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Impact of Active Case-Finding on Tuberculosis Transmission Among the Homeless in Fulton County, Georgia, 2010-2015: Secondary Data Analysis

By

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Master of Public Health

Global Health

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An abstract of

A thesis submitted to the Faculty of the Rollins School of Public Health of Emory University

in partial fulfillment of the requirements for the degree of Master of Public Health in Global Health

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Abstract

Impact of Active Case-Finding on Tuberculosis Transmission Among the Homeless in Fulton County, Georgia, 2010-2015: Secondary Data Analysis.

By Philip Oppong-Twene

Despite the efforts of the active-case finding program to detect and prevent tuberculosis (TB) transmission among the homeless shelters in Fulton County, there was an increase in the number of isoniazid-resistant TB among homeless persons in the county in 2014-2015.

To assess the impact of active-case finding on the transmission of TB among the homeless population in Fulton County.

A secondary de-identified data analysis was conducted using the Fulton County Department of Health and Wellness TB database on 344 cases with their cohort of 4472 contacts identified from January 01, 2010- December 31, 2015.

Of 344 cases of TB reported from 2010-2015, 110 (32%) occurred among the homeless. The mean age for the homeless cases was 50 years, with a median of 51 years (range 3-75 years), with the 45-64-year group comprising 75% of the homeless cases. The homeless cases were 88% male, 86% black, 91% US-born and 37% HIV positive. Treatment completion rate was 89% among both homeless and non-homeless cases. Directly observed therapy was used in 100% of the homeless cases compared to 94% among the non-homeless cases ($p<0.0016$). A mean of 7 high-risk contacts were elicited per case with a mean of 12 (median 13) days between case identification and interview of contacts. Evaluation was completed among 86% of homeless contacts. However, treatment completion rate for contacts to homeless cases was 8% lower than the state target for 2015 (67% vs. 75%) and 12% lower than the national target (67% vs.79%). Five TB cases (0.3%) and 102 (5.2%) cases of Latent Tuberculosis Infection were identified among 1948 contacts who completed evaluation.

The active-case finding program identified 0.3% additional TB cases and appeared to be effective in preventing TB transmission among the homeless population in Fulton County from 2010-2015. However, the study found lower treatment completion rate among contacts to homeless TB cases. Further studies need to be conducted to assess the factors associated with lower treatment completion rate among contacts to homeless TB cases in Fulton County.

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Background and Aims

Although the number of tuberculosis (TB) cases in the United States has remained relatively constant since 2013, with an incidence of 3.0 cases per 100,000 persons, a total of 9,557 TB cases were reported in the United States in 2015. This represents a 1.6% rise in the number of TB cases reported in the year 2014 (1). Of the reported TB cases in the United States in 2015, 66.4% occurred among foreign-born persons (1). In 2015, reported TB cases included homeless persons (5.5%) and persons with HIV infection (7.6%) (2).

In 2015, Georgia reported a total of 321 new TB cases, which represents a 4% decline from 334 cases reported in the year 2014. Georgia TB case rate declined from 3.3 cases per 100,000 persons during 2014 to 3.1 cases per 100,000 in the year 2015. This case rate was slightly above the TB case rate in the U.S. of 3.0 cases per 100,000 persons in 2015 (3). Moreover, Georgia reported the fifth highest number of new cases of TB and placed the eighth highest for TB case rates of the 50 reporting states in U.S. in 2015. Also, based on information from the Georgia Department of Public Health, four counties in the metropolitan Atlanta area and their corresponding Health Districts accounted for the highest number of TB cases in 2015. Of these four counties, Fulton County reported the highest number of TB cases in 2015 (63 cases) followed by DeKalb County (58 cases), Gwinnet County (29 cases), and Cobb county (26 cases) (Figure 1)(3). Of the eighteen health districts which oversee public health in the state of Georgia's 159 counties, the Fulton County Health District reported the second highest TB case rate in the year 2015 (6.2 per 100,000) (3).

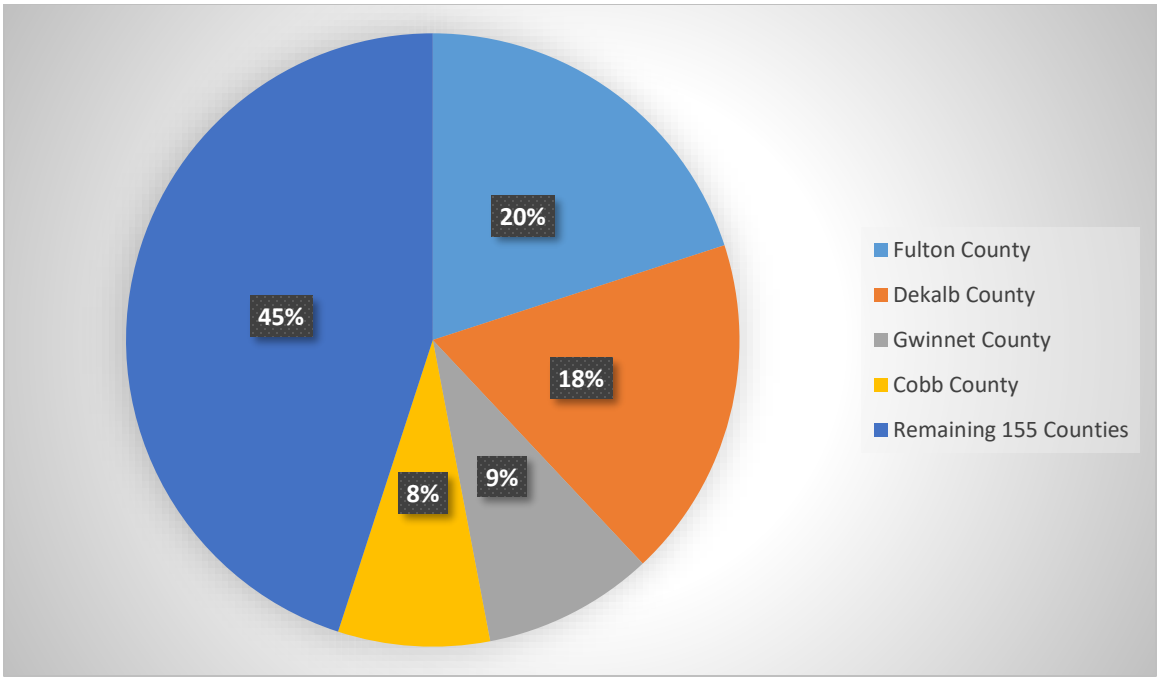

Figure 1: Number of Tuberculosis Cases Reported in Georgia, by Selected Counties, 2015

TB transmission among the homeless in the United States may be 20 times that of the adult population and most of the cases of TB among the homeless in Urban centers are thought to represent on-going transmission of TB (4). This situation is compounded by sub-optimal TB control practices for difficult-to- reach populations and inadequate shelters for the homeless in the United States (5). Numerous studies have suggested that, active case-finding and prompt initiation of appropriate treatment may be effective in reducing TB transmission among the homeless and the overall rate of TB transmission in the United States (6-8). According to 2015 estimates, Fulton County has a population of 1,010,562 making it one of the most populous counties, and the only county with a population of over 1 million in Georgia (9).

The Fulton County Department of Health and Wellness (FCDHW) in Atlanta, Georgia, primarily attends to TB care of the inner city population of downtown Atlanta, which mainly comprises

foreign-born persons, HIV-infected persons, and many individuals living in local shelters, or rehabilitation programs (10) . Fulton County has several shelters for the homeless population.

The FCDHW TB Program has a mobile TB team that conducts screening for TB and contact tracing in the homeless shelters and downtown Atlanta twice a week and on as-needed basis. Their activities mainly involve placement of TST and reading of TST results, provision of routine blood tests for HIV and rapid plasma reagin (RPR) test for syphilis, patient education, administrative performance checks at the shelters, and provision of incentives to clients to return for TST reading. Despite these commendable efforts by the FCDHW to control TB in the homeless shelters in the county, there was an outbreak of isoniazid-resistant TB in 2014-2015 in Metropolitan Atlanta associated with downtown homeless shelters (3, 10-12). This recent outbreak and possible future outbreaks of TB have the potential of becoming widespread due to the populous nature of the county, and the transient nature of the homeless population (13). Also, no assessment has been conducted to measure the impact the active case-finding program has had on the early detection, treatment, and on prevention of TB transmission among the homeless in the county. This assessment, therefore, seeks to accurately characterize the impact, this active case-finding program has had on enhanced detection of people with TB and in limiting transmission of the disease among the homeless population in the county. This project will also inform future measures to enhance early case detection and treatment, to achieve the desired impact vis-à-vis the increasing high-risk population for TB in Fulton County.

Methods

A quantitative secondary data analyses were conducted using the database collected and maintained by FCDHW TB. The data include several variables comprising demographic information of patients and their contacts, homeless status within the past year, incarceration or

resident of a correctional facility at the time diagnostic evaluation was initiated, history of injecting and non-injecting drug use, history of excess alcohol use, TST results, and treatment completion status. The data was originally collected by the TB screening team for program evaluation purposes. The cohort for analysis comprised data gathered on all TB patients and their contacts from January 01, 2010- December 31, 2015 in Fulton County. Standard definitions from the Report of a Verified Case of TB believed to be correlated with cases and outcomes were used for race, homelessness, substance abuse and medical factors such as cavitation on chest X-ray and AFB sputum smear microscopy (14). All cases met the surveillance case definition (i.e. had clinical or laboratory evidence of active disease due to *Mycobacterium tuberculosis* (MTB) complex and were verified before they were included in the analysis) (14). Contacts were characterized as high-, medium-, or low-risk based on the level of exposure to the source case. High-risk contacts were close contacts of persons with infectious tuberculosis. For outcomes, a positive TST was defined as greater than or equal to 5mm induration to 0.1 ml of 5 tuberculin units of purified protein derivative (15). Contacts to cases who were positive on an initial or follow-up TST during the contact investigation and who had no previous TB or history of TST positivity were called "converters"(16). Comparison was made between homeless and non-homeless TB cases based on demographic features such as vital status at the end of treatment, age, sex, country of birth and self-reported race/ethnicity. This stratification and comparison is valuable owing to the persistence of disparities in TB case rates in the United States (17). Other factors examined included; self-reported injection and non-injection drug use and excessive alcohol use in the year preceding the diagnosis of TB.

The following outcomes for TB contact investigations were also analyzed: time between identification of source case and interview of contacts; number of identified contacts per source case, initial TST result, follow up TST positivity; number of chest X-ray (CXR) done, active TB and Latent Tuberculosis Infection (LTBI) among contacts and treatment completion rate among those who initiated treatment. LTBI treatment refers to daily isoniazid for nine months, or daily rifampin for four months, or twice weekly isoniazid and rifapentine for twelve weeks. Directly-observed therapy (DOT) use was also analyzed among cases and their contacts.

Data Analysis and IRB "Non-research" Determination

De-identified data analyses were performed using SAS, version 9.4 (SAS Institute Inc., Cary, NC). Differences in categorical variables were tested using either the $\chi 2$ or Fisher′s exact test for descriptive analyses. For continuous variables, a 2-sample t-test was used. A 2-sided $P < 0.05$ was considered significant throughout analyses. The study was exempted from institutional review by Emory University and FCDHW Institutional Review Boards because it was determined that it does not require IRB review because it does not meet the definition of research with "human subjects" or "clinical investigation" as set forth in their institutional policies and procedures and federal rules, if applicable.

Results

A total of 344 cases of TB were reported to FCDHW from January 1, 2010 to December 31, 2015. All these cases were included in the analyses, while a cohort of 4742 contacts identified for these cases were included in the analyses for outcomes of contact investigation.

Reported TB Cases

Of the 344 reported TB cases, 110 (32%) occurred among the homeless while 234 (68%) occurred among the non-homeless ($p<0.0001$). The graphical trend for the annual cases of TB reported among the homeless and non-homeless population is depicted by Figure 1. The annual number of reported TB cases among the non-homeless was at all time points higher than the annual number of TB cases reported among the homeless, except for 2014, when there were 43 (56%) cases in homeless persons, and 34 (44%) cases in non-homeless persons.

Demographic Characteristics

The demographic characteristics of homeless and non-homeless patients are summarized in Table 1. Males accounted for 74% of the total number of reported TB cases. Among the male homeless population, 97 (88%) had TB compared to 156 (67%) of male non-homeless ($p<0.0001$). The mean age was 47 (median 49) years with a range of 1-91 years for all cases. The 45-64-year group comprised 50% of all cases with 82 (48%) of them being homeless compared to 90 (52%) non-

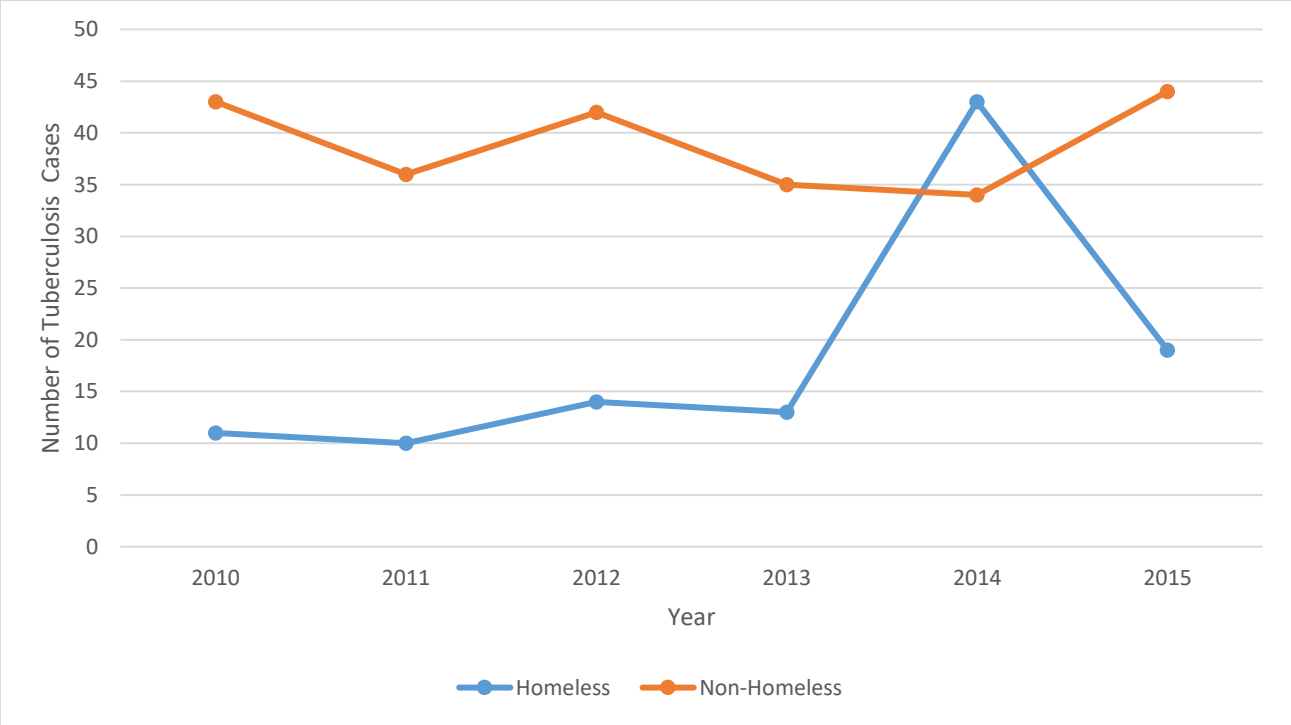

Figure 2: Number of Tuberculosis Cases Reported in Fulton County, Georgia, 2010-2015

homeless (p<0.0001). The black population comprised 241 (71%) of all cases reported from 2010-2015. Most of the reported TB cases were among U.S.-born persons (248 [72%]) as opposed to 96 [28%] among foreign born persons [p<0.0001]). Of the foreign-born TB cases, 10 (10%) were homeless while 86 (90%) were non-homeless persons. Of the US-born TB cases, 100 (40%) were homeless, and 148 (60%) were non-homeless.

Risk Factors for TB Transmission

Of the reported TB cases, 14 (4%) were incarcerated at some point in time during the 12 months preceding TB diagnosis. Non-homeless persons comprised 50% of all the incarcerated TB cases. HIV co-infection was found among 76 (22%) of all TB cases, with a higher proportion among homeless persons compared to non-homeless persons (54% vs. 46%, p<0.0001). Non-injection drug usage was higher among homeless TB cases, compared with non-homeless TB cases (60% vs. 40%, p<0.001). Diabetes mellitus was reported among 26 (8%) of all cases with a higher proportion among the non-homeless compared to the homeless, although this difference wasn't statistically significant (73% vs. 27%, p=0.6655). Excess alcohol use was found among 63 (18%) of all cases with a higher proportion among the non-homeless compared to homeless (54% vs. 46%, p=0.0108).

Disease Characteristics

Pulmonary TB disease was present in 262 (76%) of all reported TB cases, whereas pulmonary and extra-pulmonary TB disease was present in the remaining cases. Of the pulmonary TB cases, 173 (66%) occurred among non-homeless persons as opposed to 89 (34%) among homeless persons, but this difference was not statistically significant (p=0.9306). Cavitary pulmonary TB disease was

more common among non-homeless when compared with TB in homeless persons (77% vs. 23%, p=0.0308). Smear positive TB cases comprised 148 (43%) of all cases. Non-homeless cases represented 64% of the smear positive cases and homeless TB cases accounted for 34% of the smear positive cases (p=0.1557). Initial chest computerized tomography (CT) result was found to be abnormal among 198 (57%) of all the cases reported, with non-homeless accounting for 137 (69%) while the homeless accounted for 61 (31%) of abnormal CT results (p=0.1276). Culture-positive cases accounted for 213 (62%) of all cases, with the non-homeless accounting for 135 (63%) compared to 78 (37%) among the homeless (p=0.0882).

TB Treatment and Outcomes

Of the reported TB cases, 301 (89%) completed therapy, with the non-homeless comprising 204 (68%) compared with 97 (32%) among the homeless (p=0.4786). Directly Observed therapy was used as means of treatment for 322 (96%) of 337 patients who started treatment. DOT utilization was 107 (100%) among the homeless compared to 215 (94%) among the non-homeless (p=0.0016). Treatment completion rate was 287/301 (95%) among the patients who used DOT. Of the 43 patients who did not complete treatment, death accounted for 35 (81%) while the remaining 8 (19%) cases were due to loss to follow-up and unknown factors. At the end of treatment, 301 (88%) of the 344 patients identified were alive while death occurred among 35 (10%) of all patients. Death was higher among the non-homeless compared to homeless at the end of treatment completion (71% vs. 29%, p=0.4786).

Table 1: Characteristics of Tuberculosis (TB) Patients by homeless status in Fulton County, Georgia, 2010-2015 (N=344)

Characteristic	N (n=344)	Homeless Patients (n=110)	Non-Homeless Patients(n=234)	P-Value
Vital status*				0.4786
Alive	301(88)	97(88)	204(88)	
Dead	35(10)	10(9)	25(11)	
Other ‡	8(2)	4(3)	4(2)	
Male	253(74)	97(88)	156(67)	<0.0001
Age Group(years)				<0.0001
<5	4(1)	1(1)	3(1)	
5-14	1(0)	0	1(0)	
15-24	20(6)	1(1)	19(8)	
25-44	106(31)	20(18)	86(37)	
45-64	172(50)	82(75)	90(39)	
>65	40(12)	6(5)	34(15)	
Mean(SD)	47(16)	50(11)	46(18)	0.0315
Race				<0.001
Black	245(71)	94(86)	151(65)	
Asian	47(14)	1(1)	46(20)	
White	50(15)	14(13)	36(15)	
Other	2(1)	1(1)	1(0)	
Birthplace				<0.0001
US Born	248(72)	100(91)	148(63)	
Foreign Born	96(28)	10(9)	86(37)	
Incarceration §	14(4)	7(6)	7(3)	0.1517
Care Facility ¶	2(1)	2(2)	0	0.1016
HIV Positive	76(22)	41(37)	35(15)	<0.0001
Injection Drug Use	1(0)	0	1(0)	1.000
NIDU	57(17	34(31)	23(10)	<0.0001

Diabetes Mellitus	26(8)	7(6)	19(8)	0.6655
Excess Alcohol Use	63(18)	29(26)	34(15)	0.0108
Pulmonary TB	262(76)	89(81)	173(74)	0.9306
Cavitary Disease	90(44)	21(33)	69(50)	0.0308
Smear-Positive TB	148(43)	53(48)	95(41)	0.1557
Abnormal Initial Chest CT Result	198(57)	61(65)	137(75)	0.1276
Culture-Positive	213(62)	78(71)	135(58)	0.0882
Started Therapy	337(98)	107(97)	230(98)	0.0016
Completed Therapy	301(89)	97(88)	204(88)	0.4786
DOT	322(96)	107(100)	215(94)	0.0016

Abbreviations: HIV, Human Immunodeficiency Virus; NIDU, Non-Injection Drug Usage, CT, Computed Tomography; DOT, Directly Observed Therapy

† Vital status at the end of treatment period

§ Incarceration means resident of a correctional facility at the time diagnostic evaluation was initiated

¶ Care facility means resident of a long-term care facility at the time diagnostic evaluation was initiated.

‡ Other as used under vital statistics means they were lost to follow up and therefore, cannot be ascertained whether they were alive or died at the end of treatment.

Values in parentheses refer to percentages unless otherwise stated

All percentages represent column percentages unless otherwise stated.

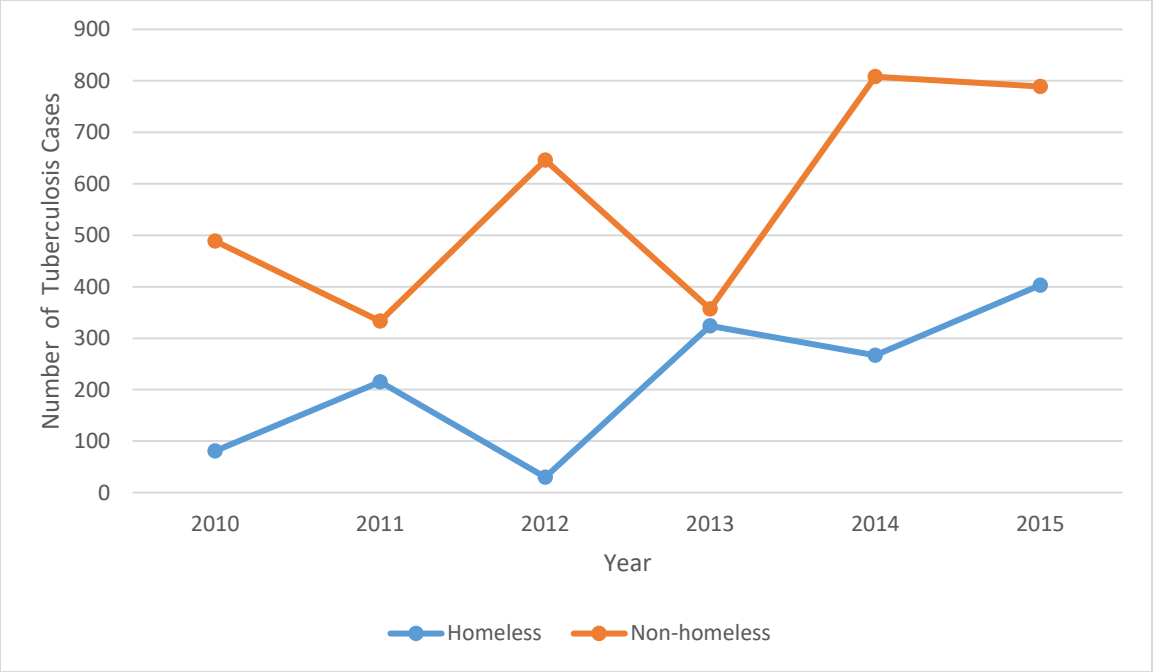

Figure 3: Contacts of Tuberculosis Cases, Fulton County, Georgia, 2010-2015

Outcomes of Contact Investigation

Time to contact interview

The mean time between source case identification and contact interview was 12 days (median of 13 days)

Characteristics of Contacts

The 344 patients had a cohort of 4742 contacts. A mean of 14 contacts were found per patient with 7 of the contacts being high-risk. The characteristics of the contacts are summarized in Table 2. The contacts were classified as high-, medium- and low-risk contacts based on their level of exposures to the source cases. There was a statistically significant difference in the proportion of high-, medium- and low-risk contacts (48% vs. 28% vs. 24%, $p<0.0001$).

TST Placement and Positivity

TST was placed on 3867 (82%) of the 4742 contacts identified, who had no prior TST placed or diagnosis of TB disease. Of persons who had TST placed, 382 (10%) tested positive on initial testing, with TST positive among the non-homeless accounting for 308 (81%) of the positive cases, while homeless persons accounted for 74 (19%) ($p<0.0001$). Among the contacts who tested negative on initial TST, 68 (2%) of them tested positive to follow-up TST while 110 (8%) of the remaining negative contacts tested positive on the third follow-up TST. The contacts who tested positive to TST on initial and subsequent follow-ups are called "converters". In all, 560 converters were found accounting for 15% of all the TST placed. There was a statistically significant difference between the initial, first follow-up and second follow-up converters (68% vs. 12% vs. 20%, $p<0.0001$). The mean time between initial TST placement and first follow up TST placement was 43 days (median of 67 days).

Chest Radiograph

Of the 3867 who had TST placed, 704 (18%) of them had an initial CXR of which 15 (2%) had an abnormal result.

Evaluation Completion

Of the 2566 contacts evaluated, 1948 (76%) of them completed evaluation, of which 1337 (70%) were contacts to non-homeless cases compared to 611 (30%) contacts to homeless patients ($p<0.0001$).

Diagnosis of TB

Of the 1948 contacts who received full evaluation, 5 (0.3%) were diagnosed with active TB disease while 102 (5.2%) received a diagnosis of LTBI. Of the 5 active TB cases, 3 (60%) occurred among non-homeless contacts compared to 2 (40%) among homeless contacts ($p<0.0001$). Latent

Tuberculosis Infection (LTBI) was diagnosed in 22/611 (3.6%) of homeless contacts, a significantly lower proportion than the 80/1337 (6.0%) in non-homeless contacts (p=0.0187).

Therapy Recommendation

Therapy was recommended for 427 (22%) of the 1948 contacts who had complete evaluation. Non-homeless contacts comprised 338 (79%) whereas homeless contacts consisted of 89 (21%) of these contacts (p<0.0001**)**

Type of treatment Regimen

A total of 451 contacts started treatment for TB, of which 5 were treated for active TB and 446 were offered treatment for LTBI. Isoniazid was offered to 232 (51%) of them while rifampin was offered to 219 (49%) of them. Most of the non-homeless contacts received isoniazid compared to the homeless contacts (99% vs. 1%, p=0.4653). Most of the non-homeless contacts received rifampin compared to homeless contacts (98% vs. 2%, p=1.000).

Completion of Therapy

Of the 1448 contacts who initiated treatment, 904 (62%) completed therapy while 544 (38%) did not complete therapy (p<0.0001). There was a significant difference among non-homeless contacts compared to homeless contacts in terms of treatment completion (67% vs. 61% p<0.0001). Some of the factors that accounted for treatment incompletion include loss to follow-up, refusal to continue treatment, death, and unknown factors.

Table 2: Characteristics of contacts of Tuberculosis Patients, Fulton County, Georgia, 2010-2015 (N=4742)

Characteristic	N (n=4742)	Contacts of Homeless Patients (n=1320)	Contacts of Non-Homeless Patients(n=3422)	P-Value
Level of Risk				<0.0001
High Risk	2280(48)	497(38)	1783(52)	
Medium Risk	1313(28)	579(44)	734(22)	
Low Risk	1149(24)	248(18)	901(26)	
Initial PPD Result				<0.0001
Positive	382(8)	74(6)	308(9)	
Negative	3485(74)	737(56)	2748(80)	
2^{ND} PPD Result				<0.0001
Positive	68(2)	6(1)	62(2)	
Negative	1775(38)	237(18)	1538(46)	
3^{RD} PPD Result				<0.0001
Positive	110(8)	39(8)	71(8)	
Negative	14(1)	11(2)	3(0)	
Initial X-Ray Result				0.0244
Abnormal	15(0)	2(0)	13(0)	
Normal	689(15)	165(13)	524(15)	
2^{ND} X-Ray Result				0.5189
Abnormal	1(0)	1(0)	0	
Normal	13(2)	5(2)	8(2)	
Evaluation Status				<0.0001
Complete	1948(76)	611(86)	1337(72)	

Incomplete	618(24)	96(14)	522(28)	
Diagnosis				<0.0001
Active TB	5(0)	2(0)	3(0)	
Latent TB	102(4)	22(3)	80(4)	
Therapy Recommended				<0.0001
Yes	427(10)	89(7)	338(11)	
No	3869(90)	1222(93)	2647(89)	
Regimen Type				
Isoniazid	232(57)	3(43)	229(58)	0.4653
Rifampin	219(54)	4(57)	215(54)	1.000
Completed Therapy				<0.0001
Yes	904(64)	232(67)	672(61)	
No	544(36)	112(33)	432(39)	

Abbreviations: PPD, Purified Protein Derivative

Discussion

Our study found 344 cases of TB with a cohort of 4472 contacts with a mean of 7 high-risk contacts per case from January 1, 2010 to December 31,2015 in Fulton County. Georgia. Most of these cases occurred among the non-homeless compared to the homeless population (68% vs.32%). In addition, latent TB infection was diagnosed in 22/611 (3.6%) of homeless contacts, a significantly lower proportion than the 80/1337 (6.0%) in non-homeless contacts (P = 0.0285**).** This lower incidence of latent TB infection among contacts of homeless TB cases suggests that the active case finding program in Fulton County is living up to its expectation by helping to keep the TB

transmission low among the homeless population despite recent TB outbreak among the homeless shelters (3, 11).

The surge in the number of TB cases in the year 2014 reported among the homeless was associated with an outbreak of TB among the homeless shelters in the county (3, 10-12). The active-case finding program probably contributes to early TB case detection of new cases, with referral to the County TB clinic for further evaluation and treatment. This comprehensive approach appears to have reduced on-going transmission in the homeless population and remarkably reduced the incidence of TB cases from 43 in 2014 to 19 in 2015. Males aged 45-64 years accounted for majority of the cases of TB among both the homeless and non-homeless. As reported in a previous study, risk factors for TB overlap with most of the sociodemographic risk factors associated with homelessness. Some of these overlapping risk factors include male sex, history of incarceration, substance abuse and black race (17, 18). Our study results corroborate the findings of this study in terms of this overlap in risk factors, with male sex constituting 88%, Black race 86%, and non-injection drug use 31% of the homeless TB cases reported from 2010-2015. HIV is one of the major risk factors for TB infection. Several studies have demonstrated the strong relationship between HIV and TB. Globally, TB is regarded as the leading cause of death among HIV patients (19, 20). Tiberi et. al refer to the close relationship between HIV and TB as "the cursed duet today" in their report of HIV and TB co-infection (19). The homeless population comprised 54% of the total HIV cases diagnosed among the reported TB patients, confirming the positive correlation between HIV/TB co-infection and homelessness (18). Knowledge of this positive correlation can help inform measures aimed at treatment and prevention of HIV and TB among the homeless.

In this analyses we could not evaluate in detail the delays between case identification and completion of evaluations for TB. However, the relatively high proportion of cavitary pulmonary TB and culture positivity among the homeless cases suggest, among other factors, an advanced form of TB at the time of diagnosis (17). Homeless TB cases received comprehensive case management after diagnosis, leading to satisfactory treatment outcomes. Also, the treatment completion rate of 89% met the 2015 State TB Objective and Performance Target (STOPT) for treatment completion of TB cases (88%) but fell 4% lower than the 2015 National TB Objective and Performance Target (NTOPT) for treatment completion of cases (93%) (21, 22). DOT was used for 96% of the cases among both homeless and non-homeless populations. Several studies have shown that the use of DOT contributes to high treatment adherence among TB patients (23-25). This ultimately results in high rates of treatment completion while simultaneously reducing the emergence of drug resistant strains of MTB (25-27).

Our study found a mean of 14 contacts per case with 7 of them being high-risk contacts. The mean time from identification of source case to the interview of contact was 12 days with a median of 13 days. Early screening and detection of TB has been shown to reduce the risk of transmission (28, 29). Contact screening rate was high in the county from 2010-2015 among both homeless and non-homeless contacts (82%), although contacts to non-homeless TB cases were at all time points higher than contacts to homeless cases (Figure 3). This was plausible due to the disparity in size between the two populations, despite perceptions that homeless populations are transient and therefore, more difficult to reach, and a higher TB transmission. This perception has been refuted by research done in a southern city in the United States in 2013 (13). TST positivity rate among contacts that tested negative on initial screening was relatively high. These contacts were detected because of the two-step testing of TST. Moreover, the higher number of high risk contacts detected

on screening suggests the effective nature of the active-case finding program in the county. This has been found to correlate with positive outcomes for treatment of TB and reduction in disease transmission (16). Overall, evaluation completion rate was 4% lower than the 2015 STOPT (76% vs. 80%) and 17% lower than the NTOPT for 2015 (76% vs. 93%) (21, 22) but was satisfactory among contacts to homeless cases (86%). Of those started on treatment, overall treatment completion rate was 11% lower than the 2015 STOPT (64% vs. 75%) and 15% lower than the NTOPT for 2015 (64% vs. 79%) (21, 22).

This assessment could not measure absolute incidence of TB among the homeless persons. It was only limited to describing the impact of program implementation. Also, we were not able to use the surveillance data to determine disease rate among homeless persons because of the lack of Census data on homeless population. Therefore, annual proportions of all TB cases reported among the homeless was calculated. Some outcomes of interest may be difficult to determine, such as precise chain of TB transmission over time.

Conclusions

The active-case finding program identified 0.3% additional TB cases and appeared to be effective in preventing TB transmission among the homeless population in Fulton County from 2010-2015. However, the study found lower treatment completion rate among contacts to homeless TB cases. Further studies need to be conducted to assess the factors associated with lower treatment completion rate among contacts to homeless TB cases in Fulton County.

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