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Our health facilities are still unsafe: why we all need to do something about TB infection control

TB infection control (IC) needs attention and activism

This special edition of HATIP covers infection control. It is aimed at health care workers, programme planners, community organisations and treatment advocates - all groups that have an important role in TB infection control.

This edition is kindly supported by the World Health Organization's Stop TB department.

Almost two years have passed since news of the outbreak of extensively drug resistant tuberculosis (XDR-TB) at the Church of Scotland Hospital in Tugela Ferry, South Africa was first announced to the world.[1] XDR-TB is defined as TB with resistance to at least rifampicin, isoniazid, a second line injectable drug (capreomycin, kanamycin or amikacin) and a fluoroquinolone.[2]

As HATIP reported previously (see December 2006 and January 2008) there was strong evidence that the initial outbreak in Tugela Ferry evolved locally and was spread to other patients at the hospital or possibly within HIV patient support groups.

The discovery led to panic and calls for compulsory detention of MDR TB patients, and highlighted the spread of TB within hospitals filled with people with HIV.

But after all the hoopla, have our health facilities, prisons, mines, or HIV care services, become any safer?

"Everyone talks about Tugela Ferry and what happened. But what has changed regarding TB IC? Nothing much, I'm sorry!" Dr Refiloe Matji said at the WHO's Three I's for HIV/TB meeting, held this past April in Geneva. Dr Matji is the regional director of University Research Inc for Southern Africa. "And who should take on that responsibility? More hospitals are being built today but has anyone checked that TB IC is in place?"

(The Three I's are activities to reduce the burden of TB in people with HIV, including intensified case finding (ICF), isoniazid prophylaxis (IPT) and TB IC.)

South Africa's Ministry of Health has now produced a new TB IC policy to respond to the crisis, but with the exception of the Church of Scotland Hospital in Tugela Ferry and a handful of other facilities (see below), most reports are that implementation of TB IC on the ground is either slow or not happening at all.

And with a few exceptions, there has been little action in many other resource-limited settings.

"It's pretty clear that TB infection control is lacking pretty much everywhere in the world," said Dr Mario Raviglione, head of the Stop TB Department at WHO.

Drug-resistant TB is more common in Africa than people think

In a recent paper, Drs Ellen Zager and Ruth McNerney argue that the burden of MDR-TB in sub-Saharan Africa is more significant than people realise.[3] Traditionally, drug-resistant TB has been presented as a proportion of the total number of TB cases — and that proportion is quite high in places like Russia or China, but lower in Africa. However, Zager and McNerney write, "if one considers the incidence of new TB cases with drug resistant disease in terms of the population, then countries of sub-Saharan Africa have amongst the highest rates of transmitted MDR-TB in the world."

When looked at this way, South Africa moves up from number 25 in the list of high prevalence MDR-TB countries to number 4.

And the majority of MDR-TB cases in sub-Saharan Africa go undetected. Those that are diagnosed remain untreated for the most part.

For instance, Dr. Argata Guracha of Kenya's Ministry of Health told the Three I's meeting that Kenya had only 82 new confirmed cases of MDR-TB last year, about 250 cumulative (currently living). But only ten percent of these are on 2nd line treatment (which began this year). "Those not on treatment act as a reservoir for the spread of the disease," he said. "And even where we treat them - that's at the national referral hospitals - patients are not isolated. Isolation facilities are not [yet] available."

The risk of leaving known patients with MDR-TB without proper treatment, is that they may be tempted to seek care from doctors who institute inadequate treatment with second line drugs, resulting in treatment failure and emergence of XDR-TB. Patients may also self-medicate with the same risks of XDR-TB emergence.

XDR-TB cases confirmed in Botswana and Namibia

And now there is confirmed evidence that XDR-TB has either spread to or has evolved spontaneously in other African countries. The first report came in January, this year, when the government of Botswana announced two cases that were detected at Princess Marina Hospital in Gaborone.

Then on May 15, the Ministry of Health and Social Services in Namibia confirmed the detection of the country's first 8 cases of XDR-TB.[4] With second-line drugs having been used since 1999, many more are likely to have gone unnoticed.

What is more troubling is that the cases were scattered throughout that country, indicating that XDR-TB is probably widespread and not clustered around one particular facility. Most were close to the border of Angola. One was in Katima Mulilo — less than four kilometres from the border post to Zambia and very close to Botswana and Zimbabwe.

It bears repeating: the drug resistant cases being identified in Africa are probably only the tip of the iceberg. The more we look, the more we're sure to find.

And the problem is sure to grow. According to a mathematical model published last year by the team in Tugela Ferry: "Without new interventions, about 1300 cases of XDR tuberculosis could arise in Tugela Ferry, KwaZulu-Natal by the end of 2012—most of which would be due to nosocomial transmission.[5] However, they estimated they could cut those numbers in half by practising fairly simple TB IC measures.

Poor TB infection control responsible for over half of TB cases in people with HIV?

But outbreaks of drug-sensitive TB within a health facility are likely to be much more common — just harder to detect. This should worry HIV programmes in particular because drug-sensitive TB is the leading cause of death in people with HIV. People should not be expected to put themselves at high risk of TB exposure in order to access HIV care.

For a host of reasons, it is difficult to determine precisely how much of the TB in people with HIV is acquired in health care settings, according to Dr Liz Corbett of the London School of Tropical

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Medicine and Hygiene and the Biomedical Research & Training Institute in Harare.[6]

"However, my guess would be that over 50% of TB disease, in some and perhaps many HIV clinic settings, is due to institutional transmission," she said.

That guess is primarily based on data from serial South African gold mining cohorts looking at TB in people living with HIV. Dr Corbett was involved in the first cohort study, which was carried out before there was an HIV care clinic and investigated the recurrence rate of TB in participants after they had been treated and cured.[7] Any active disease that occurred after a cure would be due to a re-infection (and not recrudescence of incompletely treated TB) and thus was a good way to measure TB transmission.

Not long thereafter, Dr Alison Grant published a study in the same HIV-infected population looking at secondary isoniazid preventive therapy with placebo arm.[8] But in that placebo arm, the TB recurrence rate had doubled.

- Prior to establishment of the HIV care clinic, the TB recurrence rate was 8.2 per 100 person years in HIV-infected miners
- Once an HIV clinic was established, recurrence went up to 19.2 per 100 person years in miners not taking isoniazid (it was 8.6 per 100 PYs in those that did have secondary IPT)

What had changed? An HIV clinic had been set up at the mine.

Other factors could also be contributing the differences between cohorts (such as the age of the miners), but Dr Corbett's estimate highlights a little appreciated fact about the ART-scale up: that failure to include TB infection control in HIV and ART clinics has put people at serious risk of TB (re-) infection. In fact, Dr Corbett also suggested the high rates of TB that continue to be seen in people with HIV on ART may be partly due to the continuously high risk of TB exposure in the ART clinic.

Muhamed Mulongo, a programme officer for The AIDS Support Organization (TASO) who was also at the Three I's meeting, said that programmatic experience was leading his organisation to the same conclusion.

"About 30% of the patients we treat for TB are either getting it for the 2nd or 3rd time and we've realized that many of these patients have actually been in care for a long time. We are realising that more transmission of TB is taking place within the HIV clinics. I think our corridors are dangerous, somehow," he said.

Dr Alasdair Reid of UNAIDS voiced similar concerns: "When will people realise that the ART units being built around the world are actually TB transmission units? Because the ones I've visited have been the very typical long central corridor waiting area with no ventilation, where people sit for hours waiting for their ART treatment with coughing patients."

"As an unintended consequence of the ART scale-up, we may literally be spreading TB to people coming in for care," said Dr Bess Miller, of USAID and PEPFAR, at the STOP TB Symposium before the Union World Lung Health Conference last November:

The risk to health care workers

The healthcare system's most precious resource, its staff, is also at high risk of acquiring TB in their very own facilities — particularly those who work closely with patients. "Part of the problem at my facility," Dr Francois Venter of Johannesburg Hospital told HATIP, "is that they do feel safe – as evidenced by the complete lack of concern regarding TB IC".

It's a false sense of security.

In the 1990s, Dr. Anthony Harries and colleagues in Malawi reported that healthcare workers had a 12-fold higher risk of developing TB each year compared to the general population.[9] The annual risk of TB was high among all categories of HCW, especially clinical officers.

Speaking at the STOP TB Symposium last year, Dr Martin Jagui Moscoso described TB transmission among health workers in Peru, a country with a low incidence of HIV but a relatively high incidence of TB (100-200 per 100,000) and MDR-TB. In one study, the annual rate of tuberculin skin test conversion (TST: which can detect latent or recent TB infection in most cases) was 17% among medical residents at one facility.[10]

Then, in 1997, an outbreak of active TB in Almenara Hospital involved 44 health workers (36 of whom had confirmed TB).[11] The annual TB incidence that year for the laboratory staff was 6977 per 100,000, and for the rest of the medical staff 932 per 100,000. The only risk factor for TB in the laboratory was the use of common staff areas.

A systematic review looking at TST conversion among health care workers in Asia or South America reported an incidence of 5.8% (0-11.3%) per year on the job.[12] [13] An increased incidence of positive results on TST among health workers with frequent patient contact has also been reported from Côte d'Ivoire.[14]

About TB transmission

Only people with active pulmonary or laryngeal tuberculosis are infectious, but when they speak, spit, cough or sneeze without covering their mouth, they can propel fine droplets into the air (aerosols) containing infectious *Mycobacterium tuberculosis*.[15]

Despite this, "most patients appear surprisingly un-infectious," said Dr Corbett. Current estimates are that someone with smear-positive TB may cause an average of 8-10 secondary infections per year and that only about 3 out of 10 household contacts become infected despite prolonged exposure.

But that's the mean. There are wide variations in how infectious someone might be. A small number of people with TB seem far more infectious in experimental models and DNA fingerprinting studies. [16] [17] [18] [19] Generally, these people are smear-positive, and some may also have laryngeal TB (along with pulmonary or cavitory TB).[20]

Other features of infectious people may be that: 1) they aren't on effective treatment yet (think of the undiagnosed patient sitting there coughing in the waiting room) because there is no triage, 2) they have yet to benefit from it (it generally takes a week or so on effective treatment for drug-sensitive TB to become less infectious) 3) they may be failing treatment because of drug resistance, 4) they may be non-adherent; 5) the doctor has prescribed an inadequate treatment regimen; 6) the drugs may be of inferior quality.

In one study, DNA fingerprinting of TB cases in a South African gold mining community indicated that one individual may have been responsible for about 15% of TB cases in the entire workforce (around 28,000 people).[21] This man had a prolonged period of infectiousness during a treatment failure lasting over 10 years.

It is not clear whether HIV increases susceptibility to becoming infected with TB, although it dramatically increases the likelihood of developing active disease. Most active TB disease in people with HIV appears to be recently acquired

Nor is it clear whether HIV increases infectiousness, however, because of the increased number of TB cases, HIV has dramatically increased the exposure to active TB in the community and health care settings in countries with a high burden of HIV.

A person with TB who is coughing without covering his or her mouth poses a greater risk to someone close by than someone

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sitting across the room. Even so, tiny droplets that could contain infectious bacilli can remain in a room without good ventilation for a very long time.

"A one µl droplet takes 24 hours to fall 3 metres in perfectly still air. So what happens with just a little bit of air movement? It may potentially be in that room, if it is all closed up, almost forever," said Dr Paul Jensen of the CDC at a Médecins sans Frontières' sponsored symposium on TB diagnostics last November in Cape Town before the Union World Lung Health Conference.
"Overall the risk of TB infection in African communities is 0.5% to 4% per year. The risk after 7 days in a hospital may be equivalent to 6 months to 1 year in the community," said Dr Corbett.

Reducing the risk of TB exposure through TB IC

"Infection control is not a new discovery," Dr Miller said during her talk in Cape Town. "It's been around but it's always something that we put on the back burner."

Indeed, the WHO first put out guidelines for TB IC in resource-limited settings in 1999, which have been updated with an addendum related to TB IC in HIV care settings —but these have been poorly implemented. The key activities recommended in WHO and CDC technical guidance are summarised below (see the guidelines themselves in the *Resources* section).

Five steps to infection control in HIV care settings for preventing TB transmission

From the TB IC in HIV Settings Addendum (this guidance is primarily for outpatient facilities such as ART clinics) (see resources)

Step I: Screen for TB — early recognition of cases or suspects is essential

This can be achieved by assigning a staff member to screen patients for prolonged duration of cough immediately after they arrive at the facility.

Step II: Teach cough hygiene

Clients who screen positive as TB suspects should be instructed to cover their mouth and nose when they cough or sneeze, and handed tissues or handkerchiefs if possible. Face-masks may be an option in some situations.

Step III: Separate

TB cases or suspects by the screening questions must be **separated** from other patients and requested to wait in a separate well-ventilated waiting area.

Step IV: Provide HIV/AIDS services

Triage symptomatic patients to the front of the line for the services they are seeking

Step V: Investigate for TB or refer

TB diagnosis on site or prompt (and effective) referral — followed by prompt treatment

Good work practice and administrative measures (has the greatest impact)

- A written infection control plan for each facility
- Administrative support for procedures in the plan, including quality assurance
- Training and supervision of staff
- Education of patients and increasing community awareness
- Coordination and communication with the TB programme.
- Increasing awareness: Increasing access to HIV testing, with ART, IPT and consideration of changing duties (although changing jobs has been an unpopular choice in most settings).

Environmental measures

- Ventilation (natural and mechanical)
- Filtration
- UV radiation

Personal respiratory protection

- Facemasks may prevent the spread of TB from the patient but teaching cough etiquette is less stigmatising
- N 95 respirators may protect health workers and patients but are expensive (generally only recommended for when other protections aren't sufficient — such as when seeing someone with drug-resistant TB).

Some have complained that the guidance is too technical or not well-suited to resource-limited countries. But with a little effort, some programmes have been able to adapt the policy to local conditions.

"In establishing national infection prevention control guidelines for TB in South Africa, it has become evident that most of these were derived from existing guidelines in developed countries. Though the principles were sound, the practices were not realistic for developing economies and generally not implemented in healthcare facilities," said Professor Shaheen Mehtar of Stellenbosch University and Tygerberg Hospital, near Cape Town, in a recent Lowbury Lecture. But Prof Mehtar and colleagues at Tygerberg Hospital took up the challenge and adapted the guidance as best as they could to their setting.

Updated WHO guidelines are in development that should include a package of action steps to help countries start improving TB IC taking into account differences in resources and settings. "We are developing straightforward guidance on what to do at national level in terms of TB infection control in health care and congregate settings and how to prioritise interventions," WHO's Dr Fabio Scano told HATIP.

But waiting for new WHO guidelines should not become the next excuse to do nothing. Countries or HIV programmes need to move ahead and adapt the existing guidance and develop tools, information education and communication materials and training packages. At the Three I's meeting, WHO, the CDC and other technical partners committed to providing technical assistance to help countries "translate" existing guidance into national policy and operating plans (to be discussed at more length in a future report on the Three I's meeting).

In addition, some helpful tools have already been developed such as those from The Integrated Management of Adolescent and Adult Illness (IMAI) (see resources). Others are being put together by MSF in Khayelitsha working with WHO (contact msfb-khayelitsha-ic@msf.org.za) and PEPFAR is working with ICAP to develop tools based on its experiences in the Eastern Cape.

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Expert views on TB infection control measures

TB screening and IPT as an essential part of infection control

"Intensified TB case finding (ICF), isoniazid preventive therapy (IPT), all of these are in the service of infection control," Dr Miller said in Cape Town.

"Health care workers should be aware that the most powerful intervention to reduce transmission of TB is to reduce the diagnostic delays," Dr Fabio Scano of WHO's Stop TB programme told HATIP. Intensified case finding, prompt diagnosis and rapid initiation of appropriate treatment could make a big difference. According to WHO's 1999 guidelines, "the greatest risk of transmission occurs when patients remain undiagnosed and untreated".

Diagnosis has its hazards - collection of sputum samples is often carried out without consideration for the health carew worker and others in the facility.

"Sputum collection always should be done outside (open environment) and away from other people," WHO recomends, "not in small rooms such as toilets or other enclosed areas. When outdoor sputum collection is not possible, sputum should be collected only in well ventilated areas where the risk of exposing HCWs and other patients is low."[1]

TB screening is the first step towards diagnosis and treatment. TB case loads and transmission could be reduced even further by enhanced uptake of HIV testing and counselling, routinely screening those people testing for HIV for TB and offering isoniazid preventive therapy (IPT) to those without signs and symptoms of TB.

Cough etiquette

Questions linger about the best way to encourage good cough etiquette. Facemasks can help prevent the spread of TB from the patient wearing them to others — but many people feel they stigmatise the patients who wear them.

"We are experimenting with the four possible ways of practising cough hygiene (hand /upper arm /handkerchief or tissue /surgical mask). At present, using the hand is the most accepted," according to Robin Smith, an Infection Control Practitioner working for MSF in Khayelitsha. "There is still a great deal of stigma attached to surgical masks. We have considered giving all patients surgical masks on entry into the clinic to overcome this."

Good adherence to a less than optimal barrier may be better than poor adherence to a good one. However, using a handkerchief has generally been thought to be less effective than a facemask, but according to research by Prof Mehtar "using a handkerchief or cloth to cover the mouth and nose was effective in reducing aerosol to 0.25 m, and surgical masks effectively reduced aerosols to 0.5 m." As a result, Tygerberg is emphasising using handkerchiefs and cloths.

Facemasks may be useful for patients who do not adhere to good cough etiquette or who have drug-resistant TB. Even then, it is impossible to force anyone to keep it on.

"I visited one of the smaller hospitals in Cape Town recently," said Dr Corbett, "with TB patients just mixed in with everyone else. One of the TB patients had a mask on because she'd been

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recognised as drug resistant. While we were there, her kids came in to see her and straight away she took her mask down. And people laughed but they didn't do anything about it. So I think it's very hard."

Other healthcare workers working at very busy clinics in South Africa told HATIP that they were not currently teaching *any* cough hygiene to their clients.

In contrast, Chris Green, a treatment educator at Spiritia Foundation in Jakarta, Indonesia told HATIP that facemasks are insisted upon within their HIV community support groups:

"In our support group meetings, we encourage participants to discuss the probability of peer group members coming to a meeting with a cough. We note that if they are just excluded, or asked to wear a mask, they may feel discrimination - particularly if they have recently joined. We encourage groups to discuss this in advance, and develop a group rule, to be posted on a notice board, that anybody attending with a chronic cough will be asked to wear a mask and encouraged to visit a clinic. This will also increase awareness."

He added that in some parts of Indonesia, there's another problem besides poor cough etiquette: "In Papua, many of the indigenous people chew betel-nut, and spit out the residue. A recent report raised concerns that this is contributing to TB infection in Papua New Guinea, and the same is extraordinarily true in Indonesian Papua. I remember as a lad the notices in the public conveniences in England: 'Spitting causes Consumption'. I think those campaigns were effective; we urgently need to emulate them in Papua."

At the Stop TB Partnership, TB/HIV Core Group Meeting in New York in April, both Dr. Jeroen van Gorkom of KNCV and Dr Miller said similar campaigns around cough hygiene are needed.

"Even 80 years ago in the Netherlands - we had campaigns about cough hygiene, not spitting in public and so on," said Dr van Gorkom. (You can view some good examples of early 20th century anti-TB posters here).

Dr Miller said that within months, she would like to see cough etiquette and other TB IC printed on posters and put up in thousands of clinics, as was done in the past.

Separate TB suspects - but where do they go?

Separating TB suspects may be difficult in facilities where space is a major concern.

One solution, said Dr Miller, "in climates that allow for it, is to have as many covered outside waiting areas as possible. With regard to housing MDR patients, I know in our community many years back, we had trailers that our patients were living in. So each community comes up with a make-shift answer."

But Dr Corbett said that many clinicians aren't keen on putting people with HIV who are coughing together with people with TB during triage or when admitted into hospital.

"There's an increase in the number of HIV-positive patients who have cough but do not have confirmed TB. What do we do with these people? Do you isolate them with the TB patients? It just doesn't seem right and people don't do it, so in many places this basic separation of TB in-patients and non-TB patients, has completely fallen apart. That's certainly true in Zimbabwe."

She suggested moving to a "red/amber/green" approach to separating patients. However, this could wind up disclosing a patient's HIV status.

But at his talk in Cape Town, Dr Jensen said that a well ventilated room where TB suspects have been instructed on cough etiquette is probably much safer than the waiting room — where, chances are, both groups of patients have been sitting together for hours anyway.

Why? Because we're too busy to triage

"Some of the HIV partners have discussed with us the fact that even the concept of triage is not well accepted or well understood. Patients queue up and even if they're coughing blood, if they're number 15, they're seen after number 14," said Dr. Miller.

"With the establishment of HIV care and treatment clinics we've tried to re-introduce the concept of triage, which was never implemented in many of our clinics," Dr Eric Van Praag, Country Director of Family Health International in Tanzania, said at the Three I's meeting. "Triage to get better patient flow, triage to sort out who needs emergency care or not, and triage in order to start implementing some IC components. It offers a lot of advantages. But we were not very successful. It's very difficult - that concept of triage — not to train it but to implement with the current work load in our clinics."

Task shifting might help. Some are using 'cough monitors.'

"We have just introduced the concept of a 'Cough Officer' in Site B Ubuntu TB/HIV clinic," said MSF's Mr Smith. "The guys in KZN Church of Scotland Hospital [in Tugela Ferry] had good results with this."

Written infection control plans for the facility

WHO's guidelines emphasise the importance of having a written facility-based plan. However, it may be a challenge to convince large tertiary hospital administrators and staff to prioritise infection control.

"When you speak with people about it, the eyes roll and the fingers sort of twiddle, and people try to leave the room, so there has to be some way of conveying the message in a way that is more interesting and more gripping," Dr Gerald Friedland of Yale University, and the Tugela Ferry team.

"We're going to need to sensitise a variety of persons including hospital administrators of the overall issue," said Dr. Miller in Cape Town.

Dr Jagui agreed. "The directors, who are often something like a surgeon or a neurosurgeon, don't want to put money in infection control," he said. But he suggested that whenever outbreaks, such as SARS, bird flu, etc, occur, to use the opportunity to get the hospital director's attention.

Environmental controls: windows and buildings

"In many hospitals aspects of environmental controls and respiratory protection are prioritised neglecting the implementation of administrative controls," Dr. Jagui said in Cape Town

Many of these are expensive, mechanical interventions that move air out of a room, or try to "clean" the air via filtration, or inactivate under UV lights. But lots of things can go wrong with these systems — especially in a resource-limited setting without reliable electricity. Prof Mehtar concluded that, with the exception of some window fans to blow air out of some rooms, mechanical engineering-based environmental solutions are impractical and exorbitantly expensive to install and maintain. And Dr Jensen stressed that even having a fan in the window will do no good if there is another open window right next to it, or if the door is closed.

Other environmental controls, such as natural ventilation in a well-laid out building, are another matter entirely. A recent study by Ron Escombe and colleagues has shown that ventilating tuberculosis (TB) wards by opening windows is more likely to reduce

the risk of infection than mechanical ventilation and should be practiced wherever the climate permits.[3]

Dr Jensen does like whirlybird roof vents however. Since hot air rises, if there is a breeze outside, these can move air out of a room pretty quickly.

MSF is using them, according to Robin Smith: "Electricity and maintenance are a problem here in Khayelitsha so we are working as much as possible with natural ventilation - covered outdoor waiting areas, windows, whirlybirds for example - which require neither electricity nor maintenance. This is not only in the waiting rooms, but also in the TB and HIV departments."

"I'm preaching that ventilation is the answer and that we should all be thinking about it," said Dr Venter.

However, just opening the windows won't work in every building.

"We find that counselling rooms at TB clinics - even in hospitals - are often poorly designed, laid out and ventilated," said Chris Green in Jakarta. "The older hospitals and clinics here are MUCH safer than the modern version. The older facilities tend to have higher ceilings, larger windows, better ventilation (no air conditioning), and waiting areas are often open. In contrast modern hospitals have low ceilings, are usually air-conditioned, have tinted, sealed windows, and waiting areas are closed and crowded."

Some of the facilities Dr Venter worked in fell into that latter category.

"To improve ventilation in the waiting room, we rebuilt one of our ART facilities, and plan to renovate another, with specific instruction to improve ventilation and increase access to ventilation – part DoH, part Pepfar funding," he said.

Building design is outside most healthcare workers' expertise. Health facilities will require airborne infection control assessments to determine whether opening the windows is adequate or whether renovations might be necessary. Thus, TB IC must also become integrated into national public health policy, with plans, supervision and inspections as a way to monitor and evaluate progress. These issues will be discussed in an upcoming HATIP report on the outcomes of the Three I's meeting.

But even in a building with good natural ventilation, someone has to make sure that the windows stay open, that there is the right sort of air circulation, and that staff do these things consistently.

Training and supervision of staff

"There is urgent need for wide-spread training that is comprehensive and integrates HIV and TB, but is inclusive of all aspects of care including psychosocial right down to occupational safety and how and when to put on an N95 mask," Dr Krista Dong of iTeach told HATIP.

"Lack of education was our biggest barrier," Robin Smith of MSF told HATIP. "We started by running DR-TB training sessions for all healthcare workers, now we are busy doing the same for all home-based carers, and after that we will move onto the general population."

This is a big job because people need to produce TB IC training materials and methods that are appropriate to the language and culture of the nurses and other health staff.

Prof Mehtar emphasised that English is not the first language for many and that: "The method of instruction had to be more practical than theoretical...and the local culture of communication was verbal and relied on talking, workshops and discussion with visual evidence."

These methods are time and labour-intensive.

PALSA PLUS has a wealth of experience using similar methods of training nurses who run primary care clinics in South Africa (published by the Knowledge Translation Unit at Cape Town University Lung Institute). According to Dr Ruth Cornick at the University of Cape Town Lung Institute, TB IC has been integrated into the TB section of this year's edition of PALSA PLUS, including how to take sputa safely, ventilation, and instructions on the appropriate use of facemasks and respirators.

"The guideline and training approach prioritises diagnosing and treating TB quickly and knowing the patient and health workers' HIV status which of course impact on the spread of TB. We also have several reminders about MDR and XDR TB where they would prompt appropriate action in the course of a clinical consultation," she said.

Soon this course should reach most primary care nurses throughout South Africa.

Another issue is that training generally requires supervision to ensure implementation.

For instance, following recognition of the devastating impact of nosocomial TB on healthcare workers in Malawi, infection control guidelines were written and distributed to each hospital and staff were trained.[4] The emphasis was on rapid diagnosis of patients with smear-positive pulmonary TB, administrative attempts to isolate infectious patients, and the education of patients on cough hygiene. Hospitals were requested to consider offering confidential counselling and HIV testing to their staff and to advise those who were HIV-positive against working on general wards and TB wards.

However, a survey three years later showed no significant improvement and staff only reported scattered implementation of the policy. "The introduction of guidelines for the control of TB infection is an important intervention for reducing nosocomial transmission..., but rigorous monitoring and follow-up are needed in order to ensure that they are implemented," wrote Dr Anthony Harries and colleagues

Dr Corbett recently conducted a survey rating 50 African facilities in Ethiopia, Kenya, Malawi, Mozambique and Zimbabwe on their infection control practices — and found most were lacking.

Survey of reported TB IC practice at 50 African facilities:

At this facility	Randomly selected facilities	Best practice facilities	P-value
Is there a TB IC plan?	40%	65%	0.08
Environmental measures in place:			
Outdoor TB clinics	17%	30%	0.43
Policy of always keeping windows open	50%	90%	0.003
Patients go outside to produce sputum	40%	55%	0.30
Well ventilated areas for patients with TB/HIV	50%	80%	0.032
Triage of coughing patients at OPD registration	37%	30	0.63

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Separation of non/+coughing patients in ward	50%	53%	0.87
Is there a "cough officer"/equivalent identifying patients with cough on the ward	25%	21%	0.77
Do you routinely provide cloths to patients with cough to cover their mouths with	13%	40%	0.03
Sputum pots in stock			0.11
Either wards of OPD/lab out of stock	40%	35%	
Whole facility out of stock	17%	0%	
TB microscopy functioning	50%	80%	0.028

Someone needs to be accountable, and empowered

So having a plan and putting it into practice are very different things.

Dr Francois Venter told HATIP that some of his facilities' TB IC plans were all on paper: "We have patients coughing routinely in crowded waiting rooms. What's holding up TB IC implementation? No central person is responsible. ID nurses see their role as TB notification and little else; ward nurses don't really see it as a priority." To change this, he would like to "make it someone's responsibility, and give them the resources - and the power - to implement!"

Which is exactly what MSF has done in Khayelitsha by employing Robin Smith.

"One of our largest barriers was that TB infection control currently falls under the responsibility of the facility managers and Health & Safety reps, where it gets lost in the plethora of other things that they have to worry about, particularly if they are not educated about it. Having a full time Infection Control Practitioner for the Khayelitsha sub-district has allowed us to attack the problem more cohesively and I would recommend that other sub-districts do the same."

Turning panic into activism

Not every programme will appoint and train an infection control officer, and as a number of people have pointed out, responsibility is usually given to someone without much power to change things where they work.

Advocating for a national TB IC policy (integrated with other airborne IC measures) would provide support for teams trying to scale-up TB IC where they work.

"There is need to also have mechanisms for supervision or inspection of health facilities, enforcing the implementation of standards and clinical practice. That means that you must have national standards, national policy, national training programmes and guidelines, and a monitoring and evaluation system if you want to measure whether TB IC is having an impact," Dr van Gorkom told HATIP.

In addition, the community should act as a watchdog, and draw attention to poor TB IC at their local facilities.

TB IC has to be made personal for both the healthcare community and the HIV community, because they are the ones most at risk.

There are some pretty basic things that programmes can implement and that healthcare workers can do to help protect themselves and their patients in the wards and waiting rooms, and that community members can do to make places where people with HIV gather safer (including demanding safety from their own health clinic). Just like treatment literacy efforts were used to help people understand some of the science around HIV, they can be used to help people protect themselves from TB.

Activists are beginning to mobilise around this issue and teach people the basics. But TB IC needs to be rolled out into community-based organisations as well. Incorporating good TB IC in their own organisations may further reduce TB transmission, and like the activists in Indonesia, also increases awareness of what to expect in their health care facilities.

Activism is what prompted the reaction to the MDR-TB crisis in New York — an event that resurrected TB as a global health priority — Dr Ken Castro of the CDC reminded the audience in Cape Town. "It was the healthcare worker unions who demanded to be protected, and the AIDS Coalition to Unleash Power, (ACT UP), doing protests and demonstrating in front of the Health Department. We need to bring out that sense of outrage in the community that's most affected."

"We need a bit of the same outrage that was associated with lack of ART in the developing world, a clarion call that says we have to roll-out ART responsibly - that means we can't get people sick by visiting the clinics," Dr Rene Ridzon of the Gates Foundation said at the Three I's meeting in Geneva.

Resources

Guidelines for the prevention of tuberculosis in healthcare facilities in resource-limited settings, WHO, 1999.
http://www.who.int/docstore/gtb

Tuberculosis infection control in the era of expanding HIV care and treatment; an addendum to WHO guidelines for the prevention of TB in health care settings, WHO, CDC, 2006.
http://www.cdc.gov/gap

IMAI's Tuberculosis Care with TB-HIV Co-management.
www.who.int/hiv/TB_HIVModuleCover23.05.07.pdf

Expert panel and reviewers for this edition

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about HATiP

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The newsletter is edited by Theo Smart (Cape Town) and Keith Alcorn, NAM's Senior Editor (London).

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