

# MAPPING THE LINK BETWEEN ESG PERFORMANCE AND LONGEVITY

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Longevity is increasingly recognized as a key societal objective, yet its relationship with corporate and community-level ESG (Environmental, Social, Governance) performance remains conceptually fragmented and empirically underexplored. Current sustainability frameworks often treat health and longevity as secondary social outcomes, rather than integrating them systematically into ESG impact measurement and decision-making. This paper maps the conceptual linkages between ESG performance and longevity by proposing an exploratory analytical framework that connects sustainability practices to long-term health and life expectancy outcomes. We argue that longevity should be understood not merely as a demographic indicator, but as a cumulative result of environmental quality, social cohesion, preventive health behaviors, and governance structures that sustain well-being over time. The framework stresses the need for measurable, comparable indicators that make longevity-related outcomes visible within ESG assessments and reporting. The paper contributes to sustainability impact measurement and offers practical implications for policymakers, municipalities, firms, and investors in aging societies.

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## 1 Introduction

Population ageing and the “longevity society” have elevated healthy life expectancy from a purely demographic statistic to a strategic societal objective with direct implications for economic resilience, public finance, and community well-being. At the same time, ESG (Environmental, Social, Governance) has become a dominant framework for structuring sustainability performance and non-financial decision-making across firms, investors, and public actors. Yet, despite the intuitive overlap between “sustainability” and “living longer and healthier,” the relationship between ESG performance and longevity remains conceptually fragmented and only weakly operationalized in mainstream ESG assessment and reporting. This paper emerges from that gap, it responds to the observation that longevity is often treated as a secondary social co-benefit, rather than an integrated outcome that can be systematically linked to E–S–G practices through traceable mechanisms and comparable indicators.

The topic is motivated by two converging developments. First, longevity is increasingly shaped by factors outside healthcare, including environmental exposures, built environments, social cohesion, and institutional capacity—domains that correspond closely to ESG pillars. Second, the rapid institutionalization of ESG measurement has highlighted persistent challenges in indicator selection, comparability, and outcome validity, especially when downstream endpoints are multi-causal and long-horizon. Against this background, the paper positions longevity as an integrative endpoint that can align ESG pillars under a long-term value lens and make explicit the “public value” dimension of ESG beyond reputational or compliance narratives.

Methodologically, the study adopts a concept-building, framework-development approach. Rather than estimating causal effects, it synthesizes relevant strands of literature and organizes them into an exploratory analytical framework that specifies plausible transmission channels from ESG-related inputs and practices to longevity-relevant endpoints. The framework is articulated through a multi-level impact perspective—community (place-based), organizational (firm-based), and program (intervention-based)—to clarify where longevity-relevant indicators can be observed, governed, and meaningfully attributed. Within each level, the paper distinguishes sequential result categories (inputs/activities, outputs, intermediate

outcomes, and ultimate outcomes) to support indicator logic that is measurable and comparable while remaining conceptually linked to life expectancy and healthy life expectancy.

The remainder of the paper is structured as follows. First, it reviews ESG as a performance and measurement domain and highlights the key challenges of comparability and outcome validity. Second, it develops the argument for longevity as an integrated ESG outcome and presents the multi-level analytical lens. Third, it maps longevity-relevant transmission channels across the environmental, social, and governance pillars. Fourth, it derives measurement implications and proposes a level-linked indicator logic to support evaluable, longevity-oriented ESG assessment. The paper concludes by summarizing contributions and outlining priorities for future empirical research.

## **2 ESG in general**

Environmental, Social, and Governance (ESG) has become a dominant umbrella for assessing corporate sustainability performance and investor-relevant non-financial risks and opportunities. In corporate finance and management research, ESG commonly operationalizes the idea that firms create (and destroy) value not only through short-term cash flows, but also through their externalities, stakeholder relationships, and institutional conduct (Gillan et al., 2021; Starks, 2023).

From a theoretical perspective, ESG aligns with stakeholder theory—i.e., the claim that firm performance and legitimacy depend on managing relationships with multiple stakeholder groups, not solely shareholders (Donaldson & Preston, 1995; Freeman et al., 2004). ESG also maps onto the natural-resource-based view of the firm, which positions environmental constraints and eco-capabilities (pollution prevention, product stewardship, sustainable development) as potential sources of durable advantage (Hart, 1995).

At the same time, ESG measurement is contested. A key problem is that ESG ratings across providers often diverge, reflecting differences in scope, weighting, data sources, and the distinction between “what a firm does” versus “what outcomes occur” (Chatterji et al., 2009; Berg et al., 2022; Gibson Brandon et al., 2021). This disagreement makes it difficult to interpret ESG as a consistent proxy for real-world

impact—especially for outcomes that are downstream, long-horizon, and multi-causal, such as health and longevity.

Empirically, many studies support a non-negative association between ESG and corporate financial performance, but the mechanisms vary by sector, geography, and measurement approach (Friede et al., 2015; Eccles et al., 2014; Halbritter & Dorfleitner, 2015). These findings have reinforced ESG’s strategic relevance while leaving open a central question for public value: how (and under what conditions) do ESG practices translate into measurable improvements in population well-being and, ultimately, longer healthy lives?

Building on ESG conceptualizations used in applied assessment work, ESG can be treated as an integrated performance domain (E, S, G) whose indicators can be tailored to organizational context while still enabling comparability across entities. However, even when “health and safety” or “community well-being” appear in social metrics, longevity is rarely framed as an explicit integrated ESG outcome with a defined pathway model and indicator logic.

## **2.1 ESG and longevity: why longevity should be treated as an integrated ESG outcome**

Longevity is often treated as a demographic indicator (e.g., life expectancy at birth, survival rates), yet public health and social epidemiology conceptualize it as a cumulative outcome shaped by environmental exposures, social conditions, and institutional arrangements across the life course (Marmot, 2005). Accordingly, longevity is not “owned” by the health sector alone but is co-produced through policies and practices in energy, transport, housing, food systems, labor markets, and governance—domains that closely map onto ESG’s three pillars.

This paper therefore reframes longevity as an integrated ESG outcome: a long-horizon measure of how environmental quality (E), social cohesion and protective behaviors (S), and governance capacity and integrity (G) jointly enable longer, healthier lives. This approach addresses the conceptual fragmentation of sustainability frameworks in which health is often positioned as a secondary social co-benefit rather than an explicit performance target.

To operationalize the ESG–longevity relationship without causal identification, we propose a multi-level analytical lens spanning place-based community conditions, firm-based organizational practices, and intervention-based programs. Across these levels, we specify plausible pathways whereby ESG inputs (policies, investments, operational changes) shape exposures and behaviors, influence intermediate health outcomes (e.g., cardiometabolic risk, mental well-being, morbidity, premature mortality), and ultimately affect longevity metrics (life expectancy and healthy life expectancy). The paper maps these channels across E, S, and G and derives implications for indicator selection, measurement validity, and comparability in ESG assessment and reporting.

## **2.2 Environmental (E) aspects of longevity**

Environmental conditions shape longevity through chronic exposure pathways (e.g., air pollution, heat, water quality), through the built environment’s structuring of behavioral opportunities (e.g., walkability, green space), and via systemic risks linked to climate change and food-system sustainability. Epidemiological evidence consistently associates long-term PM2.5 exposure with elevated cardiopulmonary mortality and lung cancer risk (Pope et al., 2002), while reductions in PM2.5 have been linked to measurable gains in life expectancy across U.S. settings (Pope et al., 2009); earlier work also documented associations between ambient air pollution and mortality across cities after accounting for individual risk factors (Dockery et al., 1993). These findings translate into ESG-relevant mechanisms across levels: community policies and urban planning that reduce emissions represent “E performance” with direct longevity relevance; organizational pollution prevention and clean production reshape local exposure profiles (Hart, 1995); and program-level interventions (e.g., fleet electrification, industrial filtration) can be monitored via emissions and ambient PM2.5 indicators and subsequently related to premature mortality trends.

Climate change is increasingly framed as a public-health threat through heat stress, extreme events, food security, and infectious disease dynamics, with the 2015 Lancet Commission synthesizing evidence and emphasizing policy responses to protect population health (Watts et al., 2015). Mitigation and adaptation therefore sit naturally within the environmental pillar, while a longevity framing makes the human endpoint explicit: decarbonization policies that also improve air quality can generate

near-term health benefits, and adaptation measures such as heat-action plans and resilient housing can reduce risks among older populations in aging societies. Diet provides another dual pathway, as it is both a determinant of health and a driver of environmental pressures; global dietary transitions can threaten ecosystems while increasing chronic disease burdens (Tilman & Clark, 2014). The EAT–Lancet Commission argues that healthy diets from sustainable food systems can jointly support planetary stability and reduce diet-related disease risks (Willett et al., 2019), and modeling studies estimate substantial health and climate co-benefits from dietary change (Springmann et al., 2016). From an ESG perspective, sustainable agriculture, reduced waste, and lower-emission supply chains can be linked to food-related exposure determinants, while their longevity relevance depends on whether they shift availability, affordability, and norms toward healthier consumption patterns.

Finally, the built environment shapes daily activity patterns and stress exposures. Evidence syntheses associate green space exposure with multiple health outcomes (Twohig-Bennett & Jones, 2018), while physical inactivity has been quantified as a major contributor to the global burden of disease with life-expectancy implications (Lee et al., 2012). Cross-city evidence further links physical activity to urban environmental attributes (Sallis et al., 2016), and urban transport strategies that reduce greenhouse-gas emissions via active travel can deliver public-health benefits through increased physical activity and lower air pollution (Woodcock et al., 2009). Although built-environment design is often treated as a public-sector domain, firms influence these pathways through location decisions, commuting policies, logistics, and community investment; accordingly, environmental ESG measurement can incorporate both place-based indicators (e.g., green space accessibility, mobility-related emissions) and organizational indicators (e.g., employee travel mode share, logistics emissions) aligned with longevity-relevant mechanisms..

### **2.3 Social aspects of longevity**

The social pillar connects most directly to longevity through the social determinants of health: inequality, social cohesion, psychosocial stress, and preventive behaviors shaped by community norms and institutional access.

Health inequalities are systematically patterned by socioeconomic conditions. Marmot (2005) highlights the social gradient in health and the role of social determinants in explaining large differences in life expectancy. Social ESG factors—such as living wage policies, employment security, inclusion and equal-opportunity practices, workforce development, and community investment—can be conceptualized as upstream interventions acting on the social determinants of health. By shaping material conditions, psychosocial stress exposure, and access to protective resources across the life course, these practices may cumulatively influence risk profiles for chronic disease and, ultimately, survival and longevity outcomes.

Social cohesion and trust can matter for mortality at population level. Evidence from U.S. ecological analysis linked social capital and income inequality to mortality patterns (Kawachi et al., 1997). More broadly, social relationships are associated with survival: a meta-analytic review found that stronger social relationships are linked to reduced mortality risk (Holt-Lunstad et al., 2010). In many ESG frameworks, “community engagement” is operationalized primarily as a reputational or license-to-operate construct, emphasizing activities and narratives rather than population-level effects. Reframing the social pillar through a longevity lens redirects analytical focus toward measurable social infrastructure—including community cohesion, volunteering and mutual-aid networks, intergenerational programs, and caregiver support systems—as plausible mechanisms that mitigate social isolation, strengthen psychosocial resilience, and support healthier aging trajectories.

Psychosocial stress and coping resources influence health behaviors and physiological pathways. The stress-buffering hypothesis emphasizes that social support can mitigate the effects of stress on well-being (Cohen & Wills, 1985). Across the life course, prevention culture and intergenerational transmission of health behaviors (nutrition norms, activity habits, help-seeking) can shape long-run morbidity and survival. While this paper does not claim a single canonical causal estimate, the literature supports the plausibility of such pathways and motivates ESG-aligned program design focused on prevention, social support, and health literacy. At the organizational level, the social pillar encompasses occupational health and safety, work–life balance arrangements, mental health and psychosocial support provision, and inclusive workplace practices. These domains can be theorized as determinants of long-run health by shaping cumulative stress exposure, burnout risk,

and the persistence of health-related behavioral patterns over time. At the community level, the social pillar extends to structured partnerships with civil society organizations and local stakeholders to implement prevention-oriented programs and cohesion-building initiatives, which may reduce loneliness and social isolation while strengthening informal support and caregiving networks that are salient for healthy aging.

#### **2.4 Governance (G) aspects of longevity**

Governance shapes longevity by determining whether resources are converted into effective, sustained, health-promoting outcomes through institutional quality, integrity, coordination capacity, and measurement systems. A recurrent insight in development economics and public administration is that governance conditions the productivity of public spending: Rajkumar and Swaroop (2008) demonstrate that the impact of public expenditures on development outcomes depends on factors such as corruption and bureaucratic quality, while cross-country evidence in health contexts indicates that corruption is negatively associated with multiple health indicators (Lio & Lee, 2016). Translating this logic to ESG, the governance pillar in corporate settings encompasses anti-corruption and compliance systems, board oversight and accountability structures, enterprise risk management, and ethical conduct standards; in community and public-sector settings it includes transparent procurement, integrity in service delivery, and evidence-informed allocation. Together, these capacities condition whether environmental and social investments are effectively implemented and maintained over time, thereby affecting the likelihood that they generate durable, population-relevant health and longevity benefits.

Because many determinants of longevity lie outside healthcare, governance for longevity requires cross-sector coordination. The Health in All Policies (HiAP) approach explicitly calls for integrating health implications across sectors and levels of government (Health in All Policies Framework for Country Action, 2014; Puska, 2014). HiAP is therefore closely aligned with the multi-level perspective advanced in this paper: by institutionalizing cross-sector integration and legitimizing decision instruments such as health/impact assessment, structured stakeholder participation, and transparency and accountability mechanisms, it provides a practical template for embedding longevity-relevant objectives into ESG strategy and implementation.

**Table 1: Multi-level ESG–Longevity integration: where to measure, attribute, and govern impacts**

Level	ESG examples	Measures	Attribution logic	Key implication
Community (place-based)	E: low-emission zones, green space expansion, active mobility infrastructure, heat-action planning. S: social infrastructure, community prevention networks, anti-loneliness initiatives. G: transparent procurement, cross-sector coordination bodies, Health-in-All-Policies-style integration	Population-facing exposures and intermediate outcomes (ambient PM2.5/NOx, heat exposure proxies, walkability/mode share, greenspace access; social cohesion/isolation proxies)	Stronger for place-based evaluation designs (before–after, difference-in-differences, natural experiments across comparable areas)	Longevity becomes analytically tractable via shared exposure environments that accumulate over time into mortality and healthy-life-expectancy patterns
Organizational (firm-based)	E: operational decarbonization, emission abatement, sustainable procurement/supply-chain standards. S: living wage, job security, OSH systems, mental health supports, DEI, training. G: anti-corruption and compliance, board oversight, ERM, ethics and reporting controls	Inputs/outputs and near-term outcomes within the reporting boundary (emissions intensity, energy mix, safety incidents, participation/coverage of wellbeing programs; workforce turnover; selected worker health proxies where feasible)	Stronger for within-firm longitudinal designs (panel analyses, matched controls); weaker for downstream population longevity without linkage to community exposure metrics	ESG→longevity linkage strengthens if firms extend reporting toward worker health trajectories and local exposure footprints, not only policies and ratings
Program (intervention-based)	E: retrofit projects, fleet electrification pilots, site-level pollution reduction. S: targeted prevention programs, workplace wellbeing interventions, intergenerational or volunteering initiatives. G: measurement frameworks, integrity/transparency upgrades in program delivery, stakeholder co-governance	Implementation outputs and intermediate outcomes (pollutants reduced; participation/compliance; behavior change such as active commuting; loneliness reduction; service uptake)	Strongest when interventions are evaluable (stepped rollout, quasi-experiments, RCTs where feasible, or robust monitoring with comparison groups)	Programs provide the practical “bridge” by producing measurable intermediate outcomes that plausibly cumulate into longevity impacts at community scale

Source: Authors' own compilation

This is particularly salient for municipalities, infrastructure providers, and large employers, whose policies and operational choices systematically structure everyday exposures, opportunity sets, and risk environments across the life course.

A further governance challenge concerns measurement and accountability. ESG disclosure can drift toward policies and narratives rather than outcomes, and evidence suggests that ratings and disclosure do not automatically capture underlying performance (Chatterji et al., 2009), while divergence across ESG ratings introduces additional interpretive uncertainty (Berg et al., 2022; Gibson Brandon et al., 2021). A longevity-oriented measurement perspective therefore requires an explicit indicator logic that differentiates sequential result levels, distinguishing ESG inputs and activities (e.g., emissions-reduction investments, preventive health initiatives) from outputs (e.g., pollutants reduced, coverage and participation rates) and from intermediate outcomes that reflect changes in exposures and behaviors (e.g., lower ambient PM<sub>2.5</sub>, increased active commuting, reduced loneliness). These intermediate outcomes constitute the most tractable bridge to ultimate outcomes, where longevity-relevant endpoints are captured by longer-horizon indicators such as premature mortality trends and changes in life expectancy and healthy life expectancy. The goal is not to collapse ESG evaluation into life expectancy alone—which is slow-moving and highly confounded—but to design a traceable results chain in which longevity serves as the coherent endpoint and intermediate indicators are selected to be measurable, comparable, and plausibly connected to survival and healthy aging trajectories.

The level-based perspective in Table 1 provides a coherent way to connect ESG performance to longevity because ESG-related actions are typically enacted at different analytical levels, whereas longevity is a downstream endpoint that emerges from the cumulative interaction of multiple determinants over long time horizons. The community level is crucial for rendering measurable the shared exposure environments—such as ambient air quality, heat risk, active-living infrastructure, and social isolation—that plausibly shape mortality and healthy life expectancy through life-course processes. The organizational level specifies how firm-level E–S–G practices influence both worker health trajectories and local exposure footprints, while also determining the scope for coordination with local stakeholders and public institutions. The program level, in turn, offers the strongest basis for attribution, as discrete interventions generate observable outputs and intermediate outcomes—

such as emission reductions, participation and coverage rates, behavior change, or reduced loneliness—within evaluable time frames. The central implication is that treating longevity as an ESG-relevant outcome requires moving beyond input and output reporting toward an explicit results chain that links program-level intermediate outcomes to community-level exposure metrics, thereby establishing a traceable pathway to longer-run longevity indicators (life expectancy and healthy life expectancy) and strengthening the empirical and governance foundations of longevity-oriented ESG strategies.

### **3 Conclusion**

This paper conceptualizes longevity as a societally salient, integrative endpoint that can align the environmental, social, and governance pillars of ESG within a coherent long-term value framework. The core contribution is the development of a structured transmission-channel map showing how improvements in environmental quality and climate resilience may reduce harmful exposures and expand the conditions for healthy living, how social cohesion, a prevention-oriented culture, and supportive workplace and community environments may attenuate psychosocial stressors and strengthen protective behaviors, and how governance quality—through integrity, coordination capacity, and measurement transparency—conditions whether environmental and social investments are effectively implemented and sustained so that they translate into durable, population-relevant health and longevity outcomes.

The proposed multi-level impact perspective spanning community, organizational, and programmatic levels helps to specify where longevity-relevant indicators can be most meaningfully observed, attributed, and governed. It also clarifies why longevity remains comparatively underexamined within ESG research and practice, given that it is a downstream endpoint shaped by multiple interacting determinants over long time horizons and is frequently situated beyond firms' conventional reporting boundaries. Nevertheless, the literature synthesized in this study supports the plausibility and policy salience of ESG-consistent pathways through which environmental conditions, social determinants, and governance capacities may jointly contribute to longer and healthier lives, particularly in aging societies. Future empirical research can build on this framework by strengthening identification strategies for place-based interventions, extending firm-level ESG analyses to

incorporate worker health trajectories and community exposure metrics, examining whether improvements in transparency and integrity increase the health returns to environmental and social investment, and advancing measurement methodology by developing longevity-linked indicator sets that reduce rating divergence and enhance cross-entity comparability.

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