INVESTING IN HEALTH PAYS BACK

The Growing Research Behind the Business Case for Healthy Buildings and Healthy Organizations

INTERNATIONAL WELL BUILDING INSTITUTE™

Published Dec. 13, 2022

Cover and section illustrations by Alex Eben Meyer.

TABLE OF CONTENTS

Executive Snapshot

This research review highlights and summarizes the growing body of knowledge behind the business case for healthy buildings and healthy organizations, encompassing both academic and industry research that focuses on healthy buildings, organizational health and well-being strategies, as well as return on investment in health.

01 Healthy Buildings Support a Healthy Economy

Realizing Economy-wide Benefits

By helping to boost productivity and well-being, healthy building solutions can yield significant, economy-wide financial gains.

- An annual productivity **gain of up to $200 billion** corresponds to a **20% to 50% reduction in Sick Building Syndrome symptoms** for office workers in the U.S.[1]
- There is an estimated **$38 billion in annual economic benefits** from increasing minimum ventilation rates in U.S. offices from 8 to 15 liters per second. If ventilation rates are only improved by a minimum of 8 to 10 liters per second, there is still a $13 billion annual economic benefit.[2] [3]

02 Healthy People, Healthy Organizations

Research Underpinning the Organizational Value of Healthy Building Strategies

IMPROVED PRODUCTIVITY

- A high-performance, healthy building, based on benefits *only* related to productivity, retention and improved well-being, yields a **net present value (NPV) of $21,172 per employee, or $115 per square foot (SF) over 10 years**, assuming a conservative $20 per SF cost premium.[4]
- Higher ventilation rates **increase employee productivity from $6,500 to $7,500 per person per year.**[5]
- Improvements to air quality, thermal comfort and lighting generated a health-related **NPV of $2 million in one building over 10 years**, which is **more than 45 times** the energy-related NPV of $44,000 for those same measures.[6]
- Enhanced indoor environmental quality **improves cognitive function by between 61% to 101%**, depending on the extent of improvements.[7]
- Better ventilation, lighting and environmental quality results in an **NPV of $37 to $55 per square foot** as a result of productivity gains from less sick time and greater worker productivity.[8]
- WELL Certification is linked to improvements in overall occupant perceived productivity by **10 median points**.[9]

MITIGATING ABSENTEEISM AND PRESENTEEISM

- Improvements in health and well-being lead to significantly enhanced job satisfaction (a proxy for presenteeism) with a **2% reduction in the prevalence of sick leave** (a proxy for absenteeism).[10]
- An increased ventilation rate of up to 25 liters per second per person reduces absenteeism due to sickness, Sick Building Syndrome symptoms and respiratory illnesses.[11]
- Increased ventilation of 1 liter per second per person is associated with a **1% to 1.5% decrease in illness-based absenteeism**.[12]
- Employees participating in workplace wellness programs are absent less than those who don't participate in the programs.[13]

REDUCED MEDICAL AND HEALTHCARE COSTS

- Every dollar spent on workplace wellness **programs can save $3.27 in medical costs**.[14]
- Workplace health programs led to **an average of 24.5% savings in healthcare costs**.[15]
- Participation in a wellness program over five years lowered company healthcare costs and decreased healthcare use.[16]

REAL ESTATE BENEFITS

03

How Investing in Health and Well-being Strengthens Real Estate Returns

Healthy Building Certification Boosts Rent Premiums, Lease Terms and Property Values

- Certified healthy buildings saw a **4.4% to 7.7% increase in rents** compared to nearby non-certified buildings.[17]
- Spaces with health-focused attributes **yield longer lease terms**; more than a year longer (**88.3 months compared to 75.3 months**) than spaces without them.[18]
- WELL Certified buildings report improvements in overall **occupant satisfaction by nearly 30%**, **occupant perceived well-being scores by 26%**, **reported mental health by 10%**, and **productivity scores by 10 median points**.[19]
- Overall, sustainability and indoor environment characteristics in real estate enhance and complement an asset's market value.[20]

Healthy Building Strategies that Enhance Rent Premiums and Property Values

BIOPHILIA

- More biophilia, based on high Green View Index scores, creates a **5.6% to 7.8% rent premium** for offices in New York City compared to those with very low scores.[21]
- Greenery and biophilia in offices improves mental and physical health and productivity.[22] [23] [24]

DAYLIGHTING

- A **5% to 6% rent premium** has been found for spaces with high levels of daylight in New York City compared to those with low levels of daylight.[25]
- Windowless environments negatively affect workers' productivity and sleep.[26] [27]

ERGONOMICS

- Deploying ergonomic solutions lead to fewer medical claims, employee sick days and paid costs per claim.[28]

WALKABILITY

- Walkability, based on a 10-point walkability score increase, **improves property values by up to 9%**, depending on the property type.[29]

POWERING ESG PERFORMANCE

04

How Health is Driving Better Investment Decisions

Companies investing in employee health and well-being perform better than those that don't.

- Socially responsible companies that invested in employee health and well-being were shown to **appreciate 325% in stock value** compared with the market average appreciation of 105% over a 14-year tracked period.[30]
- Companies that received high scores in a health and wellness assessment **appreciated by 235%**, compared to an overall S&P 500 Index **appreciation of 159%** over a six-year simulation period.[31]

Introduction

In the last decade healthy buildings have become a strategic imperative for organizations worldwide, not only helping support and sustain employee health and well-being, but also driving improved economic performance. While the health benefits of these people-first practices have long been established in public health and building science research (see IWBI's Research Digests), we see an increase in publications systematically evaluating economic returns linked to health and well-being strategies deployed at the building and organizational levels.

The aim of this research review is to highlight and summarize the growing body of knowledge behind the business case for healthy buildings and healthy organizations, encompassing both academic and industry research focused on healthy buildings, organizational health and well-being strategies and return on investment in health. High-performing organizations are finding that investing in the health and well-being of their people helps drive economic returns. Some of these investments are interventions focused on the physical environment, while others address health through corporate policy, inclusive design and operations.

Just as studies focused on the health impact of healthy building design and operation vary in scope and applicability, so too does the research that examines the economic impact. In the sections that follow, this research review is organized across three main approaches that researchers have taken to assess economic value: benefits that accrue to the economy; benefits that are achieved at the company level, and financial benefits to the value of real estate investment. In the final section, we consider research that shows how health drives better market performance and investment decisions, which, in turn, accelerates a shift across the ESG and investment landscape to elevate health and associated human and social capital management practices.

DEFINITION OF A HEALTHY BUILDING

> A space that supports the physical, psychological and social health and well-being of people.
>
> — **World Health Organization**

THE WELL BUILDING STANDARD

Fostering a Culture of Health and Driving Economic Value

The International WELL Building Institute is the global authority for transforming health and well-being in buildings, organizations and communities. IWBI advances this work through the WELL Building Standard, a library of evidence-based building and organizational strategies that, when implemented, can improve human health and well-being. Since its launch in 2014, WELL has quickly become the premier global standard in health, growing to more than **125 countries in more than 40,000 locations**. As of December 2022, WELL is being implemented across over **more than 4.5 billion square feet** of space, helping organizations everywhere prioritize the health and safety of their people, maximize real estate value and optimize the human and social capital performance of their business.

I'm excited to...usher in WELL v2 to the world. It's essential that we have the right tool to help deliver better buildings for all as we strive to achieve a culture of health and ensure everyone has the chance to attain their full health potential.

— **Risa Lavizzo-Mourey**, M.D., PIK Professor of Health Equity and Health Policy, University of Pennsylvania, and former President and CEO of the Robert Wood Johnson Foundation

Business is blooming.

01

Healthy Buildings Support a Healthy Economy

Every day, the economy faces steep financial losses due to adverse workplace conditions that affect health and well-being, mental health, productivity and absenteeism.

According to research, these losses create a pervasive drag on national GDP. For example, researchers found that the **U.S. loses $150 billion every year from sickness-related presenteeism**, which is equivalent to more than 70% of the total cost of lost productivity.[32] The U.S. also endures the highest economic losses associated with poor sleep — up to $411 billion a year, or the equivalent of 2.28% of GDP.[33] In the U.K., employers lose $30 billion a year from poor employee mental health, which negatively affects absenteeism, productivity and recruitment.[34] In terms of missed work, the **U.S. loses more than 175 million workdays** and experiences another 121 million workdays with restricted activity because of four common respiratory illnesses; the common cold, influenza, pneumonia and bronchitis.[35] **In Australia, presenteeism is costing the country $26 billion a year**, while absenteeism costs the country $7 billion a year.[36]

Realizing Economy-wide Benefits

A widescale approach to implementing healthy building strategies can mitigate these losses and yield significant economic value and far-reaching benefits. According to the research, by helping boost productivity and reduce symptoms associated with sickness, these strategies have the potential to yield massive, economy-wide financial gains. For example, a **20% to 50% reduction in Sick Building Syndrome** symptoms for office workers would power an **annual productivity gain of $20 billion to $200 billion in the U.S.**[37] Research also shows that boosting minimum ventilation rates in U.S. offices (from 8 to 15 liters per second) would create $38 billion in annual economic benefit, while even a more modest increase of 8 to 10 liters per second would generate $13 billion in economic benefit.[38]

Buildings – the places where each of us spends roughly 90% of our lives – must be at the heart of the solution to foster wellness and deliver positive health outcomes at scale, not to mention the many economic benefits for organizations implementing these science-backed strategies.

— **Dr. Richard Carmona**, 17th Surgeon General of the United States

Building mental wealth.

02

Healthy People, Healthy Organizations

Research Underpinning the Organizational Value of Healthy Building Strategies

At the heart of every successful organization is their most valuable asset – their people. Incorporating human health considerations into corporate policies, as well as decisions about the design and operations of the workplace, is rapidly becoming common practice for developers, real estate owners and organizations.

For many leading companies, these efforts are focused on combating many well-known productivity pinch points, such as the costs associated with absenteeism and presenteeism, which pose staggering economic costs.[39] One study found **absenteeism costs U.S. companies $2,074 per employee per year, and the U.K. £595 per employee per year**.[40] Another study found a **productivity loss of $61 billion per year in the U.S. from common conditions** such as headaches or back problems.[41] In the Netherlands, researchers showed that **workers lost an average of 2.5 days a year from unsatisfactory indoor environmental conditions**, representing 25% of total absenteeism.[42] Overall, poor environmental conditions in the workplace are strongly associated with reduced employee productivity, with losses of up to 10%.[43] [44] [45] [46]

For these reasons, **savvy organizations have realized that pursuing even modest improvements in areas like productivity, absenteeism, cognitive performance, recruitment and retention have a substantial effect on financial performance**. All of these are increasing demand and adoption of holistic approaches to health and well-being at the building and organizational levels. In fact, the Massachusetts Institute of Technology (MIT) research team that examined the financial impact of healthy buildings found that healthy building adoption was accelerating rapidly. "Relative to green building certification, there is double the adoption rate of these healthy spaces," said the MIT researchers in the study, after assessing internal data at the MIT Real Estate Innovation Lab.[47]

...pursuing even modest improvements in areas like productivity, absenteeism, cognitive performance, recruitment and retention have a substantial effect on financial performance.

Understanding the Impact of WELL Certification

A study published in *Building and Environment* found WELL Certification boosts occupant perceived satisfaction, health, well-being and productivity.

BRIEF SYNOPSIS

In the largest and most comprehensive research of its kind, a newly published peer-reviewed study in *Building and Environment* found that occupants in WELL Certified spaces report improved workplace satisfaction, increased levels of productivity and gains in their health and well-being. The study analyzed the impact of WELL Certification using more than 1,300 pre- and post-occupancy survey responses from six companies in North America, with analyses conducted at both the aggregate and company level. Specifically, the study showed the buildings that pursued WELL Certification **improved overall occupant satisfaction by nearly 30%**, and **increased occupant perceived well-being scores by 26%**. In addition, these projects also found that **mental health scores improved by 10%** on average and productivity gains **increased by 10 median points**.

KEY FINDINGS

Using extensive pre- and post-occupancy survey data, the analysis was able to assess the impact of WELL Certification on the people inside a space when compared to their experiences before certification. The study comprehensively analyzed the impacts of WELL Certification on occupants from four different perspectives: satisfaction with the workplace, physical and mental health, well-being and productivity. According to the study's survey findings, WELL Certification showed a series of statistically significant occupant benefits, including:

- A **near-30% improvement in overall satisfaction** with the workplace, which **jumped from 42% to 70%**
- A **10% increase** in reported mental health and a **2% increase** in reported physical health
- A **26% overall increase** in reported well-being scores
- A **10-point jump** in median productivity scores

TITLE

Impact of WELL Certification on Occupant Satisfaction and Perceived Health, Well-being, and Productivity: A Multi-Office Pre- Versus Post-Occupancy Evaluation

AUTHORS

- **Nasim Ildiri**, University of Colorado Boulder
- **Heather Bazille**, Cornell University
- **Yingli Lou**, University of Colorado Boulder
- **Kathryn Hinkelman**, Pennsylvania State University
- **Whitney A. Gray**, International WELL Building Institute
- **Wangda Zuo**, Pennsylvania State University and National Renewable Energy Laboratory

CITATION

Ildiri, N., Bazille, H., Lou, Y., Hinkelman, K., Gray, W. A., & Zuo, W. (2022). Impact of WELL Certification on occupant satisfaction and perceived health, well-being, and productivity: A multi-office pre- versus post-occupancy evaluation. *Building and Environment*, *224*, Article 109539. https://doi.org/10.1016/j.buildenv.2022.109539

> For organizations and companies, the study verifies the material benefits of WELL, which could very well serve as another powerful accelerant for healthy building adoption.
>
> — **Nasim Ildiri**, lead author, University of Colorado Boulder

Improved Productivity

By investing in safer, healthier spaces, organizations are driving return on investment by boosting productivity and creating environments that foster creativity and innovation.

In 2019, Stok, a global advisory firm of interdisciplinary experts in the built environment, published a report quantifying the bottom line of high-performance buildings by analyzing the upfront costs compared to the long-term productivity, retention and wellness benefits. Using this model, the researchers then calculated NPV per employee and per square foot of one high-performance building.

The results were compelling. A high-performance, healthy building, based on benefits only related to productivity, retention and well-being, **yields a net present value (NPV) of $21,172 per employee, or $115 per square foot, over 10 years**, assuming a conservative $20 per SF cost premium.[48] To illustrate further, a company with 100 employees would see a $2.1 million NPV over 10 years; for 1,000 employees, it would be over $21 million.

Similarly, in 2020, Pacific Northwest National Laboratory (PNNL) published a study on estimated financial gains from improving indoor environmental quality, bundling the benefits of air quality, thermal comfort and lighting. In a series of case studies, the research analyzed the economic benefits related to energy savings, compared to the economic benefits related to health and productivity based on performance thresholds cited in the WELL Building Standard. One case study that focused on a building on PNNL's campus showed that the estimated 10-year NPV for *energy* was $44,000, whereas the **estimated 10-year NPV for *health and productivity* was over $2 million, almost 45 times more**.[49]

These findings are consistent with research led by experts at Harvard's T.H. Chan School of Public Health, which examined the effect of improving indoor air quality on cognitive function, as well as its associated financial impact on productivity. They found that **improved indoor air quality increased cognitive function by 61% to 101%**, depending on the level of air quality improvement. Another benefit created by the enhanced ventilation, according to the study, was an **increase in employee productivity by a whopping $6,500 to $7,500 per person per year**.[50]

> ...improved indoor air quality increased cognitive function by 61% to 101%, depending on the level of air quality improvement.[50]

PROOF IS IN THE PRODUCTIVITY

Landsec's London Workplace, which achieved WELL Certification at the Silver level, prioritizes in-person collaboration, health and well-being and indoor environmental quality within a green building. After occupying the new office, the percentage of employees reporting that the space allowed them to work **productively rose by 30%**. This tremendous leap in employee performance was realized **with less than 3% increase in project costs**.[51]

Research published in 2022 showed that WELL Certification has a significant impact on occupant productivity.[52] In a study in *Building and Environment*, a team of researchers analyzed the impacts of WELL Certification on occupants across four perspectives: satisfaction with the workplace and perceived health (physical and mental), well-being, and productivity. The study found that WELL certification was linked to an **improvement in occupant perceived productivity by 10 median points**. These productivity gains mirrored the findings across each of the six organizations included in the study. The **average occupant productivity scores increased for each company, with improvements ranging from 1.39% to as much as 6.72%**.

Mitigating Absenteeism and Presenteeism

As mentioned earlier, absenteeism and presenteeism have a negative impact on the economy and on companies. According to a Gallup survey, full-time workers in the U.S. who display risk factors or have other chronic health conditions miss an estimated 450 million additional days of work each year compared with workers that do not exhibit such risk factors. This results in an **estimated cost of more than $153 billion in lost productivity annually**.[53]

Presenteeism, defined as employees being present at work but unable to be fully engaged in the work environment, can lead to measurable loss of productivity. The economic costs related to presenteeism may exceed those of absenteeism and even employer health costs.[54] More recently, the term "quiet quitting" has emerged to describe how some employees are choosing to disengage from work and only do the minimum. Some experts have linked it to presenteeism, arguing that the act of quiet quitting can be a precursor to burnout.[55]

However, research now shows how health and well-being strategies in the workplace can help mitigate both absenteeism and presenteeism. By supporting better workplaces and improved indoor environmental conditions, these healthy building strategies correspond to increased job satisfaction and engagement. In 2020, research published in *PLOS ONE* found organizations that demonstrated **improvement in employee health and well-being led to significantly enhanced job satisfaction**, which is used as a proxy for presenteeism, and a **2% reduction in the prevalence of sick leave, a proxy for absenteeism**.[56]

> ...organizations that demonstrated improvement in employee health and well-being led to significantly enhanced job satisfaction.[56]

PRESENT! ADDRESSING ABSENTEEISM AT WORK

The headquarters of the American Society of Interior Designers in Washington, D.C., WELL Certified at the Platinum level, was designed to lead on environmental sustainability, health and wellness with a focus on indoor air quality, employee satisfaction and productivity. A comprehensive multi-year independent research study on the impact of ASID's health strategies found that **absenteeism decreased by 19%**.[57]

ELUDING THE GREAT RESIGNATION

Cundall's London office, WELL Certified at the Gold level, implemented features focused on improved indoor air quality, including continuous monitoring of carbon dioxide and volatile organic compounds. Through research analyzing the impact of these measures, they found a **reduction of four sick days per year per employee (a 58% reduction) and a 27% reduction in staff turnover**. The case study concludes, "Taken together, these two outcomes provided a **£200,000 savings per year.**"[58]

In another study conducted on a major telecommunication company in Malaysia, researchers found that respondents who attended workplace wellness programs had lower employee absenteeism than respondents who did not attend wellness programs.[59] Similarly, in a study in *American Psychologist*, researchers using control groups found a **strong connection between reduction in absenteeism and the implementation of comprehensive health promotion programs**.[60]

Reduced Medical and Healthcare Costs

An investment in employee health may lower health care costs and insurance claims. Employees with more risk factors, such as being overweight, smoking and having diabetes not only pay more for healthcare, but also cost more to insure.[61] [62] Workplace health programs have the potential to keep employees in lower-risk categories healthier by promoting health maintenance. These programs also benefit employees in higher-risk categories by encouraging the adoption of healthier behaviors. In doing so, these programs have the potential to lower health insurance costs across the board.

A systematic review of 22 published studies of workplace health programs showed that programs that are implemented effectively can lead to an **average of 24.5% savings on healthcare costs**.[63] A study published in the *RAND Health Quarterly* suggests that participation in a wellness program over five years is associated with a trend toward lower healthcare costs and decreasing healthcare use.[64]

In a meta-analysis of the literature on costs and savings associated with workplace wellness programs, Harvard scholars found that for **every dollar spent on wellness programs, $3.27 was saved on medical costs**.[65] Johnson & Johnson's Health and Wellness Program has seen a long-term impact on controlling health care costs through its policy, environmental and education components that address risks leading to high blood pressure and high levels of cholesterol.[66] Notably, the company's **medical costs decreased by approximately $225 per participating employee per year** during a four-year study.

> ...for every dollar spent on wellness programs, $3.37 was saved on medical costs.[65]

WELL worth it.

03

REAL ESTATE BENEFITS

How Investing in Health and Well-being Strengthens Real Estate Returns

Investing in health across real estate is driving a significant return on investment and improved business performance. The research has consistently demonstrated benefits across key financial indicators particularly important to the business of real estate, from commanding higher rents, higher occupancy rates, longer term leases and better valuation.

Healthy Building Certification Boosts Rent Premiums and Lease Terms

Researchers at MIT examined the relationship between healthy buildings and rental increases in the Boston market, finding sizable rent premiums. Specifically, the results showed that buildings that pursued a healthy building standard, such as WELL, garnered **higher effective rents between 4.4% and 7.7% more per square foot** compared to their nearby peers that didn't pursue a healthy building standard.[67] The research controlled across all other factors, such as building age, renovation, lease duration and submarket. These results indicate that buildings that support tenant health and well-being generate greater demand and rent premiums.

Research focused on lease terms tells a similar story. **Spaces with health-focused attributes had an average lease term of 88.3 months**, while controlled spaces without them averaged a lease term of only 75.3 months, a term difference of more than a year.[68] This is particularly important for real estate where reducing transaction costs can have significant economic impact on the business, with longer lease terms contributing to lower transaction costs.

Furthermore, research consistently shows that **sustainability and indoor environment characteristics in real estate enhance and complement an asset's market value**.[69]

> Well-being is one of the driving factors for creating the best precincts where people want to work, and our tenants see wellness as a way to attract and retain the very best people.

— **Andrew Cole**, Group Head of ESG, Charter Hall

> Healthy features stand to pay back in both qualitative and quantitative benefits. It far exceeds per-person energy costs. Relative to salary costs, this financial premium for healthy spaces indicates that healthy buildings are seen as an asset that improves employee well-being and productivity.[70]
>
> — **Natasha Sadikin**, **Irmak Turan** and **Andrea Chegut**, MIT researchers examining the financial impact of healthy buildings

Just as many of these real estate benefits are coming into sharper focus, so too are the occupant benefits of WELL Certification. In the largest and most comprehensive longitudinal research of its kind, a recent study in *Building and Environment* analyzed the impacts of WELL Certification on occupants across four perspectives: satisfaction with the workplace and perceived health (physical and mental), well-being, and productivity. In the study, titled "Impact of WELL Certification on Occupant Satisfaction and Perceived Health, Well-being, and Productivity: A Multi-Office Pre- Versus Post-Occupancy Evaluation," the research team found **occupant satisfaction in the workplace improved by nearly 30%; well-being scores by 26%; reported mental health by 10%; and occupant perceived productivity by 10 median points**.

Healthy Building Strategies that Enhance Rent Premiums and Property Values

Additional research shows similarly strong relationships between more specific healthy building strategies – including biophilia, daylighting, ergonomics and walkability – and financial performance, like rent premiums and increased property values:

Biophilia

- More biophilia, based on high Green View Index scores, creates a **5.6% to 7.8% rent premium** for offices in New York City compared to those with very low scores.[71]
- Greenery and biophilia in the office improve mental and physical health and productivity.[72] [73] [74]

Daylighting

- A **5% to 6% rent premium** is found for spaces with high levels of daylight in New York City compared to those with low levels of daylight.[75]
- Windowless environments negatively affect workers' productivity and sleep.[76] [77]

Ergonomics

- Deploying ergonomic solutions supports fewer medical claims, fewer days out by employees and fewer medical paid costs per claim.[78]

Walkability

- Walkability, based on a 10-point walkability score increase, **improves property values by 1% to 9%**, depending on the property type.[79]

PROUD TO BE PEOPLE-FIRST

Edge Technologies' employees agreed almost unanimously that they are proud to bring visitors to their WELL Certified Platinum HQ office (**97.8% agreed**) and that it is an enjoyable environment to work in (**96.7%**).

SPOTLIGHT ON:

The Mounting Economic Cost of Low Occupancy

Commercial real estate leaders are focused more than ever on the return to office as many office buildings in urban areas around the world continue to report low occupancy.[81] At the end of March 2022, the occupancy in office buildings in 10 major U.S. metropolitan cities averaged 40%, according to the Kastle Back to Work Barometer.[82] Another report looking at the impact of the hybrid work trend said **as much as 30% of office buildings, worth an estimated $1.1 trillion, are at risk of becoming obsolete** as "tenants' tastes shift."[83]

"A Flight to Quality"

With the rise of remote and hybrid work and increased demand for flexibility, the future of office occupancy is in question and could pose economic challenges to the commercial office sector and the urban areas where such organizations are located. These impacts are already being felt on asset valuation. For example, compared to pre-pandemic levels, **average U.S. office values are down 4%**, the worst performance of any type of commercial real estate, according to Green Street data through February 2022. But look closer and the findings show a tale of a divided real estate market. Randall Zisler, an independent consultant and former head of real estate research at Goldman Sachs Group Inc., said that the data shows prices for newer, **amenity-filled offices have actually gained about 15% but that smaller, older properties are down 20%**.[84]

> I strongly suspect what will result is a move to concentration, a flight to quality. Over the next few years, as tenants start to rethink space needs and their leases rollover, they'll go into better buildings, and the [worse] buildings will be in trouble.
>
> — **Joseph Gyourko**, Wharton Real Estate Professor[85]

Winning the War for Talent

Minimizing Turnover and Attracting Top-tier Talent Presents a Massive Economic Boon

Recruiting and retaining employees is costly for many businesses, particularly for those competing for specialized talent. When employees do leave, replacing them requires significant staff time to recruit, interview and train new hires. Not to mention new employees have long ramp-up times before they become as productive as their predecessors. According to the Society for Human Resource Management, it costs a company, on average, six to nine months of an employee's salary to replace that person.[86]

As an example, an employee making $60,000 per year would cost the company $30,000 to $45,000 in recruiting and training a new hire.[87] In the aggregate, these costs add up quickly — **U.S. businesses lose $1 trillion every year due to voluntary turnover**.[88]

But healthy workplace design has a considerable impact on retention and overall employee satisfaction with their organizations. According to the Rocky Mountain Institute, a study led by Knoll and DYG, Inc., "**Employees planning to leave an organization were 25% less satisfied with their physical workplace than those who planned to stay**."[89]

Additionally, workplaces that put well-being at the center of design and operations, such as the WELL case studies cited below, show a sharp decrease in employee turnover and an increase in employee satisfaction.

GOOD FOR PEOPLE, GREAT FOR BUSINESS

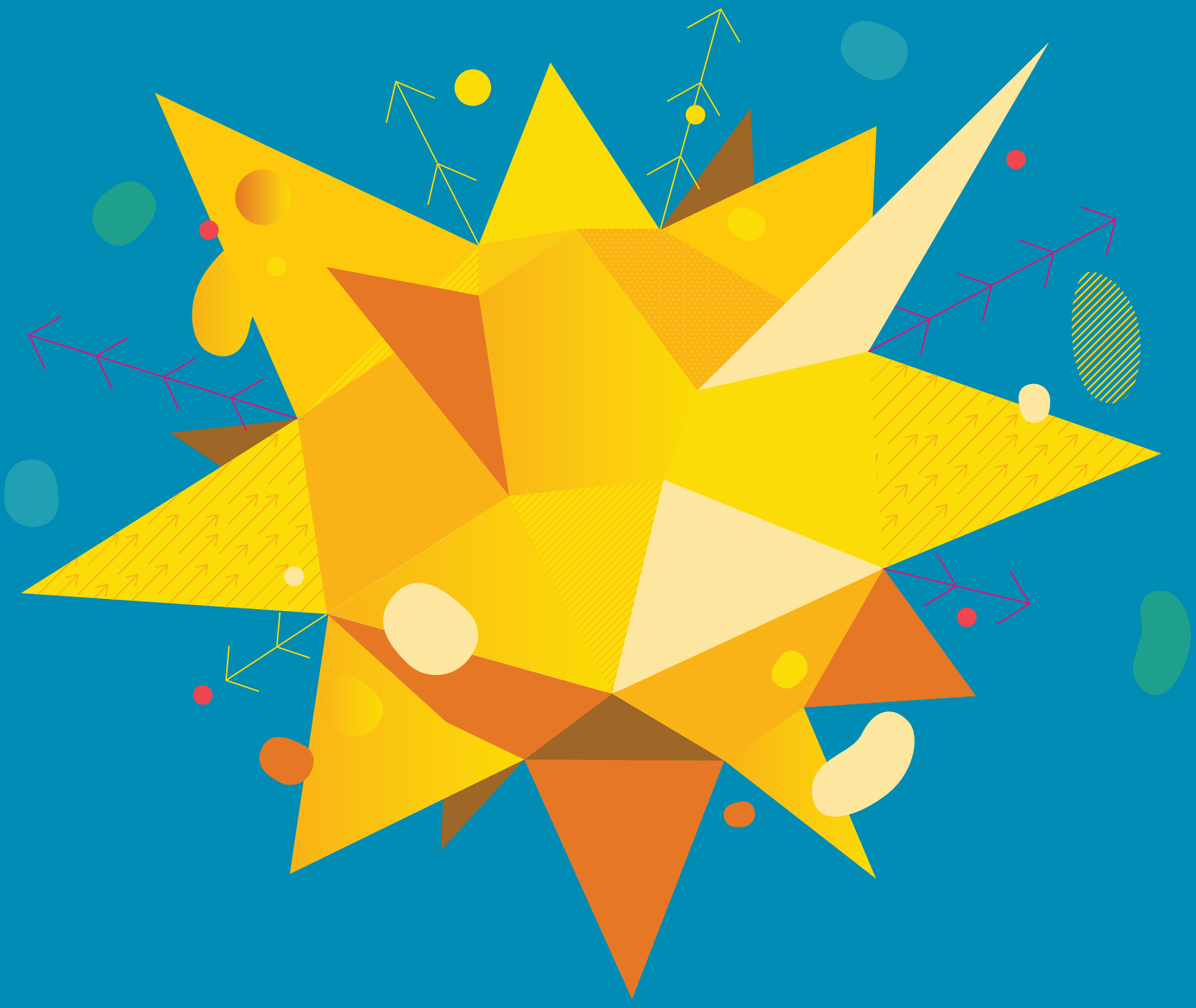
The **employee turnover rate fell by almost a third** at CBRE's Toronto and Vancouver offices after achieving WELL Certification and incorporating key WELL features, such as proper daylight and circadian lighting, optimized ventilation rates and air quality, increased collaborative space, staircases and sit-stand desks.[90]

RECRUIT, RETAIN AND REVITALIZE

Genentech, after achieving WELL Certification in Building 34 (nicknamed the Hub and located in its South San Francisco campus) reported **improved recruitment and retention and higher engagement and satisfaction among employees**. The project implemented key features, including proper daylight, optimized ventilation rates and improved air quality, an on-site primary healthcare center, marketplace services and a Zen garden.[91]

The future is bright.

04



POWERING ESG PERFORMANCE

How Health is Driving Better Investment Decisions

A growing body of research demonstrates the economic case for investing in health and leading on human and social capital management. Several peer-reviewed studies, using simulation and past market performance, support that **businesses with strong employee health and well-being programs outperform the S&P 500 significantly**. For example, portfolios composed of companies that scored high on Corporate Health Achievement Awards (CHAA) **appreciated by between 204% to 333%** compared to the overall S&P 500 Index appreciation of 105%.[92] A different study, comparing 45 companies that received high scores in a health and wellness assessment, **appreciated by 235%** compared to an overall S&P 500 Index appreciation of 159% over a six-year simulation period.[93]

Investing in health accrues measurable financial benefits at the organizational level and throughout the real estate value chain. But these benefits flow up to the investor level as well. For those investing in companies, increased employee performance drives increased organizational performance. For those investing in real estate, increased asset values and rents; better leasing terms; increased tenant satisfaction; reduced borrowing rates; and improved community relations all influence the financial value of an asset and the fund in which it resides. However, the impact of health on organizational performance and real estate value is more readily identified at the entity level. Historically, it has been relatively common for investors to miss the connection between health and financial performance. In the wake of the global pandemic, this is no longer the case.

Looking Ahead: The Materiality of Health

The global pandemic highlighted the intrinsic value of health, demonstrating both the materiality of health and its effect on the fabric of our economy. It emphasized the often-overlooked fact that **supporting the safety, health and well-being of employees, customers and supply chain workers is critical to maintaining a sustainable and resilient business**. It is expected that markets and regulators will continue to reflect and act on this lesson, moving directionally to more fully account for public health

When it comes to maximizing returns and boosting profitability in the near and long term, investing in people is the formula. Leading actions in WELL have offered material advantages during the difficult and unprecedented times of the pandemic, but they are also evergreen strategies that cut directly to performance in all circumstances.

— **Rachel Hodgdon**, President and CEO, IWBI, in "Charting the Future of Investing for Health" from the *Economist Impact*

in an organization's overall risk assessment. Already, forward-looking investors are staying ahead of the curve by asking the entities they invest in to report on their health performance.

The increased focus on environmental, social and governance (ESG) performance within capital markets provides an established and trusted framework for companies and investors to incorporate health considerations into their decision making and reporting. An entity's **financial sustainability is inextricably linked to the health of the planet and of society at large**. Incorporating public health considerations into sustainability and ESG frameworks allows for investors to take a holistic approach to identifying sources of both potential risk and value creation.

Elevating Health Across the ESG Landscape

As a mechanism for incorporating non-financial factors into investment management, ESG continues to evolve to utilize health and social performance metrics to drive better investment decisions, but efforts are still emergent. Most ESG reporting frameworks, from the Global Reporting Initiative to the Sustainability Accounting Standards Board, not to mention government regulatory bodies, are beginning to take action to more holistically address ESG by increasing focus on human and social capital. This trend to elevate health across the ESG landscape will likely continue to accelerate as awareness of the unequivocal connection between business performance and sound human and social capital management increases. In turn, investors will more likely proactively incorporate health into ESG strategy and reporting when engaging with the entities that they invest in.

Regulators Seek More Transparency in Human and Social Capital Metrics

Global regulators, as well as U.S. lawmakers, have sharpened their focus on policy opportunities to require transparency and reporting of human and social capital metrics. In May of 2021, U.S. Rep. Cindy Axne (D-IA) and Sen. Mark Warner (D-VA) introduced "The Workforce Investment Disclosure Act," legislation that would require public companies to disclose information about their workforce management policies, including the investments they make on skills training, workforce health and safety and employee retention.

> Generating sustainable returns over time requires a sharper focus not only on governance, but also on environmental and social factors facing companies today. Over the longterm, environmental, social and governance (ESG) issues – ranging from climate change to diversity to board effectiveness – have real and quantifiable financial impacts. At companies where ESG issues are handled well, it is often a signal of operational excellence.
>
> — **Larry Fink**, CEO, Blackrock

Upon the bill's introduction, the lawmakers stressed the importance of taking steps to disclose and standardize health and associated human and social capital management practices. "Over the past century, we've seen businesses become less reliant on physical assets and more reliant on their workers, but the public disclosures we ask of our businesses don't cover the investments they're making in their employees," said Rep. Axne. "We expect our public companies to disclose their holdings and their balance sheets – but in an economy that needs people in order to be productive, we must keep that same transparency to make the U.S. a leader in helping investors understand the long-term prospects of the companies they're investing in. The COVID-19 pandemic has only emphasized how important this information is, especially when it comes to workplace health and safety or the ability to work from home."[94]

Meanwhile U.S. regulators have already signaled intentions to introduce requirements consistent with Axne and Warner's proposed legislation. "Investors increasingly want to understand information about…one of the most critical components of companies, their workforce," said Gary Gensler, chair of the U.S. Securities and Exchange Commission. "This is one of my top priorities and will be an early focus during my tenure at the SEC."[95]

Similar efforts are being advanced in other parts of the world. In the European Union, for example, the EU Social Taxonomy extends the EU Sustainable Finance Taxonomy for sustainable activities and establishes a foundation to guide economic activity to address the EU's social goals. The EU Social Taxonomy provides classifications to help investors, companies and regulators distinguish between economic activities that are sustainable from a social perspective and those that are not. Actions deemed socially valuable by the Taxonomy include protecting human rights, minimizing the negative societal impacts of economic activities and actively promoting the well-being of employees, customers and society. As the EU Social Taxonomy continues to take shape, it is expected to have influence both through direct regulation and by influencing future sustainable finance frameworks, such as those that aim to standardize definitions for green and social bonds and loans.

WELL and GRESB Alignment

Established in 2009, GRESB has quickly become the leading ESG benchmark for real estate and infrastructure investments across the world. In 2022, GRESB's ESG benchmark covered more than 1,800 property companies, real estate investment trusts, funds and developers, as well as more than 700 infrastructure funds and assets. Combined, **GRESB represents over $51 trillion in assets under management**. The ESG data reported to GRESB is used by more than 170 institutional and financial investors to monitor investments across portfolios and understand the opportunities, risks and choices that need to be made as the industry transitions to a more sustainable future.

In 2016, GRESB worked with the Green Health Partnership to release the GRESB Health and Well-being Module, which assesses the processes to promote the health and well-being of employees, tenants, customers and communities. From 2016-18, 399 real estate funds participated in the GRESB Health & Well-being Module at least once.[96] This move reflected an institutional and fund-level interest in health-centered real estate assets, signaling positive growth for healthy initiatives moving forward. In 2019, the GRESB Health & Well-being Module was formally integrated into the GRESB Real Estate Assessment, signaling the definitive role and value that this health data has to investors.

For reporting, **WELL v2 features align with almost 40% of the 2022 GRESB Real Estate Assessment**. Engaging with WELL can help an organization report on 15 GRESB indicators in full and 32 GRESB indicators in part.

References

[1] Fisk, W. J. (2000). Estimates of potential nationwide productivity and health benefits from better indoor environments: An Update. In J. D. Spengler, J. M. Samet, & J. F. McCarthy (Eds.), *Indoor Air Quality* Handbook. McGraw-Hill. https://eta-publications.lbl.gov/sites/default/files/42123.pdf

[2] Fisk, W. J., Black, D., & Brunner, G. (2012). Changing ventilation rates in U.S. offices: Implications for health, work performance, energy, and associated economics. *Building and Environment*, 47, 368–372. https://doi.org/10.1016/j.buildenv.2011.07.001

[3] Fisk, W. J. (2000). Estimates of potential nationwide productivity and health benefits from better indoor environments: An Update. In J. D. Spengler, J. M. Samet, & J. F. McCarthy (Eds.), *Indoor Air Quality* Handbook. McGraw-Hill. https://eta-publications.lbl.gov/sites/default/files/42123.pdf

[4] Attema, J. E., Fowell, S. J., Macko, M. J., & Neilson, W. C. (2018). *The financial case for high performance buildings* [White paper]. Stok, LLC. https://stok.com/wp-content/uploads/2022/04/Stok_High-Performance-Buildings-Report.pdf

[5] MacNaughton, P., Pegues, J., Satish, U., Santanam, S., Spengler, J., & Allen, J. (2015). Economic, environmental and health implications of enhanced ventilation in office buildings. *International Journal of Environmental Research and Public Health*, 12(11), 14709-14722. https://doi.org/10.3390/ijerph121114709

[6] Office of Energy Efficiency & Renewable Energy. (2020). *Healthy buildings initiative: Pacific northwest national laboratory pilot study.* (PNNL-SA-153885). U.S. Department of Energy. https://www.energy.gov/sites/default/files/2020/08/f77/healthy-buildings-initiative-pnnl-pilot.pdf

[7] MacNaughton, P., Pegues, J., Satish, U., Santanam, S., Spengler, J., & Allen, J. (2015). Economic, environmental and health implications of enhanced ventilation in office buildings. *International Journal of Environmental Research and Public Health*. 12(11), 14709-14722. https://doi.org/10.3390/ijerph121114709

[8] Capital E. (2003). *The costs and financial benefits of green building: A report to California's sustainable building task force*. Sustainable Building Task Force. https://noharm-uscanada.org/sites/default/files/documents-files/34/Building_Green_Costs_Benefits.pdf

[9] Ildiri, N., Bazille, H., Lou, Y., Hinkelman, K., Gray, W. A., & Zuo, W. (2022). Impact of WELL certification on occupant satisfaction and perceived health, well-being, and productivity: A multi-office pre- versus post-occupancy evaluation. *Building and Environment*, *224*, Article 109539. https://doi.org/10.1016/j.buildenv.2022.109539

[10] Palacios, J., Eichholtz, P., & Kok, N. (2020). Moving to productivity: The benefits of healthy buildings. *PLoS ONE*, 15(8), e0236029. https://doi.org/10.1371/journal.pone.0236029

[11] Sundell, J., Levin, H., Nazaroff, W. W., Cain, W. S., Fisk, W.J., Grimsrud, D.T., Gyntelberg, F., Li, Y., Persily, A. K., Pickering, A. C., Samet, J. M., Spengler, J. D., Taylor, S. T., & Weschler, C. J. (2010). Ventilation rates and health: Multidisciplinary review of the scientific literature. *Indoor Air*, *21*(3), 191-204. https://doi.org/10.1111/j.1600-0668.2010.00703.x

[12] Mendell, M. J., Eliseeva, E. A., Davies, M. M., Spears, M., Lobscheid, A., Fisk, W. J., & Apte, M. G. (2013). Association of classroom ventilation with reduced illness absence: A prospective study in California elementary schools. *Indoor Air*, *23*(6), 515-28. https://doi.org/10.1111/ina.12042

[13] Abdullah, D. N., & Lee, O. Y. (2012). Effects of wellness programs on job satisfaction, stress and absenteeism between two groups of employees (attended and not attended). *Procedia - Social and Behavioral Sciences*, *65*, 479-484. https://doi.org/10.1016/j.sbspro.2012.11.152

[14] Baicker, K., Cutler, D., & Song, Z. (2010). Workplace wellness programs can generate savings. *Health Affairs*, *29*(2), 304-311. https://doi.org/10.1377/hlthaff.2009.0626

[15] Chapman, L. S. (2012). Meta-evaluation of worksite health promotion economic return studies: 2012 update. *American Journal of Health Promotion*, *26*(4), 1-12. https://doi.org/10.4278/ajhp.26.4.tahp

[16] Mattke, S., Liu, H., Caloyeras, J., Huang, C., Van Busum, K., Khodyakov, D., & Shier, V. (2013). *Workplace wellness programs study: Final report* [White paper]. RAND Corporation. https://www.rand.org/pubs/research_reports/RR254.html

[17] Sadikin, N., Turan, I., & Chegut, A. (2021). The financial impact of healthy buildings: Rental prices and market dynamics in commercial office. *MIT Center for Real Estate Research*. http://dx.doi.org/10.2139/ssrn.3784779

[18] Ibid.

[19] Ildiri, N., Bazille, H., Lou, Y., Hinkelman, K., Gray, W. A., & Zuo, W. (2022). Impact of WELL certification on occupant satisfaction and perceived health, well-being, and productivity: A multi-office pre- versus post-occupancy evaluation. *Building and Environment*, *224*, Article 109539. https://doi.org/10.1016/j.buildenv.2022.109539

[20] Lützkendorf, T., & Lorenz, D., (2011). Capturing sustainability-related information for property valuation. *Building Research & Information*, *39*(3), 256-273. https://doi.org/10.1080/09613218.2011.563929

[21] Yang, J., Rong, H., Kang, Y., Zhang, F., & Chegut, A. (2020). The financial impact of street-level greenery on New York commercial buildings. *MIT Center for Real Estate Research*. https://doi.org/10.2139/ssrn.3714858

[22] Ambrey, C., & Fleming, C. (2014). Public greenspace and life satisfaction in urban Australia. *Urban Studies*, *51*(6), 1290–1321. https://doi.org/10.1177/0042098013494417

[23] Arvanitidis, P. A., Lalenis, K., Petrakos, G., & Psycharis, Y. (2009). Economic aspects of urban green space: A survey of perceptions and attitudes. *International Journal of Environmental Technology and Management*, *11*(1–3), 143–168. https://doi.org/10.1504/IJETM.2009.027192

[24] Aydogan, A., & Cerone, R. (2020). Review of the effects of plants on indoor environments. *Indoor and Built Environment*, *30*(4). https://doi.org/10.1177/1420326X19900213

[25] Turan, I., Chegut, A., Fink, D., & Reinhart, C. (2020). The value of daylight in office spaces. *Building and Environment*, *168*, Article 106503. https://doi.org/10.1016/j.buildenv.2019.106503

[26] Boubekri, M., Cheung, I. N., Reid, K. J., Wang, C. H., & Zee, P. C. (2014). Impact of windows and daylight exposure on overall health and sleep quality of office workers: A case-control pilot study. *Journal of Clinical Sleep Medicine*, *10*(6), 603-611. https://doi.org/10.5664%2Fjcsm.3780

[27] Petrullo, M., Morton, B., Jones, S. A., Laquidara-Carr, D., Walloga, M. E., Lorenz, A., Yamada, T., Buckley, B., Logan, K., & Barnett, S. (2016). *Drive toward healthier buildings 2016: Tactical intelligence to transform building design and construction* [White paper]. Dodge Data and Analytics. https://microsolresources.com/wp-content/uploads/2017/01/The-Drive-Toward-Healthier-Buildings-2016.pdf

[28] Brace, T. (2005). Office ergonomics: Do they work?: An analysis of the effectiveness of the state of Oregon's office ergonomics initiative. *Professional Safety*, *50*(9), 51-55. https://www.proquest.com/openview/ceff9bb173e730f98dc6f48eb63e5eac/1?pq-origsite=gscholar&cbl=47267

[29] Pivo, G., & Fisher, J. D. (2011). The walkability premium in commercial real estate investments. *Real Estate Economics*, *39*(2), 185-219. https://doi.org/10.1111/j.1540-6229.2010.00296.x

[30] Goetzel, R. Z., Fabius, R., Fabius, D., Roemer, E. C., Thornton, N., Kelly, R. K., Pelletier, K. R. (2016). The stock performance of C. Everett Koop award winners compared with the Standard & Poor's 500 Index. *Journal of Occupational and Environmental Medicine*, *58*(1), 9-15. https://doi.org/10.1097/JOM.0000000000000632

[31] Grossmeier, J., Fabius, R., Flynn, J. P., Noeldner, S. P., Fabius, D., Goetzel, R. Z., & Anderson, D. R. (2016). Linking workplace health promotion best practices and organizational financial performance. *Journal of Occupational and Environmental Medicine*, *58*(1), 16-23. https://doi.org/10.1097/jom.0000000000000631

[32] Prochaska, J. O., Evers, K. E., Johnson, J. L., Castle, P. H., Prochaska, J. M., Sears, L. E., Rula, E. Y., & Pope, J. E. (2011). The wellbeing assessment for productivity: A wellbeing approach to presenteeism. *Journal of Occupational and Environmental Medicine*, *53*(7), 735-742. https://doi.org/10.1097/jom.0b013e318222af48

[33] Hafner, M., Stepanek, M., Taylor, J., Troxel, W. M., & Van Stolk, C. (2016). *Why sleep matters — the economic costs of insufficient sleep: A cross-country comparative analysis* [White paper]. RAND Corporation. https://www.rand.org/pubs/research_reports/RR1791.html

[34] World Green Building Council. (2014). *Health, wellbeing and productivity in retail: The impact of green buildings on people and profit*. World Green Building Council. https://worldgbc.org/article/health-wellbeing-and-productivity-in-retail-the-impact-of-green-buildings-on-people-and-profit/

[35] Fisk, W. J. (2000). Health and productivity gains from better indoor environments and their relationship with building energy efficiency. *Annual Review of Energy Environment*, *25*(1): 537-566. https://www.annualreviews.org/doi/abs/10.1146/annurev.energy.25.1.537

[36] World Green Building Council. (2014). *Health, wellbeing and productivity in retail: The impact of green buildings on people and profit*. World Green Building Council. https://worldgbc.org/article/health-wellbeing-and-productivity-in-retail-the-impact-of-green-buildings-on-people-and-profit/

[37] Fisk, W. J. (2000). Estimates of potential nationwide productivity and health benefits from better indoor environments: An Update. In J. D. Spengler, J. M. Samet, & J. F. McCarthy (Eds.), *Indoor Air Quality Handbook*. McGraw-Hill. https://eta-publications.lbl.gov/sites/default/files/42123.pdf

[38] Fisk, W. J., Black, D., & Brunner, G. (2012). Changing ventilation rates in U.S. offices: Implications for health, work performance, energy, and associated economics. *Building and Environment*, *47*, 368–372. https://doi.org/10.1016/j.buildenv.2011.07.001

[39] Hemp, P. (2004, October). Presenteeism: At work, but out of it. *Harvard Business Review*. https://hbr.org/2004/10/presenteeism-at-work-but-out-of-it

[40] World Green Building Council. (2014). *Health, wellbeing and productivity in retail: The impact of green buildings on people and profit*. World Green Building Council. https://worldgbc.org/article/health-wellbeing-and-productivity-in-retail-the-impact-of-green-buildings-on-people-and-profit/

[41] Palacios, J., Eichholtz, P., & Kok, N. (2020). Moving to productivity: The benefits of healthy buildings. *PLoS ONE*, *15*(8), e0236029. https://doi.org/10.1371/journal.pone.0236029

[42] Roelofsen, C. P. G. (2001). The design of the workplace as a strategy for productivity enhancement. *7th REHVA World Congress*, *Clima 2000/Napoli 2001*. http://dx.doi.org/10.13140/RG.2.1.1864.9441

[43] Dorgan, C. E., & Dorgan, C. B. (2005). Assessment of link between productivity and indoor air quality. In D. Clements-Croome (Ed.), *Creating the productive workplace: Places to work creatively* (pp. 113-133). Taylor & Francis. https://doi.org/10.4324/9780203696880

[44] Wyon, D. (2004). The effects of indoor air quality on performance and productivity. *Indoor Air*, *14*(7), 92-101. https://doi.org/10.1111/j.1600-0668.2004.00278.x

[45] Fisk, W. J., & Rosenfeld, A. H. (1997). Estimates of improved productivity and health from better indoor environments. *Indoor Air*, *7*(3), 158-172. https://doi.org/10.1111/j.1600-0668.1997.t01-1-00002.x

[46] Wargocki, P., Wyon, D. P., & Fanger, P. O. Productivity is affected by the air quality in offices. *Proceedings of Healthy Buildings 2000*, *1*, 635-640. https://www.researchgate.net/publication/239923331_Productivity_is_affected_by_the_air_quality_in_offices

[47] Sadikin, N., Turan, I., & Chegut, A. (2021). The financial impact of healthy buildings: Rental prices and market dynamics in commercial office. *MIT Center for Real Estate Research*, http://dx.doi.org/10.2139/ssrn.3784779

[48] Attema, J. E., Fowell, S. J., Macko, M. J., & Neilson, W. C. (2018). *The financial case for high performance buildings* [White paper]. Stok, LLC. https://stok.com/wp-content/uploads/2022/04/Stok_High-Performance-Buildings-Report.pdf

[49] Office of Energy Efficiency & Renewable Energy. (2020). *Healthy buildings initiative: Pacific northwest national laboratory pilot study*. (PNNL-SA-153885). U.S. Department of Energy. https://www.energy.gov/sites/default/files/2020/08/f77/healthy-buildings-initiative-pnnl-pilot.pdf

[50] MacNaughton, P., Pegues, J., Satish, U., Santanam, S., Spengler, J., & Allen, J. (2015). Economic, environmental and health implications of enhanced ventilation in office buildings. *International Journal of Environmental Research and Public Health*, *12*(11), 14709-14722. https://doi.org/10.3390/ijerph121114709

[51] Ammendolia, C., Côté, P., Cancelliere, C., Cassidy, J. D., Hartvigsen, J., Boyle, E., Soklaridis, S., Stern, P., & Amick, B. (2016). Healthy and productive workers: Using intervention mapping to design a workplace health promotion and wellness program to improve presenteeism. *BMC Public Health*, *16*(1), Article 1190. https://doi.org/10.1186/s12889-016-3843-x

[52] Ildiri, N., Bazille, H., Lou, Y., Hinkelman, K., Gray, W. A., & Zuo, W. (2022). Impact of WELL certification on occupant satisfaction and perceived health, well-being, and productivity: A multi-office pre- versus post-occupancy evaluation. *Building and Environment*, *224*, Article 109539. https://doi.org/10.1016/j.buildenv.2022.109539

[53] Witters, D., & Agrawal, S. (2021). *Unhealthy U.S. workers' absenteeism costs $153 billion. Gallup*. https://news.gallup.com/poll/150026/unhealthy-workers-absenteeism-costs-153-billion.aspx

[54] Ammendolia, C., Côté, P., Cancelliere, C., Cassidy, J. D., Hartvigsen, J., Boyle, E., Soklaridis, S., Stern, P., & Amick, B. (2016). Healthy and productive workers: Using intervention mapping to design a workplace health promotion and wellness program to improve presenteeism. *BMC Public Health*, *16*(1), Article 1190. https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-016-3843-x

[55] Harter, J.. (2022). *Is quiet quitting real? Gallup*. https://www.gallup.com/workplace/398306/quiet-quitting-real.aspx

[56] Palacios, J., Eichholtz, P., & Kok, N. (2020). Moving to productivity: The benefits of healthy buildings. *PLoS ONE*, *15*(8), e0236029. https://doi.org/10.1371/journal.pone.0236029

[57] American Society of Interior Designers HQ Office Research. (2017). *Design impacts lives* [White paper]. American Society of Interior Designers. https://www.asid.org/lib24watch/files/download/3912

[58] Laski, J. (2018). *Doing right by planet and people: The business case for health and wellbeing in green building*. World Green Building Council. https://globalabc.org/resources/publications/doing-right-planet-and-people-business-case-health-and-wellbeing-green

[59] Abdullah, D. N., & Lee, O. Y. (2012). Effects of wellness programs on job satisfaction, stress and absenteeism between two groups of employees (attended and not attended). *Procedia — Social and Behavioral Sciences*, *65*, 479-484. https://doi.org/10.1016/j.sbspro.2012.11.152

[60] Gebhardt, D. L., & Crump, C. E. (1990). Employee fitness and wellness programs in the workplace. *American Psychologist*, *45*(2), 262-272. https://doi.org/10.1037/0003-066x.45.2.262

[61] Yen, L., Schultz, A., Schnueringer, E., & Edington, D. W. (2006). Financial costs due to excess health risks among active employees of a utility company. *Journal of Occupational and Environmental Medicine*, *48*(9), 896-905. https://doi.org/10.1097/01.jom.0000235987.75368.d0

[62] Goetzel, R. Z., Anderson, D. R., Whitmer, R. W., Ozminkowski, R. J., Dunn, R. L., & Wasserman, J. (1998). The relationship between modifiable health risks and health care expenditures. *Journal of Occupational and Environmental Medicine*, *40*(10), 843-854. https://doi.org/10.1097/00043764-199810000-00003

[63] Chapman, L. S. (2012). Meta-evaluation of worksite health promotion economic return studies: 2012 update. *American Journal of Health Promotion*, *26*(4), 1-12. https://doi.org/10.4278/ajhp.26.4.tahp

[64] Mattke, S., Liu, H., Caloyeras, J., Huang, C., Van Busum, K., Khodyakov, D., & Shier, V. (2013). *Workplace wellness programs study: Final report* [White paper]. RAND Corporation. https://www.rand.org/pubs/research_reports/RR254.html

[65] Baicker, K., Cutler, D., & Song, Z. (2010). Workplace wellness programs can generate savings. *Health Affairs*, *29*(2), 304-311. https://doi.org/10.1377/hlthaff.2009.0626

[66] Ozminkowski, R. J., Ling, D., Goetzel, R. Z., Bruno, J. A., Rutter, K. R., Isaac, F., & Wang, S. (2002). Long-term impact of Johnson & Johnson's health & wellness program on health care utilization and expenditures. *Journal of Occupational and Environmental Medicine*, *44*(1), 21-29. https://doi.org/10.1097/00043764-200201000-00005

[67] Sadikin, N., Turan, I., & Chegut, A. (2021). The financial impact of healthy buildings: Rental prices and market dynamics in commercial office. *MIT Center for Real Estate Research*. http://dx.doi.org/10.2139/ssrn.3784779

[68] Ibid.

[69] Lützkendorf, T., & Lorenz, D. (2011). Capturing sustainability-related information for property valuation. *Building Research & Information*, *39*(3), 256-273. https://doi.org/10.1080/09613218.2011.563929

[70] Sadikin, N., Turan, I., & Chegut, A. (2021). The financial impact of healthy buildings: Rental prices and market dynamics in commercial office. *MIT Center for Real Estate Research*. http://dx.doi.org/10.2139/ssrn.3784779

[71] Yang, J., Rong, H., Kang, Y., Zhang, F., & Chegut, A. (2020). The financial impact of street-level greenery on New York commercial buildings. *MIT Center for Real Estate Research*. https://doi.org/10.2139/ssrn.3714858

[72] Ambrey, C., & Fleming, C. (2014). Public greenspace and life satisfaction in urban Australia. *Urban Studies*, *51*(6), 1290–1321. https://doi.org/10.1177/0042098013494417

[73] Arvanitidis, P. A., Lalenis, K., Petrakos, G., & Psycharis, Y. (2009). Economic aspects of urban green space: A survey of perceptions and attitudes. *International Journal of Environmental Technology and Management*, *11*(1–3), 143–168. https://doi.org/10.1504/IJETM.2009.027192

[74] Aydogan, A., & Cerone, R. (2020). Review of the effects of plants on indoor environments. *Indoor and Built Environment*, *30*(4). https://doi.org/10.1177/1420326X19900213

[75] Turan, I., Chegut, A., Fink, D., & Reinhart, C. (2020). The value of daylight in office spaces. *Building and Environment*, *168*, Article 106503. https://doi.org/10.1016/j.buildenv.2019.106503

[76] Boubekri, M., Cheung, I. N., Reid, K. J., Wang, C. H., & Zee, P. C. (2014). Impact of windows and daylight exposure on overall health and sleep quality of office workers: A case-control pilot study. *Journal of Clinical Sleep Medicine*, *10*(6), 603-611. https://doi.org/10.5664%2Fjcsm.3780

[77] Petrullo, M., Morton, B., Jones, S. A., Laquidara-Carr, D., Walloga, M. E., Lorenz, A., Yamada, T., Buckley, B., Logan, K., & Barnett, S. (2016). *Drive toward healthier buildings 2016: Tactical intelligence to transform building design and construction* [White paper]. Dodge Data and Analytics. https://microsolresources.com/wp-content/uploads/2017/01/The-Drive-Toward-Healthier-Buildings-2016.pdf

[78] Brace, T. (2005). Office ergonomics: Do they work?: An analysis of the effectiveness of the state of Oregon's office ergonomics initiative. *Professional Safety*, *50*(9), 51-55. https://www.proquest.com/openview/ceff9bb173e730f98dc6f48eb63e5eac/1?pq-origsite=gscholar&cbl=47267

[79] Pivo, G., & Fisher, J. D. (2011). The walkability premium in commercial real estate investments. *Real Estate Economics*, *39*(2), 185-219. https://doi.org/10.1111/j.1540-6229.2010.00296.x

[81] The true cost of empty offices. (2022, February 19). *The Economist*. https://www.economist.com/finance-and-economics/the-true-cost-of-empty-offices/21807703

[82] Rogers, J. (2022, June 6). Kastle says 43% office occupancy "new normal" nationwide. *GlobeSt*. https://www.globest.com/2022/06/06/kastle-says-43-office-occupancy-new-normal-nationwide/

[83] Gittelsohn, J. (2022, March 14). U.S. office buildings face $1.1 trillion obsolescence hurdle. *Bloomberg*. https://www.bloomberg.com/news/articles/2022-03-14/u-s-office-buildings-face-a-1-1-trillion-obsolescence-problem

[84] Ibid.

[85] Basiouny, A. (2022). What's going to happen to all those empty office buildings?. *Knowledge at Wharton Business Journal*. https://knowledge.wharton.upenn.edu/article/whats-going-to-happen-to-all-those-empty-office-buildings/

[86] The cost of replacing an employee and the role of financial wellness. (2022). *The Well*. https://www.enrich.org/blog/The-true-cost-of-employee-turnover-financial-wellness-enrich#:~:text=The%20Society%20for%20Human%20Resource,in%20recruiting%20and%20training%20costs

[87] Ibid.

[88] McFeely, S., & Wigert, Ben. (2019, March 13). This fixable problem costs U.S. businesses $1 trillion. *Gallup*. https://www.gallup.com/workplace/247391/fixable-problem-costs-businesses-trillion.aspx

[89] Bendewald, M., Hutchinson, R., Muldavin, S., & Torbert, R. (2014). *How to calculate and present deep retrofit value: A guide for owner-occupants*. Rocky Mountain Institute. https://rmi.org/wp-content/uploads/2017/04/RMIDeepRetrofitValue_January2014_2014-01-1.pdf

[90] McCormick, K. (2018). *The business case for healthy buildings: Insights for early adopters*. The Urban Land Institute. https://globalwellnessinstitute.org/wp-content/uploads/2018/12/Business-Case-for-Healthy-Buildings-FINAL.pdf

[91] Ibid.

[92] Goetzel, R. Z., Fabius, R., Fabius, D., Roemer, E. C., Thornton, N., Kelly, R. K., Pelletier, K. R. (2016). The stock performance of C. Everett Koop award winners compared with the Standard & Poor's 500 Index. *Journal of Occupational and Environmental Medicine*, *58*(1), 9-15. https://doi.org/10.1097/JOM.0000000000000632

[93] Grossmeier, J., Fabius, R., Flynn, J. P., Noeldner, S. P., Fabius, D., Goetzel, R. Z., & Anderson, D. R. (2016). Linking workplace health promotion best practices and organizational financial performance. *Journal of Occupational and Environmental Medicine*, *58*(1), 16-23. https://doi.org/10.1097/jom.0000000000000631

[94] U.S. Congresswoman Cindy Axne. (2021, May 25). *Axne, Warner introduce updated legislation to reveal investments in U.S. workforce development* [Press release]. https://axne.house.gov/media/press-releases/axne-warner-introduce-updated-legislation-reveal-investments-us-workforce

[95] Johnson, K. (2021, May 14). U.S. SEC chair planning new workforce data disclosures for public companies. *Reuters*. https://www.reuters.com/business/sustainable-business/us-sec-chair-planing-new-workforce-data-disclosures-public-companies-2021-05-13/

[96] Wordon, K., Pike, C., & Trowbridge, M. (2019). *Health & well-being in real estate*. Green Health Partnership and GRESB. https://gresb.com/wp-content/uploads/2019/09/health-well-being-in-real-estate-exec-0923.pdf

About the International WELL Building Institute

The International WELL Building Institute (IWBI) is a public benefit corporation and the world's leading organization focused on deploying people first-places to advance a global culture of health. IWBI mobilizes its community through the administration of the WELL Building Standard (WELL) and the WELL Ratings, management of the WELL AP credential, the pursuit of applicable research, the development of educational resources and advocacy for policies that promote health and well-being everywhere.
More information on WELL can be found at: **wearewell.com**

This report was written by the following contributors from the International WELL Building Institute:

- **Jason Hartke**, Ph.D., Executive Vice President, External Affairs
- **Minjia Yang**, Vice President, Investing for Health
- **Whitney Austin Gray**, Ph.D., Senior Vice President, Research
- **Kelly Worden**, Vice President, ESG and Investing for Health

IWBI would like to acknowledge the many team members who also supported this work, including: Catherine Chmiel, Kristen Coco, Jessica Cooper, Lindsay Jacobs, Angela Loder, Victoria Malloy, Jodie Pimentel, Andre Poremski, Alex Stevenson, Yan Tai, Judith Webb and Sian Welch.

Contacts for the report: Alex Stevenson (alex.stevenson@wearewell.com) and Sian Welch (sian.welch@wearewell.com).

Cite this work as: Hartke, J., Yang, M., Gray, W. A., & Worden, K. (2022). *Investing in health pays back: The growing research behind the business case for healthy buildings and healthy organizations*. International WELL Building Institute. https://wearewell.com/health-pays-back