



**AQLI** Air Quality  
Life Index®

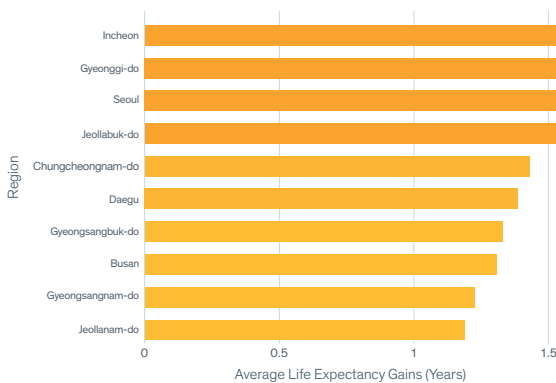
# South Korea Fact Sheet

In 2020, South Korea was amongst the top 50 most polluted countries in the world in terms of average concentration of fine particulate matter (PM<sub>2.5</sub>). The AQLI shows that an average resident of South Korea stands to gain 1.5 years of life expectancy if the PM<sub>2.5</sub> concentration is reduced to meet the World Health Organisation's (WHO) guideline of 5 µg/m<sup>3</sup>. The gain is even higher in the most polluted parts of South Korea. For example, residents of the Municipal Level Division of Osan (in the Province level division of Gyeonggi-do) stand to gain almost 2 years of life expectancy on average.

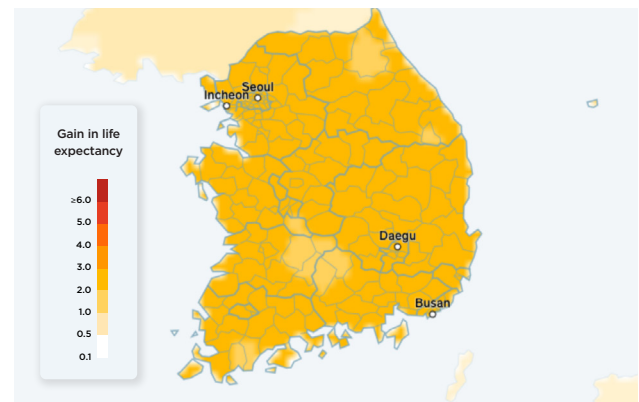
## KEY TAKE-AWAYS

- Average particulate pollution levels in 2020 stood about 10 percent higher than 1998 levels. But, since 2019 particulate pollution has declined by 4.8 percent on average across all of the top 25 most populous municipal level divisions in South Korea. The level of particulate pollution in 2020—a year characterised by pandemic-related lock-downs—was the lowest in the last seventeen years.
- Despite a decline in pollution, particulate pollution is still four times the WHO guideline. South Korea has been in compliance with the country's national standard (25 µg/m<sup>3</sup>) since 2003.
- Incheon is the most polluted region in South Korea, followed by Gyeonggi-do and Seoul. The average resident of Incheon is set to gain 1.8 years of life expectancy on average, if the country meets the WHO guideline.
- Seoul, the capital city and also the most populous (home to about 9.9 million people), stands to lose 16.1 million person years if current pollution level persists.

**Figure 2** · Potential Gain in Life Expectancy from Reducing PM<sub>2.5</sub> to the WHO Guideline in the 10 Most Populous Regions of South Korea

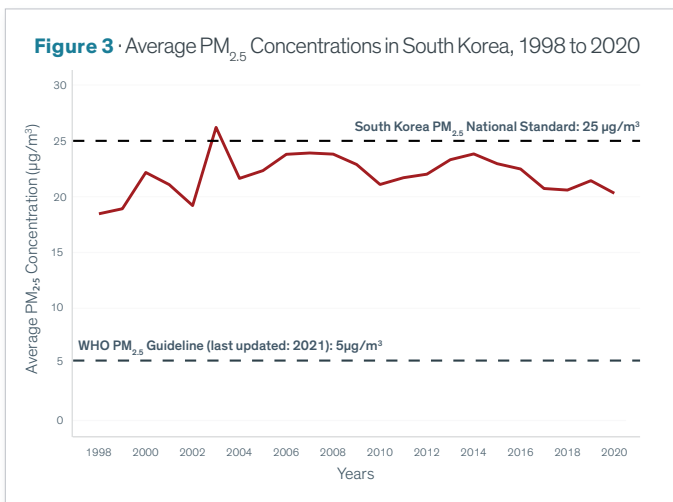


**Figure 1** · Potential Gain in Years of Life Expectancy through Permanently Reducing PM<sub>2.5</sub> from 2020 Concentration to the WHO Guideline, South Korea



# Potential Life Expectancy Impacts of Particulate (PM<sub>2.5</sub>) Pollution Reductions in the 25 most populous regions of South Korea

From 2020 Concentration



Province-Level Division	Municipal-Level Division	Population (Millions)	PM <sub>2.5</sub> Concentration 2020 (µg/m³)	To WHO Guideline of 5 µg/m³	To the National Standard of 25 µg/m³
Daegu	Buk	1.4	19.1	1.4	0
Gyeonggi-do	Suwon	1.1	23.6	1.8	0
Gyeonggi-do	Hwaseong	1.1	24.2	1.9	0
Gyeonggi-do	Goyang	0.9	22.6	1.7	0
Gyeonggi-do	Seongnam	0.9	20.9	1.6	0
Gyeonggi-do	Anyang	0.9	22.7	1.7	0
Gyeonggi-do	Yongin	0.9	22.4	1.7	0
Seoul	Gangseo	0.7	24	1.9	0
Gwangju	Gwangsan	0.7	18.5	1.3	0
Jeollabuk-do	Jeonju	0.7	19.8	1.5	0
Gyeonggi-do	Pyeongtaek	0.6	24.9	2	0
Incheon	Gyeyang	0.6	24.8	1.9	0
Gyeonggi-do	Namyangju	0.6	19	1.4	0
Incheon	Seo	0.6	23.4	1.8	0
Gwangju	Buk	0.6	17.6	1.2	0
Chungcheongnam-do	Cheonan	0.6	20.6	1.5	0
Chungcheongbuk-do	Cheongju	0.6	20.3	1.5	0
Gyeongsangnam-do	Gimhae	0.6	18.4	1.3	0
Gyeonggi-do	Yangju	0.6	19.4	1.4	0
Gyeonggi-do	Guri	0.6	20	1.5	0
Seoul	Seongbuk	0.5	20.7	1.5	0
Seoul	Yeongdeungpo	0.5	23.4	1.8	0
Seoul	Nowon	0.5	19.5	1.4	0
Gyeonggi-do	Paju	0.5	21.7	1.6	0
Gyeongsangbuk-do	Pohang	0.5	17.3	1.2	0

## ABOUT THE AIR QUALITY LIFE INDEX (AQLI)

The AQLI is a pollution index that translates particulate air pollution into perhaps the most important metric that exists: its impact on life expectancy. Developed by the University of Chicago's Milton Friedman Distinguished Service Professor in Economics Michael Greenstone and his team at the Energy Policy Institute at the University of Chicago (EPIC), the AQLI is rooted in recent research that quantifies the causal relationship between long-term human exposure to air pollution and life expectancy. The Index then combines this research with hyper-localized, global particulate measurements, yielding unprecedented insight into the true cost of particulate pollution in communities around the world. The Index also illustrates how air pollution policies can increase life expectancy when they meet the World Health Organization's guideline for what is considered a safe level of exposure, existing national air quality standards, or user-defined air quality levels. This information can help to inform local communities and policymakers about the importance of air pollution policies in concrete terms.

Methodology: The life expectancy calculations made by the AQLI are based on a pair of peer-reviewed studies, Chen et al. (2013) and Ebenstein et al. (2017), co-authored by Michael Greenstone, that exploit a unique natural experiment in China. By comparing two subgroups of the population that experienced prolonged exposure to different levels of particulate air pollution, the studies were able to plausibly isolate the effect of particulates air pollution from other factors that affect health. The more recent of the two studies found that sustained exposure to an additional 10 µg/m³ of PM<sub>10</sub> reduces life expectancy by 0.64 years. In terms of PM<sub>2.5</sub>, this translates to the relationship that an additional 10 µg/m³ of PM<sub>2.5</sub> reduces life expectancy by 0.98 years. To learn more about the methodology used by the AQLI, visit: [aqli.epic.uchicago.edu/about/methodology](http://aqli.epic.uchicago.edu/about/methodology)

