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Why Is Coal Still Mined? Insights from Asbestos and the Structures of Risk Invisibilization

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The deleterious consequences of coal mining are well known, but little attention is paid to the most egregious of all: black lung disease. The 21st-century resurgence of black lung sheds light onto the persistent inability of regulations to address this problem. Despite this, voices seeking the fading out of coal mining based on health concerns are scarce. This paper examines why coal is still mined in the United States through a comparison with asbestos mining in Quebec, Canada, which ended in 2013 for similar health reasons. Drawing on archival research, I argue that the persistence of coal is the result of greater risk invisibilization. I rely on a structural approach to risk construction and highlight how macro-level factors shape the social construction of risks downstream. Three factors explain the unique trajectory of coal: labor's cooptation of black lung activism, the bottom-up formulation of the federal regulatory framework, and the concentration of health risks within mining communities. This paper specifies conditions under which certain regulatory issues can become visible and lead to reforms, while others remain on the margins of the political agenda.

> If the preventive provisions of the Federal coal mine health and safety act [...] are successful by 1980, no new cases of black lung disease will occur.
>
> –Charles River Associates, Inc. 1973.[1]

> Although the incidence of black lung disease has rebounded recently, I believe that, together with our continued commitment, we can reverse course. We can and must 'end black lung,' and move the vital work of coal-mining to a healthier, brighter future.
>
> –Robert C. Byrd, U.S. Senator for West Virginia, 2009.[2]

Introduction

Pollution from coal mining has deleterious effects on land, water, and air quality, and contributes to climate change. Coal mining is also dangerous, consistently ranking among the top ten occupations in days lost due to injury.[3] Every few years, the public is reminded of coal hazards by yet another mine disaster. Since the 1969 Federal Coal Mine Health and Safety Act (hereafter, the Coal Act), there have been 26 such disasters in the United States, for a total of 479 fatalities.[4] The severe environmental and human consequences of coal mining have galvanized advocacy for more potent regulations. These efforts have generally been successful, although some note that only under exceptional media scrutiny following disasters has the U.S. government been truly responsive (Wallace 1987; Smith 2020).

Even more devastating are the consequences of coal for miners' respiratory health. Coal workers' pneumoconiosis (CWP), commonly known as black lung disease, kills far more than mining disasters. CWP's prevalence has surged to alarming levels since

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[1] Charles River Associates, Inc. Jan. 1973. Report PB-223 668—"The Economic Impact of Public Policy on the Appalachian Coal Industry and the Regional Economy, Vol II: Impact of environmental and other policies on the Appalachian coal industry", for the Appalachian Regional Commission, p. 181., 1997ms282, Box 124, Folder 1866.

[2] Robert C. Byrd Congressional Office. "Byrd promotes black lung benefits for coal miners. Secures provision in Senate health care bill to aid widows of victims of black lung disease." December 3rd, 2009. https://arlweb.msha.gov/s&hinfo/blacklung/SupportStatements/U%20S%20%20Senator%20Robert%20C%20%20Byrd%20Promotes%20Black%20Lung%20Benefits.pdf. Accessed November 8th, 2024.

[3] Smith, Sean. 2013. "Injuries, illnesses, and fatal injuries in mining in 2010," *Beyond the Numbers*, vol 2., n°1, U.S. Bureau of Labor Statistics. https://www.bls.gov/opub/btn/volume-2/injuries-illnesses-and-fatal-injuries-in-mining-in-2010.htm. Accessed November 23rd, 2024.; U.S. Bureau of Labor Statistics. "Fact Sheet. Mining, Quarrying, and Oil and Gas Extraction," May 2019. https://www.bls.gov/iif/factsheets/mining-fact-sheet-2017.htm. Accessed November 23rd, 2024.

[4] Mine Safety and Health Administration. "Historical Data on Mine Disasters in the United States," https://arlweb.msha.gov/MSHAINFO/FactSheets/MSHAFCT8.htm. Accessed November 23rd, 2024.

the 1990s (Almberg et al. 2023), and between 1999 and 2016 alone, at least 4,334 U.S. miners died from the disease (Mazurek et al. 2018). To this day, one-tenth to one-fourth of long-term miners are affected by black lung. Beyond activist calls to "keeping it in the ground," there are few voices advocating for the phase-out of coal mining due to health concerns. Chowkwanyun (2022) suggests that, from the 1970s, coal mining risks have been evacuated from public discourse, replaced by an ever-growing consensus on the necessity of coal mining for achieving energy sovereignty. How did this consensus come about, and how is it sustained? *Why* is coal still mined?

Reasons for this might seem obvious. Coal has long been an essential building block of industrial development in the United States and elsewhere. In some regions, coal mining is a key source of economic output. Additionally, the coal industry has assembled a powerful lobbying apparatus that exerts national political influence against stringent regulations. These factors make it seem almost inevitable that coal mining has not faded out in the United States. However, other economically essential but hazardous industries backed by powerful lobbies have disappeared. Take the case of asbestos. Throughout the 20th century, asbestos was an economically essential resource with over 3,000 industrial applications. Like coal, its production was geographically concentrated, with the Canadian province of Quebec consistently accounting for more than half of world production (Van Horssen 2016, 7). As asbestos use became widespread, though, more and more research highlighted the toll it took on miners. Asbestosis (or white lung) and mesothelioma were then identified as major occupational risks. Like the coal industry, asbestos producers developed a powerful lobbying apparatus to defend their interests. Yet unlike the coal industry, after decades of controversy, asbestos mining was banned in Quebec in 2013.[5] The asbestos comparison challenges the explanatory power of economic factors, such as economic dependence, industrial policy, or corporate power, to explain the coal case.

In similar circumstances and under similar regulatory crises, why, then, did asbestos fade out in Quebec, while coal remained unchallenged in the United States? In this paper, I argue that coal risks in the United States became invisibilized to a greater extent than asbestos risks were in Quebec for three reasons. First, a different relationship between organized labor and health activist groups, one of confrontation in the asbestos case and one of cooptation in the coal case, contributed to divergent trajectories. The cooptation of black lung activism by labor in the coal case eventually led to marginalizing health-related grievances in favor of economistic concerns related to wages, pensions, and

[5] Today, not only has asbestos use been banned in many Western countries including Canada (2018) and the United States (2024), but corporations, governments, and other entities spend significant amounts on asbestos removal from built infrastructure.

welfare. Meanwhile, the confrontational attitude of labor toward health activism in the asbestos case enabled the emergence of a radical discourse within public health circles on the future of the asbestos industry. Second, the bottom-up formulation of the Coal Act paved the way for an enduring consensus around solutions to the black lung problem. The top-down formulation of asbestos policy in Quebec led, instead, to a persistent challenge to regulatory solutions. Third, the perception of coal risks as a local issue with little resonance beyond mining communities prevented it from reaching national salience. In the asbestos case, inversely, the eventual discovery of environmental health hazards of asbestos extended the realm of perceived risk beyond mining communities. As international anti-asbestos legislation spread, political elites in Quebec felt pressured to act.

This comparative study investigates the mechanisms that inhibit regulatory change to address health and environmental crises. I advance a novel argument about how macro-level factors shape the social construction of downstream risks. This allows me to specify conditions under which certain regulatory issues can become visible and lead to reforms, while others remain on the margins of the political agenda. Analytically, this paper explores new avenues in the study of risk by situating social construction in long-term, macro-level processes. Empirically, it challenges the mainstream understanding of labor as the primary force behind occupational health reforms, extends knowledge on the consequences of policies for mobilizations, and highlights the role of international pressures in conditioning domestic regulatory debates.

The paper proceeds as follows. I first detail the similarities between the U.S. coal and the Quebec asbestos cases. Next, I critically review economic explanations for cross-case divergence. After discussing methods and data, I introduce a theory of risk invisibilization that focuses on macro-level structures. I then delve into how three specific structures of risk invisibilization affected the coal and the asbestos trajectories. Finally, I discuss the challenges of making regulatory health and environmental problems visible.

Comparing Coal and Asbestos

Some could argue that U.S. coal and Quebec asbestos are not comparable due to fundamental differences in their health risks or political-economic trajectories. Against common assumptions, however, the gap between those cases is quite narrow. First and foremost, available evidence suggests that coal occupational diseases in the United States are found in similar rates to asbestos-induced diseases in Quebec. In the present era of black lung resurgence, 10% of all long-tenured coal miners in the United States have CWP, and that number surpasses 20% in Central Appalachia (Blackley, Halldin,

and Laney 2018).[6] Asbestosis rates among ex-Quebec miners was also in the 10 to 20% range per existing estimates at the turn of the century (De Guire and Provencher 2009). This parallel stands for the most severe ailment associated with these substances, as rates of progressive massive fibrosis among coal miners in Central Appalachia and rates of pleural mesothelioma among Quebec asbestos miners were both in the 5% range for the last available data points (De Guire 2003; Almberg et al. 2018).

Both materials also generate important risks for the broader population. Coal burning is a key driver of greenhouse gas emissions, thus contributing to the burden of environmental and health risks induced by climate change. Coal extraction significantly contributes to air pollution, water contamination, and land depletion in mining areas and beyond (Bell and York 2012). Emissions from coal power plants are also associated with detrimental environmental health outcomes, such as increased asthma rates among nearby residents (Cohen et al. 1972). Asbestos products in the home and the workplace, notably in the form of insulation, are a major health risk (Goldberg and Luce 2009; DeBono et al. 2021). Environmental exposure in communities near asbestos treatment facilities is found to increase the risk of mesothelioma (Tarrés et al. 2013; Ramos-Bonilla et al. 2019). The impact of asbestos mining residues on air, water, and land quality are less clear, but are nonetheless surveilled by the scientific community (Jacques and Pienitz 2022).

U.S. coal and Quebec asbestos also follow remarkably similar political-economic trajectories. In both the United States and Canada, the development of mining hubs shaped landscapes by spatially concentrating production in a few key mining areas. In the United States, the history of the Appalachian region is intimately tied to its position as the longest-standing underground coal mining hub. The region still accounts for a third of total U.S. coal production and about half of coal employment.[7] In Canada, asbestos mines were almost exclusively situated in the "Amiante region" in Quebec. The province consistently produced around half of the world's asbestos and, at its peak in the 1960s, accounted for around 80% of world production (Van Horssen 2016, 7).

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[6] The 21st century resurgence follows an all-time low in the 1990s. Nevertheless, over the past few decades, CWP rates were consistently above 10% in the United States and above 15% in Central Appalachia (Blackley et al. 2018). The difference between Central Appalachia and the rest of the United States is attributable to multiple factors but can be explained by the prevalence of underground mining in Appalachia, whereas surface mining is the most common method in other regions.

[7] U.S. Energy Information Agency. 2023. "Annual Coal Report, Table ES1. Coal Production, 1949–2022." https://www.eia.gov/coal/annual/pdf/acr.pdf. Accessed October 14th, 2023; Appalachian Regional Commission. 2023. Coal Production and Employment in Appalachia, 2023. https://www.arc.gov/report/coal-production-and-employment-in-appalachia-2023/. Accessed November 17th, 2023.

Moreover, in both nations, these industries were symbols and drivers of economic nationalism. In the United States, coal became associated with energy sovereignty and freedom from "foreign" fuels from the Cold War era onward. In Quebec, the 1949 asbestos strike played a fundamental part in springboarding the social transformation of French Canadian society that eventually grew into the Quiet Revolution (Trudeau 1970). Issues such as ownership of the mines became tied to the broader question of the autonomy and agency of the Québécois people. As the secessionist movement expanded in the 1970s, asbestos became perceived as both an economic lever and a symbol of political affirmation (Lévesque 2021). The nationalist connotations of both U.S. coal and Quebec asbestos strengthened sentiments of pride and belonging in mining communities (Bell and Braun 2010; Van Horssen 2016). In both cases, the political meanings and implications of these industries far surpassed their sheer economic importance.

Such parallels are echoed in similar paths to regulatory development. From the 1941 Mine Inspection Act, U.S. federal institutions have been in charge of the bulk of coal regulations. In Canada, provinces have preeminence over most aspects of mining regulations, from the allocation of land claims to occupational health. As a result, the federal trajectory of U.S. coal most closely mirrors the provincial trajectory of Quebec asbestos. Respectively, coal and asbestos mining have preceded and laid ground for the overarching occupational health and safety regulatory framework of the United States and Quebec. The 1969 Coal Act inspired the Occupational Safety and Health Act in 1970, which created two correlate agencies, the enforcing Occupational and Health Safety Administration (OSHA), and the expertise-making National Institute of Occupational Safety and Health (NIOSH). In Quebec, regulatory developments around asbestos mining and health in the mid-1970s led to the bill on occupational health and safety in 1979 and the creation of the *Commission de la santé et de la sécurité du travail* (Occupational Health and Safety Commission, or CSST), responsible for the bill's implementation. As a result, both are strategic cases for studying the broader development of regulatory health in the United States and Canada.

Limits to Economic Explanations

Given these parallels, one should expect similar outcomes in the U.S. coal and Quebec asbestos cases. However, while Quebec ceased asbestos mining in 2013, U.S. coal remains largely unchallenged on the basis of health concerns. Existing understandings of regulatory politics point to economic solutions to this puzzle. In this section, I review three of these explanations and underline their shortcomings in a comparative setting.

Economic dependence

Coal mining is a foundational building block of the U.S. economy and remains a sizeable source of employment and economic output in mining-heavy regions like Central Appalachia. Therefore, a common answer to why coal is still mined relies on economic dependence: market forces curtail the emergence of anti-coal discourse. Extant scholarship on occupational and environmental risk indeed looks to economic dependence as a determining factor in shaping the distribution of political power and policy outcomes. Research within the treadmill of production framework in environmental sociology advances the idea that economic concerns supersede regulatory projects when they are irreconcilable with the necessities of capitalist production (Jorgensen et al. 2023). The output of select industries is often prioritized over the health of at-risk communities (Lerner 2012).

Following this literature, one might identify economic dependence as the primary reason coal mining goes unchallenged on health grounds. This view, though, is severely limited given existing data, which support a diminishing role for coal in the U.S. economy. As shown in **Figure 1**, U.S. coal employment has trended down for the past eight decades. While technological advances explain some of the decrease occurring in the 1950s (Navarro 1983, 220), the ongoing downturn, which originates in the 1980s, is tied to a decrease in domestic demand. From 1990 to 2018, U.S. coal consumption decreased by 72%. In parallel, from 1980 to 2022, coal employment decreased by around 75%.

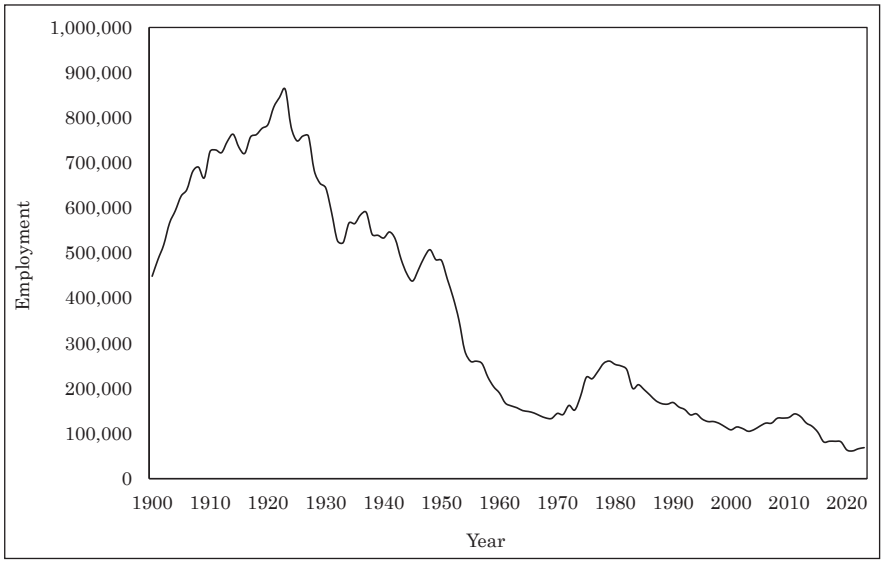

Figure 1: Employment in U.S. coal mining. Data: Mine Safety and Health Administration. 2021. "Coal Fatalities for 1900 Through 2023." https://arlweb.msha.gov/stats/centurystats/coalstats.asp. From 1973, employees include office workers.

Moreover, as shown in **Figure 2**, coal production has declined in the United States since the early 2010s, reaching pre-1970s levels by 2020. This decline is all the more telling given a concurrent uptick in global coal consumption.[8] The story of asbestos production is similar but reflects a different context—one of declining global demand. This industry's growth reached almost 300% between 1945 and 1973, then steeply declined from 1980 onward. The same goes for asbestos industry employment, which fell considerably in the same period (Van Horssen 2016, 77). The province of Quebec remained one of asbestos's largest producers and exporters into the 21st century (Virta 2006).

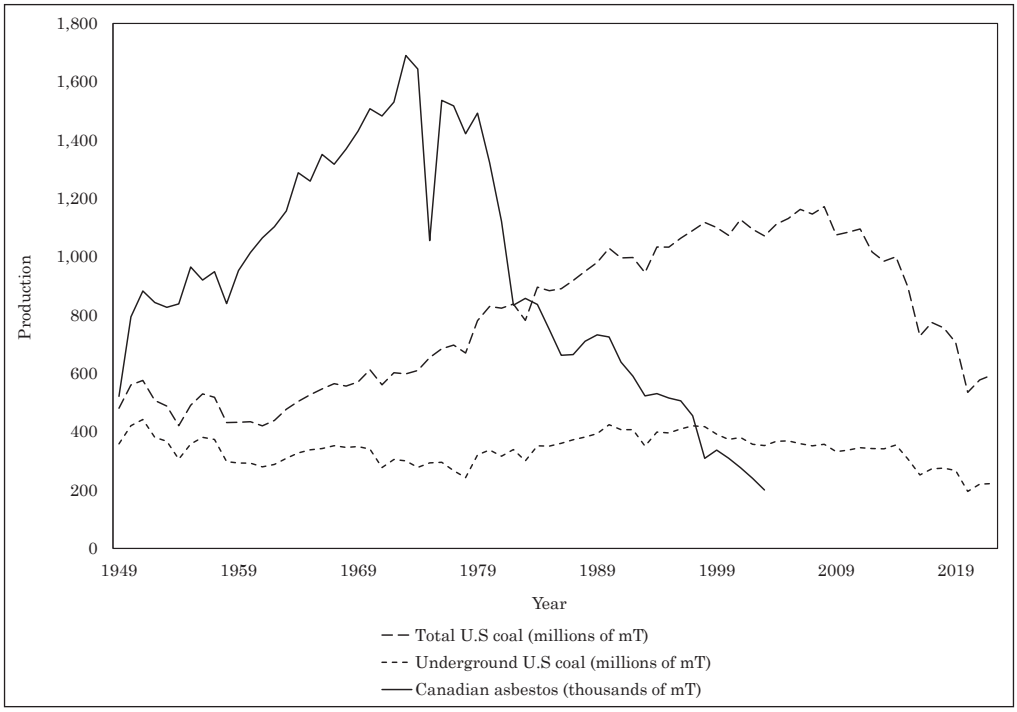

Figure 2: U.S. total and underground coal production, 1949–2022, and Canadian asbestos production, 1949–2003.
Coal data: U.S. Energy Information Agency. 2023. "Annual Coal Report, Table ES1. Coal Production, 1949–2022." https://www.eia.gov/coal/annual/pdf/acr.pdf. Asbestos data: Virta, Robert L. 2006. "Worldwide Asbestos Supply and Consumption Trends from 1900 through 2003." Circular 1298. U.S. Department of the Interior/U.S. Geological Survey. https://pubs.usgs.gov/circ/2006/1298/c1298.pdf.

[8] International Energy Agency. 2021. "World Coal Consumption, 1978–2020." https://www.iea.org/data-and-statistics/charts/world-coal-consumption-1978-2020. Accessed February 17th, 2022.

Coal's fall from prominence is also reflected at the regional level. As **Figure 3** suggests, Appalachian coal production experienced a stark downturn in the 21st century while sectors such as healthcare, services, and administration grew faster in this region than they did, on average, in the United States as a whole.[9] Over the past two decades, the coal industry has accounted for just about 1% of employment in Appalachia. Even in the Central Appalachian subregion, it only accounted for 3 to 4% of employment over that period.[10] In short, Appalachia is moving on from its legacy as a mining-dependent region.

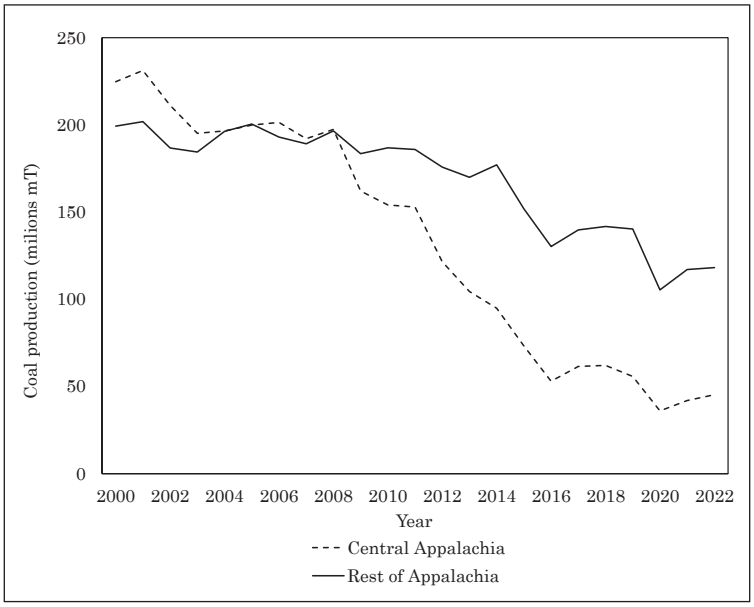

Figure 3: Appalachian coal production, 2000–2022. Data: Appalachian Regional Commission. 2023. "Coal Production and Employment in Appalachia, 2023." https://www.arc.gov/report/coal-production-and-employment-in-appalachia-2023/.

Overall, available evidence runs against mainstream understandings of coal as an immovable pillar of the United States and Appalachian economies. The transition away from coal is an already occurring process, its effects currently felt in mining-heavy counties.[11] The downturn of the Quebec asbestos industry in the 1980s gave way to

[9] Appalachian Regional Commission. 2020. "A Shift-Share Analysis of the Appalachian Region." https://www.arc.gov/report/a-shift-share-analysis-of-the-appalachian-region/. Accessed November 17th, 2023.

[10] Appalachian Regional Commission. 2019. "Industrial Make-Up of the Appalachian Region: Employment and Earnings, 2002–2017." https://www.arc.gov/report/industrial-make-up-of-the-appalachian-region-employment-and-earnings-2002-2017/. Accessed November 17th, 2023.

[11] Appalachian Regional Commission. 2021. "An Economic Analysis of Appalachian Power Industry Ecosystems." https://www.arc.gov/report/an-economic-analysis-of-appalachian-power-industry-ecosystems/. Accessed November 17th, 2023.

public challenges to its legitimacy due to rising health concerns. This forecasted the end of asbestos mining in the following decades. The same has not happened with coal in the United States.

Industrial policy

Market-based indicators can be questioned as an explanatory factor simply on the grounds that they might downplay the political causes of economic dependence. In both the coal and asbestos cases, a sole focus on market forces as the source of divergence obscures the fact that neither industry could have been sustained without major policy intervention. In the 1970s and 1980s, both sectors were shaken by economic instability, declining demand, and diminishing prospects. Key policies were proactively enacted to stabilize production and employment. While the global asbestos industry suffered a general decline with the judicialization of disease compensation in the United States from the 1970s (Jasanoff and Perese 2004), this decline was not reflected to the same extent in Quebec. Some U.S. companies that were involved in Canada, like the Johns-Mainville corporation, did file for bankruptcy, but others experienced more modest production slowdowns (Marier 2016). The Bell and Société Asbestos mines, for instance, suffered decline but were then nationalized by the Quebec government in 1980 and 1982.[12] These nationalizations formalized bonds between corporate and state interests, as reflected in the government's aggressive pro-asbestos strategy beginning in the mid-1980s (Lévesque 2021).

Meanwhile, with the rise of coal alternatives, especially oil and gas, international demand significantly declined from the 1960s. Governments in countries like Canada and the U.K. responded by moving away from coal and favoring alternative energy sources. The United States adopted the opposite strategy, instating a system of subsidies and advantageous tariffs that stabilized the industry through domestic coal consumption.

This strategy was embedded in the Federal Inland Energy Development Impact Assistance Act of 1977 and the National Energy Act of 1978. This legislation created incentives for the proliferation of coal-fired power plants as well as for state, municipal, corporate, and household selection of coal over other energy sources. As a result of these policies, more than 85% of today's U.S. coal production is consumed domestically. In addition, domestic coal consumption declines have been significantly delayed in the United States compared to the trends seen in other industrialized nations.[13]

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[12] Quebec Executive Council, Decisions 77–28, 77–171, 77–375, 77–441 (1977), BAnQ, E5 Fonds.

[13] U.S. Energy Information Administration. 2022. Coal Explained. Coal Imports and Exports. https://www.eia.gov/energy-

Despite their adoption of distinct strategies, i.e., through nationalization in Quebec and through favorable fiscal policy and deregulations in the United States, dependence on coal and asbestos crystallized not from sheer market forces but from political choices, too. In light of rising occupational health concerns from the 1970s, these sectors could have been faded out in favor of less-hazardous options. The question of why they weren't—why other interests were prioritized over health concerns—thus remains.

Corporate interference

Extant research on toxic substances regulation highlights corporate interference in political and scientific processes as the primary cause for inadequate regulations (Henry et al. 2021). In line with this argument, this literature discusses at length the historical role of coal operators in downplaying coal risks and undermining black lung awareness (Derickson 1998; Bodenhamer 2017). Other research shows that the coal industry operated sophisticated public relations campaigns to maintain support from mining communities (Gaventa 1982; Bell and York 2010; Shriver, Adams, and Messer 2014).

Still, the viability of corporate interference as an explanation for the U.S. coal trajectory depends on how it measures up to the asbestos counterfactual. In that regard, existing research suggests that corporate interference was just as strong in the asbestos case (McCulloch and Tweedale 2008). The asbestos industry specifically targeted scientific production on asbestos-induced diseases, which should have put them in a better position when concerns over asbestos risks arose. But King Coal's main lobbying priority in the second half of the 20th century was gaining competitive advantage vis-à-vis the oil, gas, and nuclear energy alternatives (Kahle 2019). This effort included anti-regulatory lobbying, but most of all pressure to obtain a stable and advantageous policy environment. In some cases, the coal industry was amenable to environmental or health regulations, if those regulations secured governmental support in return.

In the asbestos case, the primary goal of industry lobbying groups like the Quebec Asbestos Mining Association (QAMA) and, later on, civil society groups like the Pro-Amiante Chrysotile association, was to shape public discourse on asbestos risks. Major companies were aware of asbestos-related diseases starting in the 1930s, some 30 years before large epidemiological studies on the topic were first published in Canada.

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explained/coal/imports-and-exports.php. Accessed November 10th, 2023; International Energy Agency. 2021. "World Coal Consumption, 1978–2020." https://www.iea.org/data-and-statistics/charts/world-coal-consumption-1978-2020, Accessed November 6th, 2024.

They responded by deploying a well-organized coverup strategy, investing in health studies that contradicted existing research and bullying academic journals to limit the publication of compromising data throughout the 20th century (Kotelchuk 1989). In Quebec's mining regions, corporations extended this concealment strategy by impeding on the communication of health standards to their workers and by hiring company physicians who would not diagnose asbestosis (Van Horssen 2016, 51–64).

As Busemeyer and Thelen (2020) argue, relative degrees of corporate structural power should be understood as the outcomes of enabling or inhibiting institutional settings. Corporate power on environmental regulations should also be evaluated in relation to the "regulation triangle" that industry forms with states and other civil society actors (Rudel, Roberts, and Carmin 2011, 227). To understand why coal is still mined and asbestos is not, we need to identify factors that have allowed coal corporate strategies to continuously succeed, while similar asbestos industry efforts proved insufficient.

In sum, economic factors are ill-suited to explain why coal is still mined in the United States while asbestos mining was eventually faded out in Quebec. In both cases, economic dependence follows a similar path of rise and fall in the 20th century. Albeit through different means, both the U.S. and Quebec governments similarly intervened to keep demand afloat in times of economic slowdown. Last, the strength of coal corporate power in the United States was matched by health-targeted asbestos lobbying in Quebec. This leaves the task of explaining why these similar conditions led to distinct fates.

Methods and Data

In this paper, I contrast the trajectories of Quebec asbestos and U.S. coal. I focus on the Appalachian region, the center of both underground coal production and black lung, for the U.S. case. This allows me to better address the relationship between regional and national dynamics. I rely on a mechanistic comparison (Lange 2013, 101–4) to delineate causal pathways, or generative processes, paying specific attention to the factors that condition their likelihood in each case (Ermakoff 2019, 591). I deploy a most-similar comparative strategy to investigate what led to cross-case divergence, accounting for factors that are broadly conducive to divergence, such as fundamental political-economic differences. The analysis is grounded upon a nominal strategy, wherein I extract key characteristics from each case that I can qualify through case matching or contrasting. This strategy yields the most explanatory power when, as I do here, one attempts to isolate a few causal factors for theory-building purposes (Mahoney 1999,

1157–60). From the analysis of those characteristics, I identify mechanisms through which cases have diverged over time. Because temporally ordered factors mattered, I also rely on narrative analysis.

I collected archival data in the United States and Canada and used case-specific historiography as a complement. I began collecting data on the asbestos case in 2019 and conducted subsequent archival visits in the United States and Quebec in 2023 and 2024. Archival sources include local and national newsclips, private correspondence, notes and briefs, meeting minutes, finances and newsletters, governmental reports, corporate documents, and technical briefs. In total, I surveyed approximately 30,000 pages of documents located in six archival sites as well as online. I focused on records related to the evolving relationships between local mining communities and corporations; unions, corporations, policymakers, and public administrations; and activist groups and unions. The Appendix reports on my archival sources.

Why are Risks Invisibilized?

The occupational health risks of coal and asbestos have both been invisible in the 20th century. However, in this paper, I argue that the structural factors that enabled invisibility of risks in the coal case were sustained throughout the controversy, while they eventually broke down in the asbestos case. If greater risk invisibilization in the U.S. coal case explains its divergence from the Quebec asbestos case, then how can we theorize contrasting degrees of invisibilization? Risk, defined as the "likelihood or possibility of a future, typically negative, outcome" (DeSoucey and Waggoner 2022, 53), has drawn sizeable attention from social scientists in recent decades. Early scholarship on risk offers a realist perspective, chiefly concerned with the role of technical experts in measuring and mitigating risk (Mendeloff 1979; Douglas and Wildavsky 1982; Harrison and Hoberg 1994). These works advance our understanding of the role knowledge plays in the regulation of risk, but obscure the facts that both risk assessment and risk management are conducted under considerable uncertainty (Murphy 2006; Brown 2007) and that they thereby reflect political and economic considerations just as much as scientific ones (Habermas 1990; Corn 1992; Castleman and Ziem 1994; Irwin et al. 1997; Rosner and Markowitz 2006, Appendix).

In response to these works, the bulk of sociological work on risk has built on constructionist approaches to uncover the relationship between technical assessments, risk perceptions, and social change (Tierney 1999). This attention helps to "unmask appearances of objectivity" in risk regulations (Clarke and Short 1993, 380). There is fair heterogeneity in these approaches (Lupton 2013, 41–48), with some scholars drawing

on the risk society thesis (Beck 1992; Alario and Freudenburg 2003; Cable, Shriver, and Mix 2008), others on governmentality perspectives (Lupton 1995; Petersen 1997; Rose 2001), and yet others emphasizing cultural and cognitive aspects (Tulloch 2008). Recent research builds more forcefully on the latter and highlights that risk construction is the result of micro-level negotiations (Urena 2022), that it mirrors meso-level conflict (Auyero, Hernandez, and Stitt 2019), and that it is framed differently depending on contexts of exposure (DeSoucey and Waggoner 2022). These works conceptualize social construction processes from the bottom-up, showing how interactions between individuals and groups, often within affected communities (Auyero and Swistun 2008; Hart 2023), lead to the consolidation of shared risk perceptions.

While they solve issues with the realist framework, current works in the constructionist vein run into a counterfactual problem; they delineate pathways through which risk perceptions consolidate, but fall short of explaining why certain constructions emerge instead of others (see Eyal 2013, 867). In the study of risk, extant scholarship does not sufficiently probe the mechanisms that influence the selection of constructions, nor potential shifts between them. In this study, it is insufficient to explain the divergence in trajectories by arguing that coal in the United States has been constructed as less dangerous than asbestos in Quebec. Rather, the analysis must focus on what led to different ideas about risk over the long term (see Krippner 2023) and specify the key power dynamics driving risk construction (Clarke and Short 1993, 381). To achieve this, I depart from bottom-up constructionist frameworks that view risk perceptions as the result of micro-level processes. I instead opt for a top-down view of construction processes, through which I investigate the macro-level processes that shape downstream possibilities.

Risk invisibilization

The puzzle of why certain health risks become visible while others remain invisible is inescapably connected to the recognition of issues in the public sphere, to the underlying dynamics of *issue salience* (Hilgartner and Bosk 1988). When unremedied risks are publicly salient, they are more likely to lead to regulatory reform. Inversely, when risks are evacuated from the public sphere, reforms become less likely. Issue invisibilization, or the process through which the general public and those primarily concerned by an issue believe it to be solved or contained (Vogel 2012, 224; Henry 2017), is thus my focal point for solving this paper's core puzzle. Disease as a form of risk is subject to the interplay between visibility and invisibility in the public sphere (Armstrong, Carpenter, and Hojnacki 2006; Best 2012). In the case of occupational diseases, salience is an even more prominent concern because few people are affected, and they are affected in ways

that are stratified along other social determinants of health. As Markowitz and Rosner (2013, 22) note, in the 20th century, "occupational health issues were exactly that: problems borne by the workforce but no threat to the public at large."

Previous scholarship on risk invisibility shows that the practices of political and scientific elites foster regimes of invisibility (Henry 2017) and that the complexity and uncertainty of risks may render them imperceptible to regulators (Murphy 2006; Wylie 2018). This scholarship explains what invisibilization looks like and what policy outcomes it leads to, but falls short of explaining why it emerges. One solution to this problem comes from scholarship on "agnotology," which examines ignorance production processes (Proctor and Schiebinger 2008). In this literature, the production of unknowns rests on strategic action by powerful actors, most notably corporations (Pinto 2017, 55–56; McGoey 2019), to interfere in knowledge accumulation. In the field of toxics, corporate attempts at producing ignorance about the risks of their products are well documented (Michaels 2008, 2020; Oreskes and Conway 2011; Henry et al. 2021). These attempts at deception have included lobbying behind closed doors to prevent governmental scrutiny (Aguiton et al. 2021), but also public-facing strategies to promote products and anticipate public relations crises (Markowitz and Rosner 2013).

The agnotology literature focuses on intentional production of ignorance by corporate actors, as well as on the institutional incentives that foster such behavior (Richter, Cordner, and Brown 2021, 633). Although the underlying "passive" processes through which ignorance emerges are a foundational concern in this literature (Proctor 2008, 6–9), most scholarship focuses narrowly on the strategic actions of corporations and states. In doing so, recent literature has overlooked the conditions that enable invisibility to emerge (Croissant 2014; Girel 2023). Yet, the "labor of confusion" (Auyero and Swistun 2008) performed by corporate and state actors needs a favorable context to be fruitful. In addition to highlighting active strategies to produce ignorance, then, "passive" mechanisms that enable them ought to be specified (Crockford 2023).

I approach this problem from a structural perspective. In their history of silicosis, Rosner and Markowitz (2006) show how ties between states and industries create and reproduce obstacles to the visibility of mining hazards. Boudia et al. (2022) and Henry (2011), for their part, underscore how bureaucratization of health problems linked to exposure to toxic substances in industrialized societies constructs an apparatus and language that systematically obscures risks. Following these insights, I examine specific structures of invisibilization and show why they crystallized in the coal case while eventually breaking down in the asbestos case. I outline three such structures: the relationship between labor and health activism, the technocratic process through

which regulatory problems were solved, and the perceived scale of risks. An analytical focus on these structural mechanisms allows me to contextualize state and corporate efforts to produce ignorance and identify barriers to overcoming risk invisibilization.

Labor and environmental health

First, I argue that the decisive feature of the relationship between labor and environmental health activism is the extent to which activists are able to integrate the labor movement and the extent to which unions consistently incorporate activists' views. I highlight a paradox in the relationship between the two, wherein collaboration leads to labor's cooptation of health activist groups. This is a substantial benefit for activist groups, as it increases their access to decision-making spheres, but only so long as labor takes interest in the issue. I show that the cooptation of the Black Lung Association (BLA) by the United Mine Workers of America (UMWA) eventually marginalized the issue of health in favor of economistic concerns.

Research on the role of social movements in advancing regulatory reforms is torn between an emphasis on labor (Rosner and Markowitz 1989; Corn 1992) or on health advocacy (Brown and Ferguson 1995; Epstein 2008; Best 2012) as the primary disruptive force. I take both claims seriously and examine the undertheorized relationship between labor and social movements in environmental health (Pellow and Brehm 2013, 243). Previous scholarship finds that labor and environmental movements, or "blue-green coalitions," cooperate when they identify common goals and bridge cultural differences within favorable political opportunity structures (Mayer 2009; Obach 2004). In addressing occupational and environmental health, these accounts overlook the unequal distribution of power between labor and other social movements and how it shapes their relationship. For instance, unions generally have greater resources and access to legislators and regulators, and they are more institutionalized organizations than are environmental health activist groups. Yet, the relationship labor entertains with health concerns involves a necessary trade-off with other, more immediate concerns. Job security, social benefits, and safety are key worker grievances, and their prioritization in the hierarchy of union grievances may hinder the expression of health concerns. Meanwhile, health activists are not necessarily affected by the built-in tension between health and more immediate concerns, but their limited resources may lead them to seek alliances with labor, even if that means sacrificing part of their autonomy. I assess how the changing priorities and preferences of labor punctuates its relationship with activists to shape the (in)visibility of risks in public discourse.

Technocratic solutions

Second, I argue that when technocratic solutions to regulatory problems are developed from the bottom-up, they are more likely to build consensus. When they are imposed

from the top-down, they are more likely to be contested. The bottom-up formulation of the 1969 Coal Act paved the way for an enduring consensus around technocratic solutions to the black lung problem, which was fed by the continued belief in the adequacy of the Coal Act's framework. Meanwhile, the top-down formulation of asbestos policy in Quebec led to a persistent challenge of regulatory solutions to asbestos-induced diseases.

Over the 20th century, risks have increasingly been managed by expert bureaucracies or other technocratic means (Demortain 2020). The technocratization of decision-making encloses risk management in the field of regulatory science and leads to the capture of regulation-making by public agencies (Elliott and Frickel 2015, 1746). Technocratic tools can thus systematically obscure health problems ensuing from toxic substance exposure by creating a political "dynamic of inaction" (Boudia et al. 2022, 5–13). In occupational health, this commonly includes setting exposure standards or establishing risk surveillance procedures. Technocratization deeply affects possibilities for regulatory reform. On the one hand, it mediates political conflict such that contentious issues appear to be rationally solved. This fuels risk invisibilization by locating the implementation and evaluation of technocratic tools in bureaucratic instances and out of the public's sight. On the other hand, technocratization contains legitimacy crises faced by states through the appearance that regulatory problems are solved. Overall, as I will detail, the success of technocratic solutions in securing legitimacy is bound to their ability to garner widespread support.

Perceived scale of risks

Third, I argue that the perceived scale of risks leads to divergent trajectories when diseases become more or less salient in the public sphere. In the asbestos case, the eventual discovery of environmental risks extended the realm of perceived threats beyond mining communities. This discovery, coupled with pressures from anti-asbestos legislation elsewhere, enhanced the visibility of asbestos-induced diseases in Quebec. Meanwhile, in the coal case, health risks continued to be perceived as locally concentrated, enabling the continued invisibilization of the black lung problem.

Medical sociologists have argued that the extent to which a disease is perceived to be widespread bolsters public awareness (Lantz and Booth 1998; Adelman and Verbrugge 2000). In parallel, environmental sociologists have argued that the spatial concentration of risk explains discrepancies between the prominence of problems at the local level and the absence of policies to address them at higher levels of policymaking (Hess 2007, 93–94; Kinchy 2014). These complementary insights suggest that the unequal geographic distribution of risks is likely to inhibit the visibility of diseases beyond the regions most affected. The extent to which risks are locally embedded structurally determines attempts at raising public awareness and enacting policy

change. Emergent knowledge on risks for non-workers (Holzman 2011) can, in that sense, alter the perceived scale of risks.

Moreover, the enactment of stricter regulations in neighboring or partner states can enhance the salience and credibility of domestic pressures to enact change (Harrison 1995, 38). Elite resistance to change might also be curbed by perceived pressures from other actors on the international stage. When the imperative to maintain legitimacy in front of the "world audience" becomes important to domestic elites—namely, to the preservation of their commercial and economic interests—activists can gain political leverage (Skrentny 1998, 251–55). I assess how these national and international pressures contributed to breaking down invisibilization in the asbestos case but were unable to do so in the coal case. In the remainder of the paper, I compare how these three structures of risk invisibilization played out in the U.S. coal and Quebec asbestos regulatory trajectories.

Health Activist Cooptation and Decline

Economistic grievances—those related to wages, pensions, and welfare—are historically at the forefront of union demands in both cases. Thus health risks were often a peripheral element in labor discourse. Yet, from the 1980s, concerns over worker exposition to asbestos dust became salient in Quebec, while exposure to coal dust faded from public discourse in the United States. What, if not a distinct hierarchy of labor grievances, accounts for this divergence? As suggested in **Figure 4**, this was the by-product of a different relationship between organized labor and health activist groups, one of cooptation in the coal case and one of confrontation in the asbestos case.

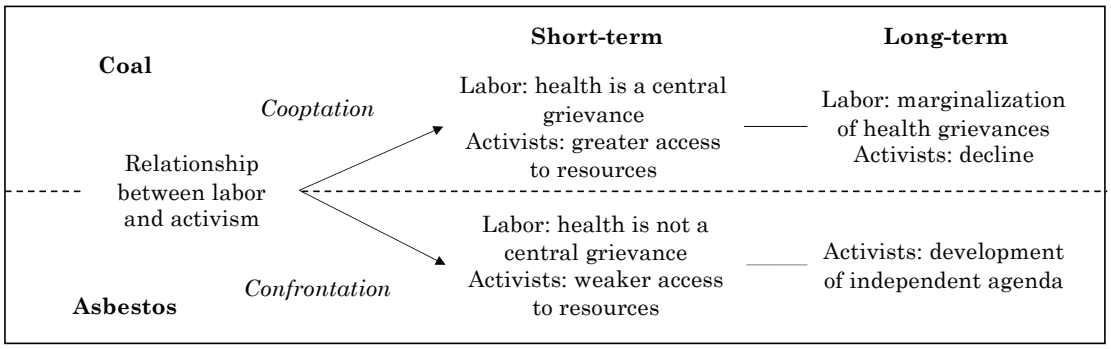

Figure 4: Short- and long-term outcomes of different relationships between health activists and labor.

Coal: Cooptation of health activism

The United Mine Workers of America (UMWA) is bound to a legacy of economism that was built off wage and pension gains during John L. Lewis's tenure as president (1920–1960).[14] Two issues historically complicated the UMWA's relationship with black lung. First, whereas healthcare is nationalized in Canada, projects of national health insurance never succeeded in the United States (see Maioni 1997). This gap in welfare coverage was consequential for labor strategy. From the 1940s, the UMWA dedicated important resources to developing a company-funded health insurance program and succeeded in establishing the Welfare and Retirement Fund as part of the 1943 collective bargaining agreement. Industry-funded hospitals in Appalachia were also established in 1956 as part of an effort to provide healthcare in underserved areas.[15] Second, union concern over mine safety historically centered on the risks tied to explosions, not on respirable dust. Federal and state administrations have collected data on mining disasters in the United States since 1839. Of the 726 disasters reported, 86% are attributable to coal mines.[16] Overall, efforts around mine explosions and healthcare hindered the ability of black lung concerns to become a central union grievance.

Health activism around coal dust was born in Appalachia and was mainly organized around the activist group Black Lung Association (BLA). Its membership was diverse and included individuals from academia, local government, the media, charities, healthcare, and religious organizations. It also gained an "uncharacteristic support" from UMWA members compared to other similar occupational health activist groups (Fox and Stone 1980, 52). In the late 1960s, despite being led by only a handful of organizers (Judkins 1986, 80), efforts by local BLA chapters led to tremendous regulatory gains in mining states and drew national attention in the run-up to the 1969 Coal Act. By 1971, the BLA had almost 20 local chapters in Appalachia (Nyden 2009, 473). Early on, it was independent from the UMWA, to the point that central union officials reportedly did not engage at all with the Association.[17] Indeed, central UMWA leadership opposed mobilizations for state-level black lung compensation laws in 1968 and 1969 (Derickson 1998, 143–61). The union's lack of involvement regarding health

[14] Lewis was preoccupied by the prospect of job losses in the coal industry that resulted from instable coal demand. Oral history interview with Frances Perkins, 1955, Columbia University Libraries, Digital Collections, p. 403, 463. https://dlc.library.columbia.edu/catalog/cul:3xsj3txc7v. Accessed January 20th, 2023.

[15] 1985UA020, Case 12–306; BCA 0253, Box 52, Folders 10–12.

[16] National Institute for Occupational Safety & Health (NIOSH). 2024. "Mining Disasters: 1839 to Present." https://wwwn.cdc.gov/NIOSH-Mining/MMWC/MineDisasters/Table. Accessed November 10th, 2024.

[17] Derickson, Alan. Lorin Kerr: Oral history interview on coal miners' respiratory diseases. Personal interview 1990, NIOSHTIC No. 20048465, p. 54. Retrieved on February 17th, 2023 by email request at the NIOSHTIC publication service.

risks was harshly criticized by the BLA and other activists.[18] In its infancy, then, one of the BLA's central battles was against the UMWA.

After Arnold Miller's election as UMWA president in 1972, however, central leadership drastically shifted its stance on black lung. As the candidate of the Miners for Democracy reform movement and an ex-BLA organizer in West Virginia, Miller created favorable conditions for the expression of health concerns within the union. From that point on, BLA-affiliated miners were able to influence UMWA's agenda by proposing policies at national conventions under a new, more democratic union organization. The integration of BLA proposals and actions into mainstream UMWA activities led to the institutionalization of a distinctive black lung agenda within the union.[19] In 1972, this new UMWA-BLA coalition gained a seat at the table to help design the Black Lung Benefits amendments led by the U.S. Department of Health, Education and Welfare. These amendments, as eventually implemented, drew from the position of the BLA, notably by liberalizing eligibility requirements and providing measures to ensure inter-generational equality between members.[20]

In the early 1970s, the BLA was incrementally coopted by the UMWA. By 1973, the UMWA had become the BLA's primary funder, replacing grassroots Appalachian organizations like the Council of Southern Mountains in that role. In return, black lung became a core legislative concern of the UMWA's political action committee (UMWA-COMPAC).[21] The union was vocal in the struggle for the passage of the federal H.B. 3333 in 1975–1976, which would have automatically entitled miners to black lung benefits after a career in the mines. When the bill was killed in the Senate in 1976, the UMWA subsequently threw itself into the struggle for the 1977 Black Lung Benefits amendments. Although less ambitious than H.B. 3333, these amendments transformed the management of compensation, most notably by creating a compensation program partially funded by industry for ex-miners affected by the disease. These legislative fights were, at every step, informed by the expertise of the BLA. Virtually complete cooptation was achieved around 1979, with archival evidence suggesting that BLA's independent organizing had become marginal: membership was union-based,

[18] BCA 0253, Box 50, Folder 1. Derickson (1998:143–61) notes a major tension between the national UMWA leadership, generally unresponsive to concerns over black lung, and an increasing number of local officials that mobilized to make black lung a key labor grievance.

[19] A tension nonetheless persisted between Miller and other central union officials on that issue during his tenure as president. BCA 0101 SAA 101, Series IV, Box 219, Folder 2.

[20] BCA 0101 SAA 101, Series IV, Box 213, Folder 17.

[21] For example, the Association's literature, in the form of handbooks and pamphlets, started to be used as official union literature for widespread diffusion. BCA 0253, Box 70, Folder 09; BCA 0101 SAA 101, Series IV, Box 146, Folder 4.

meetings were tied to those of the UMWA, and the BLA had lost a strong associational life of its own.

UMWA-BLA activism culminated in the protest against the 1981 Black Lung Benefits amendments of the Reagan Administration; these reduced governmental funding for the compensation program, increased black lung-directed taxes on coal producers, and established targets for reducing the share of approved benefit claims. The Reagan Administration successfully took advantage of a program viewed by fiscal conservatives as plagued by scandals over fraud and overpayments, and an automatic pension plan to miners and their families.[22] The passage of this reform was an emphatic defeat for UMWA-BLA mobilization. From there, mobilization around the black lung issue progressively faded, and the BLA lost its distinctive voice inside the union. Black lung never reemerged as a central issue for labor mobilization on the national stage. Local BLA chapters were dismantled throughout the 1980s, and attempts at their revival in the 1990s failed.[23] By the late 1990s, a National Black Lung Association remained, but its meetings were sparse at best, and its action was restricted to logistical (e.g., helping disability claimants) rather than political terrain.[24]

Asbestos: Confrontation of health activism

During the 1949 asbestos miners' strike, grievances related to dust levels and exposure were put aside by unions to maximize their chance of gaining the Rand formula, a mechanism for compulsory unions dues and higher wages. Unions succeeded in obtaining the former, but were unable to make significant progress on the latter (David 1969; Van Horssen 2016, 90). Their commitment to economism is thus not explained by a legacy of successive victories like in the UMWA case, but by one of defeat.

Unions briefly engaged in pro-regulatory action in the 1970s. In 1971, the new research service of the *Confédération des syndicats nationaux* (CSN) took on the question of miners' health. This interest materialized in 1974 around a research project undertaken in close conjunction with renowned Mount Sinai researcher Irving Selikoff and his team. The publication of their study's early results cast a shadow over existing safety practices and drew widespread attention to asbestos diseases.[25] The 1975 miners'

[22] BCA 0253, Box 51, Folders 7–9.

[23] Many saw the demise of the BLA as unproblematic. For instance, John Rosenberg at the Appalachian Research and Defense Fund then underlined that the strength of compensation programs made BLA activism less relevant at the time. See Mountain Eagle, May 29th, 1991. BCA 0253, Box 50, Folder 8.

[24] The UMWA had become more preoccupied by preserving existing gains than lobbying for new ones. BCA 0253, Box 50, Folder 09; Box 51, Folder 13.

[25] Rodrigue, Norbert. "L'amiante ou quosse ça donne 25 ans après," CSN, June 1976, 16 p. Private archives of Micheline Marier.

strike provided another opportunity to make health and safety in the industry more salient. The sheer magnitude of this strike, which involved more than 3,000 miners from the CSN and the FTQ-Métallos unions (that is, about half of the entire asbestos workforce) and lasted 7 months (Marier 2016, 59–60), succeeded in making asbestos exposure a key industrial health problem in Quebec—one that begged for state involvement. Media reports on the inadequacies of asbestos regulations increased, and political parties came under pressure to take a clear stance on the issue.[26] Nonetheless, throughout the strike, there was a tension between the CSN and the other two asbestos unions, the FTQ-Métallos and the *Centrale des syndicats démocratiques* (CSD), over the soundness of focusing on health. While the CSN had been working on that front for several years, the other unions had considered wages the most critical issue of the strike.[27] In its aftermath, unions moved back to an economistic focus and distanced themselves from health critiques of the asbestos industry.

In the 1980s and 1990s, unions drifted even further from health activism as they showed support to the increasingly scrutinized asbestos industry. As a result of labor's approach, health activists were forced to organize independently. Local regional women's groups such as the *Comité de femmes d'appui aux mineurs de Thetford Mines* (1975–1979), *Regroupement des femmes dont les maris sont décédés d'accident du travail ou de maladies professionnelles* (1979–1997), and the *Association des veuves des victimes d'amiantose et d'accidents de travail* (mid-1980s) emerged. In the long term, however, these groups were unable to maintain a strong political presence and eventually split up.[28] From the 1990s, new groups like Mining Watch and Ban Asbestos were able to gather support across Canada. These groups were better able to institutionalize, despite lacking support from the asbestos unions.[29]

In 1998, the newly created *Institut national de santé publique du Québec* (INSPQ), an independent expert agency funded by the state, became a central vehicle for the

[26] Whereas media reports on asbestos risks in previous years were mostly confined to mining regions, reports started to emerge in national French media. The Liberal Party, in power at the time, took a conciliatory approach where it sought to balance industry and labor demand. Le Citoyen. "L'amiante en '73. Revue de presse," and "L'amiante en '74. Revue de presse". UQAM Governmental publications.

[27] In internal communications, FTQ-Métallos officials note that the union's absence of any direction or policy related to asbestos diseases is a problem. See Émile Boudreau, Letter to Fernand Daoust et al., June 14th, 1975. Private archives of Micheline Marier.

[28] For example, the *Comité de femmes d'appui aux mineurs de Thetford Mines* overcame opposition and exclusion from asbestos union meetings and became an influential voice for more stringent regulations during the 1975 strike, but failed to sustain resources, membership and political presence in its aftermath. It was dissolved in January 1979, after having held no meeting for over a year. Centre d'archives de la région de Thetford MRC, P188, Box 1. Folders: Procès-verbaux, Relations extérieures.

[29] Private archives of Micheline Marier.

sharing and diffusion of knowledge on asbestos risks. It especially was able to do so after the publication of a report on the presence of asbestos in schools by the *Institut de recherche Robert-Sauvé en santé et en sécurité du travail* in 2000.[30] In December 2001, the INSPQ conveyed a conference on asbestos exposure in Montreal, providing a platform for coalition-building among academics, public health officers, public administrators, and some media outlets. A parallel opportunity for coalition-building, this time among activists and concerned citizens, emerged at the International Ban Asbestos conference in Ottawa in 2003. That same year, the Asbestos Victims Association of Quebec (AVAQ) was founded. In the early 2000s, members of the AVAQ conducted a citizen-led study on the presence of asbestos dust in homes in the mining town of Thetford Mines, the results of which painted a dire picture (Marier et al. 2007).[31]

Around the turn of the century, media reports on asbestos risks in the workplace and in the environment dramatically increased, and interventions from public health experts and physicians against asbestos mining became commonplace. When, in 2011, the Liberal government of Quebec promised a CAD $58 million investment for the renewal of the asbestos industry at the Jeffrey Mine, it was met with firm opposition from lay and expert organizations.[32] This time around, even the CSN was against it, as most of its unionized mines had already been closed (Marier 2016, 137–38). These loosely coalesced groups mobilized once again on the Canadian legislation to ban asbestos use in 2018. In the end, most anti-asbestos health activism in Quebec unfolded independently from—even in opposition to—labor organizing.

The autonomy-effectiveness trade-off

Both BLA's rise to prominence during the 1970s and its downfall in the 1980s are attributable to its close relationship with the UMWA. From the 1970s, and especially from the inauguration of the Carter Administration in 1977, conditions were favorable to the advancement of occupational health. In that short period, because of its inclusion

[30] Dion, Chantal. "Évaluation de la concentration de fibres d'amiante émises dans l'air ambiant de bâtiments scolaires." Institut de recherche Robert-Sauvé en santé et en sécurité du travail, Montréal, IRSST, 2000. https://www.irsst.qc.ca/media/documents/PubIRSST/R-256.pdf. Accessed May 4th, 2024.

[31] Private archives of the *Association des victimes de l'amiante du Québec*.

[32] Bourgault, Marie-Hélène, and Denis Belleville. 2010. "Présence de fibres d'amiante dans l'air intérieur et extérieur de la Ville de Thetford Mines: estimation des risques de cancer du poumon et de mésothéliome." Institut national de santé publique du Québec. https://www.inspq.qc.ca/sites/default/files/publications/1225_risqueamianterapp_maj-sept2010.pdf.

Frank, Arthur L., A. Lemen, and al. 2011. "Lettre urgente à Charles Bernard." Notebaert, Éric, Fernand Turcotte, and al. 2011. https://meteopolitique.com/Fiches/mine/amiante/Complicite/Amiante-arthur-l-frank-lettre.pdf.;

"Lettre adressée à Charles Bernard." https://meteopolitique.com/Fiches/mine/amiante/Medecin/Amiante_Quebec-refuse-d-entendre-les-medecins.html. Accessed June 21st, 2023.

within the UMWA's political activities, the BLA secured a degree of policy influence unrivaled by health activist organizations in the Quebec asbestos case.

The story changed in the late 1970s, a period characterized by rising uncertainty for the coal industry. The UMWA helped further the Inland Energy Development Impact Assistance Act of 1977 and the National Energy Act of 1978, which, respectively, included fiscal and regulatory incentives to increase domestic coal demand and reduce competition from foreign oil. The UMWA Trumka leadership (1982–1995) responded to uncertainty in the coal industry by emphasizing job security and retirement provisions. The UMWA by then framed its approach to contract bargaining as a display of its new "pragmatic" and "cooperative" approach to industrial relations.[33] There was ever-less room for the expression of non-economistic grievances, and the BLA eventually faded out.

Ultimately, from an ideational standpoint, the BLA's lack of autonomy hindered its ability to develop an ambitious program when its goals undermined labor priorities. In the asbestos case, civic and expert associations became convinced that asbestos should not be mined anymore in Quebec, but the BLA was never in a position to transcend the UMWA's focus on economistic grievances in the coal case.

Bottom-Up Technocratic Solutions

The development of technocratic solutions to manage occupational disease contributed to risk invisibilization in both cases. These solutions were developed at moments when state action on occupational health was perceived as insufficient. Yet, the use of technocratic solutions did not resorb the political crisis to the same extent in the Quebec asbestos case as it did in the U.S. coal case. What accounts for the difference? As suggested in **Figure 5**, it depended on the degree of consensus that these solutions were able to achieve. Early black lung policies were initiated from the bottom-up and built consensus that furthered invisibilization, while the top-down passage of asbestos policies laid the ground for continued contestation. This fueled more stable technocratization in the coal case than in the asbestos case. As a result, technocratic solutions were self-sustaining in the former case while they needed to be actively legitimated by industry and the state in the latter.

[33] Faced with an important decrease in coal employment in the 1980s, a key focus of the UMWA from the Trumka leadership was to ensure that unionized laid-off workers would have priority over new mining jobs. BCA 0253, Box 75, Folder 9. In that period, there is only sparse evidence of local opposition to proposed UMWA contracts by miners. This suggests that the rank-and-file aligned with the central leadership's prioritization of economistic grievances. BCA 0253, Box 54, Folder 02; BCA 0253, Box 69, Folders 2–5.

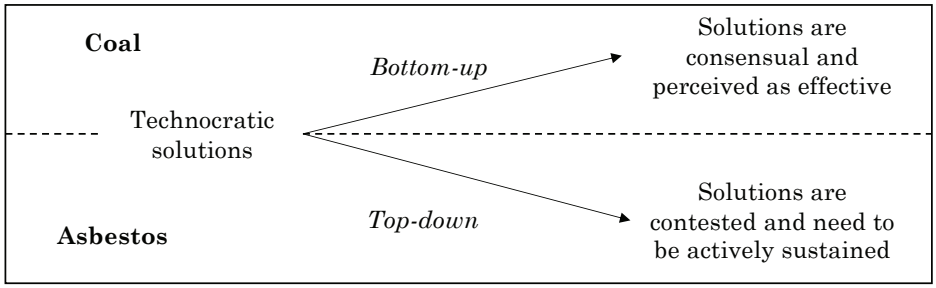

Figure 5: Outcomes of different technocratic processes.

Coal: Bottom-up and consensus-building solutions

The 1964 publication of a study of coal miners' health by the U.S. Public Health Service (PHS) put the black lung issue on state and federal political agendas. In following years, health activist groups pressured state governments to enact coal legislation. The Farmington coal mining disaster of November 1968, in which seventy-eight miners perished, became an instant national scandal and fueled a severe legitimacy crisis vis-à-vis existing regulations.[34] State legislatures became permeable to health activism, and several—like that of West Virginia and Alabama—responded by enacting coal mine health and safety regulations and compensation programs. The federal Coal Act, sanctioned in December 1969, emulated the prevention and compensation policies of those states (Derickson 1998). The Coal Act established the occupational exposure limit of 3mg/m^3 recommended the year before by the Department of Health, Education, and Welfare. It also set forth nation-wide health and safety norms in the mines, granted inspectorial powers to the Mine Enforcement Safety Administration, and created a federal compensation program to supplement state policies where they existed and backstop where they did not. The Coal Act became the most stringent coal legislation in the Western world,[35] even though prior to 1969 coal health and safety had been largely unregulated. This significant leap toward comprehensive federal oversight indicates the success of health activist organizations in creating a sense of urgency among legislators (Fox and Stone 1980).

[34] A wide range of interventions in the Hearings on the 1969 Coal Act, from the UMWA to the National Coal Association, discussed the "tragic" nature of the disaster and directly linked it to the necessity of better regulations. Hearings before the General Subcommittee on Labor of the Committee on Education and Labor, House of Representatives, 91st Congress, 1st session, on H.R. 4047, H.R. 4295, and H.R. 7976, bills to improve the health and safety conditions of persons working in the coal mine industry of the United States. https://www.govinfo.gov/app/details/CHRG-91hhrg29016/context. Accessed December 14th, 2023.

[35] Hearings, House of Representatives, 91st Congress, p. 280–281.

The bottom-up nature of this sequence—from activists to state legislatures to the federal Congress—opened an opportunity for consensus. The Coal Act became a prism-like political object through which every actor could claim vindication. The UMWA hailed it as an unequivocal victory for the labor movement.[36] Mine operators celebrated its fairness, as they sought to frame themselves as collaborative and responsible actors amid the crisis.[37] And federal legislators from both sides of the aisle used the Coal Act as a stepping-stone to extend the government's involvement in regulatory policy over the following decade. Occupational health policies had become as close to a cross-partisan issue as one can hope.

The relative agreement between labor, industry, and policymakers on the adequacy of the Coal Act's overall framework resulted in it becoming a consensual regulatory pipeline through which further demands could be addressed. In its aftermath, labor discourse on black lung shifted away from prevention and toward more comprehensive and easier-to-access compensation benefits. These were partially granted by the 1972 and 1977 Black Lung Benefits amendments.[38] From the early 1980s, most UMWA messaging revolved around compensation; demands to enhance prevention disappeared from labor discourse.

The repeated use of the 1969 framework to amend regulations reflects its institutionalization as the central policy instrument for improving conditions in coal mines. This lock-in effect contributed to the self-sustaining invisibilization of black lung in two ways. First, it invisibilized the Coal Act's inadequacies. In the lead up to the 1981 amendments, which significantly reduced program funding and made eligibility requirements stricter, the UMWA-BLA coalition voiced firm opposition.[39] At the implementation stage, however, resistance was much weaker. Throughout the 1980s and into the 1990s, the rate of accepted black lung claims was abysmal (under 5% in some states). This did not result in widespread questioning of the black lung program, nor did it lead to stronger labor resistance. Only after the election of the Clinton Administration in 1992 did the UMWA increase its pressure to loosen black lung

[36] BCA 0253, Box 69, Folders 7–9, Box 70, Folders 1–3, Box 74, Folder 7, Box 82, Folders 3–4.

[37] Industry statements were overwhelmingly supportive of the bill's intent and of its proposed instruments. For instance, there was no opposition to the establishment of dust standards. Rather, industry's strategy was to work within proposed parameters and request to set a transitory standard of 4.5mg/m3 (Bituminous Coal Research, Inc., p. 125). This was also the position of the Nixon administration (Secretary of Labor, p. 257). Even the most pro-regulation legislators recognized the collaborative attitude of coal operators (Rep. Ken Hechler, p. 98). House Hearing, 91st Congress.

[38] The 1972 amendments provided more extensive coverage for past and current beneficiaries of the black lung compensation program, as well as lowered the dust standard from 3mg/m^3 to 2mg/m^3. The 1977 amendments completed the federalization of the program, corrected pitfalls in eligibility requirements, and created a tax on coal production that would feed the compensation fund. BCA 0253, Box 51, Folders 1–6.

[39] BCA 0253, Box 51, Folder 7, Box 75, Folders 5–6, Box 82, Folder 4.

compensation eligibility requirements and to allocate more resources to the federal compensation board. These demands were translated into the 2001 amendments. A similar story took place regarding preventive measures. Without truly examining whether occupational exposure limits were effective in practice, mine safety standards were amended six times after the 1969 Coal Act (1972, 1977, 1981, 2001, 2010, and 2015). The occupational exposure limit was lowered to 2mg/m^3 in 1972, and again to 1.5mg/m^3 in 2016 (a limit still in effect, despite a 1995 Centers for Disease Control report that suggests lowering it to 1mg/m^3).[40]

Second, the repeated use of the 1969 framework contributed to the widespread belief that the Coal Act had solved health problems in the mines and, more importantly, that it was only a matter of time before black lung was eradicated. Yet, there was never any indication by experts that the framework would be sufficient to eliminate black lung. Quite the opposite: At the Coal Act hearings in 1969, experts such as Vernon G. Mackenzie from the PHS were keen to emphasize that a dose-response relationship existed between coal dust and black lung and that no zero-risk threshold for exposure could be identified.[41] Not only was there scarce initial expert backing for the idea that black lung would disappear, multiple evaluation reports in subsequent years affirmed that black lung remained a problem.[42] Nevertheless, the mainstream understanding from the 1980s onward was that any lingering black lung concerns reflected poor surveillance practices, not built-in regulatory inadequacies. The means of expressing this belief changed over the years, from the notion that no new miners would develop black lung disease in the post-1969 era, to the notion that the proportion of disabled miners would steadily decrease until none remained. Regardless, until the late 1990s, most actors from industry, labor, government, and civil associations were convinced that existing regulations were adequate and that black lung was on its way out. It was not.

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[40] From 1977, the Federal Mine Safety and Health act combined provisions for coal and for metal/nonmetal mines alike. Mine Safety and Health Administration, Labor. 30 C.F.R. § 70.100, Subpart B, p. 451. https://www.govinfo.gov/content/pkg/CFR-2015-title30-vol1/pdf/CFR-2015-title30-vol1-sec70-100.pdf. Accessed May 7th, 2024; U.S. Department of Health And Human Services 1995. Criteria for a Recommended Standard: Occupational Exposure to Respirable Coal Mine Dust, DHHS (NIOSH) Publication No. 95–108 https://www.cdc.gov/niosh/docs/95-106/pdfs/95-106.pdf. Accessed May 7th, 2024.

[41] Statement of Charles C. Johnson, Jr., Dr. Keith C. Morgan, Dr. Marcus M. Key, and Vernon G. Mackenzie, House Hearings, 91st congress, p. 281.

[42] BCA 0101 SAA 101, Series IV, Box 213, Folder 18; Sharp, Gerald. 1978. "Dust Monitoring and Control in the Underground Coal Mines of Eastern Kentucky," Institute for Mining and Minerals Research, University of Kentucky, 71 p.; Charles River Associates. 1973. "The Economic Impact of Public Policy on the Appalachian Coal Industry and the Regional Economy, vol. II. Impact of Environmental and Other Policies on the Appalachian Coal Industry," National Technical Information Service, 495 p. 1997ms282, Box 124, Folder 1866.

Asbestos: Top-down solutions and lingering contestation

In the Quebec asbestos case, consensus over technocratic solutions was only partially achieved, because they were developed in top-down fashion. Hence, technocratization was not self-sustained, but needed to be actively maintained by the state and the asbestos industry. The lack of consensus between unions regarding whether asbestos diseases should be pursued alongside other labor grievances resulted in more diffuse expressions of health concerns early on. Still, amid the 1975 strike, the Quebec government introduced Bill 52 to establish a compensation program for asbestosis and silicosis. The first provincial legislation specifically aimed at asbestos-induced diseases, some envisioned Bill 52 as a compromise with labor that would help shorten the strike.[43] The same year, the Liberal government established an occupational exposure limit of 5f/cc.

The 1975 strike successfully made asbestos diseases a more salient concern for legislators. In the aftermath of the strike, rising public concerns over asbestos led the government to create the Beaudry Committee on hygiene in the asbestos industry, charged with examining gaps in risk prevention and formulating policy recommendations for asbestos mines, mills, and factories. While compensation legislation was introduced in Quebec's Parliament, the call for better prevention originated in this two-year expert committee. Its preliminary report, published in April 1976, contributed to defining the problem as one of ventilation and technology implementation.[44] Emerging solutions were directly inspired by such expert views (Vézina 2018). The CSD, whose miners had not participated in the 1975 strike, criticized the technical approach of the Beaudry Committee and declared its preference for a more "comprehensive" perspective. It emphasized the need for workers to participate in developing and enforcing asbestos safety regulations, recasting the problem as one of industrial conflict and not as a merely technocratic one.[45]

The final report of the Beaudry Committee, published later in 1976, answered expert demands on many aspects. Most notably, it recommended a dust standard of 2f/cc.[46] This

[43] Jean Cournoyer, then Minister of Labor, argued that the law should detail the extent of compensation and its process to ease negotiations between industry and labor. Hansard of the Commission permanente du travail, de la main-d'oeuvre et de l'immigration, 30th Legislature, 3rd session, June 25, 1975—vol. 16 N° 161, p. B-5314. https://www.assnat.qc.ca/en/travaux-parlementaires/commissions/ctmoi-avant-1984-30-3/journal-debats/CTMOI-750625.html. Accessed June 2nd, 2023.

[44] Beaudry, René, Gilles Lagacé, Laurier Juteau, and Martin Rochette. 1976. "Rapport Préliminaire. Comité d'étude sur la salubrité dans l'industrie de l'amiante." UQAM Governmental archives.

[45] CSD. "Position de la C.S.D concernant le mandat du comité d'étude sur la salubrité de l'amiante," Montreal, October 1975, 15 p. Private archives of Micheline Marier.

[46] Beaudry, René, Gilles Lagacé, Laurier Juteau, and Martin Rochette. 1976. "Rapport Final. Comité d'étude sur la salubrité dans l'industrie de l'amiante." UQAM Governmental archives.

dust standard was adopted by the Parti Québécois government in 1978, which claimed it as a response to the will of labor. The same year, the Ministry of Social Development published a white paper on occupational health and safety that spurred wide-ranging conversation on a matter still largely left unregulated in the province.[47] This led to the *Loi sur la santé et sécurité au travail*, which granted powers to its new implementation agency, the CSST, in a format inspired by the 1970 OSH Act. Asbestos unions disagreed on whether this new legislation was sufficient: the FTQ (parent union of the Métallos) offered its full support to the government, while the CSN and CSD felt the legislation included significant downsides for labor (Marier 2016, 98–105). The main critique of the CSN was that, by centralizing compensation, prevention, and inspection powers into a single commission, the legislation would be more easily subject to regulatory capture and limit the influence of labor.[48]

Overall, the policies that followed from the Beaudry Committee's report never achieved consensus in the same way as the 1969 Coal Act did in the United States. The asbestos industry never embraced state involvement in industrial health, but suggested that it could manage risks on its own. Experts in public agencies, too, remained unconvinced by the adequacy of the legislative approach, as evidenced in several reports from the 1980s and 1990s.[49] These reports demonstrate a dislocation between the view of state experts and that of enforcing agencies. Civil associations also expressed continued concerns, notably over the management of asbestos compensation programs.[50]

This lack of consensus over technocratic solutions meant that they never completely addressed the crisis the Quebec government faced in the mid-1970s. Instead, legitimacy had to be actively pursued. In 1979, the Quebec government set up the *Institut de*

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[47] Marois, Pierre. "La Politique québécoise de la santé et de la sécurité des travailleurs," Assemblée nationale du Québec, http://www.santecom.qc.ca/Bibliothequevirtuelle/santecom/35567000041639.pdf. Accessed June 2nd, 2023.

[48] Rodrigue, Norbert for the CSN. Hansard of the Commission permanente du travail et de la main d'oeuvre. 31st Legislature, 4th Session, September 11th, 1979—vol. 21, N° 177. https://www.assnat.qc.ca/en/travaux-parlementaires/commissions/ctmo-2-avant-1984-31-4/journal-debats/CTMO-790911.html. Accessed August 20th, 2023.

[49] Bonneau, Michel. 1984. "L'industrie de l'amiante au Québec en 1983. État de la situation." Direction de la politique et de l'évaluation, Service de l'économie minérale; Laurent, Bernhard and Maxime Trottier. 1984. "Amiante et santé : État des connaissances." Direction de la politique et de l'évaluation, Service de l'économie minérale. UQAM Governmental publications.

[50] In parliamentary commission on a reform of workplace injury policies, Mrs. Delisle from the *Regroupement des femmes dont les maris sont décédés d'amiantose* (Asbestos miners' widow association) stated that "We believe that the laws administered by the [Commission] are structured to prevent people from accessing their rights." (Translation mine). Audition de personnes et d'organismes sur le projet de loi 42—Loi sur les accidents du travail et les maladies professionnelles, B-14870. https://www.assnat.qc.ca/fr/travaux-parlementaires/commissions/ctrav-avant-1984/mandats/Mandat-29131/index.html. Accessed May 30th, 2023.

recherche et de développement de l'amiante in conjunction with the QAMA, a research center tasked with researching technologies to ensure better health conditions in the mines. In 1984, QAMA created the Chrysotile Institute, a pro-asbestos think tank funded by both the federal and provincial governments to promote asbestos use.[51] The state further participated in efforts to clean up the public image of asbestos by publishing educational materials about the extent of regulatory changes.[52]

Concentration of Risks

Workers are the most affected by coal and asbestos risks, and mines are often located away from large urban centers. This concentrates risk in remote places and, by the same token, creates a spatial barrier against widespread visibility. In addition, it can lead to the normalization of disease within mining communities (Bell and Braun 2010; Van Horssen 2016). As suggested in **Figure 6**, two factors contributed to breaking down this barrier in the asbestos case: the extension of the perceived realm of risks, and international pressures that reinforced domestic legitimacy threats. In the U.S. coal case, risks were never perceived as extending beyond mining communities.

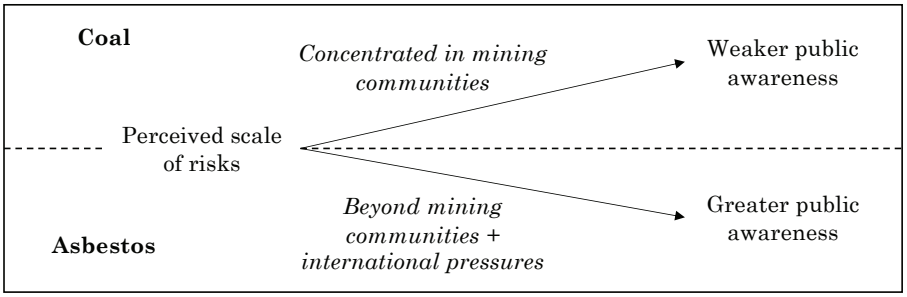

Figure 6: Outcomes of different perceived scales of risks.

In the 1970s, asbestos started to be viewed as dangerous not only as a primary resource, but also as a final product. Earlier studies had shown a relationship between exposure to fibers and adverse health outcomes at the extraction and transformation stages, suggesting that only workers were at risk. However, emerging research started to highlight that the general public was also exposed to asbestos in buildings, cars,

[51] Its focus was to promote the idea that chrysotile asbestos, the type of asbestos found in Quebec, was less harmful than other types of asbestos. For example, see Nash, Gary. 1986. "Le dossier de l'EPA contre l'amiante chrysotile est-il vraiment sérieux ?," Institut du Chrysotile, 48 p. UQAM Governmental publications.

[52] Ministère de l'Énergie et des ressources du Québec, Institut de l'amiante and Energy, Mines et Resources Canada. "Vivre avec l'Amiante," 1986. BAnQ Montreal Archives, Fonds E10, Series 77, File DVC90–651.

and the environment (McCulloch and Tweedale 2008). Since asbestos was by then widely used, these findings transformed an occupational and circumscribed issue into a broader public health crisis. In turn, the visibility of widespread risks of asbestos favored a recognition of the disproportionate burden of risks assumed by miners and their communities. Fear and uncertainty around asbestos use also fueled an unfavorable business context. The downturn of the industry in the 1980s, that is, is attributable to the public recognition of risk beyond the mines and correlate fear from investors (Van Horssen 2016). Quebec media started to report regularly on the issue in the 1990s. The 2001 INSPQ symposium and ensuing 2003 report only enhanced public scrutiny and media enquiry into the matter. And starting in the mid-2000s, health activist groups and prominent public figures began calling for an asbestos ban.[53] This loosely structured coalition of voices united in the fight against asbestos-related diseases was instrumental in challenging preexisting risk perceptions.

In the coal case, such a turning point never occurred. In the mid-1970s, the environmental impacts of coal mining drew increasing attention amid debates about the impacts of surface mining on air, water, and land quality.[54] Successive reports from state agencies such as the Bureau of Mines and the Appalachian Regional Commission testified to the seriousness of environmental problems, especially those related to water contamination, flooding, and land depletion.[55] In an era of rising environmental consciousness (Taylor 2009), these issues were taken up by regional activist groups like Appalachia: Science for the Public Interest (Chowkwanyun 2022, 189). This created a unique opportunity for extending the realm of perceived risks from miners to entire mining communities and beyond. Pressures from activists and their allies in state, regional, and federal policy circles led to the passage of the 1977 Surface Mining Control and Reclamation Act.[56] This legislation reflected a compromise between environmental concerns and the growing political consensus around coal as a dominant energy source in the United States (Chowkwanyun 2022, 183–93). In the end, the Surface Mining Act appeased political tensions and addressed the legitimacy crisis the industry faced in the region.

Debates on surface mining made more room for critical views on coal in public discourse, though they rarely included concern for miners' health. Sparse media reports

[53] Private archives of Micheline Marier.

[54] 2014ms0253, Boxes 1–2; BCA 0101 SAA 101, Series IV, Box 139.

[55] Surface Mine Pollution Abatement and Land Use Impact Investigation, Prepared for Appalachian Regional Commission, Eastern Kentucky University, Volumes I–IV, 1975, 90m1, Box 396, Folders 1–4; Proceedings of the Appalachian Minerals Evaluation Conference, June 23–24, 1976, Washington DC, p. 21. 90m1, Box 77, Folder 8.

[56] Ken Hechler, Letter to Mr. and Mrs. Caudill, October 31st, 1972. 91M2, Box 23, Folder 1.

about coal in the 1970s and 1980s implied that black lung would eventually disappear. A true renewal of public interest in dust exposure at work had to wait until the early 1990s. From 1993 to 2002, regional and national media outlets published major stories denouncing the surge in black lung rates, the ineffectiveness of the Mine Safety and Health Administration, routine falsification of dust samples by company officials, and the lack of resources for screening miners, among other problems.[57] From then on, the media framing of black lung as a soon-to-be-extinct disease was replaced by a more inquisitive attitude toward existing safeguards. In 2016–2018, an NPR series about black lung in Appalachia reinserted the debate onto the national agenda.[58] Contrary to the asbestos case, however, these reports never had a substantial impact on policy debates. The regulatory framework for addressing black lung remained essentially unchanged.

International pressures

If scrutiny about risks arose in both cases at the turn of the century, what explains the greater effect of such scrutiny on the Quebec asbestos trajectory? From the 1990s, international pressures in favor of ending asbestos mining, even banning its consumption, emulated perceptions of crisis at home and contributed to breaking down risk invisibilization. In contrast, the rising coal sector in China and India in the past few decades has strengthened the U.S. framing of coal as a necessary resource for achieving energy sovereignty. As partner states enacted restrictive asbestos policy, and as the "world audience" (Skrentny 1998) for asbestos policy became increasingly critical of Quebec's approach, domestic elites were forced to manage an ever-growing legitimacy crisis. Meanwhile, anti-asbestos forces gained leverage in regulatory debates. The passing of restrictions and bans on asbestos in neighboring and partner states put tremendous pressure on Quebec policymakers. The Baie Verte asbestos mines of Newfoundland, Canada, closed in 1981 in the aftermath of worker mobilization against mining health hazards (Rennie 1999). This set in motion a series of mine closures in U.S. states—notably in Arizona in 1982 and Vermont in 1993—that culminated with the closure of the last operating U.S. asbestos mine, the KCAC mine in California, in 2002. These events shifted risk perceptions in Quebec.

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[57] See BCA 0253, Boxes 50–53 and 2014ms0253, Box 5. See especially the 10-piece investigation by the Courier-Journal entitled "Dust, Deceit and Denial. Why Black Lung Hasn't Been Wiped Out" in 1998. BCA 0253, Box 50, Folder 5.

[58] Berkes, Howard. "Advanced Black Lung Cases Surge In Appalachia." NPR, December 15th, 2016. https://www.npr.org/2016/12/15/505577680/advanced-black-lung-cases-surge-in-appalachia. Accessed May 29th, 2023; Berkes, Howard, Huo Jingnan, and Robert Benincasa. "An Epidemic Is Killing Thousands of Coal Miners. Regulators Could Have Stopped It." NPR, December 18th, 2018. https://www.npr.org/2016/12/15/505577680/advanced-black-lung-cases-surge-in-appalachia. Accessed May 29th, 2023.

The French asbestos ban of 1997 was the most significant turning point in that regard. From its announcement the year prior, this ban served as a tipping point in public debates and spurred significant controversy. News outlets in mining regions denounced the ban as "a decision without scientific basis," and local pro-asbestos groups blamed an alleged lobby of competitor materials for this restrictive policy.[59] The close cultural and diplomatic relationship of France and Quebec contributed to greater provincial media scrutiny of asbestos risks. Provincial news outlets tempered down their once unequivocal support for the industry, adopting a more ambivalent tone. Major newspapers like Le Devoir and La Presse reported more and more on new scientific evidence about the risks of asbestos exposure to workers, their communities, and the general population. French and other international experts were increasingly featured in media reporting on the issue, much of which now compared how other nations were dealing with asbestos risks and revealed Canada and Quebec as global outliers in a move away from asbestos mining and use.

Heightened media scrutiny at home and high-profile developments in asbestos regulations abroad made it virtually impossible for Quebec's political elites not to take a stance on the asbestos issue. At the federal level, the Liberal government of Jean Chrétien promised to exert pressure on the French government in the hope that it would reverse course and lift its ban.[60] At the provincial level, the Parti Québécois government of Lucien Bouchard took a similar approach. Notably, ministers were tasked with reaching out to their French counterparts to convince them that asbestos could be mined and used safely—with proper precautions. The federal and provincial governments funded multiple conferences and events to promote the "controlled use of asbestos" at home and abroad (Castleman 2003). In conjunction with federal legislators, the provincial government also organized a 1998 visit of European diplomats to the Black Lake Mine to showcase the possibility of safe asbestos mining (Garneau 2007, 98). The *Confédération des syndicats nationaux* (CSN), the largest Canadian union representing asbestos workers, led similar diplomatic campaigns in Morocco and Brazil.[61] In 2002, the Parti Québécois government launched a new policy for enhanced use of chrysotile asbestos in public works, attempting to reverse plummeting international demand by incentivizing the use of asbestos in asphalt concrete in roadways, sewer pipes, and roofing.[62]

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[59] Courier Frontenac July 7th, 1996. Private archives of Micheline Marier.

[60] Mine d'information, August 15th, 1995. Private archives of Micheline Marier.

[61] Centre d'archives de la région de Thetford MRC, P003, Series 17, Subseries 1, Sub-sub-series 4, Folders: Bulletin Sécure-Amiante—January 24th to April 18th, 1997.

[62] Ministère de l'Énergie et des ressources naturelles. "Politique d'utilisation accrue et sécuritaire de l'amiante chrysotile au Québec," 2002, 11 p. https://mrnf.gouv.qc.ca/nos-publications/politique-amiante-chrysotile/#:~:text=R%C3%A9sum%C3%A9%3A,sant%C3%A9%20publique%20et%20l'environnement. Accessed February 10th, 2022.

Still, amid these efforts, various prominent international actors, including the World Health Organization (1998), the World Trade Organization (2000), and the European Union (2005) took a stance against asbestos use. These international pressures enhanced the legitimacy of domestic challengers to the industry. In 2010, Canada's New Democratic Party and the provincial Québec Solidaire, two left-wing minority parties, introduced bills to end asbestos mining. Despite being tabled at the introduction stage, these first-of-their-kind bills had resounding impact on public discourse in Canada. In January 2011, all 18 Regional Public Health agency directors joined forces and pressured the Quebec Minister for Economic Development, Innovation, and Exports to consider asbestos risks more seriously and ban its mining and use.[63]

When Quebec's Liberal government announced a plan for the recovery of the Jeffrey mine in April 2011, it was met with firm opposition. International organizations contributed to widespread resistance against the proposed investment. The American Asbestos Disease Awareness Organization published a statement in opposition. Demonstrations were held at the Quebec bureaus in New York, Washington, Brussels, and Seoul.[64] And during the Summer 2012 provincial election campaign, the leader of the Parti Québécois, Pauline Marois, promised to cancel the investment and put an end to asbestos mining in Quebec. Marois argued that asbestos "appears today as an industry from another age" and that "all health studies demonstrated" that it must be ended.[65] When the Parti Québécois returned to power in September 2012, it promptly followed up on Marois's promise.

The decision remains somewhat contested in ex-mining regions, but it has not been reintroduced onto the political agenda since. Asbestos was banned for most uses in Canada in 2018,[66] and the Quebec government strengthened asbestos-related work health and safety regulations in 2021.[67]

Discussion and Conclusion

In this paper, I sought to explain why U.S. coal is not challenged on the basis of health concerns in light of the Quebec asbestos case. Against explanations that emphasize economic dependence, industrial policy, or corporate interference, I argued that risk

[63] CSN. "L'amiante au-delà des mines." March 2011, Private archives of Micheline Marier.

[64] Private archives of Micheline Marier.

[65] Martin Ouellet. "Marois scelle le sort de la mine Jeffrey," Journal Métro, August 29th, 2012. https://journalmetro.com/actualites/national/147402/marois-scelle-le-sort-de-la-mine-jeffrey/. Accessed November 1st, 2024.

[66] Prohibition of Asbestos and Products Containing Asbestos Regulations, SOR/2018-196. https://laws-lois.justice.gc.ca/eng/regulations/SOR-2018-196/. Accessed November 23rd, 2024.

[67] Loi modernisant le régime de santé et de sécurité du travail, 42nd Legislature, 1st session, October 6th, 2021. https://www.assnat.qc.ca/fr/travaux-parlementaires/projets-loi/projet-loi-59-42-1.html. Accessed November 23rd, 2024.

invisibilization is the primary factor accounting for coal's persistence. I articulated this argument around three structures of risk invisibilization. First, while the UMWA-BLA coalition promoted the black lung issue in the 1970s, the cooptation of the BLA by labor contributed to its demise when the UMWA returned to a more economistic agenda in the 1980s. Meanwhile, continued confrontation between asbestos unions and activists enabled a pro-regulatory discourse independent from labor concerns and the emergence of anti-asbestos activism in Quebec. Second, the bottom-up formulation of the Coal Act made it consensual and legitimated its repeated use in amendments, as many believed the Coal Act would eventually eradicate black lung without shutting down the coal industry. Conversely, the top-down formulation of asbestos policy in Quebec made it contested and required the state to actively sustain legitimacy in the public sphere. Third, the perception of coal risks as a local issue without much resonance beyond mining communities prevented health activists from getting consistent national attention. In the asbestos case, the discovery of environmental risks extended the realm of perceived threats beyond mining communities. As international anti-asbestos legislation spread, legislators in Quebec were pressured to act. I found that, in the U.S. coal case, invisibilization was stable, consensual, deeply institutionalized, and only rarely pressured. In the Quebec asbestos case, invisibilization was built on shaky foundations, characterized by confrontation, and eventually faced insurmountable domestic and international pressures. As risks became highly visible in Quebec, a viable path to ending asbestos mining took form. Such paths never emerged in the coal case.

Findings from this paper contribute to the study of regulatory power in three ways. Labor proved to be an obstacle to health activism in both cases, albeit to different degrees. This challenges labor-centered explanations of occupational health controversies, dominant in existing historiography. By its structural position, labor could in neither case consistently support the expression of health grievances.[68] While this paper does not discard the importance of labor, in part given its important mobilization resources, it highlights when and how labor plays a central role in advancing regulatory reforms. Further, the emphasis on technocratic solutions proposed in this paper extends insights from social policy studies of how governmental programs not only structure the militant strategies of beneficiaries, but also shape how they conceptualize the problems they face (Skocpol 1992, 41). Future work on regulatory power would benefit from studies that investigate the micro-level impacts of technocratic processes and regulatory reform on activist strategies. Last, international pressures are often

[68] This remains a challenge. In the 2021–2023 UMWA Warrior Met Strike in Alabama, miners were mostly concerned with job security, and black lung was not a key part of workers' discourse. Declining coal employment in Appalachia have made labor increasingly weak in this sector, similar to what asbestos unions experienced from the 1990s in Quebec.

assumed to play a key role in toxic substance regulations at the national level (e.g., Lanier-Christensen 2021; Vogel 2012). This paper contributes to the delineation of specific mechanisms through which these pressures condition domestic debates and shape the behavior of local political elites.

The construction of risk is the end result of multi-layered processes, where actors cannot be broken down into simple categories of workers as victims, industries as perpetrators, and states as arbitrators. The framework proposed here contributes to understanding the role of macro-level actor configurations in shaping possibilities for downstream construction. Recent public health crises, the aggravation of the climate crisis, and the proliferation of industrial residues in the 21st century (Boudia et al. 2022) all urge new research in the study of regulatory power. Accelerated globalization has led to the emergence of new problems which increasingly appear out of states' reach, while increasingly resting on their shoulders (Campbell and Hall 2021). Future studies ought to investigate how international politics affects the design and implementation of domestic regulations (Perlman and Toenshoff 2024) and how the process might lead to the restructuring, strengthening, or weakening of regulatory systems operated by the environmental state (Rea and Frickel 2023).

As for coal mining, the current climate crisis provides a new opportunity to question its relevance. Clean energy transitions have gained some traction on the American left, embodied as of late by the coalition for a Green New Deal. Miners have historically been those with the most to lose from environmental regulations (Obach 2004, 103). Without assurance that their livelihood is compatible with the nation's energy future, coal miners may resist forthcoming reforms (Bolet, Green, and González-Eguino 2024), and willingly continue "digging their own graves" (Smith 2020).

APPENDIX

Collection identifier	Collection name
Hutchins Library, Berea College Special Collections and Archives	
BCA 0002 SAA 001	Council of Southern Mountains Records
BCA 0060 SAA 060	Harlan County Struggle Collection
BCA 0101 SAA 101	Council of the Southern Mountains Records, 1970–1989
BCA 0110 SAA 110	Council of the Southern Mountains Oral History Collection
BCA 0113 SAA 113	Alan J. Crain Collection
BCA 0253	Coal Vertical Files
BCA 9676	Scotia Coal Company disaster coverage, The Courier-Journal
Margaret I. King Library, University of Kentucky Special Collections Research Center	
2008ms006	Benham Coal Company Records 1911–1973
2016ms008	Anne MacKinnon coal research files
3m3006	Brent Spence papers
61m274	Thomas R. Underwood papers
63m143	Alben W. Barkley papers
72m2	Frederick Moore Vinson papers
84m1	Rogers C.B. Morton Collection 1939–1976
87m41	Coal Information Network of Kentucky Archives 1982–1986
90m1	Appalachian Regional Commission records
91m2	Anne and Harry M. Caudill Collection
92m3	James G. Wheeler papers
96m1	John B. Breckinridge papers
1985UA020	Marion Pearsall Collection, circa 1910–1984
1997ms282	John D. Whisman Papers
1997ms352	James S. Brown papers
1998ms002	Louie B. Nunn papers
2003av061	Wid Page collection on the Marlowe Coal Company
2005ms47	Frontier Nursing Service records

(Contd.)

Collection identifier	Collection name
2013ms0834	Robert F. Sexton papers
2014ms0253-001	Pauline Canterberry papers
Microfilm	Stearns Coal Strike information files 1975–1984
Université du Québec à Montréal (UQAM) Library	
–	Governmental Archives, Library of Political Science and Law
–	Institutional Publications, Library of Science
Bibliothèques et Archives nationales du Québec (BAnQ), Archives nationales in Montréal	
E5	Comité exécutif fonds
E10	Ministère des communications fonds
P56	Johns-Mainville fonds
P182	George Lakin Parker fonds
P575	Jean-Marc Phaneuf fonds
P532	William Faden fonds
P696	Fonds Jules Deschênes fonds
P718	Lucien Bouchard fonds
P839	Simonne Monet et Michel Chartrand fonds
Centre d'archives de la région de Thetford MRC des Appalaches	
P003,S17,SS1,SSS4	Bulletin Sécure-Amiante
P003,S17,SS3	Organismes de défense du chrysotile
P003,S17,SS3,SSS1	Institut de l'amiante
P003,S17,SS4	Études sur l'utilisation sécuritaire du chrysotile
P188	Fonds Comité des femmes d'appui aux mineurs
P217,S8,SS10	Bulletin de l'Association des mines d'amiante du Québec
Private archives	
–	Micheline Marier (Montreal, Canada)
–	Yv Bonnier-Viger (Montreal, Canada)
–	Association des victimes de l'amiante du Québec (Montreal, Canada)

Table A1: Archival materials.

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Competing Interests

The author has no competing interests to declare.

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