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Tuberculosis (TB) remains a serious public health problem in the Republic of Korea. Based on the national TB survey in Korea, observed prevalence of radiologically active pulmonary TB in 1965 was 5,065 per 100,000 population aged over 5 years, which was decreased to 1,032 per 100,000 population aged over 5 years in 1995<sup>1</sup>. This decrement could be ascribed to its enhanced national TB control program and rapid economic growth between the 70s and 80s<sup>2</sup>. However, Korea still has a disproportionately higher burden of TB than high-income countries<sup>3</sup>. It is essential to understand trends of changes of TB burden to aid policy makers to plan, implement, and evaluate the national TB control program. The Korea Disease Control and Prevention Agency (KDCA) publishes 'Annual report on the notified tuberculosis in Korea' to analyze information of TB patients diagnosed or treated at public health centers and private medical facilities<sup>4</sup>. Herein, we described the Korean burden of TB in 2021 based on the most recently updated data of the notified TB patients<sup>5</sup>.

In Korea, TB has been considered a legal communicable disease since 1957 in accordance with the Communicable Disease Control and Prevention Act, which made its reporting mandatory. In 1968, reporting and registration became mandatory based on the Tuberculosis Prevention Act. According to these acts, doctors should report to the public health center when they diagnose bacteriologically confirmed or clinically diagnosed TB cases. In mid-2000, the Korea Institute of Tuberculosis and KDCA launched the Korean TB surveillance system to collect data of all notified TB cases, such as personal information, examination results, treatments, and treatment outcomes. Notified cases in which the diagnosis was changed to other diseases such as non-tuberculous mycobacteria were excluded. Ethics approval was waived because it involved anonymised data sets that could be obtained from the public domain without containing any individual human data.

A total of 22,904 TB cases were notified during 2021, which was 2,446 less than that during 2020 (25,350), showing a decrease of 9.6% from 2020 to 2021. The overall notification rate of TB cases per 100,000 population decreased from 49.4 in 2020 to 44.6 in 2021. The number of new TB cases in 2021 decreased from 19,933 in 2020 to 18,335 in 2021, with a reduction of 8.0% (Table 1). The overall notification rate of new TB cases per 100,000 decreased from 38.8 in 2020 to 35.7 in 2021.

Of all new TB cases, 10,639 (58.0%) were males and 7,696 (42.0%) were females. The notification rate of new cases in men was 41.6 per 100,000, which was 1.4 times higher than that in women (29.9 per 100,000). In all age groups, the number of new TB cases stratified by age groups in 2021 decreased compared to the previous year. Among those aged under 65 years, the notification rate of new cases decreased from 23.5 per 100,000 in 2020 to 20.9 per 100,000 in 2021, with a reduction rate of 12.0%. The notification rate of new cases among those aged 65 years and over decreased from 120.3 per 100,000 in 2020 to 109.7 per 100,000 in 2021. However, it was 5.2 times higher than that among those under 65 years.

Among all notified new TB cases, 5.6% occurred among foreigners in 2021. The

**Table 1.** New tuberculosis notification cases and rates between 2020 and 2021 in the Republic of Korea

Variable	2020		2021	
	No. (%)	Rate*	No. (%)	Rate*
All the new tuberculosis cases	19,933 (100.0)	38.8	18,335 (100.0)	35.7
Sex				
Male	11,608 (58.2)	45.3	10,639 (58.0)	41.6
Female	8,325 (41.8)	32.3	7,696 (42.0)	29.9
Age, yr				
<65	10,151 (50.9)	23.5	8,929 (48.7)	20.9
≤65	9,782 (49.1)	120.3	9,406 (51.3)	109.7
Foreigner	1,076 (5.4)	93.9 <sup>†</sup>	1,029 (5.6)	94.6 <sup>†</sup>
Medical aid beneficiaries	NA	NA	1,686 (9.2)	110.5 <sup>‡</sup>

\*Tuberculosis notification rate was obtained by dividing the total number of notified tuberculosis cases by the mid-year population of the year made by Statistics Korea. Its unit is per 100,000 population. <sup>†</sup>The rate was calculated using the number of registered foreigners for each calendar year based on Statistics Korea. <sup>‡</sup>The rate was calculated using the number of beneficiaries of the National Health Insurance in 2020.

total number of new TB cases among foreigners decreased from 1,076 in 2020 to 1,029 in 2021. The notification rate of new TB cases among medical aid beneficiaries was 110.5 per 100,000, which was 3.5 times higher than that among health insurance beneficiaries (32.0 per 100,000). Despite decrement in the number of multidrug-resistant TB cases between 2020 and 2021, the percentage of multidrug-resistant TB cases among all notified TB patients was slightly increased from 1.57% (399/25,350) in 2020 to 1.62% (371/22,904) in 2021.

In Korea, the notification number of new TB cases decreased by more than half from 39,557 in 2011 to 18,335 in 2021 with an average annual reduction of 7.4%. One of the main reasons for such sharp decline during the last decade could be ascribed to successful implementation of Korea's TB control policy. The government announced the 2030 TB Elimination Plan in 2006 and developed the first National Strategic Plan for TB Control in 2013 with increased mobilization of resources. During this period, a pilot project of public-private partnership focusing on comprehensive TB patient management was implemented in 2007 and expanded nationwide in 2011<sup>6</sup>. Korea TB Epidemic Investigation Service was organized in 2013 to help local public health officers conduct contact investigation at congregate settings. However, according to the Global TB Report<sup>7</sup>, Korea still has the highest incidence of TB (49 per 100,000 population) and the third-highest TB mortality rate (3.8 per 100,000 population) among the 38 member countries of the Organization for Economic Co-operation and Development in 2020.

High TB incidence and mortality among elderly populations are major huddles for controlling TB endemics in Korea. Those who have experienced periods of poverty and high TB prevalence after the Korean War in 1950 are reservoirs of latent TB infection. They became part of elderly populations in an aged society of Korea in 2020s. The proportion of the elderly aged 65 years and over among all new TB cases has steadily increased every year, accounting for more than half (51.3%) in 2021 for the first time. As TB burdens among the elderly continues to increase, it is necessary to establish a diagnosis and treatment strategy suitable for elderly TB patients.

Currently, the Korean government is preparing the third National Strategic Plan for TB Control. In preparing this policy, it is necessary to strengthen active case identification of TB patients and provision of appropriate people-centered TB care services. It is also necessary to encompass the most vulnerable populations such as foreigners and medical aid beneficiaries. The World Health Organization predicted that the negative impact of the coronavirus disease 2019 (COVID-19) outbreak on TB prevention and control would become worse in 2022<sup>7</sup>. Although Korea was able to mitigate its deleterious effect during the early phase<sup>8-10</sup>, the government should also strengthen policies through interdisciplinary cooperation and public-private partnership to maintain essential medical services for TB prevention and care during the pandemic.

## Authors' Contributions

Conceptualization: Min J. Writing - original draft preparation: Min J. Writing - review and editing: Kim HW, Kim JS. Approval of final manuscript: all authors.

## Conflicts of Interest

No potential conflict of interest relevant to this article was reported.

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