INT J TUBERC LUNG DIS 3(7):613–619

Spot sputum screening: evaluation of an intervention in two homeless shelters

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SUMMARY

SETTING: Two homeless shelters in Birmingham, Alabama.

OBJECTIVE: To interrupt tuberculosis transmission and evaluate the utility of spot sputum screening.

DESIGN: Two shelters participated in the study between May 1996 and February 1997. A spot sputum specimen was collected on a given evening from each overnight client. Information was obtained regarding symptoms and tuberculin skin test (TST) status. There were four screenings during two rounds, with TST in round one only.

RESULTS: Of 127 persons involved in the study, 120 (95%) provided specimens, and four tuberculosis cases were identified (4/127, 3.1%). Symptoms were infrequently reported. RFLP analysis (IS*6110*) confirmed a two-band cluster in three of the four cases; another matching two-band strain was found in a drug rehabilitation client staying in one shelter. Secondary RFLP typing (pTBN12) confirmed the homeless cluster. Costs were $1311 per case identified. Among 92 clients with a prior TST, 40% reported a positive result (37/92). Of 21 PPD tests read, 11 were ⩾10 mm (52%).

CONCLUSION: Spot sputum screening is effective in identifying unsuspected tuberculosis cases in shelters. It has acceptable costs, is logistically simple and efficient. Symptom screening was not useful in this general homeless population. RFLP analysis showed cloning of the two-band strain. Given the evidence for ongoing transmission, sputum screening should be considered in shelter settings.

KEY WORDS: tuberculosis; homeless persons; sputum; polymorphism, restriction fragment length

SCREENING OF HIGH-RISK populations has emerged as an important aspect of the strategy for eliminating tuberculosis in the United States. The Centers for Disease Control and Prevention (CDC) has established infection-control guidelines for various congregate settings such as nursing homes, correctional facilities, hospitals and homeless shelters.[1–3] In general, two essential steps are recommended. Foremost is the early identification and adequate treatment of active pulmonary cases in order to interrupt transmission with an emphasis on directly observed therapy. Concurrent with therapy initiation and appropriate isolation procedures is a thorough contact investigation around the index case or tuberculosis suspect. Contact screening utilizes the Mantoux tuberculin skin test (TST) with consideration for preventive therapy. Skin testing programs for health care workers, other employees considered at risk, inmates and nursing home clients are also employed.

With regard to high-risk homeless persons, particularly those in shelter settings, several primary screening procedures have been used: symptoms evaluation, TST and chest radiography (CXR). The greatest yield of active cases has come from the screening of clinic-based populations as opposed to general shelter populations. In New York City, two shelter clinic screenings yielded from 4.5% to 5.5% active tuberculosis cases, while screening of a general shelter population found only seven new cases among the several thousand screened either by TST or with CXR.[4]

In Birmingham, Alabama (metropolitan area population 651 525), the homeless accounted for 29% (51/175) of all new tuberculosis cases diagnosed during the period 1994–1995. Based on homeless community survey results, the 1995 case detection rate was 1103 per 100 000 homeless. Given this extraordinarily high rate of disease in addition to evidence of an ongoing epidemic among the homeless using restriction-fragment-length polymorphism (RFLP) analysis,[5] we developed an intervention program during 1996–1997 in two city shelters utilizing a spot sputum specimen for examination and culture, col-

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Article submitted 26 May 1998. Final version accepted 17 February 1999.

lected on a given evening from each overnight shelter client.

We report our experience from a 10-month trial period. While our primary goal is to decrease tuberculosis morbidity and transmission among the homeless, our evaluation focuses on two intermediate objectives: 1) to assess both the feasibility and utility of spot sputum screening in shelters to identify unexpected pulmonary cases, and 2) to evaluate the usefulness of symptom screening among a general homeless clientele.

STUDY POPULATION AND METHODS

Screening rationale

There were several considerations in choosing a single spot sputum examination methodology. First, the Birmingham area is experiencing a tuberculosis epidemic among the homeless, with evidence of recent transmission and spillover to the greater community.[5] Given a homeless disease rate that exceeds the general rates of developing countries, the established international priority in such country settings is to find and treat smear-positive pulmonary cases starting with a spot sputum sample.[6] Second, logistical requirements for sputum collection are relatively simple (sputum tube, postal mailer, registration form), and existing health department procedures could be readily utilized. Neither a mobile radiography unit nor transportation to the county health department is available. Additionally, data from community-based Health Care for the Homeless showed a return rate for TST measurement of only 46% (273/599) at their inner city clinic during the preceding 6-month period (October 1995–March 1996). Normally, all patients with a positive Mantoux skin test (purified protein derivative [PPD], 5 tuberculin units) are referred to the health department for evaluation. Finally, spot sputum samples can be collected during a single encounter, in contrast to TST, which requires a minimum of two encounters, for placement and reading, or more if a chest radiograph is required.

Intervention sites and protocol

The health department conducted sputum screening in the two largest downtown shelters, which serve men only. There were two screening rounds, 10 months apart, in each location starting in 1996: shelter A (bed capacity 40)—May and November; shelter B (bed capacity 80)—June and February (1997). Skin testing was done during round one only. A brief questionnaire was used to assess clients for symptoms of active tuberculosis disease, history of homelessness and prior preventive or multidrug therapy. All screenings were done during the evening hours before the assignment of beds to registered clients, which was the only time that their movements could be controlled. All clients identified with tuberculosis disease are tested for human immunodeficiency virus (HIV) infection; patients who are positive by enzyme-linked immunosorbent assay are confirmed by Western blot analysis.

Sample handling and analysis

Sputum samples are collected in screw-top polypropylene tubes, refrigerated overnight and sent the following workday by postal service to the state mycobacteriology laboratory in Montgomery. Specimens are stained for acid-fast bacilli (AFB) using Kinyoun's modification[7–10] and cultured on solid media (Middlebrook 7H-11 and Löwenstein-Jensen). Positive smears are reported by telephone within 24 hours of specimen receipt. *Mycobacterium tuberculosis* identification is by high performance liquid chromatography (HPLC).[11–13]

RFLP analysis with IS*6110* is done at the University of Alabama at Birmingham (UAB) according to standard method.[14] Each gel is read independently by two persons who are blinded to patients' epidemiologic data. Whole Band Analyzer, version 3.3 (Bio Image, Inc., Ann Arbor, MI) is also used. Secondary typing with plasmid pTBN12 is done for all IS*6110*-determined clusters with a low-band number (<6).[15,16] An IS*6110* cluster is defined as two or more patients with identical patterns. A pTBN12 subcluster is defined as two or more patients with identical patterns by visual inspection, independently confirmed by two persons.

Client information was analyzed using the software package Epi Info 6.03 (CDC, public domain). Names were checked to ensure that no one was counted twice. For any client interviewed twice, the initial screening data was used. In calculating screening costs, however, all the sputum specimens collected ($n = 128$) were included.

RESULTS

Client population and tuberculin skin testing

A total of 127 persons were interviewed (Table 1); nine were encountered twice. Ninety-two clients reported a prior skin test, the majority (58/92) during the previous two years. Although confirmation of results was known for only a few, 40% (37/92) reported a prior positive TST. Among these 37, 15 reported receiving isoniazid therapy, eight multi-drug therapy and 12 no therapy. During round 1, PPD placement was done on 26 persons; 21 (81%) were read by a health department nurse. Ten were negative at 48–72 hours while 11 (52%) were positive at $\geqslant$10 mm (mean 17, median 14, range 11–40 mm).

Case detection and presence of symptoms

Of the 127 persons interviewed, 120 (95%) provided a sputum specimen; eight gave a second specimen during subsequent screenings. Four tuberculosis cases (Table 2) were identified and confirmed by culture,

Table 1 Characteristics of individuals screened

Total number screened	127
Age in years (SD*)	40.8 (±9.4)
Race	
White	18 (14.3%)
Black	102 (81.0%)
Hispanic white	4 (3.2%)
Hispanic black	2 (1.6%)
Sex	
Male	127 (100%)
Shelter	
A	70 (55.4%)
B	57 (44.9%)
Length of current stay in days (SD*)	53.1 (±121.3)
Prior TST	92 (72.4%)
Positive by report	37 (40.2%)

* SD = standard deviation; TST = tuberculin skin test.

yielding a disease prevalence of 3.1% (4/127). There were no cases among the clients screened twice. Only one person was AFB smear-positive at screening. Two cases were found in each shelter; their current lengths of stay ranged from 1 to 548 days. Two were from Birmingham, one from another area of the state and one from Michigan. The latter had been staying at the shelter since arriving 4 months previously. All four were HIV-negative. RFLP analysis with IS*6110* revealed two unique patterns of 2 and 11 bands; three of the four were clustered into the 2-band group (Figure). The fourth client (11-bander) was the recent migrant from Michigan. Secondary analysis with pTBN12 confirmed that all three two-banders matched. Individuals in this cluster came from both shelters, and sputum samples were collected on three separate days. All cases had abnormal chest radiographs consistent with tuberculosis disease.

Symptoms were infrequently reported by shelter clients (n = 127): productive cough 7%, weight loss 4%, dyspnea 3%, night sweats 2%, fatigue 2%. Only one of four cases reported a productive cough; he was AFB-positive on sputum examination and had a cavity on CXR. All four cases were started on directly observed anti-tuberculosis therapy (DOT), and completed treatment without incident. Culture confirmation took 20, 21, 24 and 36 days, respectively. The last patient was smear-negative with culture growth of only seven colonies and an abnormal CXR. Time to initiation of treatment took an additional 1 to 5 days after the culture report date (reported by telephone on the same day). One client, hospitalized 2 weeks after the screening, was started on therapy before screening culture results were known (24 colonies, smear-negative). This patient underwent a bronchial wash (smear and culture positive); sputum smears remained negative.

During the intervention period, an additional case (sputum smear-negative, culture-positive) was identified in a shelter B worker with a positive TST (25 mm). Another case (sputum smear-negative, culture-positive) was found in a client enrolled in a shelter B drug rehabilitation program located in an adjacent building, identified after required TST screening (positive at 15 mm) for program entry. Both cases were HIV-negative, and their IS*6110* patterns were unique (Figure). The substance abuse center client had the same two-band pattern as seen in the homeless cluster. His sputum sample was collected on a different date in July, 1996; secondary analysis with pTBN12 showed a unique pattern (Figure). Interestingly, he had recently migrated to Birmingham from Atlanta. Both patients had abnormal CXR.

Screening feasibility and costs

Each screening was conducted by two to four persons from the health department, including one registered nurse plus additional tuberculosis control staff. Cost analysis is based on a mean of three persons, which was found to be the minimal number of staff required for an efficient encounter. Each screening was completed in approximately 2 hours. Total person-hours (p-h) for the four screenings were 24 (three staff × 2 hours/

Table 2 Characteristics of identified cases

Case	#1	#2	#3	#4
Age (years)	29	38	62	44
Race	Black	White	Black	Black
Shelter	A	B	B	A
Date screened	5/21/96	6/17/96	6/17/96	11/26/96
Smear results	Negative	Positive	Negative	Negative
Culture results*	Positive (7 colonies)	Positive (3+)	Positive (2+)	Positive (24 colonies)
Symptoms†	No	Yes	No	No
Prior tuberculin skin test	No	Yes	Yes	Yes
Result	—	Positive	Positive	Negative
Prior tuberculosis therapy	None	Multi-drug	None	None
RFLP pattern (# of bands)‡	2	11	2	2

* 1+ (50–100 colonies), 2+ (>100–200 colonies), 3+ (>200–500 colonies), 4+ (confluent).
† Productive cough.
‡ IS*6110*.

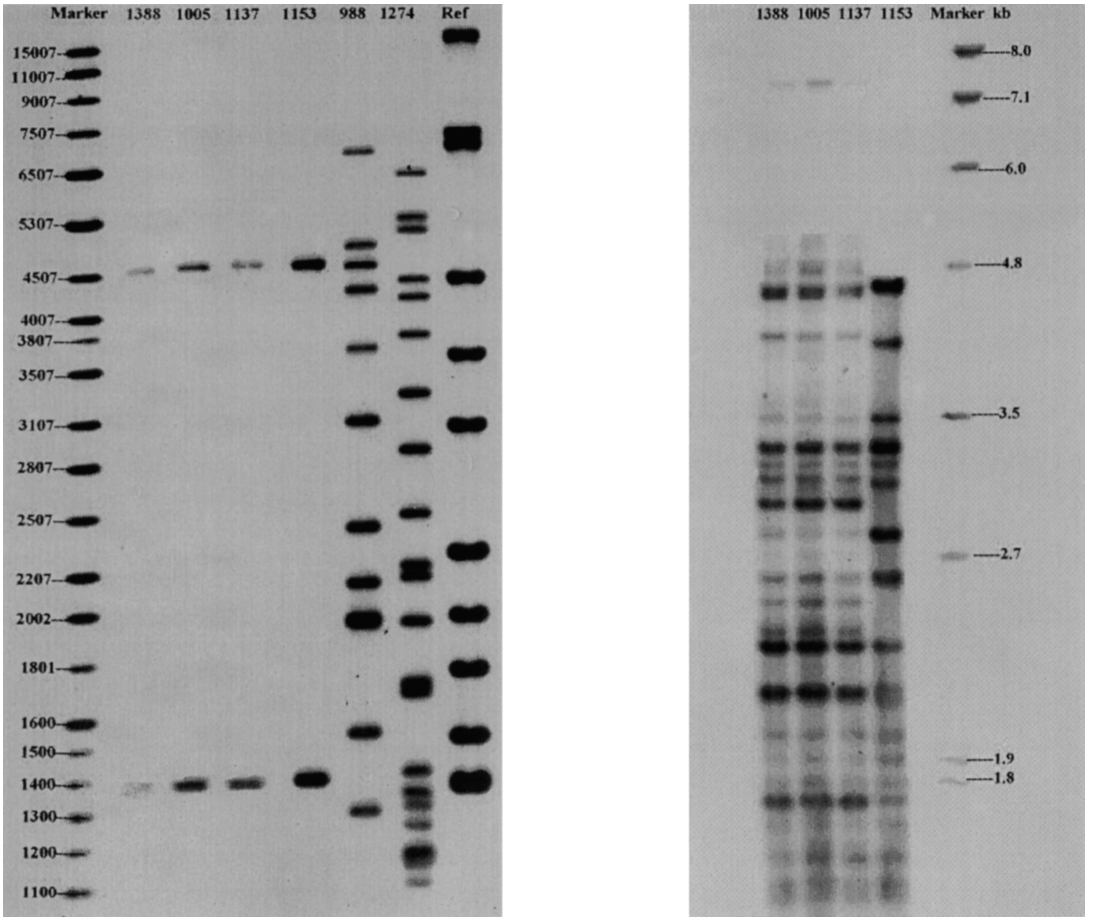

Figure RFLP results by IS*6110* and pTBN12 analysis of *M. tuberculosis* isolates from cases identified. The panel A (left) southern blot shows the results of IS*6110* RFLP analysis with a standard reference strain on the far right and CDC marker (with the number of bases indicated) on the far left. Numbers 1388, 1005, 1137 and 988 represent *M. tuberculosis* isolates collected from the homeless shelter cases; number 1153 is from the drug rehabilitation client, and number 1274 from the shelter staff person. The panel B (right) southern blot shows the results of secondary RFLP typing with pTBN12. A CDC standard is shown on the far right (with the number of kb indicated) Only the two-band (JH2) cluster is shown, according to the number sequence used in Panel A. Numbers 1388, 1005 and 1137 represent an identical IS*6110*/pTBN12 cluster. Number 1153 shows differences in the pTBN12 banding pattern over the molecular weight range of 1.9 to 3.5 kb, implying non-clonality.

screening × 4 screenings). Staff costs were calculated using the median salary for a health department nurse ($16.76/hour). Total staff costs were therefore $402.24 (24 p-h × $16.76/hour). Overtime pay was not required. Specimen cost was based on required postage per sample ($2.60) plus state laboratory processing fees ($35.23), which include staff salary, sputum tubes and mailers, giving total specimen costs of $4842.24 (128 samples × $37.83/sample). The sum total for the four cases found using the described screening method was $5244.48, or $1311.12 per case identified.

DISCUSSION

Given health department constraints, it is essential that available resources be utilized in a cost-effective way. Screening of high-risk populations using various strategies is well-established. However, the method employed and the group targeted for screening may differ by location and over time, depending upon local epidemiologic disease patterns. In this report, we present our experience with spot sputum screening in a mid-sized urban center. Initiation of this intervention was based upon the recognition of a significant tuberculosis epidemic affecting the area's homeless, and our intent to interrupt transmission.

We found an unexpected 3.1% (4/127) prevalence of active pulmonary tuberculosis cases in a general homeless shelter population through four screenings during 10 months. These results are similar to those described from New York City using clinic-based screening.[4] Of the two additional (non-homeless) cases detected at shelter B, one (shelter worker) was identified as a direct consequence of the screenings; the other was found coincidentally following routine procedures. Latent tuberculosis infection was documented in 52% of those not previously screened, similar to homeless data reported elsewhere.[17–19] While it

is clear that the health department can effectively deliver DOT (all cases found completed therapy), it is also evident that routine case finding methods normally used in this at-risk population and in the shelter setting are inadequate. The inherent difficulties of screening homeless persons through skin testing and the additional difficulties in assuring adequate preventive therapy are widely reported,[20–25] thus highlighting the challenge to develop alternative strategies.

To our surprise, symptoms were reported by only one of four cases identified, implying that such questioning is less reliable in this setting and of limited value. Productive cough was the most common symptom noted among all clients, including the single AFB smear-positive case. In a recent study that utilized symptom screening among indigent persons seeking social services in a large urban center, only 55% of tuberculosis cases discovered (6/11) reported symptoms upon initial questioning.[25] Unlike our findings, where no case was HIV-infected and all were tested, the study's authors found HIV infection in five of the six cases tested, which could explain the higher proportion of symptomatic patients. Similar to our findings, they found a positive AFB sputum smear in only 27% of cases (versus 25% in our study using a single spot sputum).

While sputum examination, even under optimal conditions, is not as sensitive as chest radiography, it is more specific, less costly and simple to perform. Since we have limited capacity for mass CXR screening, we were unable to compare the two methods directly. The efficiency of a mass CXR approach, however, in homeless or similar at-risk populations is unclear, and CXR screening requires additional resources.[25–27] In a study by Patel et al.,[28] some success was obtained with mobile CXR screening using food vouchers as inducements, yet only 47% of at-risk residents responded to the program. From 1978–1982, they found 133 cases (1.5%) of active pulmonary tuberculosis by routine CXR examination among 9132 persons living in lodging houses.

An important cautionary aspect of our screening approach is the time required for a culture-based diagnosis, especially if the specimen is AFB-negative (75% of cases found). For a smear-negative client, this leads to a potential delay in initiation of therapy. However, we found that cultures became positive most often within 20–24 days, up to a maximum of 36 days. The public health significance of any delay is predominantly in terms of patient morbidity and potential transmission by contagious cases. While all patients identified were treated successfully, the client with smear-positive disease was started on therapy within 3 days of the screening, and all cases were started on anti-tuberculosis therapy within 5 days of the culture report date. Nonetheless, given that symptom screening was of limited value, spot sputum analysis did succeed in finding unexpected cases at an acceptable cost without requiring additional personnel or equipment. In the future, however, it is important that more sensitive and rapid amplification methods for detection of *M. tuberculosis* be evaluated in the homeless shelter setting. If found beneficial, they could play an important role in targeted screening services.

RFLP results were useful in several respects. By initially using IS*6110* data, we discovered a micro-epidemic involving three homeless persons (75% of cases found) plus one drug rehabilitation client, indicating a probable yet unknown common source case or frequented location (i.e., street, shelter). It is likely that homeless shelter clients and residents involved in substance abuse programs intermingle. Despite IS*6110* low-copy numbers, this cluster of cases was epidemiologically linked to two shelters. Secondary analysis with pTBN12 confirmed the homeless group linkage and clearly indicates clonality of the infecting organism. The fourth person in the IS*6110* cluster was found to have a unique pattern by pTBN12 analysis and was likely infected before arriving in Birmingham.

There was no evidence for laboratory cross-contamination during the screenings. The three IS6110/pTBN12 clustered specimens were collected in either shelter and processed on separate dates. All cases had abnormal CXR consistent with tuberculosis disease. We did encounter the common two-band pattern (JH2) previously reported among clustered Birmingham-Jefferson County homeless patients during 1994–1995.[5] Given a statewide JH2 background rate of 18% and a 34% JH2 predominance in the Birmingham area (67% among homeless cases), transmission among the homeless population appears ongoing and is likely occurring in these two shelters.

CONCLUSIONS

In summary, our intervention utilizing spot sputum analysis is both feasible and effective in identifying unsuspected pulmonary tuberculosis cases among a general, high-risk shelter population. As the costs are acceptable, one can view it as an intermediate step in controlling disease transmission in such settings until more effective measures can be established. One proposed environmental measure is the use of ultraviolet germicidal irradiation (UVGI) air disinfection as part of a multi-pronged control strategy.[1,2,29–31] However, there are no data from controlled clinical trials of UV lights in shelter settings that assess their effectiveness under varying field conditions.[32] These studies are just now underway. Additionally, our findings indicate that symptom screening is not useful in this general homeless population.

Concerning community involvement, shelter management was supportive of screening activities, and a partnership with community-based Health Care for the Homeless was also strengthened. Future efforts will depend on these collaborations and will continue

to be guided by ongoing evaluation of the local epidemiologic picture.

Acknowledgements

The authors would like to thank the management and staff of The Firehouse Shelter and The Jimmy Hale Mission for their cooperation with the Jefferson County tuberculosis control program. Their service to the homeless community is unabating. We also thank Ms Gwendalyn Curtis, the area tuberculosis control program manager during the evaluation period, for her assistance. Dr Jack Crawford kindly provided us with the CDC standards used for the RFLP IS*6110* analysis.

Partial funding was through CDC Cooperative Agreement #C60117087.

References

1 Prevention and control of tuberculosis in US communities with at-risk minority populations and prevention and control of tuberculosis among homeless persons. MMWR Morb Mortal Wkly Rep 1992; 41(RR-5): 1–23.

2 Guidelines for preventing the transmission of *Mycobacterium tuberculosis* in health-care facilities. MMWR Morb Mortal Wkly Rep 1994; 43(RR-13): 1–132.

3 Prevention and control of tuberculosis in correctional facilities. MMWR Morb Mortal Wkly Rep 1996; 45(RR-8): 1–27.

4 Brickner P W, Scharer L L, McAdam J M. Tuberculosis in homeless populations. In: Reichman L B, Hershfield E S, eds. Tuberculosis: a comprehensive international approach. New York: Marcel Dekker Inc. 1993; 433–454.

5 Kimerling M E, Benjamin W H, Lok K H, Curtis G, Dunlap N E. Restriction-fragment-length polymorphism (RFLP) screening of MTB isolates: population surveillance for targeting disease transmission in a community. Int J Tuberc Lung Dis 1998; 2: 655–662.

6 Enarson D A, Rieder H L, Arnadottir T, Trébucq A. Tuberculosis guide for low income countries. 4th ed. Germany: IUATLD 1996: 1–65.

7 David H L. Bacteriology of the mycobacterioses, Atlanta: Centers for Disease Control, PHS, HEW, 1976. (Available from Superintendent of Documents, US Government Printing Office, Washington, DC 20402).

8 Kinyoun J J. A note on Uhlenhuth's method for sputum examination for tubercle bacilli. Am J Public Health 1915; 5: 867–870.

9 Lennette E H, Spaulding E H, Truant J P. Manual of clinical microbiology. 2nd ed. Washington, DC: American Society for Microbiology 1974.

10 Smithwick R W. Laboratory manual for acid-fast microscopy. 2nd ed. Atlanta: Centers for Disease Control, 1976.

11 Butler W R, Kilburn J O. Identification of major slowly growing pathogenic mycobacteria and *Mycobacterium gordonae* by high-performance liquid chromatography of their mycolic acids. J Clin Microbiol 1988; 26: 50–53.

12 Butler W R, Kilburn J O. High performance liquid chromatography patterns of mycolic acids as criteria for the identification of *Mycobacterium chelonae*, *Mycobacterium fortuitum*, and *Mycobacterium smegmatis*. J Clin Microbiol 1990; 28: 2094–2098.

13 Butler W R, Thibert L, Kilburn J O. Identification of *Mycobacterium avium* complex strains and some similar species by high-performance liquid chromatography. J Clin Microbiol 1992; 30: 2698–2704.

14 Van Embden J D A, Cave M D, Crawford J T, et al. Strain identification of *Mycobacterium tuberculosis* by DNA fingerprinting: recommendations for a standardized methodology. J Clin Microbiol 1993; 31: 406–409.

15 Warren R, Richardson M, Sampson S, et al. Genotyping of *Mycobacterium tuberculosis* with additional markers enhances accuracy in epidemiologic studies. J Clin Microbiol 1996; 34: 2219–2224.

16 Yang Z, Chaves F, Barnes P F, et al. Evaluation of method for secondary DNA typing of *Mycobacterium tuberculosis* with pTBN12 in epidemiologic study of tuberculosis. J Clin Microbiol 1996; 34: 3044–3048.

17 McAdam J M, Brickner P W, Scharer L L, Crocco J A, Duff A E. The spectrum of tuberculosis in a New York City men's shelter clinic (1983–1988). Chest 1990; 97: 798–805.

18 Paul E A, Lebowitz S M, Moore R E, Hoven C W, Bennett B A, Chen A. Nemesis revisited: tuberculosis infection in a New York city men's shelter. Am J Public Health 1993; 83: 1743–1745.

19 Zolopa A R, Hahn J A, Gorter R, et al. HIV and tuberculosis in San Francisco's homeless adults: prevalence and risk factors in a representative sample. JAMA 1994; 272: 455–461.

20 Nardell E A. Tuberculosis in homeless, residential care facilities, prisons, nursing homes, and other close communities. Semin Respir Infect 1989; 4: 206–215.

21 Tuberculosis among residents of shelters for the homeless—Ohio, 1990. MMWR Morb Mortal Wkly Rep 1991; 40: 869–877.

22 Nazar-Stewart V, Nolan C M. Results of a directly observed intermittent isoniazid preventive therapy program in a shelter for homeless men. Am Rev Respir Dis 1992; 146: 57–60.

23 Polesky A, Farber H W, Gottlieb D J, et al. Rifampin preventive therapy for tuberculosis in Boston's homeless. Am J Respir Crit Care Med 1996; 154: 1473–1477.

24 Pilote L, Tulsky J P, Zolopa A R, Hahn J A, Schecter G F, Moss A R. Tuberculosis prophylaxis in the homeless. Arch Intern Med 1996; 156: 161–165.

25 Schluger N W, Huberman R, Wolinsky N, Dooley R, Rom W N, Holzman R S. Tuberculosis infection and disease among persons seeking social services in New York City. Int J Tuberc Lung Dis 1997; 1: 31–37.

26 Ramsden S S, Baur S, El Kabir D J. Tuberculosis among the central London single homeless. J Roy Coll Physicians Lond 1988; 22: 16–17.

27 Pelletier A R, DiFerdinando G T, Greenberg A J, et al. Tuberculosis in a correctional facility. Arch Intern Med 1993; 153: 2692–2695.

28 Patel K R. Pulmonary tuberculosis in residents of lodging houses, night shelters and common hostels in Glasgow: a 5-year prospective survey. Br J Dis Chest 1985; 79: 60–66.

29 Iseman M D. A leap of faith: what can we do to curtail intrainstitutional transmission of tuberculosis? Ann Intern Med 1992; 117: 251–253.

30 Nardell E A. Interrupting transmission from patients with unsuspected tuberculosis: a unique role for upper-room ultraviolet air disinfection. Am J Infect Control 1995; 23: 156–164.

31 ACCP consensus statement. Institutional control measures for tuberculosis in the era of multiple drug resistance. Chest 1995; 108: 1690–1710.

32 Occupational Safety and Health Administration. Occupational exposure to tuberculosis: proposed rule. Fed Reg 1997; 62: 54299.

RÉSUMÉ

CADRE : Deux refuges pour personnes sans-abri, Birmingham, Alabama.

OBJECTIF : Interrompre la transmission de la tuberculose et évaluer l'utilité d'un dépistage par expectoration sur place.

SCHÉMA : Deux refuges ont participé à l'étude entre mai 1996 et février 1997. Un spécimen d'expectoration a été prélevé sur place, un soir donné, pour chaque client d'une nuit. Des informations ont été obtenues en ce qui concerne leurs symptômes et leur statut tuberculinique (TST). Il y a eu quatre dépistages au cours de deux séries, mais le TST n'a été réalisé qu'une seule fois.

RÉSULTATS : Des échantillons ont été fournis par 120 des 127 personnes (95%). Quatre cas de tuberculose ont été identifiés (4/127, soit 3.1%). Les symptômes n'ont été que rarement signalés. L'analyse RFLP par IS*6110* a confirmé une grappe avec présence de deux bandes chez trois des quatre sujets ; une autre souche à deux bandes correspondantes a été décelée chez un client en voie de réhabilitation pour drogue dans un abri. Un typage secondaire par RFLP (au moyen de pTNB12) a confirmé la grappe chez les sans-abri. Les coûts ont été de 1311 US$ par cas identifié. Parmi les 92 clients qui disposaient d'un test tuberculinique antérieur, 40% ont signalé un résultat positif (37/92) ; des 21 tests à la PPD lus, 11 (52%) s'avérèrent ⩾10 mm.

CONCLUSION : Un dépistage par expectoration sur place est efficace pour l'identification de cas non suspectés de tuberculose dans des refuges. Il est aisé sur le plan logistique, efficace, et son coût est acceptable. Le dépistage des symptômes ne s'est pas avéré utile dans cette population générale de sans-abri. L'analyse par RFLP a démontré un clone de souches à deux bandes. Vu l'existence courante d'une transmission, le dépistage de l'expectoration devrait être envisagé dans le cadre des refuges.

RESUMEN

MARCO DE REFERENCIA : Dos refugios para personas sin hogar en Birmingham, Alabama.

OBJETIVO : Interrumpir la transmisión de la tuberculosis y evaluar la utilidad de la detección por examen de esputos en el lugar.

MÉTODO : Participaron dos refugios (mayo 1996–febrero 1997). Se recogió en el lugar una muestra de esputos en una noche determinada por cada persona alojada. Se obtuvo información sobre los síntomas y la reacción tuberculínica (TST). Hubo cuatro detecciones en dos rondas y TST sólo en una ronda.

RESULTADOS : Se obtuvieron muestras de 120 sobre un total de 127 personas (95%). Se identificaron cuatro casos de tuberculosis (47/127, 3,1%). Los síntomas eran escasos. El análisis RFLP (IS*6110*) confirmó un conglomerado de dos bandas en tres de cuatro y se halló otra cepa coincidente de dos bandas en una persona en rehabilitación por drogo-dependencia ubicada en un refugio. La tipificación RFLP secundaria (pTBN12) confirmó el conglomerado de las personas sin hogar. Cada caso identificado costó la suma de US$ 1311. Sobre 92 personas con TST previo, el 40% mostraron un resultado positivo (37/92). Sobre 21 tests de PPD leídos, 11 eran ⩾10 mm (52%).

CONCLUSIÓN : La detección por examen de esputos en el lugar es efectivo para identificar a los tuberculosos desconocidos en los refugios. Tiene costos aceptables, es logísticamente simple y eficaz. La detección de síntomas no fue útil en esta población sin hogar. El análisis RFLP mostró clonación en la cepa en dos bandas. Dada la evidencia de la transmisión continuada se debe considerar la detección de esputos en el contexto de refugios.