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# Patient-cost survey for tuberculosis in the context of patient-pathway modelling

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SUMMARY

SETTING: Eight tuberculosis treatment sites in Cavite Province, the Philippines, including two sites specialising in management of multidrug-resistant tuberculosis (MDR-TB).

OBJECTIVE: To evaluate costs incurred by TB patients and to determine the proportion of households that faced catastrophic costs, then to consider cost survey responses alongside results of detailed patient-pathway modelling.

DESIGN: Clustered cross-sectional survey using a field testing version of the WHO TB patient-costing tool and protocol; face-to-face interviews with 194 patients conducted in May–August 2016. Costs included direct-medical, direct non-medical and indirect costs using the human capital approach. Patients were deemed to incur catastrophic expenditure if TB-related costs exceeded 20% of annual household income. Patient pathways were modelled following multiple health staff interviews.

RESULTS: Estimated mean cost incurred by patients with drug-susceptible TB was US$321 vs. $2356 for MDR-TB patients. Catastrophic costs were suffered by 28% of drug-susceptible and 80% of MDR-TB patients, with lost income being the largest contributor. Patient-pathway modelling suggested most patients had under-reported health visits.

CONCLUSION: Survey results indicate that patient costs are large for all patients in Cavite, particularly for MDR-TB patients. Patient-pathway modelling suggests these costs are an underestimate due to poor recollection of health visits, suggesting that the WHO instrument and protocol could be improved to better capture the diagnostic journey.

KEY WORDS: health expenditures; computer simulation; cost of illness; catastrophic costs

TUBERCULOSIS (TB) IS CLOSELY associated with poverty: populations with few resources and poor access to healthcare face the greatest burden.[1] Although TB drugs are typically available to patients without charge, patients often incur numerous costs on the care pathway: direct out-of-pocket costs for medical expenses, transport, temporary accommodation and food, and indirect costs due to lost income. High patient costs place an immense burden on household-finances,[2] become an obstacle to accessing treatment[3] and are a factor in treatment non-completion.[4,5] When considering TB interventions, an understanding of the size, origins and drivers of these costs should be considered alongside other evidence in decision-making.

Interest in patient costs and 'catastrophic expenditure' for TB has grown in recent years.[6–8] Along with setting targets relating to TB incidence and deaths, the WHO post-2015 Global TB Strategy (End TB Strategy) set a third target of eliminating catastrophic costs for TB-affected families by 2020,[9] in line with efforts to move health systems closer to universal health coverage. Families are considered to incur catastrophic expenditure if 20% or more of their annual household income is spent on TB-related costs.[10] This 20% threshold aims to capture the point at which households would forgo basic sustenance expenditure. Research in Peru also found that this threshold was associated with poor biomedical outcomes from TB treatment.[11]

The 2016 Philippine National Prevalence Survey (NPS) places the country fourth worldwide in terms of TB incidence rates,[12] with potentially one million people living with active disease.[13] Although Filipino poverty is declining, 26.3% remain below the national poverty line.[14] Philippines is a high-burden country for multidrug-resistant TB (MDR-TB), representing 2.6% of new and 28% of previously treated TB cases.[15]

Tupasi et al. found Filipino MDR-TB patients who

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were lost to follow-up (LTFU) had incurred significantly higher travel costs to treatment facilities than patients who completed treatment.[5] Loss to follow-up was also associated with lack of time to visit facilities due to work/family commitments, and individuals who were LTFU were significantly less likely to have received food and transport assistance, or medication for adverse drug reactions. Among the long-term recommendations of the NPS is the development of adequate social protection strategies;[16] however, successful implementation requires a clearer understanding of the make-up of costs and where they occur along the pathway.

## STUDY SETTING AND CONTEXT

Cavite is one of Philippines' most populous, fastest growing and most industrialised provinces.[17] Barangay Health Workers (primary care) typically refer presumptive drug-susceptible TB (DS-TB) cases to local DOTS centres, and presumptive MDR-TB patients to specialised Programmatic Management of Drug-Resistant Tuberculosis centres (PMDT), where they are treated as outpatients for 18–24 months. The standard tests at these centres are respectively sputum smear microscopy (SSM) and the Xpert® MTB/RIF assay (Cepheid, Sunnyvale, CA, USA). Smear-negative cases are typically diagnosed clinically using chest X-ray (usually patient-funded), and borderline cases diagnosed by a regularly convened TB Diagnostic Committee (TBDC).

A patient-pathway initiative to identify potential benefits of implementing new diagnostic strategies has been developed for Cavite using the approach previously developed for Tanzania, Brazil and South Africa,[18–20] but extended to include patient cost impacts. This offers a unique opportunity to report patient cost data collection and analyses alongside the findings of patient-pathway modelling.

### *Study objectives*

Study objectives were 1) to document the magnitude and composition of TB patient-costs in Cavite; 2) to determine the percentage of TB patients treated in the National TB Programme (NTP) in Cavite who incurred catastrophic costs; and 3) to consider responses to the patient-cost survey alongside TB patient-pathway modelling to enhance understanding of financial barriers for TB patients.

## METHODS

### *Study design*

The study used a field testing version of the WHO TB patient costing tool (November 2015) and protocol to evaluate direct and indirect TB patient costs.[10] The refined instrument can be downloaded from the WHO website.[21] The field testing instrument differs slightly from the current instrument and is available on request from the authors in either Tagalog or English. Data were collected through face-to-face interviews with patients enrolled across eight treatment sites in Cavite between May and August 2016. Patient inclusion criteria were age $\geq$16 years, being on treatment for pulmonary TB and current treatment phase (intensive or continuation) being started over 2 weeks previously.

### *Ethics*

Ethical approval was granted by the Liverpool School of Tropical Medicine Research Ethics Committee, Liverpool, UK, and De La Salle Medical and Health Sciences Institute's Institutional Ethics Committee, Cavite, The Philippines. Patients were read a disclosure statement before agreeing to participation and were given 300 Philippine pesos ($6.38) for their time. Interviews were conducted in Tagalog.

### *Sample size*

Calculations were based on 18% with catastrophic costs and a relative precision of 40%.[22] The sample size calculated was 164, with 95% confidence intervals, and design effect of 1.5, based on a population of one million. Assuming a non-participation rate of 15%, we required a sample size of 194. This was split across sites according to the number of registered cases in 2015.

### *Estimating costs*

For more details see Supplementary Tables S1–S3 and WHO handbook[10]). TB treatment regimens have two phases: intensive, followed by continuation. DS-TB patients undergo 2 months of intensive phase treatment, followed by 4 months of the continuation phase; MDR-TB patients typically undergo respectively 6 and 18 months. The WHO instrument is a cross-sectional survey, with each participant interviewed only once, answering patient cost questions about their current phase. Assuming a consistent frequency of trips and uniform expenditure within the phase, costs were then scaled up to be representative of the full phase-length. For example: for costs asked about 'so far in this phase', if a patient was a third of the way through the phase, costs were tripled. Transport costs were similarly asked 'per trip' and scaled to full phase.

Costs for the other phase (not currently experienced by the patient) were estimated, based upon the median costs in each category reported by patients in their facility within that phase of their treatment (DS/MDR). New patients in the intensive-phase were also asked about pre-treatment health-seeking costs incurred before their registration within the NTP network.

Because most patients were expected to be earning informally,[23] changes in regular income were difficult

to accurately detect; our main analysis is therefore based on the human capital approach for calculating indirect costs. That is, each patient's time lost due to treatment was estimated and multiplied by their hourly wage, as derived from their reported hours worked and monthly earnings.

All patients were asked about 'coping strategies' their households had employed throughout treatment. These included the selling of land/assets, taking out of loans, any money borrowed, and if any household member had prematurely left schooling.

Patients who indicated that they had a 'guardian' during treatment were asked whether this guardian was a household member, and whether this guardian lost an income when accompanying them; their lost time was assumed to equal the patient's, and valued at the national minimum wage (378.5 PHP/day or US$8.05/day).

### *Measuring household income*

Self-reported household income prior to TB disease was used. For patients who reported a household income of zero, this was taken at face value, and households subsequently considered to incur catastrophic costs.

### *Missing values*

Missing values were replaced with median data field values for other patients within the phase.

### *Sensitivity analyses*

Sensitivity analyses were conducted on the human capital vs. output method, wherein cost of lost time is estimated through income change across time points, and the catastrophic cost threshold.

### *Patient-pathway model*

As part of a separate modelling study evaluating potential diagnostic strategies for TB and MDR-TB in Cavite, a detailed operational model has been built by the authors, with full details to be published elsewhere. This model was structured around the journey (pathway) to diagnosis taken by patients across the eight Cavite sites. Created using WITNESS software,[24] it was developed and populated with evidence gathered from in-depth interviews with local health system staff and additional data from site logbooks and medical records, while patient cost inputs were guided by the findings of this survey. Within the present study, findings of this pathway modelling have been compared with responses collected using the WHO questionnaire, and the discrepancies explored.

## RESULTS

### *Demographics*

Of the 195 patients invited to participate, only one declined. Within the sample (Table 1), the mean age was 41 years (standard deviation [SD] 16); 66% were male; 58% were in work (81% of these informally); 71% had achieved a highest educational level no higher than secondary school; 53% were in households where over two adults regularly slept (with 10% six plus). The mean number of children per household was 1.6.

**Table 1** Participant demographic data

| Attributes | Category | *n* | % |
|---|---|---|---|
| All patients | | 194 | 100 |
| Sex | Male | 129 | 66 |
| | Female | 65 | 34 |
| Patient age group, years | 15–19 | 11 | 6 |
| | 20–29 | 49 | 25 |
| | 30–39 | 35 | 18 |
| | 40–49 | 35 | 18 |
| | 50–59 | 30 | 15 |
| | 60–69 | 26 | 13 |
| | ≥70 | 8 | 4 |
| Type of employment | Unemployed | 78 | 40 |
| | Formal paid work | 21 | 11 |
| | Informal paid work | 91 | 47 |
| | Retired | 3 | 2 |
| | Housework | 1 | 1 |
| Highest educational level attained by patient | Primary school | 39 | 20 |
| | Secondary school | 99 | 51 |
| | University | 42 | 22 |
| | Graduate school | 9 | 5 |
| | Other | 5 | 3 |
| Highest educational level attained by head of household | Did not attend school | 5 | 3 |
| | Primary school | 41 | 21 |
| | Secondary school | 90 | 46 |
| | University | 11 | 6 |
| | Graduate school | 36 | 19 |
| | Other | 11 | 6 |
| How many adults regularly sleep in your house? | 1 | 18 | 9 |
| | 2 | 74 | 38 |
| | 3 | 40 | 21 |
| | 4 | 25 | 13 |
| | 5 | 17 | 9 |
| | 6+ | 20 | 10 |
| How many children* regularly sleep in your house? | 0 | 56 | 29 |
| | 1 | 47 | 24 |
| | 2 | 41 | 21 |
| | 3 | 26 | 13 |
| | 4 | 16 | 8 |
| | 5+ | 8 | 4 |
| How many rooms in your house excluding the bathroom? | 0 | 4 | 2 |
| | 1 | 78 | 40 |
| | 2 | 76 | 39 |
| | 3 | 27 | 14 |
| | 4 | 8 | 4 |
| | 5 | 1 | 1 |

* No age limit given; could potentially have been misinterpreted as children of *any* age.

### *TB status within sample*

Overall, 169 patients were on DS-TB treatment and 25 on MDR-TB treatment (Table 2); 30% were retreatment patients (MDR-TB, 24 [96%]; DS-TB, 33 [20%]), and 12% currently had another household member on treatment; 42% of patients were interviewed in the intensive phase and 58% in the continuation phase.

**Table 2** TB-specific participant data

| Attributes | Category | *n* | % |
|---|---|---|---|
| TB diagnosis and treatment site | | | |
| | All patients | 194 | 100 |
| | Drug-susceptible TB | 169 | 87 |
| | Dasmariñas City Health Office | 43 | 22 |
| | Imus | 21 | 11 |
| | Silang Canossa | 10 | 5 |
| | Tanza | 48 | 25 |
| | Trece Martires | 34 | 18 |
| | Tagaytay | 13 | 7 |
| | MDR-TB | 25 | 13 |
| | PMDT La Salle | 15 | 8 |
| | General Aguinaldo Memorial Hospital | 4 | 2 |
| | Imus | 2 | 1 |
| | Tanza | 4 | 2 |
| Previously treated? | Yes, retreatment | 57 | 29 |
| | No, new | 137 | 71 |
| Bacteriologically confirmed? | Bacteriologically confirmed | 102 | 53 |
| | Clinically diagnosed | 92 | 47 |
| Treatment phase | Intensive | 82 | 42 |
| | Continuation | 112 | 58 |
| Treatment facility type | Public health centre | 163 | 84 |
| | Public hospital | 5 | 3 |
| | NGO hospital | 10 | 5 |
| | Private clinic | 14 | 7 |
| | Other | 1 | 1 |
| How many other members of your household are receiving treatment for TB? | 0 | 170 | 88 |
| | 1 | 17 | 9 |
| | 2 | 3 | 2 |
| | 3 | 2 | 1 |
| | 4 | 1 | 1 |
| | 5 | 1 | 1 |

TB = tuberculosis; MDR-TB = multidrug-resistant TB; PMDT = Programmatic Management of Drug-Resistant Tuberculosis; NGO = non-governmental organisation.

### *Household income*

The mean household annual income (Table 3) was PHP169 635, equal to $3610 ($1 = PHP46.99, July 2016[25]), with a SD PHP209 123 ($4450); 55% were earning below the poverty line of PHP131 628 (PHP10 969 or $233 monthly). Nine patients (5%) reported zero household income.

### *Pre-diagnosis*

Pre-diagnostic patient-costs made up 9.4% of total DS-TB patient costs, and 4.7% of total MDR-TB patient costs. For both DS and MDR-TB patients, these costs primarily came from direct medical costs, but also included travel and lost income. However, 31% recalled only one trip for DS-TB diagnosis (including trip for results of diagnostic tests) with another 31% stating two trips (mean 2.4). For MDR-TB patients, the mean was 2.5 trips (Table 4). For trips reported during treatment see Supplementary Data, Table S4).

**Table 3** Household income before contracting TB*

| Annual household income pre-TB (PHP) | (upper bound in US$) | *n* | % | Cumulative % |
|---|---|---|---|---|
| 0 | 0 | 9 | 4.6 | 4.6 |
| 1–19 999 | 426 | 10 | 5.2 | 9.8 |
| 20 000–39 999 | 851 | 11 | 5.7 | 15.5 |
| 40 000–59 999 | 1277 | 8 | 4.1 | 19.6 |
| 60 000–79 999 | 1702 | 30 | 15.5 | 35.1 |
| 80 000–99 999 | 2128 | 20 | 10.3 | 45.4 |
| 100 000–149 999 | 3192 | 32 | 16.5 | 61.9 |
| 150 000–199 999 | 4256 | 25 | 12.9 | 74.7 |
| 200 000–299 999 | 6384 | 24 | 12.4 | 87.1 |
| 300 000–399 999 | 8512 | 13 | 6.7 | 93.8 |
| ≥400 000 | | 12 | 6.2 | 100.0 |
| Total | | 194 | 100 | |

* Annual income bracketed in Philippine pesos (PHP) (1US$ ≈ 46.99 PHP).
TB = tuberculosis.

### *Patient costs*

A total of 33% of patients had paid for travel for their most recent follow-up visit (mean cost $1.09; maximum cost $9.53 (Figure 1 and Supplementary Data

**Table 4** Number of trips to a health centre before treatment initiation that patients were able to recall and provide costs for

| Number of trips to a health centre before treatment initiation | Drug-susceptible TB | | | MDR-TB | | |
|---|---|---|---|---|---|---|
| | *n* | % | Cumulative % | *n* | % | Cumulative % |
| 1 | 15 | 31 | 31 | 1 | 8 | 8 |
| 2 | 15 | 31 | 62 | 7 | 53 | 61 |
| 3 | 10 | 20 | 82 | 3 | 23 | 84 |
| 4 | 6 | 12 | 94 | 2 | 15 | 100 |
| 5 | 2 | 4 | 98 | 0 | 0 | 100 |
| 6 | 1 | 2 | 100 | 0 | 0 | 100 |
| Mean number of trips | 2.4 | | | 2.5 | | |

MDR-TB = multidrug-resistant tuberculosis.

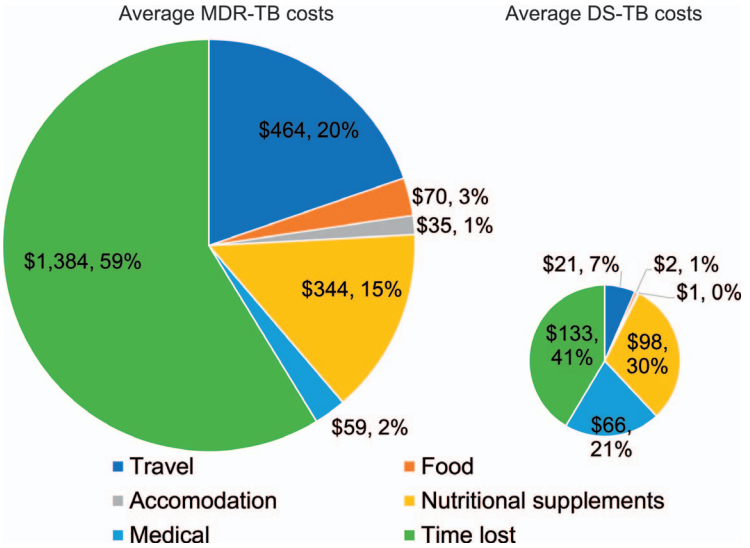


**Figure 1** Total cost breakdown showing relative proportions between (all) MDR-TB and DS-TB patients. Note: the areas of the charts are proportional with respect to costs. MDR-TB = multidrug-resistant tuberculosis; DS-TB = drug-susceptible TB.

Table S5). Only four patients (2%) had accommodation costs for their last follow-up visit; 4% of patients had paid radiography costs in their most recent follow-up appointment, while only 1% had paid for other tests. Overall, 73% reported spending money on nutritional supplements outside their regular diet, with similar likelihood across MDR-TB and DS-TB patients. The mean extra weekly spend on nutrition for DS-TB patients was $4.61 during the intensive, and $4.23 during the continuation phase, rising to $5.33 and $5.61 for MDR-TB patients. When scaled to full treatment length, these costs become considerable, estimated at $98 for DS-TB patients and $344 for MDR-TB patients. Although not powered to analyse between-site differences, the study found variability, including average transport costs 10x larger in Tagaytay than Tanza ($112 vs. $11), likely due to the rural landscape. The proportion incurring catastrophic costs (DS-TB only) ranged from 4.8% (Imus) to 38.5% (Tagaytay).

### *Guardian accompaniment*

Overall, 32% of MDR-TB patients and 42% of DS-TB patients answered that they had a 'guardian'; however only nine people indicated this guardian lost income, included within the indirect costs in Figure 1.

### *Financial assistance and insurance*

Few patients had insurance other than the Department of Health's national insurance plan *Philhealth*.[26] Of MDR-TB patients, 76% reported receiving goods or vouchers, whereas only 12% for DS-TB patients.

### *Social impact and coping*

Overall, 7% of patients had sold assets due to illness, including mobile phones, animals, household items and employment-specific construction equipment; 37% had used savings to cover costs, with mean spend $145; 36% had borrowed money (mean $112), with 70% expected to pay this back; 46% lost a job, while 26% reported social exclusion. Furthermore, 19% reported facing food insecurity and 6% had seen a household member interrupt schooling. Two patients (1%) reported separating/divorcing due to their illness.

### *Catastrophic costs*

Overall, 28% of DS-TB patients and 80% of MDR-TB patients suffered catastrophic costs. Across categories, average costs were generally higher for patients facing catastrophic costs. For DS-TB patients, direct medical costs are almost three times larger for patients who were catastrophic. The largest contributor to costs for all groups are indirect costs, being particularly severe for MDR-TB patients facing catastrophic costs (60% of costs) (See also Figure 2 and Supplementary Data Table S5).

### *Sensitivity analysis*

The Output method for lost-income was separately calculated, giving much higher indirect and total costs: $470 for DS-TB patients and $4660 for MDR-TB (vs. $321 and $2356 above) (Supplementary Data Table S5). With a threshold as low as 10%, there would be 58% of families deemed to be facing catastrophic costs with the human capital approach (62% using the output approach). With a threshold of 50%, 20% of households incurred catastrophic costs (Supplementary Data Figure S1).

### *Patient-pathway modelling*

Patient-pathway modelling revealed that across all six

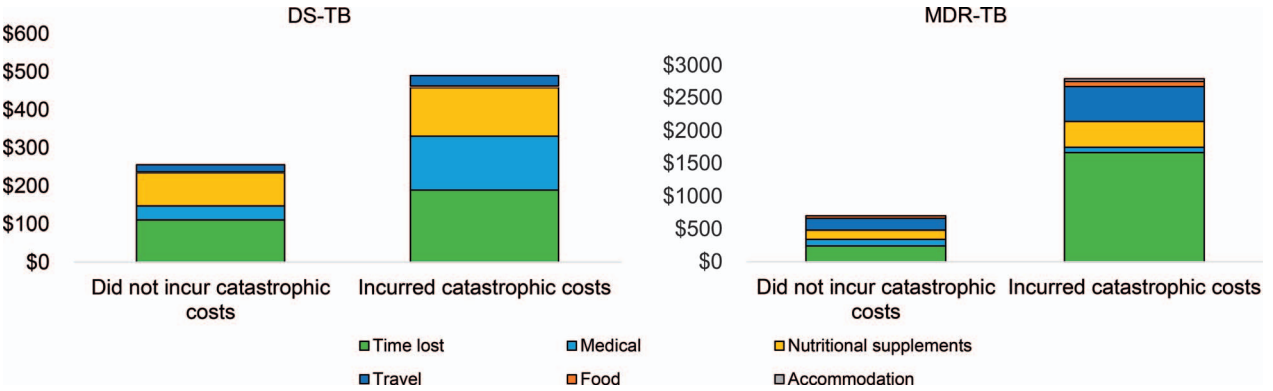


**Figure 2** Patient cost breakdown split by whether or not patients incurred catastrophic costs. The two bars on the left hand side show for DS-TB patients, while the bars on the right show for MDR-TB patients. DS-TB = drug-susceptible TB; MDR-TB = multidrug-resistant tuberculosis.

DOTS sites, patients must make a minimum of four trips to receive a diagnosis for DS-TB, increasing to seven for smear-negative patients who do not have a recent chest X-ray. This would be attained at the hospital at a patient's expense. Figure 3 shows a simplified patient-pathway for an example DS-TB site (*Tanza*).

## DISCUSSION

In Cavite, 80% of MDR-TB and 28% of DS-TB patient households faced catastrophic costs. Furthermore, our parallel pathway modelling suggests that this is likely an underestimate of the true scale.

Patient-costs were greater for MDR-TB patients than DS-TB patients, the largest cost-component being lost-income (59% and 41%, respectively). Those without catastrophic expenditure had lost a smaller proportion of income, suggesting that reducing or reimbursing income-loss could reduce the likelihood of costs becoming catastrophic. Evidence suggests this could be achieved through targeted social-protection schemes;[27] however, currently in Philippines such schemes are limited. While someone in formal employment could receive sick-pay for TB (up to 2 months for MDR-TB) e.g., SSS, GSIS,[28,29] formal employment is rare among our sample (only 11%) where most are employed informally. None of the 11% working formally reported receiving sick pay. The poorest may also have been eligible for the Bridging Program for the Filipino Family ('4Ps') conditional cash-transfer programme,[30] although currently access is limited. Nevertheless, with increased political drive there is scope for broadening and strengthening such policies. Furthermore, indirect-costs for MDR-TB patients may soon see considerable reductions, with encouraging recent evidence regarding shorter 9-month treatment regimens for MDR-TB.[31] It is noteworthy that six (24%) of our MDR-TB patients answered they had not received vouchers or goods during treatment, despite policy being that MDR-TB patients should have received $2/day during treatment, plus $95 after 6 and 12 months, and $191 at completion.[32] Participants were not asked why, but this may have been due to lack of 'full adherence'.[33]

Medical expenditure, while only a small part of MDR-TB patient-costs, made up 20% (and with a

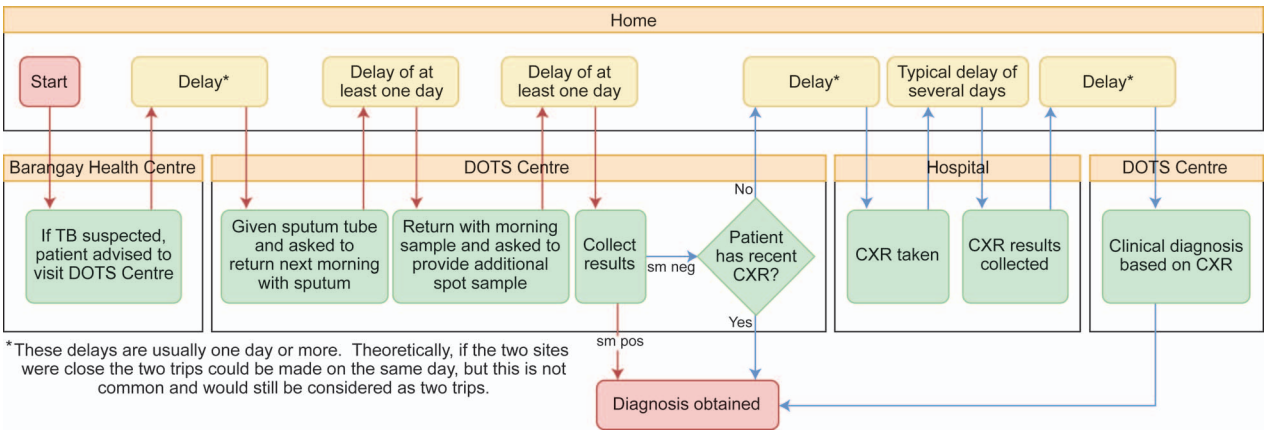


**Figure 3** Drug-susceptible TB patient pathway for Tanza, the Philippines (morning-spot collection site) showing minimum number of patient trips required to obtain diagnosis (red arrows). CXR = chest X-ray; sm neg = smear-negative; sm pos = smear-positive.

larger absolute value) for DS-TB patients. This is principally due to high hospitalisation costs being covered by the PMDT for MDR-TB patients. Travel was a considerably larger component of MDR-TB costs, due to more centre visits, indicating scope for reducing costs through transportation interventions or decentralising some MDR-TB appointments to reduce travel distances.

Nutritional supplement costs were notably high, increasing in patients with catastrophic expenditure, and making up almost a third of all costs for DS-TB patients, despite a lack of evidence supporting their effectiveness.[34] Improved nutritional information with less emphasis on expensive supplements may help reduce these costs and should be investigated.

Overall reported medical expenses were lower than our patient-pathway modelling expected. For pre-diagnostic costs, only half (16/31) of CD patients stated any radiography costs, while the number of trips reported in attaining TB diagnoses was considerably lower than the pathway suggests. 31% of DS-TB patients reported a single trip, however pathway-modelling showed a minimum of four trips required. In all sites smear-negative patients would be required to return with an X-ray, however the mean number of reported trips did not differ between SM-/+ patients. This suggests that interviews inadequately elicited pre-diagnostic information – whether due to recall bias or some other mechanism - likely leading to overall underreporting of costs. Furthermore, by asking patients about most recent visits (and with a 2-week minimum treatment requirement for survey participation), it is possible that medical expenses early in the treatment phase were missed.

We acknowledge limitations in the study instrument and the study design. The length of the WHO instrument frequently caused patient fatigue, while the shifting time-frames used throughout the questionnaire (e.g., '. . .most recent visit', '. . .over the last week', '. . .since the start of this phase', 'since the start of treatment') may have caused confusion. Both factors could have impacted data quality. Additionally, the cross-sectional design requires numerous simplifying assumptions in scaling-up values. While it is conceivable that expenditure would vary over the course of treatment, the extrapolation method is insensitive to such changes. Furthermore, coping mechanisms are not scaled-up under the design, and so certainly provide an underestimate.

## CONCLUSION

Patient costs in Cavite are high, and many patients are suffering from catastrophic expenditure. The WHO questionnaire—here and worldwide—likely underestimates the true extent of such costs, due to its cross-sectional design and errors in inducing accurate patient recall. It would be valuable to compare longitudinal study results from a similar population to explore this further. The present evidence suggests the challenge of achieving zero catastrophic costs in Cavite requires interventions and resources to address lost income and costs incurred purchasing nutritional supplements. Since differing expenditures afflict patients with varying severity, targeted initiatives are required to mitigate or recompense these costs, so that TB-affected households can be safeguarded from the spiral of impoverishment and disease.

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Conflicts of interest: none declared.

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## RÉSUMÉ

**CONTEXTE : Huit sites de traitement de la tuberculose (TB) dans la province de Cavite, Philippines, dont deux sites spécialisés en prise en charge de la TB multirésistante (MDR-TB).**

**OBJECTIF : Evaluer les coûts incombant aux patients tuberculeux et déterminer la proportion de foyers qui ont subi des coûts catastrophiques, puis considérer les réponses à l'enquête de coût parallèlement aux résultats de la modélisation détaillée du parcours des patients.**

**SCHÉMA : Enquête transversale en grappes basée sur une version adaptée au terrain du de l'outil et le protocole de l'Organisation mondiale de la Santé (OMS) d'évaluation des coûts ; des entretiens face à face avec 194 patients réalisés entre mai et août 2016. Les coûts ont inclus les dépenses directes médicales, directes non médicales et indirectes grâce à l'approche du capital humain. Les patients ont été invités à exposer des dépenses catastrophiques si celles liées à la tuberculose excédaient 20% des revenus annuels du foyer. Les parcours des patients ont été modélisés après de multiples entretiens avec le personnel de santé.**

**RÉSULTATS : Le coût moyen estimé pour les patients atteints de tuberculose pharmacosensible a été de 321$US et pour les patients atteints de MDR-TB, de 2356 $US. Les coûts catastrophiques ont concerné 28% des patients pharmacosensibles et 80% des patients MDR-TB, la perte de revenus y contribuant le plus. La modélisation du parcours des patients a suggéré que la majorité des patients avaient sous déclaré leurs consultations.**

**CONCLUSION : Les résultats de l'enquête montrent que les coûts sont importants pour tous les patients de Cavite, particulièrement les patients MDR-TB. La modélisation du parcours des patients a suggéré que ces coûts étaient sous-estimés en raison d'une médiocre mémorisation des consultations, suggérant que l'instrument de l'OMS et le protocole pouvaient être améliorés afin de mieux saisir le parcours diagnostique.**

## RESUMEN

**MARCO DE REFERENCIA: Ocho centros de tratamiento de la tuberculosis (TB) en la Provincia de Cavite de Filipinas, incluidos dos centros especializados en el tratamiento de la TB multirresistente (MDR-TB).**

**OBJETIVOS: Evaluar los costos asumidos por los pacientes con TB, determinar la proporción de hogares que afrontan «costos catastróficos» y analizar luego las respuestas a la encuesta sobre costos, al mismo tiempo que los resultados de una modelización detallada de la trayectoria de los pacientes hasta obtener el diagnóstico.**

**MÉTODO: Se realizó un estudio transversal en conglomerados con una versión de ensayo sobre el terreno de la herramienta y el protocolo de la Organización Mundial de la Salud (OMS) de evaluación de los costos para los pacientes a causa de la TB; se llevaron a cabo entrevistas presenciales a 194 pacientes de mayo a agosto del 2016. Se analizaron los costos médicos directos, los costos directos no médicos y los costos indirectos con el método de capital humano. Se consideró que los pacientes asumían gastos catastróficos cuando los gastos relacionados con la TB excedían 20% del ingreso familiar anual. La trayectoria de los pacientes se modelizó a partir de entrevistas múltiples a los profesionales de salud.**

**RESULTADOS: La estimación del costo promedio para los pacientes con TB normosensible fue 321 USD y para los pacientes con MDR-TB fue 2356 USD. La TB normosensible generó costos catastróficos en 28% de los pacientes y la MDR-TB en 80% de los casos y la principal razón fue la pérdida de ingresos. La modelización de la trayectoria diagnóstica indicó que la mayoría de los pacientes había subestimado el número de consultas por salud.**

**CONCLUSIÓN: Los resultados del estudio indican que los costos son considerables para todos los pacientes en Cavite, sobre todo los pacientes con MDR-TB. La modelización de la trayectoria de los pacientes revela una subestimación de estos costos debido a una memoria deficiente de las consultas médicas, lo cual señala la posibilidad de mejorar la herramienta y el protocolo de la OMS para que capte mejor los datos sobre el recorrido del paciente hasta obtener el diagnóstico.**