

Abstract

Results of the 2020 Homeless Tuberculosis (TB) Screening in South Korea

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Tuberculosis(TB) is a respiratory infection caused by *Mycobacterium tuberculosis*. TB can be completely cured by taking regular medication for more than six months. However, homeless people are a high-risk group for TB due to poor housing, hygiene, and nutritional conditions, and low accessibility to medical use. The aim of this study was to report results of Korea Disease Control and Prevention Agency's (KDCA) 2020 homeless TB screening in South Korea.

12,692 people were participated in total; homeless on streets 1,859, homeless in shelters 6,531, residents of jjokbangs 3,006, undocumented residents/registered foreigners 297, workers in shelters 999. As homeless people are recommended to be screened more than once every six months, 15,777 screenings were conducted. As a result of chest x-rays (15,777) and sputum examinations (2,362), 21 TB patients (165.5 people per 100,000 population) were reported. This was about 4.3 times higher than the incidence of TB in the general population (38.8 people per 100,000 population, 19,933 people).

In the case of males, elderly people, symptoms of TB, histories of TB, drinking, and underlying diseases, no TB screenings in the last year increased the TB incidence. The treatment status of 21 TB patients found is 2 were cured and 1 was completed their treatment, and 17 were undergoing treatment and one returned home infection disappeared.

The KDCA is continuing its homeless TB screening project in 2021. This will strengthen the management of TB and resolve blind spots for vulnerable groups by supporting various health and welfare links to expand screening of undocumented residents and improve the success rate of treatment for TB patients.

Keywords: Tuberculosis (TB), Homeless, Mass Screening, X-Rays, Sputum, Incidence

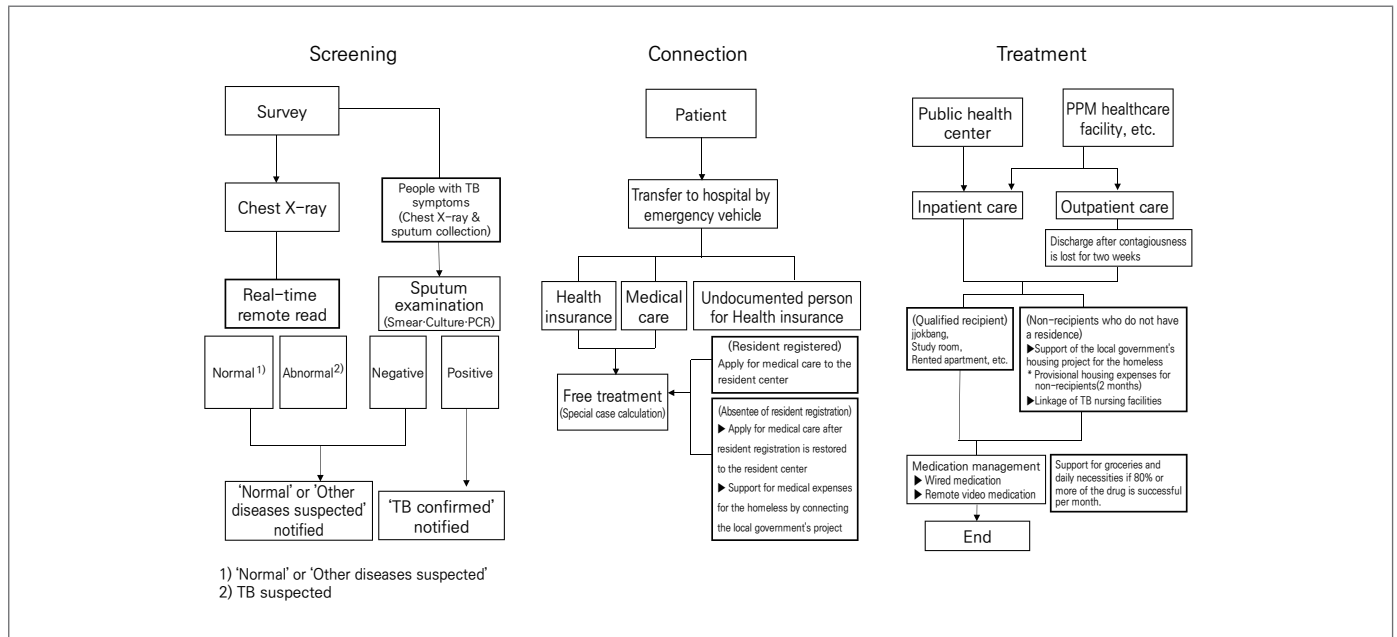


Figure 1. Protocol for the management of tuberculosis (TB) screening and treatment of homeless people

Table 1. General characteristics of screening participants and tuberculosis (TB) patients

| Variables | Screening participants | TB patients | |
|----------------------------|------------------------|-------------------|--|
| | n (%) | n (%) | Incidence rate (per 100,000 people) |
| Total | 12,692 (100.0) | 21 (100.0) | 165.5 |
| Sex | | | |
| Male | 9,675 (76.2) | 18 (85.7) | 186.0 |
| Female | 3,017 (23.8) | 3 (14.3) | 99.4 |
| Nationality | | | |
| Korean | 12,378 (97.5) | 19 (90.5) | 153.5 |
| Non-Korean | 314 (2.5) | 2 (9.5) | 636.9 |
| Age | | | |
| < 40 | 1,184 (9.3) | 1 (4.8) | 84.5 |
| 40-44 | 760 (6.0) | 0 (0.0) | 0.0 |
| 45-49 | 1,198 (9.5) | 0 (0.0) | 0.0 |
| 50-54 | 1,701 (13.4) | 3 (14.3) | 176.4 |
| 55-59 | 2,068 (16.3) | 5 (23.8) | 241.8 |
| 60-64 | 2,232 (17.6) | 3 (14.3) | 134.4 |
| 65-69 | 1,577 (12.4) | 3 (14.3) | 190.2 |
| 70-74 | 904 (7.1) | 2 (9.5) | 221.2 |
| 75-79 | 647 (5.1) | 2 (9.5) | 309.1 |
| ≥ 80 | 421 (3.3) | 2 (9.5) | 475.1 |
| Type of insurance | | | |
| Health insurance(work) | 2,068 (16.3) | 0 (0.0) | 0.0 |
| Health insurance(district) | 2,166 (17.1) | 7 (33.3) | 323.2 |
| Medical care | 7,670 (60.4) | 9 (42.9) | 117.3 |
| Missing | 788 (6.2) | 5 (23.8) | 634.5 |
| Underlying disease | | | |
| Yes | 5,085 (40.0) | 10 (47.6) | 196.7 |
| No | 7,395 (58.3) | 10 (47.6) | 135.2 |
| Unknown | 212 (1.7) | 1 (4.8) | 471.7 |
| Smoking | | | |
| Yes | 6,014 (47.4) | 9 (42.9) | 149.7 |
| No | 6,678 (52.6) | 12 (57.1) | 179.7 |
| Drinking | | | |
| Yes | 3,558 (28.0) | 8 (38.1) | 224.8 |
| No | 9,134 (72.0) | 13 (61.9) | 142.3 |
| TB symptoms | | | |
| Yes | 385 (3.0) | 6 (28.5) | 1558.4 |
| No | 12,191 (96.1) | 14 (66.7) | 114.8 |
| Unknown | 116 (0.9) | 1 (4.8) | 862.1 |
| TB history | | | |
| Yes | 1,375 (10.8) | 3 (14.3) | 218.2 |
| No | 10,550 (83.1) | 16 (76.2) | 151.7 |
| Unknown | 767 (6.1) | 2 (9.5) | 260.8 |

| Variables | Screening participants | TB patients | |
|---|------------------------|-------------|--|
| | n (%) | n (%) | Incidence rate (per 100,000 people) |
| TB screening for the past year | | | |
| Yes | 8,925 (70.3) | 13 (61.9) | 145.7 |
| No | 3,363 (26.5) | 8 (38.1) | 237.9 |
| Unknown | 404 (3.2) | 0 (0.0) | 0.0 |
| Group | | | |
| Homeless in street | 1,859 (14.6) | 3 (14.3) | 161.4 |
| Homeless in shelter | 6,531 (51.5) | 8 (38.1) | 122.5 |
| Residents in Chok bang | 3,006 (23.7) | 8 (38.1) | 266.1 |
| Unqualified residents /Registered foreigners | 297 (2.3) | 2 (9.5) | 673.4 |
| Workers in shelter | 999 (7.9) | 0 (0.0) | 0.0 |
| Area | | | |
| Seoul | 5,354 (42.2) | 12 (57.1) | 224.1 |
| Busan | 873 (6.9) | 2 (9.5) | 229.1 |
| Daegu | 1,120 (8.8) | 3 (14.2) | 267.9 |
| Incheon | 487 (3.8) | 0 (0.0) | 0.0 |
| Gwangju | 133 (1.0) | 0 (0.0) | 0.0 |
| Daejeon | 845 (6.7) | 1 (4.8) | 118.3 |
| Ulsan | 36 (0.3) | 0 (0.0) | 0.0 |
| Sejong | 117 (0.9) | 1 (4.8) | 854.7 |
| Gyeonggi | 916 (7.2) | 1 (4.8) | 109.2 |
| Gangwon | 177 (1.4) | 0 (0.0) | 0.0 |
| Chungbuk | 686 (5.4) | 0 (0.0) | 0.0 |
| Chungnam | 104 (0.8) | 0 (0.0) | 0.0 |
| Jeonbuk | 203 (1.6) | 0 (0.0) | 0.0 |
| Jeonnam | 622 (4.9) | 0 (0.0) | 0.0 |
| Gyeongbuk | 327 (2.6) | 0 (0.0) | 0.0 |
| Gyeongnam | 549 (4.3) | 0 (0.0) | 0.0 |
| Jeju | 143 (1.2) | 1 (4.8) | 699.3 |

Table 2. Examination results of screening participants and tuberculosis (TB) patients

| Variables | Screening participants | TB patients |
|--|------------------------|-------------|
| | n (%) | n (%) |
| Chest x-ray | | |
| Total | 15,777 (100.0) | 21 (100.0) |
| Normal | 11,494 (72.8) | 0 (0.0) |
| Need treatment* | 14 (0.1) | 2 (9.5) |
| Observation required† | 232 (1.5) | 12 (57.1) |
| Inactive TB‡ | 2,083 (13.2) | 6 (28.6) |
| Other diseases suspected | 1,954 (12.4) | 1 (4.8) |
| Sputum smear | | |
| Total | 2,362 (100.0) | 21 (100.0) |
| Negative | 2,352 (99.6) | 15 (71.4) |
| Positive | 10 (0.4) | 6 (28.6) |
| Sputum culture | | |
| Total | 2,360 (100.0) | 21 (100.0) |
| Negative | 2,265 (96.0) | 2 (9.5) |
| Positive | 19 (0.8) | 19 (90.5) |
| NTM§ | 76 (3.2) | 0 (0.0) |
| TB-PCR test | | |
| Total | 2,338 (100.0) | 21 (100.0) |
| Negative | 2,308 (98.7) | 12 (57.1) |
| Positive | 14 (0.6) | 9 (42.9) |
| NTM§ | 15 (0.6) | 0 (0.0) |
| Inspection error | 1 (0.1) | 0 (0.0) |
| Xpert MTB/RIF test¶ | | |
| Total | 14 (100.0) | 14 (100.0) |
| Negative | 8 (57.1) | 7 (50.0) |
| Positive | 6 (42.9) | 7 (50.0) |
| Rapid detection of INH/RIF resistance | | |
| Total | 19 (100.0) | 19 (100.0) |
| Sensibility | 15 (79.0) | 15 (79.0) |
| Resistance | 2 (10.5) | 2 (10.5) |
| Indeterminate | 2 (10.5) | 2 (10.5) |
| Drug sensitivity test | | |
| Total | 19 (100.0) | 19 (100.0) |
| Sensibility | 13 (68.4) | 13 (68.4) |
| Resistance | 4 (21.1) | 4 (21.1) |
| Inspection error | 2 (10.5) | 2 (10.5) |
| Coronavirus 19 (COVID-19) | | |
| Total | 1,612 (100.0) | 17 (100.0) |
| Negative | 0 (0.0) | 0 (0.0) |
| Positive | 1,612 (100.0) | 17 (100.0) |

* 'Active pulmonary tuberculosis' or 'exudative pleural effusion' which is presumed to be tuberculous, suggesting the treatment of tuberculosis, sputum examination for confirmation

† Any suspicion of 'active tuberculosis' or 'suspected tuberculosis', the final diagnosis of the doctor is necessary, including the additional tuberculosis test including sputum examination and the clinical findings of the patient in public health centers and medical institutions

‡ Pulmonary tuberculosis has developed in the past but has remained yet traces of fibrotic changes remain

§ Nontuberculous mycobacteria (NTM)

|| M. tuberculosis-polymerase chain reaction (TB-PCR)

¶ M. tuberculosis(MTB)/Rifampin (RIF)