a cross sectional study. BMC health services research. 2013;13:101.

BACKGROUND:

Patient Centred Tuberculosis Treatment (PCT) is a promising treatment delivery strategy for Mycobacterium tuberculosis (TB). It aims to improve adherence to treatment by giving patients the choice of having drug intake supervised at the health facility by a medical professional or at home by a supporter of their choice.

METHODS:

A cross-sectional survey was undertaken in three districts of Tanzania during October 2007, one year after PCT was rolled out nationally. Semi-structured questionnaires were used to assess whether key elements of the PCT approach were being implemented, to evaluate supporters' knowledge, to capture opinions on factors contributing to treatment completion, and to assess how treatment completion was measured. Transcripts from open-ended responses were analysed using framework analysis.

RESULTS:

Interviews were conducted with 127 TB patients, 107 treatment supporters and 70 health workers. In total, 25.2% of TB patients were not given a choice about the place of treatment by health workers, and only 13.7% of those given a choice reported that they were given adequate time to make their decision. Only 24.3% of treatment supporters confirmed that they were instructed how to complete patients' treatment cards. Proper health education was the factor most frequently reported by health workers as favouring successful completion of TB treatment (45.7%). The majority of health workers (68.6%) said they checked returned blister packs to verify whether patients had taken their treatment, but only 20.0% checked patients' treatment cards.

CONCLUSIONS:

The provision of choice of treatment location, information on treatment, and guidance for treatment supporters need to be improved. There is a requirement for regular re-training of health workers with effective supportive supervision if successful implementation of the PCT approach is to be sustained.

Selected List of Guidances, Tools and Manuals

- Patient Centered Approach booklet:
http://www.tbcare1.org/publications/toolbox/tools/access/download.php?file=PCA_Booklet.pdf
- International Union Against Tuberculosis and Lung Disease (The Union) BEST PRACTICE FOR THE CARE OF PATIENTS WITH TUBERCULOSIS. A Guide for low income-countries. 2007.
http://www.stoptb.org/assets/documents/countries/acsm/best_practice_guide%20for%20the%20care%20of%20patients%20with%20TB.pdf
- Pan American Health Organization. Practical Guide to Improve TB Patient Quality of Care: A Participatory Approach. 2008.
<http://www.tbcare1.org/publications/toolbox/tools/access/download.php?file=PracticalGuideImproveQualityTBPatientCare.pdf>
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- Declaration of Human Rights (1948)
<http://www.un.org/en/documents/udhr/>
- International Covenant on Economic, Social and Cultural Rights (1966)
<http://www2.ohchr.org/english/law/cescr.htm>
- International Covenant of Civil and Political Rights (1966).
<http://www2.ohchr.org/english/law/ccpr.htm>
- Committee on Economic, Social and Cultural Rights, General Comment No. 14 [http://www.unhchr.ch/tbs/doc.nsf/\(symbol\)/E.C.12.2000.4.En](http://www.unhchr.ch/tbs/doc.nsf/(symbol)/E.C.12.2000.4.En)
- Committee on Economic, Social and Cultural Rights, General comment No. 20 on non discrimination in economic, social and cultural rights
<http://www2.ohchr.org/english/bodies/cescr/comments.htm>

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<http://www.biomedcentral.com/1471-2458/8/154>
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- Horter S, Stringer B, Reynolds L, Shoaib M, Kasozi S, Casas EC, et al. "Home is where the patient is": a qualitative analysis of a patient-centred model of care for multi-drug resistant tuberculosis. BMC health services research. 2014;14(1):81.
- Loveday M, Padayatchi N, Voce A, Brust J, Wallengren K. The treatment journey of a patient with multidrug-resistant tuberculosis in South Africa: is it patient-centred? Int J Tuberc Lung Dis. 2013 Oct;17(10 Suppl 1):56-9.

Brief Description of the Approach

Studies from different parts of the world reveal that there are three main immediately actionable causes of TB-related stigma in health facilities:

- Lack of awareness among health workers of what stigma looks like and why it is damaging;
- Lack of adequate infection control for HCW and the association of HIV with improper or immoral behavior.

Nyblade et al argue that to combat stigma in health facilities, efforts must focus on the individual, environmental and policy levels.

The awareness of all who care for TB patients should be raised to decrease existing misconceptions about TB transmission, stigma and its negative consequences to prevent transmission of TB.

List of alternative names (if applicable)

Anti-discrimination

Shown to benefit

PLHIV

Potential Beneficiaries

PMTCT, Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs/Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban residents of poor areas, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

An intervention study in 9 municipalities of rural Nicaragua aimed at a reduction of internalized social stigma in new AFB positive tuberculosis (TB) patients diagnosed between March 2004 and July 2005. Five out of 9 municipal teams were coached to tailor and introduce patient-centered package. New TB patients were assigned to the intervention group when diagnosed in municipalities implementing effectively at least TB clubs and home visits.

We compared the changes in internalized stigma and TB treatment outcome in intervention and control groups. The internalized stigma was measured through score computed at 15 days and at 2 months of treatment. The treatment results were evaluated through classical TB program indicators. In all municipalities, we emphasized process monitoring to capture contextual factors that could influence package implementation, including stakeholders. TB clubs and home visits were effectively implemented in 2 municipalities after June 2004 and in 3 municipalities after January 2005. Therefore, 122 patients were included in the intervention group and 146 in the control group. After 15 days, internalized stigma scores were equivalent in both groups. After 2 months, difference between scores was statistically significant, revealing a decreased internalized stigma in the intervention group and not in the control group. This study provides initial evidences that it is possible to act on TB patients' internalized stigma, in contexts where at least patient centered home visits and TB clubs are successfully implemented. This is important as, indeed, TB care should also focus on the TB patient's well being and not solely on TB epidemics control.

Selected List of Guidances, Tools and Manuals

Nyblade L, Stangl A, Weiss E, Ashburn K. Combating HIV stigma in health care settings: what works? *J Int AIDS Soc* 2009;12:15
<http://www.biomedcentral.com/content/pdf/1758-2652-12-15.pdf>

Van Rie, A., Sengupta, S., Pungrassami, P., Balhip, Q., Choonuan, S., Kasetjaroen, Y., Strauss, R. P., et al. (2008). Measuring stigma associated with tuberculosis and HIV/AIDS in southern Thailand: exploratory and confirmatory factor analyses of two new scales. *Tropical medicine & international health : TM & IH*, 13(1), 21-30. doi:10.1111/j.1365-3156.2007.01971.x

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Brief Description of the Approach

The right to privacy is a cornerstone of public health. "Privacy is "the right and power to control the information (about oneself) that others possess". Confidentiality is "the duty of those who receive private information not to disclose it without the patient's consent". Confidentiality is the mechanism through which the individual's right to privacy is protected"¹⁴. To protect the privacy of each and every individual is crucial and critical in the field of TB and HIV/AIDS, where disclosure of health status can result in stigma/discrimination and violation of basic human right. Without the trust that disclosed health related information will be kept confidential individuals will fail to seek the diagnosis, care, and treatment they need and have rights to. The right to privacy can only be maintained if health providers and others involved fully implement policies to protect one's confidential information. Each individual appreciates assurances of confidentiality and are less open if they do not trust service providers. Proper TB patients' care, treatment and follow up require accurate information.

List of alternative names (if applicable)

Ethics, Patients rights

Potential Beneficiaries

HIV-infected/PMTCT, Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs/Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban residents of poor areas, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

WHO recommends that those offering clinical and counseling services: provide a private space for examinations, treatment and counseling and respect confidentiality.

Elements of privacy include visual privacy (protection from unnecessary bodily exposure) and auditory privacy (out of earshot of others, including children, spouses, parents, family, friends etc.). Confidentiality means that the provider has an obligation not to reveal any information about a client without her/his consent.

PLoS One. 2012;7(10):e46069. doi: 10.1371/journal.pone.0046069. Epub 2012 Oct 11. Utilization of HIV and tuberculosis services by health care workers in Uganda: implications for occupational health policies and implementation.

Buregyeya E1, Nuwaha F, Wanyenze RK, Mitchell EM, Criel B, Verver S, Kasasa S, Colebunders R.

Interventions to reduce stigma and ensure confidentiality are essential to ensure uptake of comprehensive HIV care including Isoniazid Preventive Therapy among healthcare workers (HCWs)

A cross-sectional mixed-methods study involving 499 HCWs and 8 focus group discussions was conducted in Mukono and Wakiso districts in Uganda between October 2010 and February 2011.

Overall, 5% of the HCWs reported a history of TB in the past five years. None reported routine screening for TB disease or infection, although 89% were willing to participate in a TB screening program, 77% at the workplace. By contrast, 95% had previously tested for HIV; 34% outside their workplace, and 27% self-tested. Nearly half (45%) would prefer to receive HIV care outside their workplace. Hypothetical willingness to disclose HIV positive status to supervisors was moderate (63%) compared to willingness to disclose to sexual partners (94%). Older workers were more willing to disclose to a supervisor (adjusted prevalence ratio [APR] = 1.51, CI = 1.16-1.95). Being female (APR = 0.78, CI = 0.68-0.91), and working in the private sector (APR = 0.81, CI = 0.65-1.00) were independent predictors of unwillingness to disclose a positive HIV status to a supervisor. HCWs preferred having integrated occupational services, versus stand-alone HIV care.

Discomfort with disclosure of HIV status to supervisors suggests that universal TB infection control measures that benefit all HCWs are more feasible than distinctions by HIV status, particularly for women, private sector, and younger HCWs.

Selected List of Guidances, Tools and Manuals

Interpersonal Communication and Counseling for Clients on Tuberculosis and HIV and AIDS. PATH, 2009.
<http://www.path.org/publications/detail.php?i=1770>

Selected Bibliographic References of Uses of this Strategy

Interpersonal Communication and Counseling for Clients on Tuberculosis and HIV and AIDS. PATH, 2009.

Ensuring Privacy and Confidentiality in Reproductive Health Services: A Training Module and Guide for Service Providers
http://www.path.org/publications/files/RH_ensuring_privacy.pdf

Murray EJ, Bond VA, Marais BJ, Godfrey-Faussett P, Ayles HM, Beyers N. High levels of vulnerability and anticipated stigma reduce the impetus for tuberculosis diagnosis in Cape Town, South Africa. *Health policy and planning*. 2013 Jul;28(4):410-8

Peltzer K, McHunu G, Tutshana B, Naidoo P, Matseke G, Louw J. Predictors of non-uptake of human immunodeficiency virus testing by tuberculosis public primary patients in three districts, South Africa. *Iranian journal of public health*. 2012;41(11):19-26.

Daftary A, Padayatchi N. Integrating patients' perspectives into integrated tuberculosis-human immunodeficiency virus health care. *Int J Tuberc Lung Dis*. 2013 Apr;17(4):546-51.

Buregyeya E, Nuwaha F, Wanyenze RK, Mitchell EM, Criel B, Verver S, et al. Utilization of HIV and tuberculosis services by health care workers in Uganda: implications for occupational health policies and implementation. *PloS one*. 2012;7(10):e46069.

Coreil J, Lauzardo M, Heurtelou M. Anticipated tuberculosis stigma among health professionals and Haitian patients in South Florida. *Journal of health care for the poor and underserved*. 2012 May;23(2):636-50

SEEK OUT THOSE WHO MAY BE AT HIGHER RISK SCREEN IN CONGREGATE SETTINGS

Brief Description of the Approach

People living in certain types of congregate settings, such as prisons, urban slums, mental asylums, refugee camps, homeless shelters, special workplaces, etc, are at higher risk of TB infection than the general population for two main reasons. First, vulnerable populations that have a higher baseline risk of both TB infection and progression from infection to disease are overrepresented in such settings. Second, the living conditions in such settings are often conducive for TB transmission, including crowding, poor ventilation and lack of specific infection control measures. Moreover, the vulnerable groups often found in these settings often have poor access to health services (for reasons not necessarily related to the congregate setting per se) and delayed diagnosis, inappropriate treatments, and poor treatment adherence are therefore common. Intensified TB detection, including both strategies to improved access as well as systematic screening for active TB (and in some situations latent) may be warranted. This should be coupled with enablers for accessing and adhering to appropriate diagnosis and treatment.

The choice of screening tool, and diagnostic algorithm depend of the type of congregate setting, TB epidemiology (including MDR-TB prevalence and HIV prevalence), and health systems capacity. The approach of identifying and reaching out to the population in congregate setting, and setting appropriate enabler package to promote access and adherence, need to be tailored to local social, economic, and cultural situation. Normally, at least the first screening step needs to take place outside health facilities, which has implications for logistic planning and resource demand. Linking TB screening in these populations to other disease/risk factors screening and/or initiatives for outreach social support can improve both effectiveness and efficiency.

List of alternative names (if applicable)

Active case finding; active screening

Shown to benefit

Deep Mine Miners, Shantytown/favela/slum residents, Prisoners & prison staff, HCWs/Lab staff, Homeless

Potential Beneficiaries

Orphans and vulnerable children (OVC), Military/Soldiers, Refugees/internally displaced populations (IDPs), Factory workers

Example of Good Practice

Good Practice Guidance on HIV/AIDS, Tuberculosis and Malaria. International Council on Mining and Metals (n.d.).

In a highly screened population of South African gold miners, symptom check, chest radiograph and sputum microscopy were found to be of equally low sensitivity in detecting cases (25-30%). Laboratory culture alone had a much higher sensitivity (77%). Combining test types increased sensitivity. For example, combining symptom screening with a chest radiograph increased sensitivity to 50%. The combination of symptom screening, chest radiograph and sputum microscopy increased sensitivity further to 65%. Adding sputum culture increased the sensitivity to 98%.

Selected List of Guidances, Tools and Manuals

Systematic screening for active tuberculosis: Principles and recommendations. World Health Organization 2013 ISBN 978 92 4 154860 1
http://www.tbcare1.org/publications/toolbox/tools/hss/download.php?file=Systematic_Screening_for_Active_Tuberculosis.pdf

Guidelines for intensified tuberculosis case finding and isoniazid preventive therapy for people living with HIV in resource constrained settings. Geneva, World Health Organization, 2011.
http://whqlibdoc.who.int/publications/2011/9789241500708_eng.pdf

Tuberculosis Care and Control in Refugee and Displaced Populations. Geneva, World Health Organization, 2007 (WHO/HTM/TB/2007.377).
https://extranet.who.int/iris/restricted/bitstream/10665/43661/1/9789241595421_eng.pdf

Guidelines for the Control of Tuberculosis in Prisons. TBCTA/ICRC, 2009.
http://www.tbcare1.org/publications/toolbox/tools/access/download.php?file=Guidelines_for_control_of_TB_in_prisons.pdf

Working together with businesses - Guidance on TB and TB/HIV prevention, diagnosis, treatment and care in the workplace. WHO: Geneva, 2011
http://www.tbcare1.org/publications/toolbox/tools/access/download.php?file=Working_Together_With_Businesses.pdf

Monitoring and evaluation tool for tuberculosis programs in refugee and post-conflict settings. Atlanta: US Department of Health and Human Services; 2010.
<http://www.cdc.gov/globalhealth/gdder/ierh/researchhandsurvey/tbtool.htm>

Investigation and control of TB incidents affecting children in congregate settings ECDC December 2013.
<http://www.ecdc.europa.eu/en/publications/Publications/guidance-investigation-control-tb-incident-children-in-congregate-settings.pdf>

Selected Bibliographic References of Uses of this Strategy

de Vries, G., van Hest, R. a H., & Richardus, J. H. (2007). Impact of mobile radiographic screening on tuberculosis among drug users and homeless persons. *American journal of respiratory and critical care medicine*, 176(2), 201-7. doi:10.1164/rccm.200612-1877OC

Sekandi, J. N., Neuhauser, D., Smyth, K., & Whalen, C. C. (2009). Active case finding of undetected tuberculosis among chronic coughers in a slum setting in Kampala, Uganda. *The international journal of tuberculosis and lung disease*, 13(4), 508-13.

Arshad, S., Bavan, L., Gajari, K., Paget, S. N. J., & Baussano, I. (2010). Active screening at entry for tuberculosis among new immigrants: a systematic review and meta-analysis. *The European respiratory journal : official journal of the European Society for Clinical Respiratory Physiology*, 35(6), 1336-45. doi:10.1183/09031936.00054709

Kanamori H, Kimura R, Weber DJ, Uchiyama B, Hirakata Y, Aso N, et al. Lessons learned from earthquake-related tuberculosis exposures in a community shelter, Japan, 2011. *American journal of infection control*. 2014 Mar;42(3):246-8.

SEEK OUT THOSE WHO MAY BE AT HIGHER RISK SCREEN IN CONGREGATE SETTINGS

Brief Description of the Approach

TB is a workplace issue because health is essential not only to the well-being of individuals but the functioning of economies. An employee with TB may lose months of work per year, resulting in significantly less annual household income. Some workplaces are a source for disease transmission as employees work for long periods in close proximity. Loss of wages and job discrimination are barriers to accessing TB services

Addressing TB in the workplace can help overcome these barriers and facilitate access to health care in general and TB care in particular. In 2003, WHO and the International Labor Organization (ILO) released guidelines (88) for TB control activities in the workplace. These describe cost-effective steps to protect workforce productivity. Drawing on the practical experience of employers and workers and the technical expertise of WHO and ILO, the guidelines target employers, employees and their associations and health workers - all of whom can play a significant role in their implementation. In some cases, it may be necessary to provide additional supervisory services or supplies (such as anti-TB drugs) to facilitate high-quality treatment.

List of alternative names (if applicable)

Industrial Hygiene

Shown to benefit

Deep Mine Miners, prison staff, HCWs/Lab staff, Shantytown/favela/slum residents, Prisoners & prison staff, HCWs/Lab staff, Homeless

Potential Beneficiaries

Military/Soldiers, Factory workers

Example of Good Practice

de Vries, G., M. M. Sebek, et al. (2006). "Healthcare Workers with tuberculosis infected during work." *Eur Respir J* 28(6): 1216-1221.

The risk for Healthcare Workers (HCWs) of tuberculosis (TB) attributable to occupational exposure is difficult to determine, as are the conditions contributing to this risk. The objective of the present study was to determine which TB cases among HCWs in the Netherlands were infected during work and to analyze factors which contributed to infection and subsequent disease. The total study population consisted of 101 cases over a 5-yr period. In 67 (66%) subjects the route of infection could be determined by epidemiological and microbiological information. Of these cases, 28 out of 67 (42%) were due to infection at work, 19 (28%) were community acquired, and 20 (30%) were infected abroad. The 28 cases infected at work were subject to an in-depth analysis. Delayed diagnosis of the index case, especially in the elderly patient, was the main cause of patient-to-HCW transmission. In some circumstances, inadequate infection-control measures also contributed to transmission. In conclusion, a high suspicion of tuberculosis by the clinician, adequate infection control measures by hospital authorities, and early identification of latent tuberculosis infection by occupational and public-health specialists are necessary to prevent tuberculosis among HCWs.

Selected List of Guidances, Tools and Manuals

WHO Policy on TB Infection Control in Health-Care Facilities, Congregate Settings and Households. WHO/HTM/TB/2009.419.
http://whqlibdoc.who.int/publications/2009/9789241598323_eng.pdf

Joint WHO-ILO policy guidelines for improving health worker access to HIV and TB prevention, treatment, care and support. Geneva: WHO and ILO, 2010.
http://whqlibdoc.who.int/publications/2010/9789241500692_eng.pdf

Guide on the Monitoring of TB Disease Incidence Among Health Care Workers
http://www.tbcare1.org/publications/toolbox/tools/hss/download.php?file=HCW_TB_Incidence_Measuring_Guide.pdf

Systematic screening for active tuberculosis: Principles and recommendations. World Health Organization 2013 ISBN 978 92 4 154860 1
http://www.tbcare1.org/publications/toolbox/tools/hss/download.php?file=Systematic_Screening_for_Active_Tuberculosis.pdf

Recommendations for investigating contacts of persons with infectious tuberculosis in low- and middle-income Countries. WHO 2012.
http://www.tbcare1.org/publications/toolbox/tools/hss/download.php?file=Guidelines_on_TB_Contact_Investigation.pdf

Guide to Measure the Prevalence of Active TB Disease Among Health Care Workers
http://www.tbcare1.org/publications/toolbox/tools/hss/download.php?file=HCW_TB_Prevalence_Measuring_Guidelines.pdf

International Council of Mining & Metals. Good Practice Guidance on HIV/AIDS, Tuberculosis and Malaria http://www.tbhiv-create.org/sites/default/files/Thibela_pub_T-P-3.pdf

Guidelines for workplace TB control activities: the contribution of workplace TB control activities to TB control in the community. Geneva, WHO, 2003 (WHO/CDS/TB/2003.323).

Implementing the WHO Policy on TB Infection Control in Health-Care Facilities, Congregate Settings and Households: A framework to plan, implement and scale-up TB infection, control activities at country, facility and community level. (TBCTA), 2010.
http://www.tbcare1.org/publications/toolbox/tools/ic/download.php?file=TB_IC_Implementation_Framework.pdf

International Labour Office, Geneva, 2010 Recommendation concerning HIV and AIDS and the world of work, 2010, Geneva, 2010.
http://www.ilo.org/aids/WCMS_142706/lang--en/index.htm

Development of TB Occupational Safety Framework. University Research Co., LLC 2011
<http://urc.tbcare.net/sites/urc.tbcare.net/files/TB%20CARE%2011%20TB%20Occupational%20Safety%20Review%20and%20Framework%20Nov%202011.pdf>

Selected Bibliographic References of Uses of this Strategy

Workshop Report: Occupational Safety for TB Programs
http://urc.tbcare.net/sites/urc.tbcare.net/files/Workshop%20Report_0.pdf

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SEEK OUT THOSE WHO MAY BE AT HIGHER RISK SCREEN IN CONGREGATE SETTINGS

Screen in High Burden Communities

Brief Description of the Approach

TB screening in the high burden communities vs. a health facility presents both opportunities and challenges. TB screening often identifies TB disease earlier or later than passive case finding. Often a different sort of TB patient is reached. Moreover, the range of interventions described as “TB screening” can be very broad, the potential target populations are equally diverse, and the diagnostic algorithms applied vary widely making simplistic conclusions about the value of TB screening a challenge.

List of alternative names (if applicable)

Active-case finding (ACF), prevalence surveys

Shown to benefit

Residents in poor areas

Potential Beneficiaries

Military/Soldiers
HIV-infected/PMTCT, Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs/Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban residents of poor areas, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Factory workers

Example of Good Practice

Lancet. 2010 Oct 9;376(9748):1244-53. doi: 10.1016/S0140-6736(10)61425-0.

Comparison of two active case-finding strategies for community-based diagnosis of symptomatic smear-positive tuberculosis and control of infectious tuberculosis in Harare, Zimbabwe (DETECTB): a cluster-randomised trial.

Corbett EL1, Bandason T, Duong T, Dauya E, Makamure B, Churchyard GJ, Williams BG, Munyati SS, Butterworth AE, Mason PR, Mungofa S, Hayes RJ.

Clusters of neighbourhoods in the high-density residential suburbs of Harare, Zimbabwe, were randomised to receive six rounds of active case finding at 6-monthly intervals by either mobile van or door-to-door visits. Randomisation was done by selection of discs of two colours from an opaque bag, with one disc to represent every cluster, and one colour allocated to each intervention group before selection began. In both groups, adult (≥ 16 years) residents volunteering chronic cough (≥ 2 weeks) had two sputum specimens collected for fluorescence microscopy. Community health workers and cluster residents were not masked to intervention allocation, but investigators and laboratory staff were masked to allocation until final analysis. The primary outcome was the cumulative yield of smear-positive tuberculosis per 1000 adult residents, compared between intervention groups; analysis was by intention to treat. The secondary outcome was change in prevalence of culture-positive tuberculosis from before intervention to before round six of intervention in 12% of randomly selected households from the two intervention groups combined; analysis was based on participants who provided sputum in the two prevalence surveys. This trial is registered, number ISRCTN84352452.

FINDINGS:

46 study clusters were identified and randomly allocated equally between intervention groups, with 55 741 adults in the mobile van group and 54,691 in the door-to-door group at baseline. HIV prevalence was 21% (1916/9060) and in the 6 months before intervention the smear-positive case notification rate was 2.8 per 1000 adults per year. The trial was completed as planned with no adverse events. The mobile van detected 255 smear-positive patients from 5466 participants submitting sputum compared with 137 of 4711 participants identified through door-to-door visits (adjusted risk ratio 1.48, 95% CI 1.11-1.96, $p=0.0087$). The overall prevalence of culture-positive tuberculosis declined from 6.5 per 1000 adults [95% CI 5.1-8.3] to 3.7 per 1000 adults [2.6-5.0; adjusted risk ratio 0.59, 95% CI 0.40-0.89, $p=0.0112$). Wide implementation of active case finding, particularly with a mobile van approach had rapid effects on tuberculosis transmission and disease.

Selected List of Guidances, Tools and Manuals

Systematic screening for active tuberculosis: Principles and recommendations. World Health Organization 2013 ISBN 978 92 4 154860 1
http://www.tbcare1.org/publications/toolbox/tools/hss/download.php?file=Systematic_Screening_for_Active_Tuberculosis.pdf

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SEEK OUT THOSE WHO MAY BE AT HIGHER RISK SCREEN IN CONGREGATE SETTINGS

Screen in Health Institutions

Brief Description of the Approach

Attendees of health facilities are often in need of TB screening and can be reached easily in waiting rooms by cough officers or triage teams who help identify individuals who may benefit from TB screening.

Persons seeking health care are not by definition more likely to have TB than people not found in health facilities. However, given the comparative ease of screening this population (and the benefits in terms of limiting transmission to vulnerable patients) TB screening in this group usually make sense in high burden settings.

Moreover, certain types of patients (e.g. those seeking diabetes, HIV, cancer, respiratory care, infants) may be at heightened risk of TB and there is an established benefit from TB screening.

List of alternative names (if applicable)

Cough Officer, Triage, enhanced case finding (ECF),

Shown to benefit

Health care workers, Children under 5, Diabetes, HIV-infected/PMTCT, Malnourished, Persons with Previous TB, Peri-partum women

Potential Beneficiaries

All clinical risk groups : Adolescents, Alcohol dependent, Attendees of health care facilities, Drug dependent, Elderly (institutionalized), Mentally ill (institutionalized), Smokers,

Example of Good Practice

E. Bloss, R. Makombe, E. Kip, M. Smit, J. Chirenda, V. M. Gammino, T. Creek, J. E. Oeltmann

Lessons learned during tuberculosis screening in public medical clinics in Francistown, Botswana INT J TUBERC LUNG DIS e-publication ahead of print 6 June 2012

<http://dx.doi.org/10.5588/ijtld.11.0736>

TB screening was implemented among adults at patient intake in five clinics in Francistown between August-December 2009. ATB checklist was implemented. Staff asked patients aged ≥ 18 years if they currently had any of the following: cough for ≥ 2 weeks, fever, night sweats, unexplained weight loss, coughing with blood, enlarged lymph nodes, history of TB or contact with a person with TB disease. Patients with a positive TB screen (cough for ≥ 2 weeks or any combination of 2-8 other signs, symptoms or risk factors) were flagged for further clinical evaluation. There was 97% acceptance of screening. Among 11,779 TB screenings at intake, 926 were selected for further investigation. Nineteen patients were diagnosed with TB. Routine TB screening at intake was operationally feasible, but had low yield.

Selected List of Guidances, Tools and Manuals

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http://www.tbcare1.org/publications/toolbox/tools/access/download.php?file=Guiding_Principles_Practical_Steps_Engaging_Hospitals_TB_Care_Control.pdf

Childhood contact screening and management
http://www.stoptb.org/wg/dots_expansion/assets/documents/IJTLD_OS_ChildhoodTB_Chapter4.pdf

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SEEK OUT THOSE WHO MAY BE AT HIGHER RISK SCREEN TB CONTACTS

Invite Close Contacts to Seek Screening

Brief Description of the Approach

Encouraging TB patients to extend an invitation to his or her close contacts to travel to seek out TB screening a health may help identify those who have TB or who may benefit from IPT.

In some settings, where travel is relatively easy, screening is convenient and free, and health care service delivery is high quality and well appreciated, this may work. In some populations, who use health facilities often and who are not considered "high priority contacts" (i.e. They are not immunocompromised, under 5 years of age, have not had intensive exposure to the index patient while infectious, etc.) this strategy may be appropriate.

Since the onus is on the individual, the results of this strategy may vary widely.

List of alternative names (if applicable)

Enhanced case finding, referral, recommendation, opt-in screening, self-referral

Shown to benefit

TB contacts

Potential Beneficiaries

Low-priority TB contacts

Example of Good Practice

K. Borgen, B. Koster, H. Meijer, V. Kuyvenhoven, M. van der Sande, and F. Cobelens, Evaluation of a large-scale tuberculosis contact investigation in the Netherlands *Eur Respir J* 2008 32:419-425;

In November 2004, a 25-yr-old male, Dutch-born, full-time supermarket employee in the Netherlands, was diagnosed with sputum smearpositive cavitary TB after a 12-month history of cough. Of 12 close contacts, three (25%) were diagnosed with active TB and seven (58%) with LTBI. Among 80 supermarket co-workers subsequently examined, TB infection was diagnosed in 47 (59%), including one case of TB disease. Mycobacterium tuberculosis isolates were shown to have the same IS6110 restriction fragment length polymorphism (RFLP) pattern as the index case. These results indicated that the source patient was highly infectious or had been infectious for a long period. In early December 2004, the local authorities decided to offer screening to customers of the supermarket. An invitation letter was posted to all households (23,700 inhabitants) to come to a local sports hall and screening occurred over 1 week. Screening of 15,518 people yielded 12 cases of TB disease (1,293 screenings per case identified). Radiographical screening of 5,945 subjects yielded no cases.

Selected List of Guidances, Tools and Manuals

Systematic Screening for Active Tuberculosis: Principles and Recommendations. World Health Organization 2013 ISBN 978 92 4 154860 1
http://www.tbcare1.org/publications/toolbox/tools/hss/download.php?file=Systematic_Screening_for_Active_Tuberculosis.pdf

Recommendations for Investigating Contacts of Persons with Infectious Tuberculosis in low- and Middle-Income Countries. WHO 2012.
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Childhood Contact Screening and Management
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Mulder C, Harting J, Jansen N, Borgdorff MW, van Leth F. Adherence by Dutch public health nurses to the national guidelines for tuberculosis contact investigation. *PloS one*. [Research Support, Non-U.S. Gov't]. 2012;7(11):e49649.

Brief Description of the Approach

Close contacts of multidrug-resistant (MDR) TB patients should receive careful clinical follow-up for at least 2 years. If active disease develops, prompt initiation of treatment with a regimen designed to treat MDR-TB is recommended. On the basis of the currently available evidence, the World Health Organization does not recommend second-line drugs for chemoprophylaxis in MDR-TB contacts.

List of alternative names (if applicable)

Active-case finding (ACF), finding, referral, recommendation, opt-in screening, self-referral

Potential Beneficiaries

HIV-infected/PMTCT, Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs/ Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban residents of poor areas, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

Velasquez, G. E., M. Yagui, et al. (2011). "Targeted drug-resistance testing strategy for multidrug-resistant tuberculosis detection, Lima, Peru, 2005-2008." *Emerg Infect Dis* 17(3): 432-440.

The Peruvian National Tuberculosis Control Program issued guidelines in 2006 specifying criteria for culture and drug-susceptibility testing (DST), including district-level rapid DST. All patients referred for culture and DST in 2 districts of Lima, Peru, during January 2005-November 2008 were monitored prospectively. Of 1,846 patients, 1,241 (67.2%) had complete DST results for isoniazid and rifampin; 419 (33.8%) patients had multidrug-resistant (MDR) TB at the time of referral. Among patients with new smear-positive TB, household contact and suspected category I failure were associated with MDR TB, compared with concurrent regional surveillance data. Among previously treated patients with smear-positive TB, adult household contact, suspected category II failure, early relapse after category I, and multiple previous TB treatments were associated with MDR TB, compared with concurrent regional surveillance data. The proportion of MDR TB detected by using guidelines was higher than that detected by a concurrent national drug-resistance survey, indicating that the strategy effectively identified patients for DST.

Selected List of Guidances, Tools and Manuals

Systematic screening for active tuberculosis: Principles and recommendations. World Health Organization 2013 ISBN 978 92 4 154860 1
http://www.tbcare1.org/publications/toolbox/tools/hss/download.php?file=Systematic_Screening_for_Active_Tuberculosis.pdf

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Singla N, Singla R, Jain G, Habib L, Behera D. Tuberculosis among household contacts of multidrug-resistant tuberculosis patients in Delhi, India. *Int J Tuberc Lung Dis.* 2011 Oct;15(10):1326-30.

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Lorent N, Choun K, Thai S, Kim T, Huy S, Pe R, et al. Community-based active tuberculosis case finding in poor urban settlements of Phnom Penh, Cambodia: a feasible and effective strategy. *PLoS one.* 2014;9(3):e92754.

SEEK OUT THOSE WHO MAY BE AT HIGHER RISK SCREEN TB CONTACTS

Brief Description of the Approach

TB patients living with HIV may live in households where there are other vulnerable persons who will benefit from screening for TB and HIV as well as other co-morbidities.

In settings with generalized HIV epidemics or in defined sub-populations in which HIV is concentrated, TB contact investigations can be an important opportunity for both TB and HIV case finding. NTPs may wish to consider joint TB-HIV contact investigations. Indeed such households are known to benefit from a wide range of supportive interventions to identify and reduce health risks and facilitate full recovery - including water and sanitation, malaria prevention, nutritional support. Etc. a health systems approach to these families is recommended.

List of alternative names (if applicable)

The 5 I's - Intensified case finding, Isoniazid preventive therapy, Infection control, Initiation of ARVs, Integration of TB and HIV programmes and service.

Shown to benefit

PLHIV, children under five

Potential Beneficiaries

All other TB contacts

Example of Good Practice

Thind, D., S. Charalambous, et al. (2012). "An evaluation of 'Ribolola': a household tuberculosis contact tracing programme in North West Province, South Africa." *Int J Tuberc Lung Dis* 16(12): 1643-1648.

SETTING:

Rural/peri-urban community, South Africa.

OBJECTIVES:

To examine the yield of tuberculosis (TB) cases, TB preventive therapy (TBPT) initiation and human immunodeficiency virus (HIV) diagnoses from household TB contact tracing.

DESIGN:

Retrospective program analysis.

METHODS:

Households of index TB cases were visited and their contacts screened for TB and HIV. TB suspects provided sputum or were referred for assessment. Contacts aged <5 years were referred for assessment for TBPT initiation.

RESULTS:

There were 732 index TB cases (67.1% HIV-positive). Among 3627 household contacts, 3573 (98.5%) had known outcomes, of which 183 (5.0%) were already on appropriate treatment. Among 3390 remaining contacts, 361 (10.6%) were aged <5 years, of whom 34 (9.4%) started anti-tuberculosis treatment and 286 (79.2%) started TBPT. Among 3029 contacts aged <5 years, 93 (3.1%) started anti-tuberculosis treatment: 19 (20.4%) were smear-positive and 71 (76.3%) were culture-positive. Among contacts aged ≥14 years, 794/2133 (37.2%) underwent HIV testing, of whom 208/794 (26.2%) tested positive.

CONCLUSIONS:

Household active case finding in this high TB and HIV prevalence setting obtained high yields of TB, particularly in those aged <5 years, and facilitated assessment for TBPT. There was a good yield of new HIV diagnoses, and a gain in efficiency due to integration within one program.

Selected List of Guidances, Tools and Manuals

Guidelines for intensified tuberculosis case finding and isoniazid preventive therapy for people living with HIV in resource constrained settings. Geneva, World Health Organization, 2011.

http://whqlibdoc.who.int/publications/2011/9789241500708_eng.pdf

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Childhood contact screening and management

http://www.stoptb.org/wg/dots_expansion/assets/documents/IJTLD_OS_ChildhoodTB_Chapter4.pdf

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SEEK OUT THOSE WHO MAY BE AT HIGHER RISK

ACTIVE CASE FINDING

Brief Description of the Approach

WHO policy mandates that PLHIV should be screened for TB at EVERY contact with the health services, regardless of whether:

- They have already received isoniazid preventive therapy (IPT) to reduce the risk of active TB,
- They are taking IPT now, or,
- They are taking antiretroviral therapy.

The International Union Against Tuberculosis and Lung Disease recommends that screening for TB in PLHIV “should be done in every section of the health facility where they are seen so that no referral is necessary. This includes out-patient departments, HIV care/ART clinics, in-patient wards, maternity and child health departments and client-initiated testing and counselling centres.” WHO recommends screening patients with its 4 TB symptom screen or a local adaptation,

List of alternative names (if applicable)

Active-case finding (ACF)

Shown to benefit

PLHIV

Potential Beneficiaries

PMTCT clients

Example of Good Practice

Helen M Ayles, Charalambos Sismanidis, Nulda Beyers, Richard J Hayes and Peter Godfrey-Faussett1 Zamstar, The Zambia South Africa TB And HIV Reduction Study: Design Of A 2 × 2 Factorial Community Randomized Trial
Trials 2008, 9:63 doi:10.1186/1745-6215-9-63
<http://www.trialsjournal.com/content/9/1/63>

In the ZAMSTAR project, all TB cases diagnosed and notified through the TB control program were invited to participate in this intervention. All households of TB patients receive information about HIV and TB within the home from a specially trained counsellor. The household members are encouraged to be tested for HIV and screened for TB. A “shared confidentiality” is encouraged between household members to facilitate open discussion of the outcome of the investigations. The household is also encouraged to take responsibility for the member diagnosed with TB and to supervise and encourage treatment compliance. Household members with HIV who do not have active tuberculosis diagnosed are offered TB preventive therapy, as are all children under the age of 6 years, in keeping with national policies (although these are otherwise poorly implemented). Adherence is supported within the family, as well as by the routine treatment support service of the district. All HIV-positive household members will be encouraged to obtain HIV care including anti-retroviral therapy (ART) which is provided by the health centers or district hospitals in all of the communities.

Selected List of Guidances, Tools and Manuals

Guidelines for intensified tuberculosis case finding and isoniazid preventive therapy for people living with HIV in resource constrained settings. Geneva, World Health Organization, 2011.

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Thind, D., S. Charalambous, et al. (2012). "An evaluation of 'Ribolola': a household tuberculosis contact tracing programme in North West Province, South Africa." *Int J Tuberc Lung Dis* 16(12): 1643-1648.

SEEK OUT THOSE WHO MAY BE AT HIGHER RISK

ACTIVE CASE FINDING

Brief Description of the Approach

To motivate certain high-risk populations to seek out TB diagnosis and treatment, it is often beneficial to offer incentives and enablers to offset the hidden costs of care seeking. Incentives and enablers can range widely and should be tailored to the preferences of individual groups. Transport reimbursement, expedited care (skipping the queue) and material incentives are popular.

A 2012 Cochrane review of material incentives found that “material incentives may increase the return rate for reading of tuberculin skin test results compared to normal care (two trials, 1,371 participants: RR 2.16, 95% CI 1.41 to 3.29, low quality evidence). Similarly, incentives probably improved clinic re-attendance for initiation or continuation of anti-tuberculosis prophylaxis (three trials, 595 participants: RR 1.58, 95% CI 1.27 to 1.96, moderate quality evidence), and may have improved subsequent completion of prophylaxis in some settings (three trials, 869 participants: RR 1.79, 95% CI 0.70 to 4.58, low quality evidence). The researchers identified 11 eligible studies. Ten were conducted in the United States: in adolescents (one trial), in injection drug or cocaine users (four), in homeless adults (three), and in prisoners (two). One additional trial recruited malnourished men receiving active treatment for TB in Timor-Leste.

Material incentives may also be more effective than motivational education at improving return for tuberculin skin test results (low quality evidence), but may be no more effective than peer counseling, or structured education at improving continuation or completion of prophylaxis (low quality evidence). There is limited evidence to support the use of material incentives to improve return rates for TB diagnostic test results and adherence to anti-TB preventive therapy. The data are currently limited to trials among predominantly male drug users, homeless, and prisoner sub-populations in the United States, and therefore the results are not easily generalized to the wider adult population, or to low- and middle-income countries, where the TB burden is highest. Further high-quality studies are needed to assess both the costs and effectiveness of incentives to improve adherence to long-term treatment of TB.”

List of alternative names (if applicable)

Enhanced case finding (ECF)

Shown to benefit

Homeless, prisoners, malnourished

Potential Beneficiaries

Mentally ill, drug dependent

Example of Good Practice

Eang, M. T., P. Satha, et al. (2012). “Early detection of tuberculosis through community-based active case finding in Cambodia.” *BMC Public Health* 12(469): 1471-2458.

Since 2005, Cambodia’s national tuberculosis program has been enabling screening of household contacts of TB patients in poor and vulnerable communities with the use of mobile radiography units as an enabler. The overall cost per case detected through MOBILE X-RAY was US\$ 108. The MOBILE X-RAY approach detected patients from older populations (median age of 55 years) compared to self referral (PCF) (median age of 48 years; $p < 0.001$). The percentage of smear-negative TB cases detected through MOBILE X-RAY was significantly higher (71.4%) than that of PCF (40.5%). Among smear-positive patients, lower smear grades were observed in the MOBILE X-RAY group compared to the PCF group ($p = 0.002$). A fairly low initial defaulter rate (21 patients, 5.2%) was observed in the MOBILE X-RAY group. Once treatment was initiated, high treatment success rates were achieved with 96.4% in MOBILE X-RAY and with 95.2% in PCF.

Selected List of Guidances, Tools and Manuals

Guidelines for intensified tuberculosis case finding and isoniazid preventive therapy for people living with HIV in resource constrained settings. Geneva, World Health Organization, 2011.

http://whqlibdoc.who.int/publications/2011/9789241500708_eng.pdf

Tuberculosis: Clinical Diagnosis and Management of Tuberculosis, and Measures for Its Prevention and Control.

NICE Clinical Guidelines, No. 33.

<http://www.ncbi.nlm.nih.gov/books/NBK45801/>

Engage-TB: integrating community-based tuberculosis activities into the work of nongovernmental and other civil society organizations: operational guidance Getahun, Haileyesus II. Joseph, Thomas. III. Tomaskovic, Lana. IV. Raviglione, Mario C. World Health Organization. ISBN 978 92 4 150450 8 (NLM classification: WF 200)

http://apps.who.int/iris/bitstream/10665/75997/1/9789241504508_eng.pdf

Selected Bibliographic References of Uses of this Strategy

Lutge, E.E., Wiysonge, C.S., Knight, S.E., Volmink, J.. Material Incentives and Enablers in the Management of Tuberculosis; Cochrane Database of Systematic Reviews. 2012 Jan 18; Volume 1: CD007952

Operations Research and Evaluation (OR&E) Protocol Development Guide. This presentation offers some hints to design studies that can contribute hard evidence on the incremental impact of incentive and enabler activities on TB program performance.

http://www1.msh.org/projects/rpmpplus/Documents/upload/I-E_TB_Control_Presentation.pdf

<http://www1.msh.org/projects/rpmpplus/WhatWeDo/Tuberculosis/Incentives-and-Enablers.cfm>

D Boccia, J Hargreaves, K Lonnroth et al Cash Transfer and microfinance interventions for tuberculosis control: review of the impact evidence and policy implications, IJTLD 2011; 15(6):S37-S49;

A Beith, R Eichler, D. Weil Worldwide: Incentives for Tuberculosis Diagnosis and Treatment, in Performance Incentives for Global Health: Potential and Pitfalls. Center for Global Development, Washington, DC, 2009;

REACH AN APPROPRIATE FACILITY

ADDRESS LACK OF (MAL-DISTRIBUTION OF) FACILITIES

Brief Description of the Approach

“eHealth is the use of digital data - transmitted, stored and retrieved by electronic means- in support of health care, both at the local site and at a distance. It encompasses three main areas: the delivery of health information, for health professionals and health consumers, through the Internet and telecommunications; using the power of IT and e-commerce to improve public health services, e.g. through the education and training of health workers; the use of e-commerce and e-business practices in health systems management”¹⁵.

eHealth provides a new method for using health resources. The access to Internet provides a new medium for information dissemination and for interaction among all involved stakeholders.

“Possible eHealth tools are Electronic Health Records (eHR); Patient Information Systems (PIS); Hospital information Systems (HIS); General Practitioner Information Systems (GPIS); National electronic registries; National drug registries; Directories of healthcare professionals and institutions; Decision Support Systems (DSS); Telehealth (surveillance, health promotion and public health functions); tele-medicine (computer-assisted telecommunications to support management, surveillance, literature and access to medical knowledge); Geographical Information Systems (GIS)”¹⁶. To provide qualitative eHealth within the existing health care delivery framework there is a need to develop national policy, with comprehensive implementation plan under frameworks for data protection.

“The security of eHealth systems requires the assessment, development and maintenance of the credibility, accountability, quality, safety, confidentiality, integrity, availability and privacy of services, information and resources”¹⁷.

mHealth is a component of eHealth. mHealth (mobile health) is defined as medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, and other wireless devices. mHealth involves the use of a mobile phone’s core utility of voice and short messaging service (SMS) as well as general packet radio service (GPRS), global positioning system (GPS) and Bluetooth technology. mHealth is communication between individuals and health services and vice versa. eHealth and mHealth options should also be used to raise public awareness about TB and its related issues to increase community involvement in TB patient support and provision of TB treatment and care services.

List of alternative names (if applicable)

Electronic health record (EHR); Clinical Information System (CIS), eHealth for Health Care Delivery (eHCD), Tele-health, Tele- medicine, MEMS

Shown to benefit

All

Example of Good Practice

Electronic platform enables real-time monitoring of directly-observed treatment in the community

The Indus Hospital in Pakistan introduced a mobile-phone-based electronic system for recording and reporting of MDR-TB DOT (directly-observed treatment) data. The community-based program involves treatment supporters visiting the homes of MDR-TB patients to perform DOT. Each treatment supporter is given a mobile phone containing software that allows them to enter DOT data electronically. These data can then be uploaded to the hospital’s patient database in real-time over the phone network or, where mobile network connectivity may be unreliable, completed electronic forms can be stored on the phone and then bulk uploaded when connectivity is available. This method also allows real-time monitoring of treatment supporters to ensure that patients are being visited every day.

Selected List of Guidances, Tools and Manuals

- E-Health tools and services, WHO, 2006
http://www.who.int/kms/initiatives/tools_and_services_final.pdf
- Three interlinked patient monitoring systems for HIV care/ART, MCH/PMTCT and TB/ HIV: standardized minimum data set and illustrative tools
http://www.who.int/hiv/pub/imai/three_patient_monitor/
- WHO. A Guide for TB Treatment Supporter. 2002
http://whqlibdoc.who.int/hq/2002/WHO_CDS_TB_2002.300.pdf
- Case studies and good practice reports, WHO
http://www.who.int/workforcealliance/knowledge/case_studies/en
- eHealth, RESOLUTIONS AND DECISIONS, WHA58.28
http://apps.who.int/gb/ebwha/pdf_files/WHA58/WHA58_28-en.pdf
- Global Observatory for eHealth series - Volume 5 Legal frameworks for eHealth, Global Observatory for eHealth series - Volume 5, WHO, 2012, ISBN9789241503143,
http://whqlibdoc.who.int/publications/2012/9789241503143_eng.pdf
- Global eHealth survey
http://www.who.int/goe/data/global_e-health_survey_2009_en.pdf
- mHealth: new horizons for health through mobile technologies: second global survey on eHealth, WHO, 2011, ISBN9789241564250
http://whqlibdoc.who.int/publications/2011/9789241564250_eng.pdf
- Safety and security on the Internet
 Challenges and advances in Member States Global Observatory for eHealth series - Volume 4, World Health Organization 2011, ISBN9789241564397,
http://whqlibdoc.who.int/publications/2011/9789241564397_eng.pdf
- Roodenbeke E. et al, Outreach services as a strategy to increase access to health workers in remote and rural areas, WHO, 2011, ISBN 978 92 4 150151 4
http://whqlibdoc.who.int/publications/2011/9789241501514_eng.pdf
- WHO, eHealth,
http://www.who.int/eht/eHealthHCD_BOF/en

Selected Bibliographic References of Uses of this Strategy

- Guroł-Urganci I, de Jongh T, Vodopivec-Jamsek V, Atun R, Car J. Mobile phone messaging reminders for attendance at healthcare appointments. *Cochrane Database Syst Rev.* 2013 Dec 5;12:CD007458. doi: 10.1002/14651858.CD007458.pub3. Review. PubMed PMID: 24310741.
- van-Velthoven MH, Tudor Car L, Gentry S, Car J. Telephone delivered interventions for preventing HIV infection in HIV-negative persons. *Cochrane Database Syst Rev.* 2013 May 31;5:CD009190. doi: 10.1002/14651858.CD009190.pub2. Review. PubMed PMID: 23728688.
- Gentry S, van-Velthoven MH, Tudor Car L, Car J. Telephone delivered interventions for reducing morbidity and mortality in people with HIV infection. *Cochrane Database Syst Rev.* 2013 May 31;5:CD009189. doi: 10.1002/14651858.CD009189.pub2. Review. PubMed PMID: 23728687.
- de Jongh T, Guroł-Urganci I, Vodopivec-Jamsek V, Car J, Atun R. Mobile phone messaging for facilitating self-management of long-term illnesses. *Cochrane Database Syst Rev.* 2012 Dec 12;12:CD007459. doi: 10.1002/14651858.CD007459.pub2. Review. PubMed PMID: 23235644.
- Vodopivec-Jamsek V, de Jongh T, Guroł-Urganci I, Atun R, Car J. Mobile phone messaging for preventive health care. *Cochrane Database Syst Rev.* 2012 Dec 12;12:CD007457. doi: 10.1002/14651858.CD007457.pub2. Review. PubMed PMID: 23235643.
- Whittaker R, McRobbie H, Bullen C, Borland R, Rodgers A, Gu Y. Mobile phone-based interventions for smoking cessation. *Cochrane Database Syst Rev.* 2012 Nov 14;11:CD006611. doi: 10.1002/14651858.CD006611.pub3. Review. PubMed PMID: 23152238.
- Chen YF, Madan J, Welton N, Yahaya I, Aveyard P, Bauld L, Wang D, Fry-Smith A, Munafò MR. Effectiveness and cost-effectiveness of computer and other electronic aids for smoking cessation: a systematic review and network meta-analysis. *Health Technol Assess.* 2012;16(38):1-205, iii-v. doi: 10.3310/hta16380. Review. PubMed PMID: 23046909.

REACH AN APPROPRIATE FACILITY

ADDRESS LACK OF (MAL-DISTRIBUTION OF) FACILITIES

Utilize Mobile Clinics, Sputum Collection, CXR Trucks to Reach the Hard to Reach

Brief Description of the Approach

Mobile diagnosing and treatment clinics provide convenient and confidential medical care to populations with special needs and/or in remote areas. As means of active tuberculosis case finding in settings with a high burden of HIV and tuberculosis mobile clinics are a feasible solution, have a high uptake, yield, and treatment success. A number of implementation challenges to deploying mobile clinics for sputum collection or Mobile Digital X-ray Units can include infrastructure issues as well as government/non-governmental requirements. It is important to make services available at the time and location, which is convenient to the population being served.

List of alternative names (if applicable)

Outreach services and clinics, Mobile services, Improving access to diagnosis

Shown to benefit

HIV-infected, migrants, Indigenous populations, alcohol dependent, drug dependent, sex workers, homeless, prisoners, HCWs, refugees, urban residents of poor areas, migrants, truck drivers, street children/ OVC, miners, factory workers, elderly, mentally ill, soldiers

Potential Beneficiaries

Marginalized MSM, Transgender

Example of Good Practice

de Vries, G., van Hest, R. a H., & Richardus, J. H. (2007). Impact of mobile radiographic screening on tuberculosis among drug users and homeless persons. *American journal of respiratory and critical care medicine*, 176(2), 201-7. doi:10.1164/rccm.200612-1877OC

In 2002, a mobile radiographic screening program was started in Rotterdam to respond to high rates of tuberculosis (TB) among illicit drug users and homeless persons. Since January 1, 2003, all known facilities—that is, four methadone-dispensing centers, six day- or night-care facilities (some of them also having safe drug consumption rooms), three residential homes, and the street prostitution zone—were visited twice per year with a Mobile Digital X-ray Units (MDXU). The screening of the 14 facilities was performed during 12 working days per half-year, with an average of 102 persons per day, ranging between 36 and 319.

Screening with mobile radiographic X-ray units decreased the annual number of notified tuberculosis cases following an outbreak and reduced transmission. During the study period, 206 individuals with TB among illicit drug users and homeless persons were notified, representing 11.4% of the total case load of 1,811 in Rotterdam. The annual number of tuberculosis cases declined from 24 at the start of the screening program to 11 cases in 2005. The screening program identified 28 cases (a prevalence rate of 327 per 100,000 radiographs), of which 12 were smear positive. In 1997- 2002, more than 80% of the illicit drug users or homeless persons with TB were infected with one of the *Mycobacterium tuberculosis* strains prevalent among these risk groups. After nearly 4 years of systematic radiographic screening this proportion declined to 45% in 2005.

Utilize Mobile Clinics, Sputum Collection, CXR Trucks to Reach the Hard to Reach

Selected List of Guidances, Tools and Manuals

Systematic screening for active tuberculosis: Principles and recommendations. World Health Organization 2013 ISBN 978 92 4 154860 1
http://www.tbcare1.org/publications/toolbox/tools/hss/download.php?file=Systematic_Screening_for_Active_Tuberculosis.pdf

Mobile Health units: methodological approach. International Committee of the Red Cross
http://www.icrc.org/eng/assets/files/other/icrc_002_0886.pdf

Selected Bibliographic References of Uses of this Strategy

Eang, M. T., P. Satha, et al. (2012). "Early detection of tuberculosis through community-based active case finding in Cambodia." *Bmc Public Health* 12(469): 1471-2458.

Kranzer K, Lawn SD, Meyer-Rath G, Vassall A, Radithalo E, et al. (2012) Feasibility, Yield, and Cost of Active Tuberculosis Case Finding Linked to a Mobile HIV Service in Cape Town, South Africa: A Cross-sectional Study. *PLoS Med* 9(8): e1001281. doi:10.1371/journal.pmed.1001281

Corbett EL, Bandason T, Duong T, Dauya E, Makamure B, Churchyard GJ, Williams BG, Munyati SS, Butterworth AE, Mason PR, Mungofa S, Hayes RJ. Comparison of two active case-finding strategies for community-based diagnosis of symptomatic smear-positive tuberculosis and control of infectious tuberculosis in Harare, Zimbabwe (DETECTB): a cluster-randomised trial. *Lancet*. 2010 Oct 9;376(9748):1244-53.

Southern, a, Premaratne, N., English, M., Balazs, J., & O'Sullivan, D. (1999). Tuberculosis among homeless people in London: an effective model of screening and treatment. *The international journal of tuberculosis and lung disease : the official journal of the International Union against Tuberculosis and Lung Disease*, 3(11), 1001-8. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/10587322>

Peter JG, Theron G, Pooran A, Thomas J, Pascoe M, Dheda K. Comparison of two methods for acquisition of sputum samples for diagnosis of suspected tuberculosis in smear-negative or sputum-scarce people: a randomised controlled trial. *The lancet Respiratory medicine*. 2013 Aug;1(6):471-8.

Brief Description of the Approach

Some vulnerable groups can be reached best by targeting the health care providers they normally utilize, especially providers that are their first port of call. Encouraging TB screening in diabetes clinics, pediatric, antenatal care, PMTCT, substance abuse treatment programs, geriatric care settings, and other areas of the health system can help to diagnose TB faster and with a holistic approach -taking into consideration the other health issues of the TB suspect.

List of alternative names (if applicable)

PAL, ICMI, horizontal integration, Health systems strengthening (HSS), task shifting

Potential Beneficiaries

All risk groups who access clinical care

Example of Good Practice

In Malawi, joint management of TB and diabetes under an adapted DOTs model began in 2009 in a diabetes clinic at Queen Elizabeth Central Hospital in Blantyre. A total of 170 new patients were registered between October and December 2010. At follow up, only three had died, 53 had defaulted and three had transferred out (Allain, T. J., J. J. van Oosterhout et al, 2011).

In studies performed in Soweto, South Africa, TB screening during routine antenatal care was found to be feasible, and added very little time to the routine consultation. Recommendations have been made that routine questioning for TB screening should be implemented in settings of high HIV prevalence, as the rates of TB infection in peri-partum women are high in these settings (Mnyani, C. N., & McIntyre, J. A., 2011).

In 2011, TB CARE II developed and disseminated two tools that address TB case finding and comprehensive HIV care within the antenatal care setting. The Focused Antenatal Care + (FANC +) tool and fundal height measurement tape were both launched at the International Confederation of Midwives quadrennial congress. Both tools focus on challenges of integration of TB/HIV in countries with high burdens of both diseases and are designed to assist countries with high burdens of TB and HIV in particular to ensure new diagnostic tools & pathways are incorporated.

Selected List of Guidances, Tools and Manuals

MOST for TB tool
http://www.tbcare1.org/publications/toolbox/tools/hss/download.php?file=MOST_for_TB-English.pdf

The Focused Antenatal Care + (FANC +) Job Aid
http://urc.tbcare.net/sites/urc.tbcare.net/files/TB%20CARE%20IFANCplus_JobAid_0.pdf

Fundal height measurement tape job aid
http://urc.tbcare.net/sites/urc.tbcare.net/files/TBCARE%20ITapeMeasure_0.pdf

Engage-TB: integrating community-based tuberculosis activities into the work of nongovernmental and other civil society organizations: operational guidance Getahun, Haileyesus II. Joseph, Thomas. III. Tomaskovic, Lana. IV. Raviglione, Mario C. World Health Organization. ISBN 978 92 4 150450 8 [NLM classification: WF 200]
http://apps.who.int/iris/bitstream/10665/75997/1/9789241504508_eng.pdf

A New Approach to Global Health - Positive Synergies
<http://www.who.int/healthsystems/GHSynergies/en/>

Selected Bibliographic References of Uses of this Strategy

Allain, T. J., J. J. van Oosterhout, et al. (2011). "Applying lessons learnt from the DOTs Tuberculosis Model to monitoring and evaluating persons with diabetes mellites in Bhatyre, Malawi." *Tropical Medicine and International Health* 16 (9): 1077-1084.

Mnyani, C. N., & McIntyre, J. A. (2011). Tuberculosis in pregnancy. *Bjog-an International Journal of Obstetrics and Gynaecology*, 118(2), 226-231. doi:10.1111/j.1471-0528.2010.02771. <http://onlinelibrary.wiley.com/doi/10.1111/j.1471-0528.2010.02771.x/pdf>

Ngadaya, E. S., Mfinanga, G. S., Wandwalo, E. R., & Morkve, O. (2009). Pulmonary tuberculosis among women with cough attending clinics for family planning and maternal and child health in Dar Es Salaam, Tanzania. *Bmc Public Health*, 9. doi:27810.1186/1471-2458-9-278. <http://www.biomedcentral.com/content/pdf/1471-2458-9-278.pdf>

Nachega J et al. Tuberculosis active case-finding in a mother-to-child HIV transmission prevention programme in Soweto, South Africa. *AIDS*, 2003, 17(9):1398-1400.

Brief Description of the Approach

People with TB turn to a broad array of health care providers; public and private; formal and informal. Vulnerable groups are more likely than others to seek care from lower levels of the health system including pharmacies/drug shops and informal providers. When they do seek care in secondary and tertiary care institutions and from formal private sector providers they are more likely than others to face catastrophic health expenditures. Public private mix approaches (one of six components of the Stop TB Strategy) can help reach vulnerable groups early, improve their treatment results, and help protect them financially by introducing quality controlled (in line with national guidelines and international standards), subsidized or free diagnosis and treatment in all relevant public and private health care facilities utilized by these groups.

List of alternative names (if applicable)

Hospital-DOTS linkage (HDL)

Potential Beneficiaries

All salaried workers with social security coverage

Example of Good Practice

Guidance on Involving Social Security Organizations in TB Control. TBCAP. 2010

The 1995 "National Health Insurance Act"¹ created the Philippine Health Insurance Corporation (PhilHealth) that manages the NHIP. By June 2008 approximately 73% of The Philippines population was covered by PhilHealth (66 million). PhilHealth intends to achieve universal coverage. About half of those people insured by PhilHealth belonged to the public or private employed sector, whose premium is paid through payroll contribution; around 15 million PhilHealth members (22%) are under the "indigent or sponsored program" whose premiums are paid by national and/or local government units - premium sharing is dictated by the income class of the province or municipality. Other categories of members are individually insured, overseas workers and pensioners. PhilHealth insurance covers mainly inpatient care, but also a set of outpatient packages for maternal and child health and selected diseases such as tuberculosis. Services to PhilHealth members are provided through 1,536 hospitals and 1,211 health centers belonging to the general health care (DOH) network, including accredited private sector facilities.

Selected List of Guidances, Tools and Manuals

Guiding Principles and Practical Steps for Engaging Hospitals in TB Care and Control
http://www.tbcare1.org/publications/toolbox/tools/access/download.php?file=Guiding_Principles_Practical_Steps_Engaging_Hospitals_TB_Care_Control.pdf

Mapping the Motivations of Stakeholders to Enable Improved Tuberculosis Control Mapping Tool for Use in Workshops
http://www1.msh.org/projects/rpmplus/Documents/upload/Mapping_Motivations_for_TB_Control-Workshop_Tool.pdf

Selected Bibliographic References of Uses of this Strategy

Guidance on Involving Social Security Organizations in TB control. TBCAP. 2010
http://www.tbcare1.org/publications/toolbox/tools/access/Guidance_on_Involving_Social_Security_Organizations.pdf

Irawati, S. R., C. Basri, M. S. Arias, et al. 2007. Hospital DOTS Linkage in Indonesia: A Model for DOTS Expansion into Government and Private Hospitals. *International Journal of Tuberculosis and Lung Disease*.11:33-39.

Brief Description of the Approach

People with TB turn to a broad array of health care providers; public and private; formal and informal. Vulnerable groups are more likely than others to seek care from lower levels of the health system including pharmacies/drug shops and informal providers. When they do seek care in secondary and tertiary care institutions and from formal private sector providers they are more likely than others to face catastrophic health expenditures. Public private mix approaches (one of six components of the Stop TB Strategy) can help reach vulnerable groups early, improve their treatment results, and help protect them financially by introducing quality controlled (in line with national guidelines and international standards), subsidized or free diagnosis and treatment in all relevant public and private health care facilities utilized by these groups.

List of alternative names (if applicable)

PPM, Public-Private Partnerships (PPP). See also task-shifting

Shown to benefit

Residents of poor urban areas

Potential Beneficiaries

All other risk groups

Example of Good Practice

Creating an opportunity to engage with the private sector
The Indus Hospital in Karachi, Pakistan, treats a large number of MDR-TB patients. It built an electronic system to help manage the complexity inherent in managing these patients.

In January 2011 it extended its electronic TB recording and reporting system to implement an incentive scheme to reward private doctors and community health workers for identifying and referring TB suspects, confirming TB cases and for ensuring TB patients successfully complete treatment. Family doctors and community health workers report their activities electronically using a mobile phone interface to the Indus Hospital system. Payments ('conditional cash transfers') are made via mobile banking facilities directly to the doctor or community health worker's mobile phone.

The Indus Hospital reported a doubling of TB case notifications after launching the scheme. Many of these cases would never have been notified in the past and their disease and treatment in the private sector would have remained unknown to the NTP.
http://www.stoptb.org/news/stories/2011/ns11_039.asp

Engage All Care providers Through Public-Private Mix (PPM) Approaches

Selected List of Guidances, Tools and Manuals

The PPM toolkit:

<http://www.who.int/tb/careproviders/ppm/PPMToolkit.pdf>

Guidance on engaging all care providers through PPM approaches:

http://whqlibdoc.who.int/hq/2006/WHO_HTM_TB_2006.360_eng.pdf

International Standards for Tuberculosis Care (ISTC). The Hague: Tuberculosis Coalition for Technical Assistance, 2014.

http://www.tbcare1.org/publications/toolbox/tools/access/download.php?file=ISTC_3rdEd_final_inter.pdf

PPM national situation assessment tool:

http://whqlibdoc.who.int/hq/2007/WHO_HTM_TB_2007.391_eng.pdf

Selected Bibliographic References of Uses of this Strategy

Scaling up PPM: lessons from design and implementation of the Global Fund TB grants

http://www.tbcare1.org/publications/toolbox/tools/access/Scaling_Up_PPM.pdf

Dewan P, Lal S, Lonnoth K, Wares F, Uplekar M, Sahu S, et al. Improving tuberculosis control through public private collaboration in India: literature review. *British Medical Journal*. 2006 March 11;332(7541):574-8

Lal SS, Uplekar M, Katz I, Lonnoth K, Komatsu R, Dias HMY, et al. Global Fund financing of public-private mix approaches for delivery of tuberculosis care. *Tropical Medicine & International Health*. 2011 Jun;16(6):685-92.

Lal SS, Sahu S, Wares F, Lonnoth K, Chauhan LS, Uplekar M. Intensified scale-up of public-private mix: a systems approach to tuberculosis care and control in India. *International Journal of Tuberculosis and Lung Disease*. 2011 Jan;15(1):97-104.

Mahendradhata Y, Probandari A, Ahmad RA, Utarini A, Trisnantoro L, Lindholm L, et al. The Incremental Cost-Effectiveness of Engaging Private Practitioners to Refer Tuberculosis Suspects to DOTS Services in Jogjakarta, Indonesia. *American Journal of Tropical Medicine and Hygiene*. 2010 Jun;82(6):1131-9.

Pantoja A, Floyd K, Unnikrishnan KP, Jitendra R, Padma MR, Lal SS, et al. Economic evaluation of public-private mix for tuberculosis care and control, India. Part I. Socio-economic profile and costs among tuberculosis patients. *International Journal of Tuberculosis and Lung Disease*. 2009 Jun;13(6):698-704.

Uplekar M, Lonnoth K. MDR and XDR - the price of delaying engagement with all care providers for control of TB and TB/HIV. *Tropical Medicine & International Health*. 2007 Apr;12(4):473-4.

Lonnoth K, Aung T, Maung W, Kluge H, Uplekar M. Social franchising of TB care through private GPs in Myanmar: an assessment of treatment results, access, equity and financial protection. *Health Policy and Planning*. 2007 May;22(3):156-66.

Lonnoth K, Uplekar M, Blanc L. Hard gains through soft contracts: productive engagement of private providers in tuberculosis control. *Bulletin of the World Health Organization*. 2006 Nov;84(11):876-83.

Brief Description of the Approach

The development and implementation of a comprehensive and systematic approach to manage patients with respiratory symptoms in PHC setting are likely to improve the quality of respiratory care and, subsequently, create conditions resulting in increasing TB case detection and improving the quality of TB diagnosis.

The Practical Approach to Lung health (PAL) strategy is an integrated approach to manage respiratory conditions with a focus on PHC. PAL improves the identification and management of TB with respect to the other respiratory illnesses as well as the identification and management of non tuberculous respiratory conditions with respect to TB. PAL is a minimum package of care provisions which should be offered to any respiratory patient in PHC setting.

PAL strategy includes two components:

- Standardization of clinical care through the adaptation and development of clinical practice guidelines focusing on priority respiratory diseases and targeting, particularly, the improvement of TB case detection as well as the quality of TB diagnosis within PHC system. These guidelines are based on the principle of using key symptoms and signs that lead to diagnostic classification, determination of degree of severity and appropriate decision of management.
- Coordination based on the collaboration among health workers at the same and different levels of the health system, as well as within and among the various categories of health workers in order to make the most efficient use of available resources. Coordination also implies a clear definition of the role of each health worker category and each health care level in providing respiratory care services. This contributes to establishing efficient referral system for respiratory condition cases in general and for TB suspects and TB cases in particular. In addition, coordination is needed among TB and HIV/AIDS control programs, general health services, PHC department, Essential Drug Program, health management information system (HMIS), the existing training network, and others.

List of alternative names (if applicable)

Integration into PHC

Potential Beneficiaries

All risk groups that access clinical care

Example of Good Practice

At the patient level, Samir et al 2009 demonstrated that implementing PAL reduces patients' out-of-pocket expenses, mostly due to the lower average cost per drug prescription. The PAL strategy is designed to enhance the rational use of drugs; it reduces multidrug prescriptions, the number of antibiotic prescriptions, and increases generic drug prescriptions, as well as drug use from the essential drugs list. Overall, patients visiting PAL facilities, on average, spent less on health care related costs per episode, including expenses for drugs, fees, and diagnostic tests (US\$ 0.83 vs. US\$ 1.01), as well as on non-health care related costs (US\$ 2.00 vs. US\$ 2.20). that the implementation of PAL increases the government's health expenditure, due to the increased costs associated with the training and supervision of health care providers, by US\$ 1.04 per disease episode. Therefore, before PAL is adopted, the initial increase in budget has to be guaranteed, either from the national budget or through international support. However, the cost per episode can be reduced significantly once the PAL strategy is adopted nationwide and integrated into the basic training of health care providers.

<http://www.iiasa.ac.at/Admin/PUB/Documents/RR-09-001.pdf>

Selected List of Guidances, Tools and Manuals

Practical Approach to Lung health (PAL): a primary health care strategy for integrated management of respiratory conditions in people of five years of age and over. Geneva, World Health Organization, 2005 (WHO/HTM/TB/2005.351; WHO/NMH/CHP/CPM/CRA/05.3).

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Practical Approach to Lung Health - Manual on initiating PAL implementation. WHO/HTM/TB/2008.410. Geneva, World Health Organization, 2008

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Samir K.C. 2009 Lung Health in Rural Nepal
Multi-State Modeling of Health Status and Economic Evaluation of Integrated Respiratory Care Guidelines

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Evaluation of the practical approach to lung health Report of meeting held on 18-19 June 2007, WHO, Geneva WHO/HTM/TB/2008.396

Ottmani S. [Practical approach to lung health strategy in Algeria]. *Eur Respir Rev.* [JournalReview]. 2012;21(125):186-95.

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REACH AN APPROPRIATE FACILITY

DEVELOP HUMAN RESOURCES (HRD)

Brief Description of the Approach

“Training of health workforce involves strategies to expand the numbers of new health workers (pre-service training) and maximize the efficiency and performance of the existing workforce (in-service training)”²¹.

The primarily goal of the in-service training is to empower and better equip the health workforce with the competencies needed for more effective TB care. “Collaboration between the education and health sectors, other national authorities, and the private sector is crucial to understand the critical gaps in the supply and competencies of health workforce and will improve the match between health professional education and the realities of health service delivery”²².

Training curricula must be updated to meet service delivery needs with clear set of goals, objectives, contents and outputs. Training quality can be assured by using developed up-to-date training materials, adult learning methodologies as well linking the training to exiting supervision system(s).

Scaling up of education and training of health workers is only one of interventions, equal attention must be paid to retention issues (to keep one in the system).

Staff retention involves a two-step process - understanding why employees leave and developing and implementing strategies to get them to stay. “This requires understanding the perceived value of different pay and conditions packages; information and culturally appropriate tools for managing staff performance; changes requiring new sets of skills and working practices, multi- level career path”²³.

List of alternative names (if applicable)

HRD, education, training, task- shifting, retention, human resource management

Potential Beneficiaries

Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), HIV-infected/PMTCT, Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs/Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban slum residents, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender,

Example of Good Practice

Afr Health Sci. 2013 Sep;13(3):800-7. doi: 10.4314/ahs.v13i3.40.

An evaluation of the effectiveness of the Zambian Health Worker Retention Scheme (ZHWRS) for rural areas.

Gow J1, George G, Mwamba S, Ingombe L, Mutinta G.

“The Zambia Health Worker Retention Scheme (ZHWRS) is an effort to halt the brain drain and fairly redistribute health workers between rural and urban areas. The Zambian MoH since 2003 as embarked the twin-pronged strategy to attract and retain health workers to disadvantaged health facilities by improving their cash income with a salary top-up. In addition to this, the ZHWRS also carries with it non-cash incentives which have the aim to improve professional practice environments. Such incentives have included solar lighting at health facilities, improved supply of clean water and sanitation, provision of good and improved pit latrines and transport for health workers (e.g. motorbikes, bicycles, canoes, horses).

Due to an increased number of health professionals on ZHWRS, a ZHWRS database has been created in order to improve communication between the HQ and local health management teams (provincial and district health offices).

The ZHWRS has succeeded to attract and retain doctors in the public health system since its inception in 2003. The number of doctors joining the public service has steadily increased and stabilized in comparison to the numbers of other cadres”²⁴.

Selected List of Guidances, Tools and Manuals

Tools for Planning and Developing Human Resources for HIV/AIDS and Other Health Services, MSH, WHO, 2006
http://www.who.int/hrh/tools/tools_planning_hr_hiv-aids.pdf

WHO Global Recommendations and Guidelines on Task Shifting; Treat, Train, Retain
<http://www.who.int/mediacentre/news/releases/2006/pr37/en/>

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Case studies and good practice reports, WHO
http://www.who.int/workforcealliance/knowledge/case_studies/en/

Migration and Retention: Key Resources, WHO
<http://www.who.int/workforcealliance/knowledge/themes/migration/en>

Report of the Global meeting on Human Resources for Health Observatories. Evidence-informed Human Resources for Health Policies: the contribution of HRH Observatories. WHO, 2011
http://www.who.int/hrh/resources/observatories_meeting_report.pdf

The world health report 2006: working together for health. ISBN 92 4 1563176
<http://www.who.int/whr/2006/en/>

Transformative scale up of health professional education, WHO, PEPFAR, 2011, WHO/HSS/HRH/HEP/2011.01
http://whqlibdoc.who.int/hq/2011/WHO_HSS_HRH_HEP2011.01_eng.pdf
http://www.who.int/hrh/resources/transformative_education/en/index.html

Roodenbeke E. et al, Outreach services as a strategy to increase access to health workers in remote and rural areas, WHO, 2011, ISBN 978 92 4 150151 4
http://whqlibdoc.who.int/publications/2011/9789241501514_eng.pdf

Breaking the Employee Turnover Cycle- Turing Things around. Best practices for employee retention. Canadian Food Industry Council (CFIC), 2009
http://www.cghrc.ca/images/pdf/calculator_brochure_rev9j.pdf

REACH AN APPROPRIATE FACILITY DEVELOP HUMAN RESOURCES (HRD)

Shift Tasks to the Lowest Capable Cadre

Brief Description of the Approach

To scale up health services, it is important to review current HCW job descriptions and the legal frameworks in which they are operating in clinics and/or communities. Existing rules and regulations to diagnose and treat TB patients may need adjustment(s) for several categories of HCWs to be able to deliver expected treatment and care.

Task shifting is considered a promising intervention for strengthening national health coverage by improving the skill mix in the country's health care system. "Task shifting is the name now given to a process of delegation whereby tasks are moved, where appropriate; shifting tasks from one cadre of HCW to an existing, lower-level cadre and/or shifting tasks to a new cadre developed to meet specific health care goals"²⁵.

Task shifting can make more efficient use of the existing and available workforce by taking into account information about the number of patients within the catchment area to determine if/how to expand necessary services and what kind of re-division of tasks and roles of public/private health care providers are needed. The same applies to formal and informal and/or community volunteers to make the right balance between formal service providers' responsibilities and possible contributions of informal health care providers. Possible cost savings (both in training and salary costs) may be made by using different staffing mixes to provide specific services (e.g. the training of a nurse may cost less than that of a physician). "Quality assurance mechanisms and in-service training should be in place to ensure task shifting is safe, equitable, efficient, effective and sustainable"²⁶.

List of alternative names (if applicable)

Improving the skill mix, decentralization, horizontal integration, health systems strengthening, HRD, promotion of community health workers, retention, human resource management

Shown to benefit

PLHIV

Potential Beneficiaries

Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), HIV-infected/PMTCT, Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs/Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban slum residents, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender

Example of Good Practice

Shortages and mal-distribution of certified laboratory technicians poses a serious challenge to the National TB Control Program of Afghanistan. To address the human resources challenges, the national program in collaboration with the national and international non-governmental organizations has shifted tasks normally undertaken by certified laboratory technicians to high school graduates and deployed them, following theoretical and practical training as microscopists at TB diagnostic centers. During a targeted period from July to September 2009, 7,313 slides from 386 microscopy units in 30 provinces of Afghanistan were collected and cross-checked as part of a routine external quality assurance program. Information on certification status was obtained from the Human Resource Database of the Ministry of Public Health. The quality of work of certified laboratory technicians was not significantly different from those who did not have such certification when judged in terms of the number of slides in which a major error would have led to a false diagnosis (Odds Ratio 1.11; 95% CI 0.64, 1.94).

Selected List of Guidances, Tools and Manuals

Engage-TB: integrating community-based tuberculosis activities into the work of nongovernmental and other civil society organizations: operational guidance Getahun, Haileyesus II, Joseph, Thomas. III, Tomaskovic, Lana. IV. Raviglione, Mario C. World Health Organization. ISBN 978 92 4 150450 8 [NLM classification: WF 200] http://apps.who.int/iris/bitstream/10665/75997/1/9789241504508_eng.pdf

Task shifting : rational redistribution of tasks among health workforce teams : global recommendations and guidelines. World Health Organization 2008 <http://www.who.int/healthsystems/TTR-TaskShifting.pdf>

IMAI and IMCI Tools for HIV Prevention, Care and Treatment http://www.who.int/hiv/pub/imai/IMAI_IMCI_taskshifting_brochure.pdf <http://www.who.int/hiv/pub/imai/en/>

J. Bluestone, Capacity Project Knowledge Sharing, technical brief: Task Shifting for a Strategic Skill Mix, JHPIEGO http://www.capacityplus.org/files/resources/projectTechBrief_5.pdf

Tools for Planning and Developing Human Resources for HIV/AIDS and Other Health Services, MSH, WHO, 2006 http://www.who.int/hrh/tools/tools_planning_hr_hiv-aids.pdf

Towards comprehensive TB control: HRD vision, goal, key strategies and implementation approaches http://www.who.int/tb/health_systems/human_resources/who_hrd_stoptbstrategy_table6.pdf

Selected Bibliographic References of Uses of this Strategy

Addis Ababa Declaration International Conference on Task Shifting, 2008 http://www.who.int/healthsystems/task_shifting/Addis_Declaration_EN.pdf

Morris M.B., et al, Use of task-shifting to rapidly scale-up HIV treatment services: experiences from Lusaka, Zambia, BMC Health Services Research <http://www.biomedcentral.com/1472-6963/9/5/abstract>

Taking stock: task shifting to tackle health worker shortages, WHO (2006), 2007 http://www.who.int/healthsystems/task_shifting/TTR_response.pdf

P. A. Gaye, D. "Nelson Human Resources for Health: Effective scale-up: avoiding the same old traps" <http://www.human-resources-health.com/content/7/1/2>

The world health report 2006: working together for health. ISBN 92 4 1563176 <http://www.who.int/whr/2006/en/>

WHO Global Recommendations and Guidelines on Task Shifting; Treat, Train, Retain <http://www.who.int/mediacentre/news/releases/2006/pr37/en/>

Dauod Mohammad¹, Seddiq Mohammad Khaled², Rahman Taufiqur³ Affiliation(s): ¹Aga Khan Development Network, Kabul, Afghanistan, National TB Program Afghanistan, Kabul, Afghanistan, ²BRAC Afghanistan, Kabul, Afghanistan Does Task Shifting in TB Microscopy Services to Non-Certified Microscopists Affect Quality? A Cross-Sectional Study in Afghanistan. Geneva health Forum april 18-22, 2012.

Daniel G. Datiko, Bernt Lindtjørn Cost and Cost-Effectiveness of Smear-Positive Tuberculosis Treatment by Health Extension Workers in Southern Ethiopia: A Community Randomized Trial PLoS One. 2010; 5(2): e9158. Published online 2010 February 17. doi: 10.1371/journal.pone.0009158

REACH AN APPROPRIATE FACILITY

ADDRESS LACK OF ACCESS TO HEALTH SERVICES

Address Lack of Access to Health Services Through Advocacy and Legislation

Brief Description of the Approach

At present, there is growing involvement of TB patient advocates, concerned citizens, and experts at local, national, and international levels working to improve access to quality TB care. These advocates are playing an important role in demanding better quality services, educating communities on TB, and providing care and support to other TB patients.

Evidence-based legislation and regulations grounded in a human rights framework are essential to developing and sustaining a comprehensive public health strategy for TB that protects public health and safeguards the legal rights of individuals. Best practices for drafting and advocating for effective TB policy have been documented. Recent guidance on responding to ethical issues in TB prevention, care and control includes guidance on appropriate policy and regulation (9).

List of alternative names (if applicable)

Campaigning; lobbying; citizen empowerment; civil society participation; resource mobilization

Shown to benefit

PLHIV

Potential Beneficiaries

All risk groups that are excluded or marginalized by current policy and practice: Alcohol dependent, Drug dependent, Mentally ill (institutionalized), Orphans and institutionalized children, Refugees/internally displaced populations (IDPs), Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender

Example of Good Practice

WHO and Stop TB Partnership. Advocacy, communication and social mobilization for TB control: Collection of country-level good practices. 2010.

At the center of the Mexico-wide *SOLUCION TB* program was an enhanced focus on patients. This person-centered approach significantly contributed to lowering the stigma against TB patients, by humanizing people with TB in the eyes of both health services providers and the general population. Greater societal acceptance of TB patients has, in turn, encouraged greater participation by these people, who have a unique role to play in increasing detection and treatment adherence.

Thus encouraged, TB patients publicly shared their TB experiences through highly effective forums, conferences, media interviews, support group meetings and training workshops for health staff.

The project has also helped raise awareness of the disease. By making TB patients more effective ambassadors, they have made significant strides in helping: TB patients receive better treatment by health personnel; suspects seek more timely obtainment of diagnoses; and state government officials dedicate more resources for TB control programs. Advocacy efforts saw TB patients successfully lobby state officials and decision-makers for logistical support, as well as help with information dissemination efforts. In response to the latter, the Sonora (a state with high mobility and migration) Government broadcast TB messaging at carnivals, sporting events and parades, as well as on billboards in major cities.

Selected List of Guidances, Tools and Manuals

From Expert To Advocate! Tools For Evidence-Based Advocacy In Your Community (ACTION)

<http://www.action.org/images/general/ACTION-Advocacy-Toolkit.pdf>

Achieving Impact Through Scale Up of TB-HIV Activities (RESULTS Educational Fund)

<http://www.action.org/images/general/PEPFAR.pdf>

The Activist Toolkit - developing the skills to become a trained citizen advocate (RESULTS Educational Fund)

http://www.development.results.org/skills_center/activist_toolkit/

Guidelines for social mobilization. A human rights approach to TB:

<http://www.who.int/hhr/information/A%20Human%20Rights%20Approach%20to%20Tuberculosis.pdf>

Community involvement in TB:

http://www.who.int/tb/people_and_communities/involvement/resources/en/index.html

Active engagement of civil society organizations

http://whqlibdoc.who.int/hq/2010/WHO_HTM_TB_2010.15_eng.pdf

TB/MDR-TB Advocacy Toolkit. The Advocacy Partnership. 2011

http://www.stoptb.org/assets/documents/global/awards/cfcs/TB_MDR%20Advocacy%20Tool%20Kit.pdf

Overcoming Barriers to TB Control (Curriculum) PATH

<http://www.path.org/publications/detail.php?i=2030>

Module & Toolkit: TB Advocacy at Decentralized level. TB CTA, 2009

http://www.tbcare1.org/publications/toolbox/tools/access/download.php?file=Module_Toolkit_TB_Advocacy.pdf

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Verdict on a Virus: Public Health, Human Rights and Criminal Law

<http://www.stigmindex.org/180/publications/verdict-on-a-virus-public-health-human-rights-and-criminal-law.html>

The Global Criminalisation Scan

<http://criminalisation.gnpplus.net/>

WHO and Stop TB Partnership. Advocacy, communication and social mobilization for TB control: Collection of country-level good practices. 2010.

http://www.stoptb.org/assets/documents/resources/publications/acsm/ACSM_final_24%20Nov.pdf

REACH AN APPROPRIATE FACILITY

IMPROVE THE ENABLING ENVIRONMENT FOR TB CONTROL

Partner to Uphold Workplace Policies and Protections

Brief Description of the Approach

Establishing the appropriate legal policy framework to optimize TB control in occupational settings is very important. In 2003, WHO and the International Labor Organization (ILO) released guidelines for TB control activities in the workplace. These describe cost-effective steps to protect workforce productivity. Drawing on the practical experience of employers and workers and the technical expertise of WHO and ILO, the guidelines target employers, employees and their associations and health workers - all of whom can play a significant role in their implementation. In some cases, it may be necessary to provide additional supervisory services or supplies (such as anti-TB drugs) to facilitate high-quality treatment.

In 2010, additional ILO recommendations were released to strengthen the response to workplace HIV and TB risk. These are entitled Recommendation concerning HIV and AIDS and the world of work, 2010.

TB is a workplace issue because health is essential not only to the well-being of individuals but the functioning of economies. An employee with TB may lose months of work per year, resulting in significantly less annual household income. Some workplaces are a source for TB disease transmission as employees work for long periods in close proximity. Loss of wages and job discrimination are barriers to accessing TB services. Addressing TB in the workplace can help overcome these barriers and facilitate access to health care in general and TB care in particular.

List of alternative names (if applicable)

Occupational safety, industrial hygiene, prevention of nosocomial transmission, workplace health and safety.

Shown to benefit

Health care workers, miners, factory workers, truck drivers

Potential Beneficiaries

HIV-infected

Example of Good Practice

The Youngone Industries TB Programme, Bangladesh Dots at the Workplace Guidelines for TB Control Activities at the Workplace
http://www.searo.who.int/LinkFiles/Partnership_TB_259.pdf

Established in 1988, Youngone Sports Shoe Industries Ltd, a company of the Republic of Korea, is the largest employer in the Chittagong Export Processing Zone in Bangladesh with about 22 000 employees, 85% of whom are women between 18 to 30 years of age. In 1996, the Chief Medical Officer identified TB as a serious problem affecting the health of the workers. In partnership with the National TB Program of Bangladesh, a TB control program was designed and the WHO-recommended DOTS strategy implemented.

What is unique about this initiative is that there is sustained commitment from management to TB control, with company policy clearly stating that no employee can be dismissed from service only because of TB.

Employees are allowed to return to work in two to three weeks after the initiation of therapy or when their sputum becomes negative. All TB patients are given direct observation treatment at the company's medical center and there has been no case of interrupted therapy.

Selected List of Guidances, Tools and Manuals

International Labour Office, Geneva, 2010 Recommendation concerning HIV and AIDS and the world of work, 2010 (No. 200) French: Recommandation (n° 200) concernant le VIH et le sida et le monde du travail, 2010 [ISBN 978-92-2-223819-4 (print); 978-92-2-223820-0 (Web pdf)], Geneva, 2010; and Spanish: Recomendación sobre el VIH y el sida y el mundo del trabajo, 2010 (núm. 200)[ISBN 978-92-2-323819-3 (print); 978-92-2-323820-9 (Web pdf)], Geneva, 2010.

Guidance on ethics of tuberculosis prevention, care and control. Geneva, World Health Organization, 2010 (WHO/HTM/TB/2010.16).
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Guidelines for workplace TB control activities: the contribution of workplace TB control activities to TB control in the community. Geneva, World Health Organization, 2003 (WHO/CDS/TB/2003.323).
<http://whqlibdoc.who.int/publications/2003/9241546042.pdf>

International Council of Mining & Metals. Good Practice Guidance on HIV/AIDS, Tuberculosis and Malaria
http://www.tbhiv-create.org/sites/default/files/Thibela_pub_T-P-3.pdf

Guidelines for workplace TB control activities: the contribution of workplace TB control activities to TB control in the community. Geneva, World Health Organization, 2003 (WHO/CDS/TB/2003.323).
<http://whqlibdoc.who.int/publications/2003/9241546042.pdf>

Implementing the WHO Policy on TB Infection Control in Health-Care Facilities, Congregate Settings and Households: A framework to plan, implement and scale-up TB infection, control activities at country, facility and community level. Tuberculosis Coalition for Technical Assistance (TBCTA), 2010.
http://www.tbcare1.org/publications/toolbox/tools/ic/download.php?file=TB_IC_Implementation_Framework.pdf

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University Research Co., LLC 2011
http://tbcare2.org/sites/tbcare2.org/files/TB%20CARE%20II%20TB%20Occupational%20Safety%20Review%20and%20Framework%20Nov%202011_0.pdf

Working together with businesses. Guidance on TB Care and Control in Work places. http://www.tbcare1.org/publications/toolbox/tools/access/download.php?file=Working_Together_With_Businesses.pdf

Dots at the Workplace Guidelines for TB Control Activities at the Workplace
http://www.searo.who.int/LinkFiles/Partnership_TB-_259.pdf

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Utilization of HIV and Tuberculosis Services by Health Care Workers in Uganda: Implications for Occupational Health Policies and Implementation. Buregyeya, Esther; Nuwaha, Fred; Wanyenze, Rhoda K; Mitchell, Ellen M H; Criel, Bart et al. (2012) PLoS one vol. 7 (10) p. e46069

Fisher EM, Shaffer RE. Considerations for Recommending Extended Use and Limited Reuse of Filtering Facepiece Respirators in Healthcare Settings. J Occup Environ Hyg. 2014 Mar 14. [Epub ahead of print] PubMed PMID: 24628658.

Myong JP, Ahn YS, Kim HR, Kim YJ, Park CY, Koo JW. Work-related infectious diseases among Korean workers compensated under the Industrial Accident Compensation Insurance Law, 2006-2011. Int J Occup Environ Health. 2013 Oct-Dec;19(4):344-51. PubMed PMID: 24588041.

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Barwise K, Lind A, Bennett R, Martins E. Intensifying action to address HIV and tuberculosis in Mozambique's cross-border mining sector. Int J Health Serv. 2013;43(4):699-719. PubMed PMID: 24397235.

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Wang HQ, Li T, Lü XP, Qi F. [Role of active tuberculosis screening in occupational health surveillance for coal workers]. Zhonghua Lao Dong Wei Sheng Zhi Ye Bing Za Zhi. 2013 Nov;31(11):879-80. Chinese. PubMed PMID: 24370314

REACH AN APPROPRIATE FACILITY

ADDRESS LACK OF ECONOMIC ACCESS

Reduce Out of Pocket Diagnostic Costs to Patients

Brief Description of the Approach

TB diagnosis and treatment should be free for the poor and accessible to all. While this would seem obvious, costs remain a major barrier to effective care of persons with TB. Hidden costs – such as transportation burdens due to overly centralized TB services – can have a crippling effect on TB control. In the case of diagnosis and treatment of MDR-TB, the out of pocket costs for patients can be catastrophic.

Reducing out of pocket costs for persons with presumptive TB can be achieved through a number of strategies. These may include providing vouchers, conditional cash transfer (CCT), or transport for persons who undertake TB screening and then complete all the subsequent diagnosis and treatment steps.

For many individuals working in the informal sector, the hidden cost of TB diagnosis stems from long waiting times and multiple return visits that detract from hours of employment. Thus, one-stop shop and point of care diagnostics are intrinsically cheaper for patients and more acceptable. TB services that are open during convenient hours are similarly “cheaper” for some clients.

Ambulatory and community-based care that reduces patient’s lost income should be maximized wherever possible. Clinic-based treatment supervision poses a significant economic burden on patients. The creation or strengthening of community-based treatment supervision programs would have the greatest potential impact on reducing patients’ TB-related costs.

TB programs should measure TB patient out-of-pocket costs regularly and adapt strategies to local conditions to reduce the risk of impoverishment. This is particularly important for MDR-TB patients. MDR-TB patients often benefit from housing subsidies during the intensive phase to complement nutritional, financial and psychosocial support.

List of alternative names (if applicable)

Patient costs; incentives and enablers

Shown to benefit

Drug dependent, homeless, prisoners, shantytown residents, malnourished

Potential Beneficiaries

All risk groups who live with poverty

Example of Good Practice

Southern, a, Premaratne, N., English, M., Balazs, J., & O’Sullivan, D. (1999). Tuberculosis among homeless people in London: an effective model of screening and treatment. *The international journal of tuberculosis and lung disease* : the official journal of the International Union against Tuberculosis and Lung Disease, 3(11), 1001-8. Retrieved from:

<http://www.ncbi.nlm.nih.gov/pubmed/10587322>

SETTING: Hostels and day centers for homeless people in south London.

OBJECTIVE: To develop an appropriate and effective method of screening for pulmonary tuberculosis (TB) among the homeless.

DESIGN: Observational study evaluated for acceptability, yield of cases and completion of treatment. The screening included a symptom questionnaire, a Heaf test and a chest X-ray, developed and read on site. The screening was advertised in advance at each site as a free service, available to all, with incentives provided in the form of luncheon vouchers. Incentives were also offered to encourage clients to return for the Heaf readings one week later. The uptake at each center increased steadily over time, possibly due to the trust the workers gradually built up with clients. Anecdotal evidence suggests that the use of incentives and immediate chest X-ray results also motivated many to volunteer. The use of incentives seemed to increase the uptake of screening.

Selected List of Guidances, Tools and Manuals

Tool to Estimate Patient Costs
http://www.tbcare1.org/publications/toolbox/tools/hss/download.php?file=Tool_to_Estimate_Patient_Costs.zip

Quote TB Light booklet (and tool)
http://www.tbcare1.org/publications/toolbox/tools/access/download.php?file=Quote_TB_Light.pdf

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Incentives and Enablers
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<http://www.who.int/bulletin/volumes/86/11/07-049403.pdf>

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<http://www.biomedcentral.com/1471-2458/11/43>

Mauch, V. F. Bonsu, M. Gyapong, E. Awini, P. Suarez, B. Marcelino, R. E. Melgen, K. Lönnroth, N. V. Nhung, N. B. Hoa E. KlinkenbergFree tuberculosis diagnosis and treatment are not enough: patient cost evidence from three continents INT J TUBERC LUNG DIS 17(3):381-387;
<http://dx.doi.org/10.5588/ijtld.12.0368>

REACH AN APPROPRIATE FACILITY ADDRESS LACK OF ECONOMIC ACCESS

Reimburse Transportation

Brief Description of the Approach

During diagnosis and treatment patients may have various travel expenses. Compensating these expenses reduces hurdles to in-person visits to health care facilities and is recommended to those who otherwise cannot afford to come for diagnosis and treatment or who would benefit from active case management.

List of alternative names (if applicable)

Provide enablers; facilitate treatment adherence; facilitate diagnosis; travel support

Shown to benefit

Low income individuals/families, alcohol dependent, homeless, drug dependent, street children

Potential Beneficiaries

Other risk groups with geographic access barriers

Example of Good Practice

Management of MDR-TB at ambulatory care sector in Tomsk Oblast, Russia. Golubchikova V.T., Tonkel T.P., Mishustin S.P., Golubchikova P.N., Strelis A.K., Bayerlen V. P., Gemanova I.Y.// Abstract book 39th World Conference on Lung Health of the international Union Against Tuberculosis and Lung Disease (The Union) Paris. - 2008. 19 October. - S208.

To improve adherence all patients of the Tomsk program received incentives and enablers during whole treatment (food baskets, hygiene sets, transportation reimbursement). Since 2006 new subprograms were developed to improve adherence to treatment: Council on Defaulters; subprogram medical and psychological patronage for patients severely abandoning treatment; and alcohol dependence reduction subprogram.

Selected List of Guidances, Tools and Manuals

Tool to Estimate Patient Costs
http://www.tbcare1.org/publications/toolbox/tools/hss/download.php?file=Tool_to_Estimate_Patient_Costs.zip

Quote TB Light booklet (and tool)
http://www.tbcare1.org/publications/toolbox/tools/access/download.php?file=Quote_TB_Light.pdf

Selected Bibliographic References of Uses of this Strategy

Lutge, E.E., Wiysonge, C.S., Knight, S.E., Volmink, J. Material Incentives and Enablers in the Management of Tuberculosis; Cochrane Database of Systematic Reviews. 2012 Jan 18; Volume 1: CD007952.

http://www1.msh.org/projects/rpmpplus/WhatWeDo/Tuberculosis/Incentives-and-Enablers.cfm#CP_JUMP_7850

REACH AN APPROPRIATE FACILITY ADDRESS LACK OF ECONOMIC ACCESS

Brief Description of the Approach

Governments have an ethical responsibility to provide free and universal access to TB diagnostic and treatment services. This obligation is grounded in their duty to fulfill the human right to health. Not only does TB treatment significantly improve the health condition of individuals, it also benefits the broader community by stopping the spread of a highly infectious disease²⁷.

Even when resources are limited, there are several reasons why governments should give high priority to providing universal access to TB care as part of their commitment to fulfilling the human right to health.

- First, its benefits to the individual patient are substantial: in most cases, proper treatment prevents significant morbidity and mortality and leads to a complete cure.
- Second, by slowing the spread of a highly infectious disease, it benefits not only the patient but also the broader community.
- Third, lack of proper TB care leads to the development of dangerous drug-resistant strains.
- Fourth, when used routinely, it is inexpensive and highly cost effective.
- Finally, TB affects large numbers of people, a disproportionate number of whom are vulnerable and marginalized, and TB can further increase people's vulnerability to poverty²⁸.

List of alternative names (if applicable)

Improve economic access to diagnosis and treatment; reduce out-of-pocket payments

Shown to benefit

Migrants

Potential Beneficiaries

Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), HIV-infected/PMTCT, Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs/Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban slum residents, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender

Example of Good Practice

From April 2010, foreigners, residing in Singapore with valid permits, have free treatment for TB, provided by the Singapore Anti-Tuberculosis Association CommHealth. The free treatment starts when the person is first suspected of being infected with TB. In the past, free treatment was provided only after TB was confirmed. Foreigners used to have to pay for both TB tests and the medication during this time before culture confirmation.

Selected List of Guidances, Tools and Manuals

Systematic screening for active tuberculosis: Principles and recommendations. World Health Organization 2013 ISBN 978 92 4 154860 1
http://www.tbcare1.org/publications/toolbox/tools/hss/download.php?file=Systematic_Screening_for_Active_Tuberculosis.pdf

Tool to Estimate Patient Costs
http://www.tbcare1.org/publications/toolbox/tools/hss/download.php?file=Tool_to_Estimate_Patient_Costs.zip

Guidance on Ethics in TB Prevention, Care and Control, WHO, 2010
http://whqlibdoc.who.int/publications/2010/9789241500531_eng.pdf

Selected Bibliographic References of Uses of this Strategy

Nhlema, B., J. Kemp, et al. (2003). "The state of existing knowledge about TB and poverty." *International Journal of Tuberculosis and Lung Disease* 7(supp 2): 116.

Russell, S. (2004). "The economic burden of illness for households in developing countries: a review of studies focusing on malaria, tuberculosis, and human immunodeficiency virus/acquired immunodeficiency syndrome." *American Journal of Tropical Medicine and Hygiene* 71(2 Suppl): 147 - 155.

Zhang, T. H., S. L. Tang, et al. (2007). "Persistent problems of access to appropriate, affordable TB services in rural China: experiences of different socio-economic groups." *BMC Public Health* 7.

Kemp, J. R., G. Mann, et al. (2007). "Can Malawi's poor afford free tuberculosis services? Patient and household costs associated with a tuberculosis diagnosis in Lilongwe." *Bulletin of the World Health Organization* 85(8): 580 - 585.

Brief Description of the Approach

A patient-centered approach helps to ensure that working patients can continue earning their incomes while on anti-TB treatment. For example, TB services should be provided at times and locations convenient for patients so as not to interfere with their work. This may include adding mobile and outreach diagnostic and treatment services, e-health monitoring, or allowing group pick-up of medicines to reduce travel and waiting times. Minimizing the time and travel burdens of TB treatment improves treatment adherence and reduces risks to their economic well being. Enablers, such as reimbursement of transportation costs and food packages should also be considered.

Long waiting times for appointment and referrals, Long waiting time in provider's office, and Inconvenient office hours can drive TB suspects and TB patients away from TB care. In a recent Kenyan study, 51% of TB patients cited waiting times as their reason for choosing private health care (Mauch et al 2011). Reducing crowding and queuing and minimizing time spent at a health care facility helps reduce TB transmission.

Queuing and waiting times can be improved by improving triage to identify services the patient requires. Screening for TB (or HIV) can be done for all patients while they queue for a general medical consult, so they do not have to queue again for these services after the consult²⁹.

List of alternative names (if applicable)

Lessen waiting times, expand clinic hours, Task shifting, Improve patient flow, Reduce wait times, Optimize patient flow, Improve administrative airborne infection control

Shown to benefit

Urban residents of poor areas

Potential Beneficiaries

All non-salaried workers, Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), HIV-infected/PMTCT, Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs/Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender

Example of Good Practice

Cootauco, M (Cootauco, M.)¹; Groth, J (Groth, J.)¹; Rayner, CFJ (Rayner, C. F. J.)¹
Nurse led rapid access clinic reduces waiting times and ensures timely and effective diagnosis and management of tuberculosis . THORAX Volume: 62 Supplement: 3
Pages: A83-A83 Published: DEC 2007

A nurse-led rapid access TB clinic was established in August 2005 (at St George's Hospital in London) under the supervision of the lead TB consultant. The clinic is staffed by two TB clinical nurse specialists who organise appointments directly with patients. There is a weekly nurse-led clinic but urgent referrals are seen immediately so that diagnosis is not delayed.

The TB nurses use a risk assessment tool to assess potential problems that could interfere with adherence to treatment. These include factors such as homelessness, language difficulty, history of non-adherence and substance misuse. It also helps determine whether the patient meets the criteria for a directly observed therapy (DOTS). Patients who receive DOTS are seen daily or three times per week to take their medication in the presence of a TB nurse. This guarantees that the patient is taking the medication correctly. Those who self-medicate are seen less frequently but have a regular follow-up to check compliance, side-effects, review of the dosage of medication and liver function tests. Patients who miss their appointments are followed up by the TB nurse specialists. Phone calls, repeat appointments and domiciliary visits are carried out as necessary. Establishing a nurse-led rapid access TB clinic has made a huge impact on the overall TB service. Patients who may have TB are seen immediately and investigations, treatment and contact tracing can be carried out without any delay. Since its introduction, waiting times for the TB medical clinic have reduced.

Selected List of Guidances, Tools and Manuals

Systematic Screening for Active Tuberculosis: Principles and recommendations.
World Health Organization 2013 ISBN 978 92 4 154860 1
http://www.tbcare1.org/publications/toolbox/tools/hss/download.php?file=Systematic_Screening_for_Active_Tuberculosis.pdf

Tool to Estimate Patient Costs
http://www.tbcare1.org/publications/toolbox/tools/hss/download.php?file=Tool_to_Estimate_Patient_Costs.zip

Quote TB Light booklet (and tool)
http://www.tbcare1.org/publications/toolbox/tools/access/download.php?file=Quote_TB_Light.pdf

Practical Guide to Improve the Quality of TB Patient Care
<http://www.tbcare1.org/publications/toolbox/tools/access/download.php?file=PracticalGuideImproveQualityTBPatientCare.pdf>

Selected Bibliographic References of Uses of this Strategy

Lawn SD, Shattock RJ, Griffin GE: Delays in the diagnosis of tuberculosis: a great new cost. International Journal of Tuberculosis and Lung Disease 1997, 1(5):485-486.
Needham DM, Foster SD, Tomlinson G, Godfrey-Faussett P: Socio-economic, gender and health services factors affecting diagnostic delay for tuberculosis patients in urban Zambia. Tropical Medicine & International Health 2001, 6(4):256-259.

Cootauco, M (Cootauco, M.); Groth, J (Groth, J.); Rayner, CFJ (Rayner, C. F. J.) Nurse led rapid access clinic reduces waiting times and ensures timely and effective diagnosis and management of tuberculosis . THORAX Volume: 62 Supplement: 3 Pages: A83-A83
Published: DEC 2007

<http://119.82.96.198:8080/jspui/bitstream/123456789/4964/1/Simanika%20bagali.pdf>

REACH AN APPROPRIATE FACILITY ADDRESS LACK OF ECONOMIC ACCESS

Implement Community-DOTS (C-DOTS), Community-Based Care (CBTC)

Brief Description of the Approach

Community-based care is considered to be one of the most effective approaches to date in terms of involvement, empowerment and partnership. Implemented since the 1970s, CBTC has evolved into an initiative that involves the community at a greater level than just observing treatment. As described in the WHO document; *Community Involvement in Tuberculosis Care and Prevention (2008)*, meaningful CBTC creates strong partnerships between the National TB Program (NTP), health care providers, TB patients and the community. These initiatives are based on a strategy that addresses the needs of individuals in the community by involving community members and those affected by TB in the design and implementation of TB care initiatives. CBTC contributes to increased case detection and positive treatment outcome rates through active case finding, educating the community about TB, bringing services closer to the community and empowering the community to support TB care and control activities.

List of alternative names (if applicable)

Community Based TB Care (CBTC)

Shown to benefit

Urban slum residents

Potential Beneficiaries

Adolescents, Alcohol dependent, Children under 5, Diabetes, Drug dependent, Elderly, HIV-infected/PMTCT, Malnourished, Mentally ill, Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs/Lab staff, Orphans and institutionalized children, Refugees/internally displaced populations (IDPs), Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender

Example of Good Practice

Cost Eff Resour Alloc. 2005 Jul 14;3:6.

Cost and cost-effectiveness of community based and health facility based directly observed treatment of tuberculosis in Dar es Salaam, Tanzania.
Wandwalo E1, Robberstad B, Morkve O.

Two alternative strategies were compared: health facility based directly observed treatment by health personnel and community based directly observed treatment by treatment supervisors. The total cost of treating a patient with conventional health facility based DOT and community based DOT were \$145 and \$94 respectively. Community based DOT reduced cost by 35%. Cost fell by 27% for health services and 72% for patients. When smear positive and smear negative patients were considered separately, community DOT was associated with 45% and 19% reduction of the costs respectively. Patients used about \$43 to follow their medication to health facility which is equivalent to their monthly income. Indirect costs were as important as direct costs, contributing to about 49% of the total patient's cost. The main reason for reduced cost was fewer number of visits to the TB clinic. Community based DOT was more cost-effective at \$128 per patient successfully treated compared to \$203 for a patient successfully treated with health facility based DOT.

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1180840/>

Selected List of Guidances, Tools and Manuals

Community Involvement in Tuberculosis Care and Prevention (2008),
Towards partnerships for health
http://whqlibdoc.who.int/publications/2008/9789241596404_eng.pdf

Impowering Communities for TB Advocacy: The TAG-ICW Model

Secure the Future Manual: Seven Steps to Involve the Community in HIV/AIDS
Treatment Support Programs, 5th edition

Engage-TB: integrating community-based tuberculosis activities into the work of
nongovernmental and other civil society organizations: operational guidance Getahun,
Haileyesus II. Joseph, Thomas. III. Tomaskovic, Lana. IV. Raviglione, Mario C. World
Health Organization. ISBN 978 92 4 150450 8 (NLM classification: WF 200)
http://apps.who.int/iris/bitstream/10665/75997/1/9789241504508_eng.pdf

Selected Bibliographic References of Uses of this Strategy

Cost and cost-effectiveness of community based and health facility based directly observed
treatment of tuberculosis in Dar es Salaam, Tanzania. Wandwalo, Eliud; Robberstad,
Bjarne; Morkve, Odd (2005) Cost effectiveness and resource allocation : C/E vol. 3 p. 6
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1180840/>

Wandwalo E, Kapalata N, Egwaga S, Morkve O. Effectiveness of community based directly
observed treatment for tuberculosis in an urban setting in Tanzania: a randomised
controlled trial. *Int J Tuberc Lung Dis.* 2004;8:1248-1254

Lwilla F, Schellenberg D, Masanja H, et al. Evaluation of efficacy of community based vs.
Institutional based direct observed short course treatment for the control of tuberculosis
in Kilombero district, Tanzania. *Tropical Medicine and International Health.* 2003;8:204-210.
doi: 10.1046/j.1365-3156.2003.00999.x.

Akkslip S, Rasmithat S, Maher, Sawert H. Direct observation of tuberculosis treatment
by supervised family members in Yosothorn Province, Thailand. *Int J Tuberc Lung Dis.*
1999;3:1061-1065

Ngamvithayapong J, Yanai H, Winkvist A, Saisorn S, Diwan V. Feasibility of home-based and
health centre-based DOT: perspectives of TB care providers and clients in an HIV-endemic
area of Thailand. *Int J Tuberc Lung Dis.* 2001;5:741-5. [PubMed]

OBTAIN A TIMELY, ACCURATE TB DIAGNOSIS COLLECT FEWER, BETTER SAMPLES AND TESTS

Improve Quality of Chest X Rays (CXR)

Brief Description of the Approach

The potential of radiological chest examinations has been constrained due to challenges such as observer error, over- or under-reading, and disagreement between readers. New technologies and approaches to reading CXR are overcoming these limitations and increasing the value-added of CXR in TB diagnosis.

Chest radiography is a highly sensitive technique for diagnosing pulmonary TB in immunocompetent individuals, even though it is non-specific, since TB has no pathognomonic signs. The role of the chest radiography in the diagnosis of TB is dependent on the available resources and on TB prevalence in the population. In poorer countries it is recommended to use chest radiography in TB suspected cases with three negative sputum smear microscopy results in which there is no response to antibiotic treatment. For further information on the International Standards for Tuberculosis Care, go to: <http://www.tbcare1.org/publications/toolbox/access/>

However, the HIV epidemic and dual infection of TB and HIV are now altering the role of radiological chest examinations in TB control. The role has been gaining increasing importance; especially as HIV associated TB and childhood TB are less likely to show positive smears. In addition, chest radiography plays a significant role in shortening delays in diagnosis and should be performed early in the course of investigation of TB suspects among seriously ill cases infected with HIV. To do so, the limitations that exist on the wider use of chest radiography, such as resource constraints to equip district hospitals with X-ray equipment and difficulty of interpreting results, need to be addressed.

List of alternative names (if applicable)

Quality Assurance, diagnostic accuracy interventions

Shown to benefit

Urban slum residents

Potential Beneficiaries

Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), HIV-infected/PMTCT, Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs/Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban slum residents, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

In Vietnam, the Stop TB Partnership's TB REACH program supports CellScope, simple mobile phones that merely enable large file data transfer through data compression are used to relay digital x-ray pictures, taken from mobile containerized units that screen populations for TB, to central radiology hubs. This enables quick analysis of results without the need of specialists on site³⁰.

<https://www.cellscope.com/>

Selected List of Guidances, Tools and Manuals

Handbook for District Hospitals in Resource Constrained Settings on Quality Assurance of Chest Radiography
<http://www.tbcare1.org/publications/toolbox/tools/access/download.php?file=XRayQAHandbook.pdf>

Ellis, Stephen M, The WHO manual of diagnostic imaging: Radiographic Anatomy and Interpretation of the Chest and the Pulmonary System, WHO, 2006.
http://whqlibdoc.who.int/publications/2006/9241546778_eng.pdf

Corr, Peter, Pattern recognition in diagnostic imaging, WHO, 2001.
<http://apps.who.int/iris/bitstream/10665/66843/1/9241546328.pdf?ua=1>

Sandström, Staffan, The WHO manual of diagnostic imaging: Radiographic Technique and Projections, WHO, 2003
<http://apps.who.int/medicinedocs/documents/s15634e/s15634e.pdf>

Loyd, Peter J., Quality assurance workbook: for radiographers & radiological technologists, WHO, 2001.
http://whqlibdoc.who.int/hq/2001/WHO_DIL_01.3_pp1-94.pdf

McClelland, Ian R., X-ray equipment maintenance and repair workbook: for radiographers & radiological technologists, WHO, 2004.
<http://whqlibdoc.who.int/publications/2004/9241591633.pdf>

International Commission on Radiation Units and Measurement, ICRU Report 70: Image Quality In Chest Radiography, ICRU, 2003.

Ben J. Marais, Robert P. Gie, H. Simon Schaaf, Jeff R. Starke, Anneke C. Hesselting, Peter R. Donald, Nulda Beyers A, proposed radiological classification of childhood intra-thoracic tuberculosis. *Pediatric Radiology*, Volume 34, Issue 11, pp 886-894 2004.

Systematic screening for active tuberculosis: Principles and recommendations. World Health Organization 2013
http://www.tbcare1.org/publications/toolbox/tools/hss/download.php?file=Systematic_Screening_for_Active_Tuberculosis.pdf

Selected Bibliographic References of Uses of this Strategy

Stop TB Dept., WHO, Improving the diagnosis and treatment of smear-negative pulmonary and extrapulmonary TB among adults and adolescents; Recommendations for HIV-prevalent and resource-constrained settings, WHO, 2007
http://www.who.int/tb/publications/2006/tbhiv_recommendations.pdf

http://www.tbcare1.org/publications/toolbox/tools/tb_hiv/Improving_the_diagnosis_and_treatment_of_smear_negative_p_ex_pul_TB.pdf

Daley, Charles L., Michael B. Gotway, Robert M. Jasmer, Radiographic Manifestations of Tuberculosis, Francis J. Curry National Tuberculosis Center, 2006
http://www.currytbccenter.ucsf.edu/catalogue/downloads/tbRadiographic_Complete.pdf

Okada K, Onozaki I, Yamada N, Yoshiyama T, Miura T, Saint S, et al. Epidemiological impact of mass tuberculosis screening: a 2-year follow-up after a national prevalence survey. *International Journal of Tuberculosis and Lung Disease* 2012;16(12):1619-24.

Kranzer K, Afnan-Holmes H, Tomlin K, Golub JE, Shapiro AE, Schaap A, et al. The benefits to communities and individuals of screening for active tuberculosis disease: a systematic review. *International Journal of Tuberculosis and Lung Disease* 2013;17(1815-7920 [Electronic], 1027-3719 [Linking], 4):432-46.

OBTAIN A TIMELY, ACCURATE TB DIAGNOSIS COLLECT FEWER, BETTER SAMPLES AND TESTS

Adopt the Revised Approach to Same Day Sputum Collection

Brief Description of the Approach

The definitions for suspected TB and drug-susceptible TB cases have evolved and been revised. Among other changes, this includes the (2007) definition of a new sputum smear positive pulmonary TB case, which is now based on the presence of at least one acid fast bacillus (AFB) in at least one sputum sample in countries with a well-functioning external quality assurance (EQA) system.

Evidence shows that good-quality microscopy of two consecutive sputum specimens identifies most (95-98%) smear-positive TB patients. Therefore, WHO recommends that the number of specimens examined for screening TB cases be reduced from three to two, in places where a well-functioning EQA system exists, the workload is very high, and human resources are limited.

This approach greatly reduces the workload of laboratories, a considerable advantage in countries with a high proportion of smear-negative TB patients due to HIV and/or extra-pulmonary disease.

Countries that have successfully implemented a two-specimen strategy should switch to same-day diagnosis, especially in settings where patients are likely to default if diagnosis is delayed. Countries that are still using a three-specimen strategy should gradually change to same-day diagnosis.

List of alternative names (if applicable)

Same day diagnosis; Two specimen strategy, frontloading, "spot-spot" strategy

Shown to benefit

Urban slum residents

Potential Beneficiaries

Adolescents, Alcohol dependent, Attendees of health care facilities Diabetes, Drug dependent, Elderly (institutionalized), HIV-infected/PMTCT, Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs/ Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

A 2011 trial by Cuevas et al enrolled 6,627 patients in Ethiopia, Nepal, Nigeria, and Yemen who had had a cough for more than two weeks (a characteristic symptom of tuberculosis). A quarter of the patients had culture-positive tuberculosis. The centers participating in the study were randomly assigned each week for a year to use either the SMS or the SSM sample collection scheme. Compared to mycobacterial culture, the sensitivities of the SSM and SMS schemes were 70.2% and 65.9%, respectively, which indicates that the new scheme was non-inferior to the SMS scheme. Similarly, the specificity of SSM (96.9%) was non-inferior to that of SMS (97.6%). Importantly, the sensitivity of diagnosis using just the first two samples collected in the SSM scheme was also non-inferior to the sensitivity of diagnosis using the first two samples collected in the SMS scheme (63.6% versus 64.8%; the researchers defined non-inferiority of SSM as a difference in its sensitivity compared to that of SMS of less than -5%). Finally, patients tested using the SSM scheme were more likely to provide the first two samples than patients tested using the SMS scheme (98% versus 94.2%).

Selected List of Guidances, Tools and Manuals

Reduction of number of smears for the diagnosis of pulmonary TB. Geneva, World Health Organization, 2007.

http://www.who.int/tb/laboratory/policy_diagnosis_pulmonary_tb/en/index.html

Same-day diagnosis of tuberculosis by microscopy: Policy Statement. Geneva, World Health Organization, 2011 (WHO/HTM/TB/2011.7).

http://www.who.int/tb/laboratory/whopolicy_same_day_diagnosis_bymicroscopy_mar2011.pdf

Policy Framework for Implementing New Tuberculosis Diagnostics. Geneva, World Health Organization, 2010.

http://www.who.int/tb/laboratory/whopolicyframework_rev_june2011.pdf

A Roadmap for Ensuring Quality Tuberculosis Diagnostics Services within National Laboratory Strategic Plans. Geneva, World Health Organization, 2010.

http://www.tbcare1.org/publications/toolbox/tools/road/download.php?file=GLI_Roadmap_First_Issue_2010110.pdf

World Health Organization. Framework for effective tuberculosis control. World Health Organization Document 1994; WHO/TB/94.179:1-7.

http://whqlibdoc.who.int/hq/1994/WHO_TB_94.179.pdf

World Health Organization, International Union Against Tuberculosis and Lung Disease, Royal Netherlands Tuberculosis Association. Revised international definitions in tuberculosis control. *Int J Tuberc Lung Dis* 2001;5:213-5.

Selected Bibliographic References of Uses of this Strategy

Cuevas LE, Yassin MA, Al-Sonboli N, Lawson L, Arbide I, et al. (2011) A Multi-Country Non-Inferiority Cluster Randomized Trial of Frontloaded Smear Microscopy for the Diagnosis of Pulmonary Tuberculosis. *PLoS Med* 8(7): e1000443. doi:10.1371/journal.pmed.1000443

Ramsay, A., et al., Sputum, sex and scanty smears: new case definition may reduce sex disparities in smear-positive tuberculosis. *International Journal of Tuberculosis and Lung Disease*, 2009. 13(5): p. 613-619.

Mase S, Ramsay A, Ng N, Henry M, Hopewell PC, Cunningham J, Urbanczik R, Perkins M, Aziz MA, Pai M. Yield of serial sputum specimen examinations in the diagnosis of pulmonary tuberculosis: a systematic review. *Int J Tuberc Lung Dis* 2007;11(5):485-95.

Bonnet M, Ramsay A, Gagnidze L, Githui W, Guerin PJ, Varaine F. Reducing the number of sputa examined, and thresholds for positivity: An opportunity to optimize smear microscopy. Accepted for publication, *Int J Tuberc Lung Dis*.

Brief Description of the Approach

Many newer active case finding approaches and new screening guidelines suggest that sputum be collected from TB suspects without cough. This can be very challenging. Poor quality sputum can reduce the sensitivity of TB diagnostics. Sputum coaching has been shown to improve the quality of sputum samples, particularly for women.

There are also new tools that may replace induced sputum as a means of obtaining samples from suspects without the ability to produce a sample unaided.

Innovations in sputum collection also address ways of collecting multiple samples during a single day at the point of seeking care, or at the patients residence/ neighborhood

List of alternative names (if applicable)

Sputum coughing, Lung Flute, String Test

Shown to benefit

Adults unable to expectorate independently

Potential Beneficiaries

Elderly, HIV-positive, Peri-partum women, Mentally ill, Street Children/Orphans and Vulnerable Children

Example of Good Practice

The Lung Flute® is an FDA cleared partly re-usable simple horn-shaped plastic device with a vibrating reed that costs under \$20. This CE class I (minimal risk) device produces sound waves using a thin reed and loosens mucus when an individual blows 20 times into the horn. A hard plastic tube generates a sound with a frequency of 18-22 Hz with an output of 110-115 dB using a pressure of 2.5 cm H₂O. A five minute preparatory breathing exercise has shown effectiveness in specimen production in 88% of adults unable to expectorate independently (Fujita 2009). The device produces specimens with similar cellular and biochemical characteristics to those using more invasive and resource-intensive procedures.

Selected List of Guidances, Tools and Manuals

Engage-TB: integrating community-based tuberculosis activities into the work of nongovernmental and other civil society organizations: operational guidance Getahun, Haileyesus II. Joseph, Thomas. III. Tomaskovic, Lana. IV. Raviglione, Mario C. World Health Organization. ISBN 978 92 4 150450 8 [NLM classification: WF 200] http://apps.who.int/iris/bitstream/10665/75997/1/9789241504508_eng.pdf

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Fujita, A., et al., A small audio device may be alternative to hypertonic saline inhalation for sputum induction in patients with pulmonary tuberculosis, in European Respiratory Society Conference. 2008: Berlin, Germany.

Hirooka, T., et al., [The value of proper sputum collection instruction in detection of acid-fast bacillus]. *Kekkaku*, 2004. 79(2): p. 33-7.

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Ramsay, A., et al., Sputum, sex and scanty smears: new case definition may reduce sex disparities in smear-positive tuberculosis. *International Journal of Tuberculosis and Lung Disease*, 2009. 13(5): p. 613-619.

Marais B J, Pai M. Specimen collection methods in the diagnosis of childhood tuberculosis. *Indian J Med Microbiol* 2006;24:249-51

OBTAIN A TIMELY, ACCURATE TB DIAGNOSIS

COLLECT FEWER, BETTER SAMPLES AND TESTS

Implement Gastric Aspiration/Sputum Induction

Brief Description of the Approach

Sputum induction and gastric aspiration can be used to improve detection of AFB smear positivity in patients, such as young children, who are unable or unwilling to expectorate sputum. These specimens should be sent for smear microscopy and mycobacterial culture.

Gastric aspiration: This procedure can be employed where sputum production, often including induction, is unsuccessful. A gastric aspirate:

- Should be obtained on each of three consecutive mornings
- Requires professional attention and should only be attempted in the hospital
- Gastric aspiration/lavage is performed early in the morning before eating and at least 8 hours after the patient has eaten or taken oral drugs
- A specimen of 5-10ml is required and must be neutralized with 100 mg of sodium carbonate

Sputum induction:

- Sputum production may be induced by the inhalation of a warm aerosol of sterile 5-10% sodium chloride in water produced by a nebulizer.
- The specimen should be clearly marked "INDUCED" on the request slip since nebulized sputa is watery in consistency and could be mistaken for saliva.
- Several recent studies have found that sputum induction is safe and effective in children of all ages and the bacterial yields are as good as or better than for gastric aspirates.
- Training and specialized equipment are required to perform this procedure properly.

List of alternative names (if applicable)

Infant sputum collection

Shown to benefit

Elderly, Mentally ill, Contacts of TB cases, Street children/Orphans and Vulnerable Children (under 5); HIV-positive

Potential Beneficiaries

Peri-partum women, all other risk groups that have difficulty producing sputum

Example of Good Practice

Moyo S, Verver S, Hawkridge A, Geiter L, Hatherill M, Workman L, Ontong C, Msemburi W, Tameris M, Geldenhuys H, Mulenga H, Snowden MA, Hanekom WA, Hussey G, Mahomed H; South African Tuberculosis Vaccine Initiative Neonatal Study Team.

Tuberculosis case finding for vaccine trials in young children in high-incidence settings: a randomised trial.

Int J Tuberc Lung Dis. 2012 Feb;16(2):185-91. doi: 10.5588/ijtld.11.0348.

Healthy BCG-vaccinated infants were enrolled within 2 weeks of birth and randomized to 3-monthly home visits for questionnaire-based TB screening plus record surveillance of TB registers, hospital admission and X-ray lists at health facilities for TB suspects and cases (Group 1), or record surveillance (as above) only (Group 2). Both groups received a close-out visit after 2 years. Participants with presumptive TB disease based on symptoms or contact, were admitted for induced sputa, gastric aspirates, chest X ray, and tuberculin skin tests. A total of 4786 infants were enrolled with a case-finding rate ratio of 2.6 (95%CI 1.8-4.0, P < 0.001). Routine screening detected significantly more cases than passive surveillance with a single study-end visit.

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International Standards for Tuberculosis Care (ISTC). The Hague: Tuberculosis Coalition for Technical Assistance, 2014.

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OBTAIN A TIMELY, ACCURATE TB DIAGNOSIS

IMPROVE ACCURACY OF DIAGNOSIS

Automated Detection and MDR Screening (Xpert MTB/RIF System)

Brief Description of the Approach

Amplification and detection of *M. tuberculosis* (*Mtb*) DNA is one of the fastest and most sensitive ways to detect TB and it allows the detection of genetic mutations associated with drug resistance. The Xpert MTB/RIF assay is a fully automated system that allows a relatively untrained operator to perform sample processing, DNA amplification and detection of *Mtb* and screening for rifampicin (RIF) resistance in less than 2hrs and only minutes of hands-on time. Xpert MTB/RIF can be done outside of conventional laboratory settings. WHO strongly recommends that countries use the Xpert MTB/RIF as the initial diagnostic test in individuals suspected of having MDR-TB or HIV-associated TB and (when appropriate) as a follow-on test to microscopy in settings where MDR-TB and/or HIV is of lesser concern, especially in smear-negative specimens. Guidance exists to support implementation of the Xpert MTB/RIF assay. Test costs are much higher than microscopy; however, once implemented the running costs of Xpert MTB/RIF are much lower than liquid culture or line probe assays. Xpert MTB/RIF does not eliminate the need for conventional microscopy culture and DST, which are required to monitor treatment progress and to detect resistance to drugs other than RIF. The molecular detection of RIF resistance, particularly in areas with a significant prevalence of MDR-TB, is strongly associated with an MDR-TB genotype. In areas with a low prevalence of MDR-TB the interpretation of a molecular detection of RIF resistance may be less clear. Recommended coverage is dependent on local prevalence of TB, MDR-TB and HIV. Sputum induction and gastric aspiration can be used to improve detection of AFB smear positivity in patients, such as young children, who are unable or unwilling to expectorate sputum. These specimens should be sent for smear microscopy and mycobacterial culture.

List of alternative names (if applicable)

GeneXpert platform; rapid molecular diagnostics of drug resistance

Shown to benefit

HIV-infected/PMTCT, Children under 5

Potential Beneficiaries

Adolescents, Alcohol dependent, Attendees of health care facilities, Diabetes, Drug dependent, Elderly (institutionalized), Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs/Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban slum residents, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

Lancet. 2014 Feb 1;383(9915):424-35. doi: 10.1016/S0140-6736(13)62073-5. Epub 2013 Oct 28. Feasibility, accuracy, and clinical effect of point-of-care Xpert MTB/RIF testing for tuberculosis in primary-care settings in Africa: a multicentre, randomised, controlled trial. Theron G1, Zijenah L2, Chanda D3, Clowes P4, Rachow A5, Lesosky M1, Bara W6, Mungofa S6, Pai M7, Hoelscher M5, Dowdy D8, Pym A9, Mwaba P3, Mason P10, Peter J1, Dheda K11; TB-NEAT team.

In this pragmatic, randomised, parallel-group, multicentre trial, we recruited adults with symptoms suggestive of active tuberculosis from five primary-care health-care facilities in South Africa, Zimbabwe, Zambia, and Tanzania. Eligible patients were randomly assigned using pregenerated tables to nurse-performed Xpert MTB/RIF at the clinic or sputum smear microscopy. Participants with a negative test result were empirically managed according to local WHO-compliant guidelines. Our primary outcome was tuberculosis-related morbidity (measured with the TBscore and Karnofsky performance score [KPS]) in culture-positive patients who had begun anti-tuberculosis treatment, measured at 2 months and 6 months after randomisation, analysed by intention to treat. This trial is registered with Clinicaltrials.gov, number NCT01554384.

FINDINGS:

Between April 12, 2011, and March 30, 2012, we randomly assigned 758 patients to smear microscopy (182 culture positive) and 744 to Xpert MTB/RIF (185 culture positive). Median TBscore in culture-positive patients did not differ between groups at 2 months (2 [IQR 0-3] in the smear microscopy group vs 2 [0-25-3] in the MTB/RIF group; $p=0.85$) or 6 months (1 [0-3] vs 1 [0-3]; $p=0.35$), nor did median KPS at 2 months (80 [70-90] vs 90 [80-90]; $p=0.23$) or 6 months (100 [90-100] vs 100 [90-100]; $p=0.85$). Point-of-care MTB/RIF had higher sensitivity than microscopy (154 [83%] of 185 vs 91 [50%] of 182; $p=0.0001$) but similar specificity (517 [95%] 544 vs 540 [96%] of 560; $p=0.25$), and had similar sensitivity to laboratory-based MTB/RIF (292 [83%] of 351; $p=0.99$) but higher specificity (952 [92%] of 1037; $p=0.0173$). 34 (5%) of 744 tests with point-of-care MTB/RIF and 82 (6%) of 1411 with laboratory-based MTB/RIF failed ($p=0.22$). Compared with the microscopy group, more patients in the MTB/RIF group had a same-day diagnosis (178 [24%] of 744 vs 99 [13%] of 758; $p<0.0001$) and same-day treatment initiation (168 [23%] of 744 vs 115 [15%] of 758; $p=0.0002$). Although, by end of the study, more culture-positive patients in the MTB/RIF group were on treatment due to reduced dropout (15 [8%] of 185 in the MTB/RIF group did not receive treatment vs 28 [15%] of 182 in the microscopy group; $p=0.0302$), the proportions of all patients on treatment in each group by day 56 were similar (320 [43%] of 744 in the MTB/RIF group vs 317 [42%] of 758 in the microscopy group; $p=0.6408$).

Xpert MTB/RIF can be accurately administered by a nurse in primary-care clinics, resulting in more patients starting same-day treatment, more culture-positive patients starting therapy, and a shorter time to treatment. However, the benefits did not translate into lower tuberculosis-related morbidity, partly because of high levels of empirical-evidence-based treatment in smear-negative patients.

Selected List of Guidances, Tools and Manuals

Policy Framework for Implementing New Tuberculosis Diagnostics. Geneva, World Health Organization, 2010.

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A Roadmap for Ensuring Quality Tuberculosis Diagnostics Services within National Laboratory Strategic Plans. Geneva, World Health Organization, 2010.

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Policy statement: automated real-time nucleic acid amplification technology for rapid and simultaneous detection of tuberculosis and rifampicin resistance: Xpert MTB/RIF system. Geneva, World Health Organization, 2011 (WHO/HTM/TB/2011.4).

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Tuberculosis Diagnostics Xpert MTB/RIF Test - WHO Endorsement and Recommendations. Geneva, World Health Organization. 2012

http://www.who.int/tb/features_archive/factsheet_xpert_may2011update.pdf

Rapid implementation of the Xpert MTB/RIF diagnostic test: technical and operational "How-to; practical considerations. Geneva, World Health Organization, 2011 (WHO/HTM/TB/2011.2).

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Helb D, Jones M, Story E, Boehme C, Wallace E, Ho K, et al. Rapid detection of *Mycobacterium tuberculosis* and rifampin resistance by use of on-demand, near-patient technology. *Journal of Clinical Microbiology* 2010. Jan;48(1):229-37.

Marlowe EM, Novak-Weekley SM, Cumpio J, et al. Evaluation of the Cepheid Xpert MTB/RIF assay for the direct detection of *Mycobacterium tuberculosis* complex from respiratory specimens. *Journal of Clinical Microbiology* 2011. Published online 2 February, 2011. DOI:10.1128/JCM.02214-10.

Nicol MP, Workman L, Isaacs W, Munro J, Black F, Eley B, Boehme CC, Zemanay W, Zar HJ. Accuracy of the Xpert MTB/RIF test for the diagnosis of pulmonary tuberculosis in children admitted to hospital in Cape Town, South Africa: a descriptive study. *Lancet Infect Dis*. 2011;11:819-24.

Theron G, Peter J, van Zyl-Smit R, Mishra H, Streicher E, Murray S, Dawson R, Whitelaw A, Hoelscher M, Sharma S, Pai M, Warren R, Dheda K. Evaluation of the Xpert MTB/RIF assay for the diagnosis of pulmonary tuberculosis in a high HIV prevalence setting. *Am J Respir Crit Care Med*. 2011;184:132-40.

OBTAIN A TIMELY, ACCURATE TB DIAGNOSIS IMPROVE ACCURACY OF DIAGNOSIS

Rapid Detection of INH and RIF Resistance via Molecular Line Probe Assays

Brief Description of the Approach

Strip test simultaneously detects TB bacteria and genetic mutations associated with drug resistance (to rifampicin, with/without isoniazid resistance) from smear-positive sputum specimens or culture isolates after DNA extraction and PCR amplification. Studies have shown LPAs perform well when used directly on smear-positive specimens. LPAs are high-throughput tests suitable for use at reference laboratory level. They require skilled and specially trained personnel as well as adequately designed laboratory infrastructure (e.g. three separate rooms with differential air exchange to avoid DNA cross-contamination). They do not eliminate the need for conventional culture and DST capacity, needed to monitor treatment and conducting DST to drugs other than rifampicin and isoniazid. Recommended coverage is at least one LPA laboratory for a population of 500,000 - 1 million.

List of alternative names (if applicable)

MTBDRsl Hain Lifescience (Rif and INH associated mutations),
INNO-LiPA Rif.TB Innogenetics (Rif associated mutations)

Shown to benefit

For all TB patients suspected of having MDR TB, with sputum smear-positive sputum or culture isolates

Potential Beneficiaries

Adolescents, Alcohol dependent, Attendees of health care facilities, Diabetes, Drug dependent, Elderly (institutionalized), Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs/Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban slum residents, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

Rapid screening of MDR-TB using molecular Line Probe Assay is feasible in Uganda.

Albert H, Bwanga F, Mukkada S, Nyesiga B, Ademun JP, Lukyamuzi G, Haile M, Hoffner S, Joloba M, O'Brien R. BMC Infect Dis. 2010 Feb 26;10:41. doi: 10.1186/1471-2334-10-41.

BACKGROUND:

About 500 new smear-positive Multidrug-resistant tuberculosis (MDR-TB) cases are estimated to occur per year in Uganda. In 2008 in Kampala, MDR-TB prevalence was reported as 1.0% and 12.3% in new and previously treated TB cases respectively. Line probe assays (LPAs) have been recently approved for use in low income settings and can be used to screen smear-positive sputum specimens for resistance to rifampicin and isoniazid in 1-2 days. METHODS: We assessed the performance of a commercial line probe assay (Genotype MTBDRplus) for rapid detection of rifampicin and isoniazid resistance directly on smear-positive sputum specimens from 118 previously treated TB patients in a reference laboratory in Kampala, Uganda. Results were compared with MGIT 960 liquid culture and drug susceptibility testing (DST). LPA testing was also performed in parallel in a University laboratory to assess the reproducibility of results.

RESULTS:

Overall, 95.8% of smear-positive specimens gave interpretable results within 1-2 days using LPA. Sensitivity, specificity, positive and negative predictive values were 100.0%, 96.1%, 83.3% and 100.0% for detection of rifampicin resistance; 80.8%, 100.0%, 100.0% and 93.0% for detection of isoniazid resistance; and 92.3%, 96.2%, 80.0% and 98.7% for detection of multidrug-resistance compared with conventional results. Reproducibility of LPA results was very high with 98.1% concordance of results between the two laboratories.

CONCLUSIONS:

LPA is an appropriate tool for rapid screening for MDR-TB in Uganda and has the potential to substantially reduce the turnaround time of DST results. Careful attention must be paid to training, supervision and adherence to stringent laboratory protocols to ensure high quality results during routine implementation.

Selected List of Guidances, Tools and Manuals

Policy Framework for Implementing New Tuberculosis Diagnostics. Geneva, World Health Organization, 2010.

http://www.who.int/tb/laboratory/whopolicyframework_rev_june2011.pdf

New Laboratory Diagnostic Tools for Tuberculosis Control. Geneva, World Health Organization, 2008.

<http://apps.who.int/tdr/publications/non-tdr-publications/diagnostic-tool-tb/pdf/diagnostic-tool-tb.pdf>

WHO policy statement: molecular line probe assays for rapid screening of patients at risk of multidrug-resistant tuberculosis

http://www.who.int/tb/laboratory/line_probe_assays/en/index.html

Selected Bibliographic References of Uses of this Strategy

Ling DI, Zwerling AA, Pai M. GenoType MTBDR assays for diagnosis of multidrug-resistant tuberculosis: a meta-analysis. *European Respiratory Journal*, 2008, 32:1165-74.

J. Munkhdelger, H-Y. Wang, Y. Choi, P. M. Wairagu, D. Lee, S. Park, S. Kim, B-Y. Jeon, H. Lee, K. H. Park Identification of Mycobacterium species in FFPE granulomatous lymphadenitis tissue using REBA Myco-ID@ INT J TUBERC LUNG DIS e-publication ahead of print 23 April 2013

OBTAIN A TIMELY, ACCURATE TB DIAGNOSIS IMPROVE ACCURACY OF DIAGNOSIS

Use of Commercial Liquid Medium for Culture (e.g. MGIT, BACTEC)

Brief Description of the Approach

Liquid medium is recommended as the gold standard by WHO for culture and DST in middle- and low-income countries. Liquid culture is more sensitive than solid culture and can reduce the delays in obtaining results to days rather than weeks. For DST, the delay may be reduced to as little as 10 days, compared to 28-42 days with conventional solid media. With increased sensitivity and reduced delays, liquid systems can contribute significantly to improved patient management. Liquid systems are, however, more prone to contamination by other microorganisms and the manipulation of large volumes of infectious material mandates appropriate, adequate biosafety measures. Procedures to prevent cross-contamination must be strictly followed.

Commercial broth-based systems, such as the BACTEC MGIT 960 system, detect TB bacteria and be configured for DST. They detect fluorescence in a liquid culture medium, enriched with oxygen, to indicate the presence of TB. As the bacteria grow in the culture, the oxygen is utilized, causing it to be fluorescent when placed under ultraviolet light. Methods for DST follow the same principle but use two culture samples: one with a drug added and one without the drug (a growth control). If the test drug is active against the TB bacteria, it will inhibit growth and suppress fluorescence. A small manual reader is available to identify fluorescence or a technician may visually identify fluorescence using a hand-held ultraviolet (UV) lamp. Alternative or related, automated systems have the capacity for up to 960 cultures at a time. Such systems have been thoroughly evaluated in clinical settings and approved for use in industrialized countries for years. These systems provide results significantly faster than solid culture techniques: on average, diagnosis takes 7-14 days. DST takes on average 7-14 days after the initial culture. Automated systems can benefit laboratories with a high workload, but the infrastructure requirements are high, equipment required is expensive and it must be maintained. A TB containment laboratory is required to manipulate specimens (such as for DST and/or speciation). Establishing long-term support agreements with suppliers is critical.

List of alternative names (if applicable)

BACTEC; MGIT; liquid medium

Shown to benefit

HIV-infected, Sputum smear-negative patients, Children under 5, Previous TB, Sputum smear-positive suspected to be drug resistant, Extra pulmonary TB

Potential Beneficiaries

Persons with diabetes, elderly

Example of Good Practice

BMC Infect Dis. 2010 Apr 12;10:93. doi: 10.1186/1471-2334-10-93.

The realistic performance achievable with mycobacterial automated culture systems in high and low prevalence settings.

van Kampen SC1, Anthony RM, Klatser PR.

BACKGROUND:

Diagnostic tests are generally used in situations with similar pre-test probability of disease to where they were developed. When these tests are applied in situations with very different pre-test probabilities of disease, it is informative to model the likely implications of known characteristics of test performance in the new situation. This is the case for automated Mycobacterium tuberculosis (MTB) liquid culture systems for tuberculosis case detection which were developed and are widely used in low burden settings but are only beginning to be applied on a large scale in high burden settings.

METHODS:

Here we model the performance of MTB liquid culture systems in high and low tuberculosis (TB) prevalence settings using detailed published data concentrating on the likely frequency of cross-contamination events.

RESULTS:

Our model predicts that as the TB prevalence in the suspect population increases there is an exponential increase in the risk of MTB cross-contamination events expected in otherwise negative samples, even with equivalent technical performance of the laboratories. Quality control and strict cross-contamination measures become increasingly critical as the burden of MTB infection among TB suspects increases. Even under optimal conditions the realistically achievable specificity of these systems in high burden settings will likely be significantly below that obtained in low TB burden laboratories.

CONCLUSIONS:

Liquid culture systems can play a valuable role in TB case detection in laboratories in high burden settings, but laboratory workers, policy makers and clinicians should be aware of the increased risks, independent of laboratory proficiency, of cross-contamination events in high burden settings.

Selected List of Guidances, Tools and Manuals

Tuberculosis prevention, care and control - A practical directory of new advances
http://whqlibdoc.who.int/publications/2011/9789241502658_eng.pdf

TB diagnostics and laboratory strengthening - WHO policy: The use of liquid medium for culture and DST, 2007
http://www.who.int/tb/laboratory/policy_liquid_medium_for_culture_dst/en/index.html

Policy Framework for Implementing New Tuberculosis Diagnostics. Geneva, World Health Organization, 2010.
http://www.who.int/tb/laboratory/whopolicyframework_rev_june2011.pdf

A Roadmap for Ensuring Quality Tuberculosis Diagnostics Services within National Laboratory Strategic Plans. Geneva, World Health Organization, 2010.
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TB CAP/TB CARE I Laboratory Toolbox. Geneva, Global Laboratory Initiative, 2010. New Laboratory Diagnostic Tools for Tuberculosis Control. Geneva, World Health Organization, 2008.
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http://www.stoptb.org/assets/documents/global/retooling/Diagnostic_Brochure_Print_2009_Jan_29.pdf

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Evaluation of the Rapid MGIT TBc Identification Test for Culture Confirmation of Mycobacterium tuberculosis Complex Strain Detection Ming-Chih Yu1,
<http://jcm.asm.org/content/49/3/802.abstract>

RM Anthony, FGJ Cobelens, A Gebhard, PR Klatser, R Lumb, S Rusch-Gerdes, D Van Soolingen. Liquid culture for Mycobacterium tuberculosis: proceed, but with caution [Unresolved issues]. The International Journal of Tuberculosis and Lung Disease 13 (9), 1051-1053, 2009

S van Kampen, R Anthony, P Klatser. The realistic performance achievable with mycobacterial automated culture systems in high and low prevalence settings. BMC Infectious Diseases 10 (1), 93

de Boer A S, Blommerde B, de Haas P E W, et al. False-positive Mycobacterium tuberculosis cultures in 44 laboratories in The Netherlands (1993 to 2000): incidence, risk factors, and consequences. J Clin Microbiol 2002; 40: 4004 - 4009.

Somoskövi Á, Ködmön C, Lantos Á, et al. Comparison of recoveries of Mycobacterium tuberculosis using the automated BACTEC MGIT 960 system, the BACTEC 460 TB system, and Löwenstein-Jensen medium. J Clin Microbiol 2000; 38: 2395-2397.

Performance of MGIT TBc Identification Test and Meta-Analysis of MPT64 Assays for Identification of Mycobacterium tuberculosis complex in Liquid Culture Read more:
<http://www.mdlinx.com/infectious-disease/news-article.cfm/3790057/mycobacterium-tuberculosis#ixzz1oYpe8t1>

Use of Liquid TB Culture and Drug Susceptibility Testing (DST) in Low and Medium Income Settings. Geneva, World Health Organization, 2007.

Bemer P, Palicova F, Rusch-Gerdes S, Drugeon HB, Pfyffer GE. Multicenter evaluation of fully automated BACTEC Mycobacteria Growth Indicator Tube 960 system for susceptibility testing of Mycobacterium tuberculosis. J Clin Microbiol 2002;40(1):150-4

Scarparo C, Ricordi P, Ruggiero G, Piccoli P. Evaluation of the fully automated BACTEC MGIT 960 system for testing susceptibility of Mycobacterium tuberculosis to pyrazinamide, streptomycin, isoniazid, rifampin, and ethambutol and comparison with the radiometric BACTEC 460TB method. J Clin Microbiol 2004;42(3):1109-14.

Werngren J, Klintz L, Hoffner SE. Evaluation of a novel kit for use with the BacT/ALERT 3D system for drug susceptibility testing of Mycobacterium tuberculosis. J Clin Microbiol 2006;44(6):2130-2.

Systematic review of fully automated liquid culture tests. Chapter 14 In "A systematic review of rapid diagnostic tests for the detection of tuberculosis infection", J. Dinnes (ed), Health Technology Assessment 2007;vol. 11:No 3.

OBTAIN A TIMELY, ACCURATE TB DIAGNOSIS IMPROVE ACCURACY OF DIAGNOSIS

Brief Description of the Approach

Fluorescence microscopy is more sensitive than conventional light microscopy. Allow a much larger area of the smear to be seen:

- Permit more rapid examination of the specimen (up to four times faster)
- More efficient than light microscopy for detection of TB in HIV-infected patients with paucibacillary disease
- Use has been limited by high costs, infrastructure/maintenance requirements and (in some cases) low user acceptance

LEDs have been developed to offer the benefits of fluorescence microscopy without the associated costs. WHO recommends:

- Conventional fluorescence microscopy be replaced by LED microscopy
- LED microscopy be phased in as an alternative to conventional (Ziehl-Neelsen) light microscopy
- Switch to LED microscopy be carefully phased in at country level
- Use of LED technology that meets international standards
- User acceptance of LED based microscopy has been shown to be much less of an issue than with classical Hg-vapor lamps.

One microscopy center per 100,000 population is usually sufficient; however, expansion should also account for the location and utilization of existing services, urban/rural population distribution and mechanisms for transporting specimens.

List of alternative names (if applicable)

Not applicable

Shown to benefit

TB suspects needing smear microscopy, including HIV-infected and those with previous TB

Potential Beneficiaries

Adolescents, Alcohol dependent, Attendees of health care facilities, Diabetes, Drug dependent, Elderly (institutionalized), HIV-infected/PMTCT, Malnourished, Mentally ill (institutionalized), Peri-partum women, Smokers, Factory and farm workers, HCWs/Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/ internally displaced populations (IDPs), Urban slum residents, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

The Tanzanian National TB and Leprosy Programme (NTLP) in 2007, began evaluating LED fluorescence microscopy as a more appropriate tool for improving case detection at the periphery. Standard light microscopes were converted to LED using an adaptor. Binocular high quality microscopes with integrated LED illumination suitable for TB screening are now available. Conventional fluorescence microscopy, is on average 10% more sensitive than traditional Ziehl-Neelsen microscopy, LED based FM appears to perform at least as well. Because it builds upon existing techniques, it does not require costly infrastructure or extensive training. The positive response to the LED trials has prompted the NTLP to begin rapidly scaling-up its availability at all district hospitals and high-volume sites. The adoption and implementation of such new tools requires programmatic changes, meaning for example that revised quality control and external validation (proficiency testing) strategies need to be implemented before full roll out when the impact is likely to be greatest. Confirmation of FM positives by classical microscopy is not required but examination at high magnification to exclude microscopic artifacts can ensure specificity.

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http://www.who.int/tb/laboratory/whopolicy_led_microscopy_mar2011.pdf

TB CAP/TB CARE I Laboratory Toolbox. Geneva, Global Laboratory Initiative, 2010.

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Fluorescence versus conventional sputum smear microscopy for tuberculosis: a systematic review. Karen R Steingart MD, Megan Henry MPH, Vivienne Ng MPH, Prof Philip C Hopewell MD, Andrew Ramsay MSc, Jane Cunningham MD, Richard Urbanczik MD, Mark Perkins MD, Mohamed Abdel Aziz MD, Dr Madhukar Pai MD. *The Lancet Infectious Diseases* - 1 September 2006 (Vol. 6, Issue 9, Pages 570-581) DOI: 10.1016/S1473-3099(06)70578-3

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OBTAIN A TIMELY, ACCURATE TB DIAGNOSIS

IMPROVE ACCURACY OF DIAGNOSIS

Brief Description of the Approach

Microscopic observation drug susceptibility (MODS) is a manual liquid culture technique that uses basic laboratory equipment (including an inverted light microscope) and microscopy skills to detect TB bacteria and drug resistance with high accuracy (49, 50). Colonies of TB are observed in the culture media using an inverted microscope, through the bottom of a sealed plastic container. Concurrent culture of sputum in drug-free and drug-containing media enables testing for isoniazid and rifampicin susceptibility. MODS has been standardized and testing protocols are available. MODS requires less equipment and consumables than conventional liquid culture methods, but MODS requires additional staff skills. Because MODS requires significant biosafety controls, including a laboratory separated from other areas and appropriate biosafety cabinets, scale-up and decentralization to lower-level laboratories is not recommended.

MODS, can be used as direct or indirect tests for rapid screening of patients suspected of having MDR-TB

List of alternative names (if applicable)

Noncommercial culture and DST methods.

Shown to benefit

Patients suspected of having MDR-TB, Persons with Previous TB

Potential Beneficiaries

Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), HIV-infected/PMTCT, Malnourished, Mentally ill (institutionalized), Peri-partum women, Smokers, Factory and farm workers, HCWs/Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban slum residents, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

In an operational setting in Peru, we investigated the performance of the MODS assay for culture and drug-susceptibility testing in three target groups: unselected patients with suspected tuberculosis, pre-screened patients at high risk for tuberculosis or multidrug-resistant tuberculosis, and **unselected** hospitalized patients infected with the human immunodeficiency virus. (David A.J. Moore)

Selected List of Guidances, Tools and Manuals

Policy Framework for Implementing New Tuberculosis Diagnostics. Geneva, World Health Organization, 2010.

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A Roadmap for Ensuring Quality Tuberculosis Diagnostics Services within National Laboratory Strategic Plans. Geneva, World Health Organization, 2010.

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Microscopic-Observation Drug-Susceptibility

Assay for the Diagnosis of TB

<http://www.nejm.org/doi/pdf/10.1056/NEJMoa055524>

Microscopic-observation drug susceptibility and thin layer agar assays for the detection of drug resistant tuberculosis: A systematic review and meta-analysis

http://tbevidence.org/documents/sysrev/rapid/Minion_Lancet_ID_2010.pdf

OBTAIN A TIMELY, ACCURATE TB DIAGNOSIS

IMPROVE ACCURACY OF DIAGNOSIS

Brief Description of the Approach

Building adequate laboratory capacity requires that many essential elements be addressed simultaneously within comprehensive strategies and national plans, based on local epidemiology and resources.

To be fully functional, a laboratory service relies on a steady supply of equipment and consumables, such as laboratory reagents and diagnostic kits. External technical assistance is likely required, such as to help adapt guidance and implement laboratory enhancements.

Appropriate laboratory infrastructure and biosafety allows safe handling of biological material and living organisms in laboratory settings and helps minimize risks to human health and the environment.

Care of patients with TB starts with a quality assured diagnosis. Standardized operating procedures (SOPs), routine quality assurance and laboratory accreditation are keys to high-quality laboratory practices.

Laboratory accreditation programs can ensure accountability and quality services by clearly outlining and enforcing standards. Although guidance exists, external assistance and training support is still advised.

List of alternative names (if applicable)

Laboratory accreditation; EQA; SOPs for laboratory quality assurance, Good laboratory practice (GLP), laboratory bio-safety

Shown to benefit

Patients suspected of having MDR-TB, Persons with Previous TB

Potential Beneficiaries

Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), HIV-infected/PMTCT, Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs /Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban slum residents, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

Case study: Lesotho

Since late 2006, global and national partners had already been working to improve Lesotho's TB diagnostic capabilities, including strengthening of the National Reference Laboratory (NRL). WHO recommends implementing the new technologies first in the country's national reference laboratory, so that it can provide experience during scale-up to the rest of the laboratory system.

Thanks to the close collaboration among multiple stakeholders, Lesotho established a state-of-the-art mycobacteriology laboratory and rapidly introduced new TB diagnostic technologies needed to address the challenges posed by MDR- and XDR-TB.

Partners in Health (PIH), with funding from the Open Society Institute, had established a partnership with the Ministry of Health and Social Welfare (MOH&SW) to launch a treatment program for MDR-TB.

In addition, the Foundation for Innovative New Diagnostics (FIND) had signed a memorandum of understanding with the government in April 2007 to help prepare the laboratory system in Lesotho to introduce new diagnostic technologies. The MOH&SW coordinated several levels of global and national support to rehabilitate the NRL and institute laboratory staff training programs. It installed new equipment bought through the Global Fund, developed standard operating procedures, streamlined workflow, and recruited additional technicians to tackle the new workload.

WHO provided technical guidance and appointed a country-based WHO medical officer to support laboratory strengthening. PIH provided logistics and financial assistance. FIND provided an on-site technical expert for renovation and provided a liquid culture system and rapid strip test to detect TB in cultures. In October 2008, a new molecular laboratory was finished and Lesotho started doing line probe assays as well.

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<http://www.who.int/csr/resources/publications/biosafety/en/Biosafety7.pdf>
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Brief Description of the Approach

Drug-resistant TB develops when treatment of fully sensitive TB is interrupted and the levels of drug in the body are insufficient to kill all TB bacteria. Multi-Drug Resistant TB (MDR-TB) can usually be cured with second-line drugs, but treatment is longer and requires more expensive drugs and properly trained staff for adequate management of adverse drug reactions and support to enable adherence to treatment. Effective management of drug-resistant TB requires input and cooperation from different aspects of the TB program, including case detection; treatment; prevention; surveillance; drug procurement and supply; and monitoring and evaluation. Guidelines for the programmatic management of drug-resistant TB were issued in 2006, updated in 2008 and revised in 2011 after a review of new evidence. Definitive diagnosis of MDR-TB and Extensively Drug-Resistant TB (XDR-TB) requires DST. The tools and policies for DST have evolved with new evidence, needs and technological advances. In 2009, WHO recommended that all previously treated patients should have access to culture and DST at the beginning of treatment, in order to identify MDR-TB as early as possible. Updated policy recommends that DST be conducted for all patients before treatment using a rapid test that detects resistance to isoniazid and rifampicin as the best strategy for averting deaths and preventing acquired MDR-TB. Rapid DST of isoniazid and rifampicin (or of rifampicin alone) was recommended over conventional testing or no testing at the time of diagnosis of TB, subject to available resources. Training materials have been developed to support expansion of culture and DST techniques. Recommended coverage is at least one DST laboratory for a population of 500,000 - 1 million.

List of alternative names (if applicable)

DR-TB, MDR-TB

Shown to benefit

HIV-infected, Previous TB, Prisoners and prison staff, HCWs in MDR-TB settings, Immigrants, Contacts of MDR-TB cases (especially children), homeless staying in congregate settings, Drug dependent, Alcohol dependent

Potential Beneficiaries

All other risk groups suspected of having drug-resistant TB

Example of Good Practice

Int J Tuberc Lung Dis. 2010 Jun;14(6):751-7.
Responding to the multidrug-resistant tuberculosis crisis: mainstreaming programmatic management to the Philippine National Tuberculosis Programme. Quelapio M1, Mira NR, Orillaza-Chi RB, Belen V, Muñoz N, Belchez R, Egos GE, Evangelista M, Vianzon R, Tupasi TE.

SETTING:

The Philippines ranks eighth among 27 priority countries for multidrug-resistant TB (MDR-TB).

OBJECTIVE:

To describe a model of public-private partnership in MDR-TB management.

METHODS:

An exploratory study of integrating MDR-TB management initiated in private-public mix DOTS into the National TB Programme (NTP).

RESULTS:

Recognising that MDR-TB was a threat to DOTS, the Tropical Disease Foundation initiated MDR-TB management in 1999. An official mandate for the integration of MDR-TB services into the NTP was issued by the Department of Health in 2008. With an increased government budget augmented by support from the Global Fund to Fight AIDS, Tuberculosis and Malaria, 1294 MDR-TB patients were placed on treatment from 1999 to 2008. The treatment success rate improved from 64% in 1999 to 75% in 2005. There are now five MDR-TB treatment centres with 181 treatment sites in Metro Manila, and three culture centres. People trained include 12 master trainers, 31 trainers, 25 treatment centre and 381 treatment site staff.

CONCLUSION:

Mainstreaming into the NTP of this unique model of MDR-TB management through a dynamic public-private collaboration can be considered best practice in implementation science of an evidence-based intervention leading to change in health care policy and practice.

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Medical Management of Multidrug-Resistant Tuberculosis - 2nd Edition
http://www.tbcare1.org/publications/toolbox/tools/pmdt/download.php?file=Guide_to_Medical_Management_of_MDR-TB_2013.pdf

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<http://apps.who.int/medicinedocs/pdf/s4872e/s4872e.pdf>

MDR/XDR-TB Assessment and Monitoring Tool. PATH. 2009
http://www.path.org/publications/files/TB_mdr-xdr-tb_assess_tool.pdf

Consolidated action plan to prevent and combat multidrug- and extensively drug-resistant tuberculosis in the WHO European Region 2011-2015
http://www.euro.who.int/___data/assets/pdf_file/0007/147832/wd15E_TB_ActionPlan_111388.pdf

The Use of Bedaquiline in the Treatment of Multidrug-Resistant Tuberculosis: Interim Policy Guidance. Geneva: World Health Organization; 2013.
<https://cz3xxm1r7383gmj6jj72jrt.sec.amc.nl/books/n/whocollect/>

Community-Based Care for Drug-Resistant Tuberculosis: A Guide For Implementers TB CARE II
<http://tbcare2.org/sites/tbcare2.org/files/Community%20Based%20Care%20for%20DR%20TB%20Guide%20for%20Implementers.pdf>

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Anti-tuberculosis drug resistance in the world. Third global report. Geneva, World Health Organization, 1997 (WHO/HTMTB/97.229).

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Gelmanova, I. Y., D. V. Taran, et al. [2011]. “‘Sputnik’: a programmatic approach to improve tuberculosis treatment adherence and outcome among defaulters.” *Int J Tuberc Lung Dis* 15(10): 1373-1379.

Leimane V et al. Clinical outcome of individualised treatment of multidrug-resistant tuberculosis in Latvia: a retrospective cohort study. *Lancet*, 2005, 365(9456):318-326.

Mitnick C et al. Community-based therapy for multidrug-resistant tuberculosis in Lima, Peru. *N Engl J Med* 2003; 348: 119-128.

Nathanson E et al. Multidrug-resistant tuberculosis can be successfully treated in resource-limited settings. *Emerging Infectious Diseases*, 2006, 12(9):1389-1397. Report of the meeting of the WHO Global Task Force on XDR-TB. Geneva, World Health Organization, 2007 (WHO/HTM/TB/2007.375).

Tupasi TE et al. Feasibility and cost-effectiveness of treating multidrug-resistant tuberculosis: a cohort study in the Philippines. *PLoS Medicine*, 2006, 3(9):e352.

Zignol M et al. Global incidence of multidrug-resistant tuberculosis. *Journal of Infectious Diseases*, 2006, 194(4):479-485.

Brief Description of the Approach

The International Standards for Tuberculosis Care (ISTC) is a tool that can help you effectively engage TB care providers. It describes a level of care that all practitioners should try to achieve when managing TB suspects and patients. The ISTC includes 17 standards that address four main categories of activities: diagnosis, treatment, HIV infection and other co-morbid conditions and public health. The ISTC has been endorsed by dozens of national and international organizations, both public and private, concerned with TB care and control. However, the ISTC itself cannot be implemented; it requires that strategies be developed and implemented to enable the standards to be met. The Patients' Charter for Tuberculosis Care outlines the rights and responsibilities of people with TB. It empowers people with the disease and their communities through this knowledge. Developed in tandem with the ISTC to promote a 'patient-centered' approach. Contributes to help address other priorities, such as equitable access to TB services for the vulnerable and poor population, TB/HIV co-infection and the issue of human rights.

List of alternative names (if applicable)

Quality of Care, International Standards for Tuberculosis Care

Shown to benefit

Urban residents or poor areas

Potential Beneficiaries

Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), HIV-infected/PMTCT, Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs /Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban slum residents, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

J. Lucian Davis^{1,4,6,10}, Achilles Katamba^{8,9,10}, Josh Vasquez^{6,7}, Erin Crawford⁶, Asadu Sserwanga¹⁰, Stella Kakeeto¹⁰, Fred Kizito¹⁰, Grant Dorsey^{2,6,10}, Saskia den Boon¹⁰, Eric Vittinghoff^{5,6}, Laurence, Huang^{1,3,4,6,10}, Francis Adatu⁸, Moses R. Kanya^{9,10}, Philip C. Hopewell^{1,4,6}, and Adithya, Cattamanchi^{1,4,6,10}, 11

Evaluating Tuberculosis Case Detection via Real-time Monitoring of Tuberculosis Diagnostic Services.

American Journal of Respiratory and Critical Care medicine. Published on March 11, 2011 as doi:10.1164/rccm.201012-1984OC

ABSTRACT Rationale: Tuberculosis case-detection rates are below internationally established targets in high-burden countries. Real-time monitoring and evaluation of adherence to widely endorsed standards of tuberculosis care might facilitate improved case finding. **Objective:** To monitor and evaluate the quality of tuberculosis case-detection and management services in a low-income country with a high incidence of tuberculosis. **Methods:** We prospectively evaluated tuberculosis diagnostic services at five primary healthcare facilities in Uganda for one year, after introducing a real-time, electronic performance monitoring system. We collected data on every clinical encounter, and measured quality using indicators derived from the International Standards of Tuberculosis Care. **Measurements & Main Results:** In 2009, there were 62,909 adult primary-care visits. During the first quarter of 2009, clinicians referred only 21% of patients with cough ≥ 2 weeks for sputum smear microscopy and only 71% of patients with a positive sputum examination for tuberculosis treatment. These proportions increased to 53% and 84%, respectively, in the fourth quarter of 2009. The cumulative probability that a smear-positive patient with cough ≥ 2 weeks would be appropriately evaluated and referred for treatment rose from 11% to 34% ($p=0.005$). The quarterly number of tuberculosis cases identified and prescribed treatment also increased four-fold, from 5 to 21. **Conclusions:** Poor adherence to globally accepted standards of tuberculosis care improved following introduction of real-time performance monitoring and was associated with increased tuberculosis case detection. Real-time monitoring and evaluation can strengthen health Page 3 of 28 2 systems in low-income countries and facilitate operational research on the effectiveness and sustainability of interventions to improve tuberculosis case detection.

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http://www.tbcare1.org/publications/toolbox/tools/access/download.php?file=ISTC_3rdEd_final_inter.pdf

Engaging all health care providers in TB control: guidance on implementing public-private mix approaches. Geneva, World Health Organization (WHO/HTM/TB/2006.360). http://whqlibdoc.who.int/hq/2006/WHO_HTM_TB_2006.360_eng.pdf

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Hopewell PC, Pai M. Tuberculosis, vulnerability, and access to quality care. *JAMA* 2005;293(22):2790-3.

Uplekar M. Involving private health care providers in delivery of TB care: global strategy. *Tuberculosis (Edinb)* 2003;83(1-3):156-64.

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Mohan A. International standards of tuberculosis care. *Natl Med J India* 2006;19(6):301-5.

Pai M, Daley P, Hopewell PC. International standards for tuberculosis care: relevance and implications for laboratory professionals. *Indian J Med Microbiol* 2007;25(2):89-92.

Pai M, Sharma SK. Are we providing quality care to our patients with tuberculosis? *Indian J Med Res* 2007;125(4):491-7.

Brief Description of the Approach

In 2002, WHO endorsed HIV and TB program collaboration and interventions to control TB in high HIV prevalence settings. Guidelines for implementing collaborative activities were subsequently published in 2003 and in 2004, an interim official policy defined the collaborative TB/HIV activities to implement and under what circumstances. These activities reduce the morbidity and mortality from TB in people living with HIV, such as through earlier provision of antiretroviral therapy (ART) and the Three I's for HIV/TB: intensified case-finding of TB, isoniazid preventive therapy and infection control.

Among treated TB patients, death rates are higher in HIV+ than in HIV- patients in some contexts. Guidance on treating TB in persons living with HIV has been published by WHO and should be incorporated into national treatment guidelines. In addition to immediate treatment with ART for eligible patients, it is recommended that TB patients who are living with HIV should receive at least the same duration of TB treatment as HIV- TB patients. TB patients with known HIV+ status and all TB patients living in HIV-prevalent settings should receive daily TB treatment at least during the intensive phase. For the continuation phase, the optimal dosing frequency is also daily for these patients.

All patients with TB and HIV infection should be evaluated to determine if ART is indicated during the course of treatment for TB. Appropriate arrangements for access to antiretroviral drugs should be made for patients who meet indications for treatment. Given the complexity of co-administration of anti-TB treatment and ART, consultation with a physician who is expert in this area is recommended before initiation of concurrent treatment for TB and HIV infection, regardless of which disease appeared first. However, initiation of treatment for TB should not be delayed. Patients with TB and HIV infection should also receive cotrimoxazole as prophylaxis for other infections.

List of alternative names (if applicable)

TB/HIV, Collaborative TB/HIV activities, Human Immunodeficiency Virus

Shown to benefit

HIV-infected

Potential Beneficiaries

Adolescents, Alcohol dependent, Drug dependent, Peri-partum women, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/ internally displaced populations (IDPs), Urban residents of poor areas, Transportation workers, Homeless, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

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TB/HIV: a clinical manual, 2nd ed. Geneva, World Health Organization, 2004 (WHO/HTM/TB/2004.329).
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Treatment of Tuberculosis: guidelines for national programmes, fourth edition. Geneva, World Health Organization, 2010 (WHO/HTM/TB/2009.420).
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Priority interventions: HIV/AIDS prevention, treatment and care in the health sector. Geneva, World Health Organization, 2010
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Brief Description of the Approach

TB patients who drink excessively are at heightened risk for poor outcomes, including death. TB patients should receive assistance to limit alcohol consumption. There are effective substance abuse interventions, however most strategies need cultural adaptation.

List of alternative names (if applicable)

Service integration; low threshold programs; opioid substitution therapy

Shown to benefit

Alcohol dependent, Drug dependent

Example of Good Practice

Morozova O, Dvoryak S, Altice FL. Methadone treatment improves tuberculosis treatment among hospitalized opioid dependent patients in Ukraine. *Int J Drug Policy*. 2013 Nov;24(6):e91-8

BACKGROUND:

Ukraine's volatile syndemics of tuberculosis (TB) and HIV among people who inject drugs (PWIDs) introduces numerous treatment challenges for each condition, including high mortality and development of multi-drug resistant TB (MDR-TB).

METHODS:

A prospective, non-randomized 90-day observational study was conducted in six Ukrainian TB treatment sites to assess the effectiveness of integrating methadone maintenance (MMT) with TB treatment using: (1) 90-day TB treatment retention; (2) time to treatment discontinuation; (3) TB medication adherence; and (4) subject disposition, including mortality. Of the 110 participants enrolled, 57 received MMT and 53 did not (non-MMT).

RESULTS:

All of the primary outcomes were significantly better in MMT versus non-MMT groups, including 90-day TB treatment completion (89.5% versus 73.6%; $p=0.031$), time to TB treatment discontinuation ($p=0.039$) and TB medication adherence (97.1% versus 86.2%; $p \downarrow 0.001$) after controlling for death. The major reasons for treatment non-completion in the non-MMT group included death ($N=3$), administrative discharge from the clinic ($N=5$), loss to follow-up ($N=2$), and arrest ($N=4$). Overall, 90-day mortality was high (8.2%). After controlling for covariates differing between the two groups at baseline, the only independent predictor of completing 90 days of TB treatment was receipt of MMT in an integrated treatment setting (AOR=3.05; 95% CI 1.08-8.66).

CONCLUSIONS:

MMT integrated into inpatient TB treatment significantly improves retention in TB treatment and TB medication adherence among PWIDs. These findings call for policy change to increase the number of MMT sites in TB facilities and make MMT a low-threshold treatment option for opioid dependence in Ukraine.

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Brief Description of the Approach

While it is widely recognized that TB patients need assistance to stop smoking, many NTPs are ill-equipped to make timely referrals or to provide effective interventions. Patients with TB need and should receive help in stopping smoking (Chiang et al 2011)

List of alternative names (if applicable)

Quitting; tobacco cessation

Shown to benefit

Smokers

Example of Good Practice

Awaisu et al. Substance Abuse Treatment, Prevention, and Policy 2011, 6:26
The SCIDOTS Project: evidence of benefits of an integrated tobacco cessation intervention in tuberculosis care on treatment outcomes.
<http://www.substanceabusepolicy.com/content/6/1/26>

An integrated TB-tobacco intervention was provided by trained TB directly observed therapy shortcourse (DOTS) providers at five chest clinics in Malaysia. The study was a prospective non-randomized controlled intervention using quasi-experimental design. Using Transtheoretical Model approach, 120 eligible participants who were current smokers at the time of TB diagnosis were assigned to either of two treatment groups: conventional TB DOTS plus smoking cessation intervention (integrated intervention or SCIDOTS group) or conventional TB DOTS alone (comparison or DOTS group). At baseline, newly diagnosed TB patients considering quitting smoking within the next 30 days were placed in the integrated intervention group, while those who were contemplating quitting were assigned to the comparison group. Eleven sessions of individualized cognitive behavioral therapy with or without nicotine replacement therapy were provided to each participant in the integrated intervention group. The impacts of the novel approach on biochemically validated smoking cessation and TB treatment outcomes were measured periodically as appropriate. Results: A linear effect on both 7-day point prevalence abstinence and continuous abstinence was observed over time in the intervention group. At the end of 6 months, patients who received the integrated intervention had significantly higher rate of success in quitting smoking when compared with those who received the conventional TB treatment alone (77.5% vs. 8.7%; $p \downarrow 0.001$). Furthermore, at the end of TB treatment (6 months or later), there were significantly higher rates of treatment default (15.2% vs. 2.5%; $p = 0.019$) and treatment failure (6.5% vs. 0%; $p = 0.019$) in the DOTS group than in the SCIDOTS group. Conclusion: This study provides evidence that connecting TB-tobacco treatment strategy is significant among TB patients who are smokers. The findings suggest that the integrated approach may be beneficial and confer advantages on short-term outcomes and possibly on future lung health of TB patients who quit smoking. This study may have important implications on health policy and clinical practice related to TB management among tobacco users.

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<http://www.substanceabusepolicy.com/content/6/1/26>

Brief Description of the Approach

Care of diabetes is underdeveloped in many low-income and middle-income countries. Strengthening such services may be a necessary component of collaborative activities. Potentially, optimized care of diabetes among people with TB could be an entry point for improved care of the disease in the general health system. Although there are no published trials assessing if improved glucose control reduces the risk of adverse TB treatment outcomes, the existing evidence indirectly suggests that optimized management of diabetes in TB patients, including early diagnosis, optimized treatment and health education, and clinical and therapeutic monitoring, would improve TB treatment outcomes and reduce the risk of recurrent TB. Optimized diabetes management may also improve outcomes of other co-infections in diabetes, accounting for as much as 24% of deaths in African patients. Further research needs to be conducted to better understand drug-drug interactions and determine if any changes to drug choice and/or dosage are required.

List of alternative names (if applicable)

Care of diabetes; optimize diabetes management

Shown to benefit

Persons with diabetes

Potential Beneficiaries

Persons with diabetes

Example of Good Practice

In Malawi, joint management of TB and diabetes under an adapted DOTs model began in 2009 in a diabetes clinic at Queen Elizabeth Central Hospital in Blantyre. A total of 170 new patients were registered between October and December 2010. At follow up, only three had died, 53 had defaulted and three had transferred out. Allain, T. J., J. J. van Oosterhout, et al. (2011). "Applying lessons learnt from the DOTs Tuberculosis Model to monitoring and evaluating persons with diabetes mellitus in Blantyre, Malawi." *Tropical Medicine and International Health* 16 (9): 1077-1084.

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Brief Description of the Approach

HIV counseling and testing are indicated for all TB patients as part of their routine management. Both HIV+ and HIV- TB patients who report HIV risk behaviors should receive effective interventions to prevent HIV transmission.

These may include varying packages of prevention efforts including:

1. Psychosocial counseling on risk reduction, including, condom use, reducing the number of sexual partners,
2. Voluntary medical male circumcision
3. Safer injection techniques,
4. Screening and treatment of sexually transmitted infections
5. Vaccination against HPV where appropriate
6. Addressing gender-based violence, addiction, and other factors that increase HIV transmission risk.

List of alternative names (if applicable)

Stop AIDS; service integration; integrated prevention; HIV testing and counselling to patients with presumptive and diagnosed TB

Shown to benefit

Drug dependent, Miners, Shantytown/favela/slum residents, Marginalized MSM

Potential Beneficiaries

Alcohol dependent, Prisoners, HCWs, Sex workers, Transgender, Homeless, Street children/ Orphans and Vulnerable Children, Truck drivers

Example of Good Practice

Lesedi: services for women at high risk help Reduce sexually transmitted infection (STI) Prevalence in a South African mining community

<http://www2.unescobkk.org/hivaids/fulltextdb/aspUploadFiles/FHIUNAIDSBestPracticesredux.pdf>

In the first nine months of the project, peer educators raised awareness of STIs and prevention methods. More than 400 women attended the clinic at least once for examination, counselling and treatment. Clinic protocols were designed to provide effective treatment for the most common curable STIs in the community: all women attending the clinic were offered presumptive antibiotic treatment based on their high risk of exposure. Additional treatment was added, as needed, for women who were symptomatic. For the evaluation of this first phase of the intervention, STI rates were measured both for the women attending the clinic and the miners living in the area.

Among women using the services, STI prevalence was reduced by 70-85 per cent. Local miners screened nine months after the start of the project were found to have a 43 per cent lower rate of gonorrhoea/chlamydial infection and 78 per cent fewer genital ulcers than they had had before the intervention. STI consultation rates at mine health services were also monitored, and miners living in hostels near the intervention had significantly lower rates of symptomatic STIs than those living farther away. In addition, self-reported condom use during commercial sex rose from negligible levels to 20-30 per cent of encounters within nine months. By the end of the first year, evaluation results, projections and a cost-benefit analysis were prepared and presented to the management of Harmony Mines. Based on the results, the company, with support from the Department of Health, assumed the management and implementation costs of the project.

Selected List of Guidances, Tools and Manuals

Making condoms work for HIV prevention: cutting-edge perspectives. UNAIDS Best practices collection 2004

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WHO policy on collaborative TB/HIV activities: guidelines for national programmes and other stakeholders, World Health Organization, 2012

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J. C. Kigosi, P. Heunis, E. Chikobvu, E. Wouters, and H. S. van den Berg, *Determinants of Condom Use Amongst Tuberculosis Patients in the Free State Province, South Africa* [Ph.D. thesis], Department of Psychology, Faculty of the Humanities, University of the Free State (UFS), 2011.

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Brief Description of the Approach

A pharmaceutical/commodity management system is an important component of the DOTS strategy. A Tuberculosis (TB) pharmaceutical management system involves four functions: selection, procurement, distribution, and use. All of these functions, together, are essential for the supply and management of TB medicines. It is a step-by-step approach that enables the review of critical areas within TB pharmaceutical management.

By identifying weaknesses in their TB pharmaceutical management systems and mechanisms, users can achieve strengthened and improved selection, procurement, distribution, and management support for TB medicines. This, ultimately saves money, improves treatment outcomes, and reduces the chances of drug-resistant TB (DR-TB) from developing.

This approach is intended for use by NTP stakeholders, directors and/or senior managers, Ministry of Health units, NGOs, and donors involved with TB infection control (TB-IC).

List of alternative names (if applicable)

Supply chain management, TB drug logistics, Stock-out prevention, Pharmaceutical management,

Shown to benefit

All risk groups

Potential Beneficiaries

All risk groups

Example of Good Practice

In 2003, the Dominican Republic's NTP did not have enough information on the TB pharmaceutical sector to make important program decisions and implement interventions to address the country's growing TB crisis. However, with USAID resources and the Rational Pharmaceutical Management (RPM) Plus Program, the NTP was able to design a TB pharmaceutical management system. Preliminary data from the system illustrated a depletion of security stocks in some health facilities, and an over-supply of some medicines in other facilities. The programs then redistributed the medicines to resolve this issue. The RPM Plus Program also observed an increase in prices for all TB medicines; the individual product prices led to increased prices for a complete course of treatment for a new patient.

RPM Plus and USAID presented the price analysis to the Ministry of Health and TB program authorities, and then recommended they procure lower-priced, quality medicines through international agencies. This led to the promulgation of a Ministry decree requiring TB medicines to be procured through Global Drug Facility (GDF) mechanisms. The annual savings were estimated at about USD 775,000. RPM Plus also helped the NTP make the transition to new fixed dose combinations (FDC) and assisted them in their application to the GDF.

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Rational Pharmaceutical Management Plus. 2005. Pharmaceutical management for Tuberculosis Assessment Manual. Edited by A. Zagorskiy, C. Owunna, and T. Moore. Submitted to the U.S. Agency for International Development by the RPM Plus Program. Arlington, VA: Management Sciences for Health.

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Global Drug Facility: Quality Assurance Policy and Procedures. Geneva, World Health Organization, July 2010.

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Procurement Manual for MDR-TB Projects under the Green Light Committee mechanism. Geneva, World Health Organization, 2008 (WHO/HTM/STB/2008.51).

http://whqlibdoc.who.int/hq/2008/WHO_HTM_STB_2008.51.pdf

Rapid Advice: Treatment of tuberculosis in children. Geneva, World Health Organization, 2010 (WHO/HTM/TB/2010.13).

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QUANTIMED TOOL – Drug Forecasting Tool

<http://www1.msh.org/projects.../Software-Tools/Quantimed.cfm>

QUAN-TB TOOL – Early Warning System

<http://siapsprogram.org/quantb/>

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Valdez, C., Barillas, E., Marcelino, B. and L. Reyes. Single supply system: a tool to ensure timely access to quality medicines and supplies for controlling Tuberculosis in the Dominican Republic. N.d. Presented for the United States Agency for International Development, SPS, Arlington, VA: Management Sciences for Health.

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Brief Description of the Approach

Recognition of patient's rights is at the heart of a patient centered approach. Working from a rights based approach implies that patients are entitled to receive high quality TB care services and the full range of pertinent information on diagnosis and treatment, ensuring that they can make informed choices and become equal partners in the management of their care, as well as active advocates in the fight against TB. TB service providers should realize every patient's right to non-discrimination, to universal access to care, support and complete TB treatment.

Specific attention needs to be given to recognizing gender equality issues. The power position of women and girls in many communities is often lower and thus their rights are not recognized. (WHO: Women and Health 2009)

The Patient's Charter should be visible at every health facility providing TB care and should be integrated into pre and in-service training, as well as used as a tool during sessions to educate Patient's and the community about TB. At the National level, the Patient's Charter should be fully integrated into National TB Policies and Strategies.

Training and inspiring health staff to uphold TB patients' right can increase the quality of the partnership, as well as improve patients' satisfaction and treatment outcomes. Periodically health staff should conduct an assessment of whether TB patients feel that their rights have been respected. It is important to engage patients lost to follow up as well as treatment completers in the dialog.

List of alternative names (if applicable)

Patient-centered approach (PCA)

Shown to benefit

All risk groups

Potential Beneficiaries

Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), HIV-infected/PMTCT, Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs /Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban slum residents, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

To scale-up implementation of the Patient's Charter at the country level, TB CAP supported "Rights and Responsibilities" Road shows in two countries; DR Congo and Indonesia. The road shows joined the rights based approach with the individual duty of those affected by TB to act responsibly in face of a public health threat. (World Care Council website)

The road shows consisted of two one-day advocacy meetings held consecutively; one specifically focused on patients and communities and the other focused on the National TB Program and other stakeholders to increase uptake of the Rights and Responsibilities approach.

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Guidance on ethics of tuberculosis prevention, care and control. Geneva, World Health Organization, 2010 (WHO/HTM/TB/2010.16).

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Committee on Economic, Social and Cultural Rights, General Comment No. 14

[http://www.unhchr.ch/tbs/doc.nsf/\(symbol\)/E.C.12.2000.4.En](http://www.unhchr.ch/tbs/doc.nsf/(symbol)/E.C.12.2000.4.En)

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Brief Description of the Approach

Poverty, stigma and discrimination are common problems of patients with TB, especially TB with HIV co-infection, MDR-TB and being female patients in several high TB burden countries. These complications can lead to non-adherence to TB treatment. As TB treatment requires at least 6 months, it is important to establish rapport and trust for TB patients along the treatment process. Several studies show how a good health providers- patients- relationship enhances treatment adherence. Training and inspiring health staff to promote patients' right and a patient centered approach can increase adherence to treatment and increase patients' satisfaction.

TB service providers should:

- Treat a patient as a person not as a disease
- Consider the individual patient needs and perspectives
- Share information, power and responsibility in TB treatment.
- Create opportunities for the patient to participate in planning and managing his/her own health
- Develop a professional-patient relationship based on care, sensitivity and empathy

List of alternative names (if applicable)

Address social determinants, combat stigmatization; patient support, patient's rights patient empowerment

Potential Beneficiaries

Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), HIV-infected/PMTCT, Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs /Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban slum residents, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

Macq, J., Solis, A, Martinez, G and Martiny, P. I. Tackling tuberculosis patients' internalized social stigma through patient centered care: An intervention study in rural Nicaragua. BMC Public Health 2008 8:154

Abstract

Background

We report a patient-centered intervention study in 9 municipalities of rural Nicaragua aiming at a reduction of internalized social stigma in new AFB positive tuberculosis (TB) patients diagnosed between March 2004 and July 2005.

Methods

Five out of 9 municipal teams were coached to tailor and introduce patient-centered package. New TB patients were assigned to the intervention group when diagnosed in municipalities implementing effectively at least TB clubs and home visits. We compared the changes in internalized stigma and TB treatment outcome in intervention and control groups. The internalized stigma was measured through score computed at 15 days and at 2 months of treatment. The treatment results were evaluated through classical TB program indicators. In all municipalities, we emphasized process monitoring to capture contextual factors that could influence package implementation, including stakeholders.

Results

TB clubs and home visits were effectively implemented in 2 municipalities after June 2004 and in 3 municipalities after January 2005. Therefore, 122 patients were included in the intervention group and 146 in the control group. After 15 days, internalized stigma scores were equivalent in both groups. After 2 months, difference between scores was statistically significant, revealing a decreased internalized stigma in the intervention group and not in the control group.

Conclusion

This study provides initial evidences that it is possible to act on TB patients' internalized stigma, in contexts where at least patient centered home visits and TB clubs are successfully implemented. This is important as, indeed, TB care should also focus on the TB patient's wellbeing and not solely on TB epidemics control.

Selected List of Guidances, Tools and Manuals

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<http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD003267/pdf>

Macq, J., Solis, A, Martinez, G and Martiny, P. I. Tackling tuberculosis patients' internalized social stigma through patient centered care: An intervention study in rural Nicaragua. BMC Public Health 2008 8:154

Brief Description of the Approach

Effective interpersonal communication (IPC) (counseling) between health care provider (HCP) and the patient is an important for improving treatment adherence and health outcomes.

Effective communication is not easy to be acquired on day to day basis even if the patient and health care provider come from the same geographic area and speak the same language due to different educational, socio-economic and cultural backgrounds.

Good communication enhances health care education and results in more appropriate treatment regimes. During the counselling process a person tries to sort out issues and reach decisions affecting their life. Strong counselling skills for both- disease specific testing and ongoing adherence counselling are important.

“Counseling includes establishing supportive relationships; having conversations with a purpose (not just chatting); listening attentively; helping people tell their stories without fear of stigma or judgment; giving correct and appropriate information; helping people to make informed decisions; exploring options; helping people to recognize and build on their strengths; helping people to develop a positive attitude to life; respecting everyone’s needs, values, culture, religion and lifestyle”³⁰.

“Counseling is effective when it leads to the following five outcomes:
1) the patient discloses enough information about the illness to lead to an accurate diagnosis; 2) the provider, in consultation with the client, selects a medically appropriate treatment acceptable to the client; 3) the client understands his or her condition and the prescribed treatment regimen; 4) the provider and the client establish a positive rapport; 5) the client and the provider are both committed to fulfilling their responsibilities during treatment and follow-up care”³¹.

Health care providers should remember that patients’ compliance with treatment regimes depends on how well the patients understand the nature of their disease and how they feel about the prescribed treatment.

List of alternative names (if applicable)

Effective communication strategies, Information, education and communication (IEC)
Effective interpersonal communication (IPC)

Potential Beneficiaries

All

Example of Good Practice

In Tajikistan, for the past five years, USAID has been retraining doctors who graduated from medical school as specialists to instead serve their communities as family doctors. The course emphasizes the importance of building strong relationships with patients and includes three days focused specifically on TB, during which time the doctors learn how to communicate effectively with TB patients in order to convince them to complete their treatment.

In Konibodom, the Quality Project is having a dramatic impact. The number of patients in the region tested for TB increased almost 20% between 2008 and 2010. TB diagnoses have increased, and 90% of new TB patients have been cured- an especially impressive result when only 76.8% of cases were cured in Tajikistan overall in 2010. These positive statistics are the result of the strong relationships developed between family doctors, TB specialists, and their patients.³²

Selected List of Guidances, Tools and Manuals

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http://whqlibdoc.who.int/publications/2010/9789241500463_eng.pdf

Improving Interpersonal Communication Between Health Care Providers and Clients, Quality Assurance Project, USAID
http://pdf.usaid.gov/pdf_docs/PNACE294.pdf

Selected Bibliographic References of Uses of this Strategy

Operational guidelines on HIV testing and counseling of infants, children and adolescents for service providers in the African Region, WHO AFRO, 2010

Conte C., Advanced Techniques for Counseling and Psychotherapy, ISBN:978-0-8261-0451-9, Springer Publishing Company, LLC, 2009
http://springerpub.net/samples/04502_chapter.pdf

Horizons, SHARAN, Population Council: The PLHA-friendly achievement checklist: a self-assessment tool for hospitals and other medical institutions caring for people living with HIV/AIDS (PLHA). New York 2003.

Reducing Stigma and Discrimination Related to HIV and AIDS: Training for Health Care Workers. EngenderHealth: Reducing stigma and discrimination related to HIV and AIDS: training for health care workers. New York: EngenderHealth; 2004.

Brief Description of the Approach

In TB treatment and care it is important to recognize the right of the patients to have choices. The strategy for treatment and care allocation means identify choice between health facility-based supervision and home-based treatment supervision with patient's identified treatment supporter to increase treatment adherence, compliance and to prevent development of the resistant forms of the disease. It is also important to make clear to the patients that regular returns to the health facility for follow-up visits to check-up the progress, sputum examinations, and drug collection will still be needed.

It is often assumed that close family members can't be chosen as treatment supporters due to dependency and emotional attachments.

List of alternative names (if applicable)

Community-based DOTS, Patient-centered treatment (PCT)

Shown to benefit

All

Example of Good Practice

Mkopi A, Range N, Amuri M, Geubbels E, Lwilla F, Egwaga S, Schulze A, van Leth F. Health workers' performance in the implementation of Patient Centred Tuberculosis Treatment (PCT) strategy under programmatic conditions in Tanzania: a cross sectional study. BMC Health Serv Res. 2013 Mar 16;13:101. doi: 10.1186/1472-6963-13-101. PubMed PMID: 23497025; PubMed Central PMCID: PMC3608936.

"The Tanzania experience shows that daily contact with a health facility to obtain TB treatment was seen as a burden by both the patients and the health staff. Fifty percent of the patients who found daily travel to the health facility a burden lived within 5km of the facility. It is therefore not surprising that patients mentioned the possibility of taking their drugs at a nearer health facility or at home as a way to improve the current strategy of TB treatment delivery. This is in addition to the expressed wish of having fewer drugs and/or a shorter treatment period. These factors were also mentioned by the health workers as the most important factors to improve the current TB treatment strategy.

In a home-based treatment supervision study in Uganda, patients preferred to have their treatment supervision done by a neighbor rather than a family member (Adatu et al 2003). This was to avoid uneasiness within the family if the relationship between patient and supporter was not congruent with the hierarchical pattern commonly seen in Ugandan families.

This example makes it clear that treatment delivery strategies and supervision strategies are context-specific and that the strategies have to be carefully assessed in each new setting".

<http://www.novartisfoundation.org/platform/apps/Publication/getfmfile.asp?id=&el=2303&s.e=682556354&doc=169&dse=4>

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- WHO. A Guide for TB Treatment Supporter. 2002
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http://www.emro.who.int/cbi/pdf/trainers_guide_module3_en.pdf
- Priority interventions: HIV/AIDS prevention, treatment and care in health sector, WHO, 2010, ISBN, 9789241500234
- Strategic plan for the prevention and control of multidrug-resistant and extensively drug-resistant tuberculosis in the Eastern Mediterranean Region (2010-2015) / World Health Organization. Regional Office for the Eastern Mediterranean, WHO-EM/TUB/257/E, 2010
http://www.emro.who.int/stb/pdf/stb_mdr_plan_final30dec10.pdf
- Guidelines for social mobilization. A human rights approach to TB:
<http://www.who.int/hhr/information/A%20Human%20Rights%20Approach%20to%20Tuberculosis.pdf>
- Community involvement in TB:
http://www.who.int/tb/people_and_communities/involvement/resources/en/index.html
- Active engagement of civil society organizations
http://whqlibdoc.who.int/hq/2010/WHO_HTM_TB_2010.15_eng.pdf
- Engage-TB: integrating community-based tuberculosis activities into the work of nongovernmental and other civil society organizations: operational guidance Getahun, Haileyesus II. Joseph, Thomas. III. Tomaskovic, Lana. IV. Raviglione, Mario C. World Health Organization.
 ISBN 978 92 4 150450 8 (NLM classification: WF 200)
http://apps.who.int/iris/bitstream/10665/75997/1/9789241504508_eng.pdf

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<http://www.dfid.gov.uk/What-we-do/Research-and-evidence/case-studies/research-case-studies/2010/Patient-centred-TB-treatment/>
- Saidi Egwaga et al. Assessment of patient preference in allocation and observation of anti-tuberculosis medication in three districts in Tanzania, Patient Preferences and Adherence 2008:2 1-6
<http://www.novartisfoundation.org/platform/apps/Publication/getfmfile.asp?id=&el=2303&se=682556354&doc=169&dse=4>
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- Munro, S.A., Lewin, S.A., Smith, H.J., Engel, M.E., Fretheim, A. and Volmink, J. Patient Adherence to Tuberculosis Treatment: A Systematic Review of Qualitative Research. PLoS Medicine 2007; Vol 4, Issue 4: pp 1230-1245.

Brief Description of the Approach

Traditional healers can be authoritative figures in some settings and play a key role in patient support and adherence. A number of studies have shown that traditional healers can play both a positive and negative role in TB diagnosis and treatment and when they are actively engaged in a respectful collaboration with the formal TB program, they may be less likely to delay or divert TB suspects and patients from their formal treatment path. Patients may also experience higher satisfaction with complementary care by practitioners who share their disease etiology.

List of alternative names (if applicable)

Task shifting, patient support

Shown to benefit

Indigenous populations

Potential Beneficiaries

Nomads, Pastoralists, Migrants

Example of Good Practice

Colvin, M., L. Gumede, et al. (2003). "Contribution of traditional healers to a rural tuberculosis control programme in Hlabisa, South Africa." *Int J Tuberc Lung Dis* 7(9 Suppl 1): S86-91.

SETTING: The rural health district of Hlabisa, KwaZulu-Natal, South Africa.

OBJECTIVES: To assess the acceptability and effectiveness of traditional healers as supervisors of tuberculosis (TB) treatment in an existing directly observed treatment, short-course (DOTS) program.

DESIGN: An observational study comparing treatment outcomes among new TB patients in the three intervention sub-districts offered the additional option of traditional healers for directly observed treatment (DOT) supervision with those in the remainder of the district offered the standard range of options for DOT supervision (health facility, community health worker and lay persons). A comparison was also made of treatment outcomes between different options for DOT supervision. **RESULTS:** A total of 3461 TB patients were registered in Hlabisa District from April 1999 to December 2000, of whom 2823 were discharged from hospital to the ambulatory DOT program. Treatment outcomes were known for 1816 patients in Hlabisa District (275 patients in the intervention area and 1541 patients in the control area). There was no significant difference ($P \downarrow 0.5$) in treatment outcome in the intervention and control areas (77% vs. 75%). Among 275 patients with known outcomes in the intervention area, 48 patients were supervised by traditional healers and 227 patients supervised by people other than traditional healers. Treatment completion was not significantly higher among patients supervised by traditional healers than among patients supervised by other categories of DOT supervisor (88% vs. 75%, $P = 0.3841$). Interviews with 41 of 51 traditional healer patients who had completed treatment revealed high levels of satisfaction with the care received.

CONCLUSIONS: Traditional healers make an effective contribution to TB program performance in this pilot scheme in Hlabisa district. Further evaluation will be necessary as this approach is scaled up.

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http://whqlibdoc.who.int/hq/2002/WHO_CDS_TB_2002.300.pdf

Strategic Guide for Building PPM Partnerships to Support Tuberculosis Control. PATH, KNCV. 2011
http://www.tbcare1.org/publications/toolbox/tools/access/download.php?file=Guide_PPM.pdf

WHO. 2006. Engaging All Health Care Providers in TB Control. Guidance on Implementing Public Private Mix Approaches. Geneva: WHO. (WHO/HTM/2006.360)
http://whqlibdoc.who.int/hq/2006/WHO_HTM_TB_2006.360_eng.pdf

Engage-TB: integrating community-based tuberculosis activities into the work of nongovernmental and other civil society organizations: operational guidance Getahun, Haileyesus II. Joseph, Thomas. III. Tomaskovic, Lana. IV. Raviglione, Mario C. World Health Organization. ISBN 978 92 4 150450 8 (NLM classification: WF 200)
http://apps.who.int/iris/bitstream/10665/75997/1/9789241504508_eng.pdf

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Barker RD, Millard FJ, Malatsi J, et al. Traditional healers, treatment delay, performance status and death from TB in rural South Africa. *Int J Tuberc Lung Dis* 2006;10(6):670-5.

Brouwer JA, Boeree MJ, Kager P, Varkevisser CM, Harries AD. Traditional healers and pulmonary tuberculosis in Malawi. *Int J Tuberc Lung Dis* 1998;2(3):231-4.

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Colvin M, Gumede L, Grimwade K, Maher D, Wilkinson D. Contribution of traditional healers to a rural tuberculosis control programme in Hlabisa, South Africa. *Int J Tuberc Lung Dis* 2003;7(9 Suppl 1):S86-91.

Quedraogo M, Kouanda S, Boncounou K, et al. Treatment seeking behaviour of smear-positive tuberculosis patients diagnosed in Burkina Faso. *Int J Tuberc Lung Dis* 2006;10(2):184-7.

Reniers G, Tesfai R. Health services utilization during terminal illness in Addis Ababa, Ethiopia. *Health Policy Plan* 2009;24(4):312-9.

Schneider P, Shewangizaw E, Taye E, et al. [Traditional medicine in Ethiopia in childhood diseases]. *Kinderarztl Prax* 1989;57(8):393-9.

Steen TW, Mazonde GN. Ngaka ya setswana, ngaka ya sekgoa or both? Health seeking behaviour in Botswana with pulmonary tuberculosis. *Soc Sci Med* 1999;48(2):163-72.

Tupasi TE, Radhakrishna S, Co VM, et al. Bacillary disease and health seeking behavior among Filipinos with symptoms of tuberculosis: implications for control. *Int J Tuberc Lung Dis* 2000;4(12):1126-32.

Wilkinson D, Gcabashe L, Lurie M. Traditional healers as tuberculosis treatment supervisors: precedent and potential. *Int J Tuberc Lung Dis* 1999;3(9):838-42.

Brief Description of the Approach

Peersupport is often a means of empowering patients in a health system. A patient support group is a group of people sharing the common experience of ill health. They share information and discuss ways to cope with the challenges of living with TB. Peer groups may provide support face-to-face (physically) or using available Internet sources (online-discussions including consultations, group therapy, and other resources to teach individuals how to cope and adapt to the new life-style).

Peers can reduce stigma, support patients' compliance, and increase patients' self-efficacy. Peer support groups can also free up the time of professional health and social workers by providing basic education and counseling at the clinic and by following up missed appointments.

List of alternative names (if applicable)

Peer support; Peer education, Task shifting, TB Clubs

Shown to benefit

Indigenous populations

Potential Beneficiaries

All

Example of Good Practice

Macq, J., Solis, A, Martinez, G and Martiny, P. I. Tackling tuberculosis patients' internalized social stigma through patient centered care: An intervention study in rural Nicaragua. BMC Public Health 2008 8:154.

An intervention study in 9 municipalities of rural Nicaragua aimed at a reduction of internalized social stigma in new AFB positive tuberculosis patients diagnosed between March 2004 and July 2005. Five out of 9 municipal teams were coached to tailor and introduce the patient-centered package. New TB patients were assigned to the intervention group when diagnosed in municipalities implementing effectively at least TB clubs and home visits.

We compared the changes in internalized stigma and TB treatment outcome in intervention and control groups. The internalized stigma was measured through scores computed at 15 days and at 2 months of treatment. The treatment results were evaluated through classical TB program indicators. In all municipalities, we emphasized process monitoring to capture contextual factors that could influence package implementation, including stakeholders. TB clubs and home visits were effectively implemented in 2 municipalities after June 2004 and in 3 municipalities after January 2005. Therefore, 122 patients were included in the intervention group and 146 in the control group. After 15 days, internalized stigma scores were equivalent in both groups. After 2 months, the difference between scores was statistically significant, revealing a decreased internalized stigma in the intervention group and not in the control group. This study provides initial evidence that it is possible to act on TB patients' internalized stigma, in contexts where patient centered home visits and TB clubs are successfully implemented.

Selected List of Guidances, Tools and Manuals

Patient Centered Approach booklet
http://www.tbcare1.org/publications/toolbox/tools/access/download.php?file=PCA_Booklet.pdf

Planning, Managing and Monitoring Peer Educator Programs,
International Center for AIDS Care and Treatment Programs (ICAP), Columbia University, 2009

WHO. A Guide for TB Treatment Supporter. 2002
http://whqlibdoc.who.int/hq/2002/WHO_CDS_TB_2002.300.pdf

WHO. Community involvement in tuberculosis care and prevention. Towards partnerships for health Guiding principles and recommendations based on a WHO review. Geneva: WHO. 2008
http://whqlibdoc.who.int/publications/2008/9789241596404_eng.pdf

Engage-TB: integrating community-based tuberculosis activities into the work of nongovernmental and other civil society organizations: operational guidance Getahun, Haileyesus II. Joseph, Thomas. III. Tomaskovic, Lana. IV. Raviglione, Mario C. World Health Organization. ISBN 978 92 4 150450 8 (NLM classification: WF 200)
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Advocacy, communication and social mobilization for tuberculosis control: collection of country-level good practices, WHO 2010, ISBN 978 92 4 150062 3
<http://www.stoptb.org/assets/documents/countries/acsm/26%20Jan%202011%20FINAL%20for%20WEB.pdf>

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Van Rie A, Sengupta S, Punggrassami P, Balthip Q, Choonuan S, Kasetjaroen Y, et al. Measuring stigma associated with tuberculosis and HIV/AIDS in southern Thailand: exploratory and confirmatory factor analyses of two new scales. Trop Med Int Health. 2008;13:21-30. [PubMed]

Brief Description of the Approach

Adverse drug reactions to anti-TB drugs can cause patient non-adherence to TB treatment. Serious drug reactions complicate TB treatment and lead to additional morbidities. Reports about the incidence and risk factors for adverse drug reactions are varied among the countries. TB service providers and treatment supporters should have knowledge about anti-TB drugs, the possible side effects of each drug, and how to manage drug reactions. Once a problem is identified, the solutions can be clinical, social, or economic, e.g. poor TB patients who do not have food to eat struggle to take pyrazinamide (PZA) because it causes stomach upset and nausea. TB patients with abnormal pre-treatment baseline laboratory results such as renal or liver problems should be closely monitored by clinicians. In general, TB patients should have clinical evaluations at least monthly. The body weight should be measured and provider should question patients about symptoms of adverse drug reactions including visual disturbances, skin allergy, hepatic toxicity, damage nervous system, stomach upset, and bleeding problems. Major drug reactions require stoppage of treatment and immediately seek medical care. Minor drug reactions require reassuring drug counseling.

List of alternative names (if applicable)

PMDT, side effects management

Shown to benefit

Peri-partum women, elderly, people with HIV, alcohol dependent, smokers, drug dependent, malnourished patients, and those with MDR-TB.

Potential Beneficiaries

Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), HIV-infected/PMTCT, Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs /Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban slum residents, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

A Pilot Study of an mHealth Application for Healthcare Workers: Poor Uptake Despite High Reported Acceptability at a Rural South African Community-Based MDR-TB Treatment Program. Krisda H. Chaityachati, Marian Loveday, Stephen Lorenz, Neal Lesh, Lee-Megan Larkan, Sandro Cinti, Gerald H. Friedland, Jessica E. Haberer PLoS One. 2013 May 28;8(5):e64662. doi: 10.1371/journal.pone.0064662. Print 2013. <http://www.ncbi.nlm.nih.gov/pubmed/23724075>

Introduction

As the South African province of KwaZulu-Natal addresses a growing multidrug-resistant tuberculosis (MDR-TB) epidemic by shifting care and treatment from trained specialty centers to community hospitals, delivering and monitoring MDR-TB therapy has presented new challenges. In particular, tracking and reporting adverse clinical events have been difficult for mobile healthcare workers (HCWs), trained health professionals who travel daily to patient homes to administer and monitor therapy. We designed and piloted a mobile phone application [Mobilize] for mobile HCWs that electronically standardized the recording and tracking of MDR-TB patients on low-cost, functional phones.

Objective

We assess the acceptability and feasibility of using Mobilize to record and submit adverse events forms weekly during the intensive phase of MDR-TB therapy and evaluate mobile HCW perceptions throughout the pilot period.

Methods

All five mobile HCWs at one site were trained and provided with phones. Utilizing a mixed-methods evaluation, mobile HCWs' usage patterns were tracked electronically for seven months and analyzed. Qualitative focus groups and questionnaires were designed to understand the impact of mobile phone technology on the work environment.

Results

Mobile HCWs submitted nine of 33 (27%) expected adverse events forms, conflicting with qualitative results in which mobile HCWs stated that Mobilize improved adverse events communication, helped their daily workflow, and could be successfully expanded to other health interventions. When presented with the conflict between their expressed views and actual practice, mobile HCWs cited forgetfulness and believed patients should take more responsibility for their own care.

Discussion

This pilot experience demonstrated poor uptake by HCWs despite positive responses to using mHealth. Though our results should be interpreted cautiously because of the small number of mobile HCWs and MDR-TB patients in this study, we recommend carefully exploring the motivations of HCWs and technologic enhancements prior to scaling new mHealth initiatives in resource poor settings.

Selected List of Guidances, Tools and Manuals

Guidelines for the programmatic management of drug-resistant tuberculosis: emergency update, 2008. Geneva, World Health Organization, 2008 (WHO/HTM/TB/2008.402) and (ii) Multidrug-resistant tuberculosis (MDR-TB) indicators. A minimum set of indicators for the programmatic management of MDR-TB in national tuberculosis control programmes. Geneva, World Health Organization, 2011 (WHO/HTM/TB/2010.11).

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Chapter 6: Treatment of TB Disease

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Centers for Disease Control and Prevention. Updated guidelines for the use of rifabutin or rifampin for the treatment and prevention of tuberculosis in HIV-infected persons taking protease inhibitors or non-nucleoside reverse transcriptase inhibitors. Morbidity and Mortality Weekly Report, 2000, 49:185-189.

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The Use of Bedaquiline in the Treatment of Multidrug-Resistant Tuberculosis: Interim Policy Guidance. Source Geneva: World Health Organization; 2013.

<https://cz3xxm1r7383gmj6jj72jrt.sec.amc.nl/books/n/whocollect/>

Revised WHO Guidelines for Programmatic Management of Drug Resistant Tuberculosis.2011

http://www.who.int/tb/dots/mdr_tb_guidelines_ppt.pdf

Community-Based Care for Drug-Resistant Tuberculosis: A Guide For Implementers TB CARE II

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The PIH Guide to the Medical Management of Multidrug-Resistant Tuberculosis

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<http://www.who.int/tb/publications/toman/en/index.html>

Girling DJ, Hitze KL. Adverse effects of rifampicin. Bulletin of the World Health Organization, 1979, 57:207-212.

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Brief Description of the Approach

Although directly observed treatment (DOT) is the best strategy to ensure TB treatment adherence, in some situations either health facility based or home based-DOT are not possible. For instance, patients who want to keep their illness confidential. According to the rights-based and patient centered approach, TB service providers should respect patients' decisions and plan with the patient to ensure treatment adherence. Both provider and patient should discuss and decide the follow up plan for the entire TB treatment course.

List of alternative names (if applicable)

Patient-centered approach

Shown to benefit

Peri-partum women, elderly, people with HIV, alcohol dependent, smokers, drug dependent, malnourished patients, and those with MDR-TB.

Potential Beneficiaries

HCWs/Lab staff, Military/Soldiers, Nomads/Pastoralists,

Example of Good Practice

Bulletin of the World Health Organization. 2011 Sep 1; Volume 89, Number 9: 632-9. Epub 2011 May 20. Electronic Monitoring of Treatment Adherence and Validation of Alternative Adherence Measures in Tuberculosis Patients: A Pilot Study; van den Boogaard, J., Lyimo, R.A., Boeree, M.J., Kibiki, G.S., et al.

This study assessed adherence to community-based DOT among Tanzanian TB patients using the Medication Event Monitoring System (MEMS) and validated alternative adherence measures for resource-limited settings using MEMS as a gold standard. This was a longitudinal pilot study of 50 patients recruited consecutively from one rural hospital, one urban hospital, and two urban health centers. Treatment adherence was monitored with MEMS and the validity of the following adherence measures was assessed: isoniazid urine test, urine color test, Morisky scale, Brief Medication Questionnaire, adapted AIDS Clinical Trials Group (ACTG) adherence questionnaire, pill counts, and medication refill visits. The mean adherence rate in the study population was 96.3% (standard deviation, SD: 7.7). Adherence was less than 100% in 70% of the patients, less than 95% in 21% of them, and less than 80% in 2%. The ACTG adherence questionnaire and urine color test had the highest sensitivities, but lowest specificities. The Morisky scale and refill visits had the highest specificities, but lowest sensitivities. Pill counts and refill visits combined, used in routine practice, yielded moderate sensitivity and specificity, but sensitivity improved when the ACTG adherence questionnaire was added. Patients on community-based DOT showed good adherence in this study. The combination of pill counts, refill visits, and the ACTG adherence questionnaire could be used to monitor adherence in settings where MEMS is not affordable. The findings with regard to adherence and to the validity of simple adherence measures should be confirmed in larger populations with wider variability in adherence rates.

Selected List of Guidances, Tools and Manuals

Population Council. Adherence to Antiretroviral Therapy in Adults: A guide for Trainers.2004.

<http://www.popcouncil.org/pdfs/horizons/arvadhrnctrngguide.pdf>

U.S. Department of Health and Human Services. Self-study modules on Tuberculosis. Module 4-Treatment of Latent Tuberculosis Infection and Tuberculosis Disease.

<http://www.cdc.gov/tb/education/ssmodules/pdfs/Module4.pdf>

World Health Organization. Adherence to long-term therapies: evidence for action. WHO: Geneva, 2003.

http://www.who.int/chronic_conditions/en/adherence_report.pdf

Legal Interventions in TB Control: A Web-Based Seminar

Sponsor: New Jersey Medical School Global Tuberculosis Institute

Location: Web-Based Seminar

This web-based seminar, presented by the Global TB Institute, was originally held on September 11, 2007 and explored successful and innovative approaches to implementing legal interventions in TB control programs in the US. Experts shared legal and ethical considerations, as well as hands-on experiences, practical steps, and legal tools that can be used to improve outcomes of case management, treatment outcomes, and contact investigations. Points were illustrated using lectures and case presentations.

<http://www.umdnj.edu/globaltb/audioarchives/legal.htm>

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Munro, S.A., Lewin, S.A., Smith, H.J., Engel, M.E., Fretheim, A. and Volmink, J. Patient Adherence to Tuberculosis Treatment: A Systematic Review of Qualitative Research. PLoS Medicine 2007; Vol 4, Issue 4: pp 1230-1245.

Lutge, E.E., Wiysonge, C.S., Knight, S.E., Volmink, J. Material Incentives and Enablers in the Management of Tuberculosis; Cochrane Database of Systematic Reviews. 2012 Jan 18; Volume 1: CD007952.

Brief Description of the Approach

The following tools and medicine reminders can enhance treatment adherence:

- Reduce pill burden by using fixed dose combination (FDC)
- Packing daily dose or putting medicine in pill-box to ease the medication
- Calling patient's mobile phone or sending SMS to remind medicine taking
- Patient to use alarm function of his/her mobile phone
- Patients to take medicine same time everyday together with daily routine activities (e.g. meal time, radio or television news time)
- Record in the calendar or DOT treatment card

List of alternative names (if applicable)

Medication Event Monitoring System (MEMS)

Shown to benefit

Remote populations

Potential Beneficiaries

Adolescents, Alcohol dependent, Drug dependent, Mentally ill, Persons with Previous TB, HCWs /Lab staff, Military/Soldiers, Miners/Ex-miners, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Transportation workers, Homeless, Indigenous and minority ethnic groups, Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

Bulletin of the World Health Organization. 2011 Sep 1; Volume 89, Number 9: 632-9. Epub 2011 May 20. Electronic Monitoring of Treatment Adherence and Validation of Alternative Adherence Measures in Tuberculosis Patients: A Pilot Study; van den Boogaard, J., Lyimo, R.A., Boeree, M.J., Kibiki, G.S., et al.

This study assessed adherence to community-based DOT among Tanzanian TB patients using the Medication Event Monitoring System (MEMS) and validated alternative adherence measures for resource-limited settings using MEMS as a gold standard. This was a longitudinal pilot study of 50 patients recruited consecutively from one rural hospital, one urban hospital, and two urban health centers. Treatment adherence was monitored with MEMS and the validity of the following adherence measures was assessed: isoniazid urine test, urine color test, Morisky scale, Brief Medication Questionnaire, adapted AIDS Clinical Trials Group (ACTG) adherence questionnaire, pill counts, and medication refill visits. The mean adherence rate in the study population was 96.3% (standard deviation, SD: 7.7). Adherence was less than 100% in 70% of the patients, less than 95% in 21% of them, and less than 80% in 2%. The ACTG adherence questionnaire and urine color test had the highest sensitivities, but lowest specificities. The Morisky scale and refill visits had the highest specificities, but lowest sensitivities. Pill counts and refill visits combined, used in routine practice, yielded moderate sensitivity and specificity, but sensitivity improved when the ACTG adherence questionnaire was added. Patients on community-based DOT showed good adherence in this study. The combination of pill counts, refill visits, and the ACTG adherence questionnaire could be used to monitor adherence in settings where MEMS is not affordable. The findings with regard to adherence and to the validity of simple adherence measures should be confirmed in larger populations with wider variability in adherence rates.

Selected List of Guidances, Tools and Manuals

Ickovics JR, Chambers DB, Gifford AL, Neidig J, Zwickl B, et al., et al. Self-reported adherence to antiretroviral medications among participants in HIV clinical trials: the AACTG adherence instruments. Patient Care Committee & Adherence Working Group of the Outcomes Committee of the Adult AIDS Clinical Trials Group (AACTG). *AIDS Care* 2000; 12: 255-66 doi: 10.1080/09540120050042891 pmid: 10928201

<http://www.tandfonline.com/doi/abs/10.1080/09540120050042891#.UiSQzmSL-cl>

http://www.ncbi.nlm.nih.gov/pubmed?cmd=Retrieve&list_uids=10928201&dopt=Abstract

http://www.ghdonline.org/uploads/ACTG_Adherence_Baseline_Questionnaire.pdf

Selected Bibliographic References of Uses of this Strategy

van den Boogaard, J., Lyimo, R.A., Boeree, M.J., Kibiki, G.S., et al Electronic Monitoring of Treatment Adherence and Validation of Alternative Adherence Measures in Tuberculosis Patients: A Pilot Study. Volume 89, Number 9: 632-9. Epub 2011 May 20.

Fallab-Stubi CL, Zellweger JP, Sauty A, Uldry C, Iorillo D, Burnier M. Electronic monitoring of adherence to treatment in the preventive chemotherapy of tuberculosis. *Int J Tuberc Lung Dis* 1998; 2: 525-30 pmid: 9661817.

Starr M, Sawyer S, Carlin J, Powell C, Newman R, Johnson P. A novel approach to monitoring adherence to preventive therapy for tuberculosis in adolescence. *J Paediatr Child Health* 1999; 35: 350-4 doi: 10.1046/j.1440-1754.1999.00371.x pmid: 10457290.

mHealth: new horizons for health through mobile technologies: second global survey on eHealth, WHO, 2011, ISBN9789241564250
http://whqlibdoc.who.int/publications/2011/9789241564250_eng.pdf

COPE WITH ANY CHALLENGES OF TB TREATMENT

PROVIDE INCENTIVES AND ENABLERS

Provide Incentives and Enablers (I&E) for Patients and Families

Brief Description of the Approach

Many DOTS-based programs throughout the world are seeking to improve TB case detection and cure rates through the provision of a variety of incentives and enablers (I&E) to patients. Although good adherence counselling can improve adherence to TB treatment, in some situations patients need additional support in order to thrive and respond to treatment.

TB providers should carefully design the social support based on patient centered approach to TB care and with respect to patients. Support can take many forms including:

- Phone credit or communication access
- Cash transfer
- Travel vouchers or reimbursement
- Food assistance
- Housing assistance
- Vocational training, income generation, microcredit

Preliminary evidence shows that the following interventions increased adherence, lead to positive health outcomes and health behaviors in high and low income countries:

- Nutritional support (foods or food coupon)
- Conditional cash transfers
- Hospitalization or provide shelter with foods
- Transportation vouchers

However, the sustainability of these efforts is unclear and more research is needed to understand the long term effects. Many poor patients need financial support so that they can adhere to and complete treatment. Over-reliance upon financial incentives may create ethical challenges in TB care if TB providers only give them to some patients. Promoting co-responsibility may also promote patient adherence.

List of alternative names (if applicable)

Pro-Poor Approach, patient-centered care, incentives and enablers (I&E)

Shown to benefit

All risk groups living with poverty benefit from patient support (slum residents, malnourished, homeless, orphans and vulnerable children, street children) .

Potential Beneficiaries

Risk groups with adherence challenges such as the mentally ill, alcoholics and drug users.

Example of Good Practice

Rocha, C., et al., The Innovative Socio-economic Interventions Against Tuberculosis (ISIAT) project: an operational assessment. *Int J Tuberc Lung Dis*, 2011. 15 Suppl 2: p. S50-7.

Tuberculosis (TB) affected households in impoverished shantytowns, Lima, Peru.

OBJECTIVE: To evaluate socio-economic interventions for strengthening TB control by improving uptake of TB care and prevention services.

DESIGN: Barriers to TB control were characterized by interviews with TB-affected families. To reduce these barriers, a multidisciplinary team offered integrated community and household socio-economic interventions aiming to: 1) enhance uptake of TB care by education, community mobilization and psychosocial support; and 2) reduce poverty through food and cash transfers, microcredit, microenterprise and vocational training. An interim analysis was performed after the socio-economic interventions had been provided for 2078 people in 311 households of newly diagnosed TB patients for up to 34 months.

RESULTS: Poverty (46% earned <US\$1 per day), depression (40%), stigmatization (77%), and perceived isolation (39%) were common among TB patients (all $P < 0.05$ vs. non-patients). The project had 100% recruitment, and involved 97% of TB-affected households in regular visits, 71% in community groups, 78% in psychosocial support and 77% in poverty-reduction interventions. The socio-economic interventions were associated with increases in household contact TB screening (from 82% to 96%); successful TB treatment completion (from 91% to 97%); patient human immunodeficiency virus testing (from 31% to 97%); and completion of preventive therapy (from 27% to 87%; all $P < 0.0001$).

CONCLUSIONS: Socio-economic interventions can strengthen TB control activities.
KEY WORDS: tuberculosis; control; microcredit; poverty; social determinants.

Selected List of Guidances, Tools and Manuals

Stop TB Partnership TB & Poverty Subgroup
https://c28lmydslgfv16gg8.sec.amc.nl/wg/dots_expansion/tbandpoverty/spotlight.asp

World Health Organization (2005). Addressing Poverty in TB Control: Options for National TB Control Programmes. Geneva: WHO. (WHO/HTM/TB/2005.352).
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World Health Organization (2007). Empowerment and involvement of tuberculosis patients in tuberculosis control: Documented experiences and interventions. Geneva: WHO.
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WHO. Guidance on ethics of tuberculosis prevention, care and control. 2010
http://whqlibdoc.who.int/publications/2010/9789241500531_eng.pdf

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Lagarde M, Haines A, Palmer N. The impact of conditional cash transfers on health outcomes and use of health services in low and middle income countries. Cochrane Database of Systematic Reviews 2009, Issue 4. Art. No.: CD008137. DOI:10.1002/14651858.CD008137.
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D Boccia, J Hargreaves, K Lonroth et al Cash Transfer and microfinance interventions for tuberculosis control: review of the impact evidence and policy implications, IJTLD 2011; 15(6):S37-S49;

A Beith, R Eichler, D. Weil Worldwide: Incentives for Tuberculosis Diagnosis and Treatment, in Performance Incentives for Global Health: Potential and Pitfalls. Center for Global Development, Washington, DC, 2009;

Rocha, C., et al., The Innovative Socio-economic Interventions Against Tuberculosis (ISIAT) project: an operational assessment. Int J Tuberc Lung Dis, 2011. 15 Suppl 2: p. S50-7.
http://www1.msh.org/projects/rpmpplus/WhatWeDo/Tuberculosis/Incentives-and-Enablers.cfm#CP_JUMP_7850

COPE WITH ANY CHALLENGES OF TB TREATMENT

PROVIDE INCENTIVES AND ENABLERS

Provide Nutritional Support

Brief Description of the Approach

Lack of adequate nutrition is both a risk factor for disease as well as a risk factor for poor adherence and outcomes. TB patients who do not have food to eat struggle to take certain treatments, such as pyrazinamide (PZA) because it causes stomach upset and nausea. Ideally a TB program would not only integrate nutrition care into treatment, but also think about good nutrition in terms of TB prevention. This approach involves both long and short term thinking --linking with partner efforts to engage community health workers in referral for malnutrition and follow-up, aid in the development of a locally-produced ready-to-use therapeutic food to treat malnutrition, and boost sustainable livelihood opportunities for local farmers, especially those living with TB/HIV/AIDS.

List of alternative names (if applicable)

Pro-Poor Approach, patient-centered care, incentives and enablers

Shown to benefit

Malnourished

Potential Beneficiaries

Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), HIV-infected/PMTCT, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs /Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban residents of poor areas, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

Food baskets given to tuberculosis patients at a primary health care clinic in the city of Duque de Caxias, Brazil: effect on treatment outcomes. 2009 Oct;35(10):992-7.

OBJECTIVE: To evaluate the effect that the distribution of food baskets to tuberculosis (TB) patients has on treatment outcomes at a primary health care clinic.

METHODS: Retrospective comparative study of the medical and social aspects of 142 patients at a primary health care clinic in the city of Duque de Caxias, Brazil. The patients were divided into two groups: the first group included 68 patients treated with standard regimens (between September of 2001 and December of 2003); and the second group included 74 patients treated with the same regimens but also receiving food baskets on a monthly basis (between January of 2004 and July of 2006).

RESULTS: The statistical comparison between the two groups revealed that the cure rate was higher in the group receiving the food baskets (87.1% vs. 69.7%), whereas the rate of noncompliance was markedly lower (12.9% vs. 30.3%).

CONCLUSIONS: The results indicate that the distribution of food baskets can be a useful strategy to improve compliance with TB treatment at primary health care clinics.

Selected List of Guidances, Tools and Manuals

Cambodia Experience:
http://www1.msh.org/projects/rpmpplus/WhatWeDo/Tuberculosis/Incentives-and-Enablers.cfm#CP_JUMP_7780

Getahun, Haileyesus II. Joseph, Thomas. III. Tomaskovic, Lana. IV. Raviglione, Mario C. Engage-TB: integrating community-based tuberculosis activities into the work of nongovernmental and other civil society organizations: operational guidance World Health Organization.

ISBN 978 92 4 150450 8 [NLM classification: WF 200]
http://apps.who.int/iris/bitstream/10665/75997/1/9789241504508_eng.pdf

Nutritional care and support for patients with tuberculosis
 Guideline World Health Organization
http://www.who.int/tb/publications/nutcare_support_patients_with_tb/en/

Selected Bibliographic References of Uses of this Strategy

Food baskets given to tuberculosis patients at a primary health care clinic in the city of Duque de Caxias, Brazil: effect on treatment outcomes. 2009 Oct;35(10):992-7.

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Chandra, R.K. (2004). "Nutrient supplementation as adjunct therapy in pulmonary tuberculosis." International journal for Vitamin and Nutrition Research 74 (2): 144-146
<http://www.unc-chs.com/uploads/resourceFiles/Live/UgandaNulifeFinalReport.pdf>

El Uso y la Evaluación de Incentivos en Latinoamérica y el Caribe [Use and Evaluation of Incentives in Latin America and the Caribbean] (Tegucigalpa, Honduras, Spring 2004)
http://www1.msh.org/projects/rpmpplus/WhatWeDo/Tuberculosis/Incentives-and-Enablers.cfm#CP_JUMP_7850

http://www.who.int/elena/titles/micronutrients_tuberculosis/en/index.html

COPE WITH ANY CHALLENGES OF TB TREATMENT PROVIDE INCENTIVES AND ENABLERS FOR PATIENTS AND FAMILIES

Provide Conditional Cash Transfers

Brief Description of the Approach

Cash transfers are innovative forms of social protection based on the provision of money to poor or vulnerable households and individuals (such as the elderly and children) with the aim of enabling them to move out of poverty by protecting and building their financial, physical and human capital assets³⁵.

This strategy suggests cash transfers conditional on some behavioral requirements, such as TB testing or chemoprophylaxis among TB contacts, treatment adherence and treatment completion by TB patients. Conditional cash transfers are only practical and ethical if the local TB services are adequate. The quality of TB services available is one of the most critical aspects to take into consideration when predicting the likelihood of success of a conditional cash transfer program in high TB burden countries for TB control purposes. The sustainability of cash transfer programs largely depends on their integration into existing programs and services provided by governmental institutions³⁶.

List of alternative names (if applicable)

Pro-Poor Approach, patient-centered care, incentives and enablers

Shown to benefit

Urban residents of poor areas

Potential Beneficiaries

Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), HIV-infected/PMTCT, Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban residents of poor areas, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex.

Example of Good Practice

D Boccia, J Hargreaves, K Lonroth et al. Cash transfer and microfinance interventions for tuberculosis control: Review of the impact evidence and implementation challenges. *Social Determinants of Health Discussion Paper 5* (Debate, Policy & Practice, Case studies). Geneva, WHO, 2011

Adato and colleagues suggest that it is possible to apply a “soft” form of conditionality in which conditions are simple or made less stringent in areas characterized by poor TB services or in the case of mobility impairment of the cash recipients. There is also the possibility to link TB control activities to cash transfer programs in a way that facilitates attendance of TB care services without making it compulsory (for example, by conditioning the cash transfer on the attendance of workshops and training sessions about TB to help TB-affected families to overcome the fear and the stigma of approaching the TB services without imposing on them their attendance).

Selected List of Guidances, Tools and Manuals

A Beith, R Eichler, D. Weil Worldwide: Incentives for Tuberculosis Diagnosis and Treatment, in Performance Incentives for Global Health: Potential and Pitfalls. Center for Global Development, Washington, DC, 2009;

D Boccia, J Hargreaves, K Lonroth et al. Cash transfer and microfinance interventions for tuberculosis control: Review of the impact evidence and implementation challenges. Social Determinants of Health Discussion Paper 5 (Debate, Policy & Practice, Case studies). Geneva, WHO, 2011.

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Lagarde M, Haines A, Palmer N. The impact of conditional cash transfers on health outcomes and use of health services in low and middle income countries. Cochrane Database of Systematic Reviews 2009, Issue 4. Art. No.: CD008137. DOI:10.1002/14651858.CD008137. <http://apps.who.int/whl/reviews/CD008137.pdf>
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Meredith SE, Jarvis BP, Raiff BR, Rojewski AM, Kurti A, Cassidy RN, Erb P, Sy JR, Dallery J. The ABCs of incentive-based treatment in health care: a behavioranalytic framework to inform research and practice. Psychol Res Behav Manag. 2014Mar 19;7:103-114. eCollection 2014. Review. PubMed PMID: 24672264; PubMed Central PMCID: PMC3964160.

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Adato M, Roopnaraine T, Becker E. Understanding use of health services in conditional cash transfer programs: insights from qualitative research in Latin America and Turkey. Soc Sci Med. 2011 Jun;72(12):1921-9. doi: 10.1016/j.socscimed.2010.09.032. Epub 2010 Oct 12. PubMed PMID: 21122965.

Brief Description of the Approach

Special attention must be devoted to developing an effective referral system for patients who, after diagnosis in a hospital, choose either to initiate or continue and complete therapy at community health centers or other health facilities. Active follow-up of every referral is essential to ensure that referred TB patients actually arrive at the receiving facility and continue their treatment there. The importance of appointing a referral coordinator to be responsible for hospital referrals at the regional, provincial, or district level cannot be underestimated.

Effective referral includes the following tools:

- *Patient referral form (WHO format)*: completed by staff of the DOTS unit in the hospital and given to the patient, with copies sent to the health center and the provincial referral coordinator (i.e. the province and district NTP coordinator).
- *Referral feedback forms*: completed by health center staff and sent to hospital, with a copy sent to the referral coordinator (i.e. regional or district NTP coordinator). The receiving health center is required to send feedback to the hospital on the status of the referral in a timely manner. Establish the maximal timeline (e.g. one week) in the SOPs.

List of alternative names (if applicable)

Hospital-DOTS linkage (HDL)

Potential Beneficiaries

Urban residents of poor areas

Example of Good Practice

Mahendradhata Y, Probandari A, Ahmad RA, Utarini A, Trisnantoro L, Lindholm L, et al. The Incremental Cost-Effectiveness of Engaging Private Practitioners to Refer Tuberculosis Suspects to DOTS Services in Jogjakarta, Indonesia. *American Journal of Tropical Medicine and Hygiene*. 2010 Jun;82(6):1131-9.

BACKGROUND:

To accelerate DOTS expansion, the hospital sector and specialized chest clinics must be engaged.

OBJECTIVE:

To develop a model for public-private partnership through DOTS expansion into public and private hospitals in Indonesia.

DESIGN:

Model development included gaining commitment from stakeholders, stepwise training of hospital staff, and developing unified networks for case management, patient referral, laboratory quality assurance, supervision and evaluation.

RESULTS:

The number of notified tuberculosis (TB) cases (all forms and new smear-positive) increased dramatically from baseline. Together, hospitals and chest clinics accounted for a significant proportion of the total cases notified by the province (51% of total TB cases and 56% of new smear-positive cases in 2004). Compared to health centers and chest clinics, hospitals reported lower cure and success rates. Despite the option for referral to health centers, the majority of patients diagnosed in hospitals and chest clinics in 2002-2004 opted to be fully managed by the diagnosing facility.

CONCLUSION:

The roles and strengths of hospitals differ with regard to health centers, providing a rational basis for linkage of these health service components. In Yogyakarta, linkage became effective only after establishing a stakeholder-based provincial coordinating (DOTS) committee as the recognized interface between the National Tuberculosis Program and various providers.

Selected List of Guidances, Tools and Manuals

Guiding Principles and Practical Steps for Engaging Hospitals in TB Care and Control
http://www.tbcare1.org/publications/toolbox/tools/access/download.php?file=Guiding_Principles_Practical_Steps_Engaging_Hospitals_TB_Care_Control.pdf

WHO. 2006. Engaging All Health Care Providers in TB Control, Guidance on Implementing Public Private Mix Approaches. Geneva: WHO. (WHO/HTM/2006.360)
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Tuberculosis Coalition for Technical Assistance. 2007. Handbook for Using the International Standards for Tuberculosis Care. The Hague: Tuberculosis Coalition for Technical Assistance. 2014
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Irawati, S. R., C. Basri, M. S. Arias, et al. 2007. Hospital DOTS Linkage in Indonesia: A Model for DOTS Expansion into Government and Private Hospitals. *International Journal of Tuberculosis and Lung Disease*.11:33-39.
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http://whqlibdoc.who.int/hq/2007/WHO_HTM_TB_2007.391_eng.pdf

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Barwise K, Lind A, Bennett R, Martins E. Intensifying action to address HIV and tuberculosis in Mozambique's cross-border mining sector. *Int J Health Serv*. 2013;43(4):699-719.

Robertson AM, Garfein RS, Wagner KD, Mehta SR, Magis-Rodriguez C, Cuevas-Mota J, Moreno-Zuniga PG, Strathdee SA; Proyecto El Cuete IV and STAHR II. Evaluating the impact of Mexico's drug policy reforms on people who inject drugs in Tijuana, B.C., Mexico, and San Diego, CA, United States: a binational mixed methods research agenda. *Harm Reduct J*. 2014 Feb 12;11(1):4. doi: 10.1186/1477-7517-11-4. PubMed PMID: 24520885; PubMed Central PMCID: PMC3944401.

Benoit SR, Ellingson KD, Waterman SH, Pearson ML. Antimicrobial resistance in eight US hospitals along the US-Mexico border, 2000-2006. *Epidemiol Infect*. 2013 Dec 17:1-10. [Epub ahead of print] PubMed PMID: 24480063.

Mitruka K, Blake H, Ricks P, Miramontes R, Bamrah S, Chee C, Hickstein L. A tuberculosis outbreak fueled by cross-border travel and illicit substances: Nevada and Arizona. *Public Health Rep*. 2014 Jan-Feb;129(1):78-85. PubMed PMID: 24381363; PubMed Central PMCID: PMC3863007.

van der Werf MJ, Hollo V, Noori T. Is tuberculosis crossing borders at the Eastern boundary of the European Union? *Eur J Public Health*. 2013 Dec;23(6):1058-63. doi: 10.1093/eurpub/ckt098. Epub 2013 Jun 27. PubMed PMID: 23813718; PubMed Central PMCID: PMC3840804.

Mor Z, Leventhal A, Diacon AH, Finger R, Schoch OD. Tuberculosis screening in immigrants from high-prevalence countries: interview first or chest radiograph first? A pro/con debate. *Respirology*. 2013 Apr;18(3):432-8. doi: 10.1111/resp.12054. Review. PubMed PMID: 23336500.

Brief Description of the Approach

The TB Control Programs of two or more countries whose borders are crossed by TB patients may have different drug regimens and these differences need to be considered when a patient migrates across the border. People may move regularly across country borders because of insecurity, lack of access to healthcare in one country or for employment purposes. TB diagnosis and treatment can be compromised if close monitoring does not take place. Communication with authorities across the border is necessary to follow-up patients, to coordinate transfer and to minimize the interruption of treatment.

When a mass repatriation is being planned, new patients should ideally repatriate or transfer out only when they have completed their intensive phase of treatment. If this is not possible, they should be considered for priority transfer or repatriation. It is very important that continuity of treatment occurs during transfer. If possible contact with the new treatment center should be made by the clinic staff prior to transfer. Forward planning and liaison between staff is particularly important if a large population is being transferred. If there is a difference in regimens used by the transferring and receiving program, a plan must be developed to resolve this. A reliable mechanism for transfer of records should be established. Each patient should have:

- Their personal record card up to date and with the treatment plan for the rest of the course detailed
- Sufficient quantities of TB drugs to allow travel and contact with the new clinic
- If the transferring program has a supply of drugs to complete the therapy, and the receiving program lacks an adequate supply, arrangements to have the drugs accompany the patient should be considered.

In the original TB register, patients should be recorded as transferred out. However, every effort should be made to determine the final outcome and the register updated so that the outcome may be included in the statistics for the admitting cohort.³⁹

List of alternative names (if applicable)

Cross border TB control, Continuum of TB care

Shown to benefit

Refugees, Migrants, Drug dependent, Soldiers

Potential Beneficiaries

Truck drivers

Example of Good Practice

Tuberculosis care and control in refugee and displaced populations

In 2003, Eritrean refugees repatriating from Sudan in treatment for TB who had already completed the intensive phase of treatment were provided with 4 weeks of medications and followed up by the implementing partner in Sudan, to be linked into the NTP once they reached their final destination.

It is important that demobilized soldiers and dependents are also considered among the would be "returnees". In Angola, where a long quartering phase preceded the demobilization, this became particularly relevant. Soldiers on TB treatment had to be left behind until completion of treatment. It is essential that the agency involved in transport of these people be involved in a referral system assessing the attending capacity at the end-point.

Selected List of Guidances, Tools and Manuals

Tuberculosis care and control in refugee and displaced populations: an interagency field manual. - 2nd ed. / edited by M.A. Connolly, M. Gayer and S. Ottmani. WHO, UNHCR. 2007
https://extranet.who.int/iris/restricted/bitstream/10665/43661/1/9789241595421_eng.pdf

Engage-TB: integrating community-based tuberculosis activities into the work of nongovernmental and other civil society organizations: operational guidance Getahun, Haileyesus II. Joseph, Thomas. III. Tomaskovic, Lana. IV. Raviglione, Mario C. World Health Organization.

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http://apps.who.int/iris/bitstream/10665/75997/1/9789241504508_eng.pdf

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Barwise K, Lind A, Bennett R, Martins E. Intensifying action to address HIV and tuberculosis in Mozambique's cross-border mining sector. *Int J Health Serv*. 2013;43(4):699-719.

Robertson AM, Garfein RS, Wagner KD, Mehta SR, Magis-Rodriguez C, Cuevas-Mota J, Moreno-Zuniga PG, Strathdee SA; Proyecto El Cuete IV and STAHR II. Evaluating the impact of Mexico's drug policy reforms on people who inject drugs in Tijuana, B.C., Mexico, and San Diego, CA, United States: a binational mixed methods research agenda. *Harm Reduct J*. 2014 Feb 12;11(1):4. doi: 10.1186/1477-7517-11-4. PubMed PMID: 24520885; PubMed Central PMCID: PMC3944401.

Benoit SR, Ellingson KD, Waterman SH, Pearson ML. Antimicrobial resistance in eight US hospitals along the US-Mexico border, 2000-2006. *Epidemiol Infect*. 2013 Dec 17:1-10. [Epub ahead of print] PubMed PMID: 24480063.

Stuckler D, Steele S, Lurie M, Basu S. Introduction: 'dying for gold': the effects of mineral mining on HIV, tuberculosis, silicosis, and occupational diseases in southern Africa. *Int J Health Serv*. 2013;43(4):639-49. Review. PubMed PMID: 24397231.

Mitruka K, Blake H, Ricks P, Miramontes R, Bamrah S, Chee C, Hickstein L. A tuberculosis outbreak fueled by cross-border travel and illicit substances: Nevada and Arizona. *Public Health Rep*. 2014 Jan-Feb;129(1):78-85. PubMed PMID: 24381363; PubMed Central PMCID: PMC3863007.

van der Werf MJ, Hollo V, Noori T. Is tuberculosis crossing borders at the Eastern boundary of the European Union? *Eur J Public Health*. 2013 Dec;23(6):1058-63. doi: 10.1093/eurpub/ckto98. Epub 2013 Jun 27. PubMed PMID: 23813718; PubMed Central PMCID: PMC3840804.

Mor Z, Leventhal A, Diacon AH, Finger R, Schoch OD. Tuberculosis screening in immigrants from high-prevalence countries: interview first or chest radiograph first? A pro/con debate. *Respirology*. 2013 Apr;18(3):432-8. doi: 10.1111/resp.12054. Review. PubMed PMID: 23336500.

Brief Description of the Approach

Methods for finding patients who have been lost to follow up and re-establishing TB treatment regimen include telephone calls, letters, outreach teams and home visits. Default tracing form & Default tracing register or log.

Re-contacting and resolving the challenges faced by TB patients who temporarily suspend TB treatment is vital for individual survival and national TB control. To enable resumption of communication and treatment with those who disappear from the clinic, it is necessary to pro-actively collect multiple means of communication and to gather some information on the patients social network.

The best approach to coaxing a reluctant TB patients to resume care and treatment will vary depending on their main reason for stopping. Listening skills, problem solving skills and support strategies are critical health care worker competencies to ensure discouraged patients are empowered and supported to complete their treatment regimen and regain their health.

List of alternative names (if applicable)

Loss to Follow up (LTFU), Adherence

Shown to benefit

HIV-infected/PMTCT

Potential Beneficiaries

Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs /Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban residents of poor areas, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

Thomson, K. A., E. O. Cheti, et al. (2011). "Implementation and outcomes of an active defaulter tracing system for HIV, prevention of mother to child transmission of HIV (PMTCT), and TB patients in Kibera, Nairobi, Kenya." *Transactions of the Royal Society of Tropical Medicine and Hygiene* 105(6): 320-326.

Retention of patients in long term care and adherence to treatment regimens are a constant challenge for HIV, prevention of mother to child transmission of HIV (PMTCT), and TB programs in sub-Saharan Africa. This study describes the implementation and outcomes of an active defaulter tracing system used to reduce loss to follow-up (LTFU) among HIV, PMTCT, TB, and TB/HIV co-infected patients receiving treatment at three Médecins Sans Frontières clinics in the informal settlement of Kibera, Nairobi, Kenya. Patients are routinely contacted by a social worker via telephone, in-person visit, or both very soon after they miss an appointment. Patient outcomes identified through 1066 tracing activities conducted between 1 April 2008 and 31 March 2009 included: 59.4% returned to the clinic, 9.0% unable to return to clinic, 6.3% died, 4.7% refused to return to clinic, 4.5% went to a different clinic and 0.8% were hospitalized. Fifteen percent of patients identified for tracing could not be contacted. LTFU among all HIV patients decreased from 21.2% in 2006 to 11.5% in 2009. An active defaulter tracing system is feasible in a resource poor setting, solicits feedback from patients, retains a mobile population of patients in care, and reduces LTFU among HIV, PMTCT and TB patients.

Selected List of Guidances, Tools and Manuals

Guiding Principles and Practical Steps for Engaging Hospitals in TB Care and Control
http://www.tbcare1.org/publications/toolbox/tools/access/download.php?file=Guiding_Principles_Practical_Steps_Engaging_Hospitals_TB_Care_Control.pdf

Practical Guide to Improve the Quality of TB Patient Care
<http://www.tbcare1.org/publications/toolbox/tools/access/download.php?file=PracticalGuideImproveQualityTBPatientCare.pdf>

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Kizito KW, Dunkley S, Kingori M, Reid T. Lost to follow up from tuberculosis treatment in an urban informal settlement (Kibera), Nairobi, Kenya: What are the rates and determinants? *Trans R Soc Trop Med Hyg* 2011;105:52-7.

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Fraser HSF, Allen C, Bailey C, Douglas G, Shin S, Blaya J. Information systems for patient follow-up and chronic management of HIV and tuberculosis: a life-saving technology in resource poor areas. *J Med Internet Res* 2007;9:e29.

Thomson, K. A., E. O. Cheti, et al. (2011). "Implementation and outcomes of an active defaulter tracing system for HIV, prevention of mother to child transmission of HIV (PMTCT), and TB patients in Kibera, Nairobi, Kenya." *Transactions of the Royal Society of Tropical Medicine and Hygiene* 105(6): 320-326.

Brief Description of the Approach

Monitoring the outcome of treatment is essential in order to evaluate the effectiveness of the intervention. The standardized method of determining cure/failure is based on bacteriologic laboratory testing for the growth of *M. tuberculosis* on culture media. Laboratory-based determinations are currently considered best practice. Results of bacteriologic testing, obtained during monitoring of treatments and at treatment's completion, are important for public health.

List of alternative names (if applicable)

Treatment monitoring, Cure, Laboratory confirmation, Sputum smear, Sputum culture, Evaluation of treatment

Potential Beneficiaries

Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs /Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban residents of poor areas, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

A study in Peru (Alexy et al, 2012) examined the sensitivity and specificity which illustrated the differences between using the two – bacteriological or clinical criteria – in outcome determinations. A high sensitivity of 98.9% shows that most laboratory based successful outcomes are also being identified as successful outcomes using programmatic methods. However, the specificity of 45.7% indicates that fewer than half of bacteriologically unsuccessful MDR-TB treatment outcomes are being recognized as such by clinicians. Mis-classification as failure could also be cause for concern. This cohort contained 65 patients (4.0%) whose bacteriologic results indicated cure or treatment completion but who were still receiving treatment, or had been deemed treatment failures and could be referred for additional treatment. This unnecessary treatment could have negative consequences, including increased costs and potentially toxic adverse events from second-line medications. This suggests a need to educate health care providers about the importance of continuing treatment until a successful outcome is confirmed bacteriologically.⁴²

Selected List of Guidances, Tools and Manuals

<http://www.stoptb.org/wg/gli/documents.asp>

<http://www.tbcare1.org/publications/toolbox/lab/>

World Health Organization. Guidelines for the programmatic management of drug-resistant tuberculosis: emergency update 2008. WHO/HTM/TB/2008.402. Geneva, Switzerland: WHO, 2008.
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<http://www.who.int/tb/dots/laboratory/resources>

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World Health Organization. Policy Statement on Fluorescent Light Emitting Diode Microscopy for Diagnosis of Tuberculosis, 2010.
<http://www.who.int/tb/dots/laboratory/policy/eng>

World Health Organization. Laboratory services in TB control. Part III: Culture. Geneva, WHO, 1998 (WHO/TB/98.258).
<http://www.who.int/tb/dots/laboratory/resources>

World Health Organization. Use of Liquid TB Culture and Drug Susceptibility Testing in Low- and Medium-income Settings, 2007.
<http://www.who.int/tb/dots/laboratory/policy/en/print.html>

World Health Organization. Policy Guidance on Drug Susceptibility Testing (DST) of Second-line Anti-tuberculosis Drugs. Geneva, WHO, 2008 WHO/HTM/TB/2008.392.
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Petti C A, Polage C R, Quinn T C, Ronald A R, Sande M A. Laboratory medicine in Africa: a barrier to effective health care. *Clin Infect Dis* 2006; 42: 377-382.

Brief Description of the Approach

Recording and reporting of data is a fundamental component of care of patients with tuberculosis (TB) and control of the disease. Data recording and reporting is necessary to monitor trends in the TB epidemic at global, national and subnational levels; to monitor progress in the treatment of individual patients and groups (cohorts) of patients and ensure continuity of care when patients are referred between health-care facilities; and to plan, raise funds for, implement and evaluate programmatic efforts to control TB, including forecasting the numbers of cases and the associated requirements for staffing, medicines and laboratory supplies; and analyzing treatment outcomes. When high-quality data are available, successes can be documented and corrective actions taken to address problems that are identified.

List of alternative names (if applicable)

Health management information system (HMIS), M&E

Potential Beneficiaries

HIV-infected/Preventing Mother to Child Transmission (PMTCT), Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs /Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban residents of poor areas, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

The development of web-based surveillance of TB in China

The public health emergency caused by the SARS outbreak in 2003 highlighted the lack of actionable public health information and prompted the government to develop a real-time web-based Infectious Disease Reporting System (IDRS). The system was launched in 2004 for 37 notifiable infectious diseases, including TB. A case-based TB Information Management System, using the same web platform and linked to the IDRS, was launched in 2005. This replaced the previous paper-based TB quarterly reports.

By the end of 2010 the IDRS was used by over 68 000 health care facilities nationwide, including 97% of hospitals at county level and above and 82% of township-level clinics and around 25 000 new cases of infectious diseases are reported each day. Many of these facilities operate outside the NTP and in the past had not been notifying its TB cases to the NTP.

A total of 965 000 new and relapse TB cases were notified in 2009, accounting for 17% of the 5.8 million cases notified worldwide. This is up from 454 000 cases notified in 2000 and illustrates the scale of the system's achievement in dramatically improving TB notification rates.

Selected List of Guidances, Tools and Manuals

Definitions and Reporting Framework for Tuberculosis -Revised WHO 2013
http://apps.who.int/iris/bitstream/10665/79199/1/9789241505345_eng.pdf

Electronic recording and reporting for tuberculosis care and control
http://www.tbcare1.org/publications/toolbox/tools/me/download.php?file=Electronic_RR_for_TB_CC.pdf

The web appendix contains complementary material and is a living resource to which new material will be added as it becomes available:
http://www.who.int/tb/publications/electronic_recording_reporting

Guidelines for the programmatic management of drug-resistant tuberculosis: emergency update, 2008. Geneva, World Health Organization, 2008 (WHO/HTM/TB/2008.402)
http://whqlibdoc.who.int/publications/2008/9789241547581_eng.pdf

Multidrug-resistant tuberculosis (MDR-TB) indicators. A minimum set of indicators for the programmatic management of MDR-TB in national tuberculosis control programmes. Geneva, World Health Organization, 2011 (WHO/HTM/TB/2010.11).
http://whqlibdoc.who.int/hq/2010/WHO_HTM_TB_2010.11_eng.pdf

OpenMRS programmer training materials:
<https://wiki.openmrs.org/display/RES/EHSDI+Training+Course>

Selected Bibliographic References of Uses of this Strategy

Bristow CC, Dilraj A, Margot B, Podewils LJ.
 Lack of patient registration in the electronic TB register for sputum smear-positive patients in KwaZulu-Natal, South Africa. *Tuberculosis (Edinb)*. 2013 Sep;93(5):567-8. doi: 10.1016/j.tube.2013.05.001. Epub 2013 Jun 13.

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Blaya JA, Shin SS, Yagui MJA, Yale G, Suarez CZ, Asencios L, Cegielski P, Fraser HSF: A web-based laboratory information system to improve quality of care of tuberculosis patients in Peru: design, implementation and evaluation methodology. *BMC Med Inform Decis Mak* 2007, 7(1):33. BioMed Central Full Text

Brief Description of the Approach

Recording and reporting data about people who have TB symptoms and those who are diagnosed with TB is a data-intensive process. Treatment regimens span many months (or years in some cases), and patients need to take anti-TB drugs at least a few times a week and often daily. Compliance with treatment must be recorded regularly (daily for drug-resistant treatment and weekly for drug-sensitive treatment). The results of laboratory tests are needed for the microbiological diagnosis of TB; to determine the susceptibility of *Mycobacterium tuberculosis* isolates to anti-TB drugs; to monitor patient response to medication; and to determine cure or failure of treatment⁴¹.

The most recent WHO recommendations on recording and reporting for drug-resistant TB specifically were published in 2008 and 2011.

List of alternative names (if applicable)

health management information system (HMIS), M&E,

Potential Beneficiaries

HIV-infected/PMTCT, Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs /Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban residents of poor areas, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

Highlights from Kenya's TIBU system

http://www.tbcare1.org/pdfs/TIBU_Factsheet.pdf

TIBU, meaning "to treat" in Swahili is a unique system developed for use by the Division of Leprosy, Tuberculosis and Lung Disease (DLTLD) in Kenya. TIBU is used in the field to perform regular monitoring activities like supervision and EQA. Data is collected electronically with mobile computer tablets and uploaded into the central database of the DLTLD. The data is immediately available for analysis and TIBU can generate cohort reports on case finding, treatment success, MDR incidence and mapping of specific TB issues. In addition, TIBU can be used for logistics planning of commodities and MDR patient support. To enable integration, TIBU is also linked with the national District Health Information System (DHIS2) for TB data sharing at the Ministerial level. The payment system comes into action once supervision or EQA activities are completed. TIBU indicates a need for payment to be made via mobile money transfer using M-pesa to a TB or Lab Coordinator for any costs incurred during supervision or EQA activities.

Selected List of Guidances, Tools and Manuals

Definitions and reporting framework for tuberculosis – 2013 revision'. WHO 2013.
http://apps.who.int/iris/bitstream/10665/79199/1/9789241505345_eng.pdf

Standards and benchmarks for tuberculosis surveillance and vital registration systems: The Checklist and User Guide Sept 2013. WHO
 Assessing tuberculosis under-reporting through inventory studies" WHO, 2012.
http://www.who.int/tb/publications/inventory_studies/en/

Electronic recording and reporting for tuberculosis care and control
http://www.tbcare1.org/publications/toolbox/tools/me/download.php?file=Electronic_RR_for_TB_CC.pdf

Guidelines for the programmatic management of drug-resistant tuberculosis: emergency update, 2008. Geneva, World Health Organization, 2008 (WHO/HTM/TB/2008.402)
http://whqlibdoc.who.int/publications/2008/9789241547581_eng.pdf

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http://whqlibdoc.who.int/hq/2010/WHO_HTM_TB_2010.11_eng.pdf

Centers for Disease Control and Prevention. Updated guidelines for evaluating public health surveillance systems: recommendations from the guidelines working group. MMWR 2001;50(No. RR-13):1-35
http://stacks.cdc.gov/view/cdc/7555/cdc_7555_DS1.pdf

Revised TB Recording and Reporting Forms and Registers. WHO, 2006.
http://whqlibdoc.who.int/hq/2006/WHO_HTM_TB_2006.373_eng.pdf

Compendium of indicators for monitoring and evaluating national tuberculosis programs. WHO, 2004, page 10.
http://www.who.int/tb/publications/tb_compendium_of_indicators/en/

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Blaya, J. A., T. Cohen, et al. (2009). "PDAs to collect tuberculosis bacteriology data in Peru reduce delays, errors, workload, and are acceptable to users: Cluster randomized controlled trial." *Int J Infect Dis* 13(3): 410 - 418.

Blaya, J. A., S. S. Shin, et al. (2010). "Electronic lab system reduces errors in National Tuberculosis Program: Cluster randomized controlled trial." *Int J Tuberc Lung Dis* 14(Suppl 8): 1009 - 1015.

Blaya, J. A., S. S. Shin, et al. (2007). "A web-based laboratory information system to improve quality of care of tuberculosis patients in Peru: design, implementation and evaluation methodology." *BMC Med Inform Decis Mak* 7(1): 33.

Bristow CC, Dilraj A, Margot B, Podewils LJ. Lack of patient registration in the electronic TB register for sputum smear-positive patients in KwaZulu-Natal, South Africa. *Tuberculosis (Edinb)*. 2013 Sep;93(5):567-8. doi: 10.1016/j.tube.2013.05.001. Epub 2013 Jun 13.

Methods and dimensions of electronic health record data quality assessment: enabling reuse for clinical research, Weiskopf NG, Weng C. *J Am Med Inform Assoc*, 2012.

<http://jamia.bmj.com/content/early/2012/06/24/amiajnl-2011-000681.full>

DOCUMENT & LEARN FROM THE PROCESS

IMPROVE RECORDING & REPORTING

Gather Information on Clinical, Behavioral and Social Risk Factors

Brief Description of the Approach

Variables of interest can be added over time, such as risk factors like smoking status or the presence of diabetes, which can then be used to create new types of aggregated and disaggregated reports;

The advantages of collecting additional individual data on risk factors include:

- Records can be used during clinical management of patients
- Data quality checks can be implemented, for example identifying duplicate entries or identifying implausible data combinations such as pregnant men;

List of alternative names (if applicable)

Health Management Information System (HMIS), M&E,

Potential Beneficiaries

HIV-infected/PMTCT, Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs /Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban residents of poor areas, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

The Tuberculosis Patient Management Project (USA) convened internal and external stakeholders, from CDC, the National TB Controllers Association, other national public health organizations, and state and local TB programs, in a series of Joint Analysis and Design sessions to define and document the data elements and functional requirements for the Patient Management project, which meets the core needs of the stakeholders. The result of this effort is a collection of artifacts, including a process for gathering information required for creating a treatment plan including clinical, behavioral and social risk factors. Some of the business use case specifications are:

Collect History - allows the user to collect and record historical information for a patient or for the patient's immediate family. The process of collecting history can include identifying sources for patient history, asking for history from sources using a patient-signed "Release of Medical History" request (if needed), receiving history from sources, recording history in the system, and generating a "Prior History" report. The history may be provided during a patient interview or from provider-supplied medical records. The clinical assessment data may include medication history, medical records, laboratory results, pending orders, previous TB treatment history, medication allergies, medication resistance, TB treatment compliance records and other information used by the clinician to define a care plan.

Risk Assessment - allows the user to perform a risk assessment of a patient based on some of the following issues: medical, socio-economic, transmission/exposure, treatment barriers, etc. Specific factors evaluated include risk factors for TB exposure and/or infection (correctional facility resident, long-term care resident, injected drug use, non-injected drug use, alcohol use, occupation, previous TB diagnosis, foreign birth, immigrant status), and risk factors for progression from latent TB infection to active TB (e.g. HIV status, diabetes, chronic renal failure). Other risk factors include allergies, adverse reactions to medications, and drug susceptibilities.

Resolve Barriers - allows a user to document the resolution of a barrier that could prevent patient treatment. "Enablers" linked to patient need are used to resolve treatment barriers. These enablers may include vouchers, food, housing, taxi fare, food coupons (provided at check-out), bus tokens (provided at check-out), home vouchers, food bank, etc. An outreach worker may be assigned to encourage compliance with DOT.

Track Enablers - allows a user to "track" and replenish the "Enablers" provided to patients. Enablers may include vouchers, food, housing, taxi fare, food coupons (provided at check-out), bus tokens (provided at check-out), home vouchers, food bank, updating community resource lists for coordinating services, etc.

Selected List of Guidances, Tools and Manuals

Definitions and reporting framework for tuberculosis – 2013 revision'. WHO 2013.
http://apps.who.int/iris/bitstream/10665/79199/1/9789241505345_eng.pdf

Electronic recording and reporting for tuberculosis care and control
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Guidelines for the programmatic management of drug-resistant tuberculosis: emergency update, 2008. Geneva, World Health Organization, 2008 (WHO/HTM/TB/2008.402)
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The web appendix:
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contains complementary material and is a living resource to which new material will be added as it becomes available.

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Brief Description of the Approach

During TB treatment and care process and service delivery quality assurance (QA) should be considered as an management component of any health service organization.

The key principle of QA is that it is a systematic and planned approach to monitor, improve and evaluate the quality of planned services (including counseling of patients) on a continuous basis. Quality improvement (QI) is an integral part of the QA cycle (plan, define, monitor, improve, evaluate) to provide health-care services that respond to the specific patients needs.

Supervision provided in the National TB programs often has an emphasis on quantity (number of visits) rather than quality of the provided services. A key role of supervisors should be to support, mentor and coach service providers. Team members should be encouraged to work together to recognize and understand patients' needs, analyze the processes and systems and to develop, test and implement solutions to improve their performance and patients' compliance and satisfaction.⁴⁴

List of alternative names (if applicable)

Quality improvement; supportive supervision

Shown to benefit

Health care workers

Potential Beneficiaries

HIV-infected/PMTCT, Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs /Lab staff, Military/Soldiers, Miners/Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/internally displaced populations (IDPs), Urban residents of poor areas, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/youth, Transgender, Intersex

Example of Good Practice

Electronic platform helps to prevent second-line anti-TB drug stock-outs in Brazil
The web-based e-TB Manager is a system for programmatic management of drug-susceptible and drug-resistant TB was introduced in Brazil in 2004. It integrates case management, medicine control and epidemiological surveillance into a single platform.

The medicines module uses automated functions for calculating quantities to order, management of drug distribution, tracking inventories with expiry dates and documenting overall consumption quantities. This allows the national TB program (NTP) to avoid drug stock-outs over a specified time period. Unexpected delays in procurement are managed centrally by distributing adequate security (buffer) stock and matching the exact needs of each treatment center with the number of patients enrolled for treatment, as recorded in the system.

The ability to monitor and manage second-line anti-TB drug supplies centrally using a web-based system in a continental-size country such as Brazil has made it possible to overcome many of the problems typically faced in second-line drug management

Selected List of Guidances, Tools and Manuals

Mapping the Motivations of Stakeholders to Enable Improved Tuberculosis Control Mapping Tool for Use in Workshops
<http://www1.msh.org/projects/rpmpplus/Documents/upload/Map>

Electronic recording and reporting for tuberculosis care and control
http://www.tbcare1.org/publications/toolbox/tools/me/download.php?file=Electronic_RR_for_TB_CC.pdf

The Practical Guide to Improve the Quality of TB Patient Care
<http://www.tbcare1.org/publications/toolbox/tools/access/download.php?file=PracticalGuideImproveQualityTBPatientCare.pdf>

Service Availability and Readiness Assessment (SARA)
http://www.who.int/healthinfo/systems/sara_introduction/en/index.html

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Supportive Supervision to Improve Integrated Primary Health Care. MSH. Occasional papers, 2006(2)

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<http://erc.msh.org/mainpage.cfm?file=2.5.0.htm&module=hr&language=English>

Innovative quality-assurance strategies for tuberculosis surveillance in the United States. Manangan LP, Tryon C, Magee E, Miramontes R. Tuberculosis Research and Treatment, 2012. doi:10.1155/2012/481230

Were, M. C., C. Shen, et al. (2011). "Evaluation of computer-generated reminders to improve CD4 laboratory monitoring in sub-Saharan Africa: a prospective comparative study." J Am Med Inform Assoc 18(2): 150 - 155

Brief Description of the Approach

Tracking progress in reaching and serving people at risk for TB is critical to achieving goals. However the techniques to monitor and evaluate our work are changing rapidly as are the indicators and benchmarks we set. Fortunately there are a lot of new tools available to help organizations to design and collect quality data for decision making.

List of alternative names (if applicable)

Evidence based approaches, Operations research, Implementation research

Shown to benefit

HIV-infected/PMTCT, Adolescents, Alcohol dependent, Attendees of health care facilities, Children under 5, Diabetes, Drug dependent, Elderly (institutionalized), Malnourished, Mentally ill (institutionalized), Persons with Previous TB, Peri-partum women, Smokers, Factory and farm workers, HCWs /Lab staff, Military/Soldiers, Miners/ Ex-miners, Orphans and institutionalized children, Prisoners & prison staff, Refugees/ internally displaced populations (IDPs), Urban residents of poor areas, Transportation workers, Homeless, Indigenous and minority ethnic groups, Marginalized men who have sex with men (MSM), Migrants, Nomads/Pastoralists, Sex workers (SW), Street children/ youth, Transgender

Example of Good Practice

A Pilot Study of an mHealth Application for HCWs: Poor Uptake Despite High Reported Acceptability at a Rural South African Community-Based MDR-TB Treatment Program.

Chaiyachati KH, Loveday M, Lorenz S, Lesh N, Larkan LM, Cinti S, Friedland GH, Haberer JE.

PLoS One. 2013 May 28;8(5):e64662. doi: 10.1371/journal.pone.0064662. Print 2013.

As the South African province of KwaZulu-Natal addresses a growing multidrug-resistant tuberculosis (MDR-TB) epidemic by shifting care and treatment from trained specialty centers to community hospitals, delivering and monitoring MDR-TB therapy has presented new challenges. In particular, tracking and reporting adverse clinical events have been difficult for mobile HCWs (HCWs), trained health professionals who travel daily to patient homes to administer and monitor therapy. We designed and piloted a mobile phone application (Mobilize) for mobile HCWs that electronically standardized the recording and tracking of MDR-TB patients on low-cost, functional phones.

OBJECTIVE:

We assess the acceptability and feasibility of using Mobilize to record and submit adverse events forms weekly during the intensive phase of MDR-TB therapy and evaluate mobile HCW perceptions throughout the pilot period.

METHODS:

All five mobile HCWs at one site were trained and provided with phones. Utilizing a mixed-methods evaluation, mobile HCWs' usage patterns were tracked electronically for seven months and analyzed. Qualitative focus groups and questionnaires were designed to understand the impact of mobile phone technology on the work environment.

RESULTS:

Mobile HCWs submitted nine of 33 (27%) expected adverse events forms, conflicting with qualitative results in which mobile HCWs stated that Mobilize improved adverse events communication, helped their daily workflow, and could be successfully expanded to other health interventions. When presented with the conflict between their expressed views and actual practice, mobile HCWs cited forgetfulness and believed patients should take more responsibility for their own care.

DISCUSSION:

This pilot experience demonstrated poor uptake by HCWs despite positive responses to using mHealth. Though our results should be interpreted cautiously because of the small number of mobile HCWs and MDR-TB patients in this study, we recommend carefully exploring the motivations of HCWs and technologic enhancements prior to scaling new mHealth initiatives in resource poor settings.

Selected List of Guidances, Tools and Manuals

Definitions and reporting framework for tuberculosis – 2013 revision'. WHO 2013.
http://apps.who.int/iris/bitstream/10665/79199/1/9789241505345_eng.pdf

Tuberculosis and Malaria. Monitoring and Evaluation Toolkit - 4th edition. 2011
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TB Program Evaluation Handbook - Centers for Disease Control
http://www.cdc.gov/tb/programs/evaluation/TBEvaluationHandbook_tagged.pdf

Assessing tuberculosis under-reporting through inventory studies. WHO 2012
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Manual on use of routine data quality assessment tool for TB monitoring. WHO
http://www.tbcare1.org/publications/toolbox/tools/me/download.php?file=RDQA_Tool.pdf

Electronic recording and reporting for tuberculosis care and control. WHO
http://www.tbcare1.org/publications/toolbox/tools/me/download.php?file=Electronic_recording_and_reporting_for_tb_care_and_control.pdf

A guide to monitoring and evaluation for collaborative TB/HIV activities. Stop TB
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