

ENVIRONMENTAL INDIFFERENCE

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"I can't breathe."

– Eric Garner, George Floyd, and at least seventy others¹

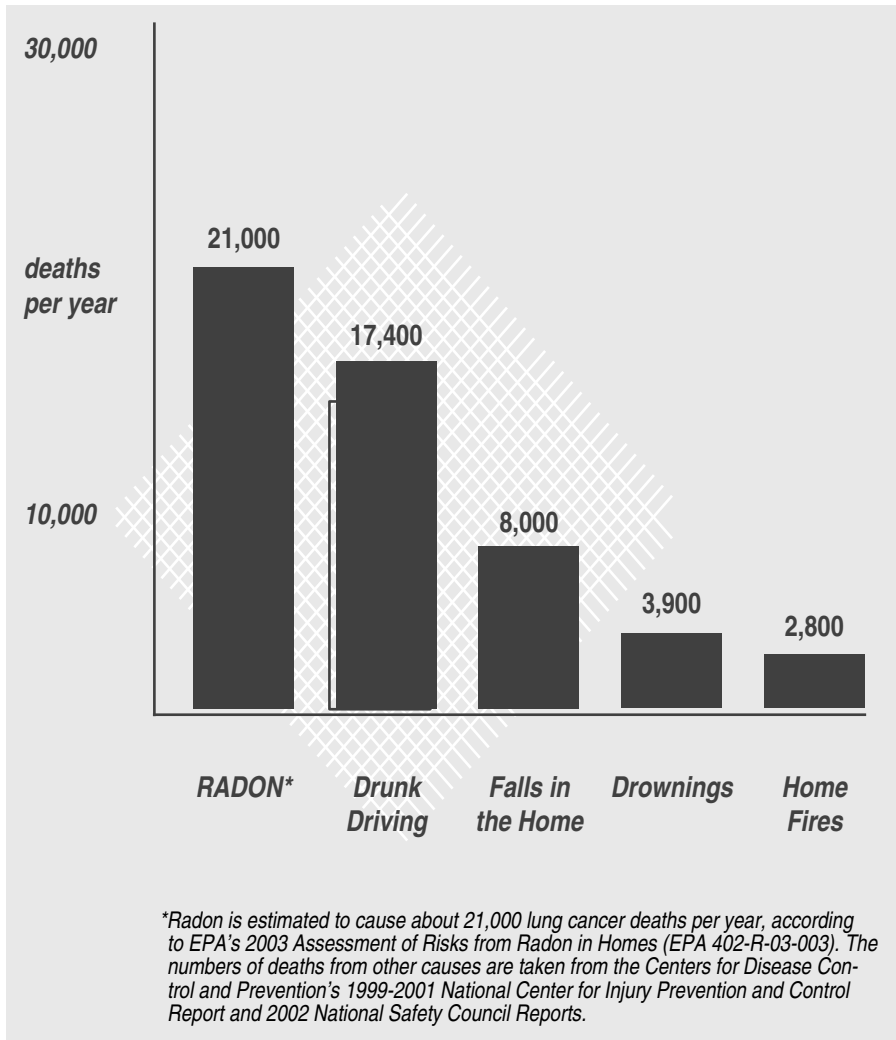
INTRODUCTION

The thought of radioactive gas in the night air in the place you lay your head is the stuff of nightmares. That nightmare has been a hidden reality for much of the United States for decades. When scientists and epidemiologists finally exposed the prevalence of radon gas in our nation's structures and the unimpeachable connection to lung cancer, the approach of homebuyers, home sellers, and homeowners permanently shifted. No prudent person would purchase a house in New England without first testing for radon; no seller would refuse to permit such a test; no responsible owner would fail to install the relatively inexpensive mitigation system. As a result, many people have adapted to life with our inert radioactive roommate. Nonetheless, over two million Americans live in structures over which the government has exclusive control—prisons. This work examines the unconstitutional environmental hazards, specifically the risks posed by radon, that these individuals are compelled to endure as a condition of their incarceration.

An odorless and invisible radioactive gas, radon comes from the natural decay of uranium found in soils and rock formations.² Uranium, a trace element in rocks common to construction such as granite, shale, and limestone, produces the gas.³ Radon gas escapes from the structure itself or the ground underneath it and moves into the indoor air by traveling through cracks and other holes in the foundations of buildings.⁴ Structures of any shape, size, age, degree of insulation, and level of sealing can experience radon gas infiltration.⁵ The resulting exposure kills an alarming number of Americans each year by causing lung cancer. The following chart from the Environmental Protection Agency's ("EPA") informational materials demonstrates the relative danger of radon as a killer:

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1. Mike Baker et al., *Three Words. 70 Cases. The Tragic History of 'I Can't Breathe.'*, N.Y. TIMES (June 29, 2020), <https://perma.cc/PY4X-5HRL>.
 2. EPA, A CITIZEN'S GUIDE TO RADON 3 (2016) [hereinafter A CITIZEN'S GUIDE TO RADON], <https://perma.cc/FH4L-5Q9F>.
 3. Carolyn Marie Shuko, *Radon Gas: Contractor Liability for an Indoor Health Hazard*, 12 AM. J.L. & MED. 241, 242 (1986) ("These radon-releasing rocks are generally used in the construction industry to make products such as brick and concrete. Granite and limestone are also the major components of mechanically shaped stone used in the construction of buildings and walkways."). See generally G.M. Reimer & L.C.S. Gundersen, *A Direct Correlation Among Indoor Rn, Soil Gas Rn and Geology in the Reading Prong near Boyertown, Pennsylvania*, 57 HEALTH PHYSICS 155 (1989).
 4. A CITIZEN'S GUIDE TO RADON, *supra* note 2, at 4.
 5. See *id.*

FIG. 1⁶



Because of the prevalence of the hazard and the well-established close connection between inhalation of radon and lung cancer, the U.S. Congress professed, “[t]he national long-term goal of the United States with respect to radon levels in buildings is that the air within buildings in the United States should be as free of radon as the ambient air outside of buildings.”⁷ Sadly, it is

6. *Id.* at 2.

7. 15 U.S.C. § 2661.

quite likely that many of our nation's prisons fall well short of that goal; at the very least, citizens and officials lack information on that life-and-death figure.

Put simply, radon in prisons kills. And because, as many have documented, the United States leads the world in imprisoning its people, particularly racial and ethnic minorities,⁸ exposure to radon in correctional institutions may be functioning as a form of mass capital punishment. As Michelle Alexander famously laid out nearly ten years ago, our criminal justice system serves as the contemporary iteration of legally sanctioned oppression of Black and Brown people.⁹ As was true a decade ago,¹⁰ despite similar rates of committing crime, Black men find themselves imprisoned at five times the rate of their white counterparts.¹¹ This racial disparity persists even as overall rates of imprisonment decline.¹² Black citizens make up only 13% of the general population, yet they comprise approximately 40% of the incarcerated population.¹³ This is in contrast to white citizens, who comprise a lower percentage of the incarcerated population (39%) than the general population (64%).¹⁴ These startling figures suggest that as we work to protect the general population from radon exposure, while leaving the incarcerated population behind, we are in fact working to disproportionately protect citizens of one race, while leaving those of another to die.

This Article will explain how the exposure of people in prisons to radon gas threatens lives and violates the Constitution. It begins with a fuller explanation of the threat posed by radon to human health. Part II then describes the efforts to mitigate radon exposure among the general population and society's general intolerance of the risk. Part III lays out how the Eighth Amendment's prohibition of "cruel and unusual punishment" applies in the context of prison

8. See MICHELLE ALEXANDER, *THE NEW JIM CROW* 7–8 (2010) ("No other country in the world imprisons so many of its racial or ethnic minorities. The United States imprisons a larger percentage of its Black population than South Africa did at the height of apartheid.").

9. See generally *id.*

10. See *id.* at 8 ("In some states, Black men have been admitted to prison on drug charges at rates twenty to fifty times greater than those of white men.").

11. E. ANN CARSON, BUREAU OF JUSTICE STATISTICS, NCJ 253516, *PRISONS IN 2018*, at 1 (2020); see also *id.* (reporting that Black women are imprisoned at 1.8 times the rate of white women); *id.* at 17 ("Black males ages 18 to 19 were 12.7 times as likely to be imprisoned as white males of the same ages, the highest Black-to-white racial disparity of any age group in 2018.").

12. See *id.* at 1, 10 ("In 2018, the imprisonment rate of Black residents (1,134 sentenced Black prisoners per 100,000 Black residents) was the lowest since 1989 (1,050 per 100,000). . . . From year-end 2008 to year-end 2018, the imprisonment rate declined 15.2% for white adults (from 316 to 268 per 100,000) and 31.7% for Black adults (from 2,196 to 1,501 per 100,000).").

13. Leah Sakala, *Breaking Down Mass Incarceration in the 2010 Census: State-by-State Incarceration Rates by Race/Ethnicity*, PRISON POL'Y INITIATIVE (May 28, 2014), <https://perma.cc/E6M6-5X73>.

14. *Id.*

conditions, particularly exposure to known toxic substances in prison. Part IV describes in detail how exposure to radon fits within that paradigm, using an ongoing federal case from Connecticut as an example of theory in practice. Part V notes the significant hurdles to successful litigation as a tool to bring about change in this area, with the following part identifying how mitigation of radon in prisons might still come about. Radon gas is far from the only environmental hazard that plagues our nation's prisons, disproportionately subjecting already marginalized community members to risks we would not tolerate elsewhere. The words printed here represent the opening stanza of an environmental and human rights saga that has gone unwritten for too long.

I. RADON EXPOSURE AND LUNG CANCER

A. History of Radon Exposure Among General Public

Radon gas is not a new threat. Perhaps unsurprisingly, uranium mining has been marked as a dangerous profession for hundreds of years. The first recorded observations of respiratory tract illness in uranium and radium miners came in the Erz Mountains of Czechoslovakia in the 16th century.¹⁵ However, it would be three centuries before European scientists would discover the malignant lung tumors at the center of the health crisis and another hundred years before American scientists would make the connection to radon gas explicit.¹⁶

In the 1950s and 60s Midwestern United States, the veritable hotbed of uranium mining, life seemed good, except for the lung cancer. It was during that time that scientific studies of uranium miners first revealed the connection between high levels of radon exposure and high incidence of lung cancer.¹⁷ A 1972 report of the National Academy of Sciences Committee on Biological Effects of Ionizing Radiation revealed that the cancer incidence rate among American workers was directly proportional to their degree of exposure to radon gas.¹⁸

In the 1980s, Americans came to the frightening realization that this dangerous environmental hazard may also find its way into the sanctity of their homes. Residents of Northeastern and Midwestern states in particular became increasingly concerned about radon exposure.¹⁹ Homes constructed on top of

15. See Shuko, *supra* note 3, at 243.

16. *Id.* at 243–44 (“In [1879] European researchers traced the increased fatality rates among the uranium mining population to malignant lung tumors.”).

17. See David Dearing, *Radon Litigation: An Overview of Homeowners’ Potential Causes of Action*, 20 CUMB. L. REV. 825, 826 (1989).

18. See Bernard L. Cohen, *Radon: Characteristics, Natural Occurrence, Technological Enhancement, and Health Effects*, 4 PROGRESS NUCLEAR ENERGY 1, 9 (1979).

19. See Shuko, *supra* note 3, at 246 (citing William R. Greer, *Radioactive Gas Alters Lives of Pennsylvanians*, N.Y. TIMES, Oct. 28, 1985, at A-10) (“The hazards of radon as an indoor

rock and soil containing small amounts of uranium work essentially to capture the radon gas that slowly seeps from the rock. Wells dug near that same rock can cause similar seepage of radon into a home's drinking water. We now know that the rock and soil that produce dangerous levels of radon gas occur throughout the United States,²⁰ with some particularly acute areas of concern. Radon levels requiring mitigation have been recorded in thirty-eight states, crisscrossing the nation.²¹ Large swaths of New England have registered uranium-rich soil; the Reading Prong, a uranium-rich geologic formation, runs under eastern Pennsylvania, New Jersey, and New York; the Appalachian Mountains contain high levels of radon; central Florida includes some phosphate mining regions with uranium, as do the Georgia and Carolina coasts; the Rocky Mountain region contains a large amount of uranium; and other areas scattered throughout Midwestern states, such as Wisconsin and Minnesota, also have reported issues with radon.²²

Exposure pathways and structural contributions to exposure work similarly in all of these areas. Airborne exposure tends to be highest in the parts of the structure that sit closest to the rock itself—generally the basement. Tightly sealed structures and residences with poor air flow also tend to compound exposure levels, as the gas accumulates in the home without escaping. As discussed in more detail below, relatively simple and inexpensive systems exist to increase flow and remove radon from indoor air. There is nothing to suggest that our nation's prisons lack the structural characteristics that contribute to radon exposure in residences—in fact, there is reason to believe that prisons might be worse on some dimensions.²³

air pollutant were first recognized when Stanley J. Watras, a resident of Boyertown, Pennsylvania, triggered the radiation monitor at his workplace. Watras, an engineer and employee of the Limerick Nuclear Power Plant, was approaching the entrance of the plant when the alarm, three feet away from an entryway monitor, sounded. A subsequent testing of the Watras' home led to the discovery of 16 working levels (WLs) of radon gas in the living room.”).

20. See Dearing, *supra* note 17, at 827 (“The Environmental Protection Agency estimates that one in every fourteen homes contains the carcinogen radon.”).
21. See *id.*
22. Jeanne Prussman, *The Radon Riddle: Landlord Liability for a Natural Hazard*, 18 B.C. ENV'T AFFS. L. REV. 715, 718–19 (1991); see also Shuko, *supra* note 3, at 244 n.26 (listing states where uranium mining continues, including New Mexico, Arizona, Utah, and Colorado). At present, the majority of radon has been discovered on the East Coast, specifically Pennsylvania, New Jersey, New York, Florida, parts of New England, and the Appalachian Mountains.
23. See, e.g., Board v. Farnham, 394 F.3d 469, 485–87 (7th Cir. 2005) (dealing with an Eighth Amendment violation related to inadequate ventilation in prisons).

B. Lung Cancer Risk

Lung cancer, like the radon gas that causes it, has a firmly established place in the American risk consciousness. Attention flocked to the disease because of its connection to cigarette smoking. It also happens to be one of the most common and deadliest types of cancer. According to the most recent data from the American Cancer Society, lung cancers account for approximately 12–13% of cancer cases in the general population of the United States,²⁴ making it the second most prevalent cancer in the nation.²⁵ The incidence rate for lung cancer has been between 50–75 per 100,000 people over the last five years (0.05% to 0.075%),²⁶ and the lifetime risk of developing lung cancer is about 1-in-15 for men and 1-in-17 for women.²⁷ The incidence rate of lung cancer among men has been declining since at least the early 1990s and for women since the early 2000s.²⁸ And among men, lung cancer occurs about 50% more frequently in Black men than in white men.²⁹ Recent statistics show a marked reduction in cigarette smoking among black youth, which public health experts hope portends decreasing rates of lung cancer and closing racial disparity in men in the general population.³⁰

Although much of the declining incidence rates can be attributed to a decrease in the prevalence of tobacco use among the general population, that does not fully explain the downward trend.³¹ One might surmise that increased awareness and mitigation of radon in homes since the 1980s has contributed in part to the declining incidence rates. Unfortunately, no scientific study on that precise question has yet been conducted.

Consistent with the popular media narrative, cigarette smoking remains far and away the most common cause of lung cancer in the United States. Garnering far less attention, radon comes in as the second-most prominent

24. See Rebecca Siegel et al., *Cancer Statistics, 2018*, 70 CA 7, 12 fig. 1 (2020) (estimating “lung and bronchus” as the site of 13% of new cancer cases in men and 12% of new cases in women during the past year).

25. See *id.* (stating prostate cancer is the most prevalent type in men and breast cancer the most prevalent in women). See also AM. LUNG ASS’N, *Lung Cancer Fact Sheet* (May 27, 2020), <https://perma.cc/B7SV-E6YB> (“Lung cancer is the most common cancer worldwide, accounting for 2.1 million new cases and 1.8 million deaths in 2018.”).

26. See Siegel et al., *supra* note 24, at 15 fig. 3.

27. *Key Statistics for Lung Cancer*, AM. CANCER SOC’Y, (Jan. 12, 2021), <https://perma.cc/BLL5-TAKZ>.

28. See Siegel et al., *supra* note 24, at 10–12 (“Lung cancer incidence continues to decline twice as fast in men as in women, reflecting historical differences in tobacco uptake and cessation, as well as upturns in female smoking prevalence in some birth cohorts.”).

29. See Anthony J. Alberg & Jonathon M. Samet, *Epidemiology of Lung Cancer*, 123 CHEST. 21S, 24S (2003).

30. See *id.*

31. See Siegel et al., *supra* note 24, at 15 fig. 3, 16.

driver of the disease, tied roughly with occupational exposure.³² Epidemiologists estimate that radon causes 10% of annual lung cancer cases.³³ Historically, since the serious study of radon as a cause of lung cancer began, medical experts have consistently attributed 8% to 25% of all lung cancer deaths to radon exposure.³⁴ These figures, along with EPA and Nuclear Regulatory Commission (“NRC”) assumptions, put radon’s generally accepted estimated annual death toll around 15,000–20,000.³⁵

People housed in America’s prisons face even graver risk of lung cancer than the general public. According to a recent study of cancer diagnoses, almost 3,000 incarcerated people will develop cancer every year.³⁶ Perhaps unsurprisingly, as the prison population rose, and then aged, across the United States, so did the number of persons inside prisons with cancer. More alarmingly, among those suffering from cancer, males from racial or ethnic minorities under the age of fifty comprise a dominant subgroup.³⁷ While many of these persons report a history of alcohol and/or tobacco use,³⁸ the demographics of those affected only amplify the already disparate impact the criminal justice system has on minority citizens.

The most common cancer in prison is lung cancer.³⁹ Lung cancer poses a specifically pronounced threat to incarcerated persons, especially when com-

32. See Alberg & Samet, *supra* note 29, at 26S (“Population attributable risk estimates for lung cancer indicate that in the United States, active smoking is responsible for 90% of lung cancer cases, occupational exposures to carcinogens account for approximately 9 to 15% of lung cancer cases, radon causes 10% of lung cancer cases, and outdoor air pollution accounts for perhaps 1 to 2% of lung cancer cases.”).

33. *Id.*

34. See, e.g., Jerome S. Puskin & Yunsong Yang, *A Retrospective Look at Rn-Induced Lung Cancer Mortality from the Viewpoint of a Relative Risk Model*, 54 HEALTH PHYSICS 635, 642 (1988).

35. See Alberg & Samet, *supra* note 29, at 37S.

36. Paul Mathew et al., *Cancer in an Incarcerated Population*, 104 CANCER 2197, 2199 (2005) (“Extrapolating from these data to the total U.S. incarcerated population and adjusting for differences in the age, gender, and racial distributions of the populations, it is expected that 2813 new cancers will be diagnosed per year among the incarcerated population in the U.S.”).

37. *Id.*; see also CHRISTOPHER J. MUMOLA, BUREAU OF JUST. STAT., U.S. DEP’T OF JUST., MEDICAL CAUSES OF DEATH IN STATE PRISONS, 2001–2004, at 2 (2007) (“Men in State prison died from cancer at twice the rate of women (60 deaths per 100,000 inmates compared to 27 per 100,000). This gender difference in cancer death rates was particularly evident for the most common fatal cancer sites. Men died from lung, liver and colon cancer at a rate nearly triple that of women.”).

38. Mathew et al., *supra* note 36, at 2197–98; see also Sara M. Kennedy et al., *Cigarette Smoking Among Inmates by Race/Ethnicity: Impact of Excluding African American Young Adult Men from National Prevalence Estimates*, 18 NICOTINE & TOBACCO RSCH. S73, S74 (2016) (“Estimated smoking prevalence among inmates was approximately 50% in 2003–2004, compared to 21% among noninstitutionalized adults.”).

39. Mathew et al., *supra* note 36, at 2200 tbl. 2 (“Lung carcinomas (443 patients) were the most common malignancy, accounting for one-fourth (24.5%) of all diagnoses.”).

pared to those in the general population. One study compared lung cancer incidence among a group of incarcerated individuals to that of a similar cohort outside the system and found lung cancer twice as prevalent in the former group.⁴⁰ As discussed throughout this work, the prison population differs demographically from the United States population on some dimensions that could have relevance with respect to cancer risk—for example, race, gender, age.⁴¹ The authors of the aforementioned study controlled for these demographic differences and still reported an incidence rate of lung cancer for the incarcerated group 10% above the control group.⁴²

Inside our nation's prisons, lung cancer proves even more deadly than it does outside them. Statistics compiled by the U.S. Department of Justice indicate that lung cancer accounts for 8% of *all* deaths in state prisons.⁴³ Multiple studies report that lung cancer causes more than one-third of all cancer deaths in prisons, more than the next six most common cancers combined.⁴⁴ Not only does lung cancer kill the incarcerated more frequently, it kills them more quickly. Incarcerated cancer patients survived a median of twenty-one months, as compared to a median length of fifty-five months for patients in the general population.⁴⁵ Survival outcomes varied among gender, racial, and ethnic groups as well, with women surviving longer than men and Hispanic men faring the best within the male population.⁴⁶

40. *Id.* at 2201 (“Lung carcinoma was twice as common in the prison population compared with the SEER cohort (25% vs. 13.8%, respectively; $p < 0.001$).”).

41. *See* Introduction, *supra*.

42. Mathew et al., *supra* note 36, at 2201 (“After controlling for demographic differences, we found that the proportion of patients with lung carcinoma remained greater in the inmate population than in the MSEER population (26% vs. 16%, respectively; $p < 0.001$).”). Lest one attribute this disparity to higher rates of cancer generally, the study also found some cancers that were *less* prevalent in prison than outside. *See id.* (“Conversely, patients with colon carcinoma (6% vs. 10%, respectively; $p < 0.001$), melanoma (1% vs. 5%, respectively; $p < 0.001$), and prostate carcinoma (5% vs. 11%, respectively; $p < 0.001$) were less common proportionately in the inmate population compared with the MSEER population.”).

43. MUMOLA, *supra* note 37, at 2.

44. *See id.* (“More State prisoner deaths were caused by lung cancer (910) than the next 6 leading sites of cancer deaths (864) combined (i.e., liver, colon, pancreas, non-Hodgkin’s lymphoma, prostate, and leukemia) . . . Regardless of gender, lung cancer caused twice as many deaths as any other site.”); Mathew et al., *supra* note 36, at 2200 (“Lung carcinoma was associated with greater than one-third of all cancer deaths among inmates.”).

45. *See* Mathew et al., *supra* note 36, at 2201–02 (“The median survival of inmates was 21 months, and 37% of inmate patients survived for 5 years. The survival of patients in both the SEER cohort and the MSEER cohort were significantly superior to the survival of the inmate cohort (SEER, 55 mos; MSEER, 54 mos; $p < 0.0001$ for both comparisons).”).

46. *See id.* at 2203 (“Variations in the distribution of lethal malignancies among gender and racial-ethnic groups of the incarcerated also may explain the various survival outcomes among these subgroups.”); *id.* at 2202 (“The median survival for female inmates was 8.4 years, with a 5-year survival rate of 67%; whereas, for male inmates, the median survival was 1.5 years, with a 5-year survival rate of 33% ($p < 0.00001$) (Fig. 3). The median survival

Perhaps most troubling, the data suggest that the problem of lung cancer in prisons is not likely to abate any time soon. On the contrary, “the rapid increase in cancer diagnoses in prison with the associated high mortality suggests that the overall burden of cancer care for the incarcerated is growing.”⁴⁷ This is true despite efforts to decrease tobacco use in prison facilities.⁴⁸ The dire health consequences for these citizens demands attention. One might be tempted to point the finger at the unique challenges of delivering oncological care in a correctional setting as the cause of some of the disparities not explained by differences in individual behavior (e.g., prevalence of smoking).⁴⁹ Indeed, improving medical care in prisons for those who develop life-threatening illnesses like lung cancer remains an important piece of the Eighth Amendment puzzle. That fact does not suggest ignoring the preventative side of the equation altogether. The strategy to combat the epidemic of lung cancer in our nation’s prisons would not be complete without an examination of the second leading cause of lung cancer—radon. To date, the risk presented by radon gas to the citizens whom the law compels to reside in correctional institutions has gone woefully understudied. Our society no longer tolerates the risk that radon poses in our homes; it should also not tolerate it in our prisons.

II. MITIGATION OF THE RADON THREAT THROUGH LAW AND POLICY

A. EPA Regulation

In response to the scientific literature and public concern, Congress acted relatively swiftly to address the problem of radon in homes. The move included amending the Toxic Substances Control Act (“TSCA”) to empower EPA to begin to combat the radon problem. Among other things, the 1988 amendments tasked the EPA Administrator with: publishing and updating a “A Citi-

was 2.7 years for Hispanics, 1.9 years for non-Hispanic whites, and 1.6 years for non-Hispanic blacks.”).

47. *Id.* at 2203 (“With the incarcerated population in the U.S. at its greatest numbers ever and the lengths of prison stay increasing significantly, the problems of prison oncology are unlikely to diminish in the near future.” (footnote omitted)).

48. See Sara M. Kennedy et al., *Smoke-Free Policies in U.S. Prisons and Jails: A Review of the Literature*, 17 NICOTINE & TOBACCO RSCH. 629, 630 (2015) (“Dramatic shifts toward establishing smoke-free policies in U.S. prisons and jails have occurred in recent decades. Until the mid-1980s, tobacco use, predominately cigarettes, was common in correctional facilities where it served as a form of currency, a reward for good behavior, and was distributed to inmates as personal rations.”).

49. See, e.g., Mathew et al., *supra* note 36, at 2203 (highlighting “the rising therapeutic, economic, psychosocial, and ethical challenges for healthcare delivery in a unique security environment, all of which define the nature of prison oncology.”).

zens' Guide to Radon";⁵⁰ developing model construction standards and techniques to reduce radon exposure in new buildings;⁵¹ providing technical⁵²

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50. Indoor Radon Abatement, Toxic Substances Control Act, Pub. L. 100-551, § 303, 102 Stat. 2755 (1988) (codified as amended at 15 U.S.C. § 2663) ("In order to make continuous progress toward the long-term goal established in section 2661 of this title, the Administrator of the Environmental Protection Agency shall, not later than June 1, 1989, publish and make available to the public an updated version of its document titled 'A Citizen's Guide to Radon'. The Administrator shall revise and republish the guide as necessary thereafter.")
51. 15 U.S.C. § 2664 ("The Administrator of the Environmental Protection Agency shall develop model construction standards and techniques for controlling radon levels within new buildings. To the maximum extent possible, these standards and techniques should be developed with the assistance of organizations involved in establishing national building construction standards and techniques. The Administrator shall make a draft of the document containing the model standards and techniques available for public review and comment. The model standards and techniques shall provide for geographic differences in construction types and materials, geology, weather, and other variables that may affect radon levels in new buildings. The Administrator shall make final model standards and techniques available to the public by June 1, 1990. The Administrator shall work to ensure that organizations responsible for developing national model building codes, and authorities which regulate building construction within States or political subdivisions within States, adopt the Agency's model standards and techniques.")
52. *Id.* § 2665. This section reads in full:

The Administrator (or another Federal department or agency designated by the Administrator) shall develop and implement activities designed to assist State radon programs. These activities may include, but are not limited to, the following:

- (1) Establishment of a clearinghouse of radon related information, including mitigation studies, public information materials, surveys of radon levels, and other relevant information.
- (2) Operation of a voluntary proficiency program for rating the effectiveness of radon measurement devices and methods, the effectiveness of radon mitigation devices and methods, and the effectiveness of private firms and individuals offering radon-related architecture, design, engineering, measurement, and mitigation services. The proficiency program under this subparagraph shall be in operation within one year after October 28, 1988.
- (3) Design and implementation of training seminars for State and local officials and private and professional firms dealing with radon and addressing topics such as monitoring, analysis, mitigation, health effects, public information, and program design.
- (4) Publication of public information materials concerning radon health risks and methods of radon mitigation.
- (5) Operation of cooperative projects between the Environmental Protection Agency's Radon Action Program and the State's radon program. Such projects shall include the Home Evaluation Program, in which the Environmental Protection Agency evaluates homes and States demonstrate mitigation methods in these homes. To the maximum extent practicable, consistent with the objectives of the evaluation and demonstration, homes of low-income persons should be selected for evaluation and demonstration.
- (6) Demonstration of radon mitigation methods in various types of structures and in various geographic settings and publication of findings. In the case of

and financial⁵³ assistance to states for the development and implementation of programs designed to mitigate radon exposure; and generally to promulgate regulations necessary to carry out the goals of the legislation.⁵⁴

In the years since, EPA has declined to adopt prescriptive regulations making particular courses of testing and mitigation mandatory. Instead, EPA has focused its efforts on increasing public awareness of the risks presented by radon gas and how to address them. For example, EPA publishes guides for buyers, sellers, and builders of homes, “recommending” radon testing and radon-resistant construction materials.⁵⁵ Since 2010, EPA has also collaborated on a “Federal Radon Action Plan” (“FRAP”) with the Department of Agriculture, Department of Defense, Department of Energy, General Services Administration, Department of Health and Human Services, Department of Housing and Urban Development, Department of the Interior, and Department of Veterans Affairs. The FRAP is based, in part, on the theory that “[s]trategic federal action can demonstrate the importance, feasibility and value of radon risk reduction in ways that spur radon partners and individual Americans to action.”⁵⁶ EPA efforts have borne fruit, but significant work remains. When radon testing in homes is not required by state law or contract, knowledge of the cancer risk that radon presents and the perception of that risk primarily drives voluntary testing.⁵⁷ A recent survey of New York residents, for instance, reported that more than 80% of residents were aware of radon, but also showed

demonstration of such methods in homes, the Administrator should select homes of low-income persons, to the maximum extent practicable and consistent with the objectives of the demonstration.

(7) Establishment of a national data base with data organized by State concerning the location and amounts of radon.

(8) Development and demonstration of methods of radon measurement and mitigation that take into account unique characteristics, if any, of nonresidential buildings housing childcare facilities.

53. *Id.* § 2666 (“For each fiscal year, upon application of the Governor of a State, the Administrator may make a grant, subject to such terms and conditions as the Administrator considers appropriate, under this section to the State for the purpose of assisting the State in the development and implementation of programs for the assessment and mitigation of radon.”).

54. *Id.* § 2670.

55. See, e.g., *Radon Protection: Buying a Home*, EPA, <https://perma.cc/R7GJ-7QAR> (“What does EPA recommend? If you are buying a home or selling your home, have it tested for radon.”).

56. EPA ET AL., PROTECTING PEOPLE AND FAMILIES FROM RADON: A FEDERAL ACTION PLAN FOR SAVING LIVES 1 (2011), <https://perma.cc/WK2V-2QXZ>.

57. Judy Y. Ou et al., *Public Awareness and Perceptions Surrounding Radon Testing in a State With High Radon Emission Potential and Low Smoking Rates*, 82 J. ENV'T HEALTH 8, 8 (2019) (citing S.F. Davis et al., *Predictors of Radon Testing Among Utah Residents Using a Theory-Based Approach*, 80 J. ENV'T HEALTH 20 (2018) and C.J. Kennedy et al., *The Relationship Between Radon Knowledge, Concern and Behavior, and Health Values, Health Locus of Control and Preventive Health Behaviors*, 18 HEALTH EDUC. Q. 319 (1991)).

limited risk comprehension.⁵⁸ Perhaps more problematic, meaningful awareness has been trending in the wrong direction in recent years,⁵⁹ with the lowest radon awareness presenting in already at-risk lower income, minority, elderly, and rural communities.⁶⁰

Should EPA do more? Probably. But that is not the subject of this work. EPA's efforts to date demonstrate the seriousness with which the federal government views the lung cancer risk presented by radon. The fact that these efforts have persisted for almost forty years evidences the consistency of the firmly held position that society should not tolerate high levels of radon in its living spaces.

B. OSHA Regulation

As described above, the first recorded incidents linking radon exposure to lung disease occurred in the workplace—uranium mines to be precise. Since then, the ubiquity of radon in many different industries and in all types of structures has garnered further attention. So, it is unsurprising that federal law concerned with workplace safety has evolved to cover radon and does so without regard to the setting where a worker may be exposed.

The Occupational Safety and Health Act of 1970⁶¹ is the hallmark legislation aimed at worker health and workplace safety. The Act established the Occupational Safety and Health Administration (“OSHA”) within the U.S. Department of Labor. Shortly after its inception, OSHA promulgated standards for exposure to various environmental hazards, including ionizing radiation, pursuant to the authority granted by section 6(a) of the Act.⁶² The ionizing radiation standard⁶³ came from an Atomic Energy Commission (“AEC”) regulation by way of a public contractor requirement from the Walsh Healy Public Contracts Act.⁶⁴ The OSHA limit applied to a forty-hour exposure in any workweek of seven consecutive days.⁶⁵

58. *Id.* (“A survey of New York residents reported that 82% of residents were aware of radon but only 21% of participants knew that radon was a carcinogen.”).

59. *See id.* (citing Denise M. Laflamme & James A. VanDerslice, *Using the Behavioral Risk Factor Surveillance System (BRFSS) for Exposure Tracking: Experiences from Washington State*, 112 ENV'T HEALTH PERSPS. 1428 (2004)).

60. *See id.* (citing Michael T. Halpern & Kenneth E. Warner, *Radon Risk Perception and Testing: Sociodemographic Correlates*, 56 J. ENV'T HEALTH 31 (1994)).

61. 29 U.S.C. §§ 651–675, 677–678.

62. *See* 29 U.S.C. § 655 (authorizing OSHA to promulgate existing federal standards and national consensus standards as enforceable workplace standards).

63. 29 C.F.R. § 1910.96 (1974).

64. 41 U.S.C. §§ 6501–6511.

65. 10 C.F.R. § 20 (1991).

According to the Bureau of Labor Statistics, more than 400,000 people work as correctional officers throughout the United States.⁶⁶ These individuals do not live in jails 24-hours-a-day, 7-days-a-week, but they do face unsafe, unhealthy conditions (like radon exposure) while at work. For that reason, they have a demonstrated interest in prison litigation focusing on exposure to excessive temperatures, disease, and toxic substances (e.g., radon).⁶⁷

C. Mitigation Strategies

Much of the government intervention described above worked by incentivizing states to mandate, or strongly encourage, radon testing and then prompt consumers to mitigate radon. Fortunately, both testing and mitigation technologies proved relatively straightforward and affordable.

Measuring the amount of radon in the air is relatively simple, and generally expressed in “picocuries per liter of air” or “pCi/L.”⁶⁸ EPA estimates the average indoor radon level to be about 1.3 pCi/L, compared to about 0.4 pCi/L found in the outside air.⁶⁹ As quoted above, Congress set a long-term goal of equalizing those two figures by reducing indoor air pollution. EPA, and most radon professionals, will acknowledge that the long-term goal is not yet technologically achievable in all cases, but the indoor air of most structures can be reduced relatively easily to 2.0 pCi/L or below.

EPA has set an “action level” for mitigation at 4.0 pCi/L,⁷⁰ meaning radon levels at or above such a level require mitigation. EPA describes the proven methods of radon mitigation as follows:

There are several proven methods to reduce radon in your home, but the one primarily used is a vent pipe system and fan, which pulls radon from beneath the house and vents it to the outside. This system, known as a soil suction radon reduction system, does not require major changes to your home. Sealing foundation cracks and other openings makes this kind of system more effective and cost-efficient. Similar systems can also be installed in houses with crawl spaces. Radon contractors can use other methods that may also work in your home. The right system depends on the design of your home and other factors.⁷¹

66. *Occupational Employment and Wages, 33-3012 Correctional Officers and Jailers*, U.S. BUREAU OF LAB. STAT. (May 2019), <https://perma.cc/979F-5VBC>.

67. Associated Press, *Connecticut Prison Guards, Inmates Ally Against State in Radon-Exposure Cases*, WBUR NEWS (Oct. 14, 2018), <https://perma.cc/CLH2-7NUB>.

68. A CITIZEN’S GUIDE TO RADON, *supra* note 3, at 5.

69. *Id.* at 7.

70. *Id.* at 2, 6.

71. *Id.* at 9.

D. Tort Litigation

All of the concern about radon was happening in the United States in the 1980s. Not only were Congresspersons and administrators paying attention to the radon problem, but so were tort lawyers.⁷² As some prominent attorneys quoted in the American Bar Association Journal put it: “Indoor pollution presents attorneys and the legal system with a whole new field of law,” and, consequently, “[p]eople should get ready for a mountainous amount of litigation.”⁷³

Aspiring trial lawyers and budding scholars alike floated numerous theories of liability, including strict liability, negligence, breach of warranty, fraud, and breach of contract.⁷⁴ Perhaps even more alluring were the lists of potential defendants, some with presumably deep pockets. That list included prior owners, landlords, real estate agents, builders and construction contractors, engineers, inspectors, and even governmental entities.⁷⁵ This theorizing also came amid a newfound wave of so-called “cancerphobia” causes of action. The boom of toxic tort litigation in the mid-1980s led to this distinct theory of liability based on increased risk of developing cancer in the future, rather than a present cancer diagnosis and treatment.⁷⁶ The theory behind cancerphobia actions ar-

72. See Joseph Sanders & Craig Joyce, *Off to the Races: The 1980s Tort Crisis and the Law Reform Process*, 27 HOUS. L. REV. 207, 228, 231 (1990) (“Overall, the National Center data and data from the Rand Corporation suggest that per capita state tort filings in the first half of the 1980s grew between three and four percent per year. . . . The most explosive growth in tort lawsuit filings has been in the third category identified by Rand, namely, mass latent torts.”); Stephen Daniels & Joanne Martin, *The Impact That It Has Had Is Between People’s Ears: Tort Reform, Mass Culture, and Plaintiff’s Lawyers*, 50 DEPAUL L. REV. 453, 463 (2001) (“The polls of the middle 1980s seem to reflect a public that sees over-litigiousness, increasingly excessive awards, costs that are too high, and a civil justice system that is unfair.”).

73. Mark Diamond, *Liability in the Air: The Threat of Indoor Pollution*, 73 A.B.A. J. 78, 78 (1987).

74. See Frank B. Cross & Paula C. Murray, *Liability for Toxic Radon Gas in Residential Home Sales*, 66 N.C. L. REV. 687, 689 (1988) (proposing “strict liability, implied warranty of habitability, negligence, and fraud” as potential causes of action); Diamond, *supra* note 73, at 84 (proposing “1. Breach of contract and express warranties contained in written agreements, sales literature or samples; 2. Breach of implied warranties (including workmanship, fitness, quiet enjoyment and habitability); 3. Negligence; 4. Product strict liability; 5. Fraud and misrepresentation” as potential causes of action); Dearing, *supra* note 17, at 830 (proposing “strict liability, negligence, fraud, and implied warranty of habitability” as potential causes of action).

75. See Diamond, *supra* note 73, at 84; Dearing, *supra* note 17, at 830.

76. Glen Donath, *Curing Cancerphobia Phobia: Reasonableness Redefined*, 62 U. CHI. L. REV. 1113, 1113 (1995); see also E. Donald Elliott, *The Future of Toxic Torts: Of Chemophobia, Risk as a Compensable Injury and Hybrid Compensation Systems*, 25 HOUS. L. REV. 781, 785 (1988) (suggesting that widespread press coverage of toxic torts stimulated public fear of cancer).

gued for dispensing with the requirement that a plaintiff actually develop cancer before accessing emotional distress damages and instead focused on legal compensation for emotional distress caused by the additional statistical risk of developing cancer.⁷⁷ Thus, exposure to radon gas, even before it led to lung cancer, could provide the basis for potentially lucrative tort litigation.

The temptation of such money damages manifested in some very early test cases in Tennessee, Colorado, and California. In *Wayne v. Tennessee Valley Authority*,⁷⁸ the plaintiffs pursued breach of implied warranty, negligence, strict liability, and fraudulent concealment claims based on the use of phosphate-containing concrete blocks in the construction of their home in 1968.⁷⁹ The Waynes lived in the home from its completion in 1969 to 1979, when the Tennessee Public Health Department and EPA recommended they vacate due to high radon emissions from the phosphate.⁸⁰ The United States Court of Appeals for the Fifth Circuit affirmed dismissal of their products-based claims on statute of limitations grounds and, with respect to fraudulent concealment, on a holding that the defendant neither knew nor reasonably could have known of the radon hazard as early as 1969.⁸¹

In *Brafford v. Susquehanna Corp.*,⁸² plaintiffs brought a negligence claim for radon exposure, which the court refused to dismiss for lack of injury. That case is significant because the homeowners had not yet developed lung cancer and premised liability solely on the *increased risk* of cancer. The court permitted the plaintiffs to proceed on the increased risk theory of damages based on the probability that they already had suffered subcellular harm from radon exposure.⁸³ The plaintiffs ultimately settled for an undisclosed amount of money. Similarly, a motion to dismiss in an unreported California case claiming radon exposure in the workplace was denied, citing damage to the employee's immune system that could lead to leukemia.⁸⁴

77. Donath, *supra* note 76, at 1130 ("A minority of courts has moved away from the physical impact, physical manifestation, and traditional reasonableness notions, and has instead followed an objective probability analysis.")

78. 730 F.2d 392 (5th Cir. 1984), *cert. denied*, 469 U.S. 1159 (1985).

79. *Id.* at 394.

80. *Id.* at 395.

81. *Id.* at 396.

82. 586 F. Supp. 14 (D. Colo. 1984).

83. *Id.* at 17-18.

84. See Michelle Galen, *Lawyers Grapple with Radon Issue*, NAT'L L. J., July 21, 1986, at 10 col. 1.

III. DELIBERATE INDIFFERENCE TO ENVIRONMENTAL TOXINS

A. Eighth Amendment History and Precedent

The Eighth Amendment to the Constitution famously outlaws “cruel and unusual punishments.”⁸⁵ The Founders drew the language for that now widely known refrain from a provision of the English Bill of Rights of 1689.⁸⁶ To this day, however, scholars and jurists vigorously debate what precisely the Amendment’s prohibition covers. Some focus on a narrowly construed set of punishments, while others look at government action (and inaction) within the penal system more broadly.⁸⁷

Even an originalist approach yields conflicting results. Justice William O. Douglas penned a concurrence to a per curiam decision in *Furman v. Georgia*⁸⁸ to emphasize the originalist roots of the anti-discrimination component of the Eighth Amendment embodied in the word “unusual.” Justice Douglas wrote that the words of the Amendment:

At least when read in light of the English proscription against selective and irregular use of penalties, suggest that it is ‘cruel and unusual’ to apply the death penalty—or any other penalty—selectively to minorities whose numbers are few, who are outcasts of society, and who are unpopular, but whom society is willing to see suffer though it would not countenance general application of the same penalty across the board.⁸⁹

Needless to say, the Court has not wholeheartedly embraced an antidiscrimination reading of the Eighth Amendment. Instead, the Court embraced an interpretation based on the perceived “excessiveness” of the punishment for a particular crime.⁹⁰ Despite convincing historical research in the same vein as

85. U.S. CONST. amend. VIII.

86. *Furman v. Georgia*, 408 U.S. 238, 242 (1972) (Douglas, J., concurring).

87. See, e.g., JOHN HART ELY, *DEMOCRACY AND DISTRUST* 14 (1980) (“The Cruel and Unusual Punishment Clause does invite the person interpreting it to freelance to a degree, but the freelancing is bounded. The object is punishments, not the entire range of government action”); Richard H. Fallon, Jr., *A Constructivist Coherence Theory of Constitutional Interpretation*, 100 HARV. L. REV. 1189, 1196 (1987) (“[A]lthough the text of the [E]ighth [A]mendment may not tell us precisely what ‘cruel and unusual punishments’ are, the language does require that the [A]mendment’s prohibition apply only to actions that can plausibly be described as ‘punishments.’” (footnotes omitted)).

88. 408 U.S. at 242 (Douglas, J., concurring).

89. *Id.* at 245.

90. See Laurence Claus, *The Antidiscrimination Eighth Amendment*, 28 HARV. J.L. & PUB. POL’Y 119, 158–59 (2004) (describing how the Court embraced “Justice Field’s ‘excessiveness’ vision of the Eighth Amendment” from *Weems v. United States*, 217 U.S. 349 (1910), in *Solem v. Helm*, 463 U.S. 277 (1983), and its progeny, eschewing both Justice Scalia’s “vicious

Justice Douglas's writing nearly fifty years ago,⁹¹ the debate over what exactly the Framers meant when they made "cruel and unusual punishments" unconstitutional rages on.⁹²

One of the fiercest battles about the Eighth Amendment's meaning was fought over the question of prison conditions. Can prison conditions be unconstitutional?⁹³ Are they punishment? For almost two hundred years, federal courts stayed out of the management of prisons, refusing to apply the Eighth Amendment to outlaw unsafe or unhealthy carceral environments.⁹⁴ "The 1970s, however, saw a general movement away from this 'hands-off' doctrine."⁹⁵ The Court began to recognize the reality that the failure to provide incarcerated people with the basic necessities of life or protect them from obvious danger could cause just as much harm as barbaric forms of physical punishment. The Court initially expanded the Eighth Amendment to include a minimum standard of care without describing the conditions as "punishment."⁹⁶ During that time, the Court imposed constitutionally mandated duties on prison officials to provide adequate medical care⁹⁷ and protect those in their custody from violence at the hands of one another.⁹⁸

methods' vision" and "the 'no-discrimination' vision of the Amendment's language, clearly expressed by Blackstone and unquestioned at the American founding").

91. *Id.* at 121 ("History resolves the Eighth Amendment's linguistic anomaly by revealing that the Amendment was meant to address a problem distinct from either excessive punishment or vicious punishment. That problem was *discriminatory* punishment.").
92. *See, e.g.,* Jeffrey S. Kinsler, *Exposure to Tobacco Smoke Is More Than Offensive, It Is Cruel and Unusual Punishment*, 27 VAL. U. L. REV. 385, 385 (1993) ("When the framers of the Constitution prohibited 'cruel and unusual punishment,' they undoubtedly envisioned punishments such as flogging and branding, as well as dismemberment and use of the rack. Such forms of physical punishment are unquestionably cruel and unusual."); *see also* Claus, *supra* note 90, at 124 ("[T]he Amendment is treated by the Court as alternating between a condemnation of discrimination and a condemnation of judicially-assessed excessiveness *per se*.").
93. Kinsler, *supra* note 92, at 385 ("What if, however, the government, rather than inflicting physical punishment upon a person, merely compels that person to live in an environment that endangers his or her health . . . ?").
94. *See* Daniel Yves Hall, *The Eighth Amendment, Prison Conditions and Social Context*, 58 MO. L. REV. 207, 207 (1993) (noting the "great deference" federal courts gave to state governments and prison officials in management of facilities).
95. *Id.*
96. James J. Park, *Redefining Eighth Amendment Punishments: A New Standard for Determining the Liability of Prison Officials for Failing to Protect Inmates from Serious Harm*, 20 QUINNIPIAC L. REV. 407, 408 (2001).
97. *Estelle v. Gamble*, 429 U.S. 97 (1976).
98. *See Farmer v. Brennan*, 511 U.S. 825, 833 (1994) (listing cases where courts have held that prisoners are entitled to reasonable protection against violence).

Then, in *Rhodes v. Chapman*⁹⁹ the Court for the first time explicitly described the conditions of confinement as punishment in and of themselves.¹⁰⁰ Despite ultimately sanctioning the double-celling at issue in that case, the Court made clear that the Eighth Amendment’s “cruel and unusual punishments” clause directly prohibits inhumane prison conditions. The Court held that double-celling prisoners, resulting in housing 38% more people than design capacity, was not categorically unconstitutional; although it might have made prison less comfortable, it alone did not lead to deprivations of food, medical care, or sanitation.¹⁰¹ Additionally, while access to prison jobs and educational facilities was limited due to the increase in population, the Court concluded that such limitations did not amount to “punishments” within the meaning of the Eighth Amendment.¹⁰²

As foreshadowed by *Rhodes*, the 1990s saw Eighth Amendment jurisprudence even more directly engage with the concept of punishment. The word “punishment” took on a limiting function, providing the basis for a series of important decisions. The liability of prison officials began to turn on whether or not certain conditions could properly be classified as punishment. The decisions of this era reasoned that some level of culpability (i.e., *mens rea*) converted conditions into punishment.¹⁰³ Considering a claim for Eighth Amendment violations based on, *inter alia*, inadequate heating and cooling, improper ventilation, and unclean restrooms, the Court held that “nothing so amorphous as overall conditions can rise to the level of cruel and unusual punishment when no specific deprivation of a single human need exists.”¹⁰⁴ As the moniker “deliberate indifference” connotes across all areas of law where it applies, some level of intentionality must be attached to neglect to render it actionable. Under the Eighth Amendment that requirement of intent, and what

99. 452 U.S. 337 (1981).

100. *Id.* at 347 (“These principles apply when the conditions of confinement compose the punishment at issue. Conditions must not involve the wanton and unnecessary infliction of pain, nor may they be grossly disproportionate to the severity of the crime warranting imprisonment.”).

101. *Id.* at 348.

102. *Id.*

103. Park, *supra* note 96, at 412.

104. *Wilson v. Seiter*, 501 U.S. 294, 305 (1991) (internal quotation marks omitted). *But see* DANIEL W. E. HOLT, COLUM. L. SCH., SABIN CTR. FOR CLIMATE CHANGE L., HEAT IN U.S. PRISONS AND JAILS: CORRECTIONS AND THE CHALLENGE OF CLIMATE CHANGE 34 (2015), <https://perma.cc/47RH-YHUC> (citing *Walker v. Schult*, 717 F.3d 119, 128 (2d Cir. 2013); *Blackmon v. Garza*, 484 F. App’x 866, 870–72 (5th Cir. 2012); *Hathaway v. Holder*, 491 F. App’x 207, 208 (2d Cir. 2012); *Graves v. Arpaio*, 623 F.3d 1043, 1049 (9th Cir. 2010); *Vasquez v. Frank*, 209 F. App’x 538, 541 (7th Cir. 2006); *Hearns v. Terhune*, 413 F.3d 1036, 1043 (9th Cir. 2005); *Chandler v. Crosby*, 379 F.3d 1278, 1294 (11th Cir. 2004); *Gates v. Cook*, 376 F.3d 323, 340 (5th Cir. 2004)) (pointing to lower federal courts reading *Wilson* as endorsing the possibility that inadequate heat, in some circumstances, could rise to the level of an Eighth Amendment violation).

state of mind satisfies it, intersected with the Court's focus on the question of whether or not conditions even met the definition of "punishment." In *Wilson*, the Court ultimately determined "knowledge" to be the requisite level of culpability, and used the knowledge element to draw the boundary around actionable Eighth Amendment punishment.¹⁰⁵

In 1994, the Court, in *Farmer v. Brennan*,¹⁰⁶ reiterated that the Eighth Amendment requires prison officials to "provide humane conditions of confinement."¹⁰⁷ The Court even went on to list specific constitutionally required actions: prison officials must "ensure that inmates receive adequate food, clothing, shelter, and medical care, and . . . 'take reasonable measures to guarantee the safety of the inmates.'"¹⁰⁸ However, with its next breath, the Court made clear that no Eighth Amendment violation occurs unless the prison officials actually knew of, and disregarded, the risk to health.¹⁰⁹ The Court reached this conclusion by drawing on the "deliberate indifference" language first articulated in the 1976 case of *Estelle v. Gamble*.¹¹⁰

The landmark *Estelle* case presented the question of whether inadequate medical care could violate the Eighth Amendment. The Court held that "deliberate indifference" by prison officials to serious medical needs of those in their care violates the Eighth Amendment's prohibition against cruel and unusual punishment.¹¹¹ In *Farmer*, the Court explained "deliberate indifference" constituted a state of mind element more blameworthy than mere negligence but less than "acts or omissions for the very purpose of causing harm or with knowledge that the harm will result."¹¹² Nonetheless, in the years since, the state of mind element has essentially come to embody the criminal law conception of knowledge, requiring proof of subjective knowledge on the part of prison officials.

B. *Helling v. McKinney and the Anatomy of a Claim*

The expanding universe of Eighth Amendment conditions of confinement claims reached its zenith in 1993.¹¹³ In the case of *Helling v. McKinney*,¹¹⁴ the

105. *Id.*

106. 511 U.S. 825 (1994).

107. *Id.* at 832.

108. *Id.* (quoting *Hudson v. Palmer*, 468 U.S. 517, 526–27 (1984)).

109. *Id.* at 825.

110. 429 U.S. 97 (1976).

111. *Id.* at 104 (describing such indifference as the "unnecessary and wanton infliction of pain, proscribed by the Eighth Amendment" (internal quotation omitted)).

112. 511 U.S. 825, 835 (1994); see also Jason D. Sanabria, *Farmer v. Brennan: Do Prisoners Have Any Rights Left Under the Eighth Amendment?*, 16 WHITTIER L. REV. 1113, 1115 (1995).

113. Jacqueline M. Kane, *You've Come a Long Way, Felon: Helling v. McKinney Extends the Eighth Amendment to Grant Prisoners the Exclusive Constitutional Right to a Smoke-Free Environment*, 72 N.C. L. REV. 1399, 1399 (1994).

114. 509 U.S. 25 (1993).

Court for the first time considered the Eighth Amendment implications of knowing exposure to carcinogens. The facts of the case were fairly straightforward. One non-smoking individual was celled with another who smoked quite profusely (five packs a day, according to the record) in a room that lacked ventilation.¹¹⁵ Notably, the non-smoking plaintiff was not “currently suffering serious medical problem[s] caused by exposure to [environmental tobacco smoke (ETS)],”¹¹⁶ but he brought suit alleging that the risk of lung cancer created by exposure to so-called “secondhand smoke,” constituted cruel and unusual punishment. The Supreme Court agreed. In a landmark decision, the Court held that forcing someone to be exposed to secondhand smoke at levels that pose a risk to his future health could provide the basis for an Eighth Amendment claim.¹¹⁷ In reaching that conclusion, the Court explained that finding a constitutional violation required it “to assess whether society considers the risk that the prisoner complains of to be so grave that it violates contemporary standards of decency to expose anyone unwillingly to such a risk.”¹¹⁸ The willingness to expand the Eighth Amendment’s reach to risk of future harm, rather than merely present physical injury or illness, signaled an important step for prison conditions doctrine. However, the Court cabined the potentially far-reaching implications of its holding by suggesting some rather strict elements for claims based on exposure to hazardous prison conditions.¹¹⁹ From *Helling* and the cases that preceded it, we can derive three general elements that those alleging an Eighth Amendment violation based on exposure to toxic substances will have to prove: 1) exposure presents a substantial risk of future harm (objective element); 2) prison officials knew about the exposure and the danger it presents (subjective element); and 3) prison officials failed to take reasonable measures to mitigate the dangerous condition.

The first element of a deliberate indifference claim is purely objective. This element can be proved by statistical and scientific evidence demonstrating the conditions of incarceration pose a “substantial risk of serious harm.”¹²⁰ A risk is substantial if it is one that “society considers . . . so grave that it violates contemporary standards of decency to expose anyone unwillingly to such

115. *See id.* at 28.

116. *Id.* at 32.

117. *Id.* at 35.

118. *Id.* at 36; *see also id.* (“In other words, the prisoner must show that the risk of which he complains is not one that today’s society chooses to tolerate.”).

119. *See* Lisa Gizzi, *Helling v. McKinney and Smoking in the Cell Block: Cruel and Unusual Punishment*, 43 AM. U. L. REV. 1091, 1093 (1994) (describing the “three criteria” for such claims as: proof of deliberate intent to cause harm, objective statistical and scientific data supporting the alleged risk of harm, and a showing that no individual in contemporary American society would choose to tolerate the disputed risk).

120. Sanabria, *supra* note 112, at 1115 (quoting *Farmer v. Brennan*, 114 S. Ct. 1970, 1975 (1994)); *see also* Gizzi, *supra* note 118, at 1093 (arguing that plaintiffs must put forward objective statistical and scientific data supporting the alleged risk of harm).

risk.”¹²¹ By the time of the *Helling* case, the link between smoking and lung cancer was well established and, more importantly, so was the risk posed by secondhand smoke. The plaintiffs had at their disposal not only scientific studies and public opinion polling, but also a court’s finding of a changed pattern of societal attitudes and behavior towards smoking and smokers.¹²² *Helling* makes clear that the objective part of the test requires both statistical evidence of the significance of the risk to human health *and* evidence of society’s unwillingness to tolerate the risk in settings outside of correctional institutions. This two-part objective inquiry regarding the seriousness of the risk prison conditions pose has not proved to be the major barrier to the vindication of the Eighth Amendment right. It has instead been the subjective state of mind element that has proved challenging to satisfy and garnered much of the scholarly and practical criticism.

As the Court’s earlier Eighth Amendment jurisprudence indicates, the text of the Amendment, including the word “punishment,” need not be read to impute a state-of-mind requirement for a finding of a constitutional violation. By defining “punishment” narrowly as a “deliberate act intended to chastise or deter”¹²³ the Court made state of mind implicit in the Eighth Amendment. The knowledge requirement was thus judicially constructed, perhaps as a check against a feared deluge of prison conditions litigation in the federal courts. Though the sample is small, the brief period of time in the 1970s and early 1980s when the mens rea element was in flux did not produce a slew of frivolous or non-justiciable Eighth Amendment cases.¹²⁴ Nonetheless, the state-of-mind element arrived and appears here to stay. The more hotly debated question revolves around the definition of that element.

Put simply, the second part of any conditions of confinement claim requires that a plaintiff prove that the defendant prison official(s) possesses a “sufficiently culpable state of mind.”¹²⁵ But what is sufficiently culpable? Certainly more than intentional conduct is covered. The question became how much more. Two areas of law provided potential answers—tort and criminal law. Tort recklessness would set an objective standard, asking what a reasonable prison official should have known about the risk. Criminal recklessness, on the

121. *Helling*, 509 U.S. at 36 (emphasis omitted).

122. *Id.* at 29 (describing the record before the district court as including “scientific opinion supporting respondent’s claim that sufficient exposure to ETS could endanger one’s health” and “[a finding that] society’s attitude had evolved to the point that involuntary exposure to unreasonably dangerous levels of ETS violated current standards of decency”).

123. *Wilson v. Seiter*, 501 U.S. 294, 300 (1991) (quoting *Duckworth v. Franzen*, 780 F.2d 645, 652 (7th Cir. 1985)).

124. See *Hall*, *supra* note 94, at 232 (describing “a dramatic rise” in prison conditions litigation in the 1970s, which courts readily entertained and—through which—used their authority to order improvements to prison systems in a number of jurisdictions).

125. *Farmer*, 511 U.S. at 834 (quoting *Wilson*, 501 U.S. at 297).

other hand, would set a subjective standard, asking what the particular prison official actually knew about the risk.¹²⁶ The Court did not confront the choice between these standards with a blank slate—claims premised on assaults within prisons had been proceeding on a tort recklessness theory.¹²⁷ Nonetheless, as described above, the Supreme Court in *Farmer* ultimately settled on a subjective test for deliberate indifference.¹²⁸ In that case, Farmer had explicitly argued for an objective state of mind element in Eighth Amendment conditions of confinement cases.¹²⁹ The Court rejected Farmer’s formulation and instead adopted the criminal recklessness standard, first applied by the Seventh Circuit in a case called *Duckworth v. Franzen*.¹³⁰ The Supreme Court cited the Seventh Circuit favorably in *Farmer* and enshrined the subjective test that would make the next decades of litigation aimed at improving prison conditions much more difficult.¹³¹

If a litigant can satisfy the difficult task of proving that prison officials had actual knowledge of a serious risk to health and safety, all that remains is demonstrating that they failed to properly mitigate that risk. Thankfully, this is also an objective inquiry. Many of the risks facing people in prisons, such as exposure to radon gas, have been understood and addressed outside the correctional environment. Thus, evidence of reasonable mitigation measures is not hard to come by in most instances. In certain circumstances, a substantial body of tort litigation can lend the weight of judicial precedent to the question of objective reasonableness.

C. *Helling’s Wake*

In the years since *Helling*, a number of lower federal courts have tested numerous claims against the elements just described. The risks forming the basis of such claims can generally be described as environmental hazards or

126. See Edward W. Hautamaki, *The Element of Mens Rea in Recklessness and ‘Criminal Negligence’*, 2 DUKE BAR J. 55, 56 (1951) (describing the two standards of recklessness at traditional common law).

127. See Scott Rauser, Comment, *Prisons are Dangerous Places: Criminal Recklessness as the Eighth Amendment Standard of Liability in McGill v. Duckworth*, 78 MINN. L. REV. 165, 177–78 (1993) (“Tort recklessness [was] the more prevalent of the two standards in inmate assault claims, [and] entails an objective inquiry into the defendant’s state of mind.”).

128. *Farmer*, 511 U.S. at 847 (“[A] prison official may be held liable under the Eighth Amendment . . . only if he knows that inmates face a substantial risk of serious harm.”).

129. *Id.* at 837–40; see also Sanabria, *supra* note 112, at 1115 (“The Supreme Court, in a majority decision with three concurring opinions, rejected Farmer’s argument that the Court should apply an objective test for determining violations of the Eighth Amendment.”).

130. 780 F.2d 645 (7th Cir. 1985).

131. See Sanabria, *supra* note 112, at 1115 (“The ‘actual knowledge’ or ‘subjective recklessness’ standard the Court set forth in *Farmer* will have a great impact upon the rights of prisoners who allege violations of their Eighth Amendment rights.”).

toxic exposures. The Northern District of New York described *Helling's* progeny as “cases involv[ing] situations where persons are in custody, are exposed to conditions that are substantially likely to cause serious harm, and the victims therein are unable to take corrective action or avoid the harm because of their custodial status.”¹³² Before *Helling*, a circuit split had developed around the question of whether the risk of future harm presented by a known carcinogen (i.e., ETS) could form the basis of an Eighth Amendment claim. *Helling* having settled that dispute in the affirmative, the question has now become what other known carcinogens prison officials are deliberately indifferent towards and whether anything prevents Eighth Amendment claims from righting those environmental wrongs.

Unsurprisingly, the boogey man of home carcinogens—*asbestos*—made an appearance in prison conditions cases following *Helling* in fairly short order. In *LaBounty v. Coughlin*, the Second Circuit recognized that “the right to be free from deliberate indifference to serious medical needs” encompassed the right to be free from exposure to friable asbestos.¹³³ The court made clear that prison officials violate the Constitution when, with deliberate indifference, they expose incarcerated people to known toxic substances.¹³⁴ The court analyzed the objective severity of the risk presented by asbestos by looking to Congress’s recognition of friable asbestos as a dangerous toxic chemical in the early 1970s and EPA’s “hazardous air pollutant” Clean Air Act regulation.¹³⁵ The element of the prison officials’ subjective knowledge of the risk was a factual question left to the jury.

In an unpublished decision, the First Circuit dismissed an asbestos case, but did so on that subjective knowledge element, leaving open the possibility that presence of asbestos in the pipe insulation in a cell could be proved objectively unreasonable.¹³⁶ The District of Massachusetts relied on this reasoning in *Gonyer v. McDonald*¹³⁷ to find that the plaintiff’s claim of direct exposure to ripped asbestos pipe insulation six days a week, for two and a half years was sufficient to survive a motion of judgment on the pleadings.¹³⁸ Perhaps most importantly, in *Gonyer*, the court noted that the plaintiff’s allegations that the presence of asbestos fiber violated state health codes and the prison had been

132. *Citizens Accord, Inc. v. Town of Rochester*, No. 98-CV-0715, 2000 WL 504132, at *24 (N.D.N.Y. Apr. 18, 2000).

133. *See LaBounty v. Coughlin*, 137 F.3d 68, 73 (2d Cir. 1998).

134. *Id.* at 74.

135. *Id.* at 74 n.5 (citing 36 Fed. Reg. 5931 (1971)).

136. *See Scarpa v. Dubois*, 25 F.3d 1037 (1st Cir. 1994).

137. *Gonyer v. McDonald*, 874 F. Supp. 464 (D. Mass. 1995).

138. *See Johnson v. DuBois*, 20 F. Supp. 2d 138, 140 (D. Mass. 1998); *see also Gonyer*, 874 F. Supp. at 466 (concluding that allegations of free-floating asbestos fibers stated a claim on which relief could be granted).

cited for such violations were significant in demonstrating the evolving standards of decency as related to cruel and unusual punishment.¹³⁹

More recently, the Seventh Circuit held that the Eighth Amendment “right to adequate and healthy ventilation” is clearly established by *Helling* and its progeny.¹⁴⁰ The court affirmed a decision denying prison officials qualified immunity where the ventilation system allegedly caused “flow of black fiberglass dust into cells [and] numerous nosebleeds and respiratory problems.”¹⁴¹ Importantly, this case did not involve a particular, widely known carcinogen such as asbestos or radon.

Exposure to infectious disease has very recently prompted Eighth Amendment scrutiny, first in the context of H1N1 (swine flu) and then in the context of COVID-19. In these situations, officials knowingly expose those in their custody to deadly disease directly. Cases dealing with H1N1 exposure from New York and California support the conclusion that compliance with the Eighth Amendment turns on the perceived reasonableness of the preventative measures and treatment offered by prison officials. Courts have dismissed cases where facilities sanitized contaminated areas,¹⁴² promptly brought people to the medical clinic after complaining of symptoms,¹⁴³ and transferred people to outside medical facilities when conditions warranted.¹⁴⁴ In one California case, a district court held that denial of a test to one individual with a heart condition could potentially form the basis of a claim.¹⁴⁵ The U.S. Supreme Court weighed in for the first time on this issue during the COVID-19 pandemic, siding with the Texas prison system in upholding a stay of a district court injunction that would have required a geriatric prison to follow a specific sanitization and education protocol.¹⁴⁶ The Court’s refusal to vacate a stay of the injunction seems a product of the preliminary procedural posture rather than any evaluation of the merits; indeed, Justices Sotomayor and Ginsburg took the somewhat unusual step of writing separately to stress that “federal courts do have an obligation to ensure that prisons are not deliberately indifferent in the face of danger and death.”¹⁴⁷

139. *Gonyer*, 874 F. Supp. at 464, 466.

140. *Board v. Farnham*, 394 F.3d 469, 487 (7th Cir. 2005).

141. *Id.* at 486.

142. *Ayala v. N.Y.C. Dep’t of Corrs.*, No. 1:10-CIV-06295, 2011 WL 2015499 (S.D.N.Y. May 9, 2011).

143. *Jackson v. Rikers Island Facility*, No. 1:11-CIV-00285, 2011 WL 3370205 (S.D.N.Y. Aug. 2, 2011).

144. *Washington v. Harrington*, No. 1:11-CV-00848, 2012 WL 3763964, at *2 (E.D. Cal. Aug. 29, 2012), *aff’d*, 549 F. App’x 679 (9th Cir. 2013).

145. *Fraher v. Heyne*, No. 1:10-CV-00951, 2011 WL 5240441, at *1, *3 (E.D. Cal. Oct. 31, 2011).

146. *Valentine v. Collier*, 140 S. Ct. 1598 (2020) (mem.) (denial of application to vacate stay).

147. *Id.* at 1599 (statement of Sotomayor & Ginsburg, JJ. respecting denial of application to vacate stay).

The Ninth Circuit also had occasion recently to consider the Eighth Amendment implications of exposure to disease. In particular, *Hines v. Youseff*¹⁴⁸ laid out a claim that high rates of Valley Fever, a disease caused by naturally occurring fungal spores common in areas of California, Arizona, Utah, New Mexico, and Texas, caused unconstitutional conditions in California prisons. One prison in the Central Valley had an infection rate thirty-eight times greater than that of the nearby town and 600 times higher than the prevalence in the surrounding county.¹⁴⁹ Black male victims suffered disproportionately—making up 29% of the prison population yet 50% of the most serious cases and 71% of the fatalities.¹⁵⁰ Nonetheless, the court found there was no precedent to establish a clear constitutional right to be free from heightened exposure to Valley Fever. The court held that the plaintiffs failed to provide evidence that “‘society’s attitude had evolved to the point that involuntary exposure’ to such risk ‘violated current standards of decency,’ especially given that millions of free individuals tolerate a heightened risk of Valley Fever by voluntarily living in California’s Central Valley and elsewhere.”¹⁵¹ Since millions of people voluntarily lived in the Central Valley and since many people worked in the prisons where the incarcerated population had been exposed to Valley Fever, the court compared the risk to one that society was willing to tolerate, such as “the risk of being injured or killed in a traffic accident.”¹⁵² If applied strictly, this line of reasoning could prove fatal to all sorts of claims based on widespread environmental hazards.

Circuit courts do not appear to explicitly distinguish between naturally occurring hazards or pollutants and those that arise from man-made sources, but the circumstances of several cases indicate they are more likely to find a man-made risk objectively unreasonable under contemporary standards of decency.¹⁵³ This breakpoint in analysis appears to be especially pronounced when those living outside of prison are exposed to the same naturally occurring hazards as those incarcerated.

Providing a cautionary note, the Seventh Circuit has held, at least twice, that exposure to common pollutants in air and water could not be considered cruel and unusual punishment under contemporary standards of decency. For example, the court held while it is an unfortunate fact that “asbestos abounds in many public buildings,” it follows that “[e]xposure to moderate levels of asbestos is a common fact of contemporary life and cannot, under contemporary

148. 914 F.3d 1218 (9th Cir. 2019).

149. *Id.* at 1224.

150. *Id.* at 1225.

151. *Id.* at 1231 (internal citations omitted).

152. *Id.* at 1232.

153. Compare *McNeil v. Lane*, 16 F.3d 123 (7th Cir. 1993) (asbestos), with *Carroll v. DeTella*, 255 F.3d 470 (7th Cir. 2001) (radium in water).

standards, be considered cruel and unusual.”¹⁵⁴ Similarly, even though the radium levels in drinking water were above the federal EPA standards (but less than half a proposed revision to the standards), the same court, in an opinion by Judge Richard Posner, held that prison officials are not constitutionally required to provide “a maximally safe environment” or “one completely free from pollution or safety hazards.”¹⁵⁵ Judge Posner reasoned that the Eighth Amendment does not require prisons to have cleaner air or water than are enjoyed by substantial numbers of free Americans.¹⁵⁶ It is important to note, however, that Judge Posner relied in part on the proposed revision to the radium in drinking water standards and the recommended remedial measures, implying that if prison officials failed to abide by those measures the case might come out differently.¹⁵⁷

IV. DELIBERATE INDIFFERENCE TO RADON EXPOSURE

Radon exposure threatens people in our prisons with lung cancer every day. The precedent discussed in the prior Part suggests that the Eighth Amendment should not tolerate that state of affairs. And at least one circuit has expressed willingness to entertain a claim based on documented radon exposure in a state correctional institution.¹⁵⁸ In order to reduce the risk of lung cancer among the incarcerated population, a series of similar Eighth Amendment cases seeking injunctive relief may be necessary across the country. This Part explains how plaintiffs should be able to satisfy the three core elements of a claim alleging that prison officials acted with deliberate indifference to the risks posed by radon exposure, presents a real test case making just that argument, and then compares the treatment of radon exposure under the Eighth Amendment to its treatment in tort.

A. Elemental Analysis of the Claim

First and foremost, exposure to radon presents an objectively substantial risk of future harm. As detailed in Part I above, ample statistical and scientific data conclusively establish that radon causes lung cancer at rates rivaled only by cigarette smoke. The Supreme Court acknowledged in *Helling* that the risk of lung cancer posed by ETS was objectively substantial. Radon, as the documented second leading cause of lung cancer, would similarly clear that threshold. In the context of cancerphobia tort actions, one court noticed that “all of us are exposed to carcinogens every day . . . [a]lthough few are exposed to all, few

154. *McNeil*, 16 F.3d at 125.

155. *Carroll*, 255 F.3d at 472.

156. *Id.*

157. *Id.* at 473.

158. *See generally* *Vega v. Semple*, 963 F.3d 259 (2d Cir. 2020).

also can escape exposure to any.”¹⁵⁹ The logic behind making this observation appears clear enough—not every carcinogen poses an actionable, unreasonable risk.

Several district court decisions have provided some guidance on when a risk fails to qualify as objectively serious. For example, it was determined that low cell temperature alone, when the occupant had clothing, long johns, and blankets, was as a matter of law not a serious deprivation.¹⁶⁰ Radon, however, has been recognized by society as a carcinogen worthy of attention and, importantly, requiring mitigation that is currently not accessible to incarcerated persons on their own. The EPA guidance directed at homeowners caring for their families should apply with equal force to the prison officials housing our fellow citizens. If anything, society’s attitude towards radon gas is less ambiguous than its approach to ETS, which the Court found compelling enough in *Helling* to support an Eighth Amendment claim.

However, even with a finding of qualitative future harm sufficient to find a current deprivation as serious, it does not follow that every deprivation meets the quantitative requirement necessary to demonstrate the objective element of an Eighth Amendment claim. For example, in one case where individuals suffered serious injury from assault by others incarcerated with them who used prison-provided padlocks as weapons, the low incidence, both in absolute number and as a percentage of total assaults, did not support a finding of substantial risk of future harm.¹⁶¹ Padlocks were generally involved in one to two reported assaults per year, peaking at six in 2010, and were involved in between 0% and 12% of all reported assaults between 2007 and 2012.¹⁶²

Armed with years of epidemiological data, guidance from EPA, state laws covering testing and mitigation, and private housing market activity, plaintiffs should have no problem establishing the general proposition that radon gas presents a substantial risk of harm that society is unwilling to tolerate. The more difficult task on the first element will be proving the seriousness of the *specific* risk—i.e., the risk to particular residents at a particular facility. That specific risk is comprised of two exposure variables—the magnitude of exposure and the duration of the exposure. If a radon test has been conducted at or near the facility, the magnitude question is easily answered by comparing test results to EPA action levels. Without a test, plaintiffs will have to depend on risk

159. *Potter v. Firestone Tire & Rubber Co.*, 863 P.2d 795, 811–12 (1993) (quoting Terry Morehead Dworkin, *Fear of Disease and Delayed Manifestation Injuries: A Solution or a Pandora’s Box?*, 53 *FORDHAM L. REV.* 527, 565 (1984)).

160. *Skandha v. Savoie*, 811 F. Supp. 2d 535, 540 (D. Mass. 2011).

161. *Lakin v. Barnhart*, 758 F.3d 66, 71 (1st Cir. 2014).

162. *Id.* at 68. In the opinion, the court notes that the First Circuit has not yet explained with precision the difference between substantial and insubstantial risk of violence by inmates and, rather than setting out such a test, concludes only that the facts presented in the summary judgment record were well below the threshold. *Id.* at 71.

maps developed by EPA and demand testing as the first component of injunctive relief. The durational component of the risk calculus requires plaintiff classes be drawn carefully, including only those individuals whose sentences compel years of exposure.¹⁶³ At bottom, the additional complication of objectively demonstrating a sufficiently serious level of specific risk should not foreclose all potential Eighth Amendment litigation, but rather serve as a guide for the pleading and discovery phases of such.

Assuming exposure rates in prison commensurate with those in a private residence, EPA reports a non-smoker experiences a 1.5% probability of developing lung cancer from “lifetime” exposure to 8.0 pCi/L of radon. Exposure to 20 pCi/L yields a 3.6% probability of developing lung cancer. If a court compared these probabilities with the precedent on the likelihood of other injuries, such as the padlock assaults discussed above,¹⁶⁴ it might conclude that radon does not pose a statistically significant specific risk. However, if a court looks, as it should, at only the most analogous precedent—those cases concerning cancer risk from asbestos and ETS—the quantitative seriousness of the risk posed by radon exposure, at least in some circumstances, becomes apparent. In *Helling*, the Court did not require that the plaintiff establish that he was more likely than not to develop cancer;¹⁶⁵ indeed, it affirmed the principle that “a remedy for unsafe conditions need not await a tragic event.”¹⁶⁶ In *LaBounty*, the Second Circuit distinguished actionable risk from incidental, hypothetical exposure; the court did not draw a line based on percentages. Instead, the Second Circuit emphasized that it had previously “acknowledged in 1988 that friable asbestos poses a significant health risk [due to] airborne particles.”¹⁶⁷ The risk presented by radon has similarly been acknowledged as actionable by courts in other contexts.¹⁶⁸

163. For the operation of a similar constraint in the tort context, see *Rittenhouse v. St. Regis Hotel Joint Venture*, 565 N.Y.S.2d 365, 367–68 (Sup. Ct. 1990) (dismissing a claim for “mental anguish” caused by alleged exposure to asbestos while the plaintiff was a guest at the hotel).

164. Recall, padlocks were used in at most 12% of all reported assaults at a particular Maine prison, and that level was held to not constitute a substantial risk of future harm. See *supra* note 162 and accompanying text.

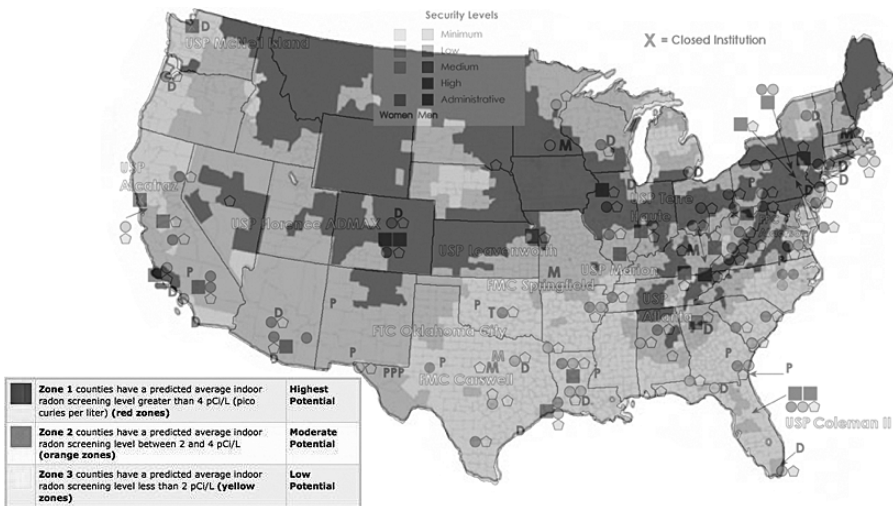
165. This rightly sits in contrast to tort recovery for cancer risk. Here, inmates seek injunctive relief as well that will hopefully mitigate the increased risk of cancer and prevent the disease from developing. See Donath, *supra* note 74, at 1116 (“Recovery for increased risk of cancer traditionally has been analyzed under a probabilistic standard of future damages that allows recovery only if the future consequences are ‘reasonably certain’ to occur. Under this standard, reasonable certainty is defined as ‘more likely than not’ or having a ‘probability of occurrence of greater than fifty percent.’” (citation omitted)).

166. *Helling v. McKinney*, 509 U.S. 25, 33 (1993).

167. *LaBounty v. Coughlin*, 137 F.3d 68, 74 n.5 (2d. Cir. 1998) (citing *Environmental Encapsulating Corp. v. City of New York*, 855 F.2d 48, 50 (2d Cir. 1988), to describe the actionable increased risk of “asbestosis, mesothelioma and lung cancer” created by asbestos particles in the air, as distinguished from encapsulated insulation).

168. See Part II.D, *supra*.

In contrast, the subjective knowledge element will likely prove the most challenging for plaintiffs to satisfy. This is particularly true when no radon testing has been conducted at or near the facility. Nonetheless, even absent a test result showing actionable levels of radon in indoor air, there may exist sufficient facts to establish knowledge on the part of at least some prison officials. The relevant facts primarily concern the siting and construction of the facilities, along with the radon zone maps developed and published by EPA and the U.S. Geological Survey (“USGS”). These maps are published, at least in part, to assist national, state, and local officials in siting and building code decisions. As the figure below illustrates, many federal prisons have been sited in areas designated as “Zone 1 - Highest Potential (greater than 4.0 pCi/L).”¹⁶⁹

FIG. 2¹⁷⁰

The subjective knowledge element can be satisfied by proof of facts from which one could infer that a substantial risk of harm exists and circumstantial proof that officials did draw such an inference.¹⁷¹ In other words, while the public availability of radon risk information and maps might not alone be enough, evidence that such information was presented to or considered by prison officials may be. The Court in *Farmer* went even further to suggest that if the risk is obvious enough, “a factfinder may conclude that a prison official knew of a substantial risk from the very fact that the risk was obvious.”¹⁷²

169. A CITIZEN’S GUIDE TO RADON, *supra* note 2.

170. Figure created with data from EPA and the Federal Bureau of Prisons.

171. See *Farmer v. Brennan*, 511 U.S. 825, 842–43 (1994).

172. *Id.* at 842 (citation omitted); see also *Walker v. Schultz*, 717 F.3d 119, 125 (2d Cir. 2013) (quoting *Brock v. Wright*, 315 F.3d 158, 164 (2d Cir. 2003)) (“[E]vidence that a risk was

Against this backdrop, the year of construction, or modification, of a prison facility becomes a vital fact.¹⁷³ As discussed above, public awareness of the risk presented by radon has changed over time, with a spike in the late 1980s and early 1990s. The Supreme Court did not decide the *Helling* case until 1993, which “clearly established”¹⁷⁴ the law in this particular sub-area of unconstitutional conditions of confinement due to toxic exposures. So, for those individuals seeking both injunctive relief and money damages, the mid-1990s emerges as a period of focus. That time also happens to coincide with an upward trend in incarceration rates,¹⁷⁵ resulting in a boom in prison construction. According to Department of Justice statistics, more than 200 state and federal prisons were built between 1990 and 1995.¹⁷⁶ By 1995, more than one-third of all incarcerated persons were housed in facilities built in 1985 or later.¹⁷⁷ By the time these facilities were sited and constructed, the risk presented by radon in indoor air was well known. Many of these facilities were nonetheless built in Zone 1 areas without any testing or mitigation.¹⁷⁸

Crucially, the subjective knowledge of defendant prison officials is a highly fact-specific inquiry, a question left to the jury so long as some circumstantial evidence of knowledge or obviousness exists. Since the majority of conditions of confinement cases will likely settle if they survive a motion to dismiss,¹⁷⁹ the

‘obvious or otherwise must have been known to a defendant’ may be sufficient for a fact finder to conclude that the defendant was actually aware of the risk.”).

173. Brenna Helppie-Schmieder, *Toxic Confinement: Can the Eighth Amendment Protect Prisoners from Human-Made Environmental Health Hazards?*, 110 NW. UNIV. L. REV. 647, 662 (2016) (“One of the first questions will be: where to build? Government officials must balance a variety of factors in planning a prison’s physical location. Some of these factors include ‘proximity to courts and hospitals, accessibility by either public transportation or major highways, community interest and support.’ Environmental factors specific to a proposed site are also sometimes considered in the decisionmaking process.” (citation omitted)).
174. See *Harlow v. Fitzgerald*, 457 U.S. 800, 815–19 (1982).
175. Associated Press, *In 90’s, Prison Building by States and U.S. Government Surged*, N.Y. TIMES, (Aug. 8, 1997), <https://perma.cc/L2B5-744J> (“In 1990, prisons held 293 inmates for every 100,000 Americans. By 1995, the figure had risen to 409 inmates per 100,000, and figures already released this year put the 1996 number at 427 per 100,000.” (citing U.S. DEPARTMENT OF JUSTICE, BUREAU OF JUST. STAT., PRISON CENSUS 1997)).
176. *Id.*; see also Helppie-Schmieder, *supra* note 173, at 663 (“In the 1990s, an average of twenty-five new prisons were built in rural areas each year, resulting in 245 new rural prisons between 1990 and 1999.”).
177. See Associated Press, *supra* note 175 (“By 1995, about half the state and Federal prisons were more than 20 years old, but almost 40 percent of inmates were in prisons built since 1985.”).
178. For example, the Massachusetts Department of Corrections built its maximum-security facility—Souza-Baranowski Correctional Center—in 1997. The facility houses over 1,000 inmates. In response to a request pursuant to the Massachusetts Public Records Act, neither the Department of Corrections nor the Department of Environmental Protection could produce any records of indoor air quality or radon testing at the facility.
179. See generally Margo Schlanger, *Inmate Litigation: Results of a National Survey*, 2003 L.J.N EXCH. 1 (2003).

pleadings become the gatekeeper. Plaintiffs must plausibly allege knowledge or facts upon which knowledge could be inferred. Then, regardless of whether a jury would find the subjective knowledge element met, a good number of at-risk incarcerated people could see some type of relief in the form of radon testing and/or mitigation.

The third and final element—failure to take reasonable measures to mitigate the dangerous risk posed by radon exposure—returns us to an objective analysis. Prison officials are afforded deference in determining reasonable response to substantial risk of harm to ensure order and discipline within their facility.¹⁸⁰ However, the impact of radon testing, and even mitigation, on the order and discipline in a correctional facility is likely to be negligible. Thus, prison officials will lack a colorable argument that addressing radon exposure is unreasonable due to countervailing safety or administrative concern. The reasonableness inquiry will instead turn almost entirely on what a homeowner or homebuilder of ordinary prudence would do when confronted with a similar risk. The reasonableness of response will thus be determined in light of current policy and attitude toward exposure to radon. In the context of radon, some states have meaningful statutes and regulations on the books requiring radon testing in some types of public or public-serving buildings (e.g., schools or apartment buildings).¹⁸¹ Reasonableness at minimum requires testing to determine specific radon levels in areas where people live.

B. *The Test Case: Vega v. Semple*

Recently, a class action advancing the claims theorized herein with respect to radon exposure in prison advanced past the motion to dismiss stage in federal court. In *Vega v. Semple*,¹⁸² the Second Circuit affirmed the decision of the U.S. District Court for the District of Connecticut denying the prisons officials qualified immunity. The facility at issue in the case—Garner Correctional Institution—was partially tested for radon in 2013, at the request of a teacher pursuant to a Connecticut law requiring radon testing in public schools.¹⁸³ The test of the classroom area revealed exposures ranging from 5.0 pCi/L to 23.7 pCi/L—well above the EPA action level of 4.0 pCi/L.¹⁸⁴ The plaintiffs allege

180. See *Whitley v. Albers*, 475 U.S. 312 (1986).

181. See, e.g., 105 ILL. COMP. STAT. 5/10-20.48 (2010); ME. REV. STAT. ANN. tit. 14 § 6030-D (2013); N.H. REV. STAT. ANN. § 125:9 (2018); OR. REV. STAT. § 433.521 (2020); 23 R.I. GEN. LAWS. §§ 23-61-2, 23-61-6, 23-61-7 (1992); CONN. GEN. STAT. § 10-220(d) (2012).

182. 963 F.3d 259 (2d Cir. 2020).

183. CONN. GEN. STAT. §10-220(d) (2012).

184. *Vega*, 963 F.3d at 270 (further explaining that “[e]xposure to indoor radon at 10.0 pCi/L is equivalent to smoking more than 1 pack of cigarettes a day; and exposure to indoor radon at 20.0 pCi/L is equivalent to smoking more than 2.5 packs of cigarettes a day”).

two general theories of Eighth Amendment violation.¹⁸⁵ First, when the facility was constructed, no testing or mitigation was done, despite knowledge of the high risk of radon in the area.¹⁸⁶ Second, once radon was detected in the classroom area in 2013, officials did not act reasonably to mitigate the risk.¹⁸⁷ The defendant officials responded by seeking dismissal on qualified immunity grounds, arguing that the law was not clearly established that exposure to radon could constitute cruel and unusual punishment.¹⁸⁸

The Second Circuit affirmed the district court's denial of qualified immunity as it pertained to any claims occurring after *Helling* was decided in 1993.¹⁸⁹ In reaching that conclusion, the Second Circuit explicitly held that "*Helling* established a prisoner's right to be free from toxic environmental substances that, like ETS, posed an unreasonable risk of some future harm."¹⁹⁰ That bold (and correct) pronouncement clearly places exposure to radon (and other environmental hazards) outside the realm of acceptable conditions of confinement. Indeed, the Second Circuit joined the district court in concluding that "[i]f anything, knowing or reckless exposure of prisoners to radon, given the facts alleged by Plaintiffs, is more obviously unconstitutional than exposure of prisoners to ETS was in 1993."¹⁹¹ The conclusion has even more force when applied to the inaction of prison officials *after* radon testing revealed dangerously high levels in the classroom areas at Garner.¹⁹²

Consistent with the previous discussion of the difficulty of proving the elements (particularly the subjective knowledge of prison officials) and the practical importance of simply overcoming initial motions to dismiss, the court in *Vega* made sure to note that it took plaintiffs' allegations as true.¹⁹³ The plain-

185. *See id.* at 266 ("They contend that Defendants, who are current and former DOC officials, were deliberately indifferent to their safety when building the Garner facility at the Newtown, Connecticut site and by failing to test for or mitigate the alleged radon exposure thereafter.").

186. *Id.* at 268–69.

187. *Id.* at 269–70.

188. *Id.* at 271 ("With regard to the qualified immunity defense, Defendants do not argue that Plaintiffs' claims cannot amount to constitutional violations; rather, they argue only that at relevant times there was no clearly established law that they violated through their actions or inaction.").

189. *Id.* at 267.

190. *Id.* at 276.

191. *Id.* (quoting *Vega v. Semple*, No. 3:17-cv-107, 2018 WL 4656236, at *6 (D. Conn. Sept. 27, 2018)).

192. *See id.* at 277.

193. *Id.* at 280 n.108 ("At this juncture, Plaintiffs have plausibly alleged subjective knowledge and deliberate intent by pleading, *inter alia*, that Defendants took *no action* in response to various triggering events, such as the discovery of unsafe uranium levels in a school that shared Garner's water supply and, most significantly, the discovery of unsafe radon levels in Garner's classroom areas. Taken as true, these allegations easily admit an inference that Defendants were deliberately indifferent to a serious health risk to prisoners from radon exposure.

tiffs in *Vega* had the unusual (at least at this point in time) ability to base their allegations on actual records of radon test results from the very facility in question. That gave them a powerful tool in plausibly pleading subjective knowledge. However, the decision in *Vega* makes clear that such record evidence is not necessary to survive a motion to dismiss. The Second Circuit specifically affirmed the denial of qualified immunity for claims from 1993 until the time of the testing. That holding indicates that plaintiffs plausibly pleaded subjective knowledge even in the absence of specific testing. This is vitally important because it seems unlikely that radon testing has been conducted at many prison facilities in high-risk areas across the country. Following Supreme Court and Second Circuit precedent, potential plaintiffs need not wait for lung cancer to develop¹⁹⁴ or for radon testing to be conducted.¹⁹⁵

The *Vega* case also sheds some light on how to properly analyze the objective elements of an Eighth Amendment toxic exposure claim. Specifically, the District Court pointed out that on the question of society's willingness to tolerate the risk, no one could credibly argue that radon is more willingly tolerated than secondhand smoke.¹⁹⁶ The complaint and the decisions made appropriate comparison between the lung cancer risks created by ETS and by radon, finding them comparably intolerable. The Second Circuit affirmed the District Court's conclusions and its proper reliance on "regulations and statutes" to "bolster the conclusion[] that . . . society is unwilling to tolerate the risks accompanying certain levels of radon exposure."¹⁹⁷ Because governments at the federal, state, and municipal levels have all taken steps to address the risks presented by radon in indoor air, the ability of future plaintiffs to use that government action as evidence of society's attitude toward the risk is quite powerful. Ample prior precedent from the Supreme Court endorsed such a reliance on state and federal policies pertaining to risk assessment and tolerance;¹⁹⁸ nonetheless, the

Indeed, the pleadings admit no obvious alternative explanation." (internal citations omitted)).

194. See *Helling v. McKinney*, 509 U.S. 25, 33 (1993).

195. See *Vega*, 963 F.3d at 276.

196. See *Vega*, 2018 WL 4656236, at *6 ("And while in 1993 the defendants in *Helling* could reasonably argue that many people at the time willingly exposed themselves to secondhand smoke, Defendants here advance no argument that anyone—today or at the time *Helling* was decided—would voluntarily expose themselves to the levels of radon concentration that Plaintiffs allege.").

197. *Vega*, 963 F.3d at 278.

198. See, e.g., *Hope v. Pelzer*, 536 U.S. 730, 743–44 (2002) (relying on the existence of an Alabama Department of Corrections regulation to reject qualified immunity); see also *Helling*, 509 U.S. at 36 ("[D]etermining whether . . . conditions of confinement violate the Eighth Amendment requires more than a scientific and statistical inquiry into the seriousness of the potential harm[.] . . . [i]t also requires a court to assess whether society considers the risk that the prisoner complains of to be so grave that it violates contemporary standards of decency to expose anyone unwillingly to such a risk.").

holding in this specific context remains important. The holding rejects any extension of the Supreme Court's holding in *Davis v. Scherer*¹⁹⁹ that “[o]fficials sued for constitutional violations do not lose their qualified immunity merely because their conduct violates some statutory or administrative provision.” Defendants in *Vega* and elsewhere have unsuccessfully argued for qualified immunity whenever the complaint makes reference to any statute, regulation, or guideline in making out a constitutional claim. As the *Vega* decision evidences, courts should welcome the helpful citation to scientific expertise that has been enshrined in law and policy when deciding cases predicated on assessments of environmental and human health risks.²⁰⁰

C. *Similarities and Differences from Radon Tort Litigation*

People outside of prisons have litigated radon claims in a number of different contexts—primarily torts.²⁰¹ It might be tempting to view those cases as cautionary precursors to Eighth Amendment litigation, given their mixed record and the repeated acknowledgement by the Supreme Court that deliberate indifference is more than mere negligence. Indeed, the Supreme Court crafted the phrase “deliberate indifference” to differentiate the claim from ordinary negligence, specifically holding in *Estelle* that medical malpractice, without more, does not violate the Eighth Amendment.²⁰² Instead, most circuits explicitly equate deliberate indifference with something akin to recklessness,²⁰³ a much more difficult evidentiary burden on the issue of the tortfeasor's state of mind. Thus, the mixed bag of tort results, and frankly the lack of a sizeable wave of radon tort litigation, foretells a hard road ahead for Eighth Amendment radon exposure claims.

Nonetheless there exists at least one area where Eighth Amendment litigants may actually have an advantage over their common law brethren—risk of future harm as cognizable injury. As outlined above, the Supreme Court in *Helling* specifically endorsed conditions of confinement claims based on increased risk of future harm, even in the absence of current physical injury. Tort law has not nearly been so expansive in its definition of injury. Tort claims seeking relief for future harm have existed for quite some time and come in two

199. 468 U.S. 183, 194 (1984).

200. The amended complaint pointed to the Toxic Substances Control Act, as well as EPA, WHO, and Connecticut Department of Public Health safety standards in alleging that Garner officials knowingly disregarded the unreasonable risk presented by radon exposure. See *Vega*, 963 F.3d at 268 (describing and drawing on some of those same sources).

201. See *supra* Part II.D.

202. Rauser, *supra* note 127, at 176.

203. *Id.*

varieties—recovery for increased risk²⁰⁴ and so-called “cancerphobia”²⁰⁵ claims. However, in both situations, courts have generally required proof of more than just nominally increased risk of harm or fear of cancer. To recover for increased risk of cancer, courts have routinely required plaintiffs to show a 50% or greater chance of developing cancer resulted from the tortious exposure²⁰⁶—an extremely high bar given the relatively low incidence of cancer generally.²⁰⁷ In cancerphobia cases, the damages compensate for emotional distress (i.e., anxiety produced by fear of developing cancer), and thus courts often demand evidence of an accompanying physical injury before allowing recovery.²⁰⁸ The Supreme Court did not impose either of these barriers to toxic exposure cases that arise under the Eighth Amendment. In contrast, the Court said unequivocally that “a remedy for unsafe conditions need not await a tragic event.”²⁰⁹

V. BARRIERS TO JUSTICE

A. Prison Litigation Reform Act

A 1996 law called the Prison Litigation Reform Act (“PLRA”)²¹⁰ erects perhaps the most significant hurdles facing incarcerated persons who want to use litigation to push back against their involuntary exposure to radon. The PLRA set out to stem the tide of lawsuits, many *pro se*, filed on behalf of people behind bars.²¹¹ It has done just that. From the perspective of a potential plain-

204. See Donath, *supra* note 76, at 1116 (“Recovery for increased risk of cancer rests solely on a claim that there is a heightened possibility of contracting cancer that can be measured with some degree of medical certainty. Plaintiffs allege future damages, including ‘future medical expenses, loss of earnings, [and] diminished life expectancy.’” (citation omitted)).

205. See *id.* (“[C]ancerphobia damages are ‘*present damages* for the serious emotional distress that [the plaintiff] *already* has suffered . . . because of the substantial risk to the plaintiff’s health posed by the defendant’s negligence.” (citation omitted)).

206. *Id.*

207. See generally *Lifetime Risk of Developing or Dying From Cancer*, AM. CANCER SOC’Y (Jan. 13, 2020), <https://perma.cc/3GU6-67YX>.

208. Donath, *supra* note 76, at 1117, 1121 (“Many courts, in a variation of the physical injury requirement, insist that plaintiffs’ mental injuries manifest themselves in some physical injury before recovery will be allowed. For example, a plaintiff claiming mental distress would be required to show physical signs of the anguish—such as headaches, ulcers, or stress—before he or she could collect damages.”); see also *id.* at 1133 (explaining the fear of being inundated with cancerphobia litigation because “[p]otential plaintiffs’ classes in cancerphobia actions may be enormous. Indeed, the numbers are daunting in the asbestos arena alone. One study found that roughly 14.1 million workers have been significantly exposed to asbestos since 1940”).

209. *Helling v. McKinney*, 509 U.S. 25, 33 (1993).

210. 42 U.S.C. § 1997e.

211. 141 CONG. REC. S14,626 (daily ed. Sept. 29, 1995) (statement of Sen. Orrin Hatch) (Jail-house lawyers with little better to do are tying our courts in knots with the endless flow of

tiff who has been exposed to radon in a correctional facility, the PLRA's exhaustion and physical injury requirements stand most prominently in the way.

The very first section of the PLRA states unequivocally that “[n]o action shall be brought with respect to prison conditions under section 1983 of this title, or any other Federal law, by a prisoner confined in any jail, prison, or other correctional facility until such administrative remedies as are available are exhausted.”²¹² The Supreme Court has interpreted this bar sweepingly, holding in *Porter v. Nussle*²¹³ that “the PLRA’s exhaustion requirement applies to all inmate suits about prison life, whether they involve general circumstances or particular episodes, and whether they allege excessive force or some other wrong.” Thus, a conditions of confinement suit premised on exposure to toxic levels of radon squarely fits within that broad interpretation. For such a claim to proceed, then, the plaintiff would have to first avail herself of the particular institution’s grievance policy (i.e., the “administrative remed[y]”). Only after prison officials failed to adequately respond to the grievance—perhaps by refusing to test for radon gas or not installing a mitigation system—would a federal court entertain a claim of an Eighth Amendment violation.

Importantly, the PLRA’s exhaustion requirement applies to claims for both compensatory and injunctive relief.²¹⁴ This holds true regardless of whether the administrative complaint system could provide the relief requested.²¹⁵ Even a complaint seeking mitigation alone would face dismissal if a grievance had not been filed on the issue of radon exposure. And in an imminently dangerous situation, where a court may be willing to award a *preliminary* injunction, such an injunction would be limited to the time it takes to file and adjudicate a grievance.²¹⁶ While this failsafe may be useful in the context of other environmental harms, it is unlikely that exposure to radon would manifest suddenly and acutely enough to meet the imminence threshold. Regardless, the injunction’s terms would still require a grievance be filed. Hence, any person who currently fears that their incarceration exposes them to toxic levels of radon must file a grievance with all deliberate speed or risk not obtaining relief in any form.

frivolous litigation.”); see also Ashley Dunn, *Flood of Prisoner Rights Suits Brings Effort to Limit Filings*, N.Y. TIMES (Mar. 21, 1994), <https://perma.cc/S5DA-NHFC>.

212. 42 U.S.C. § 1997e(a).

213. 534 U.S. 516, 532 (2002).

214. See *Botth v. Churner*, 532 U.S. 731 (2001).

215. See *id.*

216. See *Jackson v. District of Columbia*, 254 F.3d 262 (D.C. Cir. 2001) (holding that the court can only protect plaintiffs with a preliminary injunction while the court waits for them to exhaust grievance procedures); see also *Farmer v. Brennan*, 511 U.S. 825 (1994) (suggesting a prison’s internal “administrative” remedies must be pursued prior to bringing a claim in federal court).

The PLRA did not stop with the imposition of an exhaustion requirement. That was only the beginning. The Act goes on to explicitly prohibit actions “for mental or emotional injury suffered while in custody without a prior showing of physical injury.”²¹⁷ This “physical injury requirement” reintroduces one of the powerful barriers to tort recovery discussed above. As noted there, a distinguishing feature of Eighth Amendment conditions of confinement pleading had been the relaxed ability (relative to tort) to seek relief for mental distress caused by increased risk of future harm. Just three years after *Helling* definitively declared that door open, the PLRA slammed it shut. Now, a person exposed to radon while incarcerated will not be able to recover compensatory damages for the increased risk of cancer caused by the exposure, unless she can prove some accompanying medical condition. True enough, those who eventually develop lung cancer could theoretically obtain relief. But those whom the Court expressed genuine concern for in *Helling*, the individuals whose future health remains uncertain, are left without recourse.

Importantly, the PLRA’s physical injury requirement squarely applies only to compensatory claims for money damages. There has been much scholarly debate and litigation about the reach of the limitation, particularly with respect to punitive damages.²¹⁸ It is nonetheless well settled that the prohibition does not apply to suits seeking purely injunctive or declaratory relief.²¹⁹ In other words, a person who has not yet experienced symptoms of radon exposure, but nonetheless wants to mitigate the harm going forward, could avoid the PLRA’s bar by carefully drafting his or her complaint to pray for court-ordered radon detection and mitigation.

B. Qualified Immunity

The doctrine of qualified immunity, which has once again emerged as a hot topic of scholarly and popular debate,²²⁰ shields government officials, including wardens and correctional officers, from financial liability for violations of the Constitution when the law is not “clearly established.”²²¹ The doctrine essentially requires plaintiffs seeking money damages to point to existing precedent recognizing the constitutional violation they complain of. The inquiry thus

217. 42 U.S.C. § 1997e(e).

218. See Hilary Detmold, *‘Tis Enough, ‘Twill Serve: Defining Physical Injury Under the Prison Litigation Reform Act*, 46 SUFF. UNIV. L. REV. 1111, 1119 n.46 (2013) (compiling law review articles and judicial opinions that evidence the debate).

219. See, e.g., *Harper v. Showers*, 174 F.3d 716 (5th Cir. 1999); *Perkins v. Kansas Dept. of Corrs.*, 165 F.3d 803 (10th Cir. 1999); *Davis v. District of Columbia*, 158 F.3d 1342 (D.C. Cir. 1998).

220. See, e.g., Haley Fuchs, *Qualified Immunity Protection for Police Emerges as Flash Point Amid Protests*, N.Y. TIMES (June 24, 2020), <https://perma.cc/5NXJ-WDWT>.

221. *Harlow v. Fitzgerald*, 457 U.S. 800, 815–19 (1982).

puts a great deal of weight on the level of specificity adopted by the court in describing the constitutional right, and violation thereof, at issue.

The Eighth Amendment conditions of confinement context makes this definitional debate quite salient. Consider exposure to radon gas. One conception of the right in question is substance-specific; according to this reading, the right to be free from exposure to ETS is distinct from the right to be free from exposure to asbestos, which is distinct from the right to be free from exposure to radon, and so on. Such a narrow interpretation of the precedent flowing from *Helling* would eviscerate the chance of recovery for people exposed to all kinds of known toxic substances. Both the Supreme Court and circuit courts have been careful to state a slightly more generous conception of the requisite specificity for defining rights.²²² In *Vega*, the Second Circuit soundly rejected the “substance-specific” conception of the right of incarcerated persons to be free from exposure to toxic substances at harmful levels:

Defendants argue that they are entitled to qualified immunity on the basis that no binding decision discusses the constitutional implications of *radon* exposure to inmates. Essentially, they argue that qualified immunity must be granted absent binding precedent that addresses the *very same* carcinogen in this case. The argument is not compelling. . . . We have repeatedly rejected this type of argument, and we do so once more today.²²³

The court explained that the “‘contours of the right’ in *Helling* [were] ‘sufficiently clear that a reasonable officer would understand’ that deliberate indifference to radon exposure ‘violates that right’ as well.”²²⁴

If other circuits follow the reasoning of the Second Circuit, principally relying on the Supreme Court’s precedent in *Helling*, prison officials in every jurisdiction should not enjoy the protection of qualified immunity when confronted with their failure to mitigate the exposure of those in their care to radon gas (and other known toxic substances). It is by no means a forgone conclusion that uniformity across circuits will develop on this question. Indeed, given the

222. *Ashcroft v. al-Kidd*, 563 U.S. 731, 741 (2011) (“We do not require a case directly on point.”); *Hope v. Pelzer*, 536 U.S. 730, 739 (2002) (rejecting the argument that “an official action is protected by qualified immunity unless the very action in question has previously been held unlawful”); *Anderson v. Creighton*, 483 U.S. 635, 640 (1987) (“This is not to say that an official action is protected by qualified immunity unless the very action in question has previously been held unlawful.”); *Williams v. Greifinger*, 97 F.3d 699, 703 (2d Cir. 1996) (“A court need not have passed on the identical course of conduct in order for its illegality to be ‘clearly established.’”); *see also* *State Emp. Bargaining Agent Coal. v. Rowland*, 718 F.3d 126, 132 (2d Cir. 2013), *cert. denied*, 571 U.S. 1170 (2014) (denying qualified immunity even though the Court had “never articulated a standard for determining whether, and under what circumstances” the particular right would be violated).

223. *Vega v. Semple*, 963 F.3d 259, 277 (2d Cir. 2020).

224. *Id.* (quoting *LaBounty v. Coughlin*, 137 F.3d 68, 74 (2d Cir. 1998)).

range of decisions on conditions of confinement cases generally, a circuit split seems more likely. Consequently, three things emerge as noteworthy. First and foremost, it is worth reemphasizing that qualified immunity applies only to claims for money damages, so pursuit of injunctive relief should survive even in less friendly venues. Second, the jurisdictions governed by the Second Circuit imprison thousands of citizens and include areas that have earned EPA's highest risk designation for radon. Lastly, if a circuit split emerges, likely after years of litigating multiple cases, the Supreme Court may still elect not to resolve it.

VI. FUTURE LITIGATION AND POLICY

A. *Successful Litigation Remains Difficult*

Despite the permissive developments in precedent and solid theoretical grounding discussed, the subjective knowledge element of a deliberate indifference claim will continue to hinder the effectiveness of litigation in righting the environmental and constitutional wrong of radon in our prisons. As long as courts demand that plaintiffs prove actual (rather than constructive) knowledge on the part of prison officials, obtaining a judgment finding a violation of the Eighth Amendment will elude even skilled attorneys; proving what is in a person's mind remains one of the most difficult tasks in all of trial practice.²²⁵ Combine that general challenge with the nature of the proof in these cases—that the defendants knew of the existence of a particular toxic substance and appreciated the risks presented by it—and to call the task Herculean might understate it. The practical effect of this element has been to “transfer[] the duty of monitoring prison safety from prison officials to the very prisoners who are at risk.”²²⁶

Due to these realities throughout the law of deliberate indifference, some have urged reform. If we understand the current precedent as equating deliberate indifference to some form of recklessness, it becomes readily apparent that in requiring proof of subjective knowledge the Court has chosen the frame of criminal recklessness, rather than tort recklessness.²²⁷ Nothing in the Eighth Amendment's text necessitates that selection. Indeed, some have argued that a tort recklessness standard better comports with Eighth Amendment precedent

225. Rauser, *supra* note 127, at 188 (“In light of the realities of prison life, proving actual knowledge in court is as difficult as it is impractical.”).

226. *Id.*; see also Park, *supra* note 96, at 413 (“The central problem with the knowledge requirement is that it inaccurately and inadequately defines the scope of the prison official's duty. The knowledge requirement only requires prison officials to act when they know that a risk of danger is substantial. This standard is nebulous and only requires action at a point when it may be too late to avert the danger.”).

227. See Rauser, *supra* note 127, at 193.

predating the emergence of deliberate indifference cases.²²⁸ Regardless of doctrinal consistency, tort recklessness (e.g., an objective, “should have known” standard for state of mind) rightly places the burden on prison officials, those with custody and power, to ensure the safety of those in their care.

Dangerous prison conditions, such as exposure to a toxic substance, often arise over years and stem from institutional sources rather than individual actors. Because one cannot prove the subjective knowledge of an institution over time and subjective knowledge of previous officials cannot be imputed to their successors, the law as currently interpreted could leave many injured parties without a remedy.²²⁹ On this basis, some have pushed for a more permissive test, sidestepping the state-of-mind debate altogether. These reformers urge that “any objectively inhumane conditions should lead to liability regardless of the presence of individual knowledge of these conditions.”²³⁰ A similar proposed change in the law would borrow again from tort, and from property, looking at the duty owed by landlords to tenants (or invitees).²³¹ Under such a regime, prison officials would have an obligation to prevent substantial risks of harm from developing.²³² Both of these interpretations conceive of the Eighth Amendment’s prohibition against cruel and unusual punishment “as a representation that the infliction of a prison sentence meets basic standards of humanity.”²³³

Any of these reforms, and perhaps others not yet proposed, would make litigation a more viable strategy for incarcerated people exposed to environmental harms. Without one of them, the road will continue to be a difficult one, necessitating the supplementation of litigation with some of the strategies discussed below.

228. *Id.* at 187–88; *see also id.* at 194 (“The objective state of mind inquiry of tort recklessness maintains appropriate consistency between the Eighth Amendment, the Due Process Clause of the Fourteenth Amendment, and the doctrine of qualified immunity. Under the Eighth Amendment, convicted prisoners should receive the same degree of protection from assault and bear no greater burden in constitutional litigation than pre-trial detainees.”).

229. *See* Park, *supra* note 96, at 452–54.

230. *Id.* at 410 (citing Melvin Gutterman, *The Contours of Eighth Amendment Prison Jurisprudence: Conditions of Confinement*, 48 SMU L. REV. 373, 398 (1995); James P. Rosenzweig, *State Prison Conditions and the Eighth Amendment: What Standard for Reform Under Section 1983?*, 1987 U. CHI. LEGAL F. 411; Jeffrey D. Bukowski, Comment, *The Eighth Amendment and Original Intent: Applying the Prohibition Against Cruel and Unusual Punishments to Prison Deprivation Cases Is Not Beyond the Bounds of History and Precedent*, 99 DICK. L. REV. 419, 437 (1995); Diana L. Davis, Comment, *Deliberate Indifference: An “Unnecessary” Change?*, 29 HOUS. L. REV. 923, 950 (1992); Russell W. Gray, Note, *Wilson v. Seiter: Defining the Components of and Proposing a Direction for Eighth Amendment Prison Condition Law*, 41 AM. U. L. REV. 1339, 1386 (1992); Daniel Yves Hall, Note, *The Eighth Amendment, Prison Conditions, and Social Context*, 58 MO. L. REV. 207, 223 (1993)).

231. *Id.* at 414.

232. *Id.*

233. *Id.*

B. *Department of Corrections Policies and Criminal Justice Reform*

Recall that the *Vega* story began with a request from an educator to test her classroom for radon.²³⁴ When officials failed to extend the testing and mitigation to other parts of the facility, litigation ensued. But it could have played out much differently. The Department of Corrections could have responded comprehensively—testing for radon at that facility and changing their policies to prevent continued exposures throughout the system. Eventually, while that case was pending, the Connecticut Department of Corrections drafted and purportedly put into action an amendment to its directive on Life and Fire Safety, requiring correctional facilities to test for and remediate radon above 4.0 pCi/L.²³⁵ The litigants in *Vega* contend the policy is inadequate in scope and implementation. Imagine if, instead of serving officials with complaints, those affected individuals were meeting with officials to work together on an effective, comprehensive environmental health and safety policy. That alternate reality likely results in better outcomes for all involved.

Many jurisdictions now have the opportunity to choose a path of collaborative policy change instead of adversarial litigation. The precedent for a wave of deliberate indifference claims based on radon exposure exists. Notwithstanding the health and litigation risk, neither the Federal Bureau of Prisons nor any state, other than Connecticut, has a policy that explicitly addresses radon gas in indoor air at correctional facilities. Existing policies, if they address air pollution at all, tend to do so only in reference to compliance with the Clean Air Act and associated regulations.²³⁶ Even the Federal Bureau of Prisons' "National Environmental Protection Policy," which compares favorably to much less comprehensive state policies, includes an entire section on the Clean Air Act and permits required under it, yet makes no mention of indoor air quality, let alone radon specifically.²³⁷ The emphasis in correctional environmental protection policies on harm to the world outside the prison walls, and the ignorance towards the environmental harms inside them, is indicative of a systemic indifference towards the health and safety of incarcerated people. At least with respect to radon exposure, that indifference has risen to an unconstitutional level in many places. New policies, drafted with input from those exposed to the toxic substance, could provide the detection and mitigation that human health depends upon and the Constitution demands. Such a proactive approach

234. See Part IV.B, *supra*.

235. CONN. DEP'T OF CORRS., ADMINISTRATIVE DIRECTIVE 5.3, LIFE AND FIRE SAFETY (June 29, 2018).

236. See, e.g., FED. BUREAU OF PRISONS, NO. 1600.12.12, NATIONAL ENVIRONMENTAL PROTECTION POLICY (2017) (including a section devoted to "Clean Air Act" and none devoted to indoor air quality).

237. See *id.* at 23.

achieves the constitutional, humane result more efficiently, saving time, money, frustration, and lives.

Over the last decade, criminal justice reform has gained scholarly attention,²³⁸ popular media coverage,²³⁹ and legislative momentum.²⁴⁰ These efforts have largely focused on reducing the number of people our society incarcerates and the length of time it holds them for, increasingly emphasizing the disproportionate impact of the criminal justice system on racial and ethnic minorities.²⁴¹ One important component has been missing from these admirable and important efforts—an attempt to improve meaningfully the conditions of confinement. Scholars have begun to take notice of those concerns,²⁴² as have journalists in the midst of the COVID-19 pandemic, which hit our correctional institutions particularly hard.²⁴³

Future criminal justice reform efforts could, and should, begin to address the environmental hazards, including radon gas, imposed upon our incarcerated population. We subject these individuals to risks not tolerated elsewhere in society—with increased risk of lung cancer due to radon exposure chief among them. If the latest federal reform effort truly took the “first step” it proclaimed—reducing draconian prison sentences—the second step must address the unconstitutional environmental, and consequent public health, conditions in correctional institutions throughout the country. As reform efforts decrease the number of people in prisons, the racial disparity among those incarcerated remains.²⁴⁴ Ignoring the conditions facing those citizens thus not only perpe-

238. See, e.g., Citation Search Results for MICHELLE ALEXANDER, *THE NEW JIM CROW: MASS INCARCERATION IN THE AGE OF COLORBLINDNESS*, GOOGLE SCHOLAR <https://perma.cc/7ABB-XBTF> (returning a list of almost 10,000 citations to the seminal work since its publication a decade ago).

239. See, e.g., Search results for “criminal justice reform,” N.Y. TIMES ARCHIVE, <https://perma.cc/3USB-EGXF> (returning 937 articles from January 1, 2010, to March 1, 2021).

240. See, e.g., First Step Act of 2018, Pub. L. No. 115-391, 132 Stat. 5194 (2018); see also Andrea Craig Armstrong, *The Missing Link: Jail and Prison Conditions in Criminal Justice Reform*, 80 LA. L. REV. 1, 4 (2019) (“In the last few years, at both the state and national level, politicians have embraced criminal justice reform. Though the motivations may differ—economic costs, social impact, or concerns for basic human dignity and fairness—legislatures across the country are increasingly adopting laws reducing the number of people incarcerated.”).

241. See Introduction, *supra*.

242. See, e.g., Armstrong, *supra* note 240.

243. See *Pandemic in Prison*, LEGAL AID SOCIETY, <https://perma.cc/7WBC-V85U> (reporting a rate of infection within correctional facilities across the country multiple times that of the rate outside the walls); see also Timothy Williams & Danielle Ivory, *Chicago’s Jail Is Top U.S. Hot Spot as Virus Spreads Behind Bars*, N.Y. TIMES (Apr. 8, 2020), <https://perma.cc/5VRP-CGQ7> (“The jail in Chicago is now the nation’s largest-known source of coronavirus infections, according to data compiled by The New York Times, with more confirmed cases than the U.S.S. Theodore Roosevelt, a nursing home in Kirkland, Wash., or the cluster centered on New Rochelle, N.Y.”).

244. See Introduction, *supra*.

trates individual harms but also perpetuates systemic oppression. Meaningful criminal justice reform confronts, and begins to address, these environmental justice harms.

CONCLUSION

An incarcerated American underclass, disproportionately comprised of minority citizens, has been compelled to live in an unconstitutionally polluted environment. Exposure to radon gas in indoor air is just one example of that pollution. Fortunately, the legal effort to address that particular condition of confinement has already begun; the theoretical and practical discussion above strives to both highlight the importance of the issue and inform the doctrinal development. The Eighth Amendment precedent created on the specific issue of radon exposure will very likely control the courts' treatment of other environmental harms ignored by prison officials. Further work is needed to expose and analyze the risks presented by, among other things, the siting of correctional institutions on former hazardous waste sites, the pollution of drinking water at correctional institutions, and the failure to address other indoor air quality issues such as mold and infectious disease.²⁴⁵ In 2020, COVID-19 cast a spotlight on the unsafe, unhealthy conditions in our nation's prisons. As this work evidences, that deadly virus is by no means the only unreasonable risk imposed unconstitutionally upon the incarcerated; it, to date, has simply garnered the most publicity. When society punishes an individual for a crime, the Constitution prohibits that punishment from becoming "cruel and unusual." A term of imprisonment does not necessarily violate that mandate. Locking someone up with what amounts to poisonous gas is a different, and unconstitutional, story.

245. See, e.g., Helpie-Schmieder, *supra* note 173 (beginning the Eighth Amendment discussion on some of these topics).