



Social trust and health seeking behaviours: A longitudinal study of a community-based active tuberculosis case finding program in the Philippines

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ABSTRACT

Introduction: Social trust is an important driver of health seeking behaviours and plays a particularly important role for diseases that have a high degree of stigma associated with them, such as tuberculosis (TB). Individuals experiencing poverty also face additional social and financial barriers in accessing care for TB. We examined an active case finding (ACF) initiative embedded in a program targeting those living in poverty (*Transform*) implemented by International Care Ministries (ICM), a Philippine-based non-governmental organization (NGO), and analyzed how different forms of social trust may affect the initial uptake of ACF.

Methods: Program monitoring data and a cross-sectional survey conducted at the beginning of *Transform* included six dimensions of social trust: satisfaction with family life, satisfaction with friendships, and level of trust in relatives, neighbours, pastor or religious leader, and local government officials. Amongst individuals suspected of having TB who received referrals post-screening, multilevel modelling examined the effects of social trust on rural health unit (RHU) attendance.

Results: Among the subset of 3350 individuals who received TB screening in 51 communities, 889 (26.5%) were symptom positive and required referral to the RHU, but only 24.1% of those who received referrals successfully attended the RHU. Multilevel regression analysis showed that for each unit increase on the Likert scale in baseline level of family satisfaction and level of trust in relatives, the odds of attending an RHU was 1.03 times (95% CI: 0.99, 1.07) and 1.06 times greater (95% CI: 1.00, 1.11), respectively, independent of other factors.

Conclusion: These results suggest that social trust in family members could play a valuable role in addressing stigma and rejection, both cited as barriers to higher screening rates. It is recommended that ACF programs that target TB, or other diseases that are stigmatized, prioritize trust-building as an important component of their intervention.

1. Introduction

The conducive role of social trust and psychosocial resources for health promotion is well-established (Carpiano, 2006; Islam et al., 2006; Murayama et al., 2012), with a range of studies showing trust and social support to be key drivers of health seeking behaviours, treatment adherence and health outcomes (Law et al., 2019; Nieminen et al., 2013; Ramage-Morin & Bougie, 2017; van Hoorn et al., 2016; Yang et al., 2017; Zarychta, 2015). While there is some evidence for heterogeneity

in the effect of social trust in facilitating cooperative behaviours between gender groups (Irwin et al., 2015), two mechanisms that explain these associations were consistently observed in these studies: firstly, providers of support, such as family, friends, community members or healthcare providers, were able to help individuals navigate through uncertain and difficult circumstances throughout the treatment process, such as by providing health information, encouragement or physical assistance. Next, when individuals *felt* better supported, they were able to cultivate better attitudes toward their disease and its associated

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treatment, leading to increased motivation to take the necessary actions for their health and well-being.

Earlier research on health seeking behaviour had primarily been based on models that conceptualized health as a product of individual behaviours, and behaviours as modifiable characteristics. These ideas have since shifted, and there is increasing recognition that the forces shaping health seeking behaviour do not lie within the individual alone, but are instead intertwined with the relationships and societal structures that surround the individual (MacKian et al., 2004). Researchers have identified a range of factors that may affect health-seeking behaviours, including cultural and sociodemographic factors, economic factors, physical accessibility, and perceived quality of services and confidence in the health provider (Shaikh & Hatcher, 2004). In order to form a comprehensive understanding individual decision-making regarding health, health seeking cannot be conceptualized as a spontaneous event, but rather “the result of an evolving mix of social, personal, cultural and experiential factors” (MacKian et al., 2004, p. 144).

For diseases that have a high degree of stigma associated with them, such as HIV or tuberculosis (TB), processes of social support may be particularly important. Individuals affected by such diseases often experience shame, social exclusion, and discrimination in healthcare settings that affect patients’ willingness to obtain, maintain and complete treatment (Abioye et al., 2011; Bond et al., 2017; Casale, 2015). Feelings of helplessness, depression, and a lack of adequate social support were identified as three main barriers to directly observed therapy short-course (DOTS) adherence, highlighting the importance of addressing psychosocial factors during TB screening and treatment (Naidoo et al., 2009; Naidoo & Mwaba, 2010). A number of interventions which explicitly aim to foster trust and social support between patients and their surrounding community have shown benefits in improving treatment outcomes and mitigating the negative social impact of TB (Acha et al., 2007; Arshad et al., 2014; Li et al., 2018).

The Philippines accounts for 6% of global cases (WHO, 2019) and has an estimated prevalence of 1159 per 100,000 population in 2016, with similarly high prevalence estimates across all regions of the Philippines (Department of Health, 2016, p. 83). TB prevalence in many rural areas, however, are largely unknown, and there are only some studies that have examined prevalence estimates in specific rural communities (Lopez et al., 2016). Widespread stigma and discrimination towards TB in the country have posed serious challenges in the efforts to reduce TB burden, and active case-finding (ACF), has become an important screening strategy to locate active TB in a timely manner and reduce the risk of adverse outcomes associated with the disease (Golub & Dowdy, 2013). Instead of locating cases ‘passively’ by relying on symptomatic individuals to present themselves to health clinics, ACF programs systematically screen select populations in particular geographies that are considered to be at higher risk for TB. ACF programs in the Philippines are government-led initiatives as part of the National TB Control Program. They are largely funded by bilateral and multilateral organizations, and programs are implemented by local and international non-governmental organizations (NGOs) or civil society organizations (CSOs).

In the Updated Philippine Strategic TB Elimination Plan for 2020–2023, the government has pledged to intensify community-based systematic screening for TB, particularly in high-risk communities such as among the urban and rural poor (Department of Health, 2020). Indeed, the case-detection gap is often highest among low-income populations, for whom barriers to testing and treatment are exacerbated due to poor access to healthcare services and the financial burden associated with the illness, leading to delays in seeking care (Golub & Dowdy, 2013). Dimensions of social trust, such as the provision of reciprocal support and informal informational exchange, may be particularly pertinent for people experiencing poverty as they anticipate the challenges of navigating the healthcare and social landscape of living with TB.

This study examined data from an ACF program implemented by

International Care Ministries (ICM), a Philippine-based NGO that runs a poverty-alleviation program called *Transform* for extreme low-income households that live below USD\$0.50 per day. An earlier paper explored the role of symptom profiles in uptake of referral to a rural health unit (RHU) and subsequent treatment (Lee et al., 2019). This study focused on the role of social trust in the uptake of initiatives during the early stages of ACF, particularly for individuals suspected of TB in communities experiencing extreme poverty.

2. Methods

2.1. ICM TB Screening Program (TSP)

The TB Screening Program (TSP) was nested within ICM’s 16-week poverty reduction program called *Transform*. This program identified households that reported a daily income of less than US\$0.50 per person (Hung & Lau, 2019). *Transform* is carried out across the southern two-thirds of the Philippines, serving a range of communities situated in diverse geographical landscapes with distinct cultures (Fig. 1). In each community, approximately 30 participants gather for a series of weekly training sessions on health and livelihoods, led by ICM staff.

The TSP program was initiated in week 3 of *Transform* and progressed in four stages (Fig. 2). Family members, neighbours or friends of *Transform* participants who were present in the household during screening were also eligible to be enrolled in the TSP. During pre-screening and Stage 1, individuals with potential symptoms of TB were identified and monitored for two to three weeks. If individuals showed persistent symptoms during weeks five and six of *Transform*, they advanced to Stage 2 and were given a referral form to attend a rural health unit (RHU) or clinic for testing. ICM health staff followed-up with patients that did not visit an RHU to promote testing. Stage 3 was initiated if referred participants successfully attended an RHU for laboratory testing or diagnosis. All those who successfully received a diagnosis were given an RHU reply slip, and patients diagnosed as TB positive (Stage 4) were enrolled into a DOTS program.

2.2. Data collection

Data on TB symptoms for each patient enrolled into the TSP was collected as part of ICM’s program monitoring. At Stages 1 and 2, the presence of symptoms in individuals suspected of having TB were recorded by ICM staff. Patient outcomes at Stage 3 were collected through RHU reply slips and follow-up communications with RHU staff. ICM staff were responsible for collecting referral data on paper logbooks which were subsequently transferred onto an online data system.

ICM also regularly administers baseline surveys to all *Transform* participants, conducted through one-on-one interviews by contract surveyors two weeks before the start of the program. The survey contains a range of individual-level items such as household composition, economic status, and physical and social well-being (Hung & Lau, 2019). The original survey questions used to operationalize variables and their coding can be found in Table S1.

This study linked the baseline survey data of *Transform* participants in June 2014 to October 2014 to the TSP referral data using unique identifiers assigned to households. Use of data for this retrospective analysis was approved by the Research Ethics Board of the University of Toronto (Protocol Ref #30943).

2.3. Variables

The main *outcome* of interest was successful referral to an RHU for testing, a dichotomous variable that identified whether patients who had been given a referral form at Stage 2 of the TSP had attended an RHU.

The main *predictors* of interest were six dimensions of social satisfaction and trust (Table 1). Participants were asked to rate their

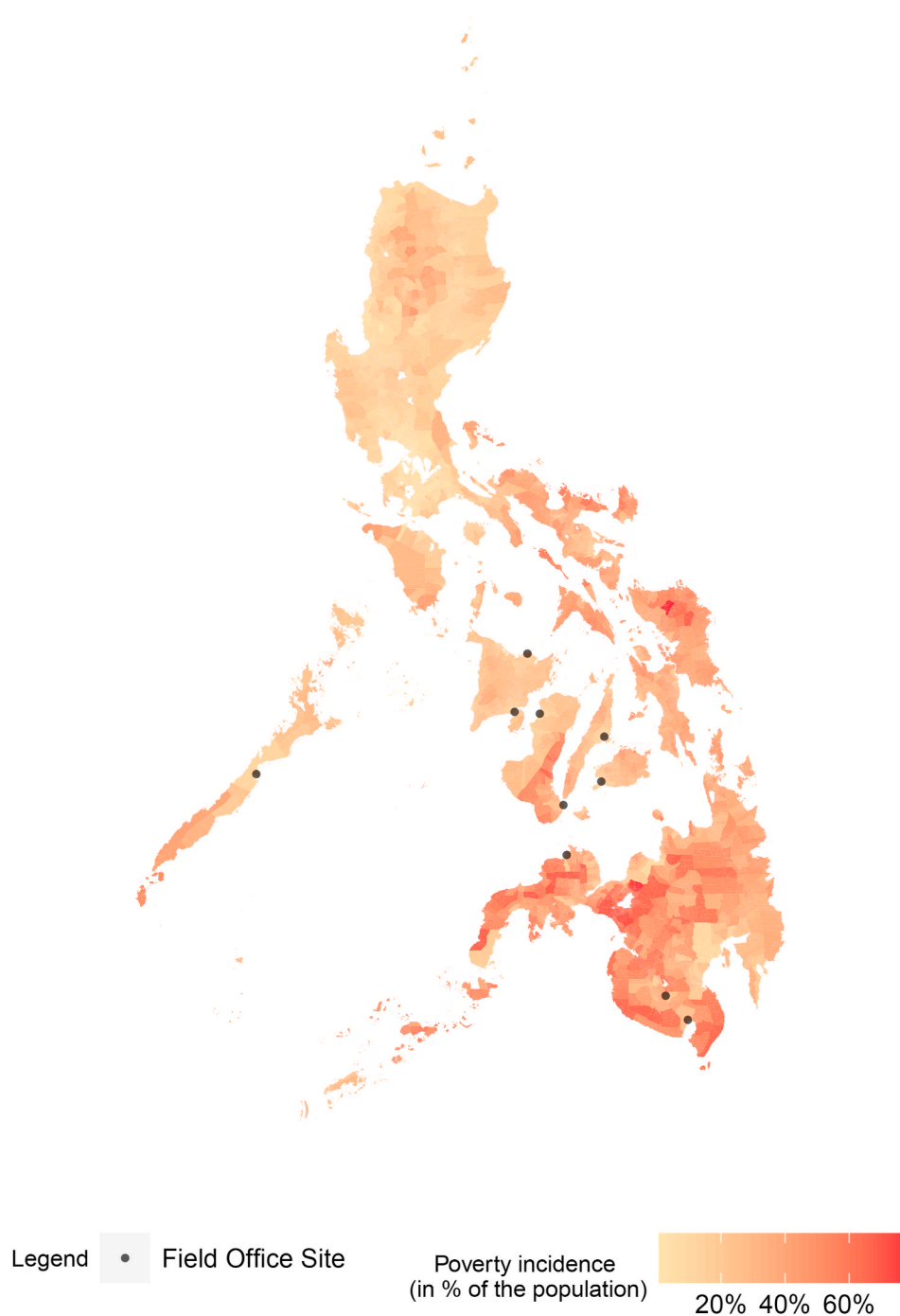


Fig. 1. Poverty incidence map of the Philippines in 2015 (PSA, 2015). Black dots indicate the locations of ICM’s field office sites.

satisfaction with family life, as well as their satisfaction with friendships on a five-point Likert scale, ranging from very dissatisfied to very satisfied. In this study, the family refers to people who ordinarily live within the same household, share common cooked meals and financial resources (Sharma, 2013). The question concerning the satisfaction of individuals with family is based on a validated scale (Zabriskie & Ward, 2013), which has also been adapted for friendship relationships (Amati et al., 2018). Participants were subsequently asked about the degree to which they trusted the following figures: their relatives (including those who may not live in their household), neighbours, pastor or religious leader, and local barangay. Barangays are the smallest local government unit in the Philippines. These items were also measured on a five-point Likert scale, ranging from no trust to very trusting. Such measures on

general trust have been widely used, notably in the World Values Survey (Inglehart et al., 2014). These questions were used part of ICM’s ongoing monitoring and evaluation activities and have been adapted over the years to be responsive to local context and understandings of social trust.

Presence of TB symptoms recorded by ICM health trainers were operationalized as dichotomous variables and covered the following six symptoms: cough or wheezing of 2 weeks or more; unexplained fever of two weeks or more; significant and unintentional weight loss; fatigue, lethargy, general malaise; failure to respond to two weeks of appropriate antibiotic therapy; failure to regain previous state of health two weeks after viral infection.

Sociodemographic variables included: age, as a continuous variable; gender, as a binary variable; educational attainment, as number of years

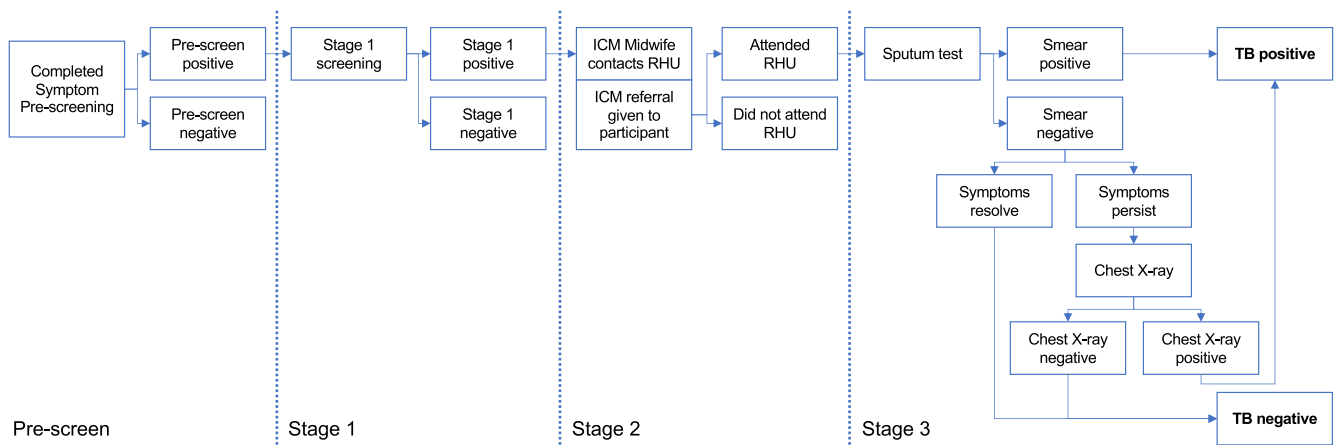


Fig. 2. Flow chart of ICM's TB Screening Program.

Table 1
Operationalization of social trust.

Variable	Question wording in the survey	Values
<i>Family satisfaction</i>	"How satisfied are you with your family life?"	Likert Scale 1–5; 5 = Very satisfied
<i>Friendship satisfaction</i>	"How satisfied are you with your friendships?"	4 = Somewhat satisfied 3 = Neutral 2 = Somewhat dissatisfied 1 = Very dissatisfied
<i>Trust in relatives</i>	Response to "Please indicate how much you trust the following people: ... "	Likert Scale 1–5;
<i>Trust in neighbours</i>		5 = Very trusting
<i>Trust in pastor or religious leader</i>		4 = Moderately trust
<i>Trust in local government official</i>		3 = Neutral 2 = Tentatively trust 1 = No trust

of schooling the participant had received; household size, as the number of people who usually reside in the household; and average household income in Philippine pesos per person per day. As intrahousehold circumstances that may influence the extent of social trust reported by individual participants, the presence of someone experiencing physical abuse or engaging in problematic substance use within the household at the time of the interview were both included as binary variables.

2.4. Statistical analyses

To investigate whether there were systematic differences between those that successfully attended an RHU compared to those who did not, Student's t-test and Pearson's chi-square test were used. All demographic characteristics, TB symptoms and dimensions of social trust were tested.

Participants represented a wide range of communities from across the Philippines. To account for unique geographical factors of each community and distinctive dynamics and interactions from different ICM field office staff, multilevel modelling was used. All ICM regional field office sites and the communities were assigned a unique identifying number. The models were fitted using Markov chain Monte Carlo (MCMC) techniques provided by the 'MCMCglmm' package (Hadfield, 2010). Although the ensuing analyses take a Bayesian approach, no priors were defined. To our knowledge, this is the first investigation into the multilevel effects of social trust on TB health seeking behaviours in the context of extreme poor settings in the Philippines. Although there are studies that have examined social trust as a predictor for various

health outcomes in other low and middle income countries (LMICs) (Agampodi et al., 2015; Grover et al., 2016), social processes differ considerably by socio-cultural context. Given the dearth of evidence in the Philippine context, we did not feel confident constructing priors that would substantially influence the outcomes of the analyses.

In the multilevel models, individual participants formed level 1, and both unique community ID and field office site ID were fitted as random effects, forming level 2. Univariate odds ratios (ORs) were first produced before the models were subsequently fitted using stepwise regression, with an aim to minimize the deviance information criterion (DIC). To examine the relative influence of the different variables, Model 1 adjusted only for the social trust variables, and models 2 and 3 adjusted for only the demographic and health-related variables, respectively. Model 2 had the lowest DIC but it was only marginally lower than the full Model 4 which adjusted for all the aforementioned variable domains and thus was selected as the final model. Model diagnostics were assessed to ensure convergence of the model (Supplementary File 1).

All analyses were conducted using R version 3.3.3 (R Core Team, R Foundation for Statistical Computing, Vienna, Austria).

3. Results

3.1. Descriptive statistics

The study population consisted of *Transform* participants from 51 communities in all 10 of the regional field office sites where ICM operates: Bacolod, Bohol, Dumaguete, General Santos, Koronadal, Palawan, Zamboanga Del Norte, Iloilo, Cebu and Roxas City. Of the total 3350 participants that were screened, 1837 individuals were identified with potential symptoms of TB (see characteristics in Table 2). While 889 individuals suspected of having TB received referrals to attend an RHU, only 214 of the referred participants visited an RHU for testing (24.1%). Of these participants, the proportion of women was slightly higher (58.9%) compared to men (41.1%). At the end of the TSP, 30 (14.0%) of the tested participants were confirmed with pulmonary TB.

3.2. Social satisfaction-trust and covariates associated with RHU attendance

Three dimensions of social trust were found to be statistically different between those who attended an RHU and those who did not: family satisfaction, friendship satisfaction and trust in relatives. The means of these social trust variables were consistently higher among those who attended an RHU (Table 3). Only gender and cough or wheezing for at least two weeks showed substantial differences between the two groups, and these effects have been explored in a previous paper (Lee et al., 2019, p. 12).

Table 2
Characteristics of Transform participants at each stage of the TB Screening Program (TSP).

	Stage 1: Suspected Cases (N = 1837)		Stage 2: Needed Referral (N = 889)		Stage 3: Attended RHU (N = 214)		TB Positive (N = 30)	
	n	%	n	%	n	%	n	%
% progressed from previous stage	1837/3350	54.8	889/1837	48.4	214/889	24.1	30/214	14.0
% overall	1837/3350	54.8	889/3350	26.5	214/3350	6.4	30/3350	0.9
Women	1016	55.3	478	53.8	126	58.9	16	53.3
Men	821	44.7	411	46.2	88	41.1	14	46.7
Registered in PhilHealth ^a	1009	54.9	489	55.0	119	55.6	18	60.0
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Age	37.5	21.9	36.8	22.1	36.6	23.5	44.9	17.8
Household size	5.2	2.1	5.0	2.1	5.1	2.2	5.0	2.6
Household Income (PHP per person per day)	22.4	25.2	19.3	19.8	19.1	18.8	18.6	16.3

N = 3350

^a PhilHealth is the Philippine government-owned nation health insurance program. It was developed to cover all Philippine citizens, although this goal has yet to be achieved. Not all citizens have been able to access and utilize the insurance scheme due to administrative challenges.

Table 3
Social trust reported by Transform participants who received a rural health unit (RHU) referral form, by RHU attendance.

Indicators of social trust	Attended RHU (N = 214)		Did Not Attend RHU (N = 675)		95% CI of difference
	Mean	SD	Mean	SD	
Family satisfaction	3.9	1.0	3.8	0.9	0.02–0.33
Friendship satisfaction	4.0	0.9	3.9	0.9	0.01–0.28
Trust in relatives	4.2	0.9	4.0	0.9	0.03–0.23
Trust in neighbours	3.9	1.0	3.9	0.9	−0.14–0.16
Trust in pastor or religious leader	4.2	0.9	4.2	0.8	−0.14–0.14
Trust in local government official	3.9	1.2	3.9	1.2	−0.15–0.21

N = 889

Table 4
Markov chain Monte Carlo (MCMC) generalized linear mixed-model testing of the effect of social trust on rural health unit (RHU) attendance.

Variables	Univariate ORs (95% CI)	Adjusted ORs (95% CI)			
		Model 1	Model 2	Model 3	Model 4
Intercept		1.14 (0.94–1.33)	1.24 (1.14–1.37)	1.18 (1.10–1.28)	1.04 (0.86–1.26)
Fixed effects					
Social Trust					
Family satisfaction	1.03 (1.00–1.07)	1.03 (1.00–1.07)			1.03 (0.99–1.07)
Friendship satisfaction	1.03 (0.99–1.06)	1.01 (0.96–1.06)			1.01 (0.96–1.06)
Trust in relatives	1.03 (1.00–1.07)	1.06 (1.01–1.11)			1.06 (1.00–1.11)
Trust in neighbours	1.01 (0.98–1.04)	0.97 (0.92–1.02)			0.97 (0.92–1.02)
Trust in pastor or religious leader	1.00 (0.97–1.04)	0.98 (0.93–1.03)			0.98 (0.94–1.04)
Trust in local government official	1.00 (0.97–1.04)	0.99 (0.93–1.03)			0.98 (0.94–1.04)
Demographics					
Age	1.00 (1.00–1.00)		1.00 (1.00–1.00)		1.00 (1.00–1.00)
Gender					
Men	–		–		–
Women	1.06 (1.00–1.12)		1.06 (1.00–1.12)		1.05 (1.00–1.11)
Years of education	1.00 (0.99–1.01)		1.00 (0.99–1.01)		1.00 (0.99–1.01)
Health-related					
Cough/Wheezing of 2 weeks or more	1.11 (1.03–1.19)			1.11 (1.03–1.20)	1.10 (1.02–1.18)
Drug abuse in household	1.01 (0.91–1.12)			1.01 (0.92–1.11)	1.01 (0.92–1.11)
Physical abuse in household	0.91 (0.75–1.15)			0.91 (0.72–1.13)	0.94 (0.76–1.18)
Random effects (Posterior mean)					
Variance (within community)		0.02	0.02	0.02	0.02
Variance (across communities, field office site)		0.08	0.09	0.05	0.06
Model information criteria					
DIC		815.55	814.13	811.704	819.19

N = 796

3.3. Multilevel model results

The final model (4) included all six dimensions of social trust, sociodemographic variables, and cough or wheezing for at least two weeks (Table 4). When stratified by gender, mean levels of social trust did not differ between the two groups across all six indicators (Table S2). Interaction terms between gender and each social trust indicator were also tested but were not statistically significant, suggesting the absence of effect modification by gender.

Due missing values on included variables, the final sample size for the multilevel models was N = 796. T-tests and chi-square tests were conducted to analyze the potential bias associated with missing values, and it was determined that complete cases were not systematically different from the study population as a whole on the key variables of interest. However, variables for which significant differences were detected included gender, educational attainment and cough or wheezing for at least two weeks. Compared to the participants who were

included in the sample, the proportion of women and of those who reported the TB symptom of coughing or wheezing for at least two weeks were greater among those who were excluded. Also, on average, participants excluded from the sample had higher levels of education than those who were included.

Among the indicators of social trust, two were noteworthy: family satisfaction and trust in relatives. For every unit increase of reported family satisfaction on the Likert scale, the odds of the participant attending an RHU was 1.03 times greater (95% CI: 0.99, 1.07). Similarly for trust in relatives, with every unit increase of trust on the Likert scale, the odds of successful RHU attendance was 1.06 times greater (95% CI: 1.00, 1.11). Cough or wheezing for two weeks or more was also a significant predictor of RHU attendance (OR 1.10, 95% CI: 1.02, 1.18). Odds of attending an RHU were 1.05 times higher amongst women compared to men (95% CI: 1.00, 1.11). Trust in neighbours, trust in pastor or religious leader and trust in local government official appeared to lower the odds of RHU attendance, although the confidence intervals for these estimates were slightly wider. There were no substantial changes in the coefficient between the successive models.

The multilevel structure of our model also revealed variation in RHU attendance within communities, as well as across field office sites. The random effects estimates for variance within field office sites was 0.06, notably greater than the variance within communities at 0.02. This three fold difference indicates that areas corresponding to ICM's field office sites explained substantially more variation in RHU attendance, than individual communities. Future research should follow up by conducting in-depth qualitative interviews with field office sites to investigate potential sources of the observed variation at this level.

4. Discussion

Social trust is an important, but often overlooked, factor in determining health seeking behaviour in LMICs (Ensor & Cooper, 2004). Especially in resource-poor settings where primary health services are poor and awareness of TB is low, individuals face numerous barriers to accessing health services such as the distance to health facilities, losing a day of income for travel, the affordability of diagnostic tests, and facing stigma associated with TB (Aspler et al., 2008; Heuvelings et al., 2017; John et al., 2009; Mhimbira, Cuevas, Dacombe, Mkopi, & Sinclair, 2015). The findings from our study highlight the importance of psychosocial resources for promoting uptake of TB testing initiatives and specifically, different *relationship types* have different effects in supporting such health seeking behaviours.

From our analyses, social trust in *family and other relatives* emerged as the dominant driver of RHU attendance. For stigmatizing diseases such as TB (Abioye et al., 2011; Daftary et al., 2017), patients face the possibility of discrimination and ostracization from their community, and the family is an important support structure to insulate them from the social consequences of being TB positive. As the family of a TB patient are also susceptible to discrimination (de Vries et al., 2017), greater trust and satisfaction in their family and relatives may reflect the resilience or willingness of the family unit to withstand stigma from the community. These findings have also been integrated into intervention programs. Based on the premise that the involvement of family members is conducive to reducing the social consequences for those living with TB, Li et al. (2018) incorporated family and community components into a comprehensive social support intervention. As a result of the psycho-educational workshops provided to family members, increased knowledge of TB and confidence were reported, and they were consequently more active in supporting patients through their course of treatment. It is interesting that our study did not find evidence for gender differences in the association between social trust and RHU attendance. While our findings are consistent with existing literature that suggest gender groups do not differ on *levels* of trust (Chaudhuri et al., 2013), other studies have observed differences between men and women in the types of behaviours trust may motivate (Irwin et al., 2015), as well as the

conditions under which trust is formed (Maddux & Brewer, 2005). It is possible that the lack of an observed difference in this study is due to the low gender-based gap in the Philippines (World Economic Forum, 2019).

In resource-poor contexts where many individuals and families are experiencing poverty, the importance of familial bonds for the provision of support are especially pertinent. *Transform* participants are pre-screened for poverty as a pre-requisite for enrollment into the program. The majority of these participants live in remote and rural communities or urban slums, and they often have unstable income sources. If confirmed to have TB, they would have to rely heavily on their family or relatives for assistance in funding their treatment and associated travel costs, as these are not covered by the government health insurance program. It is common for the extended family to share different financial burdens such as educational, medicinal, and emergency expenses (Levesque et al., 2013; Sneha et al., 2017), and this may require them to temporarily compromise their quality of life for the sake of others. We can posit that for an individual suspected of having TB, greater trust in their immediate and extended family implies a degree of confidence that they would receive financial support for treatment if needed, therefore facilitating their willingness to be tested for the disease. In addition, if TB testing, treatment and follow-up visits require TB patients to frequently forgo a day of work to travel to the health facility or recover from the side effects of the medications, having the support of their family to ease the financial burden and the associated stress is a crucial factor in determining their decision to seek, and subsequently continue, treatment (Auer et al., 2000; Lorent et al., 2015; Munro et al., 2007). Through interviews with TB patients, Paz-Soldán et al. (2013) also found that assistance received from family members were highly valued by patients, particularly as they were able to alleviate financial pressures and other stressors from having to seek treatment.

While higher family satisfaction and trust in relatives were associated with greater odds of RHU attendance in our multilevel models, other variables of social trust did not demonstrate the same effects. From each relationship type that did not appear to influence RHU attendance, we can make inferences about the facets of social trust that may drive the decision-making mechanisms of individuals suspected to have TB. The lack of effect from satisfaction in friendships and trust in friends suggest that it is not the closeness of bonds that affect RHU attendance. The lack of effect from trust in neighbours suggests it is not physical proximity, and the lack of effect from trust in religious leaders nor trust in local government official suggests it is not about the influence from authoritative figures. By contrast, the consistency of *familial* bonds as factors that promote the outcome, even when members did not share the same household, points to the importance of relatives as a supportive structure for those suspected of having TB. This is particularly relevant and specific to the context of the Philippines as close and strong family ties are at the core of Filipino culture (Morillo et al., 2020). In a systematic review that examined the functions of social capital at the level of the family, the authors found the exertion of social influence and the exchange of social support to be key mechanisms through which family social capital can affect health (Alvarez et al., 2017). The studies included in the review consistently showed that strong family ties led to beneficial health behaviours, as family members were able to shape health-related behaviours through informal social control, by serving as a buffer in stressful situations, and by providing important health information for decision-making. Other research has also demonstrated the influence of family members on health seeking behaviours over and above other relationship types, as family relationships tend to be the earliest social ties formed and they are also able to provide support in many areas of daily life (Lee & Jung, 2018; Li et al., 2018; Paz-Soldán et al., 2013).

4.1. Limitations

Globally, and in the Philippines, TB is more prevalent in men than in women (Horton et al., 2016; WHO, 2019). However, the majority of

Transform participants are women as the program is offered during the day when most men in the Philippines tend to work. As a result of this gender imbalance in our study sample, there was consistently a higher proportion of women at each stage of the TSP.

The social trust measures used in ICM's surveys were modelled after those used in large-scale, international surveys, such as the World Values Survey. However, they were adapted to better suit the local context in which ICM operates, and the reliability and validity of our social trust measures have not yet been formally assessed in this population.

We also note that as *Transform* was targeted at low-income households in low-resource settings, the generalizability of the results to varying economic contexts may be limited. As only one household representative was responsible for completing ICM's questionnaires, their sociodemographic and social trust data were used for other individuals present in the household at the time of screening that may have received an RHU referral, reducing ability to distinguish between household members.

This study focused exclusively on the outcome of RHU attendance for TB testing, a one-off event, whereas the duration of a full TB treatment regimen can span months. It would be valuable for future studies to examine whether the enabling role of social trust, in family members or other relationships, is also beneficial for DOTS treatment *adherence*.

There were also a number of variables we were unable to account for in our analyses that may have been potential confounders for the association between social trust and RHU attendance. As ICM's evaluative surveys for *Transform* are standardized in design, this study was unable to account for the social stigma associated with TB or trust and satisfaction in participants' relationships with community health workers. We were also unable to include religious affiliation due to the high volume of missing data associated with this variable, but as there were no differences in the distribution of religious affiliation between those who did and did not attend an RHU for TB testing (Table S3), we do not expect its omission to have substantially changed our results. Potential level-2 confounding variables such as average income, population size, or having been targeted by national TB campaigns would have also been important factors to explore. While there are income and population figures on the regional and provincial level (PSA, 2016; PSA, 2019), respectively, these data are not available for the level-2 units used in our analyses. Future developments in ICM's ACF strategy will incorporate training activities for ICM Health staff to *intentionally* foster trust-building amongst the community, as well as activities that promote family-based social trust.

4.2. Implications for policy and practice

The results of this study hold important applications for ACF and other health care programs that seek to promote health seeking behaviour. Given the role of satisfaction and trust in family members in promoting successful RHU attendance for testing, the effectiveness of ACF programs may be increased by incorporating social trust exercises prior to screening and diagnosis. ACF approaches can incorporate activities that involve family members, ensuring that they recognize the importance of their role in providing support to individuals suspected of having TB throughout the process of seeking care for the condition. For isolated individuals that may not have family members, in close proximity or at all, it would also be important for programs to prioritize trust-building between each ACF setting and community health workers so that they are able to serve as 'extended family' substitutes and provide an alternate structure for social support. Examples of interventions that may increase social trust may include trust-building exercises (Rhodes et al., 2020; Sseguya et al., 2018), group cognitive behavioural therapy (Papas et al., 2020), targeted training for community health workers on how to develop trusting relationships with the community (Dawson-Rose et al., 2020; Lazo-Porras et al., 2020), and guidance on participant or family engagement with the intervention (Mantovani et al., 2017; Walton et al., 2018).

This study found that social trust in family members is an important factor that may motivate health seeking behaviours, such as attending a healthcare facility for testing, for people who are suspected to have TB. These findings are especially pertinent in the context of geographically isolated, poor communities where individuals suspected of having TB face a multitude of financial and social barriers to receiving care. The influencing effect of social trust in family members and relatives, contrasted against the lack of effect from other relationships types, such as friends or community leaders, reveals an important component of health seeking decision-making: the *family* as a source of support.

It is also important to consider that social trust, in family members or others, is a complementary component, rather than the main driving force, of health seeking behaviours. The other pillars of ACF interventions must not be overlooked, such as identifying high-risk populations, investment in human resources to conduct outreach activities, reducing logistical and financial barriers to care, and educational activities about TB to reduce stigma in communities. Continued monitoring and evaluation efforts are crucial to ensure that all components are well-implemented as we pursue goals of reducing the TB burden in the Philippines and globally.

CRedit authorship contribution statement

Lincoln L.H. Lau: Conceptualization, Methodology, Investigation, Writing - original draft, Writing - review & editing. **Natalee Hung:** Investigation, Writing - original draft, Writing - review & editing. **Warren Dodd:** Investigation, Writing - review & editing. **Krishna Lim:** Methodology, Investigation. **Jansel D. Ferma:** Methodology, Investigation. **Donald C. Cole:** Conceptualization, Methodology, Writing - review & editing.

Declaration of competing interest

Authors (LLL, NH, KL & JDF) receive remuneration from ICM. The authors have been provided academic freedom by ICM to publish both negative and positive results. We declare no other competing interests according to ICMJE.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ssmph.2020.100664>.

Ethics approval

Use of all data for this retrospective analysis was approved by the Health Sciences Research Ethics Board of the University of Toronto (Protocol Ref #30943).

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