

The Importance of Superior Indoor Air Quality (IAQ)

This paper emphasizes the crucial importance of improving indoor air quality (IAQ) in urban environments, where people spend the majority of their time indoors.



INTRODUCTION

Amidst the bustling urban landscapes where most of us spend almost [90%](#) of our time indoors,¹ the significance of better indoor air quality (IAQ) cannot be overstated. This paper explores the multifaceted advantages of superior indoor air quality in our daily lives, focusing on its immense potential for fostering good health and driving impressive financial savings. The key insights shared here are firmly grounded in scientific research and empirical evidence.

HEALTH AND WELL-BEING

Indoor air quality has a profound impact on our physical and mental health. As studies consistently reveal, our well-being is closely intertwined with the air we breathe [indoors](#).² Improved indoor air quality mitigates [Sick Building Syndrome \(SBS\)](#).³ SBS characterizes instances where building occupants suffer from acute health or comfort-related issues directly linked to their time spent within the building.

On the other hand, elevated indoor air quality directly translates to better cognitive performance, which can significantly improve our quality of life. Green office environments, marked by superior air quality, are associated with remarkable gains in [cognitive function](#). Researchers measured nine cognitive function domains and identified the most significant improvements in specific areas. In crisis response, scores were 97% higher in green conditions and 131% higher in green+ environments. Strategy saw enhancements of 183% and 288%, while information usage exhibited increases of 172% and 299%.⁴

REDUCED HEALTHCARE COSTS

Improved indoor air quality leads to reduced healthcare costs. The [economic benefits](#) of healthier indoor environments extend to substantial savings on medical expenses and a decreased burden on healthcare systems.⁵ Inferior indoor air pollution carries a hefty economic cost. The U.S. EPA estimates these expenses at well over [\\$100 billion annually](#), potentially reaching \$150 billion to \$200 billion. This financial burden primarily results from preventable fatalities due to radon and environmental tobacco smoke, costing approximately 45%, with another 45% linked to lost productivity. The remaining 10% arises from avoidable respiratory diseases.⁶



PRODUCTIVITY AND EFFICIENCY GAINS

Enhancing indoor air quality is a strategic investment with tangible financial returns. As an example, doubling ventilation rates in buildings has been proven to yield an 18% increase in decision-making performance, translating into [a more productive workforce](#).⁷ Additional research conducted by the EPA indicates that workers exhibit a [5%–6% increase in productivity](#)^{vi} when exposed to favorable air quality conditions, as rated by the Environmental Protection Agency (AQI of 0–50), compared to when they are exposed to unhealthy conditions (AQI of 150–200).

¹ <https://www.hsph.harvard.edu/news/press-releases/green-office-environments-linked-with-higher-cognitive-function-scores/>

² <https://www.nature.com/articles/7500165>

³ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2796751/>

⁴ <https://www.hsph.harvard.edu/news/press-releases/green-office-environments-linked-with-higher-cognitive-function-scores/>

⁵ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7916172/>

⁶ <https://ehp.niehs.nih.gov/doi/full/10.1289/ehp.8990#b71-ehp0115-000976>

⁷ <https://iaqscience.lbl.gov/building-ventilation-rates-and-office-work-performance>

Better indoor air quality significantly reduces sick days, boosting workplace efficiency. The financial benefits of reduced absenteeism, improved job satisfaction, and enhanced worker productivity are [substantial](#).⁸

ECONOMIC AND FINANCIAL IMPACT

Individuals stand to benefit immensely from better indoor air quality. Exposure to PM2.5 pollution, which can be mitigated through improved IAQ, results in higher [lifetime earning potential](#) and a better quality of life.⁹ Also, efforts to improve indoor air quality have been shown to yield significant financial benefits for a corporation, with returns ranging from [\\$5.30 to \\$14.00 for every dollar spent](#) on interventions. These benefits accrue from averted medical costs and heightened productivity.ⁱⁱⁱ

ENVIRONMENTAL RESPONSIBILITY

Clean air isn't just a health and financial imperative; it's also an environmental responsibility. The Clean Air Act Amendments in the U.S., for instance, have not only contributed to better health and productivity but have resulted in substantial net improvements in the U.S. economy and the [welfare of its citizens](#).^v



GLOBAL PERSPECTIVE

Internationally, addressing air pollution yields impressive financial savings. In China, reducing PM2.5 pollution by even a modest degree could result in annual healthcare spending reductions of over [\\$9.2 billion](#), demonstrating the financial wisdom of investing in air quality improvement.¹⁰ Europe underscores the financial wisdom of improving air quality. A 25% reduction in fine particulate matter emissions could lead to annual costs of [€1.2 billion](#) (\$1.3 billion), offset by economic benefits that far surpass this expense.¹¹

Enhanced IAQ not only leads to improved health and cognitive function but also generates substantial economic benefits. By prioritizing air quality in our homes, workplaces, and communities, we can collectively enhance our health, secure our financial well-being, and contribute to a healthier, more prosperous future for all.

⁸ <https://www.hsph.harvard.edu/news/press-releases/green-office-environments-linked-with-higher-cognitive-function-scores/>
⁹ <https://www.bc.edu/bc-web/centers/schiller-institute/sites/masscleanair/articles/econ.html>
¹⁰ <https://www.nber.org/papers/w24688>
¹¹ <https://www.developmentaid.org/api/frontend/cms/file/2020/01/56119490-en.pdf>