The referral pathway of presumptive drug-resistant tuberculosis in an urban poor setting, The Philippines

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Setting: Socio-economically underprivileged urban areas in the Philippines.

Objectives: To identify gaps in the referral pathway of presumptive drug-resistant tuberculosis (DR-TB) patients from initial consultation until initiation of treatment.

Design: A retrospective study in which a masterlist of presumptive multidrug-resistant TB (MDR-TB) patients registered in 18 DOTS facilities in Tondo, Manila and Payatas, Quezon City, from October 2012 to September 2013, was analysed and reviewed.

Results: Among 378 presumptive DR-TB patients identified and listed in the masterlist, 97% (368/378) were referred, of whom 90% (333/368) were screened at an MDR-TB treatment centre. Of the 368 patients, 35 (9.5%) were not screened, mainly due to loss to follow-up. Among those screened, 86.4% (288/333) were recommended for anti-tuberculosis treatment, of whom 98.2% (283/288) initiated treatment. The time between sample collection and examination was significantly longer at the laboratories of non-government organisations (NGOs) than at local government units (LGUs) (1 day vs. 0 day; $P < 0.001$). The time to the release of smear examination results to patients was significantly shorter at the NGOs than at the LGUs (4 days vs. 6 days; $P = 0.009$).

Conclusion: The development of the presumptive MDR-TB masterlist facilitated tracking of patients for diagnosis and treatment. The NGOs should reduce delays in diagnosis and the LGUs should intensify patient follow-up to ensure early initiation of treatment.

MDR-TB, a total treatment duration of 9–12 months is suggested for most patients, although the duration may be modified according to the patient's response to treatment.⁵

Globally, 3.3% of new cases of TB and 20% of previously treated cases are estimated to have MDR-TB.⁶ There were an estimated 480 000 new cases of MDR-TB worldwide in 2014 and approximately 190 000 deaths from MDR-TB. Among patients with pulmonary TB (PTB) notified in 2014, an estimated 300 000 had MDR-TB. More than half of these patients were in India, China and the Russian Federation.⁶

The Philippines ranked seventh among the 27 high-burden MDR-TB countries in 2013.⁷ Enrolment of DR-TB cases has increased continuously since the inception of DR-TB treatment in 1999, with a total of 9887 DR-TB patients enrolled in treatment protocols, and >2000 enrolled annually since 2011.⁸ The Strategy 5 performance target of the Philippine Plan of Action to Control TB (PhilPACT) aims for a total of at least 15 500 MDR-TB cases detected and provided with quality assured second-line anti-tuberculosis drugs.⁹

The Philippines National Tuberculosis Control Programme (NTP) emphasises that all presumptive DR-TB cases should be screened for possible resistance to INH and/or RMP before starting treatment. This includes failure, relapse, loss to follow-up (LTFU), non-converters on retreatment, human immunodeficiency virus (HIV) co-infected patients, MDR-TB/DR-TB patients and others, including non-DOTS patients (patients with ≥ 1 month of non-DOTS treatment), other bacteriologically positive or negative cases with a history of anti-tuberculosis treatment and those in contact with a patient with MDR-TB.

The diagnosis of MDR-TB through laboratory testing takes several weeks. In general, patients wait for the confirmation of an MDR-TB diagnosis before starting treatment. In the Philippines, each case with confirmed MDR-TB or highly presumptive MDR-TB is referred by a physician to a consilium, a multi-disciplinary case management committee composed of programme staff, physicians, nurses and other relevant health care workers with expertise in MDR-TB management.¹⁰

The Research Institute of Tuberculosis/Japan Anti-Tuberculosis Association (RIT/JATA) Philippines is a local non-government organisation (NGO) established in 2008 focusing on underprivileged people in the community by bridging the gap through networks among NGOs, faith-based organisations, local government units (LGUs) and other health organisations, in-

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Multidrug-resistant tuberculosis (MDR-TB), defined as TB resistant to at least isoniazid (INH) and rifampicin (RMP), is considered a chronic disease.^{1,2} Confirmed MDR-TB is more common in persons who 1) do not take their medicine regularly or do not take all of their prescribed medicine and become bacillary positive again, 2) come from areas of the world where drug-resistant (DR) TB is common, and 3) have spent time with someone known to have DR-TB.³ According to World Health Organization (WHO) guidelines, there are five principal ways to prevent DR-TB: 1) early detection and high quality treatment of drug-susceptible TB, 2) early detection and high quality treatment of DR-TB, 3) effective implementation of infection control measures, 4) strengthening and regulation of health systems, and 5) addressing underlying risk factors and social determinants.⁴ In the treatment of patients newly diagnosed with

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FIGURE 1 Pathway of presumptive DR-TB until initiation of treatment. DR-TB = drug-resistant tuberculosis; DSSM = direct sputum smear microscopy; MDR-TB = multidrug-resistant tuberculosis.

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cluding the private sector, in support of the NTP to improve access to quality implementation of DOTS. DOTS facilities identify presumptive TB, treat and manage TB patients, and supervise directly observed treatment; NGOs and LGUs or health centres are considered DOTS facilities. RIT/JATA covers the marginalised sector in urban communities in Tondo, with a total population of 405 125 as of 2012,¹¹ and in Payatas, with a total population of 120 360 as of 2012.¹²

Due to a lack of tools to investigate how many presumptive DR-TB patients were referred, successfully screened and confirmed as MDR-TB, the RJPI developed a presumptive MDR-TB masterlist under the guidance of the Department of Health-National Capital Region Office (DOH-NCRO), the Manila Health Department (MHD) and the Quezon City Health Department (QCHD), to create a standard recording system and to assess referrals from the health centre to the MDR-TB treatment centre. In 2012, 18 DOTS facilities used data from the presumptive MDR-TB masterlist, including name, age, address, the date the patient was identified as presumptive MDR-TB, referral date, type of patient, date of screening and recommendation (treatment regimen applied) given by the MDR-TB treatment centre.

The study aimed to identify gaps in the referral pathway for presumptive DR-TB patients from initial consultation until treatment initiation in a poor urban community setting in the Philippines, and to examine ways of improving the process.

DESIGN AND METHODS

This was a retrospective descriptive study of patient data registered in the presumptive MDR-TB masterlist and the individual TB treatment records of 18 DOTS

facilities in District 1, Tondo, Manila, and Payatas, Quezon City, from October 2012 to September 2013.

The process of the presumptive DR-TB referral pathway (Figure 1) was analysed, along with the data collected by a trained research assistant.

A structured questionnaire was utilised to collect data from initial consultation at the health centre until initiation of treatment at either the health centre or the MDR-TB treatment centre. Other NTP registers, such as the NTP laboratory register, the TB register and the NTP treatment card, were used to validate the data. The presumptive MDR-TB masterlist was utilised to evaluate numbers of patients who were screened or not screened for MDR-TB. Field visits were conducted by RIT/JATA staff to validate the collected data.

The Mann-Whitney *U* test was used to compare the turnaround times at each facility. $P < 0.05$ was considered statistically significant. All analyses were performed using EZR (Saitama Medical Centre, Jichi Medical University, Saitama, Japan), a graphic user interface for R.¹³

Ethics approval

The study protocol was approved by the Department of Health Research and Ethics Review Committee of San Lazaro Hospital, Manila, the Philippines, before conducting the study. Permission was obtained from the City Health Officers of the two cities, Manila and Quezon City, and the heads of the NGOs concerned prior to the study.

RESULTS

A total of 378 presumptive DR-TB patients were identified and listed on the presumptive MDR-TB masterlists of both the LGU and NGO DOTS facilities from District 1, Tondo, Manila, and Payatas, Quezon City. Of

FIGURE 2 Summary of identified presumptive DR-TB patients. DR-TB = drug-resistant tuberculosis; LTFU = lost to follow-up; MDR-TB = multidrug-resistant tuberculosis.

these, 368 were referred to an MDR-TB treatment centre for screening with the proper referral form. Ten patients were not referred for reasons given in Figure 2. Of the 368 patients, 333 (90.4%) were screened at an MDR-TB treatment centre and 35 (9.5%) were not. Among those screened, 86.4% (288/333) were recorded as drug-susceptible TB (DS-TB) or MDR-TB. Of these, 98.2% (283/288) were initiated on treatment, 1.0% (3/288) refused treatment and 0.6% (2/288), who were changing residence, were referred to the DOTS facilities of their new area. The 6.9% (23/333) who were not diagnosed with TB among those screened were diagnosed with other lung diseases or were referred for monitoring. Among those screened, 6.6% (22/333) of patients did not retrieve their results for the following reasons: LTFU, returned to province, or died before the test results became available.

The duration of each step of the presumptive DR-TB referral pathway is shown in the Table. The major contributing factors for delays in MDR-TB diagnosis were as follows: 1) the time between direct sputum smear microscopy (DSSM) results being released

and being presented to the patient (median 6 days, interquartile range [IQR] [2–10]) was significantly longer at the LGU DOTS facilities compared with the NGOs ($P = 0.009$); and 2) the time between the DSSM results being presented to the patients and the referral to a treatment centre (median 6 days [IQR 0–26.5]) tended to be longer at the LGU DOTS facilities than at the NGOs, although the difference was not statistically significant (median 7 vs. 3 days, $P = 0.67$). There was no delay between sample collection and laboratory examination at the LGUs, while the delay at the NGOs was significantly longer, although it was only one day ($P < 0.001$). There was no difference in the total time from initial consultation until treatment initiation between the NGO and LGU DOTS facilities ($P = 0.36$).

DISCUSSION

The presumptive MDR-TB masterlist was created to describe the pathway of the referral system between the health centre and the

TABLE Duration of each step of the presumptive DR-TB referral pathway, Tondo and Payatas, The Philippines, October 2012–September 2013 ($n = 283^*$)

Presumptive DR-TB referral pathway steps	Combination of LGUs and NGOs median [IQR], days	LGUs median [IQR], days	NGOs median [IQR], days	<i>P</i> value [†]
Between initial consultation and identification as presumptive DR-TB	No delay [0–0]	No delay [0–0]	No delay [0–0]	–
Between identification at health centre and DSSM request	No delay [0–0]	No delay [0–0]	No delay [0–0]	–
Between DSSM request and request received at laboratory	No delay [0–0]	No delay [0–0]	No delay [0–0]	–
Between request received at laboratory and date of last sputum collection	1 [0–1]	1 [0–1]	1 [0–1]	0.64
Between sample collection and specimen examination at laboratory	0 [0–1]	No delay [0–0]	1 [1–2]	< 0.001
Between DSSM examination and result released to MD or RN	No delay [0–0]	No delay [0–0]	No delay [0–0]	0.12
Between DSSM result released and presentation to patient	6 [2–10]	6 [3–10]	4 [1–10.5]	0.009
Between DSSM result presentation to patient and referral to MDR-TB treatment centre	6 [0–26.5]	7 [0–28]	3 [0–21]	0.67
Between patient referral and arrival at MDR-TB treatment centre	2 [0.5–7]	2 [0–8]	1 [1–4.5]	0.59
Between patient arrival at MDR-TB treatment centre and screen	No delay [0–0]	No delay [0–0]	No delay [0–0]	0.36
Between screen and treatment initiation	16 [11–25]	17 [11–26]	16 [12–24]	0.81
Time from initial consultation until treatment initiation	46 [31–73]	45.5 [31–74.5]	43 [25–71.5]	0.36

*Total initiating treatment for DS-TB or MDR-TB.

[†]Comparison of turnaround times between the LGU and NGO facilities. $P < 0.05$, statistically significant.

DR-TB = drug-resistant tuberculosis; LGU = local government unit; NGO = nongovernment organisation; IQR = interquartile range; DSSM = direct sputum smear microscopy; MD = medical doctor; RN = registered nurse; MDR-TB = multidrug-resistant tuberculosis; DS-TB = drug-susceptible tuberculosis.

MDR-TB treatment centre. Using this list, the gaps in each step were determined and prompt interventions were carried out. The time between sample collection and laboratory examination for the NGO DOTS facilities was significantly longer than for the LGU DOTS facilities, while the time between the release of the DSSM results and their presentation to patients was significantly longer at the LGU DOTS facilities than the NGO DOTS facilities. At the NGO facilities, there were various reasons for the delays in diagnosis. Four of five NGO DOTS facilities have volunteer medical technologists who work only once or twice a week, and thus longer gaps were noted in reading the results, which prolonged the diagnostic delay. Limited days for specimen collection at the NGO facilities is another reason for delay, while the LGU DOTS facilities have regular laboratory assistance to transport sputum samples to the microscopy centres. The majority of the NGO DOTS facilities have specimen collections scheduled on Fridays and Saturdays, while specimen reading is scheduled for Sundays or Mondays. Diagnostic delays may lead to progression of TB disease and increased mortality as well as increased transmission in the community.^{14,15}

Activities to meet the expected turnaround time are critical for the rapid diagnosis of active TB patients. The turnaround time of the NGO DOTS facilities should be monitored to verify whether they meet the standard maximum 3-day turnaround time for interpreting DSSM results.^{8,16} Furthermore, a contingency mechanism to transport sputum specimens from the NGO DOTS to the LGU DOTS should be established to facilitate prompt interpretation of results and, if possible, to shorten delays in diagnosis. Delays in diagnosis on the part of health providers do not necessarily reflect inferior performance; rather, they indicate a lack of available effective diagnostic tools and human resources to efficiently diagnose patients.¹⁷ The challenge is to determine how to reduce these delays in resource-limited settings where rapid diagnostic techniques may not be available or affordable.¹⁸ The sharing of resources between the LGUs and the NGOs is a good practice, one that is observed in the sites in the Philippines, and which can strengthen their partnership to sustain the health services in the community.

The time between the release of DSSM results and presentation to patients was significantly longer at the LGU DOTS facilities than at the NGO DOTS facilities, and this is one of the major contributing factors in MDR-TB diagnostic delays. Follow-up of presumptive DR-TB was not properly undertaken, and the presumptive MDR-TB masterlist was not updated at the LGU facilities. These problems are mainly due to time constraints, as the LGU facilities handle 15 other health programmes. Furthermore, the LGU facilities have experienced shortages in human resources, rapid staff turnover and lack of proper communications from former health staff informing new staff about which patients should be followed up. In comparison, the NGO DOTS facilities have fewer delays, as the majority have only a few programmes, allowing them more time to attend to patients. Health care workers' time management and workloads should be addressed so that all programmes are manageable and quality is improved.¹⁹ Another major contributing factor for the delays noted in the MDR-TB referral pathway was the time (median 6 days) between DSSM results being presented to the patients and patient referral to a treatment centre. Communication and coordination between the DOTS facilities and the MDR-TB treatment centres should be strengthened. Furthermore, DOTS facilities staff should emphasise the importance of MDR-TB screening to motivate presump-

tive DR-TB patients to attend for screening at the MDR-TB treatment centre even when it is far from their place of residence. The MDR-TB treatment centre staff should also stress to patients the importance of receiving appropriate treatment at either the DOTS facilities or the MDR-TB treatment centre. Health education and counselling are also encouraged to increase public awareness of TB and MDR-TB, which will build trust between patients and health care providers. Home visits should be conducted for patients who are lost to follow-up to validate their status and understand why they were unable to comply with diagnosis or treatment.

A major role of monitoring and evaluation is to improve the performance of health facilities and to help them reach their targets by identifying gaps and appropriate recommendations.²⁰ The development of the presumptive MDR-TB masterlist contributed to monitoring the pathway and results of MDR-TB screening. Prior to its development there was no tool to determine the contributions from the DOTS facilities or to analyse the referral outcome of presumptive DR-TB cases referred by DOTS facilities to the MDR-TB treatment centres. The development of the presumptive MDR-TB masterlist made a significant improvement in terms of recording and reporting, and facilitated the documentation of referrals between the health centre and MDR-TB treatment centre. The assessment of presumptive MDR-TB patients from initial consultation through to initiation of treatment was thus able to be monitored from routinely obtained data. The NTP will benefit from introducing the masterlist to monitor the referral pathway of patients with presumptive MDR-TB and help improve health service delivery.

The limitations of this study include the following: 1) only patients aged ≥ 15 years were included in the study; future research should include children to analyse their diagnosis and treatment pathway; 2) missing data and other information from the NTP registry for the completion of the presumptive MDR-TB masterlist limited the research study and affected the quality of the collected data; 3) due to time limitations, only the reasons documented by the health care providers in the presumptive MDR-TB masterlist were obtained. Even with these limitations, however, the present study has provided invaluable data indicating the importance of analysing each step of the referral pathway, which can serve as a guide in terms of reducing delays and improving patient access to the DOTS facilities and the MDR-TB treatment centre.

In conclusion, the development of the presumptive MDR-TB masterlist has facilitated the tracking of patients due for diagnosis and treatment. The referral system between the health centres and the MDR-TB treatment centre should be strengthened for proper patient follow-up and provision of appropriate action. The NGOs should reduce diagnostic delays and the LGUs should follow up patients for the early initiation of treatment.

References

- 1 Caminero J A. Guidelines for clinical and operational management of drug resistant tuberculosis. Paris, France: International Union Against Tuberculosis and Lung Disease, 2013: pp 18–19.
- 2 India Ministry of Health and Family Welfare. Revised National Tuberculosis Control Programme. New Delhi, India: Central TB Division, Ministry of Health and Family Welfare, 2010.
- 3 Centers for Disease Control and Prevention. TB elimination, multidrug-resistant tuberculosis (MDR-TB). Atlanta, GA, USA: CDC, 2012.
- 4 World Health Organization. Companion handbook to the WHO guideline for the programmatic management of drug-resistant tuberculosis. WHO/HTM/TB/2014.11. Geneva, Switzerland: WHO, 2014.

- 5 World Health Organization. WHO treatment guidelines for drug-resistant tuberculosis 2016 update. WHO/HTM/TB/2016.04. Geneva, Switzerland: WHO, 2016.
- 6 World Health Organization. Global tuberculosis report, 2015. WHO/HTM/TB/2015.22. Geneva, Switzerland: WHO, 2015.
- 7 World Health Organization. Global tuberculosis report, 2014. WHO/HTM/TB/2014.08. Geneva, Switzerland: WHO, 2014.
- 8 The Philippines Department of Health. Manual of procedure of the national tuberculosis control program, Philippines. 5th ed. Manila, The Philippines: DoH, 2014.
- 9 The Philippines Department of Health. 2010–2016 Philippine plan of action (PhilPACT). Health sector reform agenda. Manila, The Philippines: DoH, 2010.
- 10 Tropical Disease Foundation and Department of Health. Management of drug-resistant tuberculosis training for health facility staff in the Philippines, Module B: Detect cases of MDR-TB. Manila, The Philippines: TDF and DoH, 2008.
- 11 Philippines Department of Health. Department Memo 2014-0008. Manila Health Department population report. Manila, Philippines: DoH, 2012.
- 12 Philippines Department of Health. Department Memo 2014-0008. Quezon City Health Department population report. Quezon City, Philippines: DoH, 2012.
- 13 Kanda Y. Investigation of the freely available easy-to-use software (EZR) for medical statistics. Bone Marrow Transplant 2013; 48: 452–458.
- 14 Storla D G, Yimer S, Bjune G A. A systematic review of delay in the diagnosis and treatment of tuberculosis. BMC Public Health 2008; 8: 15.
- 15 Sreeramareddy C T, Qin Z, Satyanaraya S, Subbaraman R, Pai M. Delays in diagnosis and treatment of pulmonary TB in India: a systematic review. Int J Tuberc Lung Dis 2014; 18: 255–266.
- 16 The Philippines Department of Health. 2013–2016 National Tuberculosis Control Programme Laboratory Network Strategic Plan. A sub-plan of the Philippine Plan of Action to Control Tuberculosis. Manila, The Philippines: DoH, 2014.
- 17 Cheng S, Chen W, Yang Y, Chu P, Liu X. Effect of diagnostic and treatment delay on the risk of tuberculosis transmission in Shenzhen, China: an observational cohort study, 1993–2010. PLOS ONE 2013; 8: e67516.
- 18 Drain P K, Hyle E P, Noubary F, et al. evaluating diagnostic point-of-care tests in resource-limited settings. Lancet Infect Dis 2014; 14: 239–249.
- 19 Hellsten L M. What do we know about time management? A review of the literature and a psychometric critique of instruments assessing time management. Rijeka, Croatia: Intech, 2012: pp 21–22.
- 20 World Health Organization. A practical handbook on pharmacovigilance used in the treatment of tuberculosis: enhancing the safety of the TB patient. Geneva, Switzerland: WHO, 2012.

Contexte : Quartiers défavorisés sur le plan socio-économique aux Philippines.

Objectifs : Identifier les failles dans le parcours de référence des patients présumés atteints de tuberculose pharmacorésistante (TB-DR) depuis la consultation initiale jusqu'à la mise en route du traitement.

Schéma : Nous avons revu et analysé rétrospectivement les patients enregistrés sur la liste des TB multirésistantes (TB-MDR) présumées de 18 structures offrant un traitement DOTS à Tondo, Manille et Payatas, Quezon City, d'octobre 2012 à septembre 2013.

Résultats : Sur 378 patients TB-DR présumés identifiés et enregistrés, 97% (368/378) ont été référés, puis 90% (333/368) dépistés dans un centre de traitement de la TB-MDR. Des 9,5% (35/368) qui n'ont pas été dépistés, ils avaient été perdus de vue en majorité. Parmi les

patients dépistés, 86,4% (288/333) ont reçu une prescription de traitement de TB. Parmi eux, 98,2% (283/288) ont débuté le traitement. Le délai entre le recueil de l'échantillon et l'examen au laboratoire des organisations non gouvernementales (ONG) a été significativement plus long que dans les unités publiques locales (LGU) (1 jour contre 0 jour ; $P < 0,001$). Le délai de remise des résultats de l'examen du frottis au patient dans les ONG a été significativement plus court que dans les LGU (4 jours contre 6 jours ; $P = 0,009$).

Conclusion : L'élaboration de listes de TB-MDR présumées a facilité la recherche des patients pour leur diagnostic et leur traitement. Les ONG devraient réduire les délais de diagnostic et les LGU devraient suivre leurs patients pour une mise en route rapide du traitement.

Marco de referencia: Las regiones desfavorecidas desde el punto de vista socioeconómico en las Filipinas.

Objetivos: Reconocer las deficiencias en el sistema de derivación de los pacientes con presunción diagnóstica de tuberculosis farmacorresistente (TB-DR), desde la consulta inicial hasta el comienzo del tratamiento.

Método: Se llevó a cabo un estudio retrospectivo de análisis y recapitulación de los pacientes registrados en la lista de referencia de casos con presunción de TB multirresistente (TB-MDR) en 18 establecimientos DOTS en Tondo, Manila y Payatas en Ciudad Quezón, de octubre del 2012 a septiembre del 2013.

Resultados: De los 378 casos con presunción clínica de TB-DR detectados y registrados en la lista de referencia, se derivó el 97% (368/378) y se investigó el 90% (333/368) en un centro de tratamiento de la TB-MDR. La causa de la falta de investigación del 9,5% de los casos presuntos (35/368) consistió en primer lugar en la

pérdida durante el seguimiento. Se recomendó el tratamiento antituberculoso a 86,4% de los pacientes examinados (288/333) y el 98,2% de estos comenzó el tratamiento (283/288). El lapso entre la recogida de las muestras y el examen de laboratorio en los establecimientos de las organizaciones no gubernamentales (ONG) fue significativamente más prolongado que en los establecimientos de las unidades del gobierno local (UGL) (un día contra 0 días; $P < 0,001$). El lapso hasta la entrega del resultado de la baciloscopia al paciente fue notablemente más corto en las ONG que en las UGL (4 días contra 6 días; $P = 0,009$).

Conclusión: La creación de la lista de referencia de casos con presunción de TB-MDR ha facilitado el seguimiento de los pacientes con fines de diagnóstico y tratamiento. Se recomienda que las ONG acorten el lapso hasta el diagnóstico y que las UGL rastreen a los pacientes con el fin de comenzar oportunamente el tratamiento.