

A WELL-planned lab

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LPA



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Learning Objectives



Learn about the ten concepts of the WELL Building Standard.



Understand how WELL principles impact Laboratory design.



Identify strategies that can be applied to satisfy WELL criteria.



Discover how WELL strategies can deliver results for scientific workers.

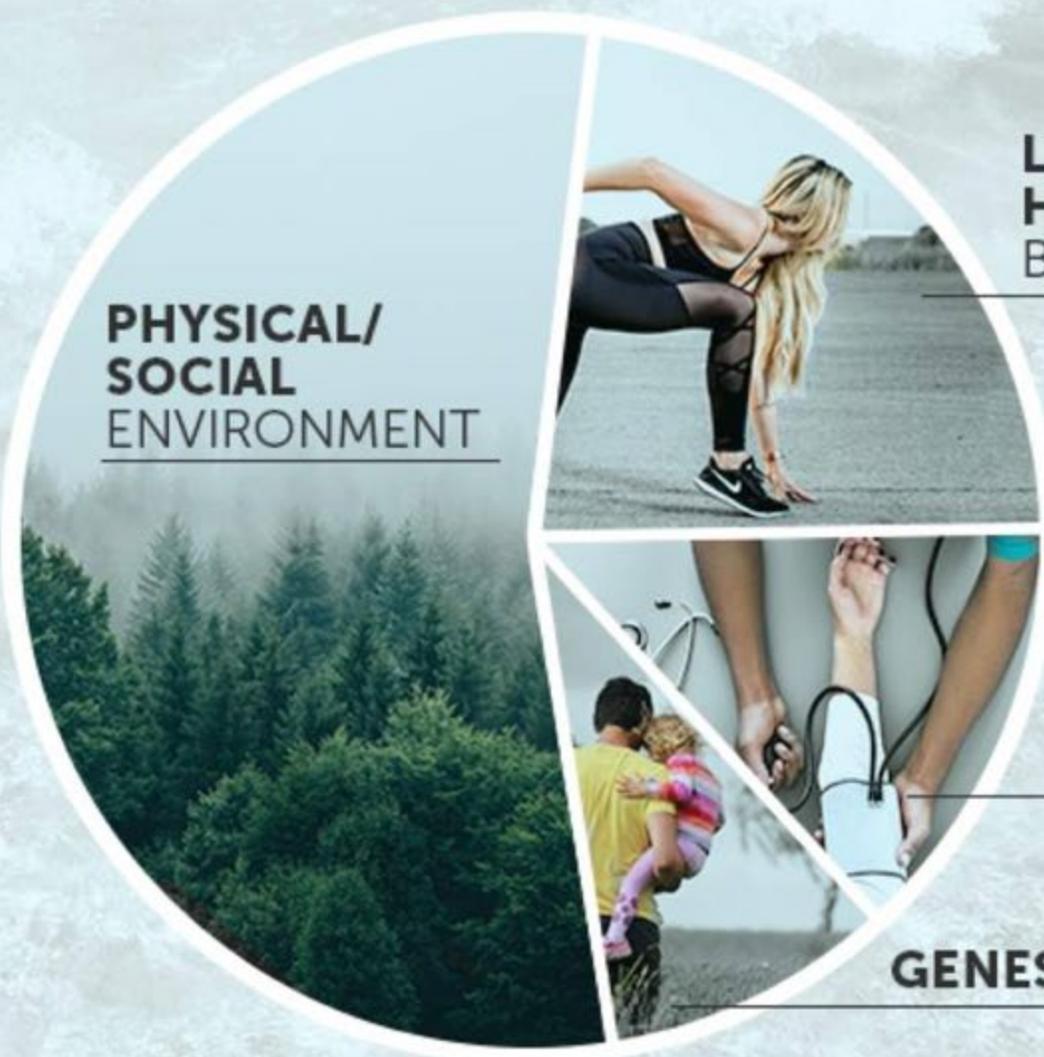
We spend approximately 90% of our time indoors, and our environment is the largest determinant of our overall health.



That means our health begins at home –
and at work, and in all of the
spaces we frequent on a daily basis.

WHAT DETERMINES THE STATE OF HEALTH?

**PHYSICAL/
SOCIAL
ENVIRONMENT**



**LIFESTYLE/
HEALTH
BEHAVIORS**

**MEDICAL
CARE**

GENES

Source: Centers for Disease Control and Prevention. Frequently Asked Questions. 2014. Available online at: <http://www.cdc.gov/ncdr/rp/socialdeterminants/faq.html>

People



Planet



INVEST IN PEOPLE FOR RETURN ON INVESTMENT

90%
SALARY/
BENEFITS

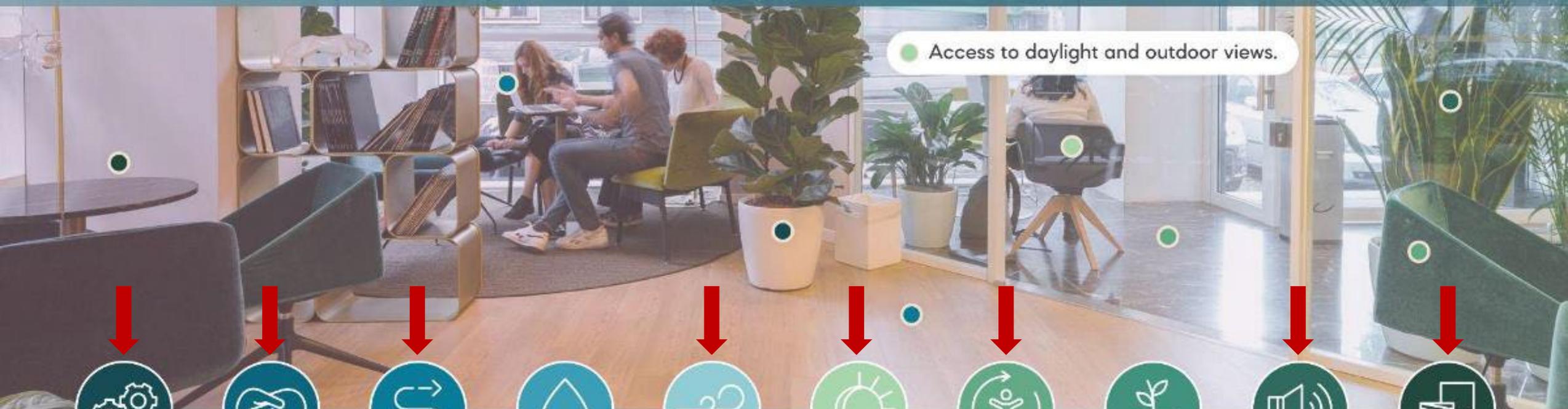
9%
RENT/
OPERATIONS

1%
ENERGY

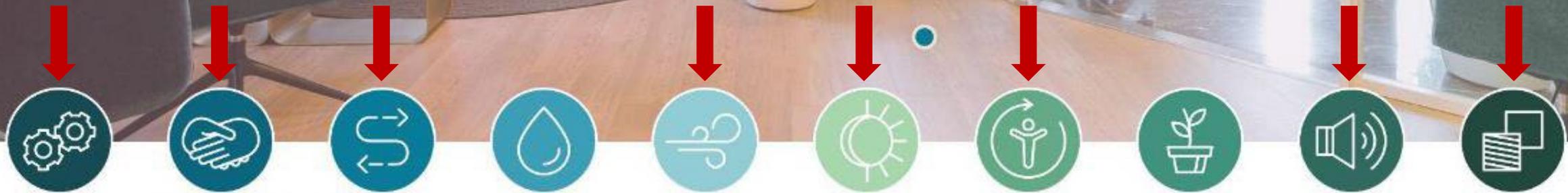


Source: Knight Workplace Research "What's Good for People, Moving from Wellness to Well Being", Q4e 2018
Studies include those conducted by organizations including Harvard Business Review and World Economic Forum
and the American Journal of Health Research. Image courtesy of World Green Building Council Report
"Health, Wellbeing & Productivity in Offices"

The WELL Standard is a library of evidence-based building and organizational strategies that can improve the health and well-being of your people.



● Access to daylight and outdoor views.



MIND

COMMUNITY

MOVEMENT

WATER

AIR

LIGHT

THERMAL COMFORT

NOURISHMENT

SOUND

MATERIALS

7,000+

peer-reviewed studies and citations

20,000+

industry leaders and practitioners

74,000+

enrolled commercial & residential locations

500+

evidence-based interventions



THERMAL COMFORT

THE IMPACT

In a laboratory setting, personal thermal comfort devices have been shown to improve self-reported productivity rates and increase thermal comfort.¹

¹ Boerstra AC, te Kulve M, Toftum J, Loomans MGLC, Olesen BW, Hensen JLM. Comfort and performance impact of personal control over thermal environment in summer: Results from a laboratory study. *Build Environ.* 2015;87:315-326. doi:10.1016/J.BUILDENV.2014.12.022.



Air /
Thermal
Comfort





LIGHT

THE IMPACT

Providing indoor access to daylight can positively influence the productivity and mood of individuals. ^{1,2}

1. LeGates TA, Fernandez DC, Hattar S. Light as a central modulator of circadian rhythms, sleep and affect. *Nat Rev Neurosci.* 2014;15(7):443-454. doi:10.1038/nrn3743.
2. Phipps-Nelson J, Redman JR, Dijk D-J, Rajaratnam SMW. Daytime exposure to bright light, as compared to dim light, decreases sleepiness and improves psychomotor vigilance performance. *Sleep.* 2003;26(6):695-700. <http://www.ncbi.nlm.nih.gov/pubmed/14572122>.





SOUND

THE IMPACT

When exposure to noise is reduced, people are less susceptible to distraction, overall stress and potential health risk.¹

The fortification of façade elements can ensure that exterior noise intrusion is subdued much to the benefit of personal comfort during work, study or sleep.²⁻⁸

1. Evans GW, Johnson D. Stress and open-office noise. *J Appl Psychol.* 2000;85(5):779-783. doi:10.1037/0021-9010.85.5.779
2. Fyhri A, Aasvang GM. Noise, sleep and poor health: Modeling the relationship between road traffic noise and cardiovascular problems. *Sci Total Environ.* 2010;408(21):4935-4942. doi:10.1016/j.scitotenv.2010.06.057
3. Jarup L, Babich W, Houthuijs D, et al. Hypertension and exposure to noise near airports: The HYENA study. *Environ Health Perspect.* 2008;116(3):329-333. doi:10.1289/ehp.10775
4. Anna L, Blangiardo M, Fortunato L, et al. Aircraft noise and cardiovascular disease near Heathrow airport in London: Small area study. *BMJ.* 2013;347(7928):9-12. doi:10.1136/bmj.f5432 Klatte M, Bergström K, Lachmann T. Does noise affect learning? A short review on noise effects on cognitive performance in children. *Front Psychol.* 2013;4(August):1-6. doi:10.3389/fpsyg.2013.00578
5. Trimmel K, Sch?tzler J, Trenmel M. Acoustic noise alters selective attention processes as indicated by direct current (DC) brain potential changes. *Int J Environ Res Public Health.* 2014;11(10):9938-9953. doi:10.3390/ijerph111009938
6. Kaltenbach M, Maschke C, Klinko R. Health consequences of aircraft noise. *Dtsch Arztebl Int.* 2008;105(31-32):548-556. doi:10.3238/arztebl.2008.0548
7. Solet J, Buxton O, Ellenbogen J, Wang W, Carballera a. Validating Acoustic Guidelines for Healthcare Facilities: Evidence-based design meets Evidence-based medicine: The Sound Sleep Study. 2010:1-56. papers2://publication/uuid/C795CF4F-BD80-4B4F-B590-C3FAADD03030.
8. Goines L, Hagler L. Noise Pollution: A Modern Plague: Adverse Health Effects of Noise. *South Med J.* 2007;100(3):287-294.



Light /
Sound





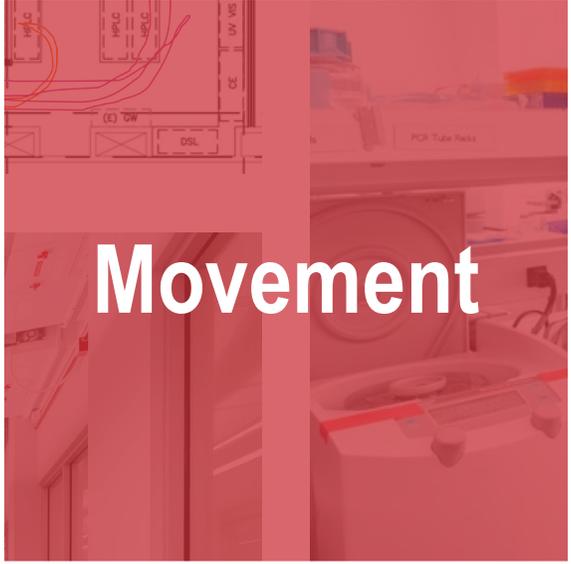
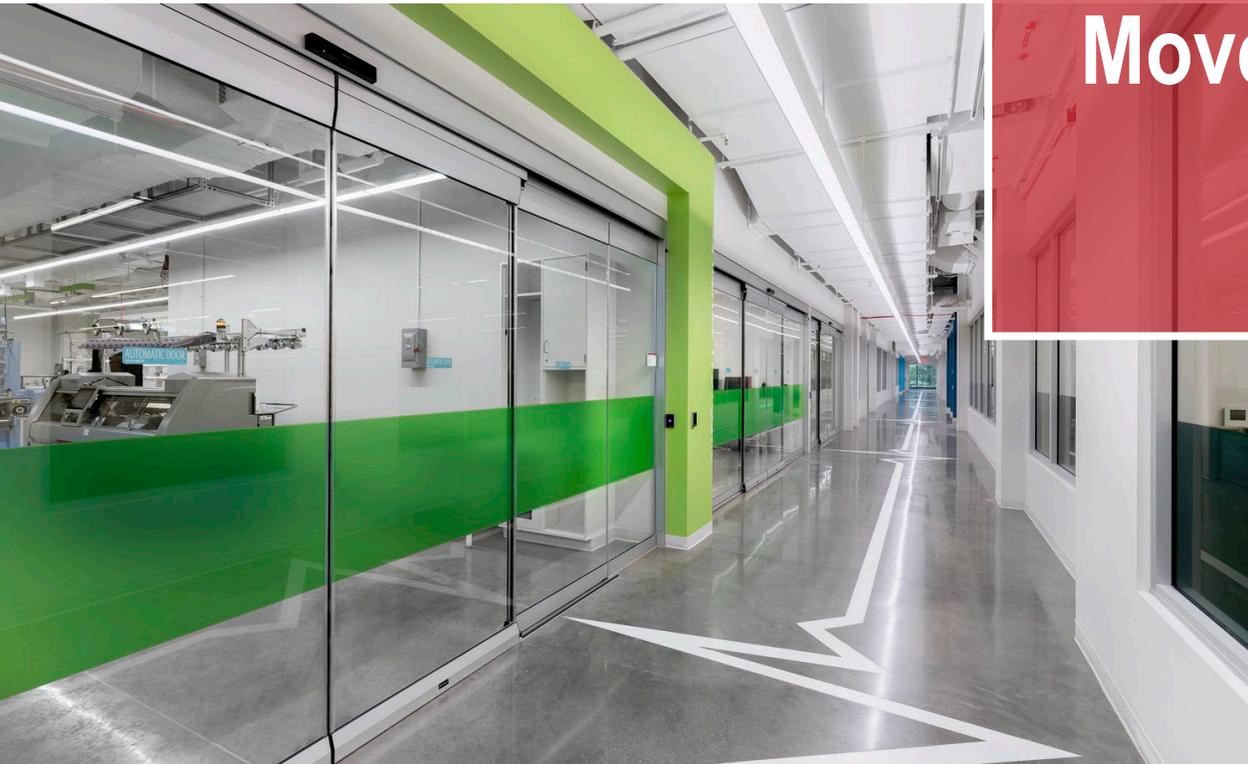
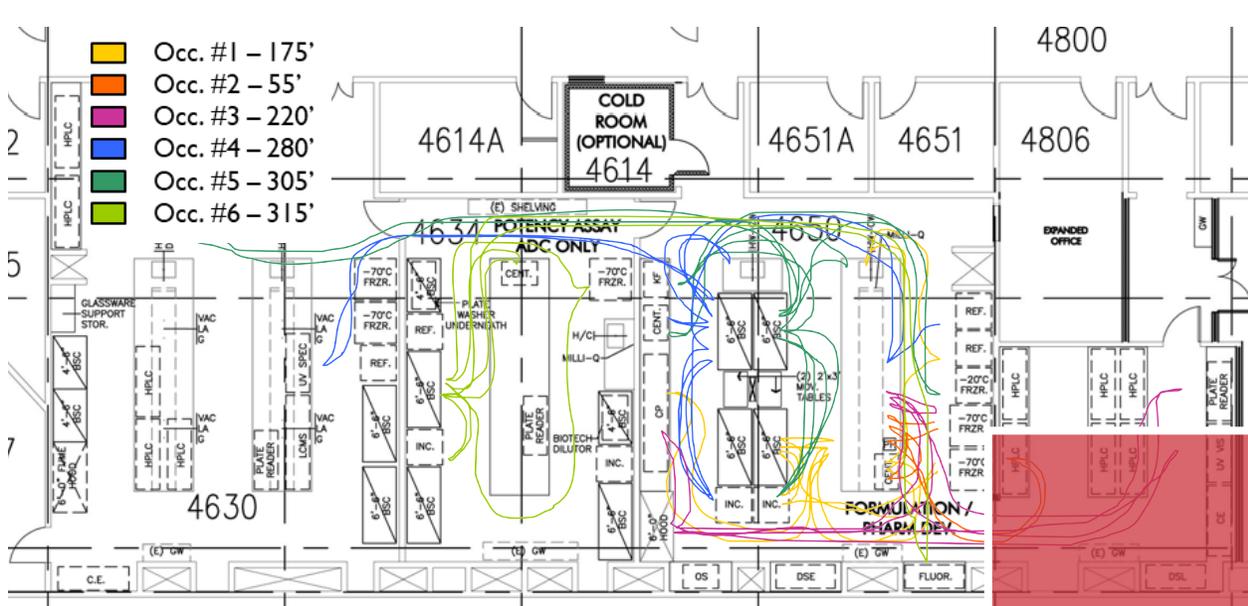
MOVEMENT

THE IMPACT

Worldwide, if physical inactivity were reduced by just 10%, more than half a million deaths could be averted, while over one million deaths could be averted if physical inactivity were reduced by 25%.¹

1. Lee IM, Shiroma EJ, Lobelo F, et al. Effect of physical inactivity on major non-communicable diseases worldwide: An analysis of burden of disease and life expectancy. *Lancet*. 2012;380(9838):219-229. doi:10.1016/S0140-6736(12)61031-9.





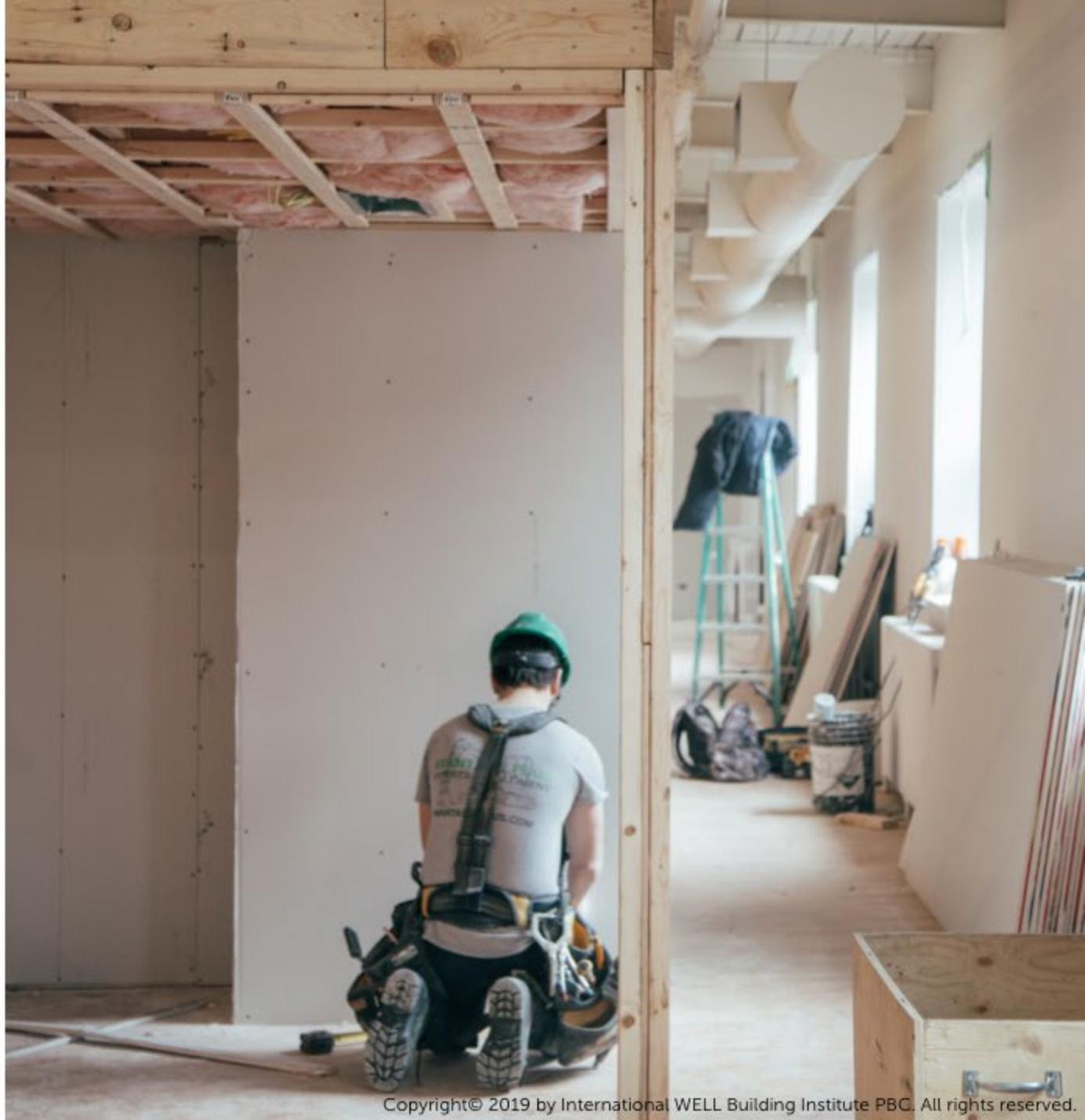


MATERIALS

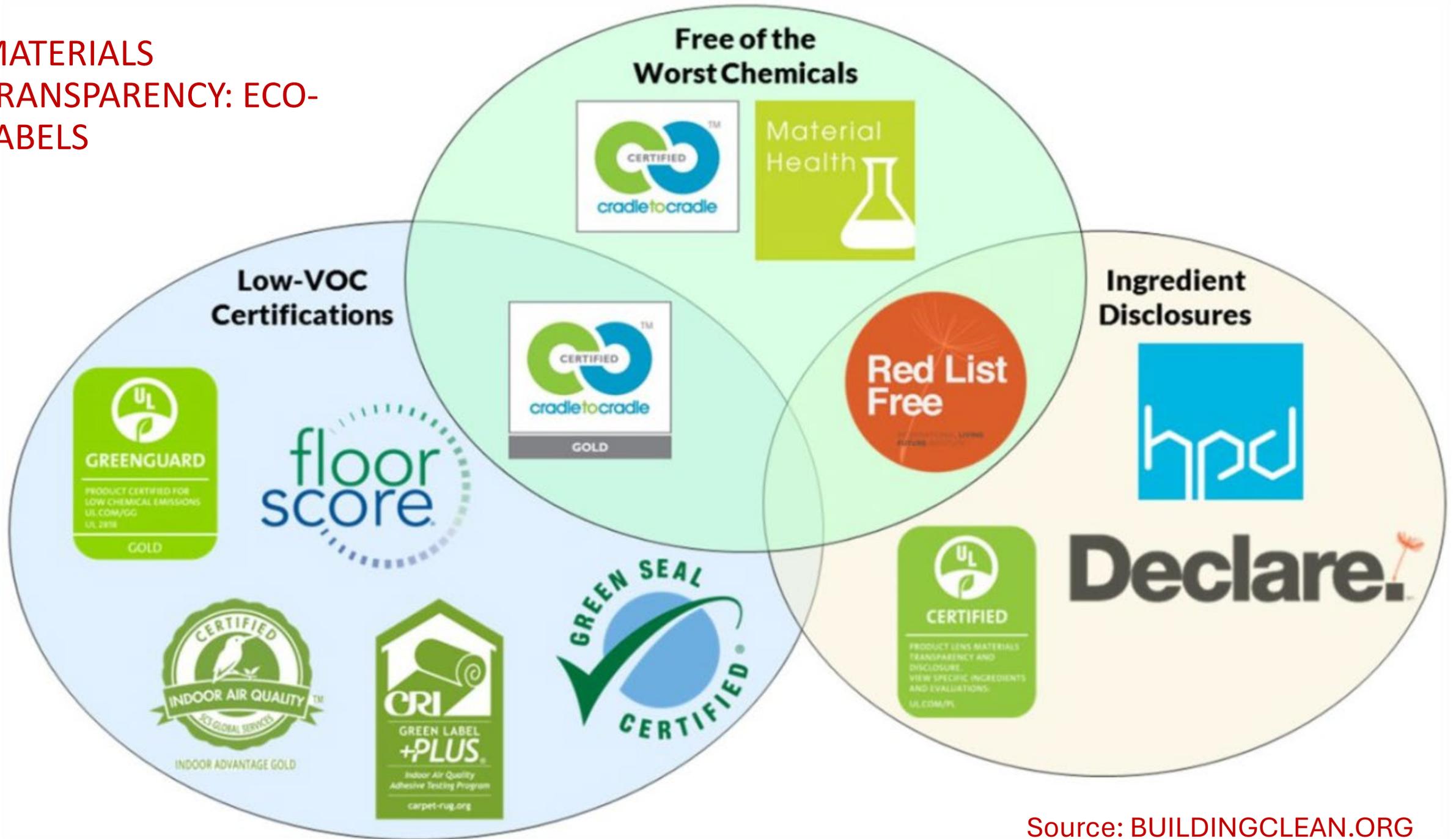
THE ISSUE

An estimated 95% of chemicals largely used in construction lack sufficient data on health impacts.¹

1. Pacheco-Torgal F, Jalali S, Fucic A. Toxicity of Building Materials. Sawston, Cambridge: Woodhead Publishing Limited; 2012.



MATERIALS TRANSPARENCY: ECO- LABELS



Source: BUILDINGCLEAN.ORG



FLOORING

- Swap vinyl flooring for
- PVC-free or phthalate-free vinyl
 - Linoleum sheet or tile
 - Concrete (densifier without PFAS)
 - low-VOC adhesives



DRYWALL

- Swap synthetic and antimicrobial for
- Natural gypsum
 - Post-consumer recycled content



COUNTERTOPS

- Swap epoxy, phenolic for
- Lower VOC epoxy
 - Low VOC Solid phenolic Compact (SPC)
 - Stainless Steel



PAINT

- Swap solvent and PFAS for
- low or no-VOC
 - PFAS and APEs free



MIND

THE IMPACT

Design strategies, such as access to indoor nature, as well as design and policy strategies that support restoration, productivity and focus can help relieve workplace stress and anxiety, reduce absences and enhance overall perceived health status.¹⁻⁶

1. Bjornstad S, Patil GG, Raanaas RK. Nature contact and organizational support during office working hours: Benefits relating to stress reduction, subjective health complaints, and sick leave. *Work*. 2016. doi:10.3233/WOR-152211.
2. Fjeld T, Veiersted B, Sandvik L, Riise G, Levy F. The Effect of Indoor Foliage Plants on Health and Discomfort Symptoms among Office Workers. *Indoor Built Environ*. 1998;7(4):204-209. <https://www.karger.com/DOI/10.1159/000024583>.
3. Largo-Wight E, Chen WW, Dodd V, Weiler R. Healthy Workplaces - The Effects of Nature Contact at Work on Employee Stress and Health. *Public Health Rep*. 2011;126:124-131. doi:10.2307/41639273.
4. Jahncke H, Hygge S, Halin N, Green AM, Dimberg K. Open-plan office noise: Cognitive performance and restoration. *J Environ Psychol*. 2011;31(4):373-382. doi:https://doi.org/10.1016/j.jenvp.2011.07.002.
5. Smith-Jackson TL, Klein KW. Open-plan offices: Task performance and mental workload. *J Environ Psychol*. 2009;29(2):279-289. doi:https://doi.org/10.1016/j.jenvp.2008.09.002.
6. Vischer JC. The effects of the physical environment on job performance: Towards a theoretical model of workspace stress. *Stress Heal*. 2007;23(3):175-184. doi:10.1002/smi.1134.





Mind





COMMUNITY

THE ISSUE

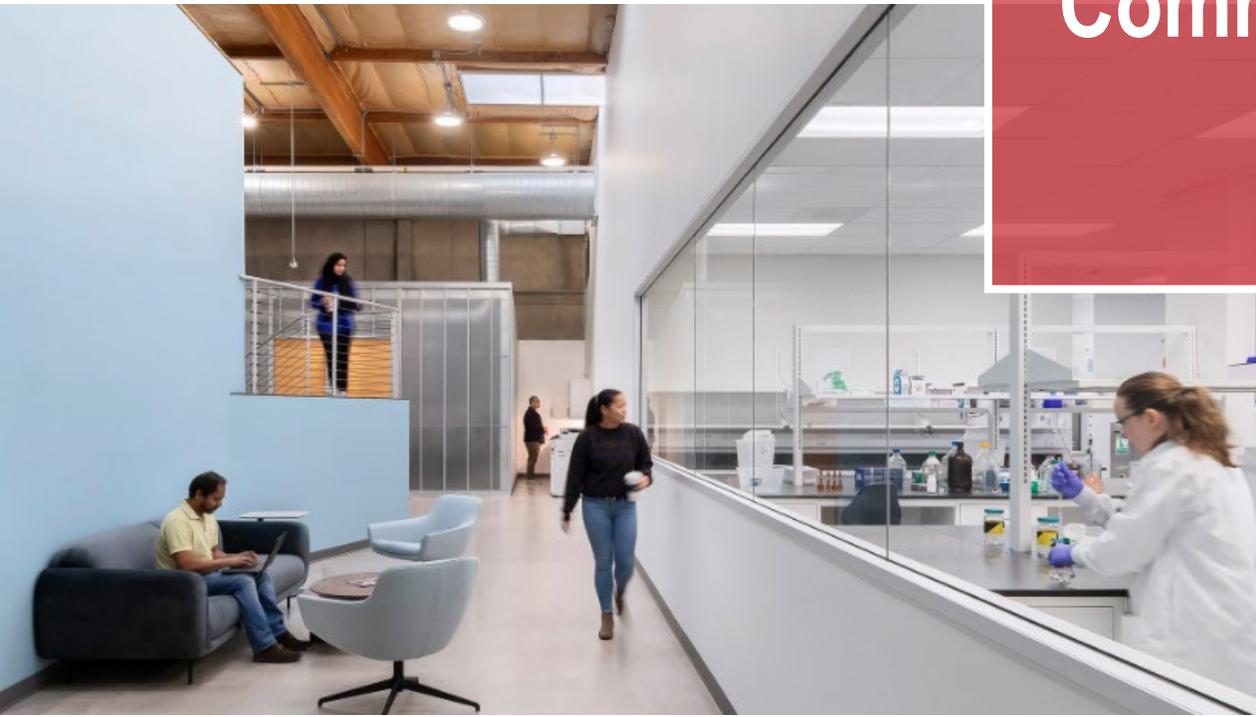
Many people around the world still struggle with access to basic health services, and access varies based factors including ethnicity, gender identity, disability status and residential location.¹

The design and function of built spaces can contribute to health disparities. Yet many environments are not designed with consideration of people with diverse abilities and priorities.

1. U.S. Department of Health and Human Services. Access to Health Services. Healthy People 2020. <https://www.healthypeople.gov/2020/topics-objectives/topic/Access-to-Health-Services>.



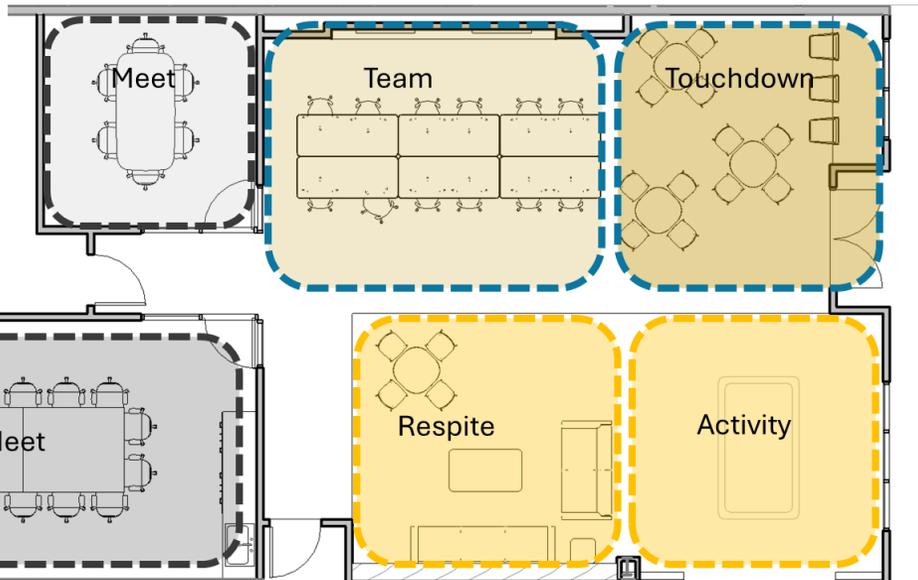
Community



Private, Alone

Public, Together

Public, Alone



Private, Together

Public, Together



**We shape our
buildings; thereafter,
they shape us.**

WINSTON CHURCHILL



Thank you
Questions?



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