We estimated costs of managing different forms of tuberculosis (TB) across Canada by conducting a retrospective chart review and cost assessment of patients treated for TB infection, drug-susceptible TB (DS TB), isoniazid-resistant TB, or multidrug-resistant TB (MDR TB) at 3 treatment centers. We included 90 patients each with TB infection and DS TB, 71 with isoniazid-resistant TB, and 62 with MDR TB. Median per-patient costs for TB infection (in 2020 Canadian dollars) were $804 (interquartile range [IQR] $587–$1,205), for DS TB $12,148 (IQR $4,388–$24,842), for isoniazid-resistant TB $19,319 (IQR $7,117–$41,318), and for MDR TB $119,014 (IQR $80,642–$164,015). Compared with costs for managing DS TB, costs were 11.1 (95% CI 9.1–14.3) times lower for TB infection, 1.7 (95% CI 1.3–2.1) times higher for isoniazid-resistant TB, and 8.1 (95% CI 6.1–10.6) times higher for MDR TB. Broadened TB infection treatment could avert high costs associated with managing TB disease.

After marked declines in tuberculosis (TB) incidence in Canada during the second half of the 20th century (1), progress toward elimination has stalled (2). Although a focus on detection and treatment of TB disease was highly effective in the past, changing epidemiology has limited the impact of this approach in reaching elimination. Additional approaches are needed. These approaches may include more targeted efforts for disproportionately affected populations, such as some Indigenous communities (2,3) and persons born outside of Canada (4).

Yet health resources are scarce (5). A fundamental aspect of decision-making in health is understanding the trade-offs associated with potential interventions or programs in comparison to other interventions and programs within the broader health agenda. To achieve the greatest return (improved health) on investment (money spent), policymakers should have accurate cost estimates for the various elements of TB prevention and care. However, costs associated with TB in Canada have not been estimated since 2004 (6). With new tests and treatments available for TB infection and disease, updated cost estimates will support informed decision-making for resource allocation around existing and emerging interventions and programs (7–13).

We sought to estimate the TB-related health system costs associated with managing persons treated for TB infection and different forms of TB disease, and the predictors of these costs, at 3 major TB treatment centers in British Columbia, Ontario, and Quebec, Canada.

Methods

Study Design and Participating TB Treatment Centers

We conducted a retrospective chart review of persons initiating treatment for TB infection, drug-susceptible
TB (DS TB) disease, isoniazid-resistant TB disease, or multidrug-resistant TB (MDR TB) disease; we defined MDR TB as TB resistant to at least isoniazid and rifampin. We extracted data at 3 TB treatment centers in Canada: the British Columbia Centre for Disease Control (BCCDC), West Park Healthcare Centre (WPHC) in Toronto, Ontario, and the Montreal Chest Institute (MCI) in Quebec. In Canada, healthcare, including TB management, is a provincial and territorial responsibility.

BCCDC operates 2 TB clinics in the greater Vancouver region, treating all persons with TB infection and TB disease in the region. In 2016, BCCDC treated 241 persons for TB disease (all forms) and 676 persons for TB infection. WPHC, a rehabilitation and complex care hospital in Toronto, Ontario, housing a 20-bed dedicated inpatient TB unit and an ambulatory TB clinic, is recognized as a referral center for complex and drug-resistant TB. WPHC treated 119 persons for TB disease (all forms) and 33 persons for TB infection in 2016. MCI is located within the McGill University Health Centre, and is a center for TB screening and surveillance for newly arrived adult migrants to Canada. MCI treated 51 persons for TB disease (all forms) and 488 persons for TB infection in 2016.

**Study Inclusion and Exclusion Criteria**

We included persons of any age who initiated treatment at any participating site during July 1, 2010–June 30, 2016; we reviewed consecutive patients, working backward from the end date, to permit adequate time to complete treatment and follow-up owing to the approximate 18–20-month duration of MDR TB treatment. All forms of TB disease required microbiologic confirmation (i.e., positive culture or positive nucleic acid amplification test). In addition, DS TB required confirmed susceptibility by phenotypic or genotypic means to all first-line TB drugs (i.e., isoniazid, rifampin, ethambutol, and pyrazinamide); isoniazid-resistant TB required confirmed resistance to isoniazid and susceptibility to rifampin; and MDR TB required confirmed resistance to at least isoniazid and rifampin. We excluded persons who initiated treatment at a participating site but later transferred to another treatment site where we could not access their charts.

For MDR TB disease, all persons meeting inclusion criteria at each site were included because of the low incidence in Canada. For TB infection, DS TB disease, and isoniazid-resistant TB disease, incidence is higher and treatment is more standardized; at each site we included up to 30 consecutive persons meeting inclusion criteria (14). This group included patients who had initiated treatment closest to June 30, 2016, for WPHC and MCI, and closest to December 31, 2015, for BCCDC.

**Procedures**

For each person, we entered data into standardized forms (Appendix Table 1, https://wwwnc.cdc.gov/EID/article/28/9/22-0092-App1.pdf). In brief, for each person we collected detailed information on demographic and clinical characteristics, TB-related diagnostic tests performed, TB-related monitoring tests performed, TB-related inpatient and outpatient visits (including any visits requiring specialists), TB medication dose, frequency, and duration, including adverse events (and, if applicable, reasons for discontinuation), method of treatment administration (directly observed vs. self-administered), adjunct medications administered during treatment, use of interpreters, number of contacts traced (for all groups except those with TB infection), and posttreatment monitoring visits and evaluations. We completed data extraction during August 2018–May 2020.

At each site, we tabulated costs for services, consumables, and overheads (Appendix Table 2). We documented costs from the health system perspective in 2020 Canadian dollars (1.00 CAD ≈ 0.75 USD). When a cost item was unavailable from a given center, we used the mean from the other centers to impute it (Appendix Table 2). To determine drivers of cost, we grouped costs in 5 different categories: diagnosis, treatment, posttreatment follow-up, hospitalization, and public health costs. We did not include costs associated with healthcare seeking before TB diagnosis or for post-TB disease complications. To estimate true resource use, we performed microcosting where possible; in all other cases, we used top-down approaches.

In the diagnosis category, we performed microcosting and considered costs associated with initial physician consultations, nurse and interpreter time, and overheads, as well as costs of diagnostic tests (e.g., tuberculin skin test, chest radiograph, smear microscopy, sputum culture, drug-susceptibility testing, and computed tomography scans) and of routine screening for other related conditions (e.g., HIV infection and viral hepatitis).

In the treatment category, we performed microcosting and considered costs associated with TB and adjunct medications, tests for treatment and adverse event monitoring (e.g., for liver transaminases, complete blood count, therapeutic drug monitoring, and audiometry), tests for treatment response (e.g., sputum culture), and personnel and overhead associated...
with follow-up visits with nurses, physicians, and specialists. Bedaquiline and clofazimine are given under compassionate-use programs in Canada and are not associated with costs to programs.

In the posttreatment follow-up category, we performed microcosting and only considered costs associated with surveillance for TB recurrence. These costs included chest imaging and costs of routine follow-up appointments.

In the hospitalization category, we performed microcosting and considered per-diem costs attributed to each day of hospitalization according to setting. We also considered costs associated with visits by physicians during the stay and with investigations and medications.

In the public health category, we considered costs of delivering directly observed therapy (DOT), when performed, and costs associated with contact investigation. For costs of delivering DOT, we performed microcosting at MCI and BCCDC, considering personnel (nurse, pharmacist, or both) and other costs (e.g., travel). We used a top-down approach at WPHC on the basis of data from Toronto Public Health. Because of the varied nature of contact investigations across sites, we used a top-down approach on the basis of data from Toronto Public Health because they had the most systematic and comprehensive data for contact investigation (Appendix).

Data Analysis
We performed descriptive analysis of patient characteristics by TB treatment center and form of TB (TB infection, DS TB, isoniazid-resistant TB, or MDR TB). For persons with TB infection, we also described those receiving different regimens: 9 months of isoniazid, 4 months of rifampin, or other isoniazid-containing regimens. For persons with MDR TB, we further described persons with additional resistance to a fluoroquinolone (ofloxacin, moxifloxacin, or levofloxacin), resistance to a second-line injectable drug (amikacin, kanamycin, or capreomycin), or both.

For each person, we used the itemized costs to estimate the costs associated with each cost category defined previously and summed them to arrive at an overall cost. We estimated median costs and interquartile range (IQR) to illustrate cost variation, but also estimated mean costs, because these data are most useful for policymakers. We estimated costs for each form of TB overall and in different subgroups (as relevant): sex, age at treatment initiation (dichotomous, based on median age in all persons), presence versus absence of adverse events causing drug cessation, duration of hospitalization (dichotomous, based on median hospitalization duration in all persons hospitalized), completion of treatment, acid-fast bacilli smear status, presence of cavities, and location of TB disease.

We performed regression by using linear mixed models to identify predictors of cost for all forms of TB together (using DS TB as the reference category). We conducted a subgroup analysis where we excluded TB infection to assess the impact of clinical characteristics such as radiography and microbiologic findings. We also conducted stratified analyses for each form of TB separately. We treated each site as a random intercept. For each analysis, we log-transformed costs and performed univariable analysis on several predictors (Appendix Table 3). We included age and sex as a priori predictors in all multivariable models and any predictor with a p value <0.2 in univariable analysis. We back-transformed the resultant estimates and 95% CIs, which we interpreted as cost ratios (15). Because costs are probably associated with treatment completion or noncompletion, we did a post hoc sensitivity analysis, in which we repeated all analyses but excluded persons who did not complete treatment. We performed all analyses in R version 4.1.0 (16) using package lme4 (version 1.1–23) (17).

This study was approved by the research ethics boards of the sites where data were collected. These boards were the Research Institute of the McGill University Health Centre (approval no. 2019-4811), the University of British Columbia (approval no. H18-01700), and West Park Healthcare Centre (approval no. 18-017-WP).

Results
Total Population
We included a total of 313 persons in the study: 101 (32%) from BCCDC, 132 (42%) from WPHC, and 80 (26%) from MCI. We tabulated the characteristics of included persons (Table 1) and the estimated costs of their management, stratified by form of TB (Table 2). We also stratified costs by patient characteristics (Appendix Tables 4–7). We determined mean costs for all analyses (Appendix Table 8). Overall, the median cost of TB infection was $804 (IQR $587–$1,205), of DS TB disease was $12,148 (IQR $4,388–$24,842), of isoniazid-resistant TB disease was $19,319 (IQR $7,117–$41,318), and of MDR TB disease was $119,014 (IQR $80,642–$164,015).

We determined the relative contribution of each cost category to the overall cost of management, again stratified by form of TB (Figure). Although diagnosis costs were a substantial contributor to overall costs
in TB infection, their contribution was comparatively smaller for other forms of TB. For TB disease (DS TB, isoniazid-resistant TB, and MDR TB), hospitalization costs accounted for a substantial proportion of all costs (54.4% for DS TB, 61.7% for isoniazid-resistant TB, and 37.2% for MDR TB).

Among the 313 persons, multivariable regression estimated costs of managing TB infection were 11.1 times lower (adjusted cost ratio 0.09 [95% CI 0.07–0.11]) than costs of managing DS TB. Conversely, costs of managing isoniazid-resistant TB were 1.7 times higher (95% CI 1.3–2.1) than DS TB, whereas costs of managing MDR TB were 8.1 times higher (95% CI 6.1–10.6) than DS TB (Table 3; univariable regression results [Appendix Table 9]). When we excluded TB infection from multivariable regression and included clinical characteristics (Appendix Table 10), adjusted cost ratios were reduced for isoniazid-resistant TB (1.3 [95% CI 1.1–1.7]) and MDR TB (3.6 [95% CI 2.6–5.1]). Estimates were not substantially different when we excluded persons who did not complete treatment (Appendix Table 11).

**TB Infection**

Overall, we included 90 persons treated for TB infection (30 at each center) (Table 1). Of these persons, 53

---

**Table 1.** Characteristics of patients initiating treatment for different forms of TB at 3 treatment centers, Canada, July 2010–June 2016*  

| Characteristic                                      | TB infection, n = 90 | DS TB, n = 90 | INHR TB, n = 71 | MDR TB, n = 62 |
|-----------------------------------------------------|----------------------|---------------|-----------------|---------------|
| **TB treatment center, province**                    |                      |               |                 |               |
| British Columbia Centre for Disease Control         | 30 (33)              | 30 (33)       | 30 (42)         | 11 (18)       |
| West Park Healthcare Centre, Ontario                | 30 (33)              | 33 (33)       | 27 (38)         | 45 (73)       |
| Montreal Chest Institute, Quebec                    | 30 (33)              | 30 (33)       | 14 (20)         | 6 (9)         |
| **Year of treatment initiation**                    |                      |               |                 |               |
| 2010–2011                                           | 0 (0)                | 0 (0)         | 12 (17)         | 10 (16)       |
| 2012–2013                                           | 1 (1)                | 0 (0)         | 13 (18)         | 19 (31)       |
| 2014                                                | 15 (17)              | 1 (1)         | 20 (28)         | 15 (24)       |
| 2015                                                | 42 (47)              | 57 (64)       | 22 (31)         | 13 (21)       |
| 2016                                                | 32 (35)              | 32 (35)       | 4 (6)           | 5 (8)         |
| **Age Median (IQR) age, y**                         | 36 (31–49)           | 43 (30–62)    | 44 (31–61)      | 32 (27–47)    |
| **Sex**                                             |                      |               |                 |               |
| F                                                   | 55 (61)              | 50 (56)       | 38 (54)         | 34 (55)       |
| M                                                   | 36 (39)              | 40 (44)       | 33 (46)         | 28 (45)       |
| **Nativity**                                        |                      |               |                 |               |
| Born in Canada                                      | 11 (12)              | 10 (11)       | 9 (13)          | 5 (8)         |
| Born outside Canada                                 | 79 (88)              | 80 (89)       | 62 (87)         | 57 (92)       |
| **HIV status**                                      |                      |               |                 |               |
| Positive                                            | 0                    | 1 (1)         | 0 (0)           | 1 (2)         |
| Negative                                            | 33 (37)              | 69 (77)       | 12 (17)         | 59 (95)       |
| Unknown                                             | 57 (63)              | 20 (22)       | 59 (83)         | 2 (3)         |
| **Diabetes**                                        |                      |               |                 |               |
| Has diabetes                                        | 12 (13)              | 13 (14)       | 10 (14)         | 10 (16)       |
| Does not have diabetes                              | 74 (82)              | 75 (83)       | 60 (85)         | 52 (84)       |
| Unknown                                             | 4 (4)                | 2 (2)         | 1 (1)           | 0             |
| **Hospitalization Information**                     |                      |               |                 |               |
| Hospitalized                                        | 0                    | 46 (51)       | 47 (66)         | 60 (97)       |
| Median (IQR) duration, d                            | NA                   | 24 (9–36)     | 23 (17–69)      | 99 (66–159)   |
| **Treatment information**                           |                      |               |                 |               |
| Median (IQR) duration, mo                           | 5.8 (4.0–9.0)        | 8.9 (6.1–9.6) | 11.7 (9.1–16.7) | 21.2 (20.0–24.7) |
| Had to stop >1 drug because of adverse event        | 7 (8)                | 38 (42)       | 29 (41)         | 52 (84)       |
| Median (IQR) drugs stopped because of adverse event | 0 (0–0)              | 0 (0–1)       | 0 (0–1)         | 2 (1–3)       |
| **Cure or treatment complete**                      | 77 (86)              | 83 (92)       | 63 (89)         | 49 (79)       |
| **Incomplete treatment**                            | 13 (14)              | 7 (8)         | 8 (11)          | 13 (21)       |
| **Clinical characteristics**                        |                      |               |                 |               |
| Pulmonary TB only                                   | NA                   | 68 (76)       | 51 (72)         | 47 (76)       |
| Extrapulmonary TB                                   | NA                   | 22 (24)       | 20 (28)         | 15 (24)       |
| AFB smear positive                                  | NA                   | 47 (52)       | 35 (48)         | 22 (35)       |
| Cavities on chest x-ray                             | NA                   | 30 (33)       | 21 (30)         | 15 (24)       |
| **Public health characteristics**                   |                      |               |                 |               |
| Used directly observed therapy                      | NA                   | 32 (36)       | 33 (46)         | 54 (86)       |
| Mean (range) no. contacts                           | NA                   | 4 (0–30)      | 8 (0–224)       | 4 (0–97)      |

*Data are no. (%) except as indicated. AFB, acid-fast bacilli; DS, drug-susceptible; INHR, isoniazid-resistant; IQR, interquartile range; MDR, multidrug-resistant; NA, not applicable; TB, tuberculosis.
RESEARCH

Table 2. Total costs and component costs of managing different forms of TB at 3 treatment centers, Canada, July 2010–June 2016*

| Characteristic               | TB infection, n = 90 | DS TB, n = 90 | INHR TB, n = 71 | MDR TB, n = 62 |
|------------------------------|----------------------|---------------|----------------|---------------|
| Median (IQR) costs†          |                      |               |                |               |
| Total costs                  | 804 (587–1,205)      | 12,148 (4,388–24,842) | 19,319 (7,117–41,318) | 119,014 (80,642–164,015) |
| Diagnosis                    | 267 (217–376)        | 701 (526–1,026) | 819 (657–1,049) | 1,083 (925–1,331) |
| Treatment                    | 521 (377–771)        | 2,145 (1,614–3,187) | 2,864 (2,263–3,919) | 61,426 (29,840–108,703) |
| Posttreatment monitoring     | 0 (0–0)              | 139 (28–283)   | 130 (39–195)   | 193 (39–341)   |
| Hospitalization              | 0 (0–0)              | 2,600 (0–15,524) | 10,400 (0–27,227) | 41,216 (35,178–55,766) |
| Associated with public health interventions | 0 (0–0) | 3,174 (632–5,232) | 2,885 (1,111–6,174) | 6,399 (4,657–6,798) |

| Mean costs‡                  |                      |               |                |               |
|------------------------------|----------------------|---------------|                |               |
| Total costs                  | 917                  | 15,772        | 32,343         | 131,780       |
| Diagnosis                    | 308                  | 789           | 860            | 1,233         |
| Treatment                    | 587                  | 2,585         | 4,641          | 74,709        |
| Posttreatment monitoring     | 22                   | 181           | 166            | 243           |
| Hospitalization              | 0                    | 8,587         | 19,963         | 48,791        |
| Associated with public health interventions | 0               | 3,630         | 6,713          | 6,804         |

| AFB, acid-fast bacilli; DS, drug-susceptible; INHR, isoniazid-resistant; IQR, interquartile range; MDR, multidrug-resistant; TB, tuberculosis. |

†Component values may not sum to the total cost value because of use of medians.
‡Component values may not sum to the total cost value because of rounding.

(59%) initiated 9 months of isoniazid, 35 (39%) initiated 4 months of rifampin, and 2 (2%) initiated isoniazid and rifampin (Appendix Tables 12, 13).

Approximately two-thirds of costs for TB infection were associated with treatment (Figure); absolute treatment costs were correlated with duration (Appendix Table 13). Persons initiating an isoniazid-containing regimen had overall costs 1.3-times (95% CI 0.98–1.7) higher than persons initiating a rifampin-only regimen (Table 3).

DS TB Disease

We included 90 persons treated for DS TB disease (30 at each center) (Table 1). Approximately half (46 [51%]) were hospitalized for a median duration of 24 (IQR 9–36) days. The median duration of treatment was 8.9 (IQR 6.1–9.6) months; treatment was shorter for persons who were smear-negative and without cavities (6.6 months [IQR 6.1–9.1]) compared with persons who were smear-positive or had cavities, or both (9.1 months [IQR 6.4–10.0]) (Appendix Table 14).

More than half the cost of DS TB disease management was related to hospitalization, whereas approximately one third reflected contact investigations and DOT administration (Figure). Costs of managing DS TB disease were much lower at MCI (median $4,987) than at WPHC ($13,328) and BCCDC ($15,201), largely because of variation in disease severity and attendant differences in hospitalization among persons treated at these centers (Appendix Table 14). Costs were 3.7 (95% CI 1.9–7.4) times higher for persons hospitalized for >2 months compared with persons not hospitalized at all or hospitalized <2 months (Table 3).

Isoniazid-Resistant TB Disease

We included 71 persons treated for isoniazid-resistant TB disease (30 at BCCDC, 27 at WPHC, and 14 at MCI) (Table 1). Of those, 47 (66%) were hospitalized, with median duration 23 (IQR 17–69) days. The
median treatment duration was 11.7 (IQR 9.1–16.7) months and varied substantially by TB treatment center (Appendix Table 15). Fifty-four (76%) persons received regimens containing a fluoroquinolone, and 8 (11%) received a second-line injectable (Appendix Table 15).

Over 60% of costs associated with isoniazid-resistant TB disease were because of hospitalization (Figure). Treatment was shortest and costs lowest for persons hospitalized <2 months compared with patients not hospitalized at all or hospitalized >2 months (Table 3).

### MDR TB Disease

We included 62 persons treated for MDR TB disease (11 at BCCDC, 45 at WPHC, and 6 at MCI) (Table 1). Of these, 2 (3%) had additional fluoroquinolone resistance, 6 (10%) had additional resistance to a second-line injectable, and 4 (6%) had both. Nearly all (60 [97%]) were hospitalized for a median duration of 17.6 months; median cost $34,400. Costs were 3.2 (95% CI 2.1–4.7) times higher for persons hospitalized >2 months compared with patients not hospitalized at all or hospitalized <2 months (Table 3).

### Table 3. Multivariable analysis of characteristics associated with increasing or decreasing costs of managing different forms of TB at 3 treatment centers, Canada, July 2010–June 2016*

| Characteristic                                | All patients, n = 313 | TB infection, n = 90 | DS TB, n = 90 | INHR TB, n = 71 | MDR TB, n = 62 |
|-----------------------------------------------|-----------------------|----------------------|---------------|-----------------|----------------|
| **TB type**                                   |                       |                      |               |                 |                |
| DS TB                                         | Referent              | NA                   | NA            | NA              | NA             |
| TB infection                                  | 0.09 (0.07–0.11)      | NA                   | NA            | NA              | NA             |
| INHR TB                                       | 1.7 (1.3–2.1)         | NA                   | NA            | NA              | NA             |
| MDR TB                                        | 8.1 (6.1–10.6)        | NA                   | NA            | NA              | NA             |
| **Age group, y**                              |                       |                      |               |                 |                |
| <40                                           | 0.97 (0.8–1.2)        | 1.3 (1.1–1.5)        | 0.9 (0.6–1.3) | 1.2 (0.9–1.6)   | 0.9 (0.7–1.1)  |
| ≥40                                           |                       |                      |               |                 |                |
| **Sex**                                       |                       |                      |               |                 |                |
| F                                             | 0.9 (0.8–1.1)         | 0.99 (0.8–1.2)       | 0.8 (0.6–1.1) | 1.01 (0.8–1.4)  | 0.98 (0.8–1.3) |
| M                                             |                       |                      |               |                 |                |
| **HIV**                                       |                       |                      |               |                 |                |
| HIV-negative or unknown                       | Referent              | NA                   | NA            | NA              | NA             |
| HIV-positive                                  | 1.8 (0.6–5.4)         | NA                   | 11.9 (2.7–52.0) | NA              | NA             |
| **Diabetes**                                  |                       |                      |               |                 |                |
| No diabetes or unknown                        | NA                    | NA                   | NA            | NA              | NA             |
| Has diabetes                                  | NA                    | NA                   | NA            | 1.4 (0.9–2.2)   | NA             |
| **Adverse events causing drug stop**          |                       |                      |               |                 |                |
| None                                          | 1.4 (1.1–1.7)         | 1.5 (1.03–2.0)       | 1.2 (0.9–1.7) | NA              | NA             |
| Because of ≥1 drug                            |                       |                      |               |                 |                |
| >2 mo                                         | 1.4 (1.1–1.7)         | 1.5 (1.03–2.0)       | 1.2 (0.9–1.7) | NA              | NA             |
| Hospitalization                               |                       |                      |               |                 |                |
| None or <2 drug                                | NA                    | NA                   | 3.7 (1.9–7.4) | 3.2 (2.1–4.7)   | 1.5 (1.1–2.0)  |
| ≥2 mo                                         | NA                    | NA                   | 3.7 (1.9–7.4) | 3.2 (2.1–4.7)   | 1.5 (1.1–2.0)  |
| **AFB smear**                                 |                       |                      |               |                 |                |
| Negative or unknown                           | NA                    | NA                   | Referent      | Referent        | NA             |
| Positive                                      | NA                    | NA                   | Referent      | Referent        | Referent       |
| Cavities on chest radiograph                  |                       |                      |               |                 |                |
| No or unknown                                 | NA                    | NA                   | Referent      | NA              | NA             |
| Yes                                           | NA                    | NA                   | 1.2 (0.8–1.8) | NA              | 1.3 (0.96–1.8) |
| **TB location**                               |                       |                      |               |                 |                |
| Pulmonary only                                | NA                    | NA                   | Referent      | NA              | NA             |
| Extrapulmonary involvement                   | NA                    | NA                   | 0.7 (0.5–1.1) | NA              | NA             |
| No. contacts                                  |                       |                      |               |                 |                |
| Per additional contact                        | NA                    | NA                   | 1.05 (1.02–1.08) | 1.02 (1.01–1.02) | 1.01 (0.99–1.01) |
| **Received DOT**                              |                       |                      |               |                 |                |
| No                                            | NA                    | NA                   | NA            | NA              | NA             |
| Yes                                           | NA                    | NA                   | NA            | 2.0 (1.2–3.3)   | 0.8 (0.5–1.3)  |
| **TB infection regimen**                      |                       |                      |               |                 |                |
| Mono-rifampin                                 | NA                    | Referent             | NA            | NA              | NA             |
| Isoniazid-containing                          | NA                    | 1.3 (0.97–1.7)       | NA            | NA              | NA             |
| MDR TB resistance pattern                     |                       |                      |               |                 |                |
| MDR TB                                        | NA                    | NA                   | NA            | NA              | Referent       |
| Fluoroquinolone-resistance, SLI resistance, or both | NA | NA | NA | NA | 1.4 (1.02–2.0) |

*AFB, acid-fast bacilli; DOT, directly observed therapy; DS, drug-susceptible; INHR, isoniazid-resistant; IQR, interquartile range; MDR, multidrug-resistant; NA, not applicable; SLI, second-line injectable; TB, tuberculosis.
†No persons living with HIV in patient group.
‡Not retained in multivariable model because p>0.2 in univariable analysis.
of 99 (IQR 66–159) days. The median duration of treatment was 21.2 (IQR 20.0–24.7) months and was similar across centers (Appendix Table 16). About half (34 [55%]) of the patients received linezolid, whereas few received the newer drugs bedaquiline (3 [5%]) or delamanid (4 [6%]) (Appendix Tables 16, 17).

Costs associated with treatment (56.5%) and hospitalization (37.2%) were the largest cost components for MDR TB management (Figure). In adjusted analyses, resistance to a fluoroquinolone, a second-line injectable, or both were associated with 1.4 (95% CI 1.02–2.0) times higher costs (Table 3).

We analyzed median duration and cost of each medication received (Table 4). Cycloserine was the most expensive drug, costing a median of $57,658 (IQR $28,942–$91,935) per person. New and repurposed drugs (i.e., linezolid, delamanid, and carbapenems) were also expensive (median cost range $8,459–$22,437). Fluoroquinolones and second-line injectables were less expensive (median cost range $330–$4,024). Compassionate-use drugs (clofazimine and bedaquiline) did not contribute to costs to TB programs.

Discussion

At 3 TB treatment centers in Canada, we found costs of managing TB infection were modest compared with costs of managing TB disease. For persons with TB disease, duration of hospitalization and extent of drug resistance were major drivers of cost. Among the 3 TB treatment centers, treatment practices varied with respect to length of hospital stays and composition or duration of treatment regimens, perhaps because of variations in treatment philosophy, isolation practices, patient profiles, or a combination of these factors, which resulted in substantial cost differences between centers.

In 2004, the average health system cost of managing TB disease in Canada was estimated to be $25,986 per person (6,18). When applying our cost estimates against the distribution of drug-resistant TB disease in Canada (2,19), we estimate an average cost of $17,506. These differences appear to be influenced by variations in study aims and approaches. The 2004 study aimed to estimate all costs spent on TB services using a top-down approach, whereas our study aimed to estimate costs per patient initiated on treatment, largely by using microcosting approaches. For example, the 2004 study included costs associated with microbiologic testing of all persons tested for TB disease, not only those ultimately treated. In contrast, our study included costs associated with outpatient specialist consultations, additional tests, and adjunctive medications, which were not included in the 2004 study.

Direct costs associated with managing MDR TB disease in Canada appear to be substantially lower than estimates from the United States for 2005–2007 (20). When inflated and converted to 2020 Canadian dollars (21), direct costs associated with MDR TB disease were $243,000, or 2.0-fold more expensive than comparative estimates from this study, whereas costs...
associated with MDR TB with additional resistance to a fluoroquinolone and second-line injectable are ≈$757,000, or 4.5-fold more expensive. These differences appear almost entirely driven by costs associated with hospitalization and inpatient care, as opposed to outpatient care.

This study highlights managing persons with evidence of TB infection is less costly than TB disease, particularly when using 4 months of rifampin (3 months of weekly isoniazid and rifapentine is not widely available in Canada). Hospitalization was a major driver of costs for TB disease; use of community care to prevent hospitalization may reduce overall costs (22). From our estimates, the total costs (including diagnosis, treatment, and posttreatment monitoring) of using 4 months of rifampin ($671 per person) for 23 persons with evidence of TB infection are equivalent to the total costs (including diagnosis, treatment, posttreatment monitoring, hospitalization, and public health interventions) of managing 1 person with DS TB disease ($15,771 per person). However, it is important to also consider costs associated with identifying persons who would benefit from TB preventive treatment in specific epidemiologic contexts, because these costs will affect the relative cost-effectiveness of preventive treatment.

Our study focused on persons initiating treatment for TB largely during 2015–2016, but new regimens have since become available. In 2018, the World Health Organization (WHO) recommended that persons with MDR TB disease treated with longer regimens should receive a fluoroquinolone, bedaquiline, linezolid, and ≥1 of clofazimine or cycloserine. Both clofazimine and bedaquiline are given under compassionate-use programs in Canada. However, a course of bedaquiline in Canada could cost $30,000 USD (23), whereas a course of clofazimine would cost approximately $600 USD (24,25). At these prices, the overall costs of treatment are unlikely to change, although regimens should be better tolerated (26). Shorter MDR TB regimens recommended by WHO (27) are not widely used in Canada. In 2021, the WHO conditionally recommended a moxifloxacin- and rifapentine-based 4-month regimen for DS TB disease (28). Despite a shorter treatment duration, costs are unlikely to be reduced in Canada because savings associated with reduced health visits and DOT will probably be outweighed by higher medication costs for rifapentine and moxifloxacin (29).

Our study’s first limitation is that costs were only considered from the health system perspective and for persons ultimately initiating treatment from the point when persons underwent diagnostic testing for TB. This approach excludes costs associated with pre-diagnosis healthcare-seeking behavior, the long-term financial impacts associated with TB disease, and other patient costs such as lost income, travel, and childcare, which may be substantial (30–32). The TB treatment centers included in this study were prioritized so as to obtain robust estimates of the costs of treatment for drug-resistant TB disease; the 3 centers treated ≈60% of all MDR TB disease in Canada during the study period (33). Other forms of TB managed at the same centers allowed for instructive comparisons. We only could capture information contained in patient charts. Most notably absent were interactions with the health system before diagnosis, which may lead to an underestimation of costs. DOT for TB disease was rarely used at BCCDC and MCI. Costs associated with public health interventions are likely to be higher at centers performing routine, daily DOT. Although we conducted microcosting to estimate true resource use where possible, we had to use top-down approaches for some costs, which may overestimate true resource use. Last, not all costs were available at all centers, and imputed costs for some centers may not be precise, although cost imputation was rare.

A key strength of our study is the comprehensive nature of data collection with respect to healthcare utilization and associated costs, which permitted microcosting of many aspects of TB care and attendant insight into cost drivers and predictors. An additional strength is the separate estimation of costs for drug-resistant TB disease, including isoniazid-resistant and MDR TB, all managed in the same centers, filling a major data gap in Canada.

In summary, costs of managing TB disease increased substantially with drug resistance and were highest among persons hospitalized for ≥2 months; the costs of managing TB infection were comparatively much smaller. Because TB rates remain stagnant in Canada, these data will be useful for policymakers considering TB prevention and care interventions to support the overall goal of TB elimination.

Acknowledgments
We acknowledge Jane McNamee, Monica Avendano, Howard Song, and Peter Derkach for their contributions toward data collection at West Park Healthcare Centre. This study was funded by a grant (awarded to principal investigator J.C.J.) from the Canadian Institutes of Health Research (grant no. PJT-153213). J.C. (award no. 287869) is funded by a postdoctoral fellowship from the Fonds de Recherche du Québec—Santé. H.R. was funded by a summer studentship from the Respiratory Epidemiology and Clinical Research Unit, Research Institute of the
McGill University Health Centre. K.R. is funded by the Canadian Institutes of Health Research Frederick Banting and Charles Best Doctoral Award. B.S. is supported, in part, by a Canada Research Chair in Economics of Infectious Diseases award (grant no. CRC-950-232429). J.C.J. is funded by a Michael Smith Health Research Award.

Author contributions: concept and design (J.R.C., O.O., J.C.J., B.S., K.S., S.K.B.); data collection and curation (J.R.C., P.N., L.C., H.K., H.R., E.R., K.R., N.S., A.U., J.C.J., K.S., S.K.B.); data harmonization and analysis (J.R.C., P.N., A.U.); drafting manuscript (J.R.C., K.S., S.K.B.); manuscript revisions and intellectual content (all authors).

About the Author
Dr. Campbell is a postdoctoral fellow at McGill University, Montreal, Quebec, Canada. His primary research interest is in tuberculosis and applying health economic, epidemiologic, and meta-analytical methods in its study.

References
1. Public Health Agency of Canada. Canadian tuberculosis standards. Seventh edition. Ottawa (Ontario): Government of Canada; 2014.
2. LaFreniere M, Hussain H, He N, McGuire M. Tuberculosis in Canada: 2017. Can Commun Dis Rep. 2019;45:67–74.
3. Inuit Tapiriit Kanatami. Inuit Tuberculosis Elimination Framework. 2018 [cited 2021 Jul 29]. https://www.itk.ca/wp-content/uploads/2018/12/FINAL-ElectronicEN-Inuit-TB-Elimination-Framework.pdf
4. Campbell J, Marra F, Cook V, Johnston J. Screening immigrants for latent tuberculosis: do we have the resources? CMAJ. 2014;186:246–7. https://doi.org/10.1503/cmaj.131025
5. Drummond MF, Sculpher MJ, Claxton K, Stoddart GL, Torrance GW. Methods for the economic evaluation of health care programmes. 4th edition. New York: Oxford University Press; 2015.
6. Menzies D, Lewis M, Oxlade O. Costs for tuberculosis care in Canada. Can J Public Health. 2008;99:391–6. https://doi.org/10.1007/BF03405248
7. Menzies D, Adjibomiey M, Ruslamri R, Trajman A, Sow O, Kim H, et al. Four months of rifampin or nine months of isoniazid for latent tuberculosis in adults. N Engl J Med. 2018;379:440–53. https://doi.org/10.1056/NEJMoa1714283
8. Sterling TR, Villarino ME, Borisov AS, Shang N, Gordin F, Bliven-Szemere E, et al.; TB Trials Consortium PREVENT TB Study Team. Three months of rifapentine and isoniazid for latent tuberculosis infection. N Engl J Med. 2011;365:2155–66. https://doi.org/10.1056/NEJMoa1104875
9. Diiallo T, Adjibomiey M, Ruslamri R, Trajman A, Sow O, Obeng Baah J, et al. Safety and side effects of rifampin versus isoniazid in children. N Engl J Med. 2018;379(5):454–63.
10. Fregonesi F, Ahuja SD, Akkerman OW, Arakaki-Sanchez D, Ayakaka I, Baghaei P, et al. Comparison of different treatments for isoniazid-resistant tuberculosis: an individual patient data meta-analysis. Lancet Respir Med. 2018;6:265–75. https://doi.org/10.1016/S2213-2600(18)30078-X
11. Abidi S, Achar J, Neino MMA, Bang D, Benedetti A, Brode S, et al. Standardised shorter regimens versus individualised longer regimens for multidrug-resistant TB. Eur Respir J. 2020;55:1901467.
12. World Health Organization. WHO consolidated guidelines on tuberculosis. Module 4: treatment: drug-resistant tuberculosis treatment. 2020 [cited 2020 Jul 31]. https://www.who.int/publications/i/item/9789240007048
13. Oh CE, Ortiz-Brizuela E, Bastos ML, Menzies D. Comparing the diagnostic performance of QFT-Plus to other tests of latent tuberculosis infection: a systematic review and meta-analysis. Clin Infect Dis. 2021;73:e1116–25. PMID 33289038
14. Kwak SG, Kim JH. Central limit theorem: the cornerstone of modern statistics. Korean J Anesthesiol. 2017;70:144–56. https://doi.org/10.1007/kjane.2017.70.2.144
15. Bastos ML, Campbell JR, Oxlade O, Adjibomiey M, Trajman A, Ruslamri R, et al. Health system costs of treating latent tuberculosis infection with four months of rifampin versus nine months of isoniazid in different settings. Ann Intern Med. 2020;173:169–78. https://doi.org/10.7326/M19-3741
16. R Core Team. R: a language and environment for statistical computing. 2021 [cited 2021 Jul 27]. https://www.r-project.org
17. Bates D, Mächler M, Bolker B, Walker S. Fitting linear mixed-effects models using lme4. J Stat Softw. 2015;67:1–48. https://doi.org/10.18637/jss.v067.i01
18. Bank of Canada. Inflation calculator. 2021 [cited 2021 Dec 8]. https://www.bankofcanada.ca/rates/inflation-calculator/
19. LaFreniere M, Hussain H, Vachon J. Tuberculosis drug resistance in Canada: 2017. Can Commun Dis Rep. 2018;44:290–6. https://doi.org/10.14754/cdr.v44i11a04
20. Marks SM, Flood J, Seaworth B, Hirsch-Moverman Y, Armstrong L, Mase S, et al.; TB Epidemiologic Studies Consortium. Treatment practices, outcomes, and costs of multidrug-resistant and extensively drug-resistant tuberculosis, United States, 2005–2007. Emerg Infect Dis. 2014;20:812–21. https://doi.org/10.3201/eid2005.13037
21. Centers for Disease Control and Prevention. CDC estimates for TB treatment costs (in 2020 U.S. dollars). 2021 [cited 2022 Jan 14]. https://www.cdc.gov/tb/publications/infographic/appendix.htm
22. Sinha P, Shenoi SV, Friedland GH. Opportunities for community health workers to contribute to global efforts to end tuberculosis, Glob Public Health. 2020;15:474-84. https://doi.org/10.1080/17441692.2019.1663361
23. McKenna L. The price of bedaquiline. 2018 [cited 2021 Dec 8]. https://www.treatmentactiongroup.org/wp-content/uploads/2018/10/reality_check_bedaquiline_10_16_18.pdf
24. Stop TB Partnership. Global Drug Facility July 2022 Medicines Catalog. 2022 [cited 2022 Aug 2]. https://www.stoptb.org/sites/default/files/gd medicinescatalog_1.pdf
25. Hwang TJ, Dotsenko S, Jafarov A, Weyer K, Falzon D, Lunte K, et al. Safety and availability of clofazimine in the treatment of multidrug and extensively drug-resistant tuberculosis: analysis of published guidance and meta-analysis of cohort studies. BMJ Open. 2014;4:e004143.
26. WHO Consolidated Guidelines on Tuberculosis Treatment 2017. Drug-resistant tuberculosis, United States, 2005–2007. Emerg Infect Dis. 2013;20:383–94. https://doi.org/10.1080/17441692.2019.1663361
27. World Health Organization. Rapid communication: Key changes to the treatment of drug-resistant tuberculosis. 2022 [cited 2022 May 3]. https://www.who.int/publications/i/item/WHO-UCN-TB-2022-2
Costs of Tuberculosis at Treatment Centers, Canada

28. Dorman SE, Nahid P, Kurbatova EV, Phillips PPJ, Bryant K, Dooley KE, et al.; AIDS Clinical Trials Group; Tuberculosis Trials Consortium. Four-month rifapentine regimens with or without moxifloxacin for tuberculosis. N Engl J Med. 2021;384:1705–18. https://doi.org/10.1056/NEJMoa2033400

29. Pease C, Alvarez G, Mallick R, Patterson M, Finn S, Habis Y, et al. Cost-effectiveness analysis of 3 months of weekly rifapentine and isoniazid compared to isoniazid monotherapy in a Canadian Arctic setting. BMJ Open. 2021;11:e047514. https://doi.org/10.1136/bmjopen-2020-047514

30. Ku CC, Chen CC, Dixon S, Lin HH, Dodd PJ. Patient pathways of tuberculosis care-seeking and treatment: an individual-level analysis of National Health Insurance data in Taiwan. BMJ Glob Health. 2020;5:e002187. https://doi.org/10.1136/bmjgh-2019-002187

31. Meghji J, Gregorius S, Madan J, Chitimbe F, Thomson R, Rylance J, et al. The long term effect of pulmonary tuberculosis on income and employment in a low income, urban setting. Thorax. 2021;76:387–95. https://doi.org/10.1136/thoraxjnl-2020-215338

32. Ghazy RM, El Saech HM, Abdulaziz S, Hammouda EA, Elzorkany AM, Khidr H, et al. A systematic review and meta-analysis of the catastrophic costs incurred by tuberculosis patients. Sci Rep. 2022;12:558. https://doi.org/10.1038/s41598-021-04345-x

33. Gallant V, Vachon J, Siu W. Tuberculosis drug resistance in Canada: 2006–2016. Can Commun Dis Rep. 2017;43:236–41. https://doi.org/10.14745/ccdr.v43i11a05

Address for corresponding: Kevin Schwartzman, Centre for Outcomes Research and Evaluation, Research Institute of the McGill University Health Centre, 5252 Boulevard de Maisonneuve Ouest, Rm D3.63, Montréal, QC H4A 355, Canada; email: kevin.schwartzman@mcmill.ca

July 2022

SARS-CoV-2 and Influenza Virus Infections

- Vaccine Effectiveness during Outbreak of COVID-19 Alpha (B.1.1.7) Variant in Men’s Correctional Facility, United States
- Updated Estimates and Mapping for Prevalence of Chagas Disease among Adults, United States
- Enterovirus D68 in Hospitalized Children, Barcelona, Spain, 2014–2021
- Epidemiologic, Clinical, and Genetic Characteristics of Human Infections with Influenza A(HSN6) Viruses, China
- Measuring Basic Reproduction Number to Assess Effects of Nonpharmaceutical Interventions on Nosocomial SARS-CoV-2 Transmission
- Analyzing and Modeling the Spread of SARS-CoV-2 Omicron Lineages BA.1 and BA.2, France, September 2021–February 2022
- Effect of Returning University Students on COVID-19 Infections in England, 2020
- Self-Reported and Physiologic Reactions to Third BNT162b2 mRNA COVID-19 (Booster) Vaccine Dose
- Nipah Virus Detection at Bat Roosts after Spillover Events, Bangladesh, 2012–2019
- Deaths from Tick-Borne Encephalitis, Sweden
- Effect of Agroecosystems on Seroprevalence of St. Louis Encephalitis and West Nile Viruses in Birds, La Pampa, Argentina, 2017–2019
- Targeted Screening for Chronic Q Fever, the Netherlands
- One Health Genomic Analysis of Extended-Spectrum β-Lactamase–Producing Salmonella enterica, Canada, 2012–2016
- Novel Mycobacterium tuberculosis Complex Genotype Related to M. caprae
- Outbreak of IncX8 Plasmid–Mediated KPC-3–Producing Enterobacteriales Infection, China
- Chronic Pulmonary Disease Caused by Tsukamurella toyonakaense
- SARS-CoV-2 Delta–Omicron Recombinant Viruses, United States
- Highly Pathogenic Avian Influenza A(H5N8) Clade 2.3.4.4b Virus in Dust Samples from Poultry Farms, France, 2021
- Genetically Diverse Highly Pathogenic Avian Influenza A(H5N1/H5N8) Viruses among Wild Waterfowl and Domestic Poultry, Japan, 2021
- Multisystem Inflammatory Syndrome after Breakthrough SARS-CoV-2 Infection in 2 Immunized Adolescents, United States
- Natural History of and Dynamic Changes in Clinical Manifestation, Serology, and Treatment of Brucellosis, China
- Arcalialiia algerae Microsporidiosis Diagnosed by Metagenomic Next-Generation Sequencing, China
- Use of Human Intestinal Enteroids to Evaluate Persistence of Infectious Human Norovirus in Seawater
- Isolation and Characterization of Novel Reassortant Influenza A(H10N7) Virus in a Harbor Seal, British Columbia, Canada

To revisit the July 2022 issue, go to: https://wwwnc.cdc.gov/eid/articles/issue/28/7/table-of-contents
Costs of Tuberculosis at 3 Treatment Centers, Canada, 2010–2016

Appendix

Methods

Additional Details on Cost Estimation for Contact Investigations

Contact investigation costs were estimated using a top-down approach based on data from Toronto Public Health in 2017. Costs for contact investigations were estimated solely on time spent (i.e., no costs of overhead or materials) by public health staff who managed the 206 pulmonary tuberculosis cases in Toronto, Ontario in 2017. From these 206 cases, 1689 contacts were identified (i.e., 8.2 contacts per case). From interviews performed by Elizabeth Rea (who works at Toronto Public Health and is an author on this manuscript), public health nurse tuberculosis case managers estimated that they spent 40% of their time on activities related to contact investigation (follow-ups, counselling, testing, sputum collection, chest x-rays, and diagnosis). The total combined annual salary (including benefits) for the 22 FTE public health nurse case managers was $2,192,465, and thus, 40% of their time was valued at $876,986. In addition, there are support staff that estimated they spent 25% of their time assisting with data management, logistics, and communication associated with contact investigations. The total combined annual salary (including benefits) of the 5 FTE support staff was $390,104, and thus, 25% of their time was valued at $97,526. Taken together, this results in estimated personnel cost associated with contact investigation of $4,730 per index tuberculosis patient or a cost of $577 per contact identified. In terms of time spent on contact investigation by public health staff, if one assumes 20 working days per month (or 240 working days per year) then the time associated with contact investigation per index tuberculosis patient was 11.7 days or 1.43 days per contact identified.
### Appendix Table 1. Data Fields for Patient Information

| Variable                                                                 | Value                                                                 |
|--------------------------------------------------------------------------|----------------------------------------------------------------------|
| Site ID                                                                  | numeric                                                              |
| Patient ID                                                               | numeric                                                              |
| Patient Age (At Treatment Start)                                         | numeric                                                              |
| Sex                                                                      | Male, Female, Unknown                                                |
| Foreign-Born                                                             | Yes, No                                                              |
| If Foreign-Born, What is the Country of Origin?                          | character                                                            |
| If Foreign-Born, What is the Year of Arrival?                            | numeric                                                              |
| If Foreign-Born, What is the Immigration Status?                        | Citizen, Permanent Resident, Temporary Permit, Refugee, Undocumented, Other |
| Occupation                                                               | Health care worker, Migrant or seasonal worker, Retired, Not seeking employment, Correctional facility employee, Military, Other, Unemployed, Undocumented, Student |
| If Employed, Had to Stop Working for Treatment                           | Yes, No, Unknown                                                    |
| Weight (kg)                                                              | numeric                                                              |
| BMI (in kg/m^2)                                                          | numeric                                                              |
| HIV Test Placed                                                          | Positive, Negative, Unknown, Not Done                                |
| HIV Status                                                               | Yes, No, Unknown                                                    |
| On ART                                                                   | Yes, No, Unknown                                                    |
| Previous Treatment?                                                      | TB Infection, DS-TB, MDR-TB, Unknown                                 |
| Most Recent Previous Treatment Date                                      | Cure, Complete, Failure, Relapse, Lost, Adverse Event, Unknown      |
| Previous Treatment Type                                                  | (mm/dd/yyyy)                                                        |
| Previous Treatment with First-Line Drugs                                 | Yes, No, Unknown                                                    |
| Previous Treatment with Second-Line Drugs                                | Yes, No, Unknown                                                    |
| Diabetes Status                                                          | Yes, No, Unknown                                                    |
| Smoking Status                                                           | Present, Ex, Never, Unknown                                         |
| Alcohol Consumption                                                      | Yes, No, Unknown                                                    |
| Injectable Drug Use                                                      | Yes, No, Unknown                                                    |
| BCG Vaccinated                                                          | Yes, No, Unknown                                                    |
| Health Insurance                                                        | Yes, No, Unknown                                                    |
| Type of Health Insurance Coverage                                        | Provincial, Interim Federal Health (Refugee Claimant), Private, None, Unknown |
| Patient Status at Diagnosis                                              | Alive, Dead                                                         |
| Chest X-Ray Date                                                        | (mm/dd/yyyy)                                                        |
| Chest X-Ray Cavitation                                                   | Yes, No, Unknown, Not Done                                          |
| Chest X-Ray Bilateral cavitation                                         | Yes, No, Unknown, Not Done                                          |
| Chest X-Ray Bilateral disease                                           | Yes, No, Unknown, Not Done                                          |
| Total Number of Chest X-Rays during diagnosis                            | numeric                                                              |
| Total Number of Chest X-Rays during treatment                           | numeric                                                              |
| Total Number of post-treatment Chest X-Rays                             | numeric                                                              |
| CT Scan                                                                  | Yes, No, Unknown, Not Done                                          |
| Total number of CT Scans during diagnosis                                | numeric                                                              |
| Total number of CT Scans during treatment                               | numeric                                                              |
| Total Number of post-treatment CT scans                                 | numeric                                                              |
| Bronchoscopy                                                             | Yes, No, Unknown, Not Done                                          |
| Date of Initial Culture                                                  | (mm/dd/yyyy)                                                        |
| Baseline culture                                                         | Positive, Negative, Unknown, Not Done                                |
| Induced Sputum Procedure                                                 | Yes, No, Unknown, Not Done                                          |
| Number of Cultures, Induced, during diagnosis                            | numeric                                                              |
| Number of Cultures, not Induced, during diagnosis                       | numeric                                                              |
| Total Number of Induced Sputum Procedure(s)                             | numeric                                                              |
| Overall Number of Cultures Ordered                                      | numeric                                                              |
| Time to Culture Conversion (in days from treatment start)               | numeric                                                              |
| Date of Initial Smear                                                    | (mm/dd/yyyy)                                                        |
| AFB Smear                                                                | Positive, Negative, Unknown, Not Done                                |
| Number of AFB Smears during diagnosis                                    | numeric                                                              |
| Number of AFB Smears during treatment                                   | numeric                                                              |
| Number of ECGs                                                           | numeric                                                              |
| Number of audiometric tests                                             | numeric                                                              |
| Anti-HBc                                                                 | Positive, Negative, Unknown, Not Done                                |
| Ag HBs                                                                   | Positive, Negative, Unknown, Not Done                                |
| Anti-HBB                                                                | Positive, Negative, Unknown, Not Done                                |
| Hepatitis Blood Draws                                                   | numeric                                                              |
| HbA1c                                                                    | Pulmonary, Extrapulmonary character                                 |
| Site of TB                                                               | numeric                                                              |
| Site of EPTB                                                             | numeric                                                              |
| Number of Ultrasounds of abdomen                                         | numeric                                                              |
| Variable                                                                 | Value |
|-------------------------------------------------------------------------|-------|
| Number of Biopsy: endometrium                                           | numeric |
| Number of X-Rays: chest lordotic view only                             | numeric |
| Number of X-Rays: Cspine (4 views or more)                             | numeric |
| Number of MRI: C and T spine C-                                       | numeric |
| Number of MRI: total spine C-T-L C+                                    | numeric |
| Number of MRI: head C- C+                                               | numeric |
| Number of CT Scans: T+ L spine C-                                      | numeric |
| Number of Puncture: lumbar                                             | numeric |
| Number of Puncture: other                                              | numeric |
| Number of Ultrasounds: doppler other                                    | numeric |
| Number of Ultrasounds: face or neck/ thyroid/ parathy                   | numeric |
| Number of Ultrasounds: doppler abdominal/ pelvis                       | numeric |
| Number of Ultrasounds: pelvis TVS or TAS                               | numeric |
| Number of Biopsy: vertebral                                            | numeric |
| Number of X-Rays: chest 2 views + lordotic view                        | numeric |
| Number of MRI: total spine C-T-L C+                                    | numeric |
| Number of MRI: head C- C+                                               | numeric |
| Number of CT Scans: abdomen and pelvis                                 | numeric |
| Number of Microbiology: tissue bacterial culture                        | numeric |
| Number of Microbiology: fungus/deep culture                            | numeric |
| Initial Tuberculin Skin Test Date                                      | (mm/dd/yyyy) |
| Tuberculin Skin Test Result                                             | Positive, Negative, Unknown |
| Overall number of tuberculin skin test                                 | numeric |
| Initial Interferon-Gamma Release Assay Date                             | (mm/dd/yyyy) |
| Type of Interferon-Gamma Release Assay                                 | QuantIFERON, T-SPOT.TB |
| Interferon-Gamma Release Assay Result                                  | Positive, Negative, Unknown |
| Overall number of Interferon-Gamma Release Assay                       | Numeric |
| Initial LPA First-Line Specimen Date                                   | (mm/dd/yyyy) |
| LPA - Isoniazid Resistant                                              | Yes, No, Unknown |
| LPA - Rifampin Resistant                                               | Yes, No, Unknown |
| Overall number of First-Line LPA ordered                               | numeric |
| Initial Xpert Date                                                     | (mm/dd/yyyy) |
| Xpert Result                                                           | resistant, susceptible, unknown |
| Overall number of Xpert Ordered                                        | numeric |
| First-Line Phenotypic DST Specimen Date                                | (mm/dd/yyyy) |
| First-Line Phenotypic DST Results Date                                 | (mm/dd/yyyy) |
| First-Line Phenotypic DST Results Reception Date                       | (mm/dd/yyyy) |
| Resistance to isoniazid                                                | resistant, susceptible, unknown |
| Resistance to rifampin                                                 | resistant, susceptible, unknown |
| Resistance to ethambutol                                               | resistant, susceptible, unknown |
| Resistance to pyrazinamide                                             | resistant, susceptible, unknown |
| Resistance to rifabutin                                                | resistant, susceptible, unknown |
| Overall Number of First-line phenotypic DST ordered                    | numeric |
| Resistance to amikacin                                                | resistant, susceptible, unknown |
| Resistance to kanamycin                                                | resistant, susceptible, unknown |
| Resistance to capreomycin                                              | resistant, susceptible, unknown |
| Resistance to ofloxacin                                                | resistant, susceptible, unknown |
| Resistance to levofloxacin                                             | resistant, susceptible, unknown |
| Resistance to moxifloxacin                                             | resistant, susceptible, unknown |
| Resistance to ciprofloxacin                                            | resistant, susceptible, unknown |
| Resistance to gatifloxacin                                             | resistant, susceptible, unknown |
| Resistance to clofazimine                                              | resistant, susceptible, unknown |
| Resistance to ethionamide                                              | resistant, susceptible, unknown |
| Resistance to cycloserine                                              | resistant, susceptible, unknown |
| Resistance to linezolid                                                | resistant, susceptible, unknown |
| Resistance to streptomycin                                             | resistant, susceptible, unknown |
| Resistance to PAS                                                     | resistant, susceptible, unknown |
| Resistance to amoxicillin-clavulanate                                  | resistant, susceptible, unknown |
| Resistance to imipenem-clastatin                                       | resistant, susceptible, unknown |
| Resistance to meropenem                                                | resistant, susceptible, unknown |
| Resistance to clarithromycin                                           | resistant, susceptible, unknown |
| Resistance to azithromycin                                             | resistant, susceptible, unknown |
| Resistance to bedaquiline                                             | resistant, susceptible, unknown |
| Resistance to delamanid                                                | resistant, susceptible, unknown |
| Overall Number of Second-line phenotypic DST ordered                   | numeric |
| Hospitalized at Treatment Start?                                       | Yes, No |
| Duration of Initial Hospitalization (days)                              | numeric |
| Variable                                           | Value                                   |
|---------------------------------------------------|-----------------------------------------|
| Hospitalized During Treatment?                    | Yes, No                                 |
| Reason Hospitalized                               | Adverse Event, Failure, Non-Adherence, Other |
| Length Hospitalized                               | numeric                                 |
| Received isoniazid?                               | Yes, No                                 |
| Record dose, start and stop date, method of administration, frequency of administration | Various                                 |
| Received rifampin?                                | Yes, No                                 |
| Record dose, start and stop date, method of administration, frequency of administration | Various                                 |
| Received ethambutol?                              | Yes, No                                 |
| Record dose, start and stop date, method of administration, frequency of administration | Various                                 |
| Received pyrazinamide?                            | Yes, No                                 |
| Record dose, start and stop date, method of administration, frequency of administration | Various                                 |
| Received rifabutin?                               | Yes, No                                 |
| Record dose, start and stop date, method of administration, frequency of administration | Various                                 |
| Received rifapentine?                             | Yes, No                                 |
| Record dose, start and stop date, method of administration, frequency of administration | Various                                 |
| Received streptomycin?                            | Yes, No                                 |
| Record dose, start and stop date, method of administration, frequency of administration | Various                                 |
| Received capreomycin?                             | Yes, No                                 |
| Record dose, start and stop date, method of administration, frequency of administration | Various                                 |
| Received kanamycin?                               | Yes, No                                 |
| Record dose, start and stop date, method of administration, frequency of administration | Various                                 |
| Received amikacin?                                | Yes, No                                 |
| Record dose, start and stop date, method of administration, frequency of administration | Various                                 |
| Received ofloxacin?                               | Yes, No                                 |
| Record dose, start and stop date, method of administration, frequency of administration | Various                                 |
| Received ciprofloxacin?                           | Yes, No                                 |
| Record dose, start and stop date, method of administration, frequency of administration | Various                                 |
| Received moxifloxacin?                            | Yes, No                                 |
| Record dose, start and stop date, method of administration, frequency of administration | Various                                 |
| Received levofloxacin?                            | Yes, No                                 |
| Record dose, start and stop date, method of administration, frequency of administration | Various                                 |
| Received gatifloxacin?                            | Yes, No                                 |
| Record dose, start and stop date, method of administration, frequency of administration | Various                                 |
| Received linezolid?                               | Yes, No                                 |
| Record dose, start and stop date, method of administration, frequency of administration | Various                                 |
| Received ethionamide?                             | Yes, No                                 |
| Record dose, start and stop date, method of administration, frequency of administration | Various                                 |
| Received prothionamide?                           | Yes, No                                 |
| Record dose, start and stop date, method of administration, frequency of administration | Various                                 |
| Received PAS?                                     | Yes, No                                 |
| Record dose, start and stop date, method of administration, frequency of administration | Various                                 |
| Received cycloserine?                             | Yes, No                                 |
| Record dose, start and stop date, method of administration, frequency of administration | Various                                 |
| Received terizidone?                              | Yes, No                                 |
| Record dose, start and stop date, method of administration, frequency of administration | Various                                 |
| Received clofazimine?                             | Yes, No                                 |
| Record dose, start and stop date, method of administration, frequency of administration | Various                                 |
| Variable                                      | Value   |
|----------------------------------------------|---------|
| Received imipenem-cilastatin?                | Yes, No |
| Record dose, start and stop date, method of administration, frequency of administration | Various |
| Received meropenem?                          | Yes, No |
| Record dose, start and stop date, method of administration, frequency of administration | Various |
| Received clarithromycin?                    | Yes, No |
| Record dose, start and stop date, method of administration, frequency of administration | Various |
| Received amoxicillin-clavulanate?            | Yes, No |
| Record dose, start and stop date, method of administration, frequency of administration | Various |
| Received azithromycin?                      | Yes, No |
| Record dose, start and stop date, method of administration, frequency of administration | Various |
| Received bedaquiline?                       | Yes, No |
| Record dose, start and stop date, method of administration, frequency of administration | Various |
| Received delamanid?                         | Yes, No |
| Record dose, start and stop date, method of administration, frequency of administration | Various |
| Received other TB medication?               | Yes, No |
| Record dose, start and stop date, method of administration, frequency of administration | Various |
| PICC Line?                                   | Yes, No |
| Number of PICC Line Insertions               | numeric |
| Given B6?                                    | Yes, No |
| Adjunctive non-TB Med Given?                | Yes, No |
| Record dose, start and stop date, method of administration, frequency of administration | Various |
| AST Measurements                             | numeric |
| ALP Measurements                             | numeric |
| ALT Measurements                             | numeric |
| Creatinine Measurements                      | numeric |
| Bilirubin Measurements                       | numeric |
| CBC Measurements                             | numeric |
| Albumin Measurements                         | numeric |
| TSH Measurements                             | numeric |
| Mg Measurements                              | numeric |
| Urea Measurements                            | numeric |
| Calcium Measurements                         | numeric |
| Phosphate Measurements                       | numeric |
| Sodium Measurements                          | numeric |
| Potassium Measurements                       | numeric |
| Chloride Measurements                        | numeric |
| Amikacin Serum Measurements                  | numeric |
| Other serum drug level measurements          | numeric |
| Liver transaminase panel measurements (not included elsewhere) | numeric |
| Number of blood draws                        | numeric |
| Therapeutic drug monitoring done             | Yes, No |
| Number of TDM tests sent out                 | numeric |
| Incentives Given?                            | Yes, No |
| Type of Incentive                            | character |
| Value of Incentive                           | numeric |
| Case manager?                                | Yes, No |
| Number of Contacts Investigated - HOME (PRIMARY) | numeric |
| Number of Contacts Investigated - HOME (SECONDARY) | numeric |
| Number of Contacts Investigated - SOCIAL (PRIMARY) | numeric |
| Number of Contacts Investigated - SOCIAL (SECONDARY) | numeric |
| Number of Contacts Investigated - SCHOOL & WORK (PRIMARY) | numeric |
| Number of Contacts Investigated - SCHOOL & WORK (SECONDARY) | numeric |
| Number of Contacts Investigated - TRAVEL (PRIMARY) | numeric |
| Variable                                                                 | Value                      |
|-------------------------------------------------------------------------|----------------------------|
| Number of Contacts Investigated - TRAVEL (SECONDARY)                    | numeric                    |
| Number of Contacts Investigated - UNASIGNED & OTHER                     | numeric                    |
| No. of Emergency Department Visits                                      | numeric                    |
| Clinic Visits (Doctor); stratified diagnosis, treatment, post-treatment | numeric                    |
| Clinic Visits (Resident); stratified diagnosis, treatment, post-treatment | numeric                    |
| Clinic Visits (Internal Medicine); stratified diagnosis, treatment, post-treatment | numeric                     |
| Clinic Visits (Specialist) - Psychiatry; stratified diagnosis, treatment, post-treatment | numeric |
| Clinic Visits (Specialist) - Ophthalmologist; stratified diagnosis, treatment, post-treatment | numeric |
| Clinic Visits (Specialist) - ENT; stratified diagnosis, treatment, post-treatment | numeric |
| Physician (Specialist) - Neurologist; stratified diagnosis, treatment, post-treatment | numeric |
| Clinic Visits (Specialist) - Gastroenterologist; stratified diagnosis, treatment, post-treatment | numeric |
| Clinic Visits (Specialist) - Dermatologist; stratified diagnosis, treatment, post-treatment | numeric |
| Clinic Visits (Specialist) - Hematologist; stratified diagnosis, treatment, post-treatment | numeric |
| Clinic Visits (Specialist) - Nutritionist; stratified diagnosis, treatment, post-treatment | numeric |
| Nurse Phone Calls; stratified diagnosis, treatment, post-treatment      | numeric                    |
| MD Phone Calls; stratified diagnosis, treatment, post-treatment          | numeric                    |
| Overall Number of Patient Visits to Clinic; stratified diagnosis, treatment, post-treatment | numeric |
| Number of Home Visits; stratified diagnosis, treatment, post-treatment  | numeric                    |
| Number of Times an Interpreter was Used; stratified diagnosis, treatment, post-treatment | numeric |
| Social worker visits; stratified diagnosis, treatment, post-treatment    | numeric                    |
| Overall DOT Visits                                                      | numeric                    |
| Number of Pharmacy DOT Visits                                           | numeric                    |
| Number of Clinic DOT Visits                                             | numeric                    |
| Number of Home DOT Visits                                              | numeric                    |
| Isolated?                                                               | Yes, No, Unknown           |
| Isolation Start Date                                                    | (mm/dd/yyyy)               |
| Isolation Stop Date                                                     | (mm/dd/yyyy)               |
| Medication Discontinued?                                                | Yes, No                    |
| Drug Stopped                                                            | character                  |
| Reason Drug Discontinued                                                | character                  |
| Type of AE                                                              | character                  |
| Did Patient Start Alternate TB Therapy?                                 | Yes, No                    |
| Specify New TB Therapy                                                  | character                  |
| Final Treatment Outcome                                                 | Complete, Death, Failure, Adverse Event, Lost to Follow-up |
| Date of Final Outcome                                                   | (mm/dd/yyyy)               |
| Duration of Treatment (days)                                            | numeric                    |
| Adherence                                                               | At Least 80%, Less Than 80% |
| If Died, Related to TB?                                                 | Yes, No                    |
| Were Post-Treatment Monitoring Services Provided?                       | Yes, No, Unknown           |
| Duration of Post-Treatment Monitoring (days)                            | numeric                    |
| Did Patient Experience Recurrence?                                     | Yes, No, Unknown           |
| Date of Recurrence                                                      | (mm/dd/yyyy)               |

Abbreviations: TB, tuberculosis; LPA, line probe assay; DOT, directly observed therapy; MD, medical doctor; AE, adverse event; DST, drug susceptibility test; AFB, acid-fast bacilli; ART, antiretroviral therapy
## Appendix Table 2. Data Fields for Costs Considered

| Item                                      | Comment (if necessary)                        |
|-------------------------------------------|-----------------------------------------------|
| Inpatient Costs                           |                                               |
| Per day in the hospital                   |                                               |
| Physician visit                           |                                               |
| Resident visit                            |                                               |
| Psychiatry visit                          |                                               |
| Nutritionist visit                        |                                               |
| Ophthalmologist visit                     |                                               |
| Neurologist visit                         |                                               |
| Gastroenterologist visit                  |                                               |
| Hematologist visit                        |                                               |
| Other Costs (Diagnosis, Treatment, Post-Treatment, Public Health) |                                               |
| Tuberculin Skin Test                      |                                               |
| Interferon-Gamma Release Assay            |                                               |
| HIV Test                                  | Missing from Ontario                          |
| Chest X-Ray                               |                                               |
| Smear (for TB)                            |                                               |
| Culture (for TB)                          |                                               |
| Sputum Induction                          |                                               |
| First Line DST                            |                                               |
| Second Line DST                           |                                               |
| First Line LPA                            |                                               |
| Second Line LPA                           |                                               |
| Xpert MTB/RIF                             |                                               |
| Ultrasound (various)                      |                                               |
| Biopsy (various)                          |                                               |
| MRI (various) costs                       |                                               |
| CT scan (various) costs                   |                                               |
| Fungal Culture                            |                                               |
| Bacterial Culture                         |                                               |
| Lumbar Puncture                           |                                               |
| Bronchoscopy                              |                                               |
| HBA1c                                     |                                               |
| Hepatitis B Serology                      |                                               |
| Hepatitis C Serology                      |                                               |
| Blood Draw Cost                           |                                               |
| Initial Physician Consultation            |                                               |
| Initial Ophthalmology Consultation        |                                               |
| Initial ENT Consultation                  |                                               |
| Initial Gastroenterologist Consultation   |                                               |
| Initial Dermatologist Consultation        |                                               |
| Initial Hematology Consultation           |                                               |
| Nutritionist Visit                        |                                               |
| Chest X-Ray Interpretation               |                                               |
| Interpreter                               |                                               |
| Isoniazid                                 | Specify dose and cost for formulation         |
| Rifampin                                  | Specify dose and cost for formulation         |
| Pyrazinamide                              | Specify dose and cost for formulation         |
| Ethambutol                                | Specify dose and cost for formulation         |
| Rifapentine                               | Specify dose and cost for formulation         |
| Rifabutin                                 | Specify dose and cost for formulation         |
| Streptomycin                              | Specify dose and cost for formulation         |
| Amikacin                                  | Specify dose and cost for formulation         |
| Capreomycin                               | Specify dose and cost for formulation         |
| Kanamycin                                 | Specify dose and cost for formulation         |
| Moxifloxacin                              | Specify dose and cost for formulation         |
| Levofloxacin                              | Specify dose and cost for formulation         |
| Gatifloxacin                              | Specify dose and cost for formulation         |
| Ofloxacin                                 | Specify dose and cost for formulation         |
| Ciprofloxacin                             | Specify dose and cost for formulation         |
| Linezolid                                 | Specify dose and cost for formulation         |
| Clofazimine                               | Specify dose and cost for formulation         |
| Ethionamide                               | Specify dose and cost for formulation; cost only available in Quebec |
| Prothionamide                             | Specify dose and cost for formulation         |
| Cycloserine                               | Specify dose and cost for formulation         |
| Terizidone                                | Specify dose and cost for formulation         |
| Bedaquiline                               | Specify dose and cost for formulation         |
| Item                                      | Comment (if necessary)                  |
|-------------------------------------------|----------------------------------------|
| Delamanid                                 | Specify dose and cost for formulation  |
| Imipenem-Cilastatin                       | Specify dose and cost for formulation  |
| Meropenem                                 | Specify dose and cost for formulation  |
| Amoxicillin-Clavulanate                   | Specify dose and cost for formulation  |
| Clarithromycin                            | Specify dose and cost for formulation  |
| Azithromycin                              | Specify dose and cost for formulation  |
| PAS                                       | Specify dose and cost for formulation  |
| Other TB Medication or Adjunct Drug Given | Specify type of drug, dose, and cost   |
| AST                                       | Specify type of drug, dose, and cost   |
| ALP                                       | Specify type of drug, dose, and cost   |
| ALT                                       | Specify type of drug, dose, and cost   |
| Creatinine                                | Specify type of drug, dose, and cost   |
| Bilirubin                                 | Specify type of drug, dose, and cost   |
| CBC                                       | Specify type of drug, dose, and cost   |
| Sodium                                    | Specify type of drug, dose, and cost   |
| Potassium                                 | Specify type of drug, dose, and cost   |
| Chloride                                  | Specify type of drug, dose, and cost   |
| Calcium                                   | Specify type of drug, dose, and cost   |
| Magnesium                                 | Specify type of drug, dose, and cost   |
| Phosphate                                 | Specify type of drug, dose, and cost   |
| Albumin                                   | Specify type of drug, dose, and cost   |
| Urea                                      | Specify type of drug, dose, and cost   |
| TSH                                       | Missing for Ontario                    |
| Amikacin Drug Levels                      | Missing for Ontario                    |
| Drug Levels for Other Drugs              | Missing for Ontario                    |
| ECG Measurement                           | Missing for Ontario                    |
| Audiometry Assessment                     | Missing for Ontario                    |
| Follow-up Physician Visit                 | Missing for Ontario                    |
| Follow-up Ophthalmology Visit            | Missing for Ontario                    |
| Follow-up ENT Visit                       | Missing for Ontario                    |
| Follow-up Gastroenterologist Visit        | Missing for Ontario                    |
| Follow-up Dermatologist Visit             | Missing for Ontario                    |
| Follow-up Hematology Visit               | Missing for Ontario                    |
| Nurse Home Visit                          | Missing for Ontario                    |
| Social Worker Visit                       | Missing for Ontario                    |
| Home Visit for DOT                        | Per visit; microcosting information missing for Ontario—used top-down approach |
| Clinic Visit for DOT                      | Per visit; microcosting information missing for Ontario—used top-down approach |
| Pharmacy Visit DOT                        | Per visit; microcosting information missing for Ontario—used top-down approach |
| Contact Investigation                     | Per contact; only available in Ontario  |
| Incentives                                | Per contact; only available in Ontario  |
| Emergency Room Visit                      | Per contact; only available in Ontario  |

Abbreviations: TB, tuberculosis; LPA, line probe assay; DOT, directly observed therapy; MD, medical doctor; AE, adverse event; DST, drug susceptibility test; AFB, acid-fast bacilli; ART, antiretroviral therapy.
### Appendix Table 3. Predictors Considered in Regression Analyses

| Type of TB | All Forms of TB | TB Infection | DS-TB | INHR-TB | MDR-TB |
|------------|-----------------|--------------|-------|---------|--------|
| Age (<40y vs. ≥40y) | Age (<40y vs. ≥40y) | Age (<40y vs. ≥40y) | Age (<40y vs. ≥40y) | Age (<40y vs. ≥40y) |
| Sex | Sex | Sex | Sex | Sex |
| Adverse Events (0 vs. ≥1) | HIV | HIV | HIV | HIV |
| Diabetes | Diabetes Starting Regimen (Rifampin vs. Other) | Diabetes Hospitalization (<2mo vs. ≥2mo) | Diabetes Sputum Smear Cavities on Chest X-Ray TB Location (Pulmonary vs. Extrapulmonary) Culture Conversion Time (<2mo vs. ≥2mo) Number of Contacts Received DOT |
| HIV | HIV |
| Diabetes | Diabetes | Diabetes | Diabetes | Diabetes |
| Starting Regimen (Rifampin vs. Other) | Hospitalization (<2mo vs. ≥2mo) | Sputum Smear Cavities on Chest X-Ray TB Location (Pulmonary vs. Extrapulmonary) Culture Conversion Time (<2mo vs. ≥2mo) Number of Contacts Received DOT |
| Adverse Events (0 vs. ≥1) |

Abbreviations: TB, tuberculosis; DS-TB, drug-susceptible tuberculosis; INHR-TB, isoniazid-resistant tuberculosis; MDR-TB, multidrug-resistant tuberculosis; DOT, directly observed therapy; SLI, second-line injectable.
## Appendix Table 4. Median Costs for Each Form of Tuberculosis Stratified by Demographic Characteristics and Treatment Outcomes

| Group Comparison | TB Infection | DS-TB | INHR-TB | MDR-TB |
|------------------|--------------|-------|---------|--------|
| Age <40 Years    | n = 53       | n = 41 | n = 30  | n = 36 |
| Median (IQR) Total Costs | $694 (IQR: $574 to $1101) | $11,299 (IQR: $4089 to $25,435) | $15,287 (IQR: $7029 to $35,608) | $87,476 to $169,970 |
| Median (IQR) Cost of Diagnosis | $252 (IQR: $194 to $367) | $714 (IQR: $488 to $1001) | $766 (IQR: $688 to $1051) | $68,870 (IQR: $35,063) |
| Median (IQR) Cost of Treatment | $437 (IQR: $350 to $710) | $2116 (IQR: $1615 to $2615) | $2685 (IQR: $2110 to $3716) | $117,520 (IQR: $54 to $326) |
| Median (IQR) Cost of Post-Treatment Monitoring | $0 (IQR: $0 to $0) | $137 (IQR: $0 to $352) | $109 (IQR: $0 to $151) | $41,781 (IQR: $35,075) |
| Median (IQR) Cost of Hospitalization | $0 (IQR: $0 to $0) | $15,600 (IQR: $0 to $315) | $13,812 (IQR: $0 to $130) | $53,811 (IQR: $131 to $151) |
| Median (IQR) Cost for Public Health Interventions | $0 (IQR: $0 to $0) | $2308 (IQR: $577 to $5028) | $1731 (IQR: $0 to $6490) | $2465 to $6864 |
| Female Sex       | n = 37       | n = 38 | n = 38  | n = 34 |
| Median (IQR) Total Costs | $870 (IQR: $690 to $1350) | $12,441 (IQR: $6698 to $23,062) | $23,461 (IQR: $7341 to $10981) | $72600 to $150,573 |
| Median (IQR) Cost of Diagnosis | $274 (IQR: $217 to $414) | $684 (IQR: $604 to $1034) | $828 (IQR: $618 to $1043) | $1042 to $1313 |
| Median (IQR) Cost of Treatment | $589 (IQR: $427 to $808) | $2150 (IQR: $1585 to $3226) | $3226 (IQR: $2345 to $45,853) | $21,294 to $296,920 |
| Median (IQR) Cost of Post-Treatment Monitoring | $0 (IQR: $0 to $0) | $141 (IQR: $54 to $227) | $145 (IQR: $26 to $277) | $16 to $220 |
| Median (IQR) Cost of Hospitalization | $0 (IQR: $0 to $0) | $3900 (IQR: $0 to $14,950) | $13,000 (IQR: $0 to $13,812) | $40,815 to $61,413 |
| Median (IQR) Cost for Public Health Interventions | $0 (IQR: $0 to $0) | $3462 (IQR: $697 to $2885) | $581 (IQR: $0 to $6378) | $4657 to $6754 |
| Male Sex         | n = 55       | n = 50 | n = 49  | n = 49 |
| Median (IQR) Total Costs | $853 (IQR: $592 to $1333) | $13,832 (IQR: $5203 to $1333) | $14,907 (IQR: $6767 to $117,761) | $78,240 to $178,390 |
| Median (IQR) Cost of Diagnosis | $315 (IQR: $217 to $362) | $737 (IQR: $600 to $1112) | $709 (IQR: $581 to $994) | $949 to $1015 |
| Median (IQR) Cost of Treatment | $550 (IQR: $385 to $818) | $2203 (IQR: $1693 to $2490) | $2490 (IQR: $2077 to $59,343) | $30,591 to $111,895 |
| Median (IQR) Cost of Post-Treatment Monitoring | $0 (IQR: $0 to $0) | $139 (IQR: $53 to $282) | $120 (IQR: $47 to $177) | $71 to $399 |
| Median (IQR) Cost of Hospitalization | $0 (IQR: $0 to $0) | $810 (IQR: $0 to $18,093) | $9750 (IQR: $0 to $21,775) | $126,500 to $620,650 |
| Median (IQR) Cost for Public Health Interventions | $0 (IQR: $0 to $0) | $2885 (IQR: $1154 to $2596) | $1154 (IQR: $0 to $6390) | $4736 to $6876 |
| No Drug Stopped due to Adverse Event | n = 83       | n = 52 | n = 42  | n = 10 |
| Median (IQR) Total Costs | $781 (IQR: $587 to $1194) | $7101 (IQR: $3678 to $13,422) | $13,422 (IQR: $7029 to $97,883) | $79,455 to $124,357 |
| Median (IQR) Cost of Diagnosis | $252 (IQR: $204 to $345) | $701 (IQR: $498 to $981) | $818 (IQR: $569 to $1003) | $1043 to $1098 |
| Median (IQR) Cost of Treatment | $496 (IQR: $374 to $757) | $2044 (IQR: $1559 to $2556) | $2556 (IQR: $2091 to $52,304) | $30,894 to $100,856 |
| Median (IQR) Cost of Post-Treatment Monitoring | $0 (IQR: $0 to $0) | $139 (IQR: $48 to $121) | $121 (IQR: $12 to $177) | $79 to $87,240 |
| Median (IQR) Cost of Hospitalization | $0 (IQR: $0 to $0) | $0 (IQR: $0 to $8450) | $2002 (IQR: $0 to $15,337) | $37,671 (IQR: $34,764 to $117,761) |
| Median (IQR) Cost for Public Health Interventions | $0 (IQR: $0 to $0) | $2308 (IQR: $542 to $2596) | $1154 (IQR: $0 to $6365) | $2277 to $6628 |
| Group Comparison       | TB Infection | DS-TB | INHR-TB | MDR-TB |
|------------------------|--------------|-------|---------|--------|
| At Least One Drug Stopped due to Adverse Event | n = 7 | n = 38 | n = 29 | n = 52 |
| Median (IQR) Total Costs | $1037 (IQR: $959 to $1230) | $14,099 (IQR: $7921 to $27,465) | $24,585 (IQR: $13,255 to $51,242) | $121,660 (IQR: $82,641 to $166,115) |
| Median (IQR) Cost of Diagnosis | $367 (IQR: $336 to $424) | $718 (IQR: $594 to $1064) | $857 (IQR: $661 to $1054) | $1083 (IQR: $892 to $1334) |
| Median (IQR) Cost of Treatment | $710 (IQR: $550 to $774) | $2408 (IQR: $1922 to $3405) | $3613 (IQR: $2448 to $4474) | $61,426 (IQR: $30,004 to $111,807) |
| Median (IQR) Cost of Post-Treatment Monitoring | $0 (IQR: $0 to $0) | $128 (IQR: $0 to $253) | $139 (IQR: $0 to $274) | $237 (IQR: $0 to $357) |
| Median (IQR) Cost of Hospitalization | $0 (IQR: $0 to $0) | $5525 (IQR: $0 to $19,339) | $15,028 (IQR: $4550 to $37,470) | $43,486 (IQR: $35,334 to $60,823) |
| Median (IQR) Cost for Public Health Interventions | $0 (IQR: $0 to $0) | $4039 (IQR: $661 to $857) | $5193 (IQR: $661 to $857) | $6437 (IQR: $661 to $857) |
| Completed Treatment | n = 77 | n = 83 | n = 63 | n = 49 |
| Median (IQR) Total Costs | $851 (IQR: $596 to $1244) | $11,855 (IQR: $4259 to $25,450) | $22,110 (IQR: $7390 to $42,445) | $125,978 (IQR: $86,108 to $165,586) |
| Median (IQR) Cost of Diagnosis | $252 (IQR: $194 to $393) | $694 (IQR: $513 to $1017) | $817 (IQR: $657 to $1002) | $1083 (IQR: $926 to $1331) |
| Median (IQR) Cost of Treatment | $555 (IQR: $392 to $784) | $2157 (IQR: $1656 to $3063) | $306 (IQR: $2362 to $4052) | $63,096 (IQR: $34,455 to $112,913) |
| Median (IQR) Cost of Post-Treatment Monitoring | $0 (IQR: $0 to $0) | $141 (IQR: $53 to $297) | $132 (IQR: $88 to $210) | $220 (IQR: $64 to $320) |
| Median (IQR) Cost of Hospitalization | $0 (IQR: $0 to $0) | $0 (IQR: $0 to $11,050) | $0 (IQR: $0 to $40,952) | $0 (IQR: $0 to $54,112) |
| Median (IQR) Cost for Public Health Interventions | $0 (IQR: $0 to $0) | $2885 (IQR: $577 to $5232) | $3096 (IQR: $1141 to $6188) | $6570 (IQR: $5575 to $6901) |
| Did Not Complete Treatment | n = 13 | n = 7 | n = 8 | n = 13 |
| Median (IQR) Total Costs | $549 (IQR: $368 to $818) | $12,441 (IQR: $1010 to $18,574) | $11,480 (IQR: $6255 to $18,632) | $85,770 (IQR: $71,565 to $118,534) |
| Median (IQR) Cost of Diagnosis | $327 (IQR: $217 to $337) | $831 (IQR: $654 to $982) | $1057 (IQR: $727 to $1077) | $1077 (IQR: $924 to $1224) |
| Median (IQR) Cost of Treatment | $211 (IQR: $150 to $481) | $1188 (IQR: $303 to $1512) | $1512 (IQR: $1319 to $36,121) | $16,585 (IQR: $16,671 to $36,121) |
| Median (IQR) Cost of Post-Treatment Monitoring | $0 (IQR: $0 to $0) | $0 (IQR: $0 to $0) | $0 (IQR: $0 to $0) | $0 (IQR: $0 to $0) |
| Median (IQR) Cost for Public Health Interventions | $0 (IQR: $0 to $0) | $4874 (IQR: $2020 to $1154) | $5098 (IQR: $77 to $5098) | $5098 (IQR: $77 to $5098) |

Abbreviations: IQR, interquartile range; TB, tuberculosis; DS-TB, drug-susceptible tuberculosis; INHR-TB, isoniazid-resistant tuberculosis; MDR-TB, multidrug-resistant tuberculosis
### Appendix Table 5. Mean Costs for Each Form of Tuberculosis Stratified by Demographic Characteristics and Treatment Outcomes

| Group Comparison                          | TB Infection | DS-TB | INHR-TB | MDR-TB |
|------------------------------------------|--------------|-------|---------|--------|
| Age <40 Years n = 53                     | $842         | $14,875 | $36,138 | $142,532 |
| Mean Total Costs                         | $289         | $774   | $879    | $1,236 |
| Mean Cost of Diagnosis                   | $533         | $2,459 | $4,480  | $83,650 |
| Mean Cost of Treatment                   | $20          | $189   | $124    | $226   |
| Mean Cost of Post-Treatment Monitoring   | $0           | $7,553 | $20,674 | $49,508 |
| Mean Cost for Public Health Interventions| $0           | $3,900 | $9,980  | $7,913  |
| Age ≥40 Years n = 49                     | $1,024       | $16,523 | $29,567 | $116,893 |
| Mean Total Costs                         | $335         | $802   | $846    | $1,229  |
| Mean Cost of Diagnosis                   | $665         | $2,691 | $4,759  | $62,331 |
| Mean Cost of Treatment                   | $24          | $173   | $197    | $267    |
| Mean Cost of Post-Treatment Monitoring   | $0           | $9,452 | $19,443 | $47,798 |
| Mean Cost for Public Health Interventions| $0           | $3,405 | $4,322  | $5,269  |
| Female Sex n = 55                        | $962         | $16,827 | $32,564 | $144,151 |
| Mean Total Costs                         | $317         | $845   | $781    | $1,158  |
| Mean Cost of Diagnosis                   | $619         | $2,631 | $5,511  | $82,182 |
| Mean Cost of Treatment                   | $537         | $2,528 | $3,640  | $65,636 |
| Mean Cost of Post-Treatment Monitoring   | $16          | $185   | $161    | $295    |
| Mean Cost of Hospitalization             | $0           | $9,333 | $22,541 | $53,881 |
| Mean Cost for Public Health Interventions| $0           | $3,832 | $3,570  | $6,635  |
| Male Sex n = 35                          | $846         | $14,454 | $30,089 | $116,759 |
| Mean Total Costs                         | $293         | $719   | $951    | $1,324  |
| Mean Cost of Diagnosis                   | $577         | $2,313 | $3,404  | $61,450 |
| Mean Cost of Treatment                   | $16          | $175   | $172    | $180    |
| Mean Cost of Post-Treatment Monitoring   | $0           | $7,655 | $16,994 | $42,609 |
| Mean Cost for Public Health Interventions| $0           | $3,378 | $10,332 | $7,010  |
| No Drug Stopped due to Adverse Event n = 35 | $901         | $13,258 | $30,599 | $106,475 |
| Mean Total Costs                         | $301         | $770   | $860    | $1,300  |
| Mean Cost of Diagnosis                   | $577         | $2,313 | $4,040  | $61,450 |
| Mean Cost of Treatment                   | $22          | $202   | $149    | $139    |
| Mean Cost of Hospitalization             | $0           | $6,624 | $17,900 | $38,669 |
| Mean Cost for Public Health Interventions| $0           | $3,349 | $7,610  | $4,916  |
| At Least One Drug Stopped due to Adverse Event n = 7 | $1,105       | $19,212 | $34,926 | $126,647 |
| Mean Total Costs                         | $386         | $815   | $859    | $1,220  |
| Mean Cost of Diagnosis                   | $703         | $2,957 | $5,512  | $77,260 |
| Mean Cost of Treatment                   | $17          | $151   | $190    | $263    |
| Mean Cost of Post-Treatment Monitoring   | $0           | $11,274 | $22,951 | $50,737 |
| Mean Cost for Public Health Interventions| $0           | $4,015 | $5,415  | $7,168  |
| Completed Treatment n = 77               | $964         | $15,810 | $34,395 | $136,647 |
| Mean Total Costs                         | $309         | $787   | $851    | $1,224  |
| Mean Cost of Diagnosis                   | $630         | $2,692 | $5,023  | $80,927 |
| Mean Cost of Treatment                   | $24          | $193   | $182    | $247    |
| Mean Cost of Hospitalization             | $0           | $8,585 | $21,827 | $49,795 |
| Mean Cost for Public Health Interventions| $0           | $3,553 | $6,512  | $7,430  |
| Did Not Complete Treatment n = 13        | $638         | $15,327 | $16,183 | $102,137 |
| Mean Total Costs                         | $298         | $815   | $933    | $1,186  |
| Mean Cost of Diagnosis                   | $332         | $1,316 | $1,634  | $51,276 |
| Mean Cost of Treatment                   | $8           | $37    | $40     | $226    |
| Mean Cost of Post-Treatment Monitoring   | $0           | $8,608 | $5,281  | $45,004 |
| Mean Cost for Public Health Interventions| $0           | $4,549 | $8,295  | $4,445  |

**Abbreviations:** IQR, interquartile range; TB, tuberculosis; DS-TB, drug-susceptible tuberculosis; INHR-TB, isoniazid-resistant tuberculosis; MDR-TB, multidrug-resistant tuberculosis
### Appendix Table 6. Median Costs for Each Form of Tuberculosis Stratified by Clinical Characteristics and Hospitalization

| Group Comparison | DS-TB | INHR-TB | MDR-TB |
|------------------|-------|---------|--------|
| No Hospitalization or Hospitalization <2 months |       |         |        |
| Median (IQR) Total Costs | $11,394 (IQR: $4,228 to $19,389) | $13,580 (IQR: $6,193 to $24,923) | $97,215 (IQR: $54,858 to $140,209) |
| Median (IQR) Cost of Diagnosis | $694 (IQR: $518 to $1,001) | $818 (IQR: $662 to $1,041) | $96 (IQR: $729 to $1,210) |
| Median (IQR) Cost of Treatment | $2,116 (IQR: $1,606 to $2,910) | $2,281 (IQR: $2,211 to $3,757) | $59,331 (IQR: $19,431 to $108,429) |
| Median (IQR) Cost of Post-Treatment Monitoring | $141 (IQR: $34 to $296) | $121 (IQR: $12 to $191) | $193 (IQR: $116 to $205) |
| Median (IQR) Cost of Hospitalization | $0 (IQR: $0 to $11,429) | $4,128 (IQR: $0 to $13,975) | $24,621 (IQR: $17,790 to $31,355) |
| Median (IQR) Cost for Public Health Interventions | $2,885 (IQR: $577 to $5,311) | $2,885 (IQR: $1,134 to $5,764) | $5,109 (IQR: $654 to $6,368) |
| Hospitalization ≥2 Months |       |         |        |
| Median (IQR) Total Costs | $52,188 (IQR: $49,374 to $52,760) | $66,341 (IQR: $51,242 to $106,412) | $124,864 (IQR: $86,564 to $174,503) |
| Median (IQR) Cost of Diagnosis | $752 (IQR: $592 to $1,192) | $871 (IQR: $654 to $1,043) | $1083 (IQR: $996 to $1,331) |
| Median (IQR) Cost of Treatment | $4,176 (IQR: $3,835 to $4,621) | $4,321 (IQR: $2,791 to $4,951) | $62,567 (IQR: $31,925 to $110,199) |
| Median (IQR) Cost of Post-Treatment Monitoring | $115 (IQR: $0 to $115) | $157 (IQR: $98 to $191) | $203 (IQR: $8 to $349) |
| Median (IQR) Cost of Hospitalization | $4,155 (IQR: $4,140 to $42,250) | $54,106 (IQR: $45,090 to $75,918) | $49,603 (IQR: $39,927 to $62,368) |
| Median (IQR) Cost for Public Health Interventions | $4,616 (IQR: $3,462 to $5,193) | $6,183 (IQR: $5,581 to $6,220) | $6,611 (IQR: $5,429 to $6,876) |
| Acid Fast Bacilli Smear Positive |       |         |        |
| Median (IQR) Total Costs | $17,070 (IQR: $12,487 to $27,164) | $27,339 (IQR: $8,286 to $106,412) | $156,251 (IQR: $91,590 to $194,866) |
| Median (IQR) Cost of Diagnosis | $640 (IQR: $510 to $923) | $779 (IQR: $671 to $1038) | $1011 (IQR: $817 to $1,148) |
| Median (IQR) Cost of Treatment | $2,571 (IQR: $1,984 to $3,867) | $3,203 (IQR: $2,362 to $4,208) | $103,076 (IQR: $36,751 to $130,946) |
| Median (IQR) Cost of Post-Treatment Monitoring | $155 (IQR: $111 to $281) | $133 (IQR: $73 to $181) | $146 (IQR: $39 to $298) |
| Median (IQR) Cost of Hospitalization | $6,500 (IQR: $0 to $19,175) | $11,700 (IQR: $0 to $35,310) | $48,097 (IQR: $39,626 to $54,012) |
| Median (IQR) Cost for Public Health Interventions | $5,210 (IQR: $2,885 to $5,765) | $5,497 (IQR: $2,020 to $6,218) | $6,428 (IQR: $6,144 to $6,877) |
| Acid Fast Bacilli Smear Negative or Unknown |       |         |        |
| Median (IQR) Total Costs | $5,292 (IQR: $3,099 to $10,292) | $14,820 (IQR: $5,995 to $24,698) | $113,952 (IQR: $76,379 to $144,753) |
| Median (IQR) Cost of Diagnosis | $729 (IQR: $608 to $1,113) | $836 (IQR: $646 to $1,073) | $1102 (IQR: $958 to $1,365) |
| Median (IQR) Cost of Treatment | $1,883 (IQR: $1,517 to $2,248) | $2,816 (IQR: $2,079 to $3,669) | $56,285 (IQR: $23,777 to $98,875) |
| Median (IQR) Cost of Post-Treatment Monitoring | $107 (IQR: $0 to $287) | $119 (IQR: $0 to $202) | $219 (IQR: $46 to $357) |
| Median (IQR) Cost of Hospitalization | $0 (IQR: $0 to $3250) | $8775 (IQR: $0 to $15,987) | $39,275 (IQR: $33,160 to $57,370) |
| Median (IQR) Cost for Public Health Interventions | $1,154 (IQR: $353 to $1731) | $1,731 (IQR: $577 to $5739) | $6393 (IQR: $1780 to $6755) |
| Cavities on Chest X-Ray |       |         |        |
| Median (IQR) Total Costs | $16,574 (IQR: $12,464 to $27,138) | $25,795 (IQR: $7,575 to $66,341) | $165,586 (IQR: $131,665 to $209,581) |
| Median (IQR) Cost of Diagnosis | $7,186 (IQR: $5,579 to $9,404) | $8,833 (IQR: $7,396 to $11,119) | $1083 (IQR: $944 to $12,759) |
| Median (IQR) Cost of Treatment | $2,158 (IQR: $1,813 to $3,078) | $3,203 (IQR: $2,496 to $4,407) | $107,991 (IQR: $74,093 to $127,872) |
| Median (IQR) Cost of Post-Treatment Monitoring | $179 (IQR: $109 to $385) | $158 (IQR: $114 to $224) | $309 (IQR: $79 to $374) |
| Median (IQR) Cost of Hospitalization | $7,475 (IQR: $0 to $18,095) | $14,950 (IQR: $0 to $37,470) | $50,308 (IQR: $39,913 to $61,631) |
| Median (IQR) Cost for Public Health Interventions | $5,219 (IQR: $3,606 to $5767) | $5,497 (IQR: $1,154 to $6218) | $6,456 (IQR: $6370 to $6817) |
| No Cavities on Chest X-Ray or Unknown |       |         |        |
| Median (IQR) Total Costs | $7,261 (IQR: $3,995 to $19,379) | $17,412 (IQR: $6,879 to $35,742) | $109,259 (IQR: $75,325 to $148,714) |
| Disease Has No Extrapulmonary Involvement | DS-TB | INHR-TB | MDR-TB |
|-----------------------------------------|-------|---------|--------|
| Median (IQR) Cost of Diagnosis          | $701 \text{ (IQR: } $515 \text{ to } $1081) | $786 \text{ (IQR: } $628 \text{ to } $994) | $1083 \text{ (IQR: } $925 \text{ to } $1331) |
| Median (IQR) Cost of Treatment          | $2071 \text{ (IQR: } $1571 \text{ to } $3178) | $2795 \text{ (IQR: } $2077 \text{ to } $3860) | $47,677 \text{ (IQR: } $23,440 \text{ to } $102,921) |
| Median (IQR) Cost of Post-Treatment Monitoring |
| Cost of Hospitalization                | $115 \text{ (IQR: } $0 \text{ to } $230) | $107 \text{ (IQR: } $2 \text{ to } $185) | $189 \text{ (IQR: } $16 \text{ to } $318) |
| Median (IQR) Cost of Post-Treatment Monitoring |
| Median (IQR) Cost of Hospitalization |
| Median (IQR) Cost for Public Health Interventions |
| Median (IQR) Total Costs               | $13,011 \text{ (IQR: } $6108 \text{ to } $23,655) | $21,322 \text{ (IQR: } $7117 \text{ to } $43,510) | $119,569 \text{ (IQR: } $84,556 \text{ to } $172,236) |
| Median (IQR) Cost of Diagnosis          | $709 \text{ (IQR: } $572 \text{ to } $981) | $828 \text{ (IQR: } $657 \text{ to } $1055) | $1102 \text{ (IQR: } $996 \text{ to } $1377) |
| Median (IQR) Cost of Treatment          | $2127 \text{ (IQR: } $1615 \text{ to } $3188) | $3024 \text{ (IQR: } $2387 \text{ to } $3919) | $62,038 \text{ (IQR: } $26,708 \text{ to } $108,560) |
| Median (IQR) Cost of Post-Treatment Monitoring |
| Median (IQR) Cost of Hospitalization |
| Median (IQR) Cost for Public Health Interventions |
| Median (IQR) Total Costs               | $5578 \text{ (IQR: } $2988 \text{ to } $25,163) | $17,444 \text{ (IQR: } $7842 \text{ to } $27,039) | $113,897 \text{ (IQR: } $78,192 \text{ to } $142,141) |
| Median (IQR) Cost of Diagnosis          | $685 \text{ (IQR: } $508 \text{ to } $1129) | $757 \text{ (IQR: } $666 \text{ to } $952) | $969 \text{ (IQR: } $856 \text{ to } $1077) |
| Median (IQR) Cost of Treatment          | $2240 \text{ (IQR: } $1548 \text{ to } $3121) | $2362 \text{ (IQR: } $1971 \text{ to } $3918) | $60,790 \text{ (IQR: } $41,066 \text{ to } $110,603) |
| Median (IQR) Cost of Post-Treatment Monitoring |
| Median (IQR) Cost of Hospitalization |
| Median (IQR) Cost for Public Health Interventions |

| Disease Has Extrapulmonary Involvement | DS-TB | INHR-TB | MDR-TB |
|---------------------------------------|-------|---------|--------|
| Median (IQR) Cost of Diagnosis        | $685 \text{ (IQR: } $508 \text{ to } $1129) | $757 \text{ (IQR: } $666 \text{ to } $952) | $969 \text{ (IQR: } $856 \text{ to } $1077) |
| Median (IQR) Cost of Treatment        | $2240 \text{ (IQR: } $1548 \text{ to } $3121) | $2362 \text{ (IQR: } $1971 \text{ to } $3918) | $60,790 \text{ (IQR: } $41,066 \text{ to } $110,603) |
| Median (IQR) Cost of Post-Treatment Monitoring |
| Median (IQR) Cost of Hospitalization |
| Median (IQR) Cost for Public Health Interventions |
| Median (IQR) Total Costs              | $5578 \text{ (IQR: } $2988 \text{ to } $25,163) | $17,444 \text{ (IQR: } $7842 \text{ to } $27,039) | $113,897 \text{ (IQR: } $78,192 \text{ to } $142,141) |
| Abbreviations: IQR, interquartile range; DS-TB, drug-susceptible tuberculosis; INHR-TB, isoniazid-resistant tuberculosis; MDR-TB, multidrug-resistant tuberculosis |
## Appendix Table 7. Mean Costs for Each Form of Tuberculosis Stratified by Clinical Characteristics and Hospitalization

| Group Comparison | DS-TB | INHR-TB | MDR-TB |
|------------------|-------|---------|--------|
| No Hospitalization or Hospitalization <2 months | n = 85 | n = 58 | n = 16 |
| Mean Total Costs | $13,741 | $20,219 | $98,227 |
| Mean Cost of Diagnosis | $783 | $854 | $1,173 |
| Mean Cost of Treatment | $2,504 | $3,757 | $68,994 |
| Mean Cost of Post-Treatment Monitoring | $186 | $159 | $249 |
| Mean Cost of Hospitalization | $6,669 | $8,712 | $23,236 |
| Mean Cost for Public Health Interventions | $3,599 | $6,736 | $4,575 |
| Hospitalization 22 Months | n = 5 | n = 13 | n = 46 |
| Mean Total Costs | $50,300 | $86,437 | $143,451 |
| Mean Cost of Diagnosis | $783 | $854 | $1,173 |
| Mean Cost of Treatment | $2,504 | $3,757 | $68,994 |
| Mean Cost of Post-Treatment Monitoring | $186 | $159 | $249 |
| Mean Cost of Hospitalization | $6,669 | $8,712 | $23,236 |
| Mean Cost for Public Health Interventions | $3,599 | $6,736 | $4,575 |
| Acid Fast Bacilli Smear Positive | n = 47 | n = 35 | n = 22 |
| Mean Total Costs | $21,486 | $41,946 | $166,159 |
| Mean Cost of Diagnosis | $783 | $854 | $1,173 |
| Mean Cost of Treatment | $2,504 | $3,757 | $68,994 |
| Mean Cost of Post-Treatment Monitoring | $186 | $159 | $249 |
| Mean Cost of Hospitalization | $6,669 | $8,712 | $23,236 |
| Mean Cost for Public Health Interventions | $3,599 | $6,736 | $4,575 |
| Acid Fast Bacilli Smear Negative or Unknown | n = 43 | n = 36 | n = 40 |
| Mean Total Costs | $9,527 | $23,007 | $112,872 |
| Mean Cost of Diagnosis | $783 | $854 | $1,173 |
| Mean Cost of Treatment | $2,504 | $3,757 | $68,994 |
| Mean Cost of Post-Treatment Monitoring | $186 | $159 | $249 |
| Mean Cost of Hospitalization | $6,669 | $8,712 | $23,236 |
| Mean Cost for Public Health Interventions | $3,599 | $6,736 | $4,575 |
| Cavities on Chest X-Ray | n = 30 | n = 21 | n = 15 |
| Mean Total Costs | $20,264 | $45,617 | $178,906 |
| Mean Cost of Diagnosis | $773 | $929 | $1,255 |
| Mean Cost of Treatment | $2,788 | $3,407 | $113,691 |
| Mean Cost of Post-Treatment Monitoring | $247 | $192 | $306 |
| Mean Cost of Hospitalization | $11,107 | $29,561 | $52,340 |
| Mean Cost for Public Health Interventions | $5,349 | $11,528 | $11,315 |
| No Cavities on Chest X-Ray or Unknown | n = 60 | n = 50 | n = 47 |
| Mean Total Costs | $13,526 | $26,768 | $116,740 |
| Mean Cost of Diagnosis | $798 | $831 | $1,226 |
| Mean Cost of Treatment | $2,484 | $5,160 | $62,269 |
| Mean Cost of Post-Treatment Monitoring | $148 | $155 | $223 |
| Mean Cost of Hospitalization | $7,327 | $15,932 | $47,658 |
| Mean Cost for Public Health Interventions | $2,771 | $4,691 | $5,365 |
| Disease Has No Extrapulmonary Involvement | n = 68 | n = 51 | n = 47 |
| Mean Total Costs | $16,073 | $34,070 | $137,823 |
| Mean Cost of Diagnosis | $791 | $964 | $1,254 |
| Mean Cost of Treatment | $2,597 | $4,230 | $75,683 |
| Mean Cost of Post-Treatment Monitoring | $183 | $172 | $253 |
| Mean Cost of Hospitalization | $8,421 | $20,747 | $52,771 |
| Mean Cost for Public Health Interventions | $3,301 | $8,057 | $7,863 |
| Disease Has Extrapulmonary Involvement | n = 22 | n = 20 | n = 15 |
| Mean Total Costs | $14,161 | $27,940 | $112,846 |
| Mean Cost of Diagnosis | $784 | $849 | $1,166 |
| Mean Cost of Treatment | $2,549 | $5,691 | $71,660 |
| Mean Cost of Post-Treatment Monitoring | $175 | $150 | $213 |
| Mean Cost of Hospitalization | $9,099 | $17,965 | $36,319 |
| Mean Cost for Public Health Interventions | $1,556 | $3,286 | $3,489 |

Abbreviations: DS-TB, drug-susceptible tuberculosis; INHR-TB, isoniazid-resistant tuberculosis; MDR-TB, multidrug-resistant tuberculosis
### Appendix Table 8. Mean Costs of Different Forms of Tuberculosis

| Group | Mean Total Cost | Mean Cost of Diagnosis | Mean Cost of Treatment | Mean Cost of Post-Treatment Monitoring | Mean Cost of Hospitalization | Mean Cost of Public Health Interventions |
|-------|----------------|------------------------|------------------------|----------------------------------------|------------------------------|------------------------------------------|
| TB Infection | | | | | | |
| British Columbia Centre for Disease Control (n=30) | $896 | $342 | $549 | $5 | $0 | $0 |
| West Park Healthcare Centre (n=30) | $1,207 | $363 | $791 | $53 | $0 | $0 |
| Montreal Chest Institute (n=30) | $647 | $218 | $421 | $8 | $0 | $0 |
| Isoniazid Only (n=49) | $1,055 | $349 | $678 | $28 | $0 | $0 |
| Rifampin Only (n=35) | $671 | $236 | $422 | $13 | $0 | $0 |
| Other Isoniazid-Containing Regimen (n=6) | $1,215 | $385 | $810 | $19 | $0 | $0 |
| DS-TB Disease | | | | | | |
| British Columbia Centre for Disease Control (n=30) | $20,893 | $945 | $3,067 | $162 | $12,622 | $4,097 |
| West Park Healthcare Centre (n=30) | $15,591 | $670 | $1,934 | $169 | $8,928 | $3,890 |
| Montreal Chest Institute (n=30) | $10,833 | $753 | $2,754 | $211 | $4,211 | $2,903 |
| INHR-TB Disease | | | | | | |
| British Columbia Centre for Disease Control (n=30) | $21,415 | $912 | $2,657 | $124 | $11,327 | $6,393 |
| West Park Healthcare Centre (n=27) | $52,090 | $820 | $7,698 | $156 | $38,338 | $5,077 |
| Montreal Chest Institute (n=14) | $17,679 | $824 | $2,998 | $274 | $3,030 | $10,554 |
| MDR-TB Disease | | | | | | |
| British Columbia Centre for Disease Control (n=11) | $187,836 | $1,229 | $132,798 | $386 | $42,056 | $11,365 |
| West Park Healthcare Centre (n=45) | $120,152 | $1,298 | $61,196 | $188 | $52,032 | $5,438 |
| Montreal Chest Institute (n=6) | $116,225 | $752 | $69,569 | $388 | $36,827 | $8,690 |
| Susceptible to both Fluoroquinolones and Second-Line Injectables (n=50) | $118,643 | $1,237 | $67,591 | $233 | $43,082 | $6,499 |
| Resistant to a Fluoroquinolone and/or Second-Line Injectable (n=12) | $186,520 | $1,216 | $104,371 | $282 | $72,576 | $8,075 |

Abbreviations: TB, tuberculosis; DS-TB, drug-susceptible tuberculosis; INHR-TB, isoniazid-resistant tuberculosis; MDR-TB, multidrug-resistant tuberculosis
| Characteristic                        | All Patients (n=313) | TB Infection (n=90) | DS-TB (n=90) | INHR-TB (n=71) | MDR-TB (n=62) |
|--------------------------------------|----------------------|---------------------|--------------|----------------|---------------|
| **TB Type**                          |                      |                     |              |                |               |
| DS-TB                                | 1.0 (reference)      | --                  | --           | --             | --            |
| TB Infection                         | 0.08 (0.06 to 0.1)   | --                  | --           | --             | --            |
| INHR-TB                              | 1.64 (1.28 to 2.09)  | --                  | --           | --             | --            |
| MDR-TB                               | 9.14 (7.04 to 11.88) | --                  | --           | --             | --            |
| **Age**                              |                      |                     |              |                |               |
| <40 years                            | 1.0 (reference)      | 1.0 (reference)     | 1.0 (reference) | 1.0 (reference) | 1.0 (reference) |
| ≥40 years                            | 1.07 (0.69 to 1.68)  | 1.29 (1.09 to 1.53) | 0.93 (0.59 to 1.46) | 1.13 (0.73 to 1.76) | 0.81 (0.62 to 1.07) |
| **Sex**                              |                      |                     |              |                |               |
| Female                               | 1.0 (reference)      | 1.0 (reference)     | 1.0 (reference) | 1.0 (reference) | 1.0 (reference) |
| Male                                 | 1.14 (0.75 to 1.73)  | 0.99 (0.83 to 1.17) | 0.74 (0.49 to 1.11) | 1.30 (0.88 to 2.00) | 0.88 (0.67 to 1.17) |
| **HIV**                              |                      |                     |              |                |               |
| HIV-Negative or unknown              | 1.0 (reference)      | --                  | --           | 1.0 (reference) | --            |
| HIV-Positive                         | 6.8 (0.55 to 84.13)  | --                  | --           | 5.74 (0.89 to 37.13) | --            |
| **Diabetes**                         |                      |                     |              |                |               |
| No Diabetes or unknown               | 1.0 (reference)      | 1.0 (reference)     | 1.0 (reference) | 1.0 (reference) | 1.0 (reference) |
| Has Diabetes                         | 1.15 (0.64 to 2.05)  | 1.1 (0.85 to 1.42)  | 1.32 (0.874 to 2.32) | 1.63 (0.88 to 3.03) | 0.88 (0.61 to 1.27) |
| **Adverse Events**                   |                      |                     |              |                |               |
| None                                 | 1.0 (reference)      | 1.0 (reference)     | 1.0 (reference) | 1.0 (reference) | 1.0 (reference) |
| At Least One                         | 6.97 (4.83 to 10.04) | 0.99 (0.72 to 1.35) | 1.56 (1.05 to 2.32) | 1.50 (0.96 to 2.34) | 1.11 (0.77 to 1.61) |
| **Hospitalization**                  |                      |                     |              |                |               |
| None or <2 months                    |                      |                     |              |                |               |
| ≥2 months                            | --                   | --                  | 4.74 (2.08 to 10.83) | 3.98 (2.42 to 6.54) | 1.75 (1.30 to 2.35) |
| **Acid Fast Bacilli Smear**           |                      |                     |              |                |               |
| Negative or unknown                  | --                   | --                  | 1.0 (reference) | 1.0 (reference) | 1.0 (reference) |
| Positive                             | --                   | --                  | 2.67 (1.87 to 3.82) | 1.92 (1.28 to 2.89) | 1.29 (0.98 to 1.71) |
| **Cavities on Chest X-Ray**          |                      |                     |              |                |               |
| None or unknown                      | --                   | --                  | 1.0 (reference) | 1.0 (reference) | 1.0 (reference) |
| Yes                                  | --                   | --                  | 1.73 (1.15 to 2.61) | 1.26 (0.78 to 2.02) | 1.53 (1.13 to 2.07) |
| **TB Location**                      |                      |                     |              |                |               |
| Pulmonary Only                       | --                   | --                  | 1.0 (reference) | 1.0 (reference) | 1.0 (reference) |
| Extrapulmonary Involvement           | --                   | --                  | 0.61 (0.39 to 0.96) | 0.99 (0.6 to 1.62) | 0.90 (0.66 to 1.24) |
| **Number of Contacts**               |                      |                     |              |                |               |
| Per Additional Contact               | --                   | --                  | 1.07 (1.04 to 1.11) | 1.02 (1.01 to 1.02) | 1.01 (1.00 to 1.02) |
| **Received DOT**                     |                      |                     |              |                |               |
| No                                   | --                   | --                  | 1.0 (reference) | 1.0 (reference) | 1.0 (reference) |
| Yes                                  | --                   | --                  | 1.39 (0.59 to 3.28) | 1.94 (0.97 to 3.88) | 0.62 (0.42 to 0.92) |
| **TB Infection Regimen**             |                      |                     |              |                |               |
| Mono-Rifampin                        | --                   | --                  | --           | --             | --            |
| Isoniazid Containing                 | --                   | 1.36 (1.05 to 1.77) | --           | --             | --            |
| **MDR-TB Resistance Pattern**        |                      |                     |              |                |               |
| MDR-TB                               | --                   | --                  | --           | --             | --            |
| Fluoroquinolone and/or SLI Resistance| --                   | --                  | --           | --             | 1.0 (reference) |
|                                      |                      |                     |              |                | 1.54 (1.11 to 2.13) |

*No one with HIV.

Abbreviations: TB, tuberculosis; DS-TB, drug susceptible tuberculosis; INHR-TB, isoniazid-resistant tuberculosis; MDR-TB, multidrug resistant tuberculosis; DOT, directly observed therapy; SLI, second-line injectable
Appendix Table 10. Multivariable Analysis of Characteristics Associated with Increasing or Decreasing Costs Among All Patients (TB Infection Excluded), Reported as Cost Ratios and 95% Confidence Intervals

| Characteristic                      | Univariable Analysis (n=223) | Multivariable Analysis (n=223) |
|-------------------------------------|------------------------------|--------------------------------|
| **TB Type**                         |                              |                                |
| DS-TB                               | 1.0 (reference)              | 1.0 (reference)                |
| INHR-TB                             | 1.63 (1.24 to 2.16)          | 1.33 (1.05 to 1.68)           |
| MDR-TB                              | 9.17 (6.77 to 12.42)         | 3.64 (2.61 to 5.08)           |
| **Age**                             |                              |                                |
| <40 years                           | 1.0 (reference)              | 1.0 (reference)                |
| ≥40 years                           | 0.72 (0.51 to 1.01)          | 0.94 (0.76 to 1.16)           |
| **Sex**                             |                              |                                |
| Female                              | 1.0 (reference)              | 1.0 (reference)                |
| Male                                | 0.78 (0.56 to 1.09)          | 0.79 (0.65 to 0.97)           |
| **HIV**                             |                              |                                |
| HIV-Negative or unknown             | 1.0 (reference)              | --                             |
| HIV-Positive                        | 2.64 (0.47 to 14.8)          | --                             |
| **Diabetes**                        |                              |                                |
| No Diabetes or unknown              | 1.0 (reference)              | --                             |
| Has Diabetes                        | 1.11 (0.7 to 1.75)           | --                             |
| **Adverse Events**                  |                              |                                |
| None                                | 1.0 (reference)              | 1.0 (reference)                |
| At Least One                        | 2.48 (1.62 to 3.4)           | 1.35 (1.08 to 1.68)           |
| **Hospitalization**                 |                              |                                |
| None or <2 months                   | 1.0 (reference)              | 1.0 (reference)                |
| ≥2 months                           | 6.71 (4.98 to 9.05)          | 2.61 (1.96 to 3.47)           |
| **Acid Fast Bacilli Smear**         |                              |                                |
| Negative or unknown                 | 1.0 (reference)              | --                             |
| Positive                            | 1.36 (0.97 to 1.89)          | --                             |
| **Cavities on Chest X-Ray**         |                              |                                |
| None or unknown                     | 1.0 (reference)              | 1.0 (reference)                |
| Yes                                 | 1.29 (0.9 to 1.84)           | 1.3 (1.03 to 1.63)            |
| **TB Location**                     |                              |                                |
| Pulmonary Only                      | 1.0 (reference)              | 1.0 (reference)                |
| Extrapulmonary Involvement          | 0.77 (0.53 to 1.11)          | 0.96 (0.75 to 1.22)           |
| **Number of Contacts**              |                              |                                |
| Per Additional Contact              | 1.02 (1.01 to 1.03)          | 1.02 (1.01 to 1.02)           |
| **Received DOT**                    |                              |                                |
| No                                  | 1.0 (reference)              | 1.0 (reference)                |
| Yes                                 | 3.94 (2.27 to 6.85)          | 1.91 (1.34 to 2.74)           |

Abbreviations: TB, tuberculosis; DS-TB, drug susceptible tuberculosis; INHR-TB, isoniazid-resistant tuberculosis; MDR-TB, multidrug resistant tuberculosis; DOT, directly observed therapy
### Appendix Table 11. Multivariable Analysis of Characteristics Associated with Increasing or Decreasing Costs, Excluding People Who Did Not Complete Treatment, Reported as Cost Ratios and 95% Confidence Intervals

| Characteristic                              | All Patients (n=272) | TB Infection (n=77) | DS-TB (n=83) | INHR-TB (n=63) | MDR-TB (n=49) |
|---------------------------------------------|----------------------|---------------------|--------------|----------------|---------------|
| **TB Type**                                 |                      |                     |              |                |               |
| DS-TB                                       | 1.0 (reference)      | --                  | --           | --             | --            |
| TB Infection                                | 0.11 (0.08 to 0.13)  | --                  | --           | --             | --            |
| INHR-TB                                     | 1.8 (1.4 to 2.31)    | --                  | --           | --             | --            |
| MDR-TB                                      | 8.06 (6.02 to 10.81) | --                  | --           | --             | --            |
| **Age**                                     |                      |                     |              |                |               |
| <40 years                                   | 1.0 (reference)      | 1.0 (reference)     | 1.0 (reference) | 1.0 (reference) | 1.0 (reference) |
| ≥40 years                                   | 0.95 (0.78 to 1.15)  | 1.20 (1.04 to 1.39) | 0.82 (0.55 to 1.2) | 1.11 (0.82 to 1.52) | 0.93 (0.7 to 1.24) |
| **Sex**                                     |                      |                     |              |                |               |
| Female                                      | 1.0 (reference)      | 1.0 (reference)     | 1.0 (reference) | 1.0 (reference) | 1.0 (reference) |
| Male                                        | 0.97 (0.81 to 1.16)  | 1.0 (0.87 to 1.16)  | 0.83 (0.59 to 1.17) | 1.05 (0.77 to 1.42) | 1.0 (0.74 to 1.36) |
| **HIV**                                     |                      |                     |              |                |               |
| HIV-Negative or unknown                     | 1.0 (reference)      | --                  | --           | --             | --            |
| HIV-Positive                                | 6.71 (1.5 to 29.95)  | --                  | 12.76 (2.99 to 54.41) | --             | --            |
| **Diabetes**                                |                      |                     |              |                |               |
| No Diabetes or unknown                      | 1.0 (reference)      | 1.0 (reference)     | 1.0 (reference) | 1.0 (reference) | 1.0 (reference) |
| Has Diabetes                                | --†                 | --†                 | --†          | 1.31 (0.83 to 2.07) | --†          |
| **Adverse Events**                          |                      |                     |              |                |               |
| None                                        | 1.0 (reference)      | 1.0 (reference)     | 1.0 (reference) | 1.0 (reference) | 1.0 (reference) |
| At Least One                                 | 1.57 (1.26 to 1.97)  | --†                 | 1.62 (1.14 to 2.3) | 1.23 (0.89 to 1.69) | --†          |
| Hospitalization                             | --                  | --                  | --           | --             | --            |
| None or <2 months                           | --                  | --                  | 1.0 (reference) | 1.0 (reference) | 1.0 (reference) |
| ≥2 months                                   | --                  | --                  | 3.64 (1.84 to 7.18) | 3.4 (2.29 to 5.06) | 1.43 (1.01 to 2.03) |
| **Acid Fast Bacilli Smear**                 |                      |                     |              |                |               |
| Negative or unknown                         | --                  | --                  | 1.0 (reference) | 1.0 (reference) | 1.0 (reference) |
| Positive                                    | --                  | --                  | 1.52 (1.01 to 2.32) | 1.34 (0.96 to 1.85) | 1.01 (0.73 to 1.41) |
| **Cavities on Chest X-Ray**                |                      |                     |              |                |               |
| None or unknown                             | --                  | --                  | 1.0 (reference) | 1.0 (reference) | 1.0 (reference) |
| Yes                                         | --                  | --                  | 1.25 (0.84 to 1.84) | 0.85 (0.6 to 1.29) | 0.9 (0.6 to 1.5) |
| **TB Location**                             |                      |                     |              |                |               |
| Pulmonary Only                              | --                  | --                  | 1.0 (reference) | 1.0 (reference) | 1.0 (reference) |
| Extrapulmonary Involvement                  | --                  | --                  | 0.7 (0.47 to 1.04) | --†            | --†          |
| **Number of Contacts**                      |                      |                     |              |                |               |
| Per Additional Contact                      | --                  | --                  | 1.05 (1.02 to 1.08) | 1.02 (1.01 to 1.02) | 1.01 (1.01 to 1.02) |
| **Received DOT**                            |                      |                     |              |                |               |
| No                                          | --                  | --                  | 1.0 (reference) | 1.0 (reference) | 1.0 (reference) |
| Yes                                         | --                  | --                  | --†          | 1.81 (1.1 to 2.98) | 0.88 (0.51 to 1.5) |
| **TB Infection Regimen**                    |                      |                     |              |                |               |
| Mono-Rifampin                               | --                  | --                  | --           | --             | --            |
| Isoniazid Containing                        | --                  | --                  | 1.26 (0.98 to 1.61) | --             | --            |
| **MDR-TB Resistance Pattern**               |                      |                     |              |                |               |
| MDR-TB                                      | --                  | --                  | --           | --             | --            |
| Fluoroquinolone and/or SLI Resistance       | --                  | --                  | --           | --             | 1.0 (reference) |

*No one with HIV.*
†Not retained in multivariable model

**Abbreviations**: TB, tuberculosis; DS-TB, drug susceptible tuberculosis; INHR-TB, isoniazid-resistant tuberculosis; MDR-TB, multidrug resistant tuberculosis; DOT, directly observed therapy; SLI, second-line injectable.
### Appendix Table 12. TB Infection Patient Characteristics and Costs Stratified by TB Treatment Centre

| Characteristic                          | British Columbia Centre for Disease Control | West Park Healthcare Centre (Ontario) | Montreal Chest Institute (Quebec) |
|----------------------------------------|--------------------------------------------|--------------------------------------|----------------------------------|
| Number of Patients                     | 30                                         | 30                                   | 30                               |
| Regimen                                |                                            |                                      |                                  |
| Isoniazid Only                         | 25 (83%)                                   | 23 (77%)                             | 1 (3%)                           |
| Rifampin Only                          | 4 (13%)                                    | 2 (7%)                               | 29 (97%)                         |
| Isoniazid and Rifampin                 | 0 (0%)                                     | 2 (7%)                               | 0 (0%)                           |
| Started Isoniazid but Switched to Rifampin | 1 (3%)                                   | 3 (10%)                              | 0 (0%)                           |
| Demographic Characteristics            |                                            |                                      |                                  |
| Median (IQR) Age, years                | 53 (IQR: 36 to 65)                         | 32 (IQR: 28 to 41)                   | 32 (IQR: 24 to 42)               |
| Male Sex                               | 16 (53%)                                   | 6 (20%)                              | 13 (43%)                         |
| Female Sex                             | 14 (47%)                                   | 24 (80%)                             | 17 (57%)                         |
| Born Outside Canada                    | 25 (83%)                                   | 26 (87%)                             | 28 (93%)                         |
| Clinical Characteristics               |                                            |                                      |                                  |
| HIV Positive                           | 0 (0%)                                     | 0 (0%)                               | 0 (0%)                           |
| HIV Negative                           | 4 (13%)                                    | 29 (97%)                             | 0 (0%)                           |
| Unknown HIV Status                     | 26 (87%)                                   | 1 (3%)                               | 30 (100%)                        |
| Has Diabetes                           | 10 (33%)                                   | 2 (7%)                               | 0 (0%)                           |
| No Diabetes                            | 17 (57%)                                   | 27 (90%)                             | 30 (100%)                        |
| Unknown Diabetes                       | 3 (10%)                                    | 1 (3%)                               | 0 (0%)                           |
| Current Smoker                         | 0 (0%)                                     | 5 (17%)                              | 2 (7%)                           |
| Ex-Smoker                              | 2 (7%)                                     | 4 (13%)                              | 1 (3%)                           |
| Never Smoker                           | 19 (63%)                                   | 21 (70%)                             | 26 (87%)                         |
| Smoking Unknown                        | 9 (30%)                                    | 0 (0%)                               | 1 (3%)                           |
| Currently Drinks ≥3 drinks per day     | 0 (0%)                                     | 1 (3%)                               | 0 (0%)                           |
| Currently Drinks <3 drinks per day     | 23 (77%)                                   | 27 (90%)                             | 29 (97%)                         |
| Drinking Habits Unknown                | 7 (23%)                                    | 2 (7%)                               | 1 (3%)                           |
| Uses Illicit Drugs                     | 0 (0%)                                     | 0 (0%)                               | 0 (0%)                           |
| Does not Use Illicit Drugs             | 21 (70%)                                   | 29 (97%)                             | 28 (93%)                         |
| Illicit Drug Use Unknown               | 9 (30%)                                    | 1 (3%)                               | 2 (7%)                           |
| Treatment Information                  |                                            |                                      |                                  |
| Median (IQR) Treatment Duration, months| 9 (IQR: 8.6 to 9.2)                        | 8.7 (IQR: 4 to 9)                    | 4 (IQR: 4 to 4.2)                |
| Cure or Treatment Complete             | 30 (100%)                                  | 21 (70%)                             | 26 (87%)                         |
| Incomplete Treatment due to Adverse    | 0 (0%)                                     | 4 (13%)                              | 0 (0%)                           |
| Event                                  |                                            |                                      |                                  |
| Incomplete Treatment due to Failure    | 0 (0%)                                     | 0 (0%)                               | 0 (0%)                           |
| Lost to Follow-up                      | 0 (0%)                                     | 5 (17%)                              | 4 (13%)                          |
| Died during Treatment                  | 0 (0%)                                     | 0 (0%)                               | 0 (0%)                           |
| Cost Information                       |                                            |                                      |                                  |
| Median (IQR) Total Costs               | $798 (IQR: $682 to $984)                   | $1189 (IQR: $1033 to $1505)          | $587 (IQR: $520 to $687)         |
| Median (IQR) Cost of Diagnosis        | $252 (IQR: $217 to $414)                   | $337 (IQR: $337 to $399)             | $194 (IQR: $194 to $217)         |
| Median (IQR) Cost of Treatment        | $530 (IQR: $394 to $691)                   | $778 (IQR: $558 to $1085)            | $391 (IQR: $311 to $473)         |
| Median (IQR) Cost of Post-Treatment Monitoring | $0 (IQR: $0 to $0) | $18 (IQR: $0 to $93) | $0 (IQR: $0 to $0) |
| Median (IQR) Cost of Hospitalization  | $0 (IQR: $0 to $0)                         | $0 (IQR: $0 to $0)                   | $0 (IQR: $0 to $0)               |

*Abbreviations: IQR, interquartile range*
## Appendix Table 13. TB Infection Patient Characteristics and Costs Stratified by Regimen Received

| Characteristic                              | Isoniazid Only | Rifampin Only | Other Isoniazid-Containing Regimen |
|---------------------------------------------|----------------|---------------|-----------------------------------|
| Number of Patients                          | 49             | 35            | 6                                 |
| TB Treatment Centre                         |                |               |                                   |
| Montreal Chest Institute (Quebec)           | 1 (2%)         | 29 (83%)      | 0 (0%)                            |
| Ontario                                     | 23 (47%)       | 2 (6%)        | 5 (83%)                           |
| British Columbia Centre for Disease Control | 25 (51%)       | 4 (11%)       | 1 (17%)                           |
| Demographic Characteristics                |                |               |                                   |
| Median (IQR) Age, years                     | 42 (IQR: 31 to 59) | 32 (IQR: 26 to 42) | 36 (IQR: 34 to 39)               |
| Male Sex                                    | 18 (37%)       | 15 (43%)      | 2 (33%)                           |
| Female Sex                                  | 31 (63%)       | 20 (57%)      | 4 (67%)                           |
| Born Outside Canada                         | 41 (84%)       | 33 (94%)      | 5 (83%)                           |
| Clinical Characteristics                    |                |               |                                   |
| HIV-Positive                                | 0 (0%)         | 0 (0%)        | 0 (0%)                            |
| HIV-Negative                                | 27 (55%)       | 1 (3%)        | 5 (83%)                           |
| Unknown HIV Status                          | 22 (45%)       | 34 (97%)      | 1 (17%)                           |
| Has Diabetes                                | 9 (18%)        | 3 (9%)        | 0 (0%)                            |
| No Diabetes                                 | 36 (73%)       | 32 (91%)      | 6 (100%)                          |
| Unknown Diabetes                            | 4 (8%)         | 0 (0%)        | 0 (0%)                            |
| Current Smoker                              | 5 (10%)        | 2 (6%)        | 0 (0%)                            |
| Ex-Smoker                                   | 5 (10%)        | 2 (6%)        | 0 (0%)                            |
| Never Smoker                                | 31 (63%)       | 29 (83%)      | 6 (100%)                          |
| Smoking Unknown                             | 8 (16%)        | 2 (6%)        | 0 (0%)                            |
| Currently Drinks ≥3 drinks per day          | 1 (2%)         | 0 (0%)        | 0 (0%)                            |
| Currently Drinks <3 drinks per day          | 41 (84%)       | 33 (94%)      | 5 (83%)                           |
| Drinking Habits Unknown                      | 7 (14%)        | 2 (6%)        | 1 (17%)                           |
| Uses Illicit Drugs                          | 0 (0%)         | 0 (0%)        | 0 (0%)                            |
| Does not Use Illicit Drugs                  | 41 (84%)       | 32 (91%)      | 5 (83%)                           |
| Illicit Drug Use Unknown                     | 8 (16%)        | 3 (9%)        | 1 (17%)                           |
| Treatment Information                       |                |               |                                   |
| Median (IQR) Treatment Duration, months     | 9 (IQR: 8.7 to 9.2) | 4 (IQR: 3.9 to 4.2) | 4.9 (IQR: 4.1 to 5.9) |
| Cure or Treatment Complete                  | 42 (86%)       | 30 (86%)      | 5 (83%)                           |
| Incomplete Treatment due to Adverse Event   | 3 (6%)         | 0 (0%)        | 1 (17%)                           |
| Incomplete Treatment due to Failure          | 0 (0%)         | 0 (0%)        | 0 (0%)                            |
| Lost to Follow-up                           | 4 (8%)         | 5 (14%)       | 0 (0%)                            |
| Died during Treatment                        | 0 (0%)         | 0 (0%)        | 0 (0%)                            |
| Cost Information                            |                |               |                                   |
| Median (IQR) Total Costs                    | $985 (IQR: $726 to $1378) | $587 (IQR: $524 to $699) | $1165 (IQR: $1065 to $1242) |
| Median (IQR) Cost of Diagnosis              | $337 (IQR: $217 to $414) | $194 (IQR: $194 to $221) | $379 (IQR: $329 to $424) |
| Median (IQR) Cost of Treatment              | $600 (IQR: $427 to $900) | $392 (IQR: $304 to $478) | $743 (IQR: $709 to $782) |
| Median (IQR) Cost of Post-Treatment         | $0 (IQR: $0 to $0) | $0 (IQR: $0 to $0) | $9 (IQR: $0 to $18) |
| Monitoring                                  | $0 (IQR: $0 to $0) | $0 (IQR: $0 to $0) | $0 (IQR: $0 to $0) |

Abbreviations: IQR, interquartile range

*Two patients initiating isoniazid and rifampin regimen, four patients initiating isoniazid and experiencing an adverse event and receiving rifampin.*
Appendix Table 14. Drug-Susceptible TB Disease Patient Characteristics and Costs Stratified by TB Treatment Centre

| Characteristic                                             | British Columbia Centre for Disease Control (Ontario) | West Park Healthcare Centre (Ontario) | Montreal Chest Institute (Quebec) |
|------------------------------------------------------------|------------------------------------------------------|-------------------------------------|----------------------------------|
| Number of Patients                                         | 30                                                   | 30                                  | 30                               |
| Demographic Characteristics                                |                                                      |                                     |                                  |
| Median (IQR) Age, years                                    | 56 (IQR: 39 to 78)                                   | 50 (IQR: 38 to 76)                  | 30 (IQR: 27 to 37)               |
| Male Sex                                                   | 12 (40%)                                             | 19 (63%)                            | 9 (30%)                          |
| Female Sex                                                 | 18 (60%)                                             | 11 (37%)                            | 21 (70%)                         |
| Born Outside Canada                                        | 26 (87%)                                             | 27 (90%)                            | 27 (90%)                         |
| Clinical Characteristics                                   |                                                      |                                     |                                  |
| HIV-Positive                                               | 0 (0%)                                               | 0 (0%)                              | 1 (3%)                           |
| HIV-Negative                                               | 24 (80%)                                             | 23 (77%)                            | 22 (73%)                         |
| Unknown HIV Status                                         | 6 (20%)                                              | 7 (23%)                             | 7 (23%)                          |
| Has Diabetes                                               | 3 (10%)                                              | 8 (27%)                             | 2 (7%)                           |
| No Diabetes                                                | 25 (83%)                                             | 22 (73%)                            | 28 (93%)                         |
| Unknown Diabetes                                           | 2 (7%)                                               | 0 (0%)                              | 0 (0%)                           |
| Current Smoker                                             | 6 (17%)                                              | 7 (23%)                             | 2 (7%)                           |
| Ex-Smoker                                                  | 1 (3%)                                               | 4 (13%)                             | 0 (0%)                           |
| Never Smoker                                               | 21 (70%)                                             | 19 (63%)                            | 28 (93%)                         |
| Smoking Unknown                                            | 3 (10%)                                              | 0 (0%)                              | 0 (0%)                           |
| Currently Drinks ≥3 drinks per day                        | 1 (3%)                                               | 0 (0%)                              | 0 (0%)                           |
| Currently Drinks <3 drinks per day                        | 24 (80%)                                             | 28 (93%)                            | 30 (100%)                        |
| Drinking Habits Unknown                                    | 5 (17%)                                              | 2 (7%)                              | 0 (0%)                           |
| Uses Illicit Drugs                                         | 0 (0%)                                               | 1 (3%)                              | 0 (0%)                           |
| Does not Use Illicit Drugs                                 | 26 (87%)                                             | 27 (90%)                            | 30 (100%)                        |
| Illicit Drug Use Unknown                                   | 4 (13%)                                              | 2 (7%)                              | 0 (0%)                           |
| Disease Characteristics                                    |                                                      |                                     |                                  |
| Acid Fast Bacilli Smear Positive                           | 19 (63%)                                             | 21 (70%)                            | 7 (23%)                          |
| Acid Fast Bacilli Smear Negative                           | 11 (37%)                                             | 9 (30%)                             | 23 (77%)                         |
| Acid Fast Bacilli Smear Unknown                            | 0 (0%)                                               | 0 (0%)                              | 0 (0%)                           |
| Cavities on Chest X-Ray                                    | 11 (37%)                                             | 12 (40%)                            | 7 (23%)                          |
| No Cavities on Chest X-Ray                                 | 18 (60%)                                             | 18 (60%)                            | 23 (77%)                         |
| Unknown Cavities                                           | 1 (3%)                                               | 0 (0%)                              | 0 (0%)                           |
| Exclusively Pulmonary Disease                              | 22 (73%)                                             | 21 (70%)                            | 25 (83%)                         |
| Disease with Extrapulmonary Involvement                    | 8 (27%)                                              | 9 (30%)                             | 5 (17%)                          |
| Treatment Information                                      |                                                      |                                     |                                  |
| Hospitalized                                               | 15 (50%)                                             | 23 (77%)                            | 8 (27%)                          |
| Median (IQR) Duration of Hospitalization, days             | 37 (IQR: 26 to 61)                                   | 13 (IQR: 8 to 27)                   | 24 (IQR: 14 to 28)               |
| Median (IQR) Drugs Stopped for Adverse Event              | 0 (IQR: 0 to 4)                                      | 1 (IQR: 0 to 1)                     | 0 (IQR: 0 to 1)                  |
| Received a TB Drug Other than Isoniazid, Rifampin,         | 10 (33%)                                             | 4 (13%)                             | 7 (23%)                          |
| Ethambutol, and Pyrazinamide                               |                                                      |                                     |                                  |
| Median (IQR) Treatment Duration, months                    | 8.9 (IQR: 6.2 to 9.7)                                | 9.1 (IQR: 7.6 to 10)                | 6.4 (IQR: 6.1 to 9)              |
| Cure or Treatment Complete                                 | 26 (87%)                                             | 27 (90%)                            | 30 (100%)                        |
| Incomplete Treatment due to Adverse Event                  | 0 (0%)                                               | 0 (0%)                              | 0 (0%)                           |
| Incomplete Treatment due to Failure                        | 0 (0%)                                               | 0 (0%)                              | 0 (0%)                           |
| Lost to Follow-up                                          | 2 (7%)                                               | 3 (10%)                             | 0 (0%)                           |
| Died during Treatment                                      | 2 (7%)                                               | 0 (0%)                              | 0 (0%)                           |
| Cost Information                                           |                                                      |                                     |                                  |
| Median (IQR) Total Costs                                   | $15,201 (IQR: $6975 to $33,983)                      | $13,328 (IQR: $7921 to $19,080)    | $4987 (IQR: $3572 to $61,196)    |
| Median (IQR) Cost of Diagnosis                            | $962 (IQR: $671 to $1165)                            | $653 (IQR: $506 to $742)            | $615 (IQR: $454 to $987)          |
| Median (IQR) Cost of Treatment                            | $2642 (IQR: $1996 to $4138)                          | $1951 (IQR: $1444 to $2158)         | $2071 (IQR: $1708 to $3319)       |
| Median (IQR) Cost of Post-Treatment Monitoring            | $115 (IQR: $0 to $230)                               | $141 (IQR: $67 to $252)             | $107 (IQR: $28 to $435)           |
| Median (IQR) Cost of Hospitalization                      | $975 (IQR: $0 to $23,888)                            | $5850 (IQR: $3250 to $5626)         | $0 (IQR: $0 to $1154)             |
| Median (IQR) Cost for Public Health Interventions         | $3174 (IQR: $1731 to $5626)                          | $5213 (IQR: $705 to $5353)          | $3462 (IQR: $238 to $3462)        |

Abbreviations: IQR, interquartile range
Appendix Table 15. Isoniazid-Resistant TB Disease Patient Characteristics and Costs Stratified by TB Treatment Centre

| Characteristic                                      | British Columbia Centre for Disease Control | West Park Healthcare Centre (Ontario) | Montreal Chest Institute (Quebec) |
|-----------------------------------------------------|--------------------------------------------|-------------------------------------|----------------------------------|
| Number of Patients                                  | 30                                         | 27                                  | 14                               |
| Median (IQR) Age, years                             | 52 (IQR: 34 to 69)                         | 41 (IQR: 30 to 57)                  | 39 (IQR: 31 to 54)               |
| Male Sex                                            | 14 (47%)                                   | 12 (44%)                            | 7 (50%)                          |
| Female Sex                                          | 16 (53%)                                   | 15 (56%)                            | 7 (50%)                          |
| Born Outside Canada                                 | 27 (90%)                                   | 25 (93%)                            | 10 (71%)                         |
| Demographic Characteristics                         |                                            |                                     |                                  |
| HIV-Positive                                        | 0 (0%)                                     | 0 (0%)                              | 0 (0%)                           |
| HIV-Negative                                        | 0 (0%)                                     | 0 (0%)                              | 12 (86%)                         |
| Unknown HIV Status                                  | 30 (100%)                                  | 27 (100%)                           | 2 (14%)                          |
| Has Diabetes                                        | 6 (20%)                                    | 3 (11%)                             | 1 (7%)                           |
| No Diabetes                                         | 24 (80%)                                   | 24 (89%)                            | 12 (86%)                         |
| Unknown Diabetes                                    | 0 (0%)                                     | 0 (0%)                              | 1 (7%)                           |
| Current Smoker                                      | 4 (13%)                                    | 5 (19%)                             | 2 (14%)                          |
| Ex-Smoker                                           | 2 (7%)                                     | 5 (19%)                             | 2 (14%)                          |
| Never Smoker                                        | 22 (73%)                                   | 15 (56%)                            | 9 (64%)                          |
| Smoking Unknown                                     | 2 (7%)                                     | 2 (7%)                              | 1 (7%)                           |
| Currently Drinks ≥3 drinks per day                  | 3 (10%)                                    | 3 (11%)                             | 0 (0%)                           |
| Currently Drinks <3 drinks per day                  | 23 (77%)                                   | 22 (81%)                            | 12 (86%)                         |
| Drinking Habits Unknown                             | 4 (13%)                                    | 2 (7%)                              | 2 (14%)                          |
| Uses Illicit Drugs                                  | 0 (0%)                                     | 0 (0%)                              | 0 (0%)                           |
| Does not Use Illicit Drugs                          | 25 (83%)                                   | 26 (96%)                            | 13 (93%)                         |
| Illicit Drug Use Unknown                            | 5 (17%)                                    | 1 (4%)                              | 1 (7%)                           |
| Clinical Characteristics                            |                                            |                                     |                                  |
| Acid Fast Bacilli Smear Positive                     | 9 (30%)                                    | 9 (33%)                             | 3 (21%)                          |
| Acid Fast Bacilli Smear Negative                     | 21 (70%)                                   | 18 (67%)                            | 6 (43%)                          |
| Acid Fast Bacilli Smear Unknown                      | 0 (0%)                                     | 0 (0%)                              | 5 (36%)                          |
| Cavities on Chest X-Ray                             | 16 (53%)                                   | 12 (44%)                            | 7 (50%)                          |
| No Cavities on Chest X-Ray                          | 14 (47%)                                   | 15 (56%)                            | 7 (50%)                          |
| Unknown Cavities                                    | 0 (0%)                                     | 0 (0%)                              | 0 (0%)                           |
| Exclusively Pulmonary Disease                       | 18 (60%)                                   | 22 (81%)                            | 11 (79%)                         |
| Disease with Extrapulmonary Disease                 | 12 (40%)                                   | 5 (19%)                             | 3 (21%)                          |
| Treatment Information                               |                                            |                                     |                                  |
| Median (IQR) Duration of Hospitalization, days      | 19 (IQR: 13 to 51)                         | 54 (IQR: 20 to 76)                  | 7 (IQR: 5 to 20)                 |
| Median (IQR) Drugs Stopped for Adverse Event        | 0 (IQR: 0 to 1)                            | 0 (IQR: 0 to 1)                     | 0 (IQR: 0 to 0)                  |
| Received a Fluoroquinolone                          | 21 (70%)                                   | 27 (100%)                           | 6 (43%)                          |
| Received a Second-Line Injectable                    | 0 (0%)                                     | 8 (30%)                             | 0 (0%)                           |
| Median (IQR) Treatment Duration, months             | 11.5 (IQR: 9.3 to 12.4)                    | 17.6 (IQR: 12.3 to 18.8)            | 8 (IQR: 6.1 to 9.4)              |
| Cure or Treatment Complete                          | 24 (80%)                                   | 25 (93%)                            | 14 (100%)                        |
| Incomplete Treatment due to Adverse Event           | 0 (0%)                                     | 0 (0%)                              | 0 (0%)                           |
| Incomplete Treatment due to Failure                 | 2 (7%)                                     | 0 (0%)                              | 0 (0%)                           |
| Lost to Follow-up                                   | 2 (7%)                                     | 2 (7%)                              | 0 (0%)                           |
| Died during Treatment                               | 2 (7%)                                     | 0 (0%)                              | 0 (0%)                           |
| Cost Information                                    |                                            |                                     |                                  |
| Median (IQR) Total Costs                            | $12,506 (IQR: $5652 to $26,443)            | $34,400 (IQR: $22,391 to $63,222)   | $6504 (IQR: $5156 to $9761)      |
| Median (IQR) Cost of Diagnosis                      | $858 (IQR: $674 to $1144)                  | $785 (IQR: $637 to $1002)           | $806 (IQR: $651 to $883)         |
| Median (IQR) Cost of Treatment                      | $2407 (IQR: $1871 to $3226)                | $3835 (IQR: $2464 to $6943)         | $2831 (IQR: $2391 to $3582)      |
| Median (IQR) Cost of Post-Treatment Monitoring      | $132 (IQR: $50 to $163)                    | $127 (IQR: $60 to $195)             | $122 (IQR: $107 to $563)         |
| Median (IQR) Cost of Hospitalization                | $3250 (IQR: $0 to $13,812)                 | $23,400 (IQR: $12,025 to $43,875)   | $0 (IQR: $0 to $2969)            |
| Median (IQR) Cost for Public Health Interventions   | $2020 (IQR: $578 to $5049)                 | $6115 (IQR: $5493 to $6218)         | $1442 (IQR: $24 to $2885)        |

Abbreviations: IQR, interquartile range
### Appendix Table 16. Multidrug-Resistant TB Disease Patient Characteristics and Costs Stratified by TB Treatment Centre

| Characteristic                              | British Columbia Centre for Disease Control | West Park Healthcare Centre (Ontario) | Montreal Chest Institute (Quebec) |
|---------------------------------------------|---------------------------------------------|--------------------------------------|-----------------------------------|
| Number of Patients                         | 11                                          | 45                                   | 6                                 |
| Demographic Characteristics                |                                             |                                      |                                   |
| Median (IQR) Age, years                    | 41 (IQR: 31 to 46)                          | 31 (IQR: 27 to 46)                  | 39 (IQR: 34 to 49)                |
| Male Sex                                   | 4 (36%)                                     | 24 (53%)                             | 0 (0%)                            |
| Female Sex                                 | 7 (64%)                                     | 21 (47%)                             | 6 (100%)                          |
| Born Outside Canada                        | 10 (91%)                                    | 41 (91%)                             | 6 (100%)                          |
| Clinical Characteristics                   |                                             |                                      |                                   |
| HIV-Positive                               | 0 (0%)                                      | 1 (2%)                               | 0 (0%)                            |
| HIV-Negative                               | 10 (91%)                                    | 44 (98%)                             | 5 (83%)                           |
| Unknown HIV Status                         | 1 (9%)                                      | 0 (0%)                               | 1 (17%)                           |
| Has Diabetes                               | 1 (9%)                                      | 8 (18%)                              | 1 (17%)                           |
| No Diabetes                                | 10 (91%)                                    | 37 (82%)                             | 5 (83%)                           |
| Unknown Diabetes                           | 0 (0%)                                      | 0 (0%)                               | 0 (0%)                            |
| Current Smoker                             | 5 (45%)                                     | 10 (22%)                             | 0 (0%)                            |
| Ex-Smoker                                  | 0 (0%)                                      | 9 (20%)                              | 0 (0%)                            |
| Never Smoker                               | 6 (55%)                                     | 26 (58%)                             | 6 (100%)                          |
| Smoking Unknown                            | 0 (0%)                                      | 0 (0%)                               | 0 (0%)                            |
| Currently Drinks ≥3 drinks per day         | 3 (27%)                                     | 17 (38%)                             | 0 (0%)                            |
| Currently Drinks <3 drinks per day         | 8 (73%)                                     | 27 (60%)                             | 6 (100%)                          |
| Drinking Habits Unknown                    | 0 (0%)                                      | 1 (2%)                               | 0 (0%)                            |
| Uses Illicit Drugs                         | 0 (0%)                                      | 9 (20%)                              | 0 (0%)                            |
| Does not Use Illicit Drugs                 | 11 (100%)                                   | 44 (98%)                             | 6 (100%)                          |
| Illicit Drug Use Unknown                   | 0 (0%)                                      | 0 (0%)                               | 0 (0%)                            |
| Disease Characteristics                    |                                             |                                      |                                   |
| Acid Fast Bacilli Smear Positive           | 5 (45%)                                     | 9 (20%)                              | 1 (17%)                           |
| Acid Fast Bacilli Smear Negative           | 6 (55%)                                     | 36 (80%)                             | 5 (83%)                           |
| Acid Fast Bacilli Smear Unknown            | 0 (0%)                                      | 0 (0%)                               | 0 (0%)                            |
| Cavities on Chest X-Ray                   | 7 (64%)                                     | 14 (31%)                             | 1 (17%)                           |
| No Cavities on Chest X-Ray                | 4 (36%)                                     | 31 (69%)                             | 5 (83%)                           |
| Unknown Cavities                           | 0 (0%)                                      | 0 (0%)                               | 0 (0%)                            |
| Exclusively Pulmonary Disease              | 9 (82%)                                     | 35 (78%)                             | 3 (50%)                           |
| Disease with Extrapulmonary Involvement    | 2 (18%)                                     | 10 (22%)                             | 3 (50%)                           |
| Smoking Unknown                            | 0 (0%)                                      | 0 (0%)                               | 0 (0%)                            |
| Currently Drinks ≥3 drinks per day         | 3 (27%)                                     | 17 (38%)                             | 0 (0%)                            |
| Currently Drinks <3 drinks per day         | 8 (73%)                                     | 27 (60%)                             | 6 (100%)                          |
| Drinking Habits Unknown                    | 0 (0%)                                      | 1 (2%)                               | 0 (0%)                            |
| Uses Illicit Drugs                         | 0 (0%)                                      | 9 (20%)                              | 0 (0%)                            |
| Does not Use Illicit Drugs                 | 11 (100%)                                   | 44 (98%)                             | 6 (100%)                          |
| Illicit Drug Use Unknown                   | 0 (0%)                                      | 0 (0%)                               | 0 (0%)                            |
| Disease Characteristics                    |                                             |                                      |                                   |
| Acid Fast Bacilli Smear Positive           | 5 (45%)                                     | 9 (20%)                              | 1 (17%)                           |
| Acid Fast Bacilli Smear Negative           | 6 (55%)                                     | 36 (80%)                             | 5 (83%)                           |
| Acid Fast Bacilli Smear Unknown            | 0 (0%)                                      | 0 (0%)                               | 0 (0%)                            |
| Cavities on Chest X-Ray                   | 7 (64%)                                     | 14 (31%)                             | 1 (17%)                           |
| No Cavities on Chest X-Ray                | 4 (36%)                                     | 31 (69%)                             | 5 (83%)                           |
| Unknown Cavities                           | 0 (0%)                                      | 0 (0%)                               | 0 (0%)                            |
| Exclusively Pulmonary Disease              | 9 (82%)                                     | 35 (78%)                             | 3 (50%)                           |
| Disease with Extrapulmonary Involvement    | 2 (18%)                                     | 10 (22%)                             | 3 (50%)                           |
| Involvement                                | 1 (9%)                                      | 10 (22%)                             | 1 (17%)                           |
| Second-Line Injectable Treatment Information|                                             |                                      |                                   |
| Hospitalized                               | 10 (91%)                                    | 45 (100%)                            | 5 (83%)                           |
| Median (IQR) Duration of Hospitalization, days | 72 (IQR: 55 to 136) | 106 (IQR: 85 to 166) | 49 (IQR: 34 to 94) |
| Median (IQR) Drugs Stopped for Adverse Event | 2 (IQR: 2 to 2) | 2 (IQR: 1 to 3) | 1 (IQR: 1 to 2) |
| Received Bedaquiline                        | 1 (9%)                                      | 2 (4%)                               | 0 (0%)                            |
| Received Linezolid                         | 5 (45%)                                     | 24 (53%)                             | 5 (83%)                           |
| Received Delamanid                         | 2 (18%)                                     | 0 (0%)                               | 2 (33%)                           |
| Median (IQR) Treatment Duration, months    | 20.8 (IQR: 20.1 to 21.6)                    | 22.7 (IQR: 20.1 to 25.8)             | 19.2 (IQR: 18.3 to 20)            |
| Cure or Treatment Complete                 | 9 (82%)                                     | 35 (78%)                             | 5 (83%)                           |
| Incomplete Treatment due to AE             | 1 (9%)                                      | 0 (0%)                               | 0 (0%)                            |
| Incomplete Treatment due to Failure        | 0 (0%)                                      | 0 (0%)                               | 0 (0%)                            |
| Lost to Follow-up                          | 1 (9%)                                      | 8 (18%)                              | 1 (17%)                           |
| Died during Treatment                      | 0 (0%)                                      | 2 (4%)                               | 0 (0%)                            |
| Cost Information                           |                                             |                                      |                                   |
| Median (IQR) Total Costs                   | $153,086 (IQR: $144,553 to $232,607)        | $107,955 (IQR: $78,951 to $149,983) | $116,751 (IQR: $113,925 to $136,444) |
| Median (IQR) Cost of Diagnosis             | $892 (IQR: $740 to $1218)                   | $1102 (IQR: $1007 to $1343)          | $742 (IQR: $677 to $795)           |
| Median (IQR) Cost of Treatment             | $134,021 (IQR: $83,946 to $162,725)         | $41,513 (IQR: $29,301 to $100,296)   | $79,240 (IQR: $32,554 to $106,371) |
| Median (IQR) Cost of Post-Treatment Monitoring | $300 (IQR: $164 to $519) | $158 (IQR: $0 to $286) | $398 (IQR: $340 to $472) |
| Median (IQR) Cost of Hospitalization       | $40,952 (IQR: $26,977 to $51,778)           | $42,082 (IQR: $37,270 to $56,318)   | $30,302 (IQR: $17,247 to $61,265) |
| Median (IQR) Cost for Public Health Interventions | $4616 (IQR: $1485 to $7338) | $6418 (IQR: $5096 to $6773) | $7058 (IQR: $5842 to $11,431) |

Abbreviations: IQR, interquartile range; AE, adverse event
# Appendix Table 17. Multidrug-Resistant TB Disease Patient Characteristics and Costs Stratified by Resistance Pattern

| Characteristic                                | Susceptible to both Fluoroquinolones and Second-Line Injectables | Resistant to a Fluoroquinolone and/or Second-Line Injectable |
|-----------------------------------------------|------------------------------------------------------------------|-------------------------------------------------------------|
| Number of Patients                            | 50                                                               | 12                                                          |
| Demographic Characteristics                   |                                                                  |                                                             |
| Median (IQR) Age, years                       | 34 (IQR: 27 to 48)                                               | 31 (IQR: 28 to 43)                                          |
| Male Sex                                      | 27 (54%)                                                        | 1 (8%)                                                      |
| Female Sex                                    | 23 (46%)                                                        | 11 (92%)                                                    |
| Born Outside Canada                           | 46 (92%)                                                        | 11 (92%)                                                    |
| Clinical Characteristics                      |                                                                  |                                                             |
| HIV-Positive                                  | 1 (2%)                                                          | 0 (0%)                                                      |
| HIV-Negative                                  | 47 (94%)                                                        | 12 (100%)                                                   |
| Unknown HIV Status                            | 2 (4%)                                                          | 0 (0%)                                                      |
| Has Diabetes                                  | 10 (20%)                                                        | 0 (0%)                                                      |
| No Diabetes                                   | 40 (80%)                                                        | 12 (100%)                                                   |
| Unknown Diabetes                              | 0 (0%)                                                          | 0 (0%)                                                      |
| Current Smoker                                | 11 (22%)                                                        | 4 (33%)                                                     |
| Ex-Smoker                                     | 7 (14%)                                                         | 2 (17%)                                                     |
| Never Smoker                                  | 32 (64%)                                                        | 6 (50%)                                                     |
| Smoking Unknown                               | 0 (0%)                                                          | 0 (0%)                                                      |
| Currently Drinks ≥3 drinks per day            | 14 (28%)                                                        | 6 (50%)                                                     |
| Currently Drinks <3 drinks per day            | 35 (70%)                                                        | 6 (50%)                                                     |
| Drinking Habits Unknown                       | 1 (2%)                                                          | 0 (0%)                                                      |
| Uses Illicit Drugs                            | 1 (2%)                                                          | 0 (0%)                                                      |
| Does not Use Illicit Drugs                    | 49 (98%)                                                        | 12 (100%)                                                   |
| Illicit Drug Use Unknown                      | 0 (0%)                                                          | 0 (0%)                                                      |
| Disease Characteristics                       |                                                                  |                                                             |
| Acid Fast Bacilli Smear Positive              | 12 (24%)                                                        | 3 (25%)                                                     |
| Acid Fast Bacilli Smear Negative              | 38 (76%)                                                        | 9 (75%)                                                     |
| Acid Fast Bacilli Smear Unknown               | 0 (0%)                                                          | 0 (0%)                                                      |
| Cavities on Chest X-Ray                       | 17 (34%)                                                        | 5 (42%)                                                     |
| No Cavities on Chest X-Ray                    | 33 (66%)                                                        | 7 (58%)                                                     |
| Unknown Cavities                              | 0 (0%)                                                          | 0 (0%)                                                      |
| Exclusively Pulmonary Disease                 | 38 (76%)                                                        | 9 (75%)                                                     |
| Disease with Extrapulmonary                   | 12 (24%)                                                        | 3 (25%)                                                     |
| Treatment Information                         |                                                                  |                                                             |
| Hospitalized                                  | 48 (96%)                                                        | 12 (100%)                                                   |
| Median (IQR) Duration of Hospitalization, days| 95 (IQR: 62 to 145)                                              | 152 (IQR: 96 to 170)                                        |
| Median (IQR) Drugs Stopped for Adverse Event  | 2 (IQR: 1 to 2)                                                 | 2 (IQR: 1 to 3)                                            |
| Received Bedaquiline                          | 1 (2%)                                                          | 2 (17%)                                                     |
| Received Linezolid                            | 25 (50%)                                                        | 9 (75%)                                                     |
| Received Delamanid                            | 3 (6%)                                                          | 1 (8%)                                                      |
| Median (IQR) Treatment Duration, months       | 20.9 (IQR: 20 to 24.2)                                          | 24.5 (IQR: 19.8 to 27)                                     |
| Cure or Treatment Complete                    | 39 (78%)                                                        | 10 (83%)                                                    |
| Incomplete Treatment due to Adverse Event     | 1 (2%)                                                          | 0 (0%)                                                      |
| Incomplete Treatment due to Failure           | 0 (0%)                                                          | 0 (0%)                                                      |
| Lost to Follow-up                             | 8 (16%)                                                         | 2 (17%)                                                     |
| Died during Treatment                         | 2 (4%)                                                          | 0 (0%)                                                      |
| Cost Information                              |                                                                  |                                                             |
| Median (IQR) Total Costs                      | $113,952 (IQR: $77,813 to $150,573)                             | $150,150 (IQR: $101,802 to $205,764)                        |
| Median (IQR) Cost of Diagnosis                | $1083 (IQR: $910 to $1313)                                       | $1108 (IQR: $989 to $1386)                                  |
| Median (IQR) Cost of Treatment                | $61,414 (IQR: $25,411 to $108,289)                               | $80,710 (IQR: $44,435 to $128,231)                         |
| Median (IQR) Cost of Post-Treatment Monitoring| $189 (IQR: $0 to $341)                                           | $219 (IQR: $118 to $338)                                   |
| Median (IQR) Cost of Hospitalization          | $40,815 (IQR: $34,322 to $52,995)                                | $61,195 (IQR: $39,576 to $104,532)                         |
| Median (IQR) Cost for Public Health Interventions| $6383 (IQR: $4657 to $6767)                                     | $6696 (IQR: $5176 to $6880)                                |

Abbreviations: IQR, interquartile range